



KOUGA LOCAL MUNICIPALITY

JULY 2022

BID NUMBER: 122/2022

TENDER DOCUMENT

FOR THE

UPGRADING OF THE LOERIE SPORTS FACILITY

(GENERAL CONDITIONS OF CONTRACT FOR CONSTRUCTION WORKS, THIRD EDITION, 2015)

VOLUME 1 (TENDER DOCUMENT)

A tender for an estimated Category 4CE or higher CIDB Registered Contractors

ISSUED BY:	PREPARED BY:
KOUGA LOCAL MUNICIPALITY Infrastructure and Engineering Directorate 33 Da Gama Road JEFFREYS BAY 6330 Contact Person : Mr J du Toit Tel : (042) 200 2200 Email: infrastructuretenders@kouga.gov.za	BOSCH PROJECTS (PTY) LTD P O Box 27158 Greenacres PORT ELIZABETH 6057 Contact Person : Mr L Streicher Tel : (041) 363 0598 Email : streicherl@boschprojects.co.za
Registered Name of Bidder:	
TRADING NAME OF BIDDER:	
Registration No. of Entity:	
Contact Person:	Kouga Local Municipality Supplier Code:
Tel. No.:	E-mail Address:
Cell No.:	Fax No:
CIDB CRS Number(s):	CIDB Grading:
FINANCIAL OFFER:	

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GENERAL TENDER INFORMATION

TENDERS INVITED	: 25 July 2022
ESTIMATED CIDB CONTRACTOR GRADING	: 4CE or higher
CLARIFICATION MEETING	: A compulsory Clarification Meeting will be held on 08 August 2022 at 12h00.
VENUE FOR SITE VISIT / CLARIFICATION MEETING	: ZOOM Meeting
CLOSING DATE	: Wednesday, 31 August 2022
CLOSING TIME	: 12:00:00 PM / 12h00
CLOSING VENUE	: Tender Box at the Municipal Office, Room 122, 16 Woltemade Street (front) / 21 St. Croix Street (back), Jeffreys Bay
VALIDITY PERIOD OF TENDER	: 120 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.

DETAILED 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	

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UPGRADING OF THE LOERIE SPORTS FACILITY
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T1 TENDERING PROCEDURES

T1.1 TENDER NOTICE AND INVITATION TO TENDER

T1.2 TENDER DATA

T1.1 TENDER NOTICE AND INVITATION TO TENDER



BID NOTICE

KOUGA LOCAL MUNICIPALITY (EC108)
DIRECTORATE: INFRASTRUCTURE AND ENGINEERING
NOTICE NO: 122/2022

ADVERTISEMENT - UPGRADING OF LOERIE SPORTS FACILITY

Suitably qualified, capable and experienced Contractors are hereby invited to submit tenders for the Upgrading of the Loerie Sports Facility.

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 Monday, 25 July 2022. After downloading the tender document from the website each prospective bidder **MUST** send a request to tenders@kouga.gov.za and copied to jdutoit@kouga.gov.za.

The link will also be available on the municipal website.

A compulsory virtual clarification session will be arranged for the **08 August 2022 @ 12h00. Any RSVP or show of interest, received after the 11:30am on the 08 August 2022 would not be considered.**

Join Zoom Meeting:

<https://kouga-gov-za.zoom.us/j/92685775647?pwd=bWxyNWs2WkVGb3VOUXJ6THEvSDVDZz09>

Please note:

- Telegraphic, telephonic, telex, facsimile, email or late tenders will not be accepted.
- This contract will be evaluated on the 80/20point scoring system.
- **An electronic copy of the completed tender document with returnable documents must be submitted with tender submission saved a 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.**
- **The Guidelines for locally produced goods or locally manufactured goods with a stipulated minimum threshold will be applied (details in document).**
- **An estimated contractor CIDB Grading of 4CE or higher is required.**
- **A minimum functional assessment score of 70% will apply to this contract.**
- A valid SARS Tax compliance Status pin to be submitted.
- Prospective Service Providers must register on Kouga Municipality's Supplier database as per the registration requirements.

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- The National Treasury Central Supplier Database Summary report must be submitted.
- In order to claim Preference points a valid originally or certified B-BBEE Status level Verification certificate or a Sworn Affidavit completed on the DTI format must be submitted to validate the claim.
- 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 must be 120 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: 122/2022: “UPGRADE OF LOERIE SPORTS FACILITY”**”, must be placed in the Tender Box 21 St Croix Street (back entrance) or 16 Woltemade Street (front entrance), Jeffrey’s Bay, Room 122 on or before **WEDNESDAY, 31st AUGUST 2022 at 12:00.**

C. DU PLESSIS
MUNICIPAL MANAGER

P.O. Box 21
JEFFREYS BAY
6330

KOUGA LOCAL MUNICIPALITY
UPGRADING OF THE LOERIE SPORTS FACILITY
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**PART A
INVITATION TO BID**

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (NAME OF MUNICIPALITY/ MUNICIPAL ENTITY)					
BID NUMBER:	122/2022	CLOSING DATE:	WEDNESDAY, 31 ST AUGUST 2022	CLOSING TIME:	12h00
DESCRIPTION	UPGRADING OF LOERIE SPORTS FACILITY				
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]	☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT		☐ Yes ☐ 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?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]	2. ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ 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	Mr Jacques du Toit
CONTACT PERSON		TELEPHONE NUMBER	042-200-2200
TELEPHONE NUMBER	042-200-2200	FACSIMILE NUMBER	n/a
FACSIMILE NUMBER		E-MAIL ADDRESS	jdutoit@kouga.gov.za
E-MAIL ADDRESS	tenders@kouga.gov.za		

PART B

TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:	
1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.	
1.2. ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED– (NOT TO BE RE-TYPED) OR ONLINE	
1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.	
2. TAX COMPLIANCE REQUIREMENTS	
2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.	
2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.	
2.3 APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.	
2.4 FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3.	
2.5 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.	
2.6 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED; EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.	
2.7 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.	
3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS	
3.1. IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO
3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO
3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO
3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO
3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?	☐ YES ☐ NO
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.	

**NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.
NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.**

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:

DATE:

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 Number	Tender Data
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F.1	General
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F.1.1	Actions
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The Employer is **KOUGA LOCAL MUNICIPALITY**.

F.1.2	Tender Documents
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Add the following:

The following documents form part of this tender:

VOLUME 2 : 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 3: 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.

Volumes 2 and 3 may also be inspected, by appointment, at the offices of the Employer during normal office hours.

The Tender Documents issued by the Employer comprise:

VOLUME 1:

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

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C1.3 - Form of Guarantee

Part C2: Pricing data
C2.1 - Pricing assumptions
C2.2 - Bill of Quantities

VOLUME 2:

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 & Safety Requirements and Procedures

Part C4: Annexures (including Drawings)

F.1.3 Interpretation

F.1.3.2 *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.

F.1.4 Communication and Employer's Agent

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:

The Employer's Agent is:

Bosch Projects (Pty) Ltd
P O Box 27158
Greenacres
Port Elizabeth
6057
Contact Person: Mr L Streicher
Tel: (041) 363 0598
Email: streicherl@boschprojects.co.za

F.1.5 Cancellation and Re-Invitation of Tenders

*Delete the full stop at the end of F.1.5.1 c) and replace with, or
Add the following after F.1.5.1 c):*
d) there is a material irregularity in the tender process.

F.1.6.2 Competitive negotiation procedure

Add the following to F.1.6.2.1:
A competitive negotiation procedure will not be followed.

F.1.6.3 Proposal procedure using the two-stage system

Add the following between F.1.6.3 and F.1.6.3.1:
A two-stage system will not be followed.

Add the following after F.1.6.3.2.2

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

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F.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.

F.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

F.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.

F.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.

F.1.6.4.5 All requests referring to clause F.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.

F.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*.

F.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.

F.2 Tenderer's obligations

F.2.1 Eligibility

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

F.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 F.2.1.2:

F.2.1.3 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.

F.2.1.4 Only those tenders that satisfy the following criteria will be declared responsive:

F.2.1.4.1 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 **4CE class of construction work** or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations.

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

F.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.

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F.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 MUST BE SUBMITTED** in the applicable Returnable Schedules.

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.

FUNCTIONALITY SCORING SCHEDULE		
1. Quality Management System		
Valid ISO9001 quality management system	5	/5
Non-accredited quality management system in place for a minimum of 6 months	2	
No Quality Management System / No proof of quality management system attached	0	
2. Company Experience in Contracts of Similar Nature (Attach Letter of Appointment and Completion Certificate for each contract)		
2.1 Number of contracts completed [in Civil Infrastructure with value of each more than R5 Million]		
5 or more contracts	40	/40
3 – 4 contracts	20	
1 – 2 contracts	10	
0 contracts / No company track record attached to T2.3.4 / No Completion Certificate	0	
3. Key Personnel: Qualifications and Experience		
3.1.1 Contracts Manager – Civil Engineering Field		
BEng / BSc / BTech	5	/5
National Diploma	2	
No qualification / No qualification(s) or CV attached to T2.3.5	0	
3.1.2 Contracts Manager – Civil Engineering Field		
10+ years	5	/5
6 – 10 years	2	
3 – 5 years	1	
0 – 3 years / No experience / No CV attached to T2.3.5	0	
3.2.1 Construction Manager (Site Agent) – Civil Engineering Field		
BEng / BSc / BTech	5	/5
National Diploma / N6	2	
No Qualification / No qualification(s) or CV attached to T2.3.6	0	
3.2.2 Construction Manager (Site Agent) - Experience in Civil Engineering Field		
10+ years	5	/5
6 – 10 years	3	
3 – 5 years	2	
0 – 3 years / No experience / No CV attached to T2.3.6	0	
3.3.1 OH&S Officer (SACPMP registered minimum requirement)		
10+ years	5	/5
6 – 10 years	2	
3 – 5 years	1	
0 – 3 years / No experience / No CV attached to T2.3.7	0	
4. Locality (Municipal billing clearance certificate/ Lease agreement/ Latest tax invoices for municipal account of address where company operates from in its Business Name):		
Business within Kouga Local Municipality	30	/30
Business within Sarah Baartman District Municipality and the NMBM Area	25	
Business Outside of the above areas	15	
TOTAL FUNCTIONALITY POINTS		/100

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The minimum score for functionality is **70%**. Tenderers that fail to achieve the minimum score for functionality will be declared as Non-Responsive, and will not be evaluated any further.

If any of the work scope component will be Sub-Contracted, or be executed by a Joint Venture partner, a signed Sub-Contractor's Agreement or a signed JV-Agreement **MUST** be included in this Tender Document, to submit a valid and responsive tender.

Where the entity tendering is a Joint Venture the tender must be accompanied by a statement **describing exactly what aspects and percentages of the full Work Scope 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.

F.2.1.4.4 Local Content

- a) The supplier shall study the terms and conditions as stated in the **Local Content Declaration / Annexure C** returnable schedule.

F.2.1.4.4.1 The stipulated minimum threshold percentages for local production and content for this bid are as follows:

Description of services, works or goods	Stipulated minimum threshold
Cement and Concrete	100%
Cables	90%

F.2.1.4.4.2 Only tenders with locally produced or locally manufactured raw material or input will be considered. If the raw material or input to be used for a specific item is not available locally, bidders should obtain written authorisation from the Department of Trade and Industry (DTI) (Chief Director: Industrial Procurement, tel. 012 394 3927 and fax 012 394 4927) should there be a need to import such raw material or input.

F.2.1.4.4.3 A copy of the authorisation letter must be submitted together with the bid document at the closing date and time of the bid.

F.2.1.4.4.4 The Employer is obliged and must ensure that contracts for **the designated sector** are awarded at prices that are market related taking into account, among others, benchmark prices designated by the DTI for the sector, value for money and economies of scale. Where appropriate, prices may be negotiated with preferred bidders in accordance with provisions for Negotiation with Preferred Bidders as set out in the Kouga Local Municipality's SCM Policy.

F.2.1.4.4.5 A bid will be declared non-responsive / disqualified if the **Local Content Declaration / Annexure C** returnable schedule T2.1.11 as well as the authorisation letter referred to above (if applicable) are not submitted as part of the bid documentation at the closing date and time of the bid.

F.2.1.4.4.6 For further information relating to the local production and content legislation, bidders may refer to website http://www.thedti.gov.za/industrial_development/ip.jsp, or may contact the Chief Director: Industrial Procurement at the DTI at telephone number (012) 394 3927 and fax (012) 394 4927, the Director: Fleet Procurement, at telephone number (012) 394 3927, or the DTI Contact Centre no 0861 843384.

F.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.

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

F.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.

F.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.

F.2.3 Check documents

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

F.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.

F.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.

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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.

F.2.12 Alternative tender offers

F.2.12.1 *Add the following to F.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

F.2.12.3 *Add the following to F.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.

F.2.13 Submitting a tender offer

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

F.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 F.2.13.3 at the end of the first sentence:

F.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 F.2.13.5 at the end of the first sentence:

F.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: 88/22: Upgrading of the Loerie Sports Facility

Sealed tenders with the Tenderer's name and address and the endorsement "**BID NO. 122/2022 : UPGRADE OF THE LOERIE SPORTS FACILITY**" on the envelope, must be placed in the appropriate official tender box at the abovementioned address.

Add the following to F.2.13.6:

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

Add the following after F.2.13.9:

F.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.

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- F.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 F.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 F.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 F.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.
- F.2.15 **Closing time**
Add the following to F.2.15.1 after the first sentence:
- F.2.15.1 The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.
- F.2.16 **Tender offer validity**
Add the following to F.2.16.1 after the first sentence:
- F.2.16.1 The tender offer validity period is **(120 calendar days)**.
- F.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.
- F.2.17 **Clarification of tender offer after submission**
Add the following to F.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.
- F.2.18 **Provide other material**
Delete the following word in F.2.18.1:
- F.2.18.1 notarized
- Add the following to F.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.

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

F.2.18.3 *Add the following after F.2.18.2:*

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.

F.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.

F.2.23 **Certificates**

Add the following after the first sentence:

The tenderer is required to submit the following:

F.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.

F.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 F.2.23.2 :

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F.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 F.3.8.2 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.

F.3 The Employer's undertakings

F.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 F.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.

F.3.4 Opening of tender submissions

Add the following to F.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.

F.3.8 Test for responsiveness

F.3.8.2 Delete par F.3.8.2 (c)

Replace the final sentence of F.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 F.3.8.2

F.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.

F.3.9 Arithmetical errors, omissions and discrepancies

Add the following after clause F.3.9.2

F.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.

F.3.10 Clarification of a tender offer

Delete the clause and replace with the following:

F.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.

F.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.

F.3.11.3(3) Add the following after par F.3.11.3(3):

In addition, the various deemed B-BBEE Status Level of Contributor in accordance with the relevant Codes can be attained and such tenderers must be awarded the appropriate number of points.

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It should be noted that such Deemed B-BBEE Status Level of Contribution can be enhanced or discounted in accordance with the relevant clauses in the applicable Codes.

F.3.11.3(4) *Delete the heading and replace with the following:*

The 80/20 preference point system for acquisition of services, works or goods up to Rand value of R50 million

F.3.11.3(4)(a)(i) *Delete the first sentence of par F.3.11.3(4)(a)(i) and replace with the following:*

(4) (a)(i) The following formula must be used to calculate the points for price in respect of tenders (including price tender) with a rand value equal to, or above R 30'000 and up to Rand value of R50'000'000 (all applicable taxes included):

Delete the text under the formula and replace with the following:

Where

Ps = Points scored for price of tender or offer under consideration;

Pt = Price of tender or offer under consideration; and

Pmin = Price of lowest acceptable tender or offer.

F.3.11.3(4)(a) *Amend the number of points for status level 3 as follows:*

B-BBEE status level of contributor	Number of points
3	14

F.3.11.3(5) *Delete the heading and replace with the following:*

The 90/10 preference point system for acquisition of services, works or goods with a Rand value above R50 million

F.3.11.3(5)(a)(i) *Delete the first sentence of par F.3.11.3(5)(a)(i) and replace with the following:*

(5) (a)(i) The following formula must be used to calculate the points for price in respect of tenders (including price tender) with a rand value above R50'000'000 (all applicable taxes included):

Delete the text under the formula and replace with the following:

Where

Ps = Points scored for price of tender or offer under consideration;

Pt = Price of tender or offer under consideration; and

Pmin = Price of lowest acceptable tender or offer.

F.3.11.3(5)(a) *Amend the number of points for status level 3 as follows:*

B-BBEE status level of contributor	Number of points
3	6

F.3.11.7 *Delete the text in the final row of the table and replace with the following:*

a	P_m is the offer of the most favourable offer. P is the offer of the tender offer under consideration.
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F.3.11.7 Scoring Financial Offers

Add the following:

The financial offer will be scored using **Formula 2 (Option 1)**.

F.3.11.8 Scoring Preferences

Add the following:

Points will be awarded to tenderers who are eligible for preferences in terms of the **Preference Schedule** (where preferences are granted in respect of B-BBEE contribution) which is included in T2.2 Returnable Schedules.

The terms and conditions of the **Preference Schedule** shall apply in all respects to the tender evaluation process and any subsequent contract.

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- F.3.11.10** *Add the following after F.3.11.9:*
Risk Analysis
Notwithstanding compliance with regard to CIDB registration or any other requirements of the tender, the employer will perform a risk analysis in respect of the following:
a) reasonableness of the financial offer
b) reasonableness of unit rates and prices
- The conclusions drawn from this risk analysis will be used by the Employer in determining the acceptability of the tender offer in terms of F.3.13 b).
- F3.13** **Acceptance of tender offer**
Delete F.3.13 and replace with the following):
Accept the tender offer, if in the opinion of the employer, it does not present any material risk and only if the tenderer:
- Delete F.3.13 a) and replace with the following):*
a) is not under restrictions, has any principals who are under restrictions, or is not currently a supplier to whom notice has been served for abuse of the supply chain management system, preventing participation in the employer's procurement,
- If an award cannot be made in terms of anything contained herein, the Employer reserves the right to consider the next ranked tenderer(s).
- F.3.16** **Notice to unsuccessful tenderers**
Replace the heading above with:
Notice to successful and unsuccessful tenderers
- F.3.16.1** *Delete the clause and replace with the following:*
Before accepting the tender of the successful tenderer, the Employer shall notify the successful tenderer in writing of the decision of the Employer's Bid Adjudication Committee to award the tender to the successful tenderer. No rights shall accrue to the successful tenderer in terms of this notice.
- F.3.16.2** *Delete clause F.3.16.2 and replace with the following:*
The Employer shall, at the same time as notifying the successful tenderer of the Bid Adjudication Committee's decision to award the tender to the successful tenderer, also give written notice to the other tenderers informing them that they have been unsuccessful.
- F.3.17** **Provide copies of the contract**
Add the following after the first sentence:
The number of paper copies of the signed contract to be provided by the Employer is one.
- F.3.19** *Add the following after F.3.19*
F.3.20 **Negotiations with preferred tenderers**
The Employer may negotiate the final terms of a contract with tenderers identified through a competitive tendering process as preferred tenderers provided that such negotiation:
a) does not allow any preferred tenderer a second or unfair opportunity;
b) is not to the detriment of any other tenderer; and
c) does not lead to a higher price than the tender as submitted.
- If negotiations fail to result in acceptable contract terms, the Municipal Manager (or his delegated authority) may terminate the negotiations and cancel the tender or invite the next ranked tenderer for negotiations. The original preferred tenderer should be informed of the reasons for termination of the negotiations. If the decision is to invite the next highest ranked tenderer for negotiations, the failed earlier negotiations may not be reopened by the Kouga Municipality.
- Minutes of any such negotiations shall be kept for record purposes.
- The provisions of this clause will be equally applicable to any invitation to negotiate with any other tenderers.
- In terms of the PPPFA Regulations, 2017, tenders must be cancelled in the event that negotiations fail to achieve a market related price with any of the three highest scoring tenderers.

Annex F
(normative)
Standard Conditions of Tender

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).

F.1 General

F.1.1 Actions

F.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 F.2 and F.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

F.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.

F.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.

F.1.2 Tender Documents

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

F.1.3 Interpretation

F.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.

F.1.3.2 These conditions of tender, the tender data and tender schedules which are only required for tender evaluation purposes, shall not form part of any contract arising from the invitation to tender.

F.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 fulfil his or her duties impartially;
 - ii) an individual or organisation 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 organisation which employs that employee.
- b) **comparative offer** means the price after the factors of a non-firm price and all unconditional

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- 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;
- e) **organization** means a company, firm, enterprise, association or other legal entity, whether incorporated or not, or a public body;
- f) **functionality** means the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

F.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.

F.1.5 Cancellation and Re-Invitation of Tenders

F1.5.1 An organ of state 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 services, works or goods requested; or
- (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.

F1.5.2 The decision to cancel a tender must be published in the CIDB website and in the government Tender Bulletin for the media in which the original tender invitation was advertised.

F1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

F.1.6 Procurement procedures

F.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to F.3.13, be concluded with the tenderer who in terms of F.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.

F.1.6.2 Competitive negotiation procedure

F.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 F.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of F.3.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

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

F.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to make a fresh 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.

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

F.1.6.3 Proposal procedure using the two stage-system

F.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.

F.1.6.3.2 Option 2

F.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.

F.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.

F.2 Tenderer's obligations

F.2.1 Eligibility

F.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.

F.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.

F.2.2 Cost of tendering

F.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.

F.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.

F.2.3 Check documents

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

F.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.

F.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.

F.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.

F.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.

F.2.8 Seek clarification

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

F.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.

F.2.10 Pricing the tender offer

F.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 14 days before the closing time stated in the tender data.

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

F.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.

F.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.

F.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.

F.2.12 Alternative tender offers

F.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.

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

F.2.12.3 An alternative tender offer may only be considered in the event that the main tender offer is the winning tender.

F.2.13 Submitting a tender offer

F.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, services or supply identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

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F.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.

F.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.

F.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.

F.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.

F.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 proposall and place the remaining returnable documents in an envelope marked —technical proposall. 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.

F.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.

F.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.

F.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.

F.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.

F.2.15 Closing time

F.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.

F.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.

F.2.16 Tender offer validity

F.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.

F.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.

F.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.

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

F.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 F.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.*

F.2.18 Provide other material

F.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.

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

F.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.

F.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.

F.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.

F.2.22 Return of other tender documents

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

F.2.23 Certificates

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

F.3 The employer's undertakings

F.3.1 Respond to requests from the tenderer

F.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five working days before the tender closing time stated in the Tender Data and notify all tenderers who drew procurement documents.

F.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, 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.

F.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 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 drew documents.

F.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.

F.3.4 Opening of tender submissions

F.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.

F.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.

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

F.3.5 Two-envelope system

F.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.

F.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.

F.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.

F.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.

F.3.8 Test for responsiveness

F.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.

F.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.

F.3.9 Arithmetical errors, omissions and discrepancies

F.3.9.1 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with F.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.

F3.9.2 The employer must correct the arithmetical errors in the following manner:

- a) Where there is a discrepancy between the amounts in words and amounts in figures, the amount in words shall govern.
- b) 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.
- c) 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.

Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of the arithmetical error in the manner described above.

F.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.

F.3.11 Evaluation of tender offers

F.3.11.1 General

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate them using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

F.3.11.2 Method 1: Price and Preference

In the case of a price and preference:

- 1) Score tender evaluation points for price
- 2) Score points for BBBEE contribution
- 3) Add the points scored for price and BBBEE.

F.3.11.3 Method 2: Functionality, Price and Preference

In the case of a functionality, price and preference:

- 1) Score functionality, rejecting all tender offers that fail to achieve the minimum number of points for functionality as stated in the Tender Data.
- 2) No tender must be regarded as an acceptable tender if it fails to achieve the minimum qualifying score for functionality as indicated in the tender invitation.
- 3) Tenders that have achieved the minimum qualification score for functionality must be evaluated further in terms of the preference points system prescribed in paragraphs 4 and 4 and 5 below.

The 80/20 preference point system for acquisition of services, works or goods up to Rand value of R1 million

4) (a)(i) The following formula must be used to calculate the points for price in respect of tenders (including price tender) with a rand value equal to, or above R 30 000 and up to Rand value of R 1 000 000 (all applicable taxes included):

$$P_s = 80 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

P_s = Points scored for comparative price of tender or offer under consideration;

P_t = Comparative price of tender or offer under consideration; and

$P_{\min}$ = Comparative price of lowest acceptable tender or offer.

- (4) (a)(ii) An employer of state may apply the formula in paragraph (i) for price tenders with a value less than R30 000, if and when appropriate:
- (4) (b) Subject to subparagraph(4)(c), points must be awarded to a tender for attaining the B-BBEE status level of contributor in accordance with the table below:

B-BBEE status level of	Number of points
1	20
2	18
3	16
4	12
5	8
6	6
7	4
8	2
Non-compliant contributor	0

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- (4) (c) A maximum of 20 points may be allocated in accordance with subparagraph (4)(b)
- (4) (d) The points scored by tender in respect of B-BBEE contribution contemplated in subparagraph (4) (b) must be added to the points scored for price as calculated in accordance with subparagraph (4)(a).
- (4) (e) Subject to paragraph 4.3.8 the contract must be awarded to the tender who scores the highest total number of points.

The 90/ 10 preference points system for acquisition of services, works or goods with a Rand value above R 1 million

(5)(a) The following formula must be used to calculate the points for price in respect of tenders with a Rand value above R1 000 000 (all applicable taxes included):

90/10

$$P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

P_s = Points scored for comparative price of tender or offer under consideration;

P_t = Comparative price of tender or offer under consideration; and

P_{min} = Comparative price of lowest acceptable tender or offer.

(5)(b) Subject to subparagraph(5)(c), points must be awarded to a tender for attaining the B- BBEE status level of contributor in accordance with the table below:

B-BBEE status level of contributor	Number of points
1	10
2	9
3	8
4	5
5	4
6	3
7	2
8	1
Non-compliant contributor	0

- (5)(c) A maximum of 10 points may be allocated in accordance with subparagraph (5)(b).
- (5)(d) The points scored by tender in respect of B-BBEE contribution contemplated in subparagraph (5) (b) must be added to the points scored for price as calculated in accordance with subparagraph (5)(a).
- (5)(e) Subject to paragraph 4.3.8 the contract must be awarded to the tender who scores the highest total number of points.

F.3.11.4 Decimal places

Score price, preference and functionality, as relevant, to two decimal places.

F.3.11.5 Scoring Price

Score price of remaining responsive tender offers using the following formula:

$$NFO = W_1 \times A$$

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where: NFO is the number of tender evaluation points awarded for price.
 W_1 is the maximum possible number of tender evaluation points awarded for price as stated in the Tender Data.
 A is a number calculated using the formula and option described in Table F.1 as stated in the Tender Data.

Table F.1: Formulae for calculating the value of A

Formula	Comparison aimed at achieving	Option 1 ^a	Option 2 ^a
1	Highest price or discount	$A = (1 + \frac{(P - P_m)}{P_m})$	$A = P / P_m$
2	Lowest price or percentage commission / fee	$A = (1 - \frac{(P - P_m)}{P_m})$	$A = P_m / P$
^a P_m is the comparative offer of the most favourable comparative offer. P is the comparative offer of the tender offer under consideration.			

F.3.11.6 Scoring preferences

Confirm that tenderers are eligible for the preferences claimed in accordance with the provisions of the tender data and reject all claims for preferences where tenderers are not eligible for such preferences.
 Calculate the total number of tender evaluation points for preferences claimed in accordance with the provisions of the tender data.

F.3.11.7 Scoring functionality

Score each of the criteria and sub criteria for quality in accordance with the provisions of the Tender Data.

Calculate the total number of tender evaluation points for quality using the following formula:

$$N_Q = W_2 \times S_O / M_S$$

where: S_O is the score for quality allocated to the submission under consideration; M_S is the maximum possible score for quality in respect of a submission; and
 W_2 is the maximum possible number of tender evaluation points awarded for the quality as stated in the tender data

F.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.

F.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:

- is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
- 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,
- has the legal capacity to enter into the contract,
- is not insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act, 2008, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his 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.

F.3.14 Prepare contract documents

F.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.

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

F.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.

F.3.16 Notice to unsuccessful tenderers

F.3.16.1 Notify the successful tenderer of the employer's acceptance of his tender offer by completing and returning one copy of the form of offer and acceptance before the expiry of the validity period stated in the tender data, or agreed additional period.

F.3.16.2 After the successful tenderer has been notified of the employer's acceptance of the tender, notify other tenderers that their tender offers have not been accepted.

F.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.

F.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.

F3.19 Transparency in the procurement process

F3.19.1 The CIBD prescripts require that tenders must be advertised and be registered on the CIDB Tender system.

F3.19.2 The employer must adopt a transparency model that incorporates the disclosure and accountability as transparency requirements in the procurement process.

F3.19.3 The transparency model must identify the criteria for selection of projects, project information template and the threshold value of the projects to be disclosed in the public domain at various intervals of delivery of infrastructure projects.

F3.19.4 The client must publish the information on a quarterly basis which contains the following information:

- Procurement planning process
- Procurement method and evaluation process
- Contract type
- Contract status

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- Number of firms tendering
- Cost estimate
- Contract title
- Contract firm(s)
- Contract price
- Contract scope of work
- Contract start date and duration
- Contract evaluation reports.

F3.19.5 The employer must establish a Consultative Forum which will conduct a random audit in the implementation of the transparency requirements in the procurement process.

F3.19.6 Consultative Forum must be an independent structure from the bid committees.

F3.19.7 The information must be published on the employer's website.

F 3.19.8 Records of such disclosed information must be retained for audit purposes.

Annex G
(normative)

Alpha-numerics 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

T2 RETURNABLE DOCUMENTS

The following documents are to be completed and returned, as they constitute the tender. Whilst many of the returnables are required for the purpose of evaluation of 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 the Tenderers return **all information requested**.

T2.1 RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES		
The Tenderer's attention is drawn to clause F2.23 of the Tender Data which stipulates that failure to submit the returnable schedules listed below will result in the Tenderer being declared <u>non-responsive</u>. In the event of a Joint Venture, the Tenderers attention is drawn to clause F2.1 of the Tender Data which stipulates that failure to submit the returnable schedules listed below for each member of the Joint Venture will result in the Tenderer being declared <u>non-responsive</u>.		
T2.1.1	Authority of Signatory	Tick if completed and submitted
T2.1.2	JV Agreement	Tick if completed and submitted
T2.1.3	Status of Concern Submitting Tender	Tick if completed and submitted
T2.1.4	Business Registration Documents (e.g. Certificate of Incorporation)	Tick if completed and submitted
T2.1.5	Proof of Registration with the Construction Industry Development Board (CIDB)	Tick if completed and submitted
T2.1.6	Three (3) Year Audited Financial Statements (applicable to contracts in excess of R10 million)	Tick if completed and submitted
T2.1.7	Proof of Registration with Central Supplier Database	Tick if completed and submitted
T2.1.8	Payments of Municipal Accounts	Tick if completed and submitted
T2.1.9	Tax Compliance Status Report Issued with a Pin (MBD2)	Tick if completed and submitted
T2.1.10	Declaration of Interest in Tender of Persons in Service of the State (MBD4)	Tick if completed and submitted
T2.1.11	Declaration Certificate for Local Production and Content (MBD6.2)	Tick if completed and submitted
T2.1.12	Declaration of Tenderer's Past Supply Chain Management Practises (MBD8)	Tick if completed and submitted
T2.1.13	Certificate of Independent Bid Determination (MBD9)	Tick if completed and submitted
T2.1.14	Declaration Concerning Fulfillment of the Construction Regulations, 2014	Tick if completed and submitted
T2.1.15	Declaration of Indemnity	Tick if completed and submitted
T2.1.16	Schedule of Work satisfactorily carried out by the Tenderer for Private Clients or Organs of State	Tick if completed and submitted
T2.1.17	Certificate of Site Inspection	Tick if completed and submitted
T2.1.18	Record of Addenda to Tender Documents	Tick if completed and submitted

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T2.1.19	Personnel Schedule and Contract Organogram	Tick if completed and submitted
T2.2 RETURNABLE SCHEDULES REQUIRED FOR PREFERENCE SCORING PURPOSES		
The Tenderer's attention is drawn to clause F2.23 of the Tender Data which stipulates that failure to submit the returnable schedules listed below will result in the Tenderer <u>scoring zero points</u> for Preference. In the event of a Partnership / Joint Venture / Consortium, a consolidated BBBEE Verification Certificate must be submitted for the Partnership / Joint Venture / Consortium, failure to submit the returnable schedules listed below will result in the Tenderer <u>scoring zero points</u> for Preference.		
T2.2.1	Preference Points Claim Form for 80/20 version (MBD6.1)	Tick if completed and submitted
T2.2.2	Broad Based Black Economic Empowerment (BBBEE) Certificate (MBD6.1)	Tick if completed and submitted
T2.3 RETURNABLE SCHEDULES REQUIRED FOR FUNCTIONALITY SCORING PURPOSES		
The Tenderers attention is drawn to clause F2.23 of the Tender Data which stipulates that failure to submit the returnable schedules listed below will result in the Tenderer <u>scoring zero points</u> for Functionality for the relevant category for which the returnable was not submitted.		
T2.3.1	Functionality Scoring	Tick if completed and submitted
T2.3.2	Quality Management Systems	Tick if completed and submitted
T2.3.3	Company Track Record	Tick if completed and submitted
T2.3.4	CV of Contracts Manager	Tick if completed and submitted
T2.3.5	CV of Site Agent	Tick if completed and submitted
T2.3.6	CV of Health and Safety Officer	Tick if completed and submitted
T2.4 OTHER DOCUMENTS AND AFFIDAVITS THAT WILL BE INCORPORATED INTO THE CONTRACT		
All documents contained in Volume 1 and Volume 2 will form part of the offer submitted by the Tenderer and will form part of the Contract if the Tenderer's offer is accepted by the Employer.		

**T2.1 RETURNABLE SCHEDULES REQUIRED FOR TENDER
EVALUATION PURPOSES**

T2.1.1 AUTHORITY OF 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	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
..... (Position in the Enterprise), and who will sign as follows:
..... be, and is hereby, authorized to sign the Bid/Tender,
and any and all documents and/or correspondence in connection with this tender and any
Contract resulting from it on behalf of the company.

As witnesses:

- | | | | |
|----|--|------------|--|
| 1. | | Chairman : | |
| 2. | | Date : | |

	NAME	CAPACITY	SIGNATURE
1			
2			
3			
4			
5			

NOTE:

1. *Delete which is not applicable.
2. NB: This resolution must be signed by all the Directors/Members/Partners of the Bidding Enterprise.
3. Should the number of Directors/Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

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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 (Position in the Enterprise), and who will sign as follows: be, and is hereby, authorized to sign the Bid/Tender, and any and all documents and/or correspondence in connection with this tender and any Contract resulting from it on behalf of the company.

NAME	ADDRESS	SIGNATURE	DATE

NOTE:

1. *Delete which is not applicable.
2. NB: This resolution must be signed by all the Directors/Members/Partners of the Bidding Enterprise.
3. 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 AND CONSORTIA

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

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

NAME OF FIRM	LEAD PARTNER (X)	ADDRESS	% OF CONTRACT VALUE	AUTHORISING SIGNATURE, NAME & CAPACITY

NOTE:

1. *Delete which is not applicable.
2. NB: This resolution must be signed by all the Directors/Members/Partners of the Bidding Enterprise.

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3. Should the number of Directors/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 : Sole owner : _____
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 _____, (Position in the Enterprise), and who will sign as follows: _____be, and is hereby, authorized to sign the Bid/Tender, and any and all documents and/or correspondence in connection with this tender and any Contract resulting from it on behalf of the company.

NAME	ADDRESS	SIGNATURE	DATE

NOTE:

1. *Delete which is not applicable
2. NB: This resolution must be signed by all the Directors/Members/Partners of the Bidding Enterprise
3. Should the number of Directors/Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

T2.1.2 JV AGREEMENT

Attach as part of your tender submission a duly completed and signed joint venture agreement in the case of the tender being submitted as joint venture.

T2.1.3 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

IF THE TENDERING ENTITY IS A:		DOCUMENTATION TO BE SUBMITTED WITH THE TENDER
1	<u>Closed Corporation</u> , 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	<u>Private Company</u> incorporated with share capital, under the companies Act, 1973, Act 61 of 1973. (including Companies incorporated under Art 53 (b)).	Copies of: CIPRO CM 1 - Certificate of Incorporation CIPRO CM 29 – Contents of Register of Directors, Auditors and Officers Shareholders Certificates of all Members of the Company.
3	<u>Private Company</u> incorporated with share capital, under the companies Act, 1973, Act 61 of 1973 in which any, or all, <u>shares are held by another</u> 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.

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IF THE TENDERING ENTITY IS A:		DOCUMENTATION TO BE SUBMITTED WITH THE TENDER
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 of the Company's Secretary confirming that the Company is a public Company. Copy of CM 29.
5	Sole Proprietary or a Partnership.	Copy of the Identity Document of: Such Sole Proprietary, or Each of the Partners in the Partnership Copy of the Partnership agreement.
6	Co-operative.	CIPRO CR2 - Copies of Company registration document. (The percentage of work to be done by each partner must clearly be indicated on Form RDB1 (or RDB2 as applicable) of the tender document: MBD6.1 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:

- 1) 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.
- 2) Include a copy of the Certificate of Change of Name (CM9) if applicable.
- 3) Registered For Vat Purposes In Terms Of The Value-Added Tax Act, (Act No. 89 of 1991).

(TICK APPROPRIATE BOX)	
YES	NO

REGISTRATION NO:

T2.1.4 BUSINESS REGISTRATION DOCUMENTS (E.G. CERTIFICATE OF INCORPORATION)

Attach as part of your tender submission the documentation to be submitted with the tender in terms of returnable T2.1.3 Status of Concern Submitting Tender, item 2 Information to be Provided.

T2.1.5 PROOF OF REGISTRATION WITH THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD (CIDB)

Tenderers shall attach to this page, proof of Registration with the Construction Industry Development Board, or other such documentation which records the Tenderer's name, CIDB grading and CRS No. for verification by the municipality.

CRS Number	
------------	-------

T2.1.6 THREE (3) YEAR AUDITED ANNUAL FINANCIAL STATEMENTS
--

Tenderers must attach hereto original audited financial statements of their company for the past three years. In the case of a joint venture, audited financial statements of all companies must be attached.

T2.1.7 PROOF OF REGISTRATION WITH THE CENTRAL SUPPLIER DATABASE
--

All businesses and suppliers wishing to conduct business with the Kouga Local Municipality must register on the Central Supplier Database.

Tenderers must attach to this page a copy of their confirmation of registration.

T2.1.8 PAYMENTS OF MUNICIPAL ACCOUNTS
--

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 Rates Clearance Certificate which provides proof that his payment of Municipal accounts is up-to-date.

These certificates are obtainable from the municipal Supply Chain Management Office, 16 Woltemade Street (front) / 21 St. Croix Street (back), Jeffreys Bay

Should the Tenderer not be based in the Kouga Local Municipality, he must submit a Rates Clearance Certificate issued by the municipality in which he is based.

The Tenderer is referred to the clause F3.13 of the Tender Data.

T2.1.9 TAX COMPLIANCE STATUS REPORT ISSUED WITH A PIN (MBD2)

In terms of Clause 14(1)(b) 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.

1. In order to meet these requirement bidders are required to complete in full 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 Partnership / Joint Venture / Consortium 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.

The Tenderer must submit a Tax Compliance Status PIN to allow Supply Chain Management to verify the real-time compliance status.

Tax Compliance Status PIN	
---------------------------	-------

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

**T2.1.10 DECLARATION OF INTEREST IN TENDER OF PERSONS IN
SERVICE OF STATE (MBD4)**

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

(TICK APPROPRIATE BOX)	
YES	NO
☐	☐

If yes, state particulars:

.....
.....

If yes, 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 are in the service of the state, or have been in the service of the state during the past twelve months.

(TICK APPROPRIATE BOX)	
YES	NO
☐	☐

If yes, 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 are in the service of the state, or have been in the service of the state during the past twelve months.

(TICK APPROPRIATE BOX)	
YES	NO
☐	☐

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If yes, 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.

(TICK APPROPRIATE BOX)	
YES	NO
☐	☐

If so, state particulars:

.....
.....

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

(TICK APPROPRIATE BOX)	
YES	NO
☐	☐

If yes, state particulars:

.....
.....

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

T2.1.11 DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT (MBD6.2)

This Municipal Bidding Document (MBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017 and the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:201x.

1. General Conditions

- 1.1. Preferential Procurement Regulations, 2011 (Regulation 9.1) and 9(3) make provision for the promotion of local production and content.
- 1.2. Regulation 9(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.
- 1.3. Regulation 9(3) prescribes that where there is no designated sector, a specific bidding condition may be included, that only locally produced services, works or goods or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered.
- 1.4. Where necessary, for bids referred to in paragraphs 1.2 and 1.3 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.
- 1.5. A person awarded a contract in relation to a designated sector, may not subcontract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 1.6. The local content (LC) as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 201x as follows:

$$LC = 1 - (x / y) * 100$$

Where:

x = imported content

y = bid price excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid as required in paragraph 4.1 below.

- the bidder fails to achieve the stipulated minimum threshold for local production and content indicated in paragraph 3 below; and
- this declaration certificate is not submitted as part of the bid documentation.

- 2.1. **“bid”** includes advertised competitive bids, written price quotations or proposals;
- 2.2. **“bid price”** price offered by the bidder, excluding value added tax (VAT);
- 2.3. **“contract”** means the agreement that results from the acceptance of a bid by an organ of state;
- 2.4. **“designated sector”** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;
- 2.5. **“duly sign”** means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility (close corporation, partnership or individual).
- 2.6. **“imported content”** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;
- 2.7. **“local content”** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;
- 2.8. **“stipulated minimum threshold”** means that portion of local production and content as determined by the Department of Trade and Industry; and
- 2.9. **“sub-contract”** means the primary contractor’s assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.

Description of services, works or goods	Stipulated minimum threshold
Building Materials (bricks, cement, sand / stone)	<u>100</u> %
_____	_____ %
	_____ %

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4. Does any portion of the services, works or goods offered have any imported content?

(TICK APPROPRIATE BOX)	
YES	NO

4.1 If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.6 of the general conditions must be the rate(s) published by the SARB for the specific currency at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid.

The relevant rates of exchange information are accessible on www.reservebank.co.za.

Indicate the rate(s) of exchange against the appropriate currency in the table below:

Currency	Rates of Exchange	Date
US Dollar		
Pound		
Sterling		
Euro		
Yen		
Other		

NB: Bidders must submit proof of the SARB rate (s) of exchange used.

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LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID No.

ISSUED BY: (Procurement Authority / Name of Municipality / Municipal Entity):

.....

NB The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.

I, the undersigned, (full names), do hereby declare, in my capacity as of(name of bidder entity), the following:

- (a) The facts contained herein are within my own personal knowledge.
- (b) I have satisfied myself that the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286.
- (c) The local content has been calculated using the formula given in clause 3 of SATS 1286 ($LC = (1-x/y) \times 100$), the rates of exchange indicated in paragraph 4.1 above and the following figures:

Bid price, excluding VAT (y)	<u>R 10,000.00</u>
Imported content (x)	<u>R 1,000.00</u>
Stipulated minimum threshold for Local (paragraph 3 above)	_____
Local content % as calculated in terms of SATS 1286	_____

If the bid is for more than one product, a schedule of the local content by product shall be attached.

(d) I accept that the Procurement Authority / Municipality /Municipal Entity has the right to request that the local content be verified in terms of the requirements of SATS 1286.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286, may result in the Procurement Authority / Municipal / Municipal Entity imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2011 promulgated under the Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

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

T2.1.12 DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES (MBD8)

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 will 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 disqualified.

ITEM	QUESTION	RESPONSE	
4.1	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? (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). The Database of Restricted Suppliers now resides on the National Treasury's website(www.treasury.gov.za)	(TICK APPROPRIATE BOX)	
		Yes	No
If so, furnish particulars:			
4.2	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)? (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)	(TICK APPROPRIATE BOX)	
		Yes	No
If so, furnish particulars:			

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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?	(TICK APPROPRIATE BOX)	
		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?	(TICK APPROPRIATE BOX)	
		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?	(TICK APPROPRIATE BOX)	
		Yes	No
If so, furnish particulars:			

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

T2.1.13 CERTIFICATE OF INDEPENDENT BID DETERMINATION (MBD9)

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

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- (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 will be reported to the National Prosecuting Authority (NPA) for criminal investigation and or will 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.

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

T2.1.14 DECLARATION CONCERNING FULFILMENT OF THE CONSTRUCTION REGULATIONS, 2014

In terms of the Construction Regulations, 2014 (hereinafter referred to as the Regulations), promulgated on 7 February 2014 in terms 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:

1. 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 APPROPRIATE BOX)	
YES	NO
☐	☐

2. 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)	☐
Own resources, still to be hired and/or trained (until competency is achieved)	☐
Specialist subcontract resources (competent) - Specify:	☐
	☐
	☐
	☐
	☐
	☐
	☐

3. 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 (SACPCMP Registration of Health and Safety Officer be attached):

Position	Name	Registration
Health and Safety Officer		

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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 Schedule 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 APPROPRIATE BOX)	
YES	NO

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

T2.1.15 DECLARATION OF INDEMNITY

I,, the undersigned, for and on behalf of, (hereinafter referred to as “the Tenderer”) hereby indemnify and safeguard the Kouga Local Municipality and its employees and agents against all action, suits, proceedings, claims, demands, costs and expenses whatsoever which may be instituted, brought or sent, or may be incurred or be payable by the council arising out of or in connection with any damage, death or injury caused or alleged to have been caused by or as a result of any act, omission by the Tenderer and/or the Tenderer’s employee or employees arising out of work done in connection with or arising out of this Tender and / or Contract.

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

**T2.1.16 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 successfully executed by me / ourselves:

EMPLOYER, CONTACT PERSON AND TELEPHONE NUMBER	DESCRIPTION OF CONTRACT	VALUE OF WORK INCLUSIVE OF VAT (RAND)	DATE COMPLETED

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.....

T2.1.17 CERTIFICATE OF SITE INSPECTION

This is to certify that (Tenderer)
has inspected the site and acquainted 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 into account any constraints
and conditions on and surrounding the site when compiling our rates and prices included in the tender.

Particulars of person(s) who inspected the site:

Name Signature

Capacity

Name Signature

Capacity

*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

T2.1.18 RECORD OF ADDENDA TO TENDER DOCUMENTS

We confirm that the communications listed below were received from the Employer or the Employer's Agent before the submission of this tender offer, amending or amplifying the tender documents, have been taken into account in this tender offer.

NO	DATE	TITLE OR DETAILS
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

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

T2.1.19 PERSONNEL SCHEDULE AND CONTRACT ORGANOGRAM

The Tenderer is to insert the number of personnel he proposes employing on this Contract and must attach to this page the organogram for the Contract of the personnel he intends using. **Failure to submit the organogram** will result in the Tenderer scoring zero for key personnel in both qualifications and experience.

JOB DESCRIPTION	PERMANENT STAFF	TEMPORARY STAFF FROM LOCAL COMMUNITY
Contracts Manager		
Construction Manager (Site Agent)		
OH&S Officer		
* Other		
* Other		
* Other		

* To be filled in by Tenderer

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

T2.2 RETURNABLE SCHEDULES REQUIRED FOR PREFERENCE SCORING PURPOSES

T2.2.1 PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017 (MBD6.1)

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution.

NB BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- a) The 80/20 system for requirements with a Rand value of up to R50 000 000.00 (all applicable taxes included); and
- b) The 90/10 system for requirements with a Rand value above R50 000 000.00 (all applicable taxes included).

1.2 The value of this bid is estimated to be below R50 000 000.00 and therefore the (80/20) system shall be applicable.

1.3 Preference points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contribution.

1.3.1 The maximum points for this bid are allocated as follows:

	POINTS
1.3.1.1 PRICE	80
1.3.1.2 B-BBEE STATUS LEVEL OF CONTRIBUTION	20
Total points for Price and B-BBEE must not exceed	<u>100</u>

1.4 Failure on the part of a bidder to fill in and/or to sign this form and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS) or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA) or an Accounting Officer as contemplated in the Close Corporation Act (CCA) together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.5 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

- 2.1 **“all applicable taxes”** includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;
- 2.2 **“B-BBEE”** means broad-based black economic empowerment as defined in section 1 of the Broad -Based Black Economic Empowerment Act;
- 2.3 **“B-BBEE status level of contributor”** means the B-BBEE status received by a measured entity based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
- 2.4 **“bid”** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of services, works or goods, through price quotations, advertised competitive bidding processes or proposals;
- 2.5 **“Broad-Based Black Economic Empowerment Act”** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- 2.6 **“comparative price”** means the price after the factors of a non-firm price and all unconditional discounts that can be utilized have been taken into consideration;
- 2.7 **“consortium or joint venture”** 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;
- 2.8 **“Contract”** means the agreement that results from the acceptance of a bid by an organ of state;
- 2.9 **“EME”** means any enterprise with an annual total revenue of R5 million or less.
- 2.10 **“Firm price”** means the price that is only subject to adjustments in accordance with the actual increase or decrease resulting from the change, imposition, or abolition of customs or excise duty and any other duty, levy, or tax, which, in terms of the law or regulation, is binding on the Contractor and demonstrably has an influence on the price of any supplies, or the rendering costs of any service, for the execution of the Contract;
- 2.11 **“functionality”** means the measurement according to predetermined norms, as set out in the bid documents, of a service or commodity that is designed to be practical and useful, working or operating, taking into account, among other factors, the quality, reliability, viability and durability of a service and the technical capacity and ability of a bidder;
- 2.12 **“non-firm prices”** means all prices other than “firm” prices;
- 2.13 **“person”** includes a juristic person;
- 2.14 **“rand value”** means the total estimated value of a Contract in South African currency, calculated at the time of bid invitations, and includes all applicable taxes and excise duties;
- 2.15 **“sub-Contract”** means the primary Contractor’s assigning, leasing, making out work to, or employing, another person to support such primary Contractor in the execution of part of a project in terms of the Contract;
- 2.16 **“total revenue”** bears the same meaning assigned to this expression in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based

Black Economic Empowerment Act and promulgated in the *Government Gazette* on 9 February 2007;

- 2.17 **“trust”** means the arrangement through which the property of one person is made over or bequeathed to a trustee to administer such property for the benefit of another person; and
- 2.18 **“trustee”** means any person, including the founder of a trust, to whom property is bequeathed in order for such property to be administered for the benefit of another person.

3. ADJUDICATION USING A POINT SYSTEM

- 3.1 The bidder obtaining the highest number of total points will be awarded the Contract.
- 3.2 Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts;
- 3.3 Points scored must be rounded off to the nearest 2 decimal places.
- 3.4 In the event that two or more bids have scored equal total points, the successful bid must be the one scoring the highest number of preference points for B-BBEE.
- 3.5 However, when functionality is part of the evaluation process and two or more bids have scored equal points including equal preference points for B-BBEE, the successful bid must be the one scoring the highest score for functionality.
- 3.6 Should two or more bids be equal in all respects; the award shall be decided by the drawing of lots.

4. POINTS AWARDED FOR PRICE

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

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

80/20 or 90/10

$$P_s = 80 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right) \quad \text{or} \quad P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where:

- P_s = Points scored for comparative price of bid under consideration
- P_t = Comparative price of bid under consideration
- $P_{\min}$ = Comparative price of lowest acceptable bid

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5. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTION

- 5.1 In terms of Regulation 5 (2) and 6 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE STATUS LEVEL OF CONTRIBUTOR	NUMBER OF POINTS (90/10 SYSTEM)	NUMBER OF POINTS (80/20 SYSTEM)
1	10	20
2	9	18
3	8	14
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

- 5.2 Bidders who qualify as EMEs in terms of the B-BBEE Act must submit 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.
- 5.3 Bidders other than EMEs must submit 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.
- 5.4 A trust, consortium or joint venture, will qualify for points for their B-BBEE status level as a legal entity, provided that the entity submits their B-BBEE status level certificate.
- 5.5 A trust, consortium or joint venture will qualify for points for their B-BBEE status level as an unincorporated entity, provided that the entity submits their consolidated B-BBEE scorecard as if they were a group structure and that such a consolidated B-BBEE scorecard is prepared for every separate bid.
- 5.6 Tertiary institutions and public entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.
- 5.7 A person will not be awarded points for B-BBEE status level if it is indicated in the bid documents that such a bidder intends sub-contracting more than 25% of the value of the Contract to any other enterprise that does not qualify for at least the points that such a bidder qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-Contract.
- 5.8 A person awarded a Contract may not sub-Contract more than 25% of the value of the Contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the Contract is sub-contracted to an EME that has the capability and ability to execute the sub-Contract.

6. BID DECLARATION

- 6.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

7. B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF PARAGRAPHS 1.3.1.2 AND 5.1

- 7.1 B-BBEE Status Level of Contribution: = (maximum of 20 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 5.1 and must be substantiated by means of a B-BBEE certificate issued by a Verification Agency accredited by SANAS or a Registered Auditor approved by IRBA or an Accounting Officer as contemplated in the CCA).

8 SUB-CONTRACTING

- 8.1 Will any portion of the Contract be sub-contracted?
YES / NO (delete which is not applicable)

- 8.1.1 If yes, indicate:

(i) what percentage of the Contract will be subcontracted?
.....%

(ii) the name of the sub-contractor?

(iii) the B-BBEE status level of the sub-contractor?

(iv) whether the sub-contractor is an EME?

YES / NO (delete which is not applicable)

9 DECLARATION WITH REGARD TO COMPANY/FIRM

9.1 Name of firm :

9.2 VAT registration number :

9.3 Company registration number :

9.4 TYPE OF COMPANY/ FIRM (TICK APPLICABLE BOX)

- ☐ Partnership / Joint Venture / Consortium
- ☐ One-person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

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9.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

.....

.....

.....

.....

9.6 COMPANY CLASSIFICATION (TICK APPLICABLE BOX)

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional service provider
- ☐ Other service providers, e.g. transporter, etc.

9.7 MUNICIPAL INFORMATION

Municipality where business is situated

Registered Account Number

Stand Number

9.8 TOTAL NUMBER OF YEARS THE COMPANY/FIRM HAS BEEN IN BUSINESS?

9.9 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contribution indicated in paragraph 7 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we 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 paragraph 7, the Contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- (iv) If the B-BBEE status level of contribution has been claimed or obtained on a fraudulent basis or any of the Conditions of Contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –
- a) disqualify the person from the bidding process;
- b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

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- 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) restrict the Bidder or Contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent
- e) basis, 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
- f) forward the matter for criminal prosecution

WITNESSES:

- 1.
- 2.

.....

SIGNATURE(S) OF BIDDER(S)

DATE:

ADDRESS:

.....

.....

T2.2.2 BROAD BASED BLACK ECONOMIC EMPOWERMENT (BBBEE) CERTIFICATE (MBD6.1)

Attach as part of your tender submission the documentation to be submitted with the tender in terms of returnable T2.2.1 Preference Points Claim Form for 90/10 Version (MBD6.1).

In the event of a Partnership / Joint Venture / Consortium, a consolidated BBBEE Verification Certificate must be submitted for the Partnership / Joint Venture / Consortium, failing which the Tenderer will score zero points for Preference.

T2.3RETURNABLE SCHEDULES REQUIRED FOR FUNCTIONALITY SCORING PURPOSES
--

T2.3.1 FUNCTIONALITY SCORING

In accordance with Tender Data F3.11, Method 2: Functionality, Price and Preference will be used for the evaluation of tender offers. In accordance with F3.11.3 the following will apply:

- 1) Functionality will be scored by a minimum of three Bid Evaluation Committee members appointed by the Employer. The scores of each of the evaluators will be averaged to obtain the final score for quality.
- 2) All tenders that fail to achieve the minimum number of points for functionality as stated in clause F3.11 of the Tender Data will be **rejected**.
- 3) Tenders that have achieved the minimum qualification score for functionality (70% or 70/100) will be evaluated further in terms of the preference points system as stated in clause F3.11.

The functionality criteria are:

- 1) Project Organogram (5 points)
- 2) Quality Management System (5 points)
- 3) Company Experience (40 points)
- 4) Key Personnel (25 points)
- 5) Financial References (Bank Rating) (25 points)

Functionality points for the Tenderer are scored as per the Functionality Scoring Schedule, the requirements of each criteria are described below. Failure to provide verifiable proof for the various criteria will result in a score of **zero points** for the particular criterion.

1. PROJECT ORGANOGRAM

The Tenderer is to attach a project organogram of the key personnel the Tenderer intends employing on this contract to returnable schedule T2.3.2.

2. QUALITY MANAGEMENT SYSTEM

The Tenderer is to attach proof of a quality management system to returnable schedule T2.3.3.

3. COMPANY EXPERIENCE IN CONTRACTS OF SIMILAR NATURE

The Tenderer is to attach a record of completed contracts of a similar nature and value to returnable schedule T2.3.4.

4. KEY PERSONNEL: QUALIFICATIONS AND EXPERIENCE

The key personnel for this contract are as follows:

4.1 Contracts Manager

The Contracts Manager is the director / partner / member who takes ultimate responsibility for the contract.

4.2 Construction Manager (Site Agent)

The Construction Manager is the person to whom the Contractor has assigned the responsibility of contractual and on-site activities on behalf of the Contractor relating to the contract. The Construction Manager shall be solely dedicated to this contract and shall be on site at all times when work is being performed.

4.3 General Foreman

The General Foreman is the person to whom the Contractor has assigned the responsibility of supervising the teams engaged in construction activities. The General Foreman shall be solely dedicated to this contract and shall be on site at all times when work is being performed.

4.4 EME Manager

The EME Manager is the person to whom the Contractor has assigned the responsibility of ensuring compliance with EME Management and Section C3.3 Procurement. -

Note :

- *Key personnel must correspond to the project organogram Returnable T2.3.2.*
- *Should a substitution of any of the key personnel be allowed, only a person with the same or higher qualifications and experience will be accepted.*

5. FINANCIAL REFERENCES

The Tenderer is to attach a letter from the bank at which he declares he conducts his account to returnable schedule T2.3.10.

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.

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FUNCTIONALITY SCORING SCHEDULE		
1. Quality Management System		
Valid ISO9001 quality management system	5	/5
Non-accredited quality management system in place for a minimum of 6 months	2	
No Quality Management System / No proof of quality management system attached	0	
2. Company Experience in Contracts of Similar Nature (Attach Letter of Appointment and Completion Certificate for each contract)		
2.1 Number of contracts completed [in Civil Infrastructure with value of each more than R5 Million]		
5 or more contracts	40	/40
3 – 4 contracts	20	
1 – 2 contracts	10	
0 contracts / No company track record attached to T2.3.4 / No Completion Certificate	0	
3. Key Personnel: Qualifications and Experience		
3.1.1 Contracts Manager – Civil Engineering Field		
BEng / BSc / BTech	5	/5
National Diploma	2	
No qualification / No qualification(s) or CV attached to T2.3.5	0	
3.1.2 Contracts Manager – Civil Engineering Field		
10+ years	5	/5
6 – 10 years	2	
3 – 5 years	1	
0 – 3 years / No experience / No CV attached to T2.3.5	0	
3.2.1 Construction Manager (Site Agent) – Civil Engineering Field		
BEng / BSc / BTech	5	/5
National Diploma / N6	2	
No Qualification / No qualification(s) or CV attached to T2.3.6	0	
3.2.2 Construction Manager (Site Agent) - Experience in Civil Engineering Field		
10+ years	5	/5
6 – 10 years	3	
3 – 5 years	2	
0 – 3 years / No experience / No CV attached to T2.3.6	0	
3.3.1 OH&S Officer (SACPMP registered minimum requirement)		
10+ years	5	/5
6 – 10 years	2	
3 – 5 years	1	
0 – 3 years / No experience / No CV attached to T2.3.7	0	
4. Locality (Municipal billing clearance certificate/ Lease agreement/ Latest tax invoices for municipal account of address where company operates from in its Business Name):		
Business within Kouga Local Municipality	30	/30
Business within Sarah Baartman District Municipality and the NMBM Area	25	
Business Outside of the above areas	15	
TOTAL FUNCTIONALITY POINTS		/100

T2.3.2 QUALITY MANAGEMENT SYSTEMS

The Tenderer is to attach to this page a copy of their valid ISO9001 quality certificate or proof of other non-accredited quality management system that has been in place for a minimum of 6 months used by the Contractor.

T2.3.3 COMPANY TRACK RECORD

The Tenderer shall attach hereto a Company Track Record of contracts of a similar nature. The Tenderer shall state details of the Contract as stipulated in the table below, as well as referee names, contact details **and certificates of completion**. Failure to provide Certificates of Completion will result in zero points awarded to company experience.

EMPLOYER	CONSULTING ENGINEER	CONTRACT NO	NATURE OF WORK	TELEPHONE NUMBERS	CONTRACT VALUE	CONTRACT DURATION	YEAR COMPLETED

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EMPLOYER	CONSULTING ENGINEER	CONTRACT NO	NATURE OF WORK	TELEPHONE NUMBERS	CONTRACT VALUE	CONTRACT DURATION	YEAR COMPLETED

T2.3.4 CV OF CONTRACTS MANAGER

The Tenderer hereby notifies the Employer that the Curriculum Vitae of the proposed Contracts Manager is as attached hereto **including certified copies of qualifications** and confirms that the proposed Contract's Manager is currently employed by the Tenderer.

Should a substitution be allowed, only a person with the same or higher qualifications and experience will be accepted.

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	

T2.3.5 CV OF SITE AGENT

The Tenderer hereby notifies the Employer that the Curriculum Vitae of the proposed Site Agent is as attached hereto **including certified copies of qualifications** and confirms that the proposed Site Agent is currently employed by the Tenderer.

The Site Agent is the person to whom the Contractor has assigned the responsibility of decision making and supervision on all matters relating to the on-site activities. He shall be committed to the project fulltime. Should a substitution be allowed, only a person with the same or higher qualifications and experience will be accepted.

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	

2.3.6 CV OF HEALTH AND SAFETY OFFICER
--

The Tenderer hereby notifies the Employer that the Curriculum Vitae of the proposed Health and Safety Officer is as attached hereto **including certified copies of qualifications** and confirms that the proposed Health and Safety Officer is currently employed by the Tenderer. The Health and Safety Officer must be SACPCMP registered.

Should a substitution be allowed, only a person with the same or higher qualifications and experience will be accepted.

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	

C1 AGREEMENT AND CONTRACT DATA

- C1.1 FORM OF OFFER AND ACCEPTANCE
- C1.2a CONTRACT DATA (PART 1)
- C1.2b CONTRACT DATA (PART 2)
- C1.3 FORM OF PERFORMANCE GUARANTEE (PRO FORMA)
- C1.4 HEALTH AND SAFETY MANDATORY AGREEMENT
- C1.5 DISCLOSURE STATEMENT (PRO FORMA)
- C1.6 ADJUDICATION BOARD MEMBER AGREEMENT (PRO FORMA)
- C1.7 CONFIRMATION OF RECEIPT OF CONTRACT (PRO FORMA)

C1.1 FORM OF OFFER AND ACCEPTANCE

1. OFFER

The Employer, identified in the acceptance signature block, has solicited offers to enter into a Contract for the procurement of:

CONTRACT NO. 122/2022: UPGRADING OF THE LOERIE SPORTS FACILITY

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 authorized, 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 and on behalf of the Tenderer:

Signature(s) of authorized agent(s)

Date:

Name(s)

Capacity of authorized agents:

Name and address of organization:

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

Witness:

Signature

Date:

Name

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, as listed in the returnable 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 securities, bonds, guarantees, proof 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 these 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) working 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 and on behalf of the Employer:

Signature(s) of authorized agent(s)

Date:

Name(s)

Capacity: MUNICIPAL MANAGER

Name and address of organization:

**Kouga Local Municipality
P O Box 21, JEFFREYS BAY, 6330**

Witness:

Signature

Date:

Name

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 be 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.

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, be the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here.

1. Subject
- Details
2. Subject
- Details
3. Subject
- Details
4. Subject
- Details
5. Subject
- Details

By the duly authorized 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

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the returnable schedules, as well as any confirmation, clarification or change 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 and on behalf of the Tenderer:

Signature(s) of authorized agent(s)

Date:

Name(s)

Capacity of authorized agents:

Name and address of organization:

.....

.....

.....

Witness:

Signature

Date:

Name

For and on behalf of the Employer:

Signature(s) of authorized agent(s)

Date:

Name(s)

Capacity

Name and address of organization:

**Kouga Local Municipality
P O Box 21, JEFFREYS BAY, 6330**

Witness:

Signature

Date:

Name

C1.2a CONTRACT DATA (PART 1)

The General Conditions of Contract for Construction Works, Third Edition, (2015) published by the South African Institution of Civil Engineering (SAICE), 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 at the Tenderer's own cost from the SAICE (Tel: 011-805 5947).

PART 1: CONTRACT-SPECIFIC 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:

No.	Clause	Description
1	1.1.1.5	The Commencement Date shall be the date on which the Contractor receives a copy of the signed Form of Offer and Acceptance and schedule of deviations if applicable.
2	1.1.1.13	The Defects Liability Period is 12 Months , measured from the date of the Certificate of Completion.
3	1.1.1.14	The time for achieving Practical Completion, calculated from the Commencement Date, is 7 months.
4	1.1.1.15	The Employer is the Kouga Local Municipality.
5	1.1.1.16	The Employer's Agent is Bosch Projects represented by an employee duly authorised to do so. <u>Add the following to the clause :</u> Any reference to the term "Engineer" in this Contract shall mean "Employer's Agent" and vice versa.
6	1.1.1.17	Add the following to the clause: Any reference to the term "Engineer's Representative" in this Contract shall mean "Employer's Agent's Representative" and vice versa.
7	1.1.1.26	The pricing strategy is Re-measurement.
8	1.2.1.2	The Employer's address for receipt of communications and notices is: INFRASTRUCTURE AND ENGINEERING DIRECTORATE 33 Da Gama Road JEFFREYS BAY 6330 Contact Person : Mr J du Toit Tel : (042) 200 2200 Email : jdutoit@kouga.gov.za

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No.	Clause	Description
9	1.2.1.2	The Employer's Agent's address for receipt of communications and notices is: Bosch Projects (Pty) Ltd P O Box 27185 Greenacres Port Elizabeth Port Elizabeth Contact Person: Mr L Streicher Tel : (041) 363 0598 Email : StreicherL@boschprojects.co.za
10	3.2.3	The Employer's Agent shall obtain specific approval from the Employer before executing the following functions or duties according to the following Clauses of the General Condition of Contract: New Clause 3.2.3.1 For expenditure on the Contract that exceeds the Contract Sum. Existing Clauses: 3.3.1 Nomination of person as Employer's Agent's Representative. 5.7.2 Night Work. 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. 5.14.4 The issue of a Certificate of Completion. 5.16.1 The issue of a Final Approval Certificate. 6.3 Variations of a value greater than R 20 000 or when any of the contingencies will be utilised. 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.
11	3.2.4	<u>Add the following to the clause :</u> The Employer has appointed an independent Health and Safety Agent (HSA) on this Contract in terms of the Construction Regulations, 2014 as promulgated in terms of section 43 of the Occupational Health and Safety Act, 1993. The Contractor shall prepare a Health and Safety Plan in accordance with the Site Specific Health and Safety Specification and submit such to the appointed HSA for legal compliance assessment and verification / approval prior to any works commencing. The Kouga Local Municipality Health & Safety Official will conduct a review of the approved Health and Safety Plan to verify compliance with the Health and Safety Specifications.

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No.	Clause	Description
12	3.2.5	<u>Add the following additional sub-clause :</u> The Employer's Agent shall have the authority to suspend, without any additional cost, portions of the Works if there are any acceptance test results outstanding (including level control), as required in terms of the relevant standardised or project specific specifications.
13	4.3.1	<u>Add the following to the clause :</u> The Contractor shall comply with the : • Basic Conditions of Employment Act, Act No 75 of 1997; • National Environmental Management Act, Act 107 of 1998; • The Basic Conditions of Employment Act, Act No 75 of 1997; • Occupational Health and Safety Act, Act No 85 of 1993; • Construction Regulations 2014; • Health and Safety Specification prepared by the Employer in terms of the Construction Regulations 2014; • Any and all other relevant applicable laws, regulations, statutory provisions and agreements.
14	4.3.3	<u>Add the following new clause:</u> "Contractor's Designer The Contractor and his designer shall accept full responsibility and liability to comply with the Occupational Health and Safety Act, 1993 (Act 85 of 1993) and the Construction Regulations, 2014 for the design of the Temporary Works and those part of the Permanent Works which the Contractor is responsible to design in terms of the Contract"
15	4.12.2	Notwithstanding the requirements of this clause, the Contractor's appointed Construction Manager shall be solely dedicated to this contract and shall be on site at all times when work is being performed.
16	4.12.4	<u>Add the following new sub-clause :</u> The Contractor shall submit a comprehensive progress report at least 24 hours prior to monthly site meetings. The progress report shall consist of at least the following documents on a monthly basis: • Approved programme indicating the base programme, actual and planned percentage complete of each item including the "time now" line; • A summary of the progress to date; • Updated realistic cash flow; • Any delays encountered or anticipated, including rainfall statistics for the month; • An information required schedule indicating any information or drawings required; • Plant and Labour Report; and Failure to submit the complete progress report will result in a fine of R 10 000 being deducted from the next payment certificate by the Employers Agent.

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No.	Clause	Description
17	5.3.1	The documentation required before Commencement of the Works are: • Health and Safety Plan (Refer to Clause 4.3) • Initial Programme (Refer to Clause 5.6) • Security (Refer to Clause 6.2) • Insurance (Refer to Clause 8.6) • Letter of good standing with the Compensation Commission • Letter of Good Standing with the Building Industry Bargain Council
18	5.3.2	The Contractor is required, within 14 days of the Commencement Date, to submit the documents listed in Contract Data clause 5.3.1 to the Employer's Agent for his approval.
19	5.4.2	Access to and possession of the Site shall not be exclusive to the Contractor, but as set out in section C3.1.5: Temporary Works. The Contractor shall bear all costs and charges for special and temporary rights of way required by him in connection with access to the Site. The Contractor shall also provide at his own cost any additional facilities outside the Site required by him for the purposes of the Works.
20	5.1.1 5.8.1	Delete the words "between sunset and sunrise" in the first line and replace with "outside normal working hours". <u>Add the following to the clause :</u> Normal working hours shall be those as stated in the applicable Sectoral Determination applicable to a 5 (five) day week (Monday to Friday) from 07:00 to 17:00. Non-working days are Saturdays and Sundays. Special non-working days are : • Public holidays; • Election day of the local government elections and national elections (when applicable); and • The official year-end holiday up to a maximum of 25 calendar days (including special non-working days).
21	5.8.1.5	<u>Add the following new sub-clause:</u> The cost of supervision by the Employer's Agent or his representatives outside of normal working hours (Monday to Friday) in accordance with this Clause shall be to the Contractor's account.
22	5.12.2.2	<u>Add the following to the clause:</u> The time-period specified as the time for completion includes allowances for those days on which it is expected that work, on the critical path items of the works, would be prevented due to weather conditions such as wind, rain falling or the subsequent waterlogged condition. Based on average weather conditions of wind, rain and sunshine the allowances are: • 3 working days per month for the months of May to October • 2 working days per month for the months of November to April 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 five calendar days of the resumption of work. 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.

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No.	Clause	Description
		The tendered sums of the appropriate time-related items shall be increased to take account of the extensions of time granted.
23	5.12.2.4	<u>Amend the clause to read as follows:</u> Any disruption which is entirely beyond the Contractor's control except for internal (Contractor's own or his subcontractors labour) unrest, disruptions, strikes, lock-outs, etc.
24	5.12.3	<u>Delete clause 5.12.3 and replace with the following:</u> "If an extension of time is granted, the Contractor shall be paid such proven additional costs based on tendered rates including for special non-working days, if applicable, as are appropriate regarding any other compensation which may have already been granted in respect of the circumstances concerned."
25	5.12.5	<u>Add the following new clause:</u> Critical Path Provision 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 into account for the extension of time.
26	5.13.1	The penalty for failing to complete the whole of the Works is R 5000 per calendar day.
27	5.14.1	The requirements for Practical Completion are: Submission of As-Built Drawings and Operating Manuals Completion of all notified defects, Once all test certificates have been issued.
28	5.14.5.5	Delete Clause 5.14.5.5 and replace with: "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."
29	5.16.3	The latent defect period is: • 10 years, The latent defects period shall commence on the date of the Final Approval Certificate.
30	6.2.1	Replace the wording "as selected" in Clause 6.2.1 with "as stated". The security to be provided by the Contractor shall be a Fixed Performance Guarantee of 10% the Contract Sum. The Fixed Performance Guarantee shall be from an Insurance Company or Financial Institution that is registered with the Financial Services Board in terms of the Financial Intelligence Centre Act and is on the list of approved Financial institutions as provided on Annexure, page C1-21 .

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No.	Clause	Description
		The Fixed Performance Guarantee shall be jointly and severally bound with the Contractor, in accordance with the provisions of the Form of Guarantee. Any other form of security including a Retention Money Guarantee is not permitted. The wording of the fixed performance guarantee shall be identical to the pro-forma provided under Clause C1.3: Form of Guarantee.
31	6.2.2	Replace the entire contents of Clause 6.2.2 with the following: "If the Contractor fails in his obligations to provide the stated security within the period stated in Clause 5.3.2, or if the fixed performance guarantee shall differ from the pro-forma provided under Clause C1.3: Form of Performance Guarantee of the Contract Data, the Employer may terminate the Contract in terms of Clause 9.2."
32	6.2.3	<u>Replace the entire contents of clause 6.2.3 with the following:</u> The Contractor shall ensure that the fixed performance guarantee remains valid and enforceable until the issue of the Certificate of Completion.
33	6.8.2	Contract Price Adjustment Schedule is not applicable on this Contract
34	6.8.3	Price adjustments for variations in the costs of special materials are not allowed.
35	6.10.1.5	The percentage advance on materials on site not yet built into the Permanent Works is 80%.
36	6.10.1.7	<u>Add the following to sub-clause</u> ... or any other fines that become due under the Contract.
37	6.10.3	<u>Replace the entire contents of Clause 6.10.3 with the following:</u> 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. The percentage retention shall be 10% of payments due up to the "Limit of retention money" which shall be 5% of the Contract Sum.
38	6.10.4	Replace the wording "within 28 days" in Clause 6.10.4 with the wording "within 45 days", but will endeavour to pay within 30 days".
39	6.10.4.1	<u>Add the following new sub-clause:</u> The Contractor is required to submit the complete, correct and signed monthly Expanded Public Works Programme (EPWP) reports, together with the monthly statement. Payment to the Contractor will not be certified by the Employer's Agent until the complete EPWP reporting for the specific month is provided. In addition, a fine for late submission of R10 000 per occurrence will be applicable if submitted after the 5th of the month. The penalty for not achieving the 10% subcontracting to local EME's/SMME's will be 1 percent (%) for every percentage (%) of the 10% threshold where the target is not achieved and is liable to be deducted on a monthly basis as determined by the Employer's Agent.

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No.	Clause	Description
40	6.10.6.2	<u>Replace clause 6.10.6.2 with the following new clause:</u> No interest shall be payable to the Contractor upon any moneys retained or overdue in terms of the Contract.
41	8.3	<u>Amend sub-clause 8.3.1.12 of clause 8.3 as follows:</u> "The design, specification or instruction of the Employer's Agent, Employer (represented by an employee authorised to do so), or defects in the materials supplied by the Employer for incorporation in the Works".
42	8.6 8.6.1	• Insurance Submit copies of receipts of registration, or payment for the premiums for the following insurances, as required by the new Clause 8.6 in this Contact Data. (a) Insurance of the works, Plant intended for incorporation in the Works, and of all materials on the Site intended for incorporation in the Works against damage or physical loss arising from whatever cause, for the period for which the Contractor is responsible for the Works in terms of Clause 8.2.1, and for a sum insured which shall be the aggregate as set out in Clauses 8.6.1.1.1 to 8.6.1.5 or not less than R20M as stipulated in Table 4 in Clause 7.9 of the Kouga Municipality SCM Policy document (or as amended from time to time). (b) 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 (c) 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; (d) 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; (e) 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; (f) 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. (g) 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. 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 effected such insurance.

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No.	Clause	Description
43	8.6.6	The Contractor and/or Sub-Contractor shall provide, as a minimum, the following: (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 R20 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.
44	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 effected such insurance.
45	8.6.8	The Contractor may effect, at his own cost, any insurance additional to that effected by the Employer which he deems necessary in his own interests. The Employer reserves the right to call for full information regarding such insurances.
46	8.6.9	The insurances to be provided by the Contractor and Sub-Contractor shall be effected with Insurers 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.
47	8.6.10	If the Contractor fails to effect and keep in force the insurances referred to, then the Employer may affect 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.
48	8.6.11	Where the Contractor is responsible for the appointment of Sub-Contractors, then the Contractor shall (a) ensure that potential and appointed Sub-Contractors are aware of the whole content of this Contract; and (b) ensure the compliance of Sub-Contractors with this Contract clause, where applicable. 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.

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No.	Clause	Description
49	9.1.4	<u>Replace Clause 9.1.4 with the following:</u> 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: a) will be entitled to an extension of time for working days lost as may be approved by the Employer's Agent, and b) will be reimbursed the cost of delay to be agreed with the Employer's Agent. 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.
50	9.2.1	<u>Delete "or" at the end of Clause 9.2.1.3.7 and add the following three Clauses after Clause 9.2.1.3.8:</u> 9.2.1.3.9 Has failed to provide the required insurances or fixed performance guarantee within the prescribed time; 9.2.1.3.10 Has committed a corrupt or fraudulent act during the tender process or the execution of the Contract; or 9.2.1.3.11 Has benefitted from an official or other role player committing any corrupt or fraudulent act during the tender process or in the execution of the Contract.
51	10.3.2	Amicable settlement in terms of Clause 10.4 shall be followed for all disputes prior to referring any dispute to adjudication or arbitration. The parties may appoint an impartial third party to assist with the amicable settlement, but this is optional and is subject to written agreement between the parties.
52	10.5.1	Dispute resolution shall be by ad-hoc adjudication.
53	10.5.3	The number of Adjudication Board Members to be appointed is one (1).
54	10.7.1	The determination of disputes which are unresolved in terms of Clause 10.5.3 shall be by arbitration.

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No.	Clause	Description												
55		<u>Add the following additional clauses:</u> 1. Details to be confidential The Contractor shall treat the details of the Works 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. 2. Fine for Health and Safety and / or Environmental non-conformance / non-compliance The Contractor shall be subject to a fine for health and safety and / or environmental non-conformances / non-compliances based on the outcome of the monthly audits as follows: • The first finding of a non-conformance / non-compliance in an audit report is considered as a warning to the Contractor. The Contractor must affect the necessary changes to correct the non-conformance / non-compliance by the date of the following audit. • The second finding of the same non-conformance / non-compliance in any of the succeeding audits are considered as an official non-conformance / non-compliance. • The third finding of the same non-conformance / non-compliance in any of the succeeding audits are considered as a recurring non-conformance / non-compliance and the Contractor may be charged a fine of R 2 000 such non-conformance / non-compliance finding. • Recurring non-conformances / non-compliances do not have to take place consecutively for the fine to be charged. The fine for recurring non-conformance / non-compliance findings will be increased as per the following formula: $f(x) = R\ 2\ 000.00 \times (x - 2)$ where (x) indicates the number of times the same non-conformance / non-compliance has been identified in the audit. The fine will be deducted from the contractors' monthly payment certificates. <u>Example:</u> <table><tr><th>Description</th><th>Amount (per non-conformance finding)</th></tr><tr><td>First finding of non-conformance</td><td>$(R\ 2\ 000.00) \times (1 - 2) = R\ 0-00$</td></tr><tr><td>Second finding of same non-conformance</td><td>$(R\ 2\ 000.00) \times (2 - 2) = R\ 0-00$</td></tr><tr><td>Third finding of same non-conformance</td><td>$(R\ 2\ 000.00) \times (3 - 2) = R\ 2\ 000-00$</td></tr><tr><td>Fourth finding of same non-conformance</td><td>$(R\ 2\ 000.00) \times (4 - 2) = R\ 4\ 000-00$</td></tr><tr><td>Fifth finding of same non-conformance</td><td>$(R\ 2\ 000.00) \times (5 - 2) = R\ 6\ 000-00$</td></tr></table> 3. Fine for poaching Poaching of any wildlife and/or livestock by any means within the surrounding area of the Contract will not be tolerated. Furthermore, the Contractor will be fined R20 000.00 per offence. If the guilty individual is caught, he / she shall be permanently removed from the site with immediate effect.	Description	Amount (per non-conformance finding)	First finding of non-conformance	$(R\ 2\ 000.00) \times (1 - 2) = R\ 0-00$	Second finding of same non-conformance	$(R\ 2\ 000.00) \times (2 - 2) = R\ 0-00$	Third finding of same non-conformance	$(R\ 2\ 000.00) \times (3 - 2) = R\ 2\ 000-00$	Fourth finding of same non-conformance	$(R\ 2\ 000.00) \times (4 - 2) = R\ 4\ 000-00$	Fifth finding of same non-conformance	$(R\ 2\ 000.00) \times (5 - 2) = R\ 6\ 000-00$
Description	Amount (per non-conformance finding)													
First finding of non-conformance	$(R\ 2\ 000.00) \times (1 - 2) = R\ 0-00$													
Second finding of same non-conformance	$(R\ 2\ 000.00) \times (2 - 2) = R\ 0-00$													
Third finding of same non-conformance	$(R\ 2\ 000.00) \times (3 - 2) = R\ 2\ 000-00$													
Fourth finding of same non-conformance	$(R\ 2\ 000.00) \times (4 - 2) = R\ 4\ 000-00$													
Fifth finding of same non-conformance	$(R\ 2\ 000.00) \times (5 - 2) = R\ 6\ 000-00$													

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No.	Clause	Description
56		<u>Add the following additional clause:</u> The Employer's Agent reserves the right to suspend portions of the Works if there are any test results outstanding (including level control), as required in terms of the relevant standardised or project specific specifications.
57		<u>Add the following additional clause:</u> The contractor shall submit the following documents monthly at the progress/site meetings: a) Updated realistic cash flow b) Progress report c) Updated Programmes
58		A fine of R1000.00 per offence will be instituted for unnecessarily disturbing, damaging or destroying trees, shrubs or vegetation within or outside the demarcated site.

C1.2b CONTRACT DATA (PART 2)

PART 2: DATA PROVIDED BY THE CONTRACTOR

No.	Clause	Description
1	1.1.1.9 1.2.1.2	The Contractor is: The Contractor's address for receipt of communications and notices is : Telephone: Facsimile: Address (Postal) : Address (Physical) :
2	6.5.1.2.3	The percentage allowance to cover overhead charges is%

C1.3 FORM OF PERFORMANCE GUARANTEE (PRO FORMA)

PERFORMANCE GUARANTEE

For use with the General Conditions of Contract for Construction Works, Third Edition, (2015).

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means:

Physical address:

"Employer" means:

"Contractor" means:

"Employer's 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:

Type of Performance Guarantee: Fixed

"Expiry Date" means: Date of issue of the Certificate of Completion

CONTRACT DETAILS

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

1. FIXED PERFORMANCE GUARANTEE

- 1.1. Where a fixed Performance Guarantee has been selected. The Guarantor's liability shall be limited to the amount of the Guarantee Sum.

1.2. The Guarantor's period of liability shall be from and including the date on which the Performance Guarantee is signed, up to and including the Expiry Date, or the date of issue by the Employer's Agent of the Certificate of Completion of the Works, or the date of payment in full of the Guaranteed Sum, whichever occurs first.

1.3. The Employer's Agent and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.

2. CONDITIONS APPLICABLE TO FIXED PERFORMANCES GUARANTEES:

2.1. The Guarantor hereby acknowledges that:

2.1.1. Any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be constructed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship.

2.1.2. Its obligation under this Performance Guarantee is restricted to the payment of money.

2.2. Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 3.2.1 to 3.2.3:

2.2.1. A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Employer's Agent in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 3.2.2;

2.2.2. 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 3.2.1 and the sum certified has still not been paid;

2.2.3. A copy of the aforesaid payment which entitles the Employer to receive payment in terms of the Contract of the sum certified in 3.2.

2.3. Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, 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:

2.3.1. The Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 3.3; or

2.3.2. 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 3.3; and

2.3.3. The aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provision liquidation court order.

2.4. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 3.2 and 3.3 shall not exceed the Guarantor's maximum liability in terms of 1.1 or 2.1

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- 2.5. Where the Guarantor has made payment in terms of 3.3, 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 the Performance Guarantee shall bear interest at the prime overdraft rate by the Employer's Bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.
- 2.6. Payment by the Guarantor in terms of 3.2 or 3.3 will only be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
- 2.7. Payment by the Guarantor in terms of 3.3 will only be made against the return of the original Performance Guarantee by the Employer.
- 2.8. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may consider fit and the Guarantor shall not have right to claim his from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
- 2.9. The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
- 2.10. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 1.1.2 or 2.2, 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.
- 2.11. This Performance Guarantee, with the required demand notices in terms of 3.2 or 3.3, shall be regarded as a liquid document for the purposes of obtaining a court order.
- 2.12. Where the 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 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)

ANNEXURE

LIST OF APPROVED FINANCIAL INSTITUTIONS

The following financial institutions are currently approved for issue of contract guarantees to the Municipality:

National Banks:

ABSA Bank Ltd.
FirstRand Bank Ltd.
Investec Bank Ltd.
Nedbank Ltd.
Standard Bank of SA Ltd.

International Banks (with branches in SA):

Barclays Bank plc.
Citibank n.a.
Credit Agricole Corporate and Investment Bank
HSBC Bank plc.
JP Morgan Chase Bank
Societe Generale
Standard Chartered Bank

Insurance companies:

ABSA Insurance
Coface s.a.
Compass Insurance Co.
Constantia Insurance Co.
Credit Guarantee Insurance Co.
Guardrisk Insurance Co.
Hollard Insurance Company Ltd.
Home Loan Guarantee Co.
Infiniti Insurance Limited
Lombard Insurance
Mutual & Federal Insurance Co.
New National Assurance Co.
Regent Insurance Co.
Renasa Insurance Company Ltd.
Santam Limited
Zurich Insurance Co.

1.4 OCCUPATIONAL HEALTH AND SAFETY MANDATORY AGREEMENT

Refer to the Health and Safety Specification.

C1.5 DISCLOSURE STATEMENT (PRO FORMA)

Date:

Contract:
.....

Contractor:

Employer:

Employer's Agent:

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:

1. I shall act with complete impartiality and know of nothing at this time, which could affect my impartiality.
2. I have had no previous involvements in this project.
3. I do not have any financial interest in this project.
4. I am not currently employed by the Contractor, Employer or Employer's Agent.
5. I do not have any financial connections with the Contractor, Employer or Employer's Agent.
6. I do have or have not had a personal relationship with any authoritative member of the Contractor, Employer or the Employer's Agent which could affect my impartiality.
7. 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

C1.6 ADJUDICATION BOARD MEMBER AGREEMENT (PRO FORMA)

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 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, Third Edition 2015 (GCC), must be referred to ad-hoc adjudication.

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

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1. The Adjudication Board Member accepts to perform his duties in accordance with the terms of the Contract, the GCC, Adjudication Board Rules and this Agreement.
2. The Adjudicator undertakes to remain independent and impartial of the Contractor, Employer and Employer's 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 disband 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:
8. A monthly retainer of(amount) fornumber of months), and / or
9. A daily fee of (amount) based on anumber) hour day, and / or
10. A hourly fee of (amount), and / or
11. A non-recurrent appointment fee of (amount) which shall be accounted for in the final sums payable.
12. 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. This Agreement is entered into:

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:

C1.7 CONFIRMATION OF RECEIPT OF CONTRACT (PRO FORMA)

The Tenderer, (now Contractor), identified in 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) on:

The (day) of (month) (year)

At (place)

It is hereby agreed that the official commencement date of the Contract will be:

The (day) of (month) (year)

For and on behalf of the Contractor:

Signature(s) of authorized agent(s) Date:.....

Name(s)

Capacity of authorized agent(s):

Witness:

(Name)

(Signature)

C2: 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 Standardised Specifications for Civil Engineering Construction is applicable, subject to the variations and amendments contained in the section “Applicable SABS 1200 standardised specifications”.

C2.1.1.2 Descriptions in the Bill of Quantities are abbreviated and comply generally with those in the Standardised Specifications. Clause 8 of each Standardised 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 Standardised Specification, or the Scope of Work, conflict with the terms of the Bill, the requirements of the Standardised or Scope of Work, as applicable, shall prevail.

A payment reference column is provided in the Bill of Quantities to assist the Tenderer when pricing this tender. Certain items may not have a payment reference and the onus is on the Tenderer to refer to the relevant specifications as stated above to ensure that the item is priced correctly. If in doubt the Tenderer shall preferably seek clarification or else qualify any assumptions made.

C2.1.1.3 The clauses in a specification in which further information regarding the bill item can be obtained appear under “Reference clause” in the Schedule. The reference clauses indicated are not necessarily the only sources of information in respect of bill items. Further information and specifications may be found elsewhere in the Contract documents. Standardised 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 Unless otherwise stated, items are measured nett in accordance with the drawings, and no allowance is made for waste. The Bill of Quantities has to be completed in black non-erasable ink and the Tenderer is referred to the Tender Specifications in regard to the correction of errors.

C2.1.1.5 The quantities set out in the Bill of Quantities are the estimated quantities of the Contract Works, but the Contractor will be required to undertake whatever quantities may be directed by the Employer’s 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.

C2.1.1.6 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.

C2.1.1.7 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 is entered will be considered to be covered by the other prices or rates in the Bill of Quantities.

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- C2.1.1.8 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.
- C2.1.1.9 All prices or rates inserted in the Bill of Quantities shall EXCLUDE VAT. Provision has been made on the Summary Page, of the Bill of Quantities, for the addition of VAT.
- C2.1.1.10 Arithmetical errors of responsive tenders will be corrected in terms of clause 5.9 of SANS 10845 - Part 3.
- C2.1.1.11 The units of measurement described in the Schedule/Bill of Quantities are metric units. Abbreviations used in the Schedule/Bill of Quantities are as follows:
- | | | | | | |
|----------------------|---|-----------------------|----------|---|------------------|
| mm | = | millimetre | h | = | hour |
| m | = | metre | kg | = | kilogram |
| km | = | kilometre | t | = | ton (1 000 kg) |
| 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 | P C sum | = | Prime Cost sum |
| ℓ | = | litre | Prov sum | = | Provisional sum |
| kℓ | = | kilolitre | % | = | per cent |
| MPa | = | Mega Pascal | kW | = | kilowatt |
- C2.1.1.12 The quantities set out in the Bill of Quantities are the estimated quantities of the Works, but the Contractor will be required to undertake whatever quantities as may be directed by the Employer’s 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.
- C2.1.1.13 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 is entered or where a word or phrase such as “included” or “provided elsewhere” will be accepted as a rate of nil (R0,00) having been entered against such items and covered by the other prices or rates in the Schedule.
- Any work executed to which such a pay item applies, shall be measured under the appropriate items in the Bill of Quantities and valued at a rate of nil (R0,00). The rate of nil shall be valid irrespective of any change in the quantities during the execution of the Contract.
- C2.1.1.14 The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule as detailed in Section C1.2 Contract Data (Part 1).
- C2.1.1.15 The Bills of Quantities must be completed by the insertion of rates / prices in accordance with the instruction described in the items above. As this Contract is a re-measurable Contract and not a Lump Sum Contract, a blank bill of quantities with only a lump sum amount will not be accepted.
- C2.1.1.16 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.

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- C2.1.1.17 Correction of entries made by the Tenderer shall be in in terms of clause 5.9 of SANS 10845 Part 3 as amended by the Tender Data.
- C2.1.1.18 Those parts of the contract to be undertaken by EME's has been marked in the Bill of Quantities under EME column. These items are for guidance only and not on exhaustive list of all items to be undertaken by EME's, or that must be undertaken by EME's.
- C2.1.1.19 Those parts of the contract to be constructed using labour-intensive methods have been marked in the Bill of Quantities with the letters "LI" in a separate column filled in against every item so designated. The works, or parts of the works so designated are to be constructed using labour-intensive methods only. The use of plant to provide such works, other than the plant specifically provided for in the scope of work, is a variation to the Contract. The items marked with the letters "LI" are not necessary an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any requirements in the generic labour intensive specification in the Scope of Works.
- C2.1.1.20 Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.

NOTE:

Tenderers are to refer to the Scope of Works and in particular the Specification Data when pricing the Bill of Quantities. Certain clauses in the Standardised Specifications and the Particular Specifications have been omitted, amended or added to and these changes must be taken into account when pricing the tender.

C2.2 BILL OF QUANTITIES

AS PER SABS 1200 & SABS 0120

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 1: PRELIMINARY & GENERAL							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
1		SECTION 1: PRELIMINARY & GENERAL					
1.1	SABS 1200A	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			
		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	8.3.3	Other fixed charge obligations	Sum	1			
1.1.6	8.3.4.	Removal of Engineer's and Contractors site establishment and reinstatement of site on completion	Sum	1			
1.2	SABS 1200A 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) PSAB 3.2	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			
	SABS 1200 A 8.4.5	Other time related obligations:					
1.2.7	PSA 8.4.5	Provision of Security Personnel	Month	7			
1.2.8	PSA 8.15	Community Liaison Officer	Month	7			
1.2.9	8.8.2	Accommodation of traffic for road crossings, access and along road (refer to SANS 1921-2)	Sum	1			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 1: PRELIMINARY & GENERAL							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
1.2.10	PSA 8.4.6	Compensation for delays incurred (a) Plant	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	SABS 1200 A 8.5	SUMS STATED PROVISIONALLY BY ENGINEER					
1.3.1	PSA 8.5	a) Acceptance Control Testing	Prov. Sum	1			R 20 000.00
1.3.2	8.5 (b)	b) Overheads, charges and profit on (a) above	%	R 20 000.00		%	
1.3.3		e) Provision sum for work undertaken by Kouga Municipality Electrical Division	Prov. Sum				R 20 000.00
1.3.4		f) Overheads, charges and profit on (a) above	%	R 20 000.00		%	
1.3.5		g) Provision sum for work undertaken by Kouga Municipality Water division	Prov. Sum				R 20 000.00
1.3.6		h) Overheads, charges and profit on (a) above	%	R 20 000.00		%	
1.3.7		Complying to EPWP, QA and Project Reporting (Annexure F and G)	Prov. Sum	-			R 20 000.00
1.4	PSA 8.7	DAYWORKS (PROVISIONAL)					
1.4.1		Labour					
1.4.1.1		Allow for total remuneration paid to workers	Prov. Sum				R 20 000.00
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)	%	R 20 000.00		%	
1.4.1.3		Skilled	h	20			Rate Only
1.4.1.4		Semi-skilled	h	20			Rate Only
1.4.1.5		Unskilled	h	20			Rate Only
1.4.2		Materials					
1.4.2.1	8.5 (b.1)	Net cost of goods or materials	Prov. Sum				R 50 000.00
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)	%	R 50 000.00		%	
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	1			R 50 000.00
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	1			R 50 000.00
1.4.4.2	PSA 8.5	Percentage adjustment on Item 1.4.4.1 Contractor's	%	R 50 000.00		%	
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SECTION 1: PRELIMINARY & GENERAL							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
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1.4.5		Survey Beacons/Pegs					
1.4.5.1	8.5 (a)	Search for, record, reference and protect survey	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			
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			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 1: PRELIMINARY & GENERAL							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
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	PROVISION OF EME MANAGER	month	6			
SECTION 1 - PRELIMINARY AND GENERAL - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 2: CLUB HOUSE							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
2		SECTION 2: CLUB HOUSE (Refer to Drg. No.8011/005/GTH/017)					
2.1		EARTHWORKS NOTE: All prices for excavation or filling are to include for "bulking".					
2.1.1	PD 1	Excavate in earth not exceeding 2m deep below natural or made up ground level for foundation trenches.	m³	45			
2.1.2		Extra over all excavations in earth for excavations in hard rock (Provisional)	m³	25			
2.1.3	PD 7	Spread and level filling from excavations under solid floors and steps and compact to 93% MOD AASHTO dry density	m³	10			
2.1.4		Spread and level filling supplied by the Contractor under solid floors and compact to 93% MOD AASHTO dry density	m³	95			
2.1.5	PD 4	Cart away surplus excavated material not exceeding 1,5 km away including spreading and levelling	m³	85			
2.1.6	PD 10	Approved ant poison applied to ground surfaces in strict accordance with the manufacturers'	m²	200			
2.2	1200 G 8.1.3.3	CONCRETE, FORMWORK AND REINFORCEMENT Concrete Unreinforced 25MPa cement concrete in: Foundations					
2.2.1			m³	20			
2.2.2		Steps	m³	5			
2.2.3		Ramps and Apron (Provisional)	m³	6			
2.2.4	PF	Reinforced 25MPa cement concrete in: Surface Beds including apron	m³	20			
2.2.5		Filling supplied by Contractor: G5 gravel compacted to 95% in layers not exceeding 150mm	m3	40			
2.2.6.1	PE	Formwork Temporary smooth formwork to concrete (use and waste) Edge not exceeding 250 mm high	m	10			
2.2.6.2		Riser exceeding 150 and not exceeding 400 mm high	m	5			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 2: CLUB HOUSE							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
2.2.7	PF	Reinforcement Steel rod reinforcement (Provisional) Bars of various diameters as reinforcement to slabs.	kg	500			
2.2.8		Fabric reinforcement reference No 245 lapped 150mm at all edges to concrete surface beds or slabs	m ²	200			
2.2.9		Sundries Strike off and cure the top surface of concrete surface beds including floating with a power trowel.	m ²	200			
2.2.10		Strike off and cure the top surface of concrete ramps and apron to falls including forming of reedings	m ²	150			
2.3	PI	BRICKWORK Common Brick Supply and install common brickwork in 5 : 1 cement mortar including wire ties, cutting etc:					
2.3.1		110 mm Selected local stock brick (Internal)	m ²	230			
2.3.2		230 mm Selected local stock brick (Foundations)	m ²	75			
2.3.3		110 mm Selected local face brick (External)	m ²	210			
2.3.4		Builders work in connection with electrical installation Allow for forming holes, chases etc, for building in or passage of pipe conduit through walls, ceilings, floors, roofs, joiner fittings etc., the provision of recesses, niches etc. for junction boxes, switches, switchboards and light fittings and for making good in all trades thereafter.	sum	1			
2.3.5		Sundries Bed wall plate in (6 : 1) cement mortar	m	65			
2.3.6		75mm Wide steel mesh reinforcement built into brick walls	m	400	100		
2.3.7		150mm Wide steel mesh reinforcement built into brick walls	m	550	100		
2.3.8		Set up and build in steel door frames (Single)	N ^o	15	100		
2.3.9		Set up and build in steel door frames (Double)	N ^o	3	100		
2.3.10		Set up and build in Aluminum windows	N ^o	18	100		
2.3.11		Forming recess 460 x 660 x 85 mm deep in 230 mm wall for meter enclosure, including all rough cutting, etc.	N ^o	1	100		
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 2: CLUB HOUSE							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
2.3.12	PI 10	2mm and 1.2mm Thick galvanised hoop iron cramp, 32mm wide, twice screwed to wood frame and bent as required or lapped around and spiked to roof member, with end split and spread and build into brickwork.	N ^o	40	100		
2.3.13		Ventilation 150 x 150mm Vents built into Walls	N ^o	10			
2.3.14		Prefabricated Prestressed Lintols 1,5 x 70 mm Precast concrete lintol, bedded at ends on brickwork in 3 : 1 cement mortar including temporary intermediate props.	No	33	100		
2.3.15		4,2 x 140 mm Precast concrete lintol, bedded at ends on brickwork in 3 : 1 cement mortar including temporary intermediate props for Double Door	No	1			
2.3.16		3,2 x 140 mm Precast concrete lintol, bedded at ends on brickwork in 3 : 1 cement mortar including temporary intermediate props for Exit and Lobby Doors	No	2			
2.4	PJ	WATER PROOFING					
2.4.1		150 Micron polyethylene sheeting laid under concrete surface beds and vertically, lapped 150 mm and sealed with 48 mm wide approved adhesive tape on both sides at all joints (Measured nett).	m ²	200			
2.4.2		0,375 mm Thick type B horizontal brick damp proof course under walls, cills, etc. including laps the full width of the wall (measured nett).	m ²	30			
2.4.3		Clear silicone sealant applied at junction of window or door frame and face silicone sealant applied at junction of window or door frame and face brickwork.	m	110			
2.5	PL	CARPENTRY AND JOINERY					
2.5.1		Timber Work Supply and install all timberwork, incl. cutting, fixing, bracing and sealant Design, supply and install Engineer Designed Roof Trusses at 760mm CTC on 38x114mm SAP Wall Plates tied down four (4) brick courses deep into walls using two (2) strands of 4mm dia thick galvanised wire - all including the issuing of a Roof Loading Certificate by Engineer / Competent Person after installation	N ^o	19			
2.5.2		114 x 38 mm Wall plate	m	30			
2.5.3		Two coats of Creosote on sawn timbers before fixing	m ²	2			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 2: CLUB HOUSE							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
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2.5.4		Fascia / Barge Boards 10 x 225 mm NUTEC Fascia and Barge Boards screwed to ends of roof timbers with countersunk head brass screws and H-section cover strips at joints.	m	65	100		
2.5.5		Mitred intersection of fascia and barge board.	Nº	6			
2.5.6		Apex mitre of barge board.	Nº	4			
2.5.7		Insulation 140mm think-pink Aerolite insulation to Ceiling	m²	200			
2.5.8		Ceilings and Cornices 38 x 38 mm Branderings for ceiling boards (elsewhere), spaced at 400 mm centres in both directions fixed with and including 76 mm stout galvanised nails driven on skew	m²	200	100		
2.5.9		6,4 mm thick Rhinoboard ceiling on 38x38mm SAP Branderings at 400mm CTC including PVCi H-section cover strips at joints.	m²	200			
2.5.10		75 mm Coved gypsum plaster cornices fixed	m	225			
2.5.11		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	2			
2.6	PSX 16	ROOF COVERINGS					
2.6.1		Double Roman Cement Roof Tiles on 38x38 S.A.P. Battens at 320 C.T.C. on 250Micron White Tile Underlay on Engineer Design Roof Trusses	m²	235	100		
2.7	PO	METAL WORK					
2.7.1		Aluminium Windows Supply and install Aluminium Windows Aluminium Top Hung Window Type PT69 (590mm x 890mm)	Nº	22	100		
2.7.2		Aluminium Top Hung Window Type PTT246 (2390mm x 590mm)	Nº	1	100		
2.7.3		Steel Doors Supply and Install Ultra Durable High Security Double Steel Doors complete with frames, hinges and locks (230 x 2195mm)	Nº	1	100		
2.7.4		Supply and Install Ultra Durable High Security Single Steel Door complete with frames, hinges and locks (230 x 813mm) for Storeroom	Nº	3	100		
2.7.5		Supply and install standard steel doors complete with frames, hinges and locks (110 x 813 mm)	Nº	15	100		
TOTAL CARRIED FORWARD TO NEXT PAGE							

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ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
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2.7.6		Steel Burglar Proofing Burglar proofing to be "Heavy Duty" and to be approved by Engineer Supply and install hot dipped galvanised steel burglar proofing to window type PT69 (single)	N ^o	18	100		
2.8	PP	PLASTERING Internal Plaster Install 4 : 1 cement plaster 12mm thick to vertical brick walls, incl. Narrow widths and rounded angle	m ²	460			
2.8.1							
2.8.2		Horizontal brick or concrete soffits.	m ²	5			
2.8.3		External Plaster Install 4 : 1 cement plaster 12mm thick to vertical brick walls, incl. Narrow widths and rounded angle	m ²	390			
2.8.4		Horizontal brick or concrete soffits.	m ²	5			
2.9	PQ	TILING 4mm Thick white glazed ceramic wall tiling size 152 x 152 mm fixed with adhesive and pointed in white cement to:					
2.9.1		Walls in splashbacks	m ²	200			
2.9.2		Sundries Single compartment soap dish built into wall.	N ^o	8			
2.9.3		Toilet roll holder built into and including forming recess in brick wall.	N ^o	4			
2.9.4		Cut and fit tiling around small pipe.	N ^o	8			
2.10	PR	PLUMBING AND DRAINAGE Rain Water Disposal Aluminium rainwater goods.					
2.10.1	PR10	115 x 125 x 115 mm VHV box section eaves gutter with spigot and socket joints made with approved bituminous mastic compound and secured with 6 mm diameter galvanised gutter bolts and asphaltic felt and galvanised steel washers, finished externally with neatly trowelled smooth fillets in cement mortar and fixing to falls on and including approved stock pattern aluminium alloy brackets screwed to fibre-cement fascia at not exceeding 1m centres, including all short lengths, cutting, etc.	m	28	100		
2.10.2		Extra on gutter for stopped end.	N ^o	2			
2.10.3		Extra over gutter for nozzle outlet to suit 100 x 76 mm pipe, including galvanised wire balloon grating	N ^o	2	100		
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 2: CLUB HOUSE							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
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2.10.4		100 x 76 mm Rainwater pipe fixed to walls	m	8	100		
2.10.5		Extra on rainwater pipe for bend	N ^o	6	100		
2.10.6	PR	Sanitary Plumbing Spigoted and Socketed Rigid uPVC pipes and fittings, including short lengths and cutting jointing with rubber O rings. 40 mm diameter soil, vent or anti syphonage pipe fixed to walls	m	2	100		
2.10.7		40 mm diameter soil, vent or anti syphonage pipe laid in chase in concrete floor	m	12	100		
2.10.8		110 mm diameter soil, vent or anti syphonage pipe fixed to walls	m	30	100		
2.10.9		Extra over uPVC piping for: 40 mm Bend	N ^o	25	100		
2.10.10		110 mm Bend	N ^o	8	100		
2.10.11		40 mm Bend with inspection eye	N ^o	10	100		
2.10.12		110 mm junction	N ^o	3	100		
2.10.13		110 mm straight pan connector	N ^o	4	100		
2.10.14		Traps 40 mm "Flexi" butyle rubber reseal "S" trap complete with necessary clips and joint to uPVC pipe	N ^o	8	100		
2.10.15		40 mm diameter brass shower trap complete with chromium plated hinged grating and frame set in outlet and setting in concrete floor and joint to uPVC pipe.	N ^o	8			
2.10.16		Sundries Galvanised iron wire balloon grating set in top of 110 mm pipe.	N ^o	4			
2.10.17		Joint of W.C. pan to 110mm uPVC pipe.	N ^o	4			
2.10.18	PR27	Sanitary Fittings 560 x 405 mm "Vaal Springbok" white glazed fireclay lavatory basin with overflow, 32 mm chromium plated waste union, plug, chain and stay, two 15 mm "Cobra ECCP No. 111" pillar taps and fixing in position on and including one pair "Vaal 8118" white enamelled cast iron concealed brackets bolted to tiled wall.	N ^o	8			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 2: CLUB HOUSE							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
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2.10.19		Low level WC, suite comprising white vitreous china pan with "P" or "S" trap, outlet, plastic double flap seat, 11 litre white enamelled cast iron low level cisten and 40 mm diameter chromium plated drawn steel bent flush pipe, including fixing pan in position on floor and cistern to wall and jointing flush pipe to cistern and pan	Nº	9			
2.10.20		415 x 315 x 275 "Vaal Flatback" vitreous china wall hung bowl urinal with 38 mm chromium plated domical grating and chromium plated top inlet spreader. To be fixed to wall with two hangar brackets and installed with exposed top inlet flushvalve "Cobra FJ6000 Flusmaster" with FJT 5.5 flushpipe.	Nº	1			
2.10.21		Water Supplies Poly Propylene Piping: 20 mm diameter pipe and fixing to walls in chase elsewhere.	m	50			
2.10.22		15 mm diameter pipe and fixing to walls in chase elsewhere.	m	30			
2.10.23		32 mm diameter pipe and fixing in roof space.	m	30			
2.10.24		20 mm diameter pipe and fixing in roof space.	m	30	100		
2.10.25		Conex bends 25 mm Bush.	Nº	15			
2.10.26		25 mm Bend.	Nº	15			
2.10.27		25 mm reducing Bush.	Nº	15			
2.10.28		Extra over Polyethylene Piping for: 15 mm Coupling.	Nº	25			
2.10.29		20 mm Coupling.	Nº	15			
2.10.30		15 mm Bend.	Nº	15			
2.10.31		20 mm Bend.	Nº	15			
2.10.32		15 mm Tee.	Nº	10			
2.10.33		20 mm Tee.	Nº	10			
2.10.34		Service Pipes, Stop Cocks, etc. 15 mm diameter copper service pipe average 450 mm girth.	Nº	20			
2.10.35		Shower set comprising one pair 15 mm "Star" ECCP, No. 128 undertile stopcocks, one overhead shower arm with wall flange CP No. 027 and one shower rose CP. No. 068BJ including joints to steel pipes	Nº	8	100		
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 2: CLUB HOUSE							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
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2.10.36		15 mm "Ball O Stop" valve including two copper unions and joints to steel pipe	N ^o	20	100		
2.10.37		25 mm brass full-way wedge valve with wheelhead and joints to steel pipe	N ^o	4	100		
2.10.38		Sundries Excavate for and build stop valve chamber size 220 x 220 x 450 mm deep internally with 75 mm concrete base, half brick sides and with concrete kerb at top finished smooth on exposed surfaces and rebated for and fitted with a cast iron hinged cover and frame.	N ^o	1			
2.10.39	PR	Soil Drainage Spigoted and Socketed Rigid uPVC pipes and fittings, including short lengths and cutting and jointing with Rubber O Rings 110 mm uPVC pipe in ground including excavation not exceeding 750 mm deep	m	8			
2.10.40		110 mm uPVC pipe in ground including excavation not exceeding 750 mm and not exceeding 1500 mm deep	m	5			
2.10.41		110 mm bend	N ^o	8			
2.10.42		110 mm bend with inspection eye.	N ^o	8			
2.10.43		110 mm Junction	N ^o	8			
2.10.44		110 mm Junction with inspection eye.	N ^o	8			
2.10.45		Sundries Cast iron rodding eye cover and frame and setting in top of 110 mm pipe.	N ^o	16			
2.10.46		110 mm Gulley trap with one 50 mm side or vertical inlet and 110 mm outlet jointed to drain pipe and hopper head fitted with cast iron grating and frame, the whole set on and encased in concrete carried up 75 mm above ground as kerb, dished down to grating and finished smooth on all exposed surfaces in 3 : 1 cement render with angles rounded, including necessary excavation and formwork.	N ^o	4			
2.10.47		Testing Test drainage work, water supplies and plumbing work to approval of the Engineer and leave perfect.	Sum	1			
2.10.48		Holes, Sleeves, Chases, Etc. Prices must include for making good to all surrounding finishes. Cut chase in brickwork for pipe not exceeding 50 mm diameter.	m	30			
2.10.49		Cut chase in concrete floor for pipe not exceeding 50 mm diameter.	m	10			
2.10.50		Hole through face brick wall for pipe not exceeding 50 mm diameter.	N ^o	20			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 2: CLUB HOUSE							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
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2.10.51		Hole through face brick wall for pipe exceeding 50 mm and not exceeding 110 mm diameter.	No.	10			
2.11	PS	GLAZING					
2.11.1		Supply and install clear float glass 4 mm thickness in panes exceeding 0,1 and not exceeding 0,5m² to steel fixed with putty	m²	6			
2.11.2		Supply and install approved obscure 4 mm glass in panes exceeding 0,1 and not exceeding 0,5 m².	m²	4			
2.12	PU PU1.2	PAINTING Paint on plaster Prepare, apply one coat plaster primer and two coats approved super acrylic PVA paint on:					
2.12.1		Plastered walls internally	m²	340			
2.12.2		Plastered walls externally	m²	460			
2.12.3		Fibre cement fascia and barge board	m²	7			
	PU1.3	Paint on Metal Etch and apply one coat zinc primer, one undercoat and two finishing coats approved universal gloss enamel paint on:					
2.12.4		Steel sashes and frames (both sides measured).	m²	3			
2.12.5		Steel doors and frames	m²	42			
2.12.6		Burglar proofing	m²	6			
2.12.8		PROVISIONAL SUMS The following provisional sums are to cover work carried out by specialists who are to be nominated by the Engineer. Unless otherwise described as nett, all provisional sums include 5% cash discount to the Contractor. Under the items described as "Profit" the Contractor is to allow for any additional profit he may require. Under items described as "Attendance" the Contractor is to allow for providing every facility to the specialists carrying out the relevant work, for taking delivery and storing of materials, and for providing the use of all ordinary scaffolding and plant					
2.12.9		Furniture and Shelving Provide the sum of R30,000 (Thirty thousand rand) for furniture, fittings and shelving installed complete.	Prov Sum				R 30 000.00
2.12.10		Add for profit on last if required.	%	R 30 000.00		%	
2.12.11		Timber manufacture Contractor to design and supply approved timber structure design drawings / details to Engineer for approval and compliance. Although roof has been detailed as a flatroof, apitched roof will also be accepted.	Prov Sum	1	100	R 20 000.00	R 20 000.00
2.12.12		Timber manufacture Contractor to allow for any additional costs not allowed for in the schedule below due to design provided.	Prov Sum	1		R 10 000.00	R 10 000.00
SECTION 2 - CLUB HOUSE - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 3: CLUB HOUSE - ELECTRICAL SERVICES							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
3		SECTION 3: CLUB HOUSE - ELECTRICAL SERVICES (Refer to Drg. No.8011/005/GTH/017)					
3.1		LOW VOLTAGE SUPPLY					
3.1.1		Supplying, Installing, testing and commissioning of the 400 V, 3-phase, 50 Hz MAIN DB fully wired with all instruments and protection devices, terminations and necessary earth works, Wall Mounted, Top & Bottom Entry:	N ^o	1			
3.2		COPPER WIRE Supply, installation, testing and commissioning of Flat Twin and Earth Cable for the Geysers					
3.2.1		4mm ²	m	52			
		Supply, installation, testing and commissioning of Single Core Insulated Copper Wire. This includes the PVC General Purpose House 600/1000V Wire, Red, Black and Green and Yellow wire and all necessary cable accessories.					
3.2.2		2.5mm ² (Red)	m	84			
3.2.3		2.5mm ² (Black)	m	84			
3.2.4		2.5mm ² (Yellow/Green)	m	84			
3.2.5		1.5mm ² (Red)	m	270			
3.2.6		1.5mm ² (Black)	m	270			
3.2.7		1.5mm ² (Yellow/Green)	m	270			
3.3		LUMINAIRES (Refer to Drg. No.8011/005/GTH/017)					
		Installed and mounted to ceiling/wall including all fixings, mounting brackets, supports, connectors, connections, tail leads fitted with 5A plug top and lamps and all necessary auxiliary works required					
3.3.1		Double Fluorescent lights (2 x32W) Supply	m	20			
3.3.2		Install	m	20			
3.3.3		Ceiling lights (11W) Supply	N ^o	8			
3.3.4		Install	N ^o	8			
		Wall lights (11W)					
3.3.5		Supply	m	13			
3.3.6		Install	m	13			
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SECTION 3: CLUB HOUSE - ELECTRICAL SERVICES							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
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3.4		WATER HEATING (Refer to Drg. No.8011/005/GTH/017) Supply, installation, connecting and testing of geysers including wires with conduit boxes and all associated hardware, fixings and accessories for the geysers. 200L Geyser					
3.4.1		Supply	N ^o	4			
3.4.2		Install	N ^o	4			
3.5		SWITCHES AND OUTLETS (Refer to Drg. No.8011/005/GTH/017) Supply, installation, testing and commissioning of switches and switch socket outlets wired with 1.5 mm ² and 2.5 mm ² wire in conduits, including devices, wires, conduits, boxes, all fixings supports, from the panel boards to specified locations as per the drawings and in accordance with SANS 10142 regulations. 10A, 1 Lever, 1 Way, flush wall mounted switch unit complete with PVC cover and PVC screws or clipped PVC cover					
3.5.1		Supply	N ^o	15			
3.5.2		Install	N ^o	15			
3.5.3		10A, 1 Lever, 2 Way, flush wall mounted switch unit complete with PVC cover and PVC screws or clipped PVC cover Supply	N ^o	4			
3.5.4		Install	N ^o	4			
3.5.5		16A, Normal Double (Euro combo) as per SANS 164-2 regulation. flush wall mounted switch socket outlet complete with white PVC cover and PVC screws or clipped PVC cover and wall box, Supply	N ^o	10			
3.5.6		Install	N ^o	10			
3.5.7		35A isolator installed at high level within 1000mm from the Geysers. Supply	N ^o	4			
3.5.8		Install	N ^o	4			
3.6		CABLE MARKERS, WIREWAYS AND TRUNKING 100 x 50 Galvanized Steel Wall Boxes					
3.6.1		Supply	N ^o	12			
3.6.2		Install	N ^o	12			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 3: CLUB HOUSE - ELECTRICAL SERVICES							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
3.6.3		100 x 100 Galvanized Steel Wall Boxes Supply	N ^o	10			
3.6.4		Install	N ^o	10			
3.6.5		concrete slab and/or installed in ceiling void including all fixtures and fittings to connect to light fittings, other conduits and the distribution board. At outlets, in-out method of installation to be adhered to. Supply	m	229			
3.6.6		Install	m	229			
3.6.7		Round PVC Loop In Box 8 Way conduit junction boxes complete with cover and couples for 2-, 3-, 4- or 5-way application Supply	N ^o	41			
3.6.8		Install	N ^o	41			
3.7		EARTHING					
3.7.1		Earthing of the complete electrical installation according to the SANS 10142 regulations.	Sum	1			
3.8		LIGHTNING PROTECTION SYSTEM					
3.8.1		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			
3.9		TEST AND COMMISSION					
3.9.1		Testing and commissioning of the complete electrical	Sum	1			
3.10		ADDITIONAL ELECTRICAL WORKS					
3.10.1		Sum allowed to be utilized as instructed by electrical	Prov Sum	1			R 25 000.00
SECTION 3 - CLUB HOUSE - ELECTRICAL SERVICES - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 4: BOUNDARY WALL							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
4		SECTION 4: BOUNDARY WALL (Refer to Drg. No.8011/005/GTH/013 and 014)					
4.1	SANS 1200 C	Excavation					
4.1.1	8.2.1	Clear and grub	m ²	85			
4.2	SANS 1200D	Earthworks					
4.2.1	8.3.2(a)	Excavate in all materials and use for backfill or dispose, as ordered by the Engineer	m ³				Rate Only
4.2.2	8.3.3(b)	Extra over Item 4.2.1 for excavation in hard rock material	m ³				Rate Only
4.3	SANS 1200 GA	Concrete Reinforced 25MPa cement concrete in:					
4.3.1		Concrete strip footing as ordered by Engineer	m ³	13			
4.3.2		Concrete in-fill using Class 25/7mm low slump concrete	m ³	5			
4.4	8.3.1	Reinforcement 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	48			
4.4.2		Two (2) x Y16 x 2,4m Vertical Bars tied to doweled Starter Bars on each face of Boundary Wall.	no	48			
4.5		Cement Blocks New Wall Panels and Pillars 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:					
4.5.1		390 x 190 x 140mm Blocks	m ²	140			
4.5.2		Inca-140 pilaster blocks	No	336			
4.5.3		Repairs to existing Wall Panels and Pillars 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	100			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 4: BOUNDARY WALL							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
4.5.4		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	250			
4.5.5		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: 390 x 190 x 140mm Blocks	m ²	100			
4.5.6		Inca-140 pilaster blocks	No	250			
SECTION 4 - BOUNDARY WALL - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 5: FENCING AND ACCESS GATES							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
5	PX 2	SECTION 5: FENCING AND ACCESS GATES (Refer to Drg. No.8011/005/GTH/012)					
5.1	SANS 1200C	Site Clearance					
5.1.1	8.2.5	Take down existing fence, gates, posts, etc. and transport to municipal stores	m	50			
5.1.2	8.2.1	Clear existing fenceline (2m wide)	m	50			
5.2	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:					
5.2.1		4m wide double leaf gate (Refer to dwg 8011/005/GTH/012)	No	2			
5.2.2	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: 1.25 m Wide x 2.0m high pedestrian gate (Refer to dwg 8011/005/GTH/012)	No	2			
5.2.3	SANS 1200 8.4.1	Extra-over Item 12.2.1, 12.2.2 & 12.2.3 for: 200 x 300 Concrete sill using 10MPa/20mm concrete	m ³	4			
5.3		Security Fencing:					
5.3.1		Supply and install new Security Fencing on Perimeter Wall	Prov Sum	1			R 20 000.00
5.4		Crowd Control Fence around Main Match Field:					
5.4.1		Take down existing Crowd Control Fence, dispose of and supply and install new Crowd Control Fence around Main Match Field.	Prov Sum	1			R 80 000.00
SECTION 5 - FENCING AND ACCESS GATES - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 6: NETBALL AND TENNIS COURT COMBINATION							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
6		SECTION 5: NETBALL AND TENNIS COURT (Refer to Drg. No.8011/005/GTH/011 and 015)					
6.1	SANS 1200DM	Earthworks:					
6.1.1	8.3.4	Cut to fill and compact to 93% Mod AASHTO density	m³	62			
6.1.2	8.3.4	Cut to Spoil	m³	590			
6.2		Site Clearance:					
6.2.1		Digging up and removing rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etc.	m2	901			
6.2.2		Stripping average 150mm thick layer of top soil and stockpiling on site.	m2	901			
6.3		Compaction of Ground Surfaces:					
6.3.1		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.	m2	901			
6.4		Filling supplied by Contractor:					
6.4.1		150mm Thick layer of G5 gravel compacted 95%	m3	135			
6.5		25MPa/19mm Concrete:					
6.5.1		Surface beds.	m3	90			
6.6		Finishing top surfaces of concrete smooth with a power float:					
6.6.1		Surface beds, slabs, etc.	m2	901			
6.7		Semi-smooth formwork to sides:					
6.7.1		Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	124			
6.8		Saw-cut joints:					
6.8.1		6 x 50mm Saw-cut joints in top of concrete.	m	442			
6.8.2		6 x 20mm Ream cut in top of concrete.	m	442			
6.9		Sika Pro-3 or similar approved sealing compound including backing cord, bond breaker, primer, etc.:					
6.9.1		6 x 20mm Joint sealant in horizontal joints including raking out.	m	442			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 6: NETBALL AND TENNIS COURT COMBINATION							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
6.10		Fabric reinforcement:					
6.10.1		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).	m2	901			
6.11		One coat primer and two coats "Plascon Polvin Super Acrylic Player Surface coat" to manufacturers specifications:					
6.11.1		On surface beds	m2	901			
6.12		50 x 50 x 2,5mm Galvanised Class A Weldmesh fence:					
6.12.1		Diamond mesh fence size 1800mm high	m	40			
6.13		Galvanised goal posts:					
6.13.1		460 x 460 x 510mm Concrete base including excavations, carting away, backfilling, etc.	No	2			
6.13.2		65mm Goal posts, 3550mm high including net	No	2			
6.14		Tennis Net:					
6.14.1		460 x 460 x 510mm Concrete base including excavations, carting away, backfilling, etc.	No	2			
6.14.2		Provide Tennis Net as per approved specifications	No	1			
6.15		Line Markings:					
6.15.1		Lines, 50mm wide for Netball Court layout	m	156			
6.15.1		Lines, 50mm wide for Tennis Court layout	m	256			
6.16		Proposed Grandstand (Prime Cost Amount of R20,000.00 each) in accordance with Manufacture's Specifications					
6.16.1		Grandstand, size 12m long x 2.7m wide x 1.95m high	No	2		R 20 000.00	R 40 000.00
SECTION 6 - NETBALL AND TENNIS COURT COMBINATION - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 7: CRICKET PRACTICE NETS							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
7		SECTION 7: CRICKET PRACTICE NETS (Refer to Drg. No.8011/005/GTH/010 and 015)					
7.1	SANS 1200DM	Earthworks:					
7.1.1	8.3.4	Cut to fill and compact to 93% Mod AASHTO density	m³	60			
7.1.2		Import fill from other excavations on sitel and compact to 93% Mod AASHTO density	m³	170			
7.2		Site Clearance:					
7.2.1		Digging up and removing rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etc.	m2	215			
7.2.2		Stripping average 150mm thick layer of top soil and stockpiling on site.	m2	215			
7.3		Compaction of Ground Surfaces:					
7.3.1		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.	m2	215			
7.4		Filling supplied by Contractor:					
7.4.1		150mm Thick layer of G5 gravel compacted 95% under floors.	m3	35			
7.5		25MPa/19mm Concrete:					
7.5.1		Surface beds.	m3	15			
7.6		Finishing top surfaces of concrete smooth with a power float:					
7.6.1		Surface beds, slabs, etc.	m2	106			
7.7		Semi-smooth formwork to sides:					
7.7.1		Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	102			
7.8		Saw-cut joints:					
7.8.1		6 x 50mm Saw-cut joints in top of concrete.	m	14			
7.8.2		6 x 20mm Ream cut in top of concrete.	m	14			
7.9		Sika Pro-3 or similar approved sealing compound including backing cord, bond breaker, primer, etc.:					
7.9.1		6 x 20mm Joint sealant in horizontal joints including raking out.	m	14			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 7: CRICKET PRACTICE NETS							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
7.10		Fabric reinforcement:					
7.10.1		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).	m2	106			
7.11		50 x 50 x 2,5mm Galvanised Class A Weldmesh fence including straining wires, etc.					
7.11.1		Diamond mesh fence size 2400mm high	m	95			
7.11.2		Diamond mesh fence for roof net	m2	65			
7.11.3		Galvanised posts, 3m long	No	14			
7.11.4		Galvanised diagonal bracing, 3.5m long	No	16			
7.11.5		25Mpa Concrete base 600 x 600 x 600, including excavations, carting away, backfilling, etc.	m3	6			
7.12		CRICKET SIGHT SCREENS & WALLS					
		Excavation in consolidated earth not exceeding 2m deep:					
7.12.1		Trenches.	m3	93			
7.13		Extra over all excavations for carting away:					
7.13.1		Surplus material from excavations and/or stock piles on site, to a dumping site to be located by the contractor.	m3	23			
7.14		Risk of collapse of excavations:					
7.14.1		Sides of trench and hole excavations not exceeding 1.5m deep.	m2	77			
7.15		Keeping excavations free of water:					
7.15.1		Keeping excavations free of all water other than subterranean water.	Item	1			
7.16		Earth filling obtained from the excavations					
7.16.1		Backfilling to trenches, holes, etc.	m3	68			
7.17		Concrete:					
7.17.1		10MPa/19mm concrete for filling of Brick Cavities	m3	4			
7.17.2		25MPa/19mm concrete for Strip Footings	m3	19			
7.18		10mm thick "Jointex" expansion joints between vertical concrete and brick surfaces:					
7.18.1		Exceeding 300mm wide	m2	10			
7.19		High tensile steel reinforcement in various diameter sizes:					
7.19.1		Mild steel reinforcement	t	1.23			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 7: CRICKET PRACTICE NETS							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
7.20		Brickwork of NFX bricks (14 MPa nominal compressive strength) in class II mortar:					
7.20.1		Half brick wall	m2	26			
7.20.2		Mass brickwork in attached piers	m3	2			
7.21		Brickwork of NFP bricks in class II mortar:					
7.21.1		Half brick wall	m2	175			
7.21.2		Mass brickwork in attached piers	m3	11			
7.22		Bagging of 1:3 cement and sand mixture:					
7.22.1		On external brick walls.	m2	238			
7.23		2,8mm Galvanised brick reinforcement:					
7.23.1		75mm Wide reinforcement built in horizontally.	m	480			
7.24		Cement plaster (1:5) on brickwork:					
7.24.1		On walls.	m2	180			
7.25		One coat primer and two coats "Plascon Polvin Super Acrylic PVA" to manufacturers specifications:					
7.25.1		Plastered walls.	m2	180			
7.25.2		Bagged walls.	m2	180			
SECTION 7 - CRICKET PRACTICE NETS - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 8: SPECTATOR SEATING							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
8		SECTION 8: SPECTATOR SEATING (Refer to Drg. No.8011/005/GTH/016)					
8.1		EARTHWORKS NOTE: All prices for excavation or filling are to include for "bulking".					
8.1.1	PD 1	Excavate in earth not exceeding 2m deep below natural or made up ground level for foundation trenches.	m³	95			
8.1.2		Extra over all excavations in earth for excavations in hard rock (Provisional)	m³	25			
8.1.3	PD 7	Spread and level filling from excavations under solid floors and steps and compact to 93% MOD AASHTO dry density	m³	10			
8.1.4		Spread and level G7 filling supplied by the Contractor under solid floors and compact to 92% MOD AASHTO dry density	m³	95			
8.1.5	PD 4	Cart away surplus excavated material not exceeding 1,5 km away including spreading and levelling	m³	85			
8.2	1200 G 8.1.3.3	CONCRETE, FORMWORK AND REINFORCEMENT Concrete Unreinforced 20MPa cement concrete in:					
8.2.1		Foundations	m³	51			
8.2.2		Reinforced 25MPa cement concrete in: Steps	m³	51			
8.2.3	PE	Formwork Temporary smooth formwork to concrete (use and waste) Edge not exceeding 150 mm high	m	20			
8.2.4		Riser exceeding 150 and not exceeding 400 mm high	m	10			
8.2.5	PF	Reinforcement Fabric reinforcement reference No 193 lapped 150mm at all edges to concrete surface beds or slabs	m²	350			
TOTAL CARRIED FORWARD TO NEXT PAGE							

SECTION 8: SPECTATOR SEATING							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
TOTAL BROUGHT FORWARD FROM PREVIOUS PAGE							
8.3	Pl	BRICKWORK Common Brick Supply and install common brickwork in 5 : 1 cement mortar including wire ties, cutting etc:					
8.3.1		230 mm Selected local stock brick (Foundations)	m ²	240			
8.4		Portable Steel Stands:					
8.4.1		Supply and deliver 2 x Portable Steel Spectator Stands	Prov Sum	1			R 20 000.00
SECTION 8 - SPECTATOR SEATING - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 9: STREET PARKING							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
9		SECTION 9: STREET PARKING (Refer to Drg. No.8011/005/GTH/004)					
9.1	SANS 1200DM	EARTH WORKS Roadbed preparation and compaction of in-situ material to a depth of 150mm					
9.1.1	8.3.3 (a)	Compact to 93% Mod AASHTO density	m³	200			
9.1.2	8.3.4	Cut to fill and compact to 93% Mod AASHTO density	m³	20			
9.2	SANS 1200DM	WEARING COURSE Construct 100 mm thick wearing course from commercial sources, compacted to 95% Mod AASHTO. (Wearing course to conform to TRH20, Table 2)					
9.2.1	8.3.16		m³	125			
9.2.2		Construct 600mm wide concrete v-channel to dwg 8011/005/GTH/004	m	160			
SECTION 9 - STREET PARKING - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 10: ELECTRICAL - LV DISTRIBUTION							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
10		SECTION 10: LV DISTRIBUTION					
10.1		REMOVE VANDALIZED EQUIPMENT					
10.1.1		Removal and disposal of vandalized Kiosk	Sum	1			
10.2		LOW VOLTAGE SUPPLY (Point of Supply)					
10.2.1		Supplying, Installing, testing and commissioning of new Kiosk	No	1			
10.2.2		Supplying, Installing, testing and commissioning of 63A TP Circuit Breaker in Kiosk	No	1			
10.2.3		Supply, programming, installation, testing and Commissioning of a Maximum Demand Energy Meter as per the Local Electricity supplier's Specification	No	1			
10.3		CABLING & INSULATED EARTH WIRE					
10.3.1		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			
10.3.2		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			
10.4		CABLE TERMINATIONS					
10.4.1		Supply and install terminations for PVC Insulated Armoured 600/1000V 25mm ² 4-core Aluminium Conductor Cable	No	4			
10.4.2		Cable Way 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			
10.4.3		40mm Round galvanised steel glandless conduit boxes complete with cover and couples for 2-, 3-, 4- or 5-way application Supply	N ^o	2			
10.4.4		Install	N ^o	2			
TOTAL CARRIED FORWARD TO NEXT PAGE							

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KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 11: AREA LIGHTING							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
11		SECTION 11: AREA LIGHTING					
11.1		REMOVE/ REPLACE EXISTING POLES / EQUIPMENT					
11.1.1		Uprooting and replanting of existing floodlight poles	Sum	1			
11.1.2		Supply, installation, testing and commissioning of PVC SWA/ECC Insulated Armoured 600/1000V 4mm² 3-core Copper Conductor Cable in ceiling void, trench, or any other available wireway from Main Distribution Board to Floodlights	m	591			
11.1.3		Supply and install terminations for PVC Insulated Armoured 600/1000V 4mm² 3-core Copper Conductor Cable	No	8			
11.1.4		Supply and installation of 20mm diameter Galvanised Steel Conduit and conduit boxes, galvanised strap saddles and all necessary accessories to install the 4mm² 3-core Cable from the trench to the pole top	m	60			
11.1.5		Supply and installation of 110mm diameter Flexible PVC sleeve and all necessary accessories. Installed 650mm deep in ground	m	34			
11.2		EARTHING					
11.2.1		Earthing of the complete electrical installation according to the SANS 10142 regulations.	Sum	1			
11.3		TEST AND COMMISSION					
11.3.1		Testing and commissioning of the complete electrical installation and issuing of Certificate of Compliance	Sum	1			
11.4		ADDITIONAL ELECTRICAL WORKS					
11.4.1		Sum allowed to be utilized as instructed by electrical engineer	Prov Sum	1			R 20 000.00
SECTION 11 - AREA LIGHTING - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 12: BOREHOLE							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
12		SECTION 12: BOREHOLE					
12.1		P & G Allowance / Establishment	Sum	1			
12.2		Exploratory investigations:					
12.2.1		Investigation to confirm drilling position	Sum	1			
12.3		Drilling:					
12.3.1		165mm dia	m	61			
12.3.2		254mm dia	m	70			
12.3.3		Extra over per meter for 165mm dia drilling	m				Rate Only
12.3.4		Install gravel pack (20 litre)	Sum	20			
12.3.5		177 mm odex	m	20			
12.3.6		Odex Shoe	ea	1			
12.4		Casing:					
12.4.1		Supply and install 177mm steel casing	m	90			
12.4.2		Supply and install 140mm uPVC Class 12 perforated casing	m	151			
12.4.3		Extra over supply and install per meter for 140mm uPVC Class 12 pipe	m				Rate Only
12.5		Pump:					
12.5.1		Supply and install Franklin Electrical SVM 100/44 bore hole pump complete (or similar approved, min. 60% efficiency)	No	1			
12.6		Pipework:					
12.6.1		Supply and install 50mmø HDPE PE80PN20 pipe with couplings	m	150			
12.6.2		Excavate, install and backfill 50mm pipework (min 600mm cover)	m	100			
12.7		Control:					
12.7.1		Supply and install control box complete for borehole pump	m	150			
12.7.2		Supply and install 4mm² 4 core cabling	m	250			
12.7.3		Supply and install float switches to well	No	2			
12.8		Allow for Professional Costs					
12.8.1		Complete yield testing	Sum	1			
12.8.2		Contingencies	Prov Sum	1			R 15 000.00
SECTION 12 - BOREHOLE - MAIN - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY TENDER NO.122/2022 UPGRADING OF THE LOERIE SPORTS FACILITY							
SECTION 13: MISCELLANEOUS WORKS							
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	LOCAL CONTENT %	RATE	AMOUNT
13		SECTION 13: MISCELLANEOUS WORKS					
13.1		Planting of Indigenous Trees for shade:					
13.1.1		Supply, plant 20 x 50 litre bag size indigenous shade trees (white ironwood "Vepris Lancialata")	No	20			
13.2	PSX3	Line Marking Machine:					
13.2.1		Supply and deliver Line Marking Machine	Prov Sum	1			R 5 000.00
13.3		Score Board:					
13.3.1		Supply and deliver Score Board	Prov Sum	1			R 10 000.00
SECTION 13 - MISCELLANEOUS WORKS - TOTAL CARRIED FORWARD TO SUMMARY							

KOUGA LOCAL MUNICIPALITY
INFRASTRUCTURE & ENGINEERING DIRECTORATE
TENDER NO. 122/2022
UPGRADING OF LOERIE SPORTS FACILITY

C2.3 SUMMARY OF BILL OF QUANTITIES		
SECTION	DESCRIPTION	AMOUNT
1	PRELIMINARY & GENERAL	
2	CLUB HOUSE	
3	CLUB HOUSE - ELECTRICAL	
4	BOUNDARY WALL	
5	FENCING AND ACCESS GATES	
6	NETBALL AND TENNIS COURT COMBINATION	
7	CRICKET PRACTICE NETS	
8	SPECTATOR SEATING	
9	STREET PARKING	
10	ELECTRICAL - LV DISTRIBUTION	
11	AREA LIGHTING	
12	BOREHOLE	
13	MISCELLANEOUS WORKS	
SUB-TOTAL		

ALLOW 10% FOR CONTINGENCIES TO BE EXPENDED AS DIRECTED BY THE ENGINEER
AND TO BE DEDUCTED IN WHOLE OR IN PART IF NOT REQUIRED

SUB-TOTAL

ALLOW 15% VALUE ADDED TAX

TOTAL AMOUNT CARRIED TO FORM OF TENDER

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 :

Name :

Position :

Tenderer :

Date :

THE CONTRACT PART C3 (OF 4): SCOPE OF WORKS
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C3.1 DESCRIPTION OF THE WORKS

C3.2 ENGINEERING

C3.3 PROCUREMENT

C3.4 CONSTRUCTION

PART A : GENERAL

PART B : VARIATIONS TO STANDARD SPECIFICATIONS

PART C : PARTICULAR SPECIFICATIONS

C3.5 MANAGEMENT

C3.6 HEALTH AND SAFETY REQUIREMENTS AND PROCEDURES

C3.1: DESCRIPTION OF THE WORKS

C3.1.1 EMPLOYER'S OBJECTIVES

The Employer's overall objective is to upgrade and refurbish the existing sports facility located in Loerieheuwel, Loerie.

C3.1.2 OVERVIEW OF THE WORKS

The Loerie Sports Facility is the only sports facility in the town of Loerie and currently only accommodates rugby and soccer. No separate practice space is available on the facility.

An assessment of the sports facility indicates that it is in a fair to poor condition, with vandalism, neglect, and poor maintenance the main contributing factors to the current state of the facility.

The club house needs to be demolished and re-built, new cricket nets and a new netball / tennis court need to be constructed. The existing boundary wall needs to be repaired in certain sections, access gates need to be installed as well as security fencing. off-site parking, where available, need also to be provided.

C3.1.3 EXTENT OF THE WORKS

This Contract covers the following works, namely:

- Club House:
 - Strip and clean existing floor and foundation area,
 - Conduct structural assessment of the floor and foundation structure, and
 - Rebuild to original state
- Fencing and Access Gates:
 - Repair Perimeter Wall at isolated sections where required,
 - Install / replace security access gates for vehicles and pedestrians where required,
 - Where sections of Perimeter Wall have not been constructed previously, construct 1,8m high brick wall similar to existing wall,
 - Provide security fencing type wire on top of boundary wall and at access gates where required, and
 - The remains of the existing crowd control fence around the existing match field to be removed and to be replaced with a new crowd control fence.

- Netball / Tennis Court combination:
 - Do earthworks to provide level surface and stabilise any side slopes with Terraforcing,
 - Construct layerworks as per engineer's design up to final playing surface,
 - Surface court,
 - Install 2 x permanent netball goal posts / tennis netting,
 - Paint court markings (Netball and Tennis), and
 - Erect 3,6m chain-link galvanised Diamond Mesh fence with one gate along the outside perimeter of the Netball / Tennis Court.

- Cricket Practice Nets:
 - Do earthworks to provide level surface and stabilise any side slopes with Terraforcing,
 - Design and construct new concrete pitches, and
 - Erect fencing and roofs for Cricket Nets

- Spectator Seating:
 - Do earthworks to provide suitably shaped surface for stepping and stabilise any side slopes with Terraforcing, and
 - Design and Construct Spectator Seating by applying Terraforcing and / or other similar approved method

- Street Parking:
 - Design and construction of gravel Parking Bays on the Nellie Street side

C3.1.4 LOCATION OF WORKS

The town of Loerie is situated about 60km west of Gqeberha (Port Elizabeth) and is about 30km north-east of Jeffreys Bay, in the south-western part of the Eastern Cape Province.

The Loerie Sports Facility is situated on the south-western boundary of Loerieheuwel, making the facility accessible to all community members with easy access from Judy, Hazel and Nellie Streets.

C3.1.5 TEMPORARY WORKS

Traffic and Site Access

No roads may be closed without prior permission.

Other Services

The Contractor shall ensure that the position of all existing services affected by the works have been verified before construction works commences.

Where the contractor is responsible for damage for which repairs must be carried out by the Employer, the cost of these repairs will be recovered by means of a deduction from the Contractor's monthly Payment Certificate.

C3.1.6 EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR-INTENSIVE WORKS

1.1 REQUIREMENTS FOR THE SOURCING AND ENGAGEMENT OF LABOUR

1. The minimum rate of pay set for local labour shall be based on the Bargaining Council for the Civil Engineering Industry (BCCEI) for a Grade 1 worker which currently is:
 - Average wage rate of R37.04/hr, or as gazetted is applicable across all sector projects within the Kouga Local Municipality.
 - Worker payment should be effected through bank transfer and proof shall be availed and attested by the payee
 - Worker affiliation with the UIF should be consistently monitored by the contractor and should form part of the continuous reports and deliverables.
2. The Contractor shall, through all available community structures, inform the local community of the labour intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:
 - a) where the head of the household has less than a primary school education;
 - b) that have less than one full time person earning an income;
 - c) where subsistence agriculture is the source of income.
 - d) those who are not in receipt of any social security pension income
3. The Contractor shall endeavour to ensure that the expenditure on the employment of temporary workers is in the following proportions:
 - a) 60 % women;
 - b) 20% youth who are between the ages of 18 and 25; and
 - c) 2% on persons with disabilities.

1.2 SPECIFIC PROVISIONS PERTAINING TO SANS 1914-5

1.2.1 Definitions

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

1.2.2 Contract participation goals:

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

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

1.2.3 Terms and conditions for the engagement of targeted labour Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

1.2.4 Variations to SANS 1914-5

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

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

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

1.3 TRAINING OF TARGETED LABOUR

1.3.1 The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.

1.3.2 The cost of the formal training of targeted labour, will be funded by the provincial office of the Department of Labour. This training should take place as close to the project site as practically possible. The contractor, must access this training by informing the relevant provincial office of the Department of Labour in writing, within 14 days of being awarded the contract, of the likely number of persons that will undergo training and when such training is required. The employer must be furnished with a copy of this request.

- 1.3.3 A copy of this training request made by the contractor to the DOL provincial office must also be faxed to the EPWP Training Director in the Department of Public Works– Cinderella Makunike, Fax Number 012 328 6820 or email cinderella.makunike@dpw.gov.za Tel: 083 677 4026
- 1.3.4 The contractor shall be responsible for scheduling the training of workers and shall take all reasonable steps to ensure that each beneficiary is provided with a minimum of six (6) days of formal training if he/she is employed for 3 months or less and a minimum of ten (10) days if he she is employed for 4 months or more.
- 1.3.5 The contractors shall do nothing to dissuade targeted labour from participating in the above-mentioned training programmes.
- 1.3.6 An allowance equal to 100% of the task rate or daily rate shall be paid by the contractor to workers who attend formal training, in terms of 1.3.4 above.
- 1.3.7 Proof of compliance with the requirements of 1.3.2 to 1.3.6 must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

C3.2: ENGINEERING

C3.2.1 DESIGN SERVICES AND ACTIVITY MATRIX

Design item / level of design	Party responsible for Design / Supply of drawings
Concept, feasibility and overall process	Employer
Basic engineering and detail layout to tender stage	Employer
Final design to approved for construction stage	Employer
All temporary works	Contractor
Record drawings	Contractor

C3.2.2 DESIGN BRIEF

Where drawings of the structures have been prepared by the Employer's Agent, the Contractor shall base their drawings on the Employer's Agents drawings and shall check that their equipment fits into and can operate satisfactorily within the structures shown on the Employer's Agent drawings. Drawings, dimensions and details of existing infrastructure and equipment are supplied to the Contractor in good faith, however, the Contractor shall base the design of their infrastructure and equipment on actual dimensions and details measured/recorded on Site by them and approved by the Employer's Agent. Any inconsistencies, including any conflict between the Employer's Agent drawings and the actual dimensions measured on site, shall immediately be drawn to the attention of the Employer's Agent, in writing.

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.

DRAWING NO.				DESCRIPTION
8011	005	GTH	003	PROPOSED CONCEPT PLAN LAYOUT OF SPORT FACILITIES
8011	005	GTH	004	OVERALL LAYOUT
8011	005	GTH	007	TYPICAL SEWER DETAILS
8011	005	GTH	008	VALVE AND CHAMBER DETAILS
8011	005	GTH	010	PROPOSED SPORTS FIELDS LAYOUTS & CRICKET NETS DIMENSIONS & MARKINGS
8011	005	GTH	011	PROPOSED NETBALL COURT PLAN SECTIONS & DETAILS
8011	005	GTH	012	TYPICAL GATE DETAIL
8011	005	GTH	013	TYPICAL WALL DETAIL
8011	005	GTH	014	PROPOSED REPAIRS TO EXISTING BOUNDARY WALL
8011	005	GTH	015	EARTHWORKS PLATFORM LAYOUT PLAN
8011	005	GTH	016	TYPICAL PLATFORM SECTIONS & DETAIL OF SPECTATORS SEATING
8011	005	GTH	017	PROPOSED CLUB HOUSE BUILDING

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: PROCUREMENT

C3.3.1 SUBCONTRACTING: PORTION OF WORKS RESERVED FOR EME's SUBCONTRACTORS

This specification covers the requirements of the Employer for the use and development of EME's as subcontractors on civil engineering projects.

C3.3.1.1 DEFINITIONS

For the purposes of the Scope of Works, the definitions given in the General Conditions of Contract for Construction Works (2015), the Standard Specifications and the Scope of Works, together with the following additional definitions shall apply:

- (i) **"Contract"** shall have the meaning assigned thereto in Clause 1.1.1.7 of the General Conditions of Contract for Construction Works (2015).
- (ii) **"Contractor"** shall have the meaning assigned thereto in Clause 1.1.1.9 of the General Conditions of Contract for Construction Works (2015).
- (iii) **"EME"** shall mean an enterprise with an annual turn total revenue of R 5 million or less, and owned or managed by black people, as defined in C3.3.4.
- (iv) **"Main Contract"**: shall mean the contract entered into between the Employer, who is the Kouga Local Municipality, and the Contractor.
- (v) **"EME Committee"**: The EME Committee shall be selected after award of the Main Contract, and its members shall consist of:
 - a. The Contractor, or his/her representative
 - b. The Employers Agent, or his representative
 - c. PMU Manager
 - d. SCM Manager
 - e. LED Manager (or delegated official)
- (vi) **"EME's Subcontract"** shall mean the contract entered into between the Contractor and any EME subcontractor.
- (vii) **"EME Work Package"** shall mean that portion of the Works which shall be set aside for construction by an EME.
- (viii) **"Contract Value"** shall mean the Contract Sum (as stated in the Form of Offer and Acceptance) less VAT, less Contingencies, less Section A: Preliminary and General and less items H4 up to and including H7.

C3.3.2 RESOURCE STANDARDS

Ten (10%) of the work will be subcontracted to EME's to expedite the objectives of Integrated development plan and economic development.

C3.3.3 SCOPE OF MANDATORY SUBCONTRACT WORKS

It is the requirement of the Kouga Local Municipality and this tender that 10% of the works needs to be subcontracted out to local EME's.

It is the Contractor's responsibility to ensure that this target percentage is attained. The contractor will during the implementation stage of the contractor provide monthly progress reports indicating the percentage spend on local EME's and if the target of 10% are not met, the contractor needs to indicate how he will achieve this,

No additional mark-up or costs will be payable to the contractor for work to be undertaken by EME's. Provision is made though for the main contractor to appoint an EME Manager to oversee works undertaken by EME's.

C3.3.4 PROPOSED EME COMPONENT BREAKDOWN

The following activities are reserved (but not restricted to) for EME's:

- Grassing,
- Paving,
- Trench excavations, and
- General building works

C3.3.5 PREFERRED SUBCONTRACTORS

Subcontractors shall be EME's. An EME's is defined as an enterprise with an annual total revenue of R 5 million or less. The company or economic activity that is owned by black persons and where there is substantial management control by Black People. Ownership refers to economic interest, whilst management refers to the membership of any board or similar governing body of the enterprise. The Broad-Based Black Economic Empowerment Act No. 53 of 2003, principles shall apply to BE's.

Enterprises shall comply with the following:

- Business shall be registered within the Kouga Local Municipality boundaries,
- Must be registered with the CIDB to a relevant class i.e CE or GB,
- Must have a current valid Tax Clearance Certificate.

C3.3.6 SUBCONTRACTING PROCEDURES

A list of EME's will be provided to the contractor by the Kouga Local Municipality after the award of the contract to price for works that can be undertaken by EME's. In cases where there is no database, EME's will be invited to submit their company profiles preference given to ward based EME's.

The Employer, Employer's Agent together with the Contractor shall evaluate the tenders received in accordance with the provisions of the Standard Conditions of Tender contained in Annex F of Standard for Uniformity in Construction Procurement. The evaluation and adjudication panel shall comprise of equal representatives from the Employer, Employer's Agent, the CLO (as an observer), Social facilitator and the Contractor. The Employer requires the EME Committee to form the Evaluation Panel.

The Contractor with assistance from the Employer's Agent will draw up mini tender documents for the EME's to price a closing date and the venue to submit it will be announced. The main contractor then has to evaluate the rates and present them to the EME committee for approval. Rates are to be agreed by the EME committee.

The Contractor shall without delay award and enter into contract with the successful tendering subcontractor based on their accepted tender submission. Deviations from the tender document shall not be accepted by the employer and the SAFCEC Agreement shall be used (Format attached).

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

C3.3.7 ATTENDANCE ON SUBCONTRACTORS

An allowance is made in the bill of quantities for managing the subcontractors during the course of the contract. The following items may be required:

- Allowance for procuring (tender) for the subcontract/s
- Allowance for mark up on the actual cost of the subcontract works
- Allowance for managing the subcontract
- Allowance for mentoring, supervising and site training
- Allowance to pay contractors within 7 days after submission of invoice

C3.3.6.1 PROCEDURE FOR ENGAGING EME'S ON THE PROJECT

The conditions of subcontract shall stipulate that the tenderer must be registered with the Construction Industry Development Board, in the relevant category, according to the estimated value of the Work Package.

The Contractor, with assistance from the Employer Agent, must undertake the following tasks in appointing EME's:

- Get a list of EME's from the Kouga Local project manager or invite profiles of contractors.
- together with the EME Committee, adjudicate and award the tenders;
- sign a subcontract agreement for each Work Package with the successful EME subcontractor using the SAFCEC format;
- assist and monitor the EME subcontractors with their work output and quality;
- issue subject to the approval of the Employer a Certification of Completion to each EME subcontractor.

The Contractor shall ensure that EME's are appointed timeously, so as not to delay the programme on the Main Contract in any way.

The above tasks are more fully described below.

C3.3.6.2 TENDER PROCESS FOR APPOINTING EME'S

1. Supply Chain Management Policy

The Contractor shall procure the services of EME'S's by following a process similar to that of the Municipality's Supply Chain Management Policy, so as to ensure fairness and equity. Tenders, of which the estimated value is below R 200 000, may be procured by obtaining three quotes. However, for work packages whose estimated value exceeds R 200 000, tenders shall be invited from names of EME's that will be provided. A List of companies will be given to the main contractor and he will invite all those companies to submit tenders. A contractor will be given names in a principle of 50% more than the required number to choose from.

The Contractor shall invite tenders and shall be responsible for the issuing of the subcontract tender documents to prospective tenderers. The Employer's Agent will monitor and approve this process.

The Contractor shall adjudicate the tenders with the assistance of the EME Committee and shall enter into a subcontract agreement with the successful EME.

All conditions of tender, as they applied to the Main Contractor on this Contract, shall apply where relevant, to the tenders for EME subcontracts.

2. Conditions of Tender

The conditions of the subcontract agreement shall be in accordance with the General Conditions of Contract for Construction Works (2015). The contract will also specify:

- (a) the terms and conditions relating to the recruitment, employment and remuneration of workers engaged on the contract works; and

- (b) details of any training to be provided to the temporary workforce.
- (c) detail of accepted rates
- (d) Payment terms which should be 7 days after issuing of an invoice on labour only contracts and where the main contractor is supplying material and plant
No early settlement discount will be charged.

3. Assistance to the Tenderers

- (a) The Contractor shall be responsible for ensuring that prospective EME tenderers fully comprehend the following:
 - Implications of the liabilities and responsibilities inherent in the subcontract into which the tenderer proposes entering;
 - implications of the tendered rates;
 - scope and extent of the works included in the subcontract;
 - proper procedures for the submission of the tender;
 - Procedures and basis on which tenders will be adjudicated and the subcontract awarded.

4. Adjudication

- (a) The Contractor shall receive all tenders at a location identified by him, with all sealed tender submissions being placed in a proper tender box for this purpose.
- (b) All tenders received shall be evaluated by the Employer's Agent and the person (Contracts Manager) mandated to act and sign on behalf of the main Contractor
- (c) The EME Committee shall have the right to interview any Tenderer for them purpose of:
 - Clarifying any aspect of the tender;
 - Verifying the eligibility of the Tenderer;
 - Querying abnormally high or low rates and prices, and
 - Clarifying rates and prices which are not in balance with other tendered rates and prices
- (d) The correction of obvious errors shall be carried out in accordance with the requirements of the CIDB Conditions of Tender.
- (e) Adjudication of the tenders received will be made by the EME Committee. The Contractor shall be prepared to explain the process of adjudication to all Tenderers and motivate his method of award, as may be necessary. All unsuccessful and successful tenderers need to be notified in writing

5. Award of Tenders

The Contractor must award the work to the successful EME Tenderer where after a subcontract agreement will be signed between the Contractor and the successful EME Tenderer using the attached SAFCEC format.

C3.3.8 ATTENDANCE ON EME SUBCONTRACTORS

The Contractor shall closely manage and supervise all EME's and shall manage, guide and assist each EME in all aspects of management, carrying out 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 EME and shall be directed at enabling the EME's to achieve the successful carrying out and completion of the subcontract.

The Contractor shall be required to appoint an EME Construction Manager who will be responsible to assist EME's as and when required. The EME Construction Manager's duties are specified in Clause PSA 8.10 below.

"PSA 8.10 EME CONSTRUCTION MANAGER"

Assistance to the EME Subcontractors

The Contractor shall, in addition to the requirements of Clause 4.4 of the General Conditions of Contract for Construction Works (2015), guide, assist and mentor all eligible potential EME's wishing to submit tenders, in the proper completion and submission of their particular tenders, including advice and guidance on how to establish rates.

The Contractor shall employ on a full-time basis, a construction manager on the Contract who will manage the EME's and report on progress to the EME Committee. 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 assistance rendered by the Construction Manager, shall *inter alia*:

- (i) be given at a level and to the extent which is commensurate with the expertise and resources of the EME,
- (ii) be given in a manner which is neither prescriptive, dictatorial, nor coercive towards the EME;
- (iii) not be utilized by the Contractor to manipulate the rates and prices submitted, to his advantage, and
- (iv) 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 the Contract but will only be on site during times when EME subcontractors are performing work.

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.

C3.3.9 CONTRACTOR'S OBLIGATIONS TO SUBCONTRACTED EME'S

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 cognizance of the level of sophistication and experience of the particular EME concerned.
- (b) closely manage and supervise all EME's and wherever feasible, give reasonable warning to EME's when any contravention of the terms of the subcontract has occurred or appears likely to occur. The Contractor shall whenever feasible, give the EME's reasonable opportunity to make good any such contravention, or to avoid such contravention and shall render all reasonable assistance to the EME in this regard.

When taking any disciplinary actions or imposing any penalties as are provided for in the subcontract, the Contractor shall explain fully to the EME's that such actions are provided for in the subcontract.

If any dispute should arise between the Contractor and an EME such dispute shall be resolved in accordance with the provisions of the subcontract.

2. Quality of Work and Performance of the EME subcontractor

2.1 Quality

The contractor shall be fully liable for the quality of work done by the EME as of that work is done by the main contractor. All works are to be done according to the specs and as specified in the tender document.

2.2 Performance

If the EME Subcontractor, in the opinion of the Employer's Agent, fails to comply with the criteria as listed below, the Employer's Agent shall issue a written warning to the Contractor, stating all the areas of non-compliance. A copy of the letter of warning shall be forwarded to the Employer. The criteria may include, but are not limited to, the following:

- (a) Acceptable standard of works as set out in the specifications in the subcontract.
- (b) Progress in accordance with the time constraints in the subcontract.
- (c) Punctual and full payment of the workforce and suppliers.
- (d) Site safety

- (e) Accommodation of traffic.

The EME Subcontractor shall have 14 days from the date of receipt of the letter of warning by the Contractor to address and rectify the issues raised by the Employer's Agent, with the exception of points (d) and (e), for which the reaction time shall be 24 hours. Failure to do so, will be sufficient grounds for the Contractor to terminate the subcontract, provided that the EME Committee is satisfied that the Contractor has made every effort to correct the performance by the EME Subcontractor.

C3.3.10 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 EME, a Certificate of Completion. The format, layout and appearance of certificates issued shall be agreed by the EME Committee, provided always that they shall be respectable and presentable in accordance with the general standards of normal business practice. All certificates issued shall be co-signed by the Employer's Agent and a senior representative of the Contractor, who has been duly authorized thereto.

The Certificate of Completion shall provide the following information:

(a) Main Contract data:

- (i) Contract title;
- (ii) Contractor's full name and address;
- (iii) Employer's Agent's name and address;
- (iv) Employer's name.

(b) Subcontract data:

- (i) EME name and address;
- (ii) Scope or extent of the subcontract works;
- (iii) Value of the subcontract works;
- (iv) Duration of the subcontract;
- (v) Date of completion of the subcontract;
- (vi) Description of the training undergone by the EME.

C3.3.11 CONTRACTOR'S LIABILITY

No provision or requirement set out in this specification shall be deemed to relieve the Contractor of any liability or obligation under the contract, and in accordance with the provisions of Clause 4.4 of the General Conditions of Contract for Construction Works (2015), the Contractor shall be fully liable for the acts, defaults and neglects of any EMEs, his agents or employees, as fully as if they were the acts, defaults and neglects of the Contractor, his agents or employees.

C3.3.12 MEASUREMENT AND PAYMENT

Under the work packages set aside for EMEs, the EME shall be responsible for all labour, plant, equipment, tools, materials and any other incidentals that may be required to carry out the works in accordance with the specifications.

In cases where the EME is unable to have the above then the main contractor is to provide plant, equipment, tools, material and other items needed by the EME in order to implement his work and such contracts will be regarded as labour only sub-contractors.

The Main Contractor shall supervise and manage the EME work at all times in order to ensure compliance with the specifications and drawings.

The Main contractor shall pay EME's 7 days after issue of an Invoice. The main contractor will not charge EME's handling costs i.e bank charges, early payment discounts etc.

C3.3.12.1 PAYMENT OF EME'S

EME's are to be invited to submit their payment certificates or claims fortnightly, and are to be paid by the contractor within 7 days.

Payment of EME's may not be delayed pending payment of the contractor by the Employer.

C3.3.13 GENERAL

Claims for extension of time due to delays caused by EME's will not be entertained; the main contractor is to programme in his work factoring the use of EME's.

Non-performance of EME's shall be dealt with in terms of the clause 10 in the SAFCEC sub contractor agreement.

i. Retention

A five percent (5%) Excluding vat of the sub contract value will be deducted as retention on EME with half to be released on issue of the completion certificate for the EME.

ii. Sub contracting by EME's

The Main contractor shall not permit the invited EME sub contractor to further sub contract on any other conditions than those applying in the project specification to subcontractors or EME subcontractor

iii. Joint Venturing & Consortium

The EME committee shall decide whether to permit the invited EME sub contractor to enter into Joint Ventures or form a consortium with an external EME.

C3.3.14 PENALTIES FOR NON-COMPLIANCE WITH SUB-CONTRACTING

Should the main contractor do the work that is earmarked for sub-contracting to EME's. The main contractor will be charged a penalty of 100% of value of any work he/she has done. The amount will be deducted from the monthly payment certificate.

C3.3.15 PROFORMA SAFCEC AGREEMENT

The standard Pro-Forma SAFCEC Subcontract Agreement shall apply for the appointment of EME's.

C3.4: CONSTRUCTION: PART A

WORKS SPECIFICATION

C3.4.1 APPLICABLE SABS 1200 STANDARDS FOR CONSTRUCTION WORKS

The Standardised Specifications listed below are applicable to the contract. It shall however be noted that reference is made in certain of the specifications to other standardised specifications which may or may not be included in the list below. Where such specifications are not included, they shall however be deemed to be included in the contract documents.

South African Bureau of Standards, Standardized Specifications for Civil Engineering Construction. SABS/SANS 1200 series, specifically:

SANS 1200 A	–	1986	General
SANS 1200 AB	–	1986	Employer's Agents Office
SANS 1200 C	–	1980	Site Clearance (As amended 1982)
SANS 1200 D	–	1988	Earthworks (As amended 1990)
SANS 1200 DA	–	1988	Earthworks (small works) (As amended 1990)
SANS 1200 DB	–	1989	Earthworks (Pipe Trenches)
SANS 1200 DM	–	1981	Earthworks (Road, Subgrade)
SANS 1200 GA	–	1982	Concrete (Small Works)
SANS 1200 L	–	1983	Medium Pressure Pipelines
SANS 1200 LB	–	1983	Bedding (Pipes)
SANS 1200 LD	–	1981	Sewers
SANS 1200 LE	–	1981	Stormwater Drainage
SANS 1200 MK	–	1996	Kerbing and channeling
SANS 1200 M	–	1996	Roads (General)
SANS 1200 ME	–	1981	Subbase
SANS 1200 MM	–	1981	Ancillary Roadworks

These have not been bound into the document but are available for inspection at the offices of the Consulting Engineers or can be obtained as follows:

- Standards South Africa, contactable at 012 428 6666

The Contractor shall always have available for reference on site a full set of the above specifications, together with any other to which they refer.

These specifications shall remain the property of the Contractor but shall be made available to the Engineer whenever required throughout the duration of the contract.

Project specific variations to these standardized specifications are included as Scope of Work: Part B. In the event of any discrepancy with a part or parts of the standard specifications, the bill of quantities or the drawings, the project specifications described in Scope of Work: Part B shall take precedence.

C3.4.2 APPLICABLE PARTICULAR STANDARDS

- PAA : Appointment of CLO & Labour employment conditions
- PA-PV : Building Specifications
- PW : Electrical Specifications

C3.4.3 APPLICABLE NATIONAL AND INTERNATIONAL STANDARDS

- The Standard Regulations for the Wiring of Premises as issued by the South African Bureau of Standards (SANS 10142-1);
- The Occupational Health Safety Act No. 85 of 1993;
- N.O.S.A. Safety Guidelines;
- The Local Fire Office Regulations;
- The Municipal by-laws and any special requirements of the local Supply Authorities of the area or district concerned;
- The applicable IEC Specifications or the BS Specifications where no SANS or IEC Specifications exist;
- The National Building Regulations;
- Post Office Regulations;
- Earthing design and installations, SANS 10199;
- The protection of structures against lightning, SANS 10313;
- Interior lighting (artificial) SANS 10114 Part 1;
- Emergency lighting SANS 10114 Part 2;

No claims for extras in respect of failure by the Contractor to comply with any of the above regulations shall be considered.

Where conflict exists between any of the above regulations and the specifications, the said conflict must be referred to the Engineer in writing for his ruling.

In addition to the above Contractors are advised that only the highest standard of workmanship shall be accepted and that all materials supplied must be strictly in accordance with this specification. If workmanship and/or materials are not suitable, the Engineer will request that the work is repeated or the materials returned until a satisfactory standard is achieved. No additional payment shall be made in respect of any remedial works.

The term “project specifications” appearing in any of the SABS 1200 standardised specifications must be replaced with the terms “scope of work”.

The variations and additions to the specifications listed in C3.4.3.1 are included/detailed to in SCOPE OF WORKS – C3.4 CONSTRUCTION: PART B: VARIATIONS TO THE STANDARD SPECIFICATIONS. And C3.4 CONSTRUCTION: PART C: PARTICULAR SPECIFICATION

C3.4.4 MATERIALS SAMPLES AND SHOP DRAWINGS

Where materials to be used in the works are required to comply with a SABS/SANS specification, they will be accepted as complying with the SABS/SANS specification if one of the following is satisfied.

- The display of a SABS/SANS mark on the product with a copy of the SABS/SANS certificate that allows the manufacturer to use the mark, or
- All the criteria in the relevant SABS/SANS specification is measured and confirmed on site or in an approved laboratory.

The same will apply to materials specified to comply with ISO, BS, ASTM or other international specifications

C3.4.5 KNOWN SERVICES

The positions of existing services, insofar as they are known, are shown on the drawings. Items have been allowed in the Schedule of Quantities for dealing with and protecting services.

C3.4.6 TREATMENT OF EXISTING SERVICES

Before construction work commences, all existing services must be located and marked. The contractor is to take levels of all the exposed services and forward to the Employer's Agent before any work can commence. The Employer's Agent will then check levels against design and only then will the Employer's Agent allow the Contractor to continue with the works. The Contractor is to allow for the exposing of services and subsequent checks by the Employer's Agent in their programme. All existing services are to be located by hand-excavation. The Contractor shall take whatever precautions are required to protect these services from damage during the period of the Contract.

C3.4.7 USE OF DETECTION EQUIPMENT FOR THE LOCATION OF UNDERGROUND SERVICES

The Contractor shall take all the necessary steps to ascertain the location of existing services before commencing any section of the works and shall exercise the greatest care when working in the vicinity of such services. No more than three weeks and not less than one week before commencing his operations in any particular area, the Contractor shall obtain from the relevant authority the latest available drawings showing the location of services already installed.

The Contractor shall take all the necessary steps to protect any existing works against damage which may arise as a result of his operations on Site. The Contractor shall bear the cost of the repair of damage to any service, the possible existence of which could reasonably have been ascertained by him in good time.

Where the Contractor is responsible for the cost of repairs carried out by a Service Authority, the Contractor will be billed directly by the Service Authority concerned.

C3.4.8 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.

C3.4.9 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.

C3.4.10 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

C3.4.11 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.

C3.4.12 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.

C3.4.13 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 Howiesonspoort 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.

C3.4.14 FACILITIES PROVIDED BY THE CONTRACTOR

Temporary Offices

Site meetings will be held in the Contractor's site office.

Sanitary Facilities

The Contractor shall supply 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 public toilet facilities.

Telephone Facilities

A site telephone will not be required by the Employer's Agent, but the time-related tendered rate for the Contractor's telephone shall include for local official calls by the Employer's Agent or his Representative.

C3.4.15 OTHER FACILITIES AND SERVICES

a) SECURITY

The provision of security for the Contractor's Site Establishment shall be his own responsibility and no claims for additional security measures taken during the currency of the contract will be considered.

Unless expressly allowed for in the contract sum, the Contractor shall in connection with the works, provide and maintain, at his own cost, all lights,

guards, barriers, fencing and watching when and where necessary or as required by the Engineer or by any competent statutory or other authority for the protection of the works or for the safety and convenience of the public.

The minimum-security requirement is for the Contractor to Employ Security Guards from an approved Security Company to give 24 hours security, 7 days a week.

b) REFUSE CONTAINER & DISPOSAL

Adequate containers for collection of refuse shall be provided by the Contractor. All containers shall have lids. Arrangements for refuse disposal shall be made with the relevant authority.

C3.4.16 VEHICLES AND EQUIPMENT

The Contractor must make available survey equipment to the Employer's Agent's Representative as may be required from time to time throughout the contract. Details are included in the Scope of Works – C3.4 Construction: Part B.

C3.4.17 NOTICE BOARDS

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

C3.4.18 SITE USAGE

The Contractor shall also provide sumps, pumps, furrows, berms and/or coffer dams to divert water flow away from the construction activities; and other temporary works as may be necessary to minimise damage, inconvenience or interference, for 24 hours a day, 7 days a week throughout the period of Construction, to adequately protect the works from flooding and damage by stormwater.

C3.4.19 PERMITS AND WAY LEAVES

The Contractor will be required to take cognisance and comply with the general way-leave 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

C3.4.20 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.

C3.4.21 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.

C3.4.22 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: CONSTRUCTION: PART B

PART B: VARIATION TO THE STANDARD SPECIFICATIONS

In certain clauses the standard specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this contract are contained in this part of the project specifications. It also contains some additional specifications required for this particular contract.

The number of each clause in this part of the project specification consists of the prefix PS followed by a letter corresponding to the part of SABS 1200 being changed and a number corresponding to the number of the relevant clause in the standard specifications.

The number of the new clause which does not form part of a clause in the standard specification and which is included herein, is also prefixed by PS followed by a letter corresponding to the part of SABS 1200 being added, followed by a new number. The new numbers follow on the last clause numbers used in the relevant section of the standard specifications.

PSA GENERAL

PSA 3 MATERIALS

PSA 3.1 QUALITY

Where a material to be used in this Contract is specified to comply with the requirements of an SABS Standard Specification, and such material is available with the official SABS mark, the material used shall bear the official mark.

PSA 4 PLANT

PSA 4.1 MEDICAL FACILITIES AND SAFETY EQUIPMENT

Suitable first aid services required for this contract shall include, inter alia, a First Aid cabinet fully equipped and maintained with the minimum contents as listed in the Annexure (Regulation 3) of the General Safety Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), to deal with accidents and ailments which are likely to occur during the construction period.

The Contractor shall provide personal safety equipment and facilities as required by Regulation 2 of the General Safety Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993)

PSA 5 CONSTRUCTION

PSA 5.2 Watching, Barricading and Lighting

Add the following

“The Contractor shall comply in all aspects with the requirements of the Occupational Health and Safety Act (Act 85 of 1993)”.

PSA 5.8 Access to Properties

Notwithstanding subclause 5.8 the Contractor shall, where practicable, maintain free access for other parties to make use of the site, and in this regard he may be called upon to carry out special works as itemised in the Schedule of Quantities. Other parties may include employees of the local authority, other contractors, members of the public who require access to adjoining properties and employees of various departments such as Eskom, etc.

Road crossings and access to erven must be provided by the Contractor at all times. The Contractor shall, at his own expense, provide suitable crossings for residents and other Contractors requiring access to the Site. Such temporary service trench 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 vehicles of mass not exceeding 2 tons. The Contractor shall also be responsible for maintaining such 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 by-passes is not feasible, construction shall be carried out under traffic in order to provide access to the erven and properties.

The Contractor may, with the approval of the Employer's Agent, arrange with the occupiers of the affected erven and properties to temporarily close off a portion of a street, road, foot-path or entrance, provided that the Contractor shall give due notice to the occupiers of the intended closure and its probable duration and shall as punctually as possible re-open the route at the prescribed time. Where possible the road 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.

If the Contractor intends to close off a bus route the relevant authorities shall be notified 24 hours prior to the work. If the Contractor intends to close off a taxi route, he shall advise and liaise with local taxi association in this regard. All roads may only be closed between the hours of 08:30 – 15:30.

Items have been included in the Preliminary and General Section of the Schedule of Quantities for the provision of access to properties.

Payment shall be a lump sum for providing access to all erven and properties, which lump sum shall be full compensation for providing access to erven and properties at all times and shall include for any additional costs due to construction under traffic, for making arrangements with the occupiers of erven and properties to temporarily close off routes and for taking the necessary precautions to provide for the safe and easy passage of traffic through the areas under construction.

PSA 5.9 Accommodation of Traffic

(New Clause)

Temporary traffic signs shall be erected at all diversions.

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 or black border.

PSA 5.10 EME Construction Manager

(New Clause)

The Contractor shall employ on a monthly basis, in addition to Clause 4.4 of the General Conditions of Contract (2015) an EME Construction manager on the Contract who will guide, assist manage and mentor all EME's appointed on the contract, and report on progress at the contract site meetings. Such a Construction Manager must be adequately experienced with EME work and the development thereof and will be subject to the approval of the Employer. The assistance rendered by the EME Construction Manager, shall *inter alia*:

- (i) Be given at a level and to the extent which is commensurate with the expertise and resources of the EME,

- (ii) Be given in a manner which is neither prescriptive, dictatorial, nor coercive towards the EME;
- (iii) Not be utilized by the Contractor to manipulate the rates and prices submitted, to his advantage, and
- (iv) 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 the Contract but will only be on site during times when EME subcontractors are performing work.

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.

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.3 Scheduled Fixed-Charge and Value-Related Items

PSA 8.3.1 Contractual Requirements

Add to sub-clause 8.3.1:

“In addition, the sum tendered shall cover all initial costs incurred in complying with the requirements of the Contract Data.

PSA 8.4 Scheduled Time-Related Items

PSA 8.4.1 Contractual Requirements

The Contractor shall tender a lump sum in the Bill of Quantities to cover his time-related establishment costs. The amount tendered and paid shall be 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 or Tender where applicable.
- (iii) Compliance with all general conditions and requirements which are not specifically measured elsewhere for payment in these Contract Documents.

The Contractor shall tender a lump sum for the abovementioned items.

Payment of the lump sum shall be made monthly in compliance with the method laid down in Sub-clause 8.2.2 of SABS 1200:A.

The Contractor will not be paid Time-Related Preliminary and General charges for any Special Non-Working Days, as stipulated in C1.2: Contract Data (Part 1), which shall be deemed to have been allowed for in his rates.

PSA 8.4.2 Adjusted Payment for Time-Related Items

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:

Sum of Tendered amounts
for Time Related Items x $\frac{\text{Extension of Time authorised by variation order}}{\text{Tender contract period}}$

*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 8.4.5 Other Time-related Obligations

Provision of Security Personnel Unit: month

This item shall cover the cost of providing such security personnel the Contractor deems appropriate, taking cognizance of the location of the site and the historical record of incidents of crime in the area.

PSA 8.4.6 Compensation in terms of Clause 5.12.2.4 of the General Conditions of Contract – 2015 and clause 9.1.4 of the Contract Data, for delays incurred. (New Clause)

- (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 Clauses 5.12.2.4, 9.1.1 and 9.1.2 of the General Conditions of Contract - 2015.

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 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 General Conditions of Contract - 2015.

This payment item shall only apply to delays which in the opinion of the Employer's Agent are due to the circumstances described in Clauses 5.12.2.4, 9.1.1 and 9.1.2 of the General Conditions of Contract - 2015.

The cost of delays incurred for all other circumstances shall be treated as provided for in the General Conditions of Contract -2015.

The provision of this clause shall in no way prejudice the rights of either the Employer or the Contractor to determine the contract in terms of the provisions in clause 9.1 of the General Conditions of Contract - 2015.

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 8.4.7 Miscellaneous Items (New Clause)

An item which, in the payment clause column of the Bill of Quantities, refers to this clause (PSA8.4.7), will be measured in the unit scheduled.

The sum or rate for such item shall cover the cost of all materials, labour and plant required to execute and complete the work as specified, described in the Bill of Quantities or shown on the drawing(s).

PSA 8.4.8 Freehaul and Overhaul (New Clause)

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.

PSA 8.5 Sums stated provisionally by Employer's Agent (Subclause 8.5)

Amend the penultimate sentence of Subclause 8.5 to read:

"The percentage rate for 8(b)(2) above shall cover the Contractor's overheads, charges and profit on the work covered by the sums provisionally stated for (b)(1) above. Payment will be made on the basis of the sums actually paid for such work."

PSA 8.7 Daywork (Subclause 8.7)

Provisional sum items are scheduled for Daywork labour, materials and plant (owned and hired by the Contractor). Percentage allowance on net cost items are scheduled for Daywork labour, materials and plant hired by the Contractor.

The Contractor will be paid:

- a) the actual cost of labour, materials and hired plant,
- b) an amount being the tendered percentage times the actual cost of labour, materials and hired plant, and
- c) the cost at agreed rates for plant owned by 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 Thomas Baines reserve 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

All existing services and protection thereof to be handled in a manner as detailed in C3.4.11 to C3.4.17, but not limited to those items. Payment will be according to "Dealing with Existing Services" in the schedule of quantities.

PSA 8.8.6 Dealing with water

Temporary works are required by the contractor to deal with the flow of water through the works. The rate tendered for this item shall be deemed to cover the installation of such a system, the maintenance thereof, and the necessary reinstatement on completion of the works.

PSA 8.8.7 Provide barricading around open excavations where required by the Employer's Agent. The rate shall cover all costs to install and maintain safety barricading around excavations where required by the Employer's Agent.

**PSA 8.9 Compliance With OHS Act And Regulations (New Clause)
(Including The Construction Regulations 2014)**

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of the OHS Act and Regulations (including the Construction Regulations 2003) at all times for the full duration of the Contract. The successful tenderer shall provide the Employer's Agent with a complete breakdown of this tendered sum. This sum will be paid to the Contractor in equal monthly amounts subject to proper/substantial compliance."

The sum shall include the management and compliance of the EME's to the OHS Act.

PSA 8.10 Provisional Sum for Accredited Training (New Clause)

Add the following payment Items:

- (a) Accredited training by the Department of Labour (provisional)..... Prov. Sum
- (b) Handling costs and charges for Contractor..... Percentage (%)

The Contractor will liaise with the Employer's Agent and the Community Liaison Officer for the training requirements of targeted local labour and arrange for formal training with the local Department of Labour, or other accredited training service providers.

PSA 8.11 Training of Employer's Staff in the Operation and Maintenance of the Works.

Add the following payment Items:

- (a) Accredited training for StaffSum
- (b) Handling costs and charges for ContractorPercentage (%)

The Sum shall include all costs for the Contractor to provide training sessions to all plant personnel in the new equipment that will be installed.

The training is to be based on 2 x 4hour training sessions by an accredited, competent service provider.

PSA 8.12 Compliance with the Environmental Management Plan (New Clause)

The tendered sum shall include full compensation to the Contractor for compliance with the Environmental Management Plan. This sum will be paid to the Contractor in equal monthly amounts subject to proper/substantial compliance.

Add the following payment Items:

- (a) Compliance with the Environmental Management PlanSum

PSA 8.13 Permits and Wayleaves (New Clause)

Although the Employer's Agent will provide wayleave drawings, the Contractor shall be responsible for liaising with the relevant service authorities and shall obtain his own wayleaves / approvals before commencing construction.

The Contractor will be required to take cognisance and comply with the general way-leave requirements of the various services providers, where applicable, during the construction of the pipeline. 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.

PSA 8.14 Barricading of Trenches (New Clause)

Barricading of trenches must be provided where there are open trenches. Excavated material must also be placed surrounding the trench to form a berm to prevent animals/people accidentally falling into excavations. Payment to be included in the excavation rates.

Where excavations pose a danger to the community/visitors/animals they are to be closed during the weekends and Public Holidays.

PSA 8.15 Appointment of CLO

The sum shall include all costs to remunerate the CLO for the duration of the contract.

PSA 8.16 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 8.17 EME Construction Managers.....Unit: Man Month

(New Clause)

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 8.18 EME Subcontract Works (Description)Unit: Provisional Sum

(New Clause)

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 8.19 Training Allowance Paid to Targeted Labour In Terms of Formal Training (New Clause)

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 ContractorPercentage (%)

PSA 8.20 Transport and Accommodation of Workers for Training (New Clause)

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 trainingProv. Sum
- (b) Handling costs and charges for ContractorPercentage (%)

PSA 8.21 Compliance to EPWP Reporting (New Clause)

A provisional sum is allowed for the compliance to EPWP reporting by contractor.

Add the following payment Items:

(a) Compliance to EPWP reportingProv. Sum

PSA 8.22 Provisional Sum for Work to be undertaken by Eskom (New Clause)

Add the following payment Items:

(a) Work undertaken by Eskom (provisional)Prov. Sum

(b) Handling costs and charges for ContractorPercentage (%)

PSA 8.23 Provisional Sum for Training of KOUGA LOCAL Staff Training (New Clause)

The rate shall include all costs to train all operators at the Waainek WTW plant, for a period of 8 hrs in the running of the plant.

Add the following payment Items:

(a) Training allowance to KOUGA LOCAL staffSum

(b) Handling costs and charges for ContractorPercentage (%)

PSA 8.24 Servicing of Installed Equipment (New Clause)

The rate shall include all costs for the main contractor (or his deligate sub-contractor to visit the WTW and inspect, lubricate & service all installed equipment under this contract.

Add the following payment Items:

(a) Servicing of installed equipment..... Rate

PSA 8.25 Testing and Commissioning (New Clause)

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.

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

Delete the first two sentences of this clause and replace with:

“Debris arising from clearing and grubbing or from the demolition of structures on site shall be removed by the Contractor and disposed of at a Municipal approved tip site.

The rate tendered shall allow for any fees to be paid at the tip site.

PSC 5 CONSTRUCTION

PSC 5.1 Areas to be Cleared and Grubbed (sub-clause 5.1)

Only the approved minimum area required for the execution of the Works including areas on which material shall be stockpiled for later re-use or on which material shall be dumped and spread, shall be cleared and grubbed.

For the pipe trenches indicated by the Employer's Agent, generally a sufficiently wide strip equal to the trench width plus the estimated allowance for trench side slopes plus the width of stockpiled backfill and a 600 mm width (which shall be maintained alongside the trench) plus the width of access to the trench shall be cleared of vegetation. The width shall, however, not exceed 10 m.

PSC 5.2 Conservation of Topsoil (Sub-clause 5.6)

Topsoil up to a depth of 100 mm, if available, shall be removed from the above specified cleared areas and stockpiled on approved sites for later re-use.

PSC 8 MEASUREMENT AND PAYMENT

PSC 8.1 Site Clearance

Cleaning of the pipeline route will be measured and paid per linear m. The tendered rate shall cover as specified in Subclause 8.2.1(a), and removing and disposing the vegetation as specified in C3.4.6.

PSC 8.2 Removal and Conservation of Topsoil (sub-clause 8.2.10)

The rate tendered for the removal of in situ topsoil shall, in addition to the items listed in Sub-clause 8.2.10, also cover the cost of stabilizing and protecting the stockpiles of topsoil in accordance with PSD5.2.1.2.

PSC 8.2.11 Demolish Items(Sub-Clause 8.2.10)

The rate shall include all costs for the breaking up and removal of items to be demolished as specified including loading and disposing at an approved waste site.

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. Track-rigs 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 3.3 Selection

Notwithstanding Subclause 3.7, in terms of which the Contractor has a choice regarding methods of selection, the Contractor is required to use selective methods of excavation. The Contractor shall selectively remove and separate the sandy material from unsuitable material and place it adjacent to the trench for re-use as backfill, selected backfill, selected granular material or for other use as ordered by the Employer's Agent.

PSDB 3.5 Backfill Materials

Delete the contents of Clause 3.5(b) and replace with the following:

“Materials used in the reinstatement of trenches beneath or within a new roadway, up to underside of the road layers, shall be 37,5mm basecourse quality material conforming to SABS 1200 MF compacted in 150mm layers to 98% Mod. AASHTO density. The area subject to loads from road traffic shall be held to apply for a width of 150mm beyond the back of kerb.”

PSDB 3.6 MATERIALS FOR REINSTATEMENT OF EXISTING ROADS AND PAVED AREAS

PSDB 3.6.1 Subbase and base:

Delete the contents of Clause 3.6.1 and replace with the following:

“Where trenches cross existing surfaced roads the following will apply:

- (a) The service (pipe, cable etc.) shall be laid on a bedding cradle, and covered with a fill blanket, as specified in section LB (Bedding - Pipes) SABS 1200 or in the Scope of Works.
- (b) The remaining portion of the trench, from the top of the fill blanket to the road surface, shall be filled with cellular trench backfill material.
- (c) The specification for this material is as follows:-
 - (i) Definition : Material shall consist of a cellular light-weight concrete incorporating large volumes of controlled micro-air cement and sand.
 - (ii) Density Range : 150 - 1400 kg/m³ and have an equivalent CBR value greater than 100.
 - (iii) Consistency : Material shall be of a pickable nature after final setting.
 - (iv) Admixture : The admixture is a pre-foam organic compound accelerated by the addition of calcium chloride. Chloride free additive must be used where the outer casing of the service being covered is metallic.
 - (v) Setting Times : The finished product must achieve initial set within 90 minutes. It must then be able to carry light traffic.
 - (vi) Specifications : British Standards draft S.W.P. 146 of July 1990.

PSDB 3.6.4 Bituminous and Premix Surfacing

Delete the contents of Clause 3.6.4 and replace with the following:

“Where this project is undertaken simultaneously with the construction of bituminous and/or premix surfaced roads, a hot premix and/or bituminous surfacing in accordance with the specifications applicable to the road surfacing shall be used in the reinstatement of the road surface. Where the construction of surfaced roads do not form part of this project a hot premix (type IVa or 7mm sidewalk mix) laid on a cleaned surface which has been previously tack coated with an anionic emulsion shall be used in the reinstatement of the road surface.”

PSDB 5 CONSTRUCTION

PSDB 5.1 Precautions Relating to Explosives (Sub-clause 5.1)

With reference to subclause 5.1.1.3 of SABS 1200D or subclause 5.1.1.3 of SABS 1200DA, the Employer's Agent shall be notified at least 48 hours beforehand of the Contractor's intention to use explosives on site.

The Contractor to provide the Employer's Agent with a detailed method statement for approval of the anticipated blasting for each blasting occasion. No damage is permitted to any businesses and dwellings in the vicinity. Track-rigs are not permitted.

PSDB 5.1.2.3 Sloping Ground

Delete the Sub-Clause and add:

The Contractor shall be responsible throughout the duration of the Contract, inclusive of the Defects Liability Period, for the provision of all soil erosion preventative measures necessary to protect the trenches, pipeline(s) and land utilised by the Contractor during the Contract from any adverse effects of soil erosion, settlement, scour, etc, resulting from the construction of the Works.

Cross-embankments, generally extending across the full width of the working strip, consisting of low earth mounds shaped to rounded form and so oriented as to have a fall of 1% along their length, shall be constructed with compacted material having a minimum density of 90% modified AASHTO density and minimum dimensions and maximum spacing dependent on the slope of the ground along the length of the pipeline, as indicated in the drawings and/or Environmental Specification.

Cross-embankments shall be constructed to the same minimum standards and dimensions indicated above wherever artificial slopes have been formed on the working strip or other areas used during construction and with the approval of the Employer's Agent, are permitted to be so left.

Berms may also be constructed using hessian cloth or plastic sandbags.

PSDB 5.1.5 Trench Excavations (*additional sub-clause*)

The precautions for excavations as specified in Clause 5.1.1 of Section 1200 DA, and the relevant clauses in PSDA, shall also apply to all trench excavations.

The Contractor shall take all the steps necessary to ensure that no person is required or allowed to work in a trench or any other unsupported overhanging excavation which is more than 1,5 m deep, and any excavation which has not been adequately supported, shored or braced if there is any danger whatsoever of the sides of the excavation collapsing. The support, shoring or bracing to be designed and constructed by the Contractor, shall be strong and sturdy enough to support the sides of the excavation in question.

PSDB 5.3 Site Clearance and Reinstatement in Developed Areas (subclause 5.3 and 5.9)

The Contractor shall employ due care in the protection of all existing improvements when carrying out excavations in developed areas and shall confine his works to the smallest practical area so as to minimise damage. He shall also remove and set aside for future replacement, plants or improvements that lend themselves to reinstatement.

Before commencing excavation in a developed area, the Contractor shall, to the satisfaction of the Employer's Agent, prepare a written record of the location and extent of existing plants and improvements within and adjacent to the anticipated construction area. The Employer's Agent drawings may form a part of this record where they show sufficient detail.

Where, in the opinion of the Employer's Agent, the Contractor has proceeded with due care, replacement or repair of damaged or removed improvements shall be at the Employer's expense. Where, in the opinion of the Employer's Agent, the Contractor has caused unnecessary destruction or damage, replacement or repair of improvements shall be to the Employer's Agent's approval and at the Contractor's own expense.

Work shall at all times be carried out with a minimum of disruption to residents, and the Contractor shall give advance notice of his intention to enter upon a property or the impending closure of roads, or driveways.

PSDB 5.4 Excavation

Add: "The excavation of trenches across a concurrently constructed carriageway shall commence after the subgrade layer has been accepted. The pipe/duct shall be laid and the trench backfilled to the acceptable requirements, including density testing before the construction of the next layer may commence".

PSDB 5.6.3 Disposal of Soft Excavation Material

Delete the contents of Clause 5.6.3. and replace with the following:

"Excess material arising from the excavations will be disposed of at a designated tip site. The rate for spoiling of excess material shall include for the loading and carting of material, and the off-loading at the tip site. The Contractor shall be responsible for all charges levied at the tip site. The current charges applicable may be obtained from the Municipality's Cleansing Division.

Where topsoil is encountered this will be set aside on site and re-used later."

PSDB 5.6.6 Completion of Backfilling

Add: "If in the opinion of the Employer's Agent's Representative the Contractor is lagging in the backfilling of trenches, he will be entitled to order that no further excavation takes place until the backfilling operation has caught up."

PSDB 5.7.2 Areas Subject to Traffic Loads

All trenches underneath and within 2,0 m of the carriageway of the access road will be considered to be subject to traffic loads and the backfill material and compaction in these trenches shall comply with the requirements of PSDB3.5 and Sub-clause 5.7.2.

PSDB 5.9.7 Procedure for Backfilling with Trenchfill

(New Clause)

- (a) The cellular backfill material (hereinafter called “trenchfill”) is ordered from the supplier, and is delivered to site in a truck-mixer. The material is poured directly into the trench, and no vibrating or additional compaction is necessary.
- (b) The trenchfill shall be cast flush with the surrounding road surface, and trowelled to an even surface.
- (c) After the trenchfill has set, either the same day or the following day, the top 40mm of the trenchfill must be scabbled off using a pick, or paving breaker and the depression reinstated using hot asphalt. After compaction, the asphalt must be finished flush with the surrounding road surface.
- (d) The asphalt reinstatement of the trench will be carried out by the Municipality or, in the case where the works are being performed by a contractor, the contractor may carry out the reinstatement.

PSDB 5.9.8 Safety

(New Clause)

- (a) During the time period between pouring the trenchfill into the trench, and the setting of this material, it is imperative that no person or animal be allowed to gain access to the trench. Suitable barricades shall be provided around the trench and a guard placed on duty at the trench until the material sets.

Should the trenchfill not be set by nightfall, safety lamps shall be placed on the barricades.

- The responsibility for public safety lies with the Contractor.

PSDB 7 TESTING

PSDB 7.1 Testing and Compaction of Backfilling to trenches and Reinstatement of Surfaces (Sub-clause 7.1)

The Contractor shall carry out density tests as specified in TMH1, in the positions indicated by the Employer's Agent, to determine the compaction of the backfill material in the trenches and the material used for reinstating the road construction layers. No single test result which is below the specified density, will be accepted.

In the case of trenches in areas subject to traffic load, the contractor shall, notwithstanding the terms of the second sentence of Sub-clause 7.1, bear the cost of all density tests carried out except as follows:

Where the test results are equal to or exceed the specified density, the Employer will bear the cost of that number of those tests ordered by the Employer's Agent in excess of one test per 20 m³ of compacted material, based on the total volume of backfill and reinstated road layers, including the replacement of any over excavation, in areas subject to traffic loads.

The Contractor shall also bear the cost of those density tests, carried out by the Employer's Agent, of which the test results are below the specified density.

Add the following Sub-Clauses:

7.2 Other Tests on Materials from within the Site

In addition to the provisions made for density testing in Clause 7.1 above, the Employer's Agent may call for any other tests such as CBR, indicator tests, etc. to be carried out on any material from within the site to determine the suitability of such material for use in any section of the Works.

The Contractor shall supply the samples required for such tests and shall include for the provision of such samples in his rates. The costs of the successful tests will be borne by the Employer.

7.3 Tests on Materials Imported from Outside the Site

Wherever material is to be imported from outside the site for use in any portion of the works, the Contractor shall make arrangements with a soils testing laboratory for tests to be carried out to indicate the suitability of such material for use in the relevant portion of the Works.

The results of such tests shall be reported to the Employer's Agent. The costs of such tests shall be included in the rates tendered in the Schedule of Quantities for the provision of such materials.

PSDB 8 MEASUREMENT AND PAYMENT
PSDB 8.3.2 Excavation

Delete the contents of payment Clause 8.3.2(b)(1). For the purpose of measurement and payment, material other than hard rock will not be separately classified.

PSDB 8.3.3.1 Deficiency in Backfill Material

Add the following to sub-clause 8.3.3.1:

The rate for 8.3.3.1(c) shall also include for compaction of basecourse quality backfill as per PSDB 3.5

PSDB8.3.6.1 Reinstate road surfaces

- (a) Extra-over for backfilling trenches using Trenchfillm³
- (b) Hot asphalt type IVA (min thickness 25mm)m²
- (c) 7mm Sidewalk Mix (min thickness 25mm)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) & (c) 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 final compacted thickness of the layer must be not less than 25mm. The rate shall also include the reinstatement of the existing layerworks. Where there is doubt with regard to the thickness and type of the existing layerworks, it shall be taken as a 150mm G5 subbase compacted to 95% MOD AASHTO density and a 150mm layer G2 base compacted to 100% MOD AASHTO density.

The rate shall cover the cost of temporary accommodation of traffic (including the signs and by-passes), 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. The rate to comply with the requirements of PSDB5.9.7 and 5.9.8.

PSDB 8.3.8 Crushed Stone in Trench Bottom

Crushed stone will be measured by the volume of stone placed in trenches where the Employer's Agent has ordered, in writing, the provision of a layer of crushed stone beneath the pipes.

The volume will be calculated as $V = L \times W \times T$, where L is the relevant length of trench, W is defined in Drawings DB-4 and T is the specified thickness of the stone layer.

Geotextile blanket will be measured by area, calculated in square metres as $A = L \times (2W + 0,50)$. No further allowance will be made for overlaps.

The unit rates shall cover the cost of additional excavation and disposal of material and supply and placing of the stone and/or the geotextile blanket.

PSDB 8.8 Reinstatement of Minor Roads

The terms of Subclause 8.3.6 shall be applicable to measurement and payment of the reinstatement of minor roads except that the rate shall include the cost of the supply and placing of an approved gravel in lieu of subbase and base.

PSDB 8.9 Road Crossings

Extra-over payment will be made for individual road crossings. The measurement will be by m² and payment will become due when the crossing has been completed.

The tendered sums shall cover the additional costs involved in constructing the necessary temporary traffic bypasses which may be required at each crossing, the delay caused to excavation in having to complete laying and backfilling a portion of the pipe sleeve before the balance of the excavation can be completed, as well as the additional costs involved in having to lay the water main inside the sleeve, having to deal with traffic, removal of all temporary works, and reinstating the whole area upon completion of the crossing.

PSDB 8.10 Exploratory Excavations to Expose Existing Services

The Contractor will be required to expose existing services which may include Telkom, electrical, sewers and existing water mains, some of which are shown on the drawings, and others of which no record exists.

Services must be successfully exposed and levels taken by Contractor and plotted on drawings by the Employer's Agent, prior to work commencing in an area.

An item is provided in the Schedule of Quantities for hand excavation to prove services and measurement will be based on the volume of material excavated.

The Contractor shall submit a written request to the Employer's Agent for their approval prior to any exploratory excavation taking place.

PSDB 8.11 Soil Crete

Supply, mix and place soilcrete with 8% Ordinary Portland Cement with approved gravel in road crossings where Instructed by the Employer's AgentUnit m³

The soilcrete will be measured net by volume to the specified width and depth. The rate shall cover the cost of formwork and the soilcrete. The soilcrete will be mixed with a mechanical concrete mixer.

Typically the volume required will be as follows:

Density of soil x percentage required

$$= 1890\text{kg/m}^3 \times 8\%$$

$$= 151\text{kg of cement per cubic metre of soil}$$

PSDB 8.12 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.

PSDB 8.13 Unsuitable Material

Replace unsuitable material with G5 material and compacted to 95% MOD AASHTO density

The rate shall cover the costs for acquiring the required material from commercial sources, and delivering it to points alongside the trench spaced to suite the Contractor's methods of working. Payment for backfill with the G5 is deemed to be covered in the tendered rates.

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 rear-guard 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

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>	The greater of 40 or d
3. <u>Beams</u> a) End cover beyond hooks b) All other surfaces	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.

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 $1/360^{\text{th}}$ 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.

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 forwork 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.
- li) The actual concrete mix proportions.
- lii) 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 water-stop 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 re-screeding 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 5.5.11 Watertight Concrete (Subclause 5.5.11)

The reservoir, mixing race, sedimentation tanks, filters and pump stations (floor, walls and roof) shall be considered to be watertight concrete and Subclause 5.5.11 shall apply.

No vertical or inclined construction joints of any kind will be permitted in the perimeter walls of water-retaining structures unless these have been specially ordered or authorised by the Engineer.

PSG 5.5.14 Repair of Defects (Subclause 5.5.14)

All defects in the concrete shall be made good as soon as possible after the formwork has been removed. Further placing of concrete in the affected section may be prohibited by the Engineer until he is satisfied that the repair work has been correctly carried out.

Add the following :

Patching and Repair

Where defects do not warrant the removal of defective concrete, one or more of the following procedures shall be required by the Engineer:

- a) Where the structural strength might be affected and must be restored, repairs may be effected by the application of either pneumatically- placed mortar or of a mortar made of silica sand and an approved epoxy formulation mixed and applied in accordance with the manufacturer's recommendations.

In addition, if the Engineer deems it necessary, an approved epoxy type resin shall be injected into cracks or honeycombed areas, by means of a suitable gun applied through nipples previously fixed in the concrete at appropriate intervals.

- b) Where there are no fears as to structural strength, all defective material shall be chipped away until a dense uniform surface of concrete exposing solid coarse aggregate is obtained. Feathered edges shall be cut away to form surfaces perpendicular to the concrete face. Seized shutter bolts shall be cut back to at least 35mm into the concrete. All loose material shall be hosed away and the surface of the cavity shall be saturated with water for at least 3 hours, after which a thin layer of neat cement mortar shall be applied to the surface. The cavity shall then be filled with stiff mortar mixed in the same proportions of cement to sand as that used in the original concrete. The mortar shall be thoroughly tamped into place in layers. The use of up to 30% white cement in place of the normal cement may be required to reduce the darker appearance of a patch. An interval of thirty minutes shall then elapse before a final surface tamping is given to the patch, after which the surface shall be treated to resemble the surrounding concrete as closely as possible. Board marks may be reproduced by striking a suitable piece of timber held against the plastic concrete. The patch shall be neat and workmanlike in appearance and after completion it shall be kept wet over a period of at least three days.

PSG 5.16 "No-fines" Concrete (New Subclause)

A nominal aggregate size of 19 mm shall be used in the manufacture of "no-fines" concrete.

The concrete shall be mixed in the following proportions:

- Cement : 50 kg
- Aggregate : 0,40 m³
- Water : 22,5 l

PSG 5.17 Pipes and Conduits Embedded in Concrete (New Subclause)

Except with the approval of the Engineer no pipes other than those shown on the drawings shall be embedded in the concrete.

PSG 5.18 Concrete in Wet Ground (New Subclause)

The design for the structures to be built in wet ground makes full allowance for the conditions likely to be encountered on Site. The documents and drawings indicate what is required to be built. However the Contractor shall be fully responsible for keeping the excavations free from water whilst the construction work is being carried out. The methods by which he proposes to achieve this shall be approved by the Engineer before being implemented. The cost of dewatering shall be included in the tendered rates for the construction work and no separate payment shall be made for such dewatering throughout the construction period.

PSG 5.19 Grouting (New Subclause)

Grouting shall be done to the instruction of the Engineer using materials of suitable consistency as follows. Unless otherwise directed, grouting mixtures shall consist of 1 part cement to two parts concrete sand by volume, well mixed and with sufficient water added to obtain the required consistency. Where recesses to be filled are of appreciable dimensions, the Engineer may direct the Contractor to replace a proportion of sand with fine stone to reduce shrinkage. The Engineer may also require the Contractor to use non-shrink or other additives in grouting mixtures where these are allowed for in the Schedule of Quantities.

PSG 5.19.1 Liquid Grout

Where liquid grout is required for bolt holes etc, water shall be added in such quantity that, when the material is thoroughly mixed and stirred, it shall flow readily so as to fill all recesses and air spaces in the work to be grouted. Before grouting any section of the work with liquid grout, the surfaces to receive grout shall first be thoroughly cleaned and flushed with water. The grout shall then be introduced in such a manner as to fill effectively all recesses. When the grout has set the surface of the work shall be finished off flush and smooth with cement mortar.

PSG 5.19.2 Grouting of Pipes/Specials through Walls

Where entry holes for pipes/specials have been provided in the walls, the Contractor shall be responsible for the grouting in of such pipes/specials regardless of whether or not these have been supplied by himself.

Before commencing the positioning in holes of any pipes/specials the Contractor shall:

- (a) remove all shuttering and boxing remaining in the holes;
- (b) make any alterations required to the position and shape of the holes and reinforcing steel (lacing bars, etc) in the holes
- (c) thoroughly clean and scabble the sides of the holes so as to obtain satisfactory bond surface for the new concrete (including the post-forming of "frogs" where longitudinal forces are to be restrained by the concrete); and
- (d) free all surfaces of the pipes/specials of all coatings, and thoroughly scrape and clean the pipes/specials.

After accurately positioning the pipes/specials in the respective holes, the Contractor shall fix the pipes/specials in a suitable manner to prevent movement.

Immediately prior to grouting being carried out by the placing of mortar and concrete around the pipes, the surface of the existing concrete shall be saturated with water. All surplus water shall be removed and the surface covered with a layer, approximately 12 mm thick, of mortar consisting of 3 parts concrete sand and 1 part cement.

The concrete ingredients shall be mixed and placed as dry as possible to obtain a dense, waterproof concrete. Where a watertight seal is required, the concrete shall be carefully worked around the puddle flange, if any, and the pipe barrel or body of the special, and shall be vibrated in layers so as to obviate any falling away from pipe/special surfaces of the concrete already placed.

The whole shall, when set, form a dense, homogeneous, and waterproof mass. A spare vibrator with an independent power source shall be kept in readiness to ensure continuity of placing in the event of the breakdown of the duty vibrator.

Smooth formwork that has been suitably strengthened for use with a vibrator shall be provided for facing the concrete around each pipe/special.

PSG 5.19.3 Dry-packed Grout

When dry-packed grout is specified, under baseplates etc, only sufficient water shall be added to make the mixture ball when squeezed in the hand. Before any grouting is done with dry caulking the surfaces between which the caulking is to be placed shall first be thoroughly cleaned and flushed with water. All surplus visible water shall be wiped or blown away and the dry caulking shall be forcefully rammed or hammered into place using suitable tools. Exposed surfaces shall be finished off neatly with a trowel and extensive exposed areas shall be covered with wet sacking and kept damp for at least 24 hours.

Where additives are required for grouting operations, these shall be brought on to site in the manufacturers unopened containers and used strictly in accordance with the manufacturer's instructions which the Contractor shall not fail to obtain. If necessary, the Engineer may require the Contractor to undertake preliminary tests to check the behaviour of proprietary additives under the conditions pertaining on the site.

PSG 5.19.4 Epoxy Grout (Epoxy mortar type only)

The manufacturer's instructions shall be observed when an epoxy grout is used.

PSG 5.20 Cement Mortar (New Subclause)

Where cement mortar is specified for filling around pipes etc, water shall be added to obtain a firm paste which can be worked with a trowel but is not fluid. Surfaces to receive mortar shall be well wetted and excess water allowed to drain, or be removed. The mortar shall be worked into place with a trowel or tamping rod, exposed surfaces floated off and covered with wet hessian for 24 hours and allowed to harden without disturbance.

PSG 5.21 Blinding Concrete (New Subclause)

No blinding concrete shall be placed until the base formation has been inspected and passed by the Engineer's Representative.

All blinding concrete shall be a minimum of 50mm thick and laid true to levels and falls to suit the finished floor. All underdrain work is to be completed in a particular area before blinding is started. A sufficient area of blinding shall be prepared in advance of placing structural concrete to allow a minimum of 7 days curing time of the blinding layer.

PSG 5.22 Structural Concrete (New Subclause)

a) Wall Footings

The wall footings shall be cast with wall starters to form a horizontal wall construction joint as shown on the drawings. The construction joint between footing bays shall also be as shown on the drawings. At least 3 days shall elapse between pouring adjacent wall footings.

b) Walls

After the wall footings have attained a minimum strength of 10Mpa, but not later than 7 days, each bay of the wall section shall be cast to full height on the same day and vertical construction joints between bays shall be formed as shown on the drawings. At least 3 days shall elapse between the pouring of adjacent wall panels.

As soon as possible after the removal of the formwork in vertical joints or after the concrete has set in horizontal joints the surface laitance of the concrete shall be removed in order to expose the large aggregate and leave a solid surface.

Openings may be left in the form work on the outside face only for pouring and vibrating of the concrete provided they are closed properly and do not impair the concrete finish.

When concreting walls care shall be taken to ensure that there is no loose matter on the concrete surface and that it is wetted in order to assist the new concrete adhering to the existing concrete.

The Contractor's attention is particularly drawn to the fact that the walls form part of a water retaining structure and that no honeycombing will be tolerated. In order to ensure this, the mix proportions of the first 250mm depth of concrete placed in contact with the horizontal joint may be adjusted, with the approval of the Engineer, by reducing the amount of coarse aggregate. The Engineer's Representative may instruct the use of trunking in placing the concrete to avoid losses of fines due to adherence to reinforcement and formwork. The concrete shall be placed evenly over the surface to be covered without reliance on vibration to transport it horizontally. Special care shall be given in order to ensure full compaction at waterstops.

c) Floor

The floor shall be cast in panels as detailed on the drawings. Consecutively cast panels shall not adjoin one another. The floor panels shall be cast in a checker board pattern with a minimum of 3 days between the pouring of adjacent panels.

d) Columns

The column and column head shall be cast in one lift. The base of the column may be cast first provided a centrally placed starter is incorporated.

e) Alternative Means of Construction

The Contractor may propose alternative means of construction which shall be subject to the approval of the Engineer.

If the Engineer accepts any alternative means of construction it shall in no way result in increased costs. The Contractor shall pay for all additional construction joints.

f) Grouting in of Pipes and Specials

The Contractor shall be responsible for the casting of plinths and grouting in of pipes and specials and grouting up of base plates etc. for the Electrical/Mechanical Sub-Contractor (where applicable).

The Contractor shall be responsible for accurately setting his pipes and specials etc. and shall also be responsible for maintaining in position those items which have been installed by the Electrical/Mechanical Sub-Contractor (where applicable) until they have been grouted/concreted in.

The sides of all holes shall be thoroughly scabbled and cleaned before the pipes and specials are positioned.

The outside surface of all pipes and specials shall be cleaned before being concreted in.

The formwork shall be designed to ensure that it fits neatly around all embedded parts and forms a flush joint around the sides of the opening.

Special care shall be taken to ensure a water tight joint at the crown of the openings.

All grout used for grouting up base plates etc. shall be of the non-shrink type such as Pro-Struct 531 Five Star Grout, or similar approved. Before grouting up all scabbled surfaces shall be thoroughly soaked with water.

g) Valve Chambers

The chambers shall be constructed to dimensions shown on the drawings. No under-pinning of the structure will be allowed.

PSG 5.23 Joints (New Subclause)

a) General

Joints in the water retaining section of the structure shall be constructed as shown on the drawings. At each joint the concrete shall be finished to an even line and surface.

Any additional construction joints (to that shown on drawing), required by the Contractor shall be to the approval of the Engineer and shall be to the Contractors expense.

b) Waterstops

Waterstops, where specified on the drawings, are to be placed in wall and floor construction joints as shown on the drawings and in accordance with the manufacturers specifications.

All intersection points shall be factory made pieces.

All joints in straight lengths and between straight lengths and intersection pieces shall be hot welded in accordance with the manufacturer's instructions. Jointing other than by hot welding will not be permitted.

Waterstops shall be carefully positioned and tied to the reinforcement to prevent displacement. Every precaution shall be taken to ensure maximum compaction around the waterstop. Waterstops in the floor joints, however, shall be held back from their horizontal position until the concrete level is just above the final location of the waterstop. The waterstop shall then be returned to their horizontal positions ensuring that no voids are formed beneath them.

c) Bandage Sealing System

The internal surface of joints in the floor and walls, where specified on the drawings, shall be sealed with a 100mm wide surface mounted "Hypalon" bandage system having an epoxy fixing system, with all materials and procedures conforming to the "Sikadur-Combiflex" surface sealing system as produced by Sika (Pty) Ltd, or similar approved. The Contractor must ensure that where one Hypalon joint intersects another (at right angles or otherwise) that the two layers of interesting hypalon are not epoxied to each other and thereby restrained from moving, i.e. the Hypalon inside an intersecting joint must not be restrained by the epoxy adhesive and the full intended width should be free to move in the intended directions.

d) Roof Slab Joint Sealant

The construction joints on the top and sides of the roof slab where specified on the drawings, are to be sealed with a 75mm wide self adhesive aluminium foil strip (Bostik "Ditsit" or similar approved) which shall be installed in accordance with the manufacturers instructions. The "Ditsit" is to be taken over the edge of the roof slab and down the side of the wall for a distance of 500mm.

The construction joints on the soffit of roof slab are to be sealed with 2 coats of a 75mm wide application of Sika Top-Seal 107 (or similar approved) applied in accordance with the manufacturer's recommendations. The soffit of the roof slab is to be ground down 1.5 to 2mm with an angle grinder and then wire brushed and sprayed clean with water. The slurry is to be applied to a damp surface.

e) Ferrule Holes

Ferrule holes to accommodate tie rods for holding together shutters on opposite sides of the water retaining concrete walls are to be formed using smooth PVC ducts through which steel tie rods can be placed for purposes of construction. After the concrete has been placed, the shutters stripped and the tie rods and end cones have been removed, the PVC sleeves shall be drilled out with a suitably sized masonry drill so that the concrete surfaces are roughened. Thereafter the surfaces of the hole and cone area are to be cleared of all dust and loose material and primed with an approved latex compound ("Barralatex" or similar approved) and the holes caulked with a sand/cement/water/latex grout in accordance with the recommendation of the supplier of the latex compound.

PSG 5.23 Watertightness Testing of Concrete Structure (New Subclause)

a) General

Backfilling of excavations for tanks and other water retaining structures will only be permitted to commence once initial watertightness tests have been passed.

Any leaks which become evident during initial watertightness testing shall be remedied to the satisfaction of the Engineer and backfilling of the excavations shall only commence on written acceptance of the initial watertightness tests by the Engineer.

b) Approval of Water Retaining Structures

Notwithstanding any approval given by the Engineer in respect of construction work, an essential criterion for the acceptance of tanks, sumps and distribution chambers shall be that they pass the appropriate watertightness tests.

The water retaining structures shall be watertight against both, external ground water pressures and internal water pressures.

c) Watertightness tests for Structures

Watertightness tests on all structures shall be carried out in accordance with B.S. 8007: 1987 Clause 9.

d) Initial Watertightness Test

All inlets and outlets shall be sealed to the satisfaction of the Engineer. The structure to be tested shall be filled to top water level with clean water at an approximately uniform rate not greater than 2m in 24 hours and shall be left standing for at least seven days to allow the concrete to absorb the water. At the Contractors request the Engineer will then inspect the structure and if he is satisfied that there are no leaks the final test shall be proceeded with.

e) Final Watertightness Test

The structure shall be topped up with water to top water level. The fall in the water level will be measured each day for a period of seven days.

Adjustments will be made to allow for evaporation and rainfall according to the following standards:

f) Evaporation – Adjustment Reduces Fall (where the structure is un-roofed)

- Measurements made on 1 February, 6mm per day
- Measurements made on 1 July, 2,5mm per day
- Measurements made between the above dates: adjustment calculated pro-rata.

g) Rainfall – Adjustment Increases Fall

If rainfall should occur during a test the Engineer may assess an adjustment or may direct that the test be continued or repeated until a dry 7-day test has been obtained. Such continuation or repetition of the test shall be at the Contractor's expense.

h) Allowable Leakage

After taking into account the losses due to evaporation, the permissible drop in the surface level shall not exceed $1/500^{\text{th}}$ of the average water depth of the structure (in mm) in 7 days.

i) Testing of Roofs for Watertightness

The roofs of liquid-retaining structures should be watertight and should, where practicable, be tested on completion by flooding the roof with water to a minimum depth of 25mm for 24 hours or longer if specified. Where it is impracticable, because of roof falls or otherwise, to contain a 25mm depth of water, the roof should have water applied by a continuous hose or sprinkler system to provide a sheet flow of water over the entire area of the roof for not less than 6 hours. In either case the roof should be considered satisfactory if no leaks or damp patches shown on the soffit. Should the structure not satisfy either of these tests, then after the completion of the remedial work it should be retested in accordance with this clause. The roof insulation and covering should be completed as soon as possible after satisfactory testing.

j) Failure to Pass Test

Should any structure fail to pass any stage of the tests the defects shall be found and repaired and the tests repeated at the Contractor's cost until the structure passes all the tests.

In the event of any leakage becoming apparent during the maintenance period, notwithstanding that a satisfactory test for watertightness may have been carried out on completion of the construction, the Contractor shall remedy the defect without delay to the satisfaction of the Engineer.

k) Measurement and Payment

The unit of measurement shall be by sum for the structure and shall include for all pumping, sealing all inlets, outlets, cleaning after testing, etc. necessary complete the test as specified.

Water will be provided to the Contractor free of charge for the initial filling of the reservoir. Should additional water be required for re-testing as a result of failure of the watertightness testing, this shall be for the Contractors account.

PSG 5.24 Roof Insulation (New Subclause)

Stone for the roof insulation shall be placed immediately after testing of the roof.

The stone shall consist of a hard washed stone, 19mm nominal size. It shall be distributed by rubber-tyred wheel barrows and deposited so as to avoid undue load concentrations.

PSG 5.25 Sterilisation of the Reservoirs (New Subclause)

Prior to the initial filling of the reservoir, the Contractor shall broom, clean and hose down the internal floor and wall surfaces with a pressure washer. Water used for cleaning purposes is to be led to waste. The reservoir is to be filled to a depth of 0,25m and the water then scoured to waste.

During the initial filling of the reservoir, the Contractor shall sterilise the reservoir by adding chlorine in the form of granular HTH, under the control of the Engineer. The reservoir is to be filled to a depth of 0,5m adding chlorine continuously to give a concentration of 50 parts per million. No further chlorine is to be added on further filling of the reservoir.

Prior to the reservoir being put into service, the chlorine content of the water shall be tested in order to ensure that it does not exceed 1,0 to 2,0 parts per million.

Should the concentration of chlorine be higher than required, the Engineer may call for additional measures in order to reduce the concentration of chlorine to within acceptable limits.

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 5.5.11 Watertightness Testing (Subclause 5.5.11)

The reservoir, being a water retaining structure, shall be subject to water tightness testing.

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.

PSG 8.5 Joints and Waterstops (Subclause 8.5)

Joints with waterstops will be measured by the net length of joint, with no allowance being made for jointing or wastage.

PSG 8.5.1 Formed Joints (New Clause)

Formed joints will be measured by the plane area of the joint.

The rates shall cover the cost of all operations and materials specified in Subclause 5.5.7 and PSG 5.11, and detailed on the drawings such as joint filler, dowel bars and tubes, bitumen coats, etc, but excluding waterstops or waterbars.

PSG 8.9 Plinths and Base-Plates (New Clause)

The pump unit shall be installed on a concrete plinth, raised from the general floor level of the building. If the existing plinth is not suitable the contractor shall allow for its demolition and replacement with a new concrete plinth to suit the new pumpset.

The pump shall be mounted together with the electrical motor on a common base-plate of rigid design, manufactured in epoxy-coated mild steel. Steel Anchor-bolts shall be provided for mounting the base-plate onto the concrete plinth. These bolts shall be electro-galvanised.

Base-plates and pipe supports shall be so constructed and the pumps so mounted, as to minimise misalignment caused by deflections arising from normal piping strains, hydraulic piping thrusts and similar causes.

Anchor-bolts shall not be less than M20. An approved pre-packed 2-part epoxy compound shall be used for grouting in of anchor-bolts.

PSGA CONCRETE (SMALL WORKS)

PSGA 3 MATERIALS

PSGA 3.1 Cement (sub-clause 3.2.1)

No cement other than ordinary Portland Cement or Portland Cement 15 shall be used without the written consent of the Employer's Agent.

PSGA 5 CONSTRUCTION

PSGA 5.1 Fixing of reinforcement (sub-clause 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 Employer's Agent.

PSGA 5.2 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 form work 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 form work 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.

PSGA 5.3 Strength concrete (sub-clause 5.4.1.5)

The Contractor shall, at an early stage in the contract, submit to the Employer's Agent for his approval, design mixes and the proposed slumps for each grade of concrete in each type of construction.

If design mixes are not submitted, the Contractor shall batch each grade of concrete in accordance with the mix proportions given in the table below:

		Hand Placed			Vibrated		
Grade Of	Minimum cement/	Approx materials Proportion per m ³			Approx Materials Proportion per m ³		
Concrete (Mpa)	Water Ratio	Cement (sacks)	sand (m ³)	stone (m ³)	cement (sacks)	sand (m ³)	stone (m ³)
10	1,09	4,6	0,80	0,75	4,4	0,75	0,79
15	1,30	5,5	0,77	0,77	5,3	0,74	0,85
20	1,56	6,4	0,70	0,77	6,1	0,67	0,85
25	1,80	7,2	0,65	0,72	7,0	0,83	0,84
30	2,02	8,1	0,65	0,73	7,8	0,62	0,86
35	2,26	9,0	0,63	0,72	8,7	0,61	0,78
40	2,50	9,8	0,59	0,68	9,6	0,58	0,86

The table given above lists the minimum cement/water ratio and approximate mix proportions by volume to produce 1m³ of finished concrete of each grade, for both hand-placed (85 mm slump) and vibrated (35 mm slump) concrete. Proportions have been based on the use of ordinary Portland Cement, medium sand and 19 mm stone, and an allowance has been made for 5% by mass of water in the sand and a bulking of the sand of 22,5%.

Irrespective of whether the Contractor submits design mixes or adopts the proportions in the table above, it shall be incumbent on him to make up trial mixes as soon as he has established site, and to cast a minimum of 6 cubes for testing purposes.

Two (2) cubes each shall be crushed at 7 day, 14 day and 28 day intervals.

No structural concrete shall be placed until the Contractor has satisfied the Employer's Agent as to the suitability of the mixes and, particularly in the case of water retaining structures, the Employer's Agent shall have received at least the 7 and 14 day test results.

PSGA 5.4 Ready-mixed concrete (sub-clause 5.4.1.6)

The Contractor may elect to use ready-mixed concrete subject to the prior approval of the Employer's Agent.

Ready-Mixed concrete shall not be delivered to site before the Contractor has furnished the Employer's Agent with a copy of his letter to the Supplier in which he has included the following:

- a) The compressive strength of concrete at 28 days.
- b) The nominal maximum size of aggregate.
- c) The type of cement.
- d) The required slump at the point of delivery, being the site; and
- e) An instruction to the Supplier to provide details of the admixture he proposes to use, if applicable. The details/information provided shall be in accordance with the requirements of Sub-Clause 3.5.1 of SABS 1200G - Concrete (structural).

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:

- f) The compressive strength of the mix.
- g) The slump.
- h) The date and time at which the mixing of the batch was commenced.
- i) The time of delivery; and
- j) The quantity of concrete supplied.

These delivery notes are to be kept on site, being available for inspection at any time.

PSGA 7 TESTING

PSGA 7.1 Testing (sub-clause 7.2)

All results of cube tests shall be immediately forwarded to the Employer's Agent.

PSGA 8 MEASUREMENT & PAYMENT

PSGA 8.2.5 Breaking into concrete

Break out (existing concrete) and/or extend existing concrete. Amount to allow for all works required for demolishing and/or extension of concrete.

PSLB BEDDING (PIPES)

PSLB 3 MATERIALS

PSLB 3.1 Selected Granular Material

Delete Subclause 3.1 and replace with the following:

Selected granular material shall be an aggregate, sand, or granular material, all of a non-cohesive nature, the grading analysis of which shows 100% passing a 9,5 mm sieve and not more than 5% passing a 0,075mm sieve (metric sizes). The Compactability Factor shall not exceed 0,4.

PSLB 3.2 Selected Fill Blanket

Selected fill material shall be an aggregate, sand, or granular material, all of a non-cohesive nature, the grading analysis of which shows 100% passing a 9,5 mm sieve and not more than 5% passing a 0,075mm sieve (metric sizes). The Compactability Factor shall not exceed 0,4.

PSLB 5 CONSTRUCTION

PSLB 5.1.1.2 Trench Bottom

The trench bottom shall be prepared in accordance with the requirements of Sub-Clause 5.5 of SABS 1200 DB as amended by Clause PSDB 5 of Scope of Works PSDB : Earthworks (Pipe Trenches).

PSLB 5.1.4 Compacting

Selected Granular Material and Selected Fill Material shall be compacted to 95% and 93% MAASHTO density, respectively, in maximum 150 mm layers.

PSLB 5.2 Construction of Bedding

Completion of the bedding cradle and placing of the selected fill blanket, and the main fill, shall commence as soon as possible after pipelaying has been completed. The Contractor shall meet all costs of operation ordered by the Employer's Agent to remedy defects in the trench caused by lengthy exposure.

PSLB 5.2.1 Class A Bedding

Add the following:

"or a period of 5 days has elapsed after the placing of the concrete in that section, whichever occurs first"

PSLB 5.2.2 Class B Bedding

The dimension "x" for all rigid and flexible pipes as referred to in drawing LB-1 and LB-2, shall be 150mm.

PSLB 5.4 Concrete Casing to Pipes

Where concrete encasement is specified, the Contractor shall place the encasement in accordance with details shown on the Employer's Agent drawings.

PSLB 7 TESTING

PSLB 7.1 Density Testing

Measurement and payment for density tests on the bedding cradle and fill blanket, where ordered by the Employer's Agent, will be by number per successful density test reported to the Employer's Agent.

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.1 Volume of Bedding Materials (sub-clause 8.1.3)

The volume of bedding material will be measured net, excluding the volume of the occupied pipe.

PSLB 8.1.5 Disposal of Displaced Material

In developed areas all displaced material shall be removed to designated sites and evenly spread to the Employer's Agent's satisfaction as covered in C3.4.6.

PSL MEDIUM PRESSURE PIPELINES

PSL 1 SCOPE

Add to sub-clause 1.1 "Drawings numbered L1, L2 and L3 are withdrawn and replaced by the Construction Drawings."

PSL 2 Code of Practice

Add to sub-clause 2.1.1 "All pipes, joints and fittings supplied under this specification shall, as a minimum, meet the requirements of AWWA C950, AWWA Standard for Fibreglas Pressure Pipe, and ASTM D3517, Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting-Resin) Pressure Pipe, in the case of pressure pipes."

PSL 3 MATERIALS

PSL 3.3 CI Pipes Fittings and Specials

Add: " All cast iron fittings to be cement mortar lined or Rillsan coated."

PSL 3.4 Steel Pipes and Fittings

All steel pipes to be used in this Contract shall be supplied by the Contractor to comply with 'Particular Specification for 100mm to 2230mm diameter Steel Pipe, Specials and Coatings and Linings' and must be manufactured in accordance with the requirements of API-5L specifications.

Pipes to be plain ended with bevelled ends for jointing by means of butt welds for pipes larger than 600mm diameter.

Flanged joints shall be supplied complete with rubber insertion 3 mm thick cut to the full depth of the flange and with all bolts, nuts and washers to BSS 10/1962 unless otherwise specified.

Before the application of any linings or coatings all surfaces shall be thoroughly cleaned and rust, grease, dirt and other contaminants or deleterious substances shall be removed.

After being subjected to surface preparation as specified above, and immediately after preparation the pipes shall be Rilsan coated internally and externally (see PDD), or similar approved.

Bolted flanged connections & "[Arpol](#)" couplings shall be wrapped as per PSL 3.9.6.

Unless otherwise specified, all flanges shall be to SABS 1123 Table 1600/3, 2500/3, 4000/3 and 6400/3 or to ASA 600.

PSL 3.4.4 FITTINGS AND SPECIALS

Add to the Sub-Clause:

Segmented bends shall be fabricated in accordance with Table 8 of BS 534 (1990) and the Table 6 below. Cut and shut bends are not permitted. All bends shall be fabricated with ends suitable for welding.

Table 6 : Fittings and Specials

C3.2	Deflection of Angle	
	1° to 5°	One pipe ends scarfed on site
	5° to 10°	Two pipe ends scarfed on site
	10° to 30°	2 segment bend
	30° to 60°	3 segment bend
	60° to 90°	4 segment bend

Bends greater than 90° shall be fabricated from combinations of items from the table above, but at all times adhering to the requirements of BS 534. Shop drawings of these bends shall be submitted to the Engineer for approval prior to manufacture. Tee pieces for air valve access; scour off-take etc shall be fabricated in accordance with Table 9 of BS 534 (1990). All other specials shall be fabricated in accordance with the relevant Clauses of BS 534.

PSL 3.8 JOINTING MATERIALS

PSL 3.8.3 Flanges and Accessories

Add to sub-clause 3.8.3:

"All flanges shall be drilled in accordance with SABS 1123. Mild steel (MS) specials shall be manufactured from 4,5 mm thick steel in accordance with BS 534 and protected against corrosion as specified in **PDD**".

"The insertion piece shall be such as to cover the full face of the flange (i.e. the O/D). Bolts and nuts shall comply with SABS 135. "

PSL 3.8.3.1 Bolted Connections (New Sub-Clause)

Add new Sub –Clause:

Bolted connections shall comply with the following:

- All pipes larger than 150mm in diameter, connected to equipment or fittings, or where specifically indicated, shall be flanged to SABS 1123 – 2000.
- All flanges shall be Type 3, plate flanges for welding and blank flanges shall be Type 8. Matched flanges shall correspond in construction and dimensions to flanges on equipment. Matched flanges shall be provided with the correct

bolts, nuts and packing rings. All piping shall be clean before connections are made.

- Bolts, tie-bolts and nuts shall be galvanised to SABS 763 and shall comply with the relevant requirements of SABS 135 – 1985 and SABS 136 – 1985.
- The length of each bolt shall be such that after the bolt has been tightened, the end of the bolt shall not project above the nut by more than two threads. Tie-bolts on restrained couplings shall be fitted with “backing nuts”.
- All bolt threads shall be liberally coated with “Copper slip” or similar approved prior to assembly. Upon completion, bolt heads and nuts shall be wrapped with the “Denso Mastic Blanket System” comprising of a priming solution, mastic blanket, petrolatum tape and lay-flat sheeting.

Satisfactory temporary end covers shall be provided by the Contractor for protection of flanges, prepared ends of open ended pipes and fittings and screwed ends, to prevent damage to internal lining during transportation and during handling on site.

PSL 3.8.4 Loose Flanges

With regard to sub-clause 3.8.4 the following standard shall apply:

"Bolts and nuts shall comply with requirements of SABS 135".

PSL 3.9 CORROSION PROTECTION

PSL 3.9.2 STEEL PIPES

PSL 3.9.2.2 S Steel Pipes of Nominal Bore over 150mm

a)(2) Delete this sub-clause and substitute with: in the case of bitumen coatings all steel pipes, fittings and specials shall be coated in accordance with the requirement of SABS 1178:2002 Edition 1.02 – Type CB6A.

c) *Add to the Sub-Clause:*

Unless otherwise specified on the drawings, all steel pipe, fittings and specials with a cement mortar lining shall be in accordance with the requirements of the Australian Standard AS 1281:1993.

PSL 3.9.2.2.1 Making Good of Cement Mortar Lining at Welded Joints (New Sub-Clause)

Add new Sub-Clause:

The steel pipe is supplied with cement mortar lining cut back 50mm from each end. This entire void shall be filled with Epidermix 338 (or approved equivalent) and rendered smooth and flush with the surrounding lining as described below.

Surface Preparation

The cement mortar surface shall be rendered free of laitance, dust, oil, grease, fractured aggregate and other deleterious matter. The steel surface shall be rendered free of rust and other deleterious matter by wire brushing (apply white spirit if necessary).

Mixing

The base and activator shall be mixed in accordance with the manufacturer's requirements on a clean board, using a clean trowel or paddle. The mixture shall not be diluted. Mixing shall continue for five minutes after streaking disappears.

Application

The product shall be applied to the annular groove, with care taken to avoid air bubbles, particularly from the "dove-tails" in the cement mortar lining. Material that has "gone off" shall be discarded.

Finish

The product shall be smoothed with a dampened trowel to be flush with the adjacent cement mortar.

Safety

Uncured product must be regarded as toxic and shall be handled in accordance with the manufacturer's instructions. Adequate ventilation shall be provided whilst working within the pipeline.

PSL 3.9.2.2.2 Making Good of Damaged Cement Mortar Lining (New Sub-Clause)

Add new Sub-Clause:

Responsibility for Repairs

Once the Contractor has accepted undamaged pipe from the Supplier, any subsequent damage will be repaired at the Contractor's cost in accordance with the procedure below. Pipes with linings damaged prior to acceptance shall be recorded by both the Contractor and the Engineer's Representative and repaired in accordance with the procedure below. The rate for repair shall be per lineal metre.

Repair Procedure

The crack shall be ground out using a mechanical grinder down to the steel wall to form a "dove-tail" groove with a minimum width of 8mm. The groove shall be filled with Epidermix 338 (or equivalent approved), mixed and applied in accordance with the procedure set out in **3.9.2.2.1 "Making Good of Cement Mortar Lining at Welded Joints"**.

PSL 3.9.2.2.3 Cement Mortar Lining of Shop-Fabricated Specials (New Sub-Clause)

Add new Sub-Clause

Where shop-fabricated specials are to be manufactured from unlined steel pipe, these shall be lined after fabrication in accordance with the latest version of SABS 1200 LH. Small diameter pipe shall be epoxy coated in accordance with Sub-Clause **PSL 3.9.2.2.7 External Corrosion Protection of Shop-Fabricated Specials for Installation in Chambers**.

PSL 3.9.2.2.4 External Corrosion Protection of Welded Joints and Field Repairs (New Sub-Clause)

Add new Sub-Clause:

All steel pipes for field welding are supplied with the coating cut back 100mm from each pipe end. Where pipes are to be cut on site, the pipe coating shall be cut back 100mm from the welded joint. Once welding is complete and all weld splatter and burnt coating is removed, all field welded pipe joints shall be wrapped in the following manner.

This specification is based on "Denso" products, but alternative products may be accepted at the discretion of the Engineer. This procedure will also apply to the welding of bends and specials onto the pipe in the field.

Surface Preparation

The bare metal shall be cleaned and wire brushed to minimum St.2 standard and if necessary, degreased with white spirit. The adjacent pipe coating shall be cleaned to a minimum of 300mm either side of the joint and the edges "feathered" to achieve

a tapered transition over a distance of 10mm. The sound, parent coating surface shall be roughened with sandpaper over an area 250mm from the joint.

Priming

The pipe surface up to 250mm on either side of the joint shall be primed using “Denso Primer D” (or equivalent approved). Care shall be taken to obtain an even film with no runs or sags. The primer shall cure for the minimum time stipulated by the manufacturer before application of the tape commences. Prime only those areas to be wrapped the same day. If primed areas are to be left overnight, these areas shall be re-primed before wrapping.

Profiling Tape

Apply a 1.5mm thick x 50mm wide “Denso Mastic Sealing Tape” (or equivalent approved) to the full circumference of the weld bead in accordance with the manufacturer’s requirements. Care shall be taken to ensure a smooth profile and to avoid air bubbles being trapped beneath the tape. (Note: The profiling tape may be omitted at the discretion of the Engineer. The Contractor shall nonetheless allow for the profiling tape in his/her rates).

Tape Wrapping

Thereafter, the joint shall be wrapped (minimum 55% overlap) with Denso Ultraflex 1250/300 starting at the roughened section (250mm from the welded joint) in accordance with the manufacturer’s requirements to create a 500mm wide wrapping, centred over the welded joint. A 100% overlap is required on the first and last revolutions of the tape wrapping operation. It is important that tension in the tape be released when the wrapping of the last half circumference of the pipe. The Contractor shall ensure that the wrapping overlaps or covers a minimum of 150mm of the pipe coating. A secondary or outer tape wrap layer is to be applied over the first layer with a 10% tape overlap.

Shrink-sleeves

An alternative to the repair of field joints on FBMDPE with tape wrapping is the use of shrink-sleeves. The shrink-sleeve is recommended at field joints, especially in areas of high clayey soils to reduce the effect of soil stresses. The surface preparation is to be carried as described above. The area to be reinstated is to be pre-heated and a WPC primer applied to the exposed steel including the roughened MDPE surface. The shrink-sleeve is to be applied in accordance with the manufacturer’s specification. The repair is to be visually inspected to ensure that a bead of mastic has exuded from the edges of the sleeve.

Adhesive Patch Repair (also known as PERP or “polyethylene repair patch” method)

This method is recommended for the repair of defects on FBMDPE pipe for repairs not exceeding an area of 200mm x 200mm. The surface preparation is to be carried as described above. The exposed metal in area to be reinstated is to be pre-heated to +/- 60 deg C and the adjacent area to +/- 40 deg C. A pre-cut piece of mastic PERP filler is to be placed over the exposed steel surface. The mastic is to be heated and smoothed with a paint scraper to cover all bare metal and to expel all voids. Cut a piece of PERP tape that overlaps the repair area by 100mm on all sides. The patch is to be heated until adhesive is exuded from the edges of the patch.

Clean the area with a solvent (acetone is suitable) wipe. Spirally apply an over tape wrap with a 10% overlap ensuring tension to eliminate voids.

PSL 3.9.2.2.5 Making Good of Polyurethane Coating (New Sub-Clause)

Add new Sub-Clause:

All repairs required for damages to Polyurethane coatings shall be carried out strictly in accordance with the manufacturer's specifications. Surface preparation shall ensure that the bare surface of the pipe is cleaned and wire brushed to minimum St.2 standard and if necessary, degreased with white spirit. The Contractor shall ensure that making good of coating defects is carried out progressively as the pipe is being laid and shall not lag behind for more than three pipe lengths at each working front.

PSL 3.9.2.2.6 Making Good of Solvent Free Epoxy Lining (New Sub-Clause)

Add new Sub-Clause:

All repairs required for damages to Solvent Free Epoxy linings shall be carried out strictly in accordance with the manufacturer's specifications. Surface preparation shall ensure that the bare surface of the pipe is cleaned and wire brushed to minimum St.2 standard and if necessary, degreased with white spirit. The Contractor shall ensure that making good of lining defects is carried out progressively as the pipe is being laid and shall not lag behind for more than three pipe lengths at each working front.

PSL 3.9.2.2.7 External Corrosion Protection of Shop-Fabricated Pipe Bends (New Sub-Clause)

Add new Sub-Clause:

This shall be carried out in accordance with **PSL 3.9.2.2.4 External Corrosion Protection of Welded Joints**.

PSL 3.9.2.2.8 External Corrosion Protection of Site-Fabricated Pipe Bends (New Sub-Clause)

Add new Sub-Clause:

This shall be carried out in accordance with **PSL 3.9.2.2.4 External Corrosion Protection of Welded Joints**.

PSL 3.9.2.2.9 External Corrosion Protection of Shop-Fabricated Specials for Installation in Chambers (New Sub-Clause)

Add new Sub-Clause:

External corrosion protection of all mild steel specials to be installed within chambers shall be carried out in accordance with "Umgeni Water's Particular Specification for 164mm to 2230mm Diameter Steel Pipe, Specials, Coatings and Linings, 5.3.7 Solvent Free/Solvent Borne Liquid Epoxy".

Epoxy coating shall terminate 100mm short of ends for field welding.

PSL 3.9.2.2.10 Corrosion Protection of Flanged and Flexible Joints (New Sub-Clause)

Add new Sub-Clause:

All buried flanges and flexible joints shall in addition to being epoxy coated, be protected as described below. This specification is based on a "Denso" system. Alternative products may be used, subject to approval by the Engineer.

Surface Preparation

The entire joint and at least 500mm of the pipe on either side of the joint shall be cleaned of mud and other deleterious matter.

Priming

The cleaned joint and pipe shall be primed with "Denso Priming Solution", or if moisture is present, with "Denso S105 Paste". The priming shall extend to at least 400mm either side of the joint.

Application of Mastic Blankets

Narrow strips cut from "Denso Mastic Blankets" shall be applied to the joint to achieve a smooth profile with a 50mm splayed fillet being formed at the joint/pipe interface. Care shall be taken, particularly at bolts, to avoid the formation of air pockets. Complete "Denso Mastic Blankets" shall then be applied (mastic side down) to the joint until the joint is completely enveloped.

The blanket shall be overlapped at least 50mm and shall extend at least 150mm along the pipe barrel on each side of the joint. The ends of the blanket shall be bound to the barrel of the pipe on each end with 100mm wide "Denso Tape". The "Denso Tape" overlaps shall be 50mm and shall extend 100mm onto the blanket and 150mm onto the pipe barrel.

Application of Protective Sheeting

The entire joint shall be wrapped with 350-micron polyethylene sheeting which shall end 400mm beyond the joint. The protective sheeting shall be secured to the pipe barrel and along the seam with 48mm wide "Denso Adhesive Tape".

PSL 3.9.2.2.11 Coating of Permanently Exposed Pipe (New Sub-Clause)

C3.3

Add new Sub-Clause:

All pipes which are to be permanently exposed shall in addition to corrosion protection at joints, be protected with the "Denso Acrylic Pipeline Tape (Steelcoat 500)" system or similar approved UV resistant coating. The pipe surface shall be prepared and the coating applied in strict accordance with the manufacturer's instructions.

Surface Preparation

The pipe surface to be wrapped shall be cleaned of dirt, grime, grease and other deleterious matter, using white spirit if necessary. Allow to dry thoroughly.

Priming

Apply Denso Primer D to the prepared surfaces at a nominal coverage rate of 8m² per litre. Care shall be taken to obtain an even film with no runs or sags. Prime only those areas to be wrapped the same day. If primed areas are to be left overnight, these areas shall be re-primed before wrapping.

Tape Wrapping

The joint shall be spirally wrapped (minimum 55% overlap) with "Denso Acrylic Tape" (or approved equivalent) in accordance with the manufacturer's requirements such that the start and end points are located at buried sections of the pipe, before it is daylight. A 100% overlap is required on the first and last revolutions of the tape wrapping operation. It is important that tension in the tape be released when the wrapping of the last half circumference of the pipe.

Final Coating

One coat of "Densoflex Fire Retardant" shall be applied to the exposed pipe at a nominal application rate of 3m² per litre.

PSL 3.9.6 Corrosive Soil

Add to Sub-clause 3.9.6 :

"The soil within the PE municipal area is classified as corrosive. All metal flanged joints, saddles, bolts and nuts 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 by the Engineer or the Engineer's Representative".

PSL 3.10 Valves

Delete the contents of this Sub-clause and replace by:

"Valves shall be cast iron wedge type gate valves complying with the requirements of SABS 664-1989 as amended. They shall be Class 16, anti-clockwise closing, non- rising spindle type with cap. They shall bear the SABS quality mark. A test certificate as per Clause 3.5.20 of SABS 644 will be acceptable. When flanged valves are specified, the drilling shall be to Table 16/11 of BS 4504".

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 as per City Engineer's Department Standard Detail Drawing No PSL 2/1". For trafficked areas surface boxes are to be cast iron type as per City Engineer's Department Standard Detail drawing No. PSL 2/2".

PSL 3.12 Hydrants (New Clause)

Hydrants shall be of the underground screw down type with an overall maximum height of 320 mm and rising spindle. The hydrant shall be opened by rotating the spindle in an anti-clockwise direction. The outlet connection shall be of the London Round Thread type. The hydrant must conform to SABS 1128: Part 1-1977.

PSL 3.13 Corrosion Protection (New Clause)

Unless otherwise specified or indicated on the drawings or Bill of Quantities, all bolts, nuts and washers shall be hot-dip galvanised to SABS 763 after threading. All bolts, nuts and washers within water retaining structures or exposed to rain water shall be fabricated from stainless steel.

The following corrosion protection specification shall apply to pipe work, specials and valves required under this Contract.

- pipes and specials - Rilsan coating (300μ) internally and externally
- Valves - Rilsan / FBE (300μ) coating internally and externally

All corrosion protection and repair work to coatings is to be carried out in accordance with manufactures specifications and as detailed in C3.6.

PSL 5 CONSTRUCTION

PSL 5.1.1 Add to sub-clause 5.1.1

"The center line of the pipeline shall normally be 2,5m from the road reserve boundary inside the road reserve. The pipeline is to be laid continuously and leaving gaps for fittings will not be allowed.

For uPVC pipelines the pipe shall be laid to within 2,0m of the connection point. For HDPE pipelines the Contractor is to lay at least 300 mm past the connection point. In both cases the Water Division will complete the connection providing their own materials unless these have been ordered by the Engineer's Representative."

PSL 5.1 Laying (sub-clause 5.1)

Pipes shall be bedded uniformly on selected granular material (see SABS 1200 LB) and the use of blocks to support the pipes will not be accepted unless both pipes and blocks have been specifically designed for that purpose and recommended by the Manufacturer.

When laying pipelines around curves, F.C pipe joints may be deflected to a maximum of 3 degrees and uPVC pipes may be deflected to an amount not to exceed the manufacturer's recommendations. Where, because of the sharpness of curve, the above procedure is not practicable, short lengths of pipe, or a series of bends connected by straight pipes shall be employed.

The Contractor will be responsible for clearing the areas required for pipe storage, which shall include the removal of rock, stones and all burnable material. He shall

also be responsible for maintaining the area in a clean and tidy condition for the duration of the Contract. No separate payment will be made for this operation.

Upon delivery of the pipes, fittings, specials and valves on site, they will be inspected jointly by the Engineer's representative and the Contractor. Any pipes, etc. found to be damaged shall be returned to the factory for repair or replacement; in which case the costs of additional transport, repair or replacement shall be borne by the Contractor.

The Contractor will be held fully responsible for the care and safety of all pipes and fittings, etc. on site, and shall bear the cost of all renewals, which may be necessary to make good losses, damages or breakage. Furthermore, he shall be fully responsible for handling and reloading material at the storage areas and for transporting and off-loading all such materials at their correct places along the pipeline route.

PSL 5.1.3 Keeping Pipelines Clean

The interior surfaces of all pipes, specials, valves and fittings shall at all times be kept free from dust, silt, foreign matter, and access by rodents, animals and birds shall be prevented. Pipes and specials shall not be used as shelters by staff or for the storage of garments, tools, materials, food containers or similar goods.

PSL 5.1.4 Depth of Cover

Unless otherwise shown on the drawings or instructed by the Engineer, cover to pipes shall be as follows: -

During Construction:

There shall be no less than 0,75m of cover over the pipes, where construction traffic is liable to cross them, hence 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 450 mm and not more than 600 mm below the final road surface.

Pipes beneath existing roadways:

The tops of pipes beneath a road shall not be less than 1,00 and not more than 1,25m below the road level.

PSL 5.2 JOINTING METHODS

PSL 5.2.3 WELDING (STEEL PIPELINES)

*Delete the title and replace with “**WELDING (STEEL PIPELINES)**”.*

Delete the 1st sentence and replace with:

Field welding of steel pipelines shall be carried out in accordance with the relevant requirements of the latest version of API 1104. The Contractor, prior to commencement of welding, shall produce a qualified welding procedure in accordance with the latest version of API 1104, for the intended sizes, processes, positions and consumables to be used on this project.

Welding shall be carried out by Welders who are competent in terms of the procedure approval test given in API 1104. Prior to commencement of welding, the current qualification of each Welder must be produced in accordance with the welding procedure. Should constant repairs be required on welds carried out by one particular Welder, the Engineer may request that the Welder be re-tested or removed from the project.

PSL 5.2.3.1 Welding Procedure (New Sub-Clause)

Add new Sub-Clause:

Welding shall generally commence at the top of the joint and proceed downwards. In addition to the root weld, at least two further passes shall be made, none of which is to exceed 3mm in depth.

PSL 5.2.3.2 Aligning (New Sub-Clause)

Add new Sub-Clause:

The alignment of abutting ends will be such that the offset does not exceed 1.5mm. Line-up clamps may be used for the “fit-ups”. The use of “bridges and wedges” or any other method that may introduce unnecessary stresses into the pipe is forbidden.

PSL 5.2.3.3 Weather Conditions (New Sub-Clause)

Add new Sub-Clause:

Welding shall not be performed under conditions that could affect the quality of the welded joint (e.g. high moisture or windy conditions). Windshields may be used where practical.

PSL 5.2.3.4 Clearance (New Sub-Clause)

Add new Sub-Clause:

The minimum clearance around the pipe during welding shall be 400mm. When welding in the trench, “fox holes” will provide adequate access for the Welders.

PSL 5.2.3.5 Visual Inspection (New Sub-Clause)

Add new Sub-Clause:

100% of each joint will be examined and the following criteria met:

PSL 5.2.3.5.1 Weld Bead

All welds shall be substantially uniform in appearance with the inner and outer weld beads not exceeding 1mm and 3mm in height respectively.

PSL 5.2.3.5.2 Undercut

Undercut will not be permitted under any circumstances.

PSL 5.2.3.5.3 Freedom from Defect

The weld, heat affected zone and surrounding parent metal shall be free from cracks, porosity and trapped slag.

PSL 5.2.3.5.4 Weld Splatter

All welds splatter must be removed prior to corrosion protection application.

PSL 5.2.3.6 Non-Destructive Testing (New Sub-Clause)

Add new Sub-Clause:

Radiographic testing will be performed on all butt welds and dye penetrant testing on fillet welds. **All** welds will be tested, adjudicated and repaired in accordance with API 1104. Testing of welds will be carried out on 100% of welds initially and this would be reduced to a minimum of 10% of welds, at the discretion of the Engineer, as work proceeds and the Engineer is satisfied that the quality of welding is of an acceptable standard.

Repairs of welded joints shall be permitted in accordance with approved repair procedures. Repairs shall be re-examined using the relevant non-destructive testing method. All costs associated with the repair of defective welds will be borne by the Contractor.

Technicians performing examinations will be suitably qualified, to the satisfaction of the Engineer.

A DCVG (direct current voltage gradient) survey will be carried out on the pipeline within 3 to 6 months after the end of the pipeline construction, within the Defects Liability Period. All coating defects identified from the DCVG survey with a value greater than 3% IR, will need to be exposed and repaired by the Contractor at the Contractor's own cost. Depending on the extent of the defects identified, the Engineer may call for a further DCVG survey after the initial defects have been repaired by the Contractor, the cost of which shall be borne by the Contractor.

PSL 5.2.3.7 Quality Control (New Sub-Clause)

Add new Sub-Clause:

Records of which welds were carried out by each individual Welder as well as non-destructive testing results shall be submitted to the Engineer at each monthly site meeting. Should there be repetitive or serious defects, this information shall be forwarded to the Engineer immediately.

PSL5-3 Connection onto existing mains

See C.3.4.1.3 and C.3.4.8.1 The Engineer's written approval shall be obtained each time immediately before an existing main is opened to make a connection.

Before commencing the excavation of pipe trenches in the vicinity of a proposed connection, the Contractor shall excavate for, expose, survey and record the position and level of the connection point on the existing watermain.

The Contractor shall be responsible, through the Engineer, for liaison with the Employer to arrange and carry out the connection.

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 5.6 Valves and Hydrant Chambers

Delete in Sub-clauses 5.6.1 and 5.6.2 the reference to drawings L1, L2 and L3 and replace by "The Standard Details of the Municipal Water Division".

PSL 5.10 Disinfecting of Potable Water Pipelines

The disinfecting of the pipelines will be undertaken by the Contractor and the Municipal Water Division prior to connecting into the new main.

PSL 5.11 Markers for Fire Hydrants (New Clause)

Markers for Fire Hydrants are to be supplied and placed by the Contractor.

PSL 6 TOLERANCES

PSL 6.2 Control Points

Add: "Valves shall be located as indicated on the plan layout opposite the boundary peg of the erf, and to within a longitudinal tolerance of 100 mm."

PSL 6.3 Alignment (Plan and Level)

Add to last sentence: ", provided this does not result in a reversal of the grade of the pipeline."

PSL 7 TESTING

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. Allowance 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 Engineer prior to the start of a leakage test. Upon the successful conclusion of a leakage test, the removal of the Contractor's equipment from the tee and the fitting of the hydrant (supplied by Contractor) will be done by the Water Division when connecting the new reticulation."

Delete the contents of sub-clause 7.3.1.2 and replace by "The test pressure for the field testing shall be 1,35 MPa for Class 9 - uPVC, class 10 GRP and Class 10 HDPE pipes; 1,8 MPa for Class 12 - uPVC, class 12 GRP and Class 12 HDPE pipes."

Delete sub-clause 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 500 mm, of a pipe included at the end of the new reticulation.

The Water Division will remove and return the end caps and short length of pipe to the Contractor once the new reticulation is connected.

PSL 7.3.3 Permissible Leakage Rates

Delete in sub-clause (a) the figure of "0,075" and replace by:

"0,0161 for Class C, AC pipes", or "0,0186 for Class D, AC pipes"

Add: "See standard drawings PSL 5/1, PSL 5/2, PSL 5/3 and PSL 5/4 for tables of permissible leakage rates for uPVC, and HDPE pipes. 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 would be at his expense."

PSL 7.3.4 The Witnessing of a Successful Leakage Test by an Official of The Water Division.

The Contractor shall take note that the Engineer's Representative is required to ensure that an Official of the Water Division 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, Water Division.

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 (New Clause)

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 (but not his flange and pipe system from the hydrant tee), the completion of the backfilling to the pipeline and construction of the hydrant and valve chambers. The Water Division will connect in the new reticulation as soon as possible and the Contractor shall supply such materials, pipes and specials as detailed by the Engineer. The completion of backfill at the connection points and the surface restoration/reinstatement shall be carried out by the Contractor.

PSL 7.5 Subsequent Maintenance Period (New Clause)

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 7.6 The Witnessing of a water reticulation test (New Clause)

Procedure to be followed:

1.1 Application by Consulting Engineer.

- The Consulting Engineer must contact the Water Operations Division direct:

1.2 The Consulting Engineer must supply:

- 2 paper prints of the plan showing the extent of the layout to be tested.
- Calculations of the leakage rate scheduled in the types, diameter and lengths of pipe.

1.3 The Consulting Engineer must:

- Witness a test so as to ensure that all is in order before arranging a test with the Infrastructure and Engineering Business Unit.
- Arrange for a test 48 hours before the test is required.

1.4 Preparations for the test.

Contractor to ensure that they adhere to the above procedures and time frames and to ensure that the items listed below are addressed.

- All areas of potential leaks should be exposed.(saddles, straight couplings, Tee pieces , joints , end caps etc.)
- All anchoring should be exposed (anchors on bends, valves, tees, etc.).
- The alignment of the proposed main and the existing main should be at the same level (for connection purposes), Therefore for this reason the existing main should be exposed.
- The ends of the reticulation must be visible.
- The take-off points from the main pipeline and the ends of all erf connections must be visible.
- Specials at changes of type of pipes must be visible.
- Flange adaptors without stainless steel bolts should be wrapped with Denso tape.
- Valves on the mains must be in the open position.
- It is not advisable to test against a closed valve, if this happens, it will be at the Contractor's risk.
- Any visible leak will result in automatic failure even if the water loss is within the permissible leakage rate.
- Testing equipment must be to the Municipal Water Division satisfaction (kpa calibrated gauges)
- The Contractor's Site Agent or nominee must be present.
- The Consulting Engineer's representative must be present.

If any of the above does not comply, the test will be deemed to have failed. If the test fails, the Consulting Engineer must apply for a re-test (at cost to the Contractor) after the problem has been rectified.

Once the pipe has been successfully tested, the contractor is not permitted to carry out any work on that section. Any repairs or alterations required on the pipe or fittings will be performed by the Municipality and will be for the contractor's account.

PSL 8 MEASUREMENT AND PAYMENT

PSL 8.2.1 Supply, Lay and Bed Pipes Complete with Couplings

Add: "The measured quantity of pipe length will only be included in the payment certificate after the reticulation has successfully passed a leakage test. Payment may be made for material on site up to this stage."

Pipelines will be measured per horizontal linear metre along the centreline of the pipeline and to the centreline of connecting mains.

Notwithstanding the requirements of Subclause 8.2.1, the rates for supplying laying and bedding pipes shall also cover the costs of cleaning and disinfecting the pipeline by the Contractor.

PSL 8.2.7 Corrosion Protection

Notwithstanding Subclause 8.2.7 and 8.2.15, the rates for pipes, valves, specials and couplings shall also cover the cost of all other corrosion protection as specified.

PSL 8.2.11 Anchor / Thrust Blocks and Pedastals

Notwithstanding Subclause 8.2.11 anchor/thrust blocks and pedestals will be measured only by volume of concrete to the net dimensions shown on the drawings or ordered.

The rate shall cover the cost of excavation, concrete, formwork.

PSL 8.2.17 Markers for Fire Hydrants (New Clause)

The rate shall include for the supply and installation of the hydrant markers in the verge as ordered.

PSL 8.2.18 Connection to Mains (New Clause)

An item shall be allowed in the Bill of Quantities, for the connection to existing mains by the Kouga Local Municipality Water Division, after acceptance of the reticulation.

PSL 8.2.19 Chambers (New Clause)

The rates tendered for the chambers shall cover the costs specified for thrust blocks and for all other necessary materials, such as air vents, access covers, locking bars, locks and access ladders to complete the chamber as detailed on the drawings (including 0,08 t of high tensile steel per m³ of concrete where not indicated on drawings). All pipework, specials and valves will be measured elsewhere.

PSL 8.2.20 Connection into Existing Reticulation

The connection into the existing 100mm ø manifold and 100mm ø pipeline will be paid by a single lump sum. The sum shall cover the total cost of locating, exposing and cutting into the pipelines.

The sums shall also cover the cost of liaising with the authority concerned to arrange for shutting down the respective pipelines, draining of the said pipelines, dealing with water, cutting pipes to fit, including turning if necessary, and the fitting of couplings to complete the connection or welding and, if required, the temporary sealing and anchoring of pipe ends for testing purposes, and corrosion protection to the cut pipe, and subsequent removal of seals and anchors. The specials required to make the connection will be measured separately. The tie into the 300mm ø pipeline is to be carried out in accordance with PSL 5.3.

PSLB BEDDING (PIPES)

PSLB 3 MATERIALS

PSLB 3.1 Selected Granular Material

Delete Subclause 3.1 and replace with the following:

Selected granular material shall be an aggregate, sand, or granular material, all of a non-cohesive nature, the grading analysis of which shows 100% passing a 9,5 mm sieve and not more than 5% passing a 0,075mm sieve (metric sizes). The Compactability Factor shall not exceed 0,4.

PSLB 3.2 Selected Fill Blanket

Selected fill material shall be an aggregate, sand, or granular material, all of a non-cohesive nature, the grading analysis of which shows 100% passing a 9,5 mm sieve and not more than 5% passing a 0,075mm sieve (metric sizes). The Compactability Factor shall not exceed 0,4.

PSLB 5 CONSTRUCTION

PSLB 5.1.1.2 Trench Bottom

The trench bottom shall be prepared in accordance with the requirements of Sub-Clause 5.5 of SABS 1200 DB as amended by Clause PSDB 5 of Scope of Works PSDB : Earthworks (Pipe Trenches).

PSLB 5.1.4 Compacting

Selected Granular Material and Selected Fill Material shall be compacted to 95% and 93% MAASHTO density, respectively, in maximum 150 mm layers.

PSLB 5.2 Construction of Bedding

Completion of the bedding cradle and placing of the selected fill blanket, and the main fill, shall commence as soon as possible after pipelaying has been completed. The Contractor shall meet all costs of operation ordered by the Engineer to remedy defects in the trench caused by lengthy exposure.

PSLB 5.2.1 Class A Bedding

Add the following:

“or a period of 5 days has elapsed after the placing of the concrete in that section, whichever occurs first”

PSLB 5.2.2 Class B Bedding

The dimension “x” for all rigid and flexible pipes as referred to in drawing LB-1 and LB-2, shall be 150mm.

PSLB 5.4 Concrete Casing to Pipes

Where concrete encasement is specified, the Contractor shall place the encasement in accordance with details shown on the Engineer's drawings.

PSLB 7 TESTING

PSLB 7.1 Density Testing

Measurement and payment for density tests on the bedding cradle and fill blanket, where ordered by the Engineer, will be by number per successful density test reported to the Engineer.

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.1 Volume of Bedding Materials (sub-clause 8.1.3)

The volume of bedding material will be measured net, excluding the volume of the occupied pipe.

PSLB 8.1.5 Disposal of Displaced Material

In developed areas all displaced material shall be removed to designated sites and evenly spread to the Engineer's satisfaction as covered in C3.4.6.

PSLC CABLE DUCTS

PSLC 3 MATERIALS

PSLC 3.2 Bedding

Delete Clauses 3.2.1 and 3.2.2 and replace with the following :

"Selected granular material shall be an aggregate, sand or granular material all of a non-cohesive nature, the grading analysis of which shows 100% passing a 13.2mm sieve and not more than 5% passing a 0,075mm sieve (Metric sizes). The Compactability Factor shall not exceed 0,4."

PSLC 5 CONSTRUCTION

PSLC 5.1.1 Excavation of Trenches

Material excavated other than hard rock, will not be separately classified for the purpose of measurement and payment. The unit rate for excavation shall cover excavation in soft and intermediate material.

PSLC 5.8 Road Crossings

Delete the last sentence and replace with :

"The duct(s) shall extend a distance of at least 0,5m beyond the backface of the kerb or the edge of the road, as applicable."

PSLC 5.10 Position to be Marked

Marking is required on both sides of the carriageway.

Delete in the second line : "..... the letters "GPO or ESC", as applicable, .." and replace with "..... the letters "T" and "E", as applicable."

Add : "The height of the letter shall be at least 100mm."

PSLC 8 MEASUREMENT AND PAYMENT

PSLC 8.2.2 Schedule Items

Delete payment clause 8.2.2(b) and add the following :

"8.2.2(b) **Extra over item (a) above for :**

Hard rock excavation Unit m³

C3.4: CONSTRUCTION: PART C

PART C: PARTICULAR SPECIFICATIONS

The following Particular Specifications are applicable to this contract

- PAA : Appointment of CLO & Labour employment conditions
- PA-PV : Building Specifications
- PW : Electrical Specifications

PAA: APPOINTMENT OF COMMUNITY LIAISON OFFICER & LABOUR EMPLOYMENT CONDITIONS
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PAA1 Duties and responsibilities of the community liaison officer

1. Represent the community and assist the Municipality, Contractor and the Engineer with communication between them and the community. Inform community regarding the project detail, safety precautions and programme.
2. Be available at the site offices generally between the hours of 07:00 and 09:00 and again from 15:00 until end of working day. Normal working hours will be from 07:00 am till 17:00.
3. Assist with relocation of people, where applicable.
4. Maintain an up-to-date record of potential employees within the community and provide the contractor with copies of this information.
5. To identify, screen and nominate labour from the community in accordance with the Contractor's requirements and determine, in consultation with the Contractor, the needs of local labour for employment and relevant technical training, where applicable.
6. Liaise between Contractor and labour regarding wages and conditions of employment.
7. Communicate daily with the Contractor on labour related issues such as numbers and skills.
8. Identify possible labour disputes, unrest, strikes, etc., in advance and assist in their resolution.
9. Have a good working knowledge of the contents of the contract document regarding labour and training matters.
10. Attend all meetings at which the community and/or labour is represented or discussed.
11. Attend contract site meetings and report on community and labour issues at these meetings.
12. Co-ordinate and assist with the obtaining of information regarding the community's needs (questionnaires, etc.).
13. Inform local labour of their conditions of temporary employment, to ensure their timeous availability and to inform them timeously of when they will be relieved.
14. Ensure that all labour involved in activities when tasks have been set, are fully informed of the principle of task based work.
15. Attend disciplinary proceedings to ensure that hearings are fair and reasonable.
16. Keep a daily written record of interviews and community liaison.
17. Arrange venues for training if required.
18. Assist with the training and education of the community regarding the correct usage of the services, where applicable.
19. Any other duties that may become necessary as the works progress.

PAA2 Benchmarking duties of the Community Liaison Officers

PAA2.1 Communication function –

- a) Represent the community and assist Municipality / Contractor / Engineer with communication between them and the community. Informs community of project details, safety issues and project plan.
- b) Attend all meetings at which the community and / or labour is represented or discussed.
- c) Inform employees of their temporary contract conditions to ensure their timeously availability and to inform them timeously of when they will be released from the project.
- d) Ensure that all temporary employees involved in activities when tasks have been set, are fully informed of the principle of the task-based work.

PAA2.2 Availability – Be available 8 hrs per day as well as after hours when required

PAA2.3 Physical Assistance - Assist with relocation of community

PAA2.4 Administrative

- a) Maintain up to date records of potential employees for current and future projects.
- b) Co-ordinate and assist with the obtaining of information regarding needs of the community via questionnaires etc.
- c) Keep a daily written record of interviews and any community liaison.
- d) Arrange venues for training when required.
- e) Complete all contractual documentation related to the employment contract of the temporary employees.

PAA2.5 Recruitment, Industrial Relations and Training activities: –

- a) Identify, screen and nominate labour in accordance to requirements of the contractor in conjunction with ward representative
- b) Liaise between contractor and employees regarding wages and conditions of employment.
- c) Communicate daily with Contractor on labour issues i.e. numbers and skills of the employees.
- d) Identify potential labour disputes, unrest, strikes in advance.
- e) Assist in resolving minor disputes.
- f) Attend contract site meetings and report on community and / or labour issues at these meetings. (must be able to interpret Labour Relations dynamics amongst the workforce)
- g) Attend disciplinary hearings to ensure that hearings are fair and reasonable.
- h) Assist with training and education of the community regarding the correct usage of the services being installed /constructed.

PAA3 Minimum employment conditions for conventional construction works

Contractors shall comply with the Basic Conditions of Employment Act (Act No 75 of 1997).

As a determination has not been made in terms of the aforesaid Act for the building sector, the minimum employment conditions which will apply to this Contract shall be guided by the most recent Sectoral Determination: Civil Engineering Sector published in the Government Gazette.

The following minimum conditions shall apply to this Contract and Contractors shall include such conditions in employment contracts:

PAA3.1 Employment contracts

The Contractor shall enter into an employment contract with every one of his/her employees, including short-term contracts i.e. contracts in which employment commencement and employment termination dates are specified. Short-term employment contracts will also apply an employee employed for only one day.

PAA3.2 Normal working hours

Normal working hours are from 07:00 to 17:00 from Monday to Friday. A tea break is taken from 09:00 to 09:15 and lunch from 12:30 to 13:00.

Actual hours to work and be paid for is 9 hours per day. If a lunch break of one (1) hour is taken then the normal working day will be as follows:

- Morning work sessions from 07:00 to 12:00.
- Lunch break from 12:00 to 13:00.
- Afternoon sessions from 13:00 to 17:00.

PAA3.3 Minimum wages

- Minimum wages shall be according to the Bargaining Council for the Civil Engineering Industry (BCCEI) Task Grade 3 which at the time of tender is R 38.96/hr.
- For a full day's work the hourly rate shall be multiplied by 9.
- Normal 5-day week hours of work shall be 45 hours and the wage calculated according to the applicable hourly rate.
- Overtime pay shall be 1.5 times the ordinary wage.
- An employee shall be paid fortnightly.

PAA3.4 Short time (excluding short time due to inclement weather)

If for reasons, which may be ascribed to the employee, e.g. arriving late for work or taking an afternoon off, the hours not worked shall be deducted from the daily wage calculation.

PAA3.5 Short time resulting from inclement weather

- If the Contractor informs his/her employees that no work will be done the following day due to inclement weather, no payment will be due to the employee for such a day.
- If the Contractor has not informed his/her employees that no work will be done due to inclement weather and no work or less than four (4) hours of work is possible during a day, the Contractor must pay the employee for four (4) hours of work.
- If more than four (4) hours of work is done, the Contractor shall pay the employee for the number of hours worked.

PAA3.6 Vacation leave

If an employee has been in full time employment for more than four (4) months, he/she shall be entitled to 1 day's paid leave for every seventeen (17) days the employee worked or was entitled to payment.

PAA3.7 Family responsibility leave

If an employee has been in full time employment for more than four (4) months, he/she shall be entitled to three days paid leave in a leave cycle of thirty-six (36) months of employment:

- When the employee's child is born.
- When the employee's child is sick.
- In the event of death of the employee's spouse or life partner, parent, grandparent, child or grandchild.

The employee shall provide the required proof to the Contractor of the event, failing which the leave shall be unpaid leave.

PAA3.8 Maternity leave

At least four (4) months unpaid leave.

PAA3.9 Sick leave

The employee shall be entitled to one (1) day's paid sick leave of normal wages for every twenty-six (26) days worked.

If an employee is absent for three (3) or more consecutive days, the employee shall provide a sick certificate from a registered medical practitioner to qualify for sick leave payment. If such certificate is not provided, no sick leave payment will be due to the employee.

PAA3.10 Piece work

Irrespective of the quantity of work done under a piece work system during a working week, the employee shall be entitled to a minimum of a week's wages determined as if no piece work applied.

The Contractor or employee may terminate an employment contract by giving notice of termination of not less than:

- On short period contracts i.e. a contract which states from which date work employment commences and on which day employment terminates, the terms of the employment contract shall apply.
- One week if employee has been employed for four (4) weeks or less, unless it is a short-term project.
- Two (2) weeks if employee has been employed for more than four (4) weeks but not more than one (1) year.
- Four (4) weeks if employee has been employed for more than one year.

PAA4 Employment conditions for labour intensive works and construction

The Ministerial Determination, Special Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice N° R63 of 25 January 2002, as reproduced below, shall apply to works described in scope of work as being labour intensive and which are undertaken by unskilled or semi-skilled workers.

This clause contains the standard terms and conditions for workers employed in elementary occupations on a Special Public Works Programme (SPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of a SPWP.

PAA4.1 Terminology

- “department” means any department of the State, implementing agent or contractor.
- “employer” means any department, implementing agency or contractor that hires workers to work in elementary occupations on a SPWP.
- “workers” means any person working in an elementary occupation on a SPWP.
- “elementary *occupation*” means any occupation involving unskilled or semi-skilled work.
- “management” means any person employed by a department or implementing agency to administer or execute an SPWP.
- “task” means a fixed quantity of work.
- “*task-based work*” means work in which a worker is paid a fixed rate for performing a task.
- “*task-rated worker*” means a worker paid based on the number of tasks completed.
- “*time-rated worker*” means a worker paid based on the length of time worked.

PAA4.2 Terms of Work

- Workers on a SPWP are employed on a temporary basis.
- A worker may NOT be employed for longer than 24 months in any five-year cycle on a SPWP.
- Employment on a SPWP does not qualify as employment as a contributor for the purposes of the Unemployment Insurance ACT 30 of 1966.

PAA4.3 Normal Hours of Work

- An employer may not set tasks or hours of work that require a worker to work:
 - more than forty hours in any week.
 - on more than five days in any week; and
 - for more than eight hours on any day.
- An employer and worker may agree that a worker will work four days per week. The worker may then work up to ten hours per day.
- A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks allocated (based on a 40-hour week) to that worker.

PAA4.4 Meal Breaks

- A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.
- An employer and worker may agree on longer meal breaks.
- A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.
- A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

PAA4.5 Special Conditions for Security Guards

- A security guard may work up to 55 hours per week and up to eleven hours per day.
- A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

PAA4.6 Daily Rest Period

Every worker is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

PAA4.7 Weekly Rest Period

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

PAA4.8 Work on Sundays and Public Holidays

- A worker may only work on a Sunday or public holiday to perform emergency or security work.
- Work on Sundays is paid at the ordinary rate of pay.
- A task-rated worker who works on a public holiday must be paid:
 - The worker's daily task rate, if the worker works for less than four hours.
 - double the worker's daily task rate, if the worker works for more than four hours.
- A time-rated worker who works on public holiday must be paid:
 - the worker's daily rate of pay, if the worker works for less than four hours on the public holiday.
 - double the worker's daily rate of pay, if the worker works of more than four hours on the public holiday.

PAA4.9 Sick Leave

- Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.
- A worker who is unable to work on account of illness or injury is entitled to claim one day's sick leave for every full month that the worker has worked in terms of a contract.
- A worker may accumulate a maximum of twelve days' sick leave in a year.
- Accumulated sick-leave may not be transferred from one contract to another contract.
- An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.
- An employer must pay a time-rated worker the worker's daily rate for a day's sick leave.
- An employer must pay a worker sick pay on the worker's usual payday.

- Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is:
 - absent from work for more than two consecutive days; or
 - absent from work on more than two occasions in any eight-week period.
- A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.
- A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Disease Act.

PAA4.10 Maternity Leave

- A worker may take up to four consecutive month's unpaid maternity leave.
- A worker is not entitled to any payment or employment-related benefits during maternity leave.
- A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.
- A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.
- A worker may begin maternity leave:
 - four weeks before the expected date of birth; or
 - on an earlier date:
 - if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or
 - if agreed to between employer and worker; or
 - on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.
- A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.
- A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the SPWP on which she was employed has ended.

PAA4.11 Family Responsibility Leave

- Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances:
 - when the employee's child is born;
 - when the employee's child is sick;
 - in the event of a death of:
 - the employee's spouse or life partner;
 - the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

PAA4.12 Statement of Conditions

- An employer must give a worker a statement containing the following details at the start of employment
 - the employer's name and address and the name of the SPWP;
 - the tasks or job that the worker is to perform; and
 - the period for which the worker is hired or, if this is not certain, the expected duration of the contract;
 - the worker's rate of pay and how this is to be calculated;
 - the training that the worker will receive during the SPWP.
- An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.
- An employer must supply each worker with a copy of these conditions of employment.

PAA4.13 Keeping Records

- Every employer must keep a written record of at least the following:
 - the worker's name and position;
 - in the case of a task-rated worker, the number of tasks completed by the worker;
 - in the case of a time-rated worker, the time worked by the worker;
 - payments made to each worker.
- The employer must keep this record for a period of at least three years after the completion of the SPWP.

PAA4.14 Payment

- An employer must pay all wages at least monthly in cash or by cheque or into a bank account.
- A task-rated worker will only be paid for tasks that have been completed.
- An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

- A time-rated worker will be paid at the end of each month.
- Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.
- Payment in cash or by cheque must take place:
 - at the workplace or at a place agreed to by the worker;
 - during the worker's working hours or within fifteen minutes of the start or finish of work;
 - in a sealed envelope which becomes the property of the worker.
- An employer must give a worker the following information in writing:
 - the period for which payment is made;
 - the numbers of tasks completed or hours worked;
 - the worker's earnings;
 - any money deducted from the payment;
 - the actual amount paid to the worker.
- If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.
- If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

PAA4.15 Deductions

- An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.
- An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.
- An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.
- An employer may not require or allow a worker to:
 - repay any payment except an overpayment previously made by the employer by mistake;
 - state that the worker received a greater amount of money than the employer actually paid to the worker; or
 - pay the employer or any other person for having been employed.

PAA4.16 Health and Safety

- Employers must take all reasonable steps to ensure that the working environment is healthy and safe.
- A worker must:
 - work in a way that does not endanger his/her health and safety or that of any other person;
 - obey any health and safety instruction;
 - obey all health and safety rules of the SPWP;
 - use any personal protective equipment or clothing issued by the employer;
 - report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

PAA4.17 Compensation for Injuries and Diseases

- It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on a SPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.
- A worker must report any work-related injury or occupational disease to their employer or manager.
- The employer must report the accident or disease to the Compensation Commissioner.
- An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

PAA4.18 Termination

- The employer may terminate the employment of a worker for good cause after following a fair procedure.
- A worker will not receive severance pay on termination.
- A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the manager the employer in advance to allow the employer to find a replacement.
- A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available of the balance for the 24-month period.
- A worker who does not attend required training events, without good reason will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

PAA4.18 Certificate of Service

- On the termination of employment, a worker is entitled to a certificate stating:
 - the worker's full name.
 - the name and address of the employer.
 - the SPWP on which the worker worked.
 - the work performed by the worker.
 - any training received by the worker as part of the SPWP.
 - the period for which the worker worked on the SPWP.
 - any other information agreed on by the employer and worker.

PA TO PV: BUILDING WORKS

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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 approve 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 25 mm and 20 mm, 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 1,20 m. 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 100 mm above ground level, the next 5 strands shall be fixed 100 mm apart with the remaining top strands being 120 mm 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 allege 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 oudklip, 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. Gum-poles 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 1200 G.

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 BLOCK 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 ASBESTOS CEMENT ROOFING

Corrugated asbestos 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 asbestos 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 a 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 ASBESTOS CEMENT CELLULOSE SHEETS

Asbestos 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 arris-rounded 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 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).

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 (vinyl asbestos) 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 inter-changeable 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 V-joints 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 V-joints 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 half-hard 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, weltd 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, weltd 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

Asbestos 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.

Asbestos 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) asbestos 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

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 asbestos cement pressure bends conforming in all respects to the straight asbestos 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 manufacturers instructions regarding the laying and jointing of asbestos 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 0112-1971 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 manufacture'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 of 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.

PW: ELECTRICAL SPECIFICATIONS

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.

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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 minisub 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.

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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.

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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.

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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

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.

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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.

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.

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.

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.

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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.

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.

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.

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The gland plates shall be in 250/300mm lengths for ease of removal and shall be bonded to the main earth bar using minimum 70mm² 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 minisub 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.

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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 minisub. The equipment itself shall only be provided if called for elsewhere in this Part.

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.

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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.

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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).

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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.

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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 AASHO 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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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 AC1 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.

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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.

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- 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 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

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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 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

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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.

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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

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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

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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.

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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 jointer 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.

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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 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.

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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-substations and kiosks, neoprene waterproofing shrouds are to be fitted over all glands.

Where cable connections from mini-substations 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**	
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 luminaires 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.

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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.

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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.

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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.

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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.

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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

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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.

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"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.

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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.

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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.

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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.

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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.

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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 3500K white tubes, unless otherwise specified.

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.

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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.

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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.

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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.

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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

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.

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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.

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 draw-through applications with spray coolers or sprayed coils.

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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.)

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.

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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.

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. FILTERS

General

Filters shall be of the type, size and quantity as specified in the Supplementary Specification.

Primary Filters

Primary Filters shall be of the washable panel type with an efficiency of 30 - 35% on the ASHRAE 52-76-test standard and an average dust arrestance rating of 92%. (Type F4)

The approach velocity shall not exceed 2,5 m/sec.

Panel filters shall be of the pleated type and not less than 50mm thick. The filter shall be washable, or disposable as specified. Synthetic media shall be used bounded together with galvanised wire for reinforcing and bonded in the frame ensuring no air bypass. The frame shall be galvanised steel or a distortion and corrosion free moulding.

The Secondary Filters

The secondary filters shall be of the compact type F9 with an efficiency of 90% on the ASHRAE 52.1-1992 test standard and an average dust arrestance rating of 98%.

Filter housing units shall be proprietary brand, flanged and mounted after the supply air fan. Access shall be side or bottom withdrawal, depending on the plant layout. The housing shall be equipped with an adequate mechanism to provide a positive filter to casing and filter-to-filter seal.

Construction and manufacture of all components shall be such that under no circumstances any un-filtered air can by-pass filters or filter banks.

Sufficient space shall be allowed in front or behind filters, as applicable, to enable inspection and servicing. The approach velocity shall not exceed 2,5 m/sec.

Spare Filters

One complete set of spare filter cells is to be supplied to the client prior to acceptance of the plant.

Manometers

An inclined manometer is to be fitted on the outside of the air-handling unit where secondary or HEPA filters are used. A separate manometer shall be fitted for each filter stage (except primary filters).

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42. DUCTING

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.

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.

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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.

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.

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'.

Exposed Ducts

Ductwork exposed to the weather shall not be less than 1mm material thickness and shall be painted to an approved colour.

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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.

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.

43. ROOM AIRCONDITIONING UNIT

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.

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.

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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.

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)

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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.

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.

44. 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.

45. DRAWINGS

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.

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.

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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.

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.

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.

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46. 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.

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47. 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.

48. 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.

49. 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, mini-sub, 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

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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

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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.

50. 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

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51. 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.

C3.5: MANAGEMENT

C3.5.1 MANAGEMENT OF THE WORKS

C3.5.1.1 Applicable SANS and SABS standards

The SABS 1200 Standardised Specification listed in C3.4.1.1 are applicable

C3.5.1.2 Particular or Generic specifications

The following SABS 1200 Standardised Specifications for civil engineering construction are applicable:

- i) SABS 1200 A : General
- ii) SABS 1200 AB : Engineer's office

The provisions of SABS 1200 A and SANS 1200 AB take precedent over the provisions of any part of SANS 2001 that is applicable to the Contract. The variations and additions to these specifications are described in section C3.4 (applicable SABS 1200 standardised specifications)

C3.5.1.3 Planning and programming

Clause 5.6 of the Conditions of Contract requires the Contractor to submit a programme for the execution of the works. In addition to the requirements of Clause 5.6, the format and information shown shall comply to the following.

The Contractor shall submit his programme in a bar chart format showing clearly the following:

- The various stages of work planned to be completed per week in sufficient detail to be able to assess construction progress.
- Critical path activities and their dependencies.
- Key dates in respect of information to be provided by the Engineer and / or others.
- Anticipated value of work to be done during each month.
- His labour resources schedule which must distinguish between the Contractor's permanent labour and his temporary local labour employment.
- The lead time for training of local labour.

When drawing up his programme, the Contractor shall, among other issues, take into consideration and make allowance for:

- Expected weather conditions and their effects.
- Known physical conditions or artificial obstructions.
- The requirements and effects of employing labour intensive construction methods.
- The accommodation and safeguarding of public access and traffic.
- The lead time required for compliance with the Health and Safety Specification.

Failure to produce a detailed programme may prejudice the Contractor in any claim for an extension of time.

The contractor is to submit labour employment reports timeously, non-compliance may result in payments not being made.

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 on or before the Completion Date, 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 Engineer to take steps as set out in Clause 9.2 of the Conditions of Contract.

The approval of a programme by the Engineer shall have no contractual significance other than the Engineer will be satisfied if the work is carried out according to the programme. The said approval shall not limit the right of the Engineer to instruct the Contractor to vary the programme if necessary.

C3.5.1.4 Environment

a) 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.

b) Environmental Impact

The Contractor shall, for the duration of the Contract, ensure that good housekeeping practices are adhered to by all his staff and that of his subcontractors.

C3.5.1.5 Format of Site Communications

A Site Book in triplicate will be provided by the Contractor in which relevant matters shall be recorded and signed by the Engineer, or his representative and the Site Agent.

All prices for Variations and related correspondence from the Contractor shall be submitted directly to the Engineer's Port Elizabeth Office.

C3.5.1.6 Key personnel

A schedule of the Contractors key personnel and their contact particulars shall be submitted to the Engineer for approval in terms of within 14 days of the Commencement Date.

C3.5.1.7 Management meetings

The Engineer, Contractor's designated representative and other Agents/Consultants as required shall hold meetings related to the progress of the works, technical issues and sub-contractor co-ordination matters at regular intervals not exceeding every 4 weeks, or at such other times as may be necessary. The representatives of the Contractor, Employer and Engineer, and their delegated authority will be confirmed at the Inaugural Site Meeting.

The Contractor shall attend all site meetings and ensure that all persons under his jurisdiction are notified timeously of all site meetings should their attendance be required. All persons attending site meetings are to have the necessary delegated authority in respect of aspects such as planning, change management, and health and safety.

C3.5.1.8 Daily records

The Contractor shall keep the site diary up to date which will be kept on site. A complete record of staff employed on the Contract is to be kept on site for use by the Engineer.

The site diary shall record the following site information:

- progress of the works
- contractor's and subcontractor's personnel on site
- delays, possible delays and inclement weather
- delivery of materials to site
- plant & equipment on site

The Contractor shall erect an effective rainfall gauge on the site of the works and record the daily rainfall figures in the site diary. The site diary shall be handed to the employer's representative for his signature no later than 10 days after rain that is considered to justify an extension of time occurs.

Extension of time due to abnormal rainfall shall be determined by as defined and described in the Contract Data.

C3.5.1.9 Bonds and guarantees

One original guarantee will be submitted by the Contractor which will be retained by the Employer.

C3.5.1.10 Payment certificates

The Contractor shall agree the monthly certificates with the Engineers Representative before the 20th of each month. Once agreed, the Contractor is to submit a signed payment statement to the Engineer for certification. After completion of the Payment Certificate by the Engineer, the Contractor will be requested to submit his invoice dated as per the Engineer's date of certification.

C3.5.1.11 Employers Requirement

The contractor shall provide a method statement to the Engineer before the commencement of any work, setting out the proposed procedure and the proposed maximum length of the stoppage required to complete the refurbishment of each pumpstation.

C3.5.1.12 Control Testing

The Contractor is required to carry out his own control testing. The Contractor shall make arrangements with a soils testing laboratory to undertake the following tests and to pass the test results to the Engineer. The costs of such tests shall be included in the rates tendered for the appropriate item in the Schedule of Quantities.

Any additional tests requested by the Contractor or any retests required, due to failure of the initial tests, will be charged to the Contractor at the rates ruling at the time.

C3.5.1.13 Protection of the Works against Flooding

The Contractor shall provide sumps, pumps, furrows, berms and/or coffer dams to divert water flow away from the construction activities; and other temporary works as may be necessary to minimise damage, inconvenience or interference, for 24 hours a day, 7 days a week throughout the period of Construction, to adequately protect the works from flooding and damage by stormwater.

The programme submitted by the Contractor must include an item and information regarding the dealing with water.

C3.5.1.14 Bonds and guarantees

The Guarantee will be kept by the Kouga Municipality for safekeeping for the duration of the contract. Originals will be returned to the guarantor on completion.

C3.5.1.15 Proof of compliance with the law

Refer to clause 4.3.1 of the Contract Data

C3.6: HEALTH AND SAFETY

C3.6 HEALTH AND SAFETY: GENERAL REQUIREMENTS & PROCEDURES

C3.6.1 Health and safety requirements and procedures

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 Engineer 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 Engineer, of such investigation, complaint or criminal charge.
- (vi) The Contractor shall furthermore, in compliance with Constructional Regulations 2014 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 health and safety plan as contemplated in regulation 7(1) 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 Engineer, 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 C3.3 : Construction, the Bill of Quantities, the Drawings, and in the Employers' health and safety specification (regulation 4(1) of the Construction Regulations 2014), which is attached as Appendix B.

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.

As per Clause 4(1)(a) of the Construction Regulations (2014) a Health and Safety Specification is included in this contract. The Contractor will take the requirements of this specification into account during the tendering and execution of the works.

Furthermore, any reference to the "Machinery and Occupational Safety Act" in any specification shall be replaced with reference to the "Occupational Health and Safety Act, 1993".

C3.6.2 General Safety

The Contractor shall be the responsible party on site to ensure that the provisions of the Occupational Health and Safety Act, 1993 and the Construction Regulations, 2003 (Notice No R 1010, dated 18 July 2003) are strictly adhered to and administered for the duration of the Contract. The Kouga Municipality will not be held liable for safety on site

C3.6.3 Protection of the Public

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

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.

C3.6.4 Barricades and lighting

The Contractor shall ensure that all the necessary steps are taken to ensure the security, protection, and safety of the public, employees of the contractor and others.

C3.6.5 Measures against disease and epidemics

Medical surveillance shall be required for all workers. Anti tetanus toxoid vaccinations will be required.

C3.6.6 Aids awareness

The following are minimum requirements to be provided by the Contractor.

- Monthly talks on HIV and Aids.
- Company policy on HIV and Aids.
- Provide condoms.
- Voluntary counselling and testing (VCT's)