



KOUGA MUNICIPALITY

DIRECTORATE TECHNICAL SERVICES

DESCRIPTION OF CONTRACT

CONSTRUCTION OF KRUISFONTEIN WESTERN OUTFALL SEWER AND ASSOCIATED WORKS

CONTRACT NO:

TENDERER		
TELEPHONE / FACSIMILE		
CLOSING DATE		
SUPER-JOB NO.		

APRIL 2014

ISSUED BY:

Kouga Municipality
Directorate Technical Services

Contact Person: Mr A Perils
Tel: 042 200 2236
e-mail: aperils@kouga.gov.za

PREPARED BY:

Uhambiso Consult (Pty) Ltd,
Consulting Engineers and Project Managers

Contact Person: Mr E Kriel
Tel: 041 373 0180
e-mail: ekriel@uhambiso.co.za

BID NOTICE



KOUGA LOCAL MUNICIPALITY (EC108)

DIRECTORATE: INFRASTRUCTURE, PLANNING AND DEVELOPMENT / DEPARTMENT: MIG

NOTICE 65/2014

CONSTRUCTION OF KRUISFONTEIN WESTERN OUTFALL SEWER AND ASSOCIATED WORKS

The Kouga Municipality invites tenders for the Construction of Kruisfontein Western Outfall Sewer and Associated Works.

A compulsory clarification meeting will be held on **Tuesday 20th May 2014** at the Municipal Offices, 42 Heugh Street, Humansdorp at **10:00**. An attendance register will be circulated and any contractor that submits a tender without having attended the clarification meeting will not be considered. Please note that no attendee arriving 15 minutes late or more will be allowed to attend the clarification meeting. No tender document will be available at the Compulsory clarification meeting.

Tenders

Tender Document will be available as from Wednesday 14th May 2014 on the Municipal Website on www.kouga.gov.za or on request.

Please note:

- Failure to complete all supplementary/requested information will result in the tender being deemed null and void.
- Telegraphic, telephonic, telex, facsimile, email or late tenders will not be accepted.
- This contract will be evaluated using the 90/10 point scoring system.
- **A CIDB Contractor grading of 6CE or higher is required.**
- Prospective Service Providers must submit a valid original SARS Tax Clearance Certificate with their tender in order to be considered.
- Prospective Service Providers must register on Kouga Municipality's Supplier database as per requirements of registration.
- In order to claim Preference points a valid original or certified B-BBEE Status level Verification certificate from an **SANAS** registered verification agency or a

registered auditor approved by the Independent Regulatory Board of Auditors (IRBA) must be submitted to validate the claim, **No B-BBEE Status Level Verification Certificate- No points to be claimed.**

- 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.
- **It is the Service Provider's responsibility to ensure that their bid is deposited in the correct tender box. No bid document delivered at any other venue or tender box than the mentioned one will be considered.**

Any information regarding this tender can be obtained from Mr. E. Kriel at 041 373 0180, Fax no. 041 373 0102 or email ekriel@uhambiso.co.za The Municipal Official responsible for this tender is Mr. A. Perils at 042 2002236 or aperils@kouga.gov.za

Completed tenders in a sealed envelope endorsed "**NOTICE NO: 65/2014: CONSTRUCTION OF KRUISFONTEIN WESTERN OUTFALL SEWER AND ASSOCIATED WORKS**", must be placed in the Tender Box **in the foyer of the Municipal Offices** at 33 Da Gama Road, Jeffreys Bay before **WEDNESDAY, 28 MAY 2014 at 12:00.**

S.S. FADI
MUNICIPAL MANAGER

P.O. Box 21
JEFFREYS BAY
6330

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T1 TENDERING PROCEDURES

T1.1 TENDER NOTICE AND INVITATION TO TENDER

KOUGA LOCAL MUNICIPALITY (EC108)

DIRECTORATE: INFRASTRUCTURE, PLANNING AND DEVELOPMENT / DEPARTMENT: MIG

NOTICE 65/2014

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- 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.
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MUNICIPAL MANAGER

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6330

T1.2 TENDER DATA

The Conditions of Tender are the Standard Conditions of Tender as contained in Annexure F of the Construction Industry Development Board's revised Standard for Uniformity in Construction Procurement promulgated in Government Gazette No. 33239 dated 28 May 2010. (Refer www.cidb.org.za)

The Standard Conditions of Tender make several references to the Tender Data. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

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

No	Clause	Wording
1	F.1.1	The Employer is THE KOUGA MUNICIPALITY
2	F.1.2	The tender documents issued by the Employer comprise: <u>THE TENDER</u> 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 <u>THE CONTRACT</u> PART C1: AGREEMENTS AND CONTRACT DATA C1.1: Form of Offer and Acceptance C1.2: Contract Data PART C2 : PRICING DATA C2.1: Pricing Data C2.2: Bill of Quantities PART C3 : SCOPE OF WORKS C3: Scope of Work PART C4 : SITE INFORMATION C4: Site Information
3	F.1.4	The Employer's agent is: Name: <i>Uhambiso Consult (Pty)Ltd</i> Address: No 131 Prospect Road, Walmer, Port Elizabeth Postal Address: PO Box 5632 Walmer 6065 Tel: 041 373 0180 Fax: 041 373 0102 Contact Person: Mr E Kriel E-mail: accounts@uhambiso.co.za

No	Clause	Wording
4	F.2.1	Only those tenderers who satisfy the following eligibility criteria are eligible to submit tenders : a) Availability of resources. b) Capacity to mobilize own and subcontracting resources. c) Availability of skills to manage and perform the contract (assigned personnel) d) Quality achievements on previous contracts of a similar nature.
5	F.2.1	Only those tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, in a contractor grading designation of 6CE are eligible to submit tenders. Joint ventures are eligible to submit tenders provided that: 1. every member of the Joint Venture is registered with the CIDB; 2. the lead partner has a contractor grading designation in the CE class of construction work; and 3 the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation of 6CE or higher who satisfy the criteria stated in the Tender Data, are eligible to submit tenders.
6	F.2.2	Add the following to this Clause: “Accept that the Employer will not compensate the tenderer for any costs incurred in attending tender interviews in the office of the Employer or the Employer’s agent.”
7	F.2.3	Delete the wording “... and notify the employer of any discrepancy ...” and replace with: “.....and notify the employer’s agent of any discrepancy.....”
8	F.2.7	The arrangements for a compulsory tender clarification meeting are: Location: Municipal Office Humansdorp, 42 Heugh Street, Humansdorp Date: Tuesday 20 th May 2014 Starting time: 10h00 Prospective Tenderers are advised to purchase tender documents ahead of the Compulsory Clarification Meeting as NO Tender documents will be available at the Clarification Meeting. Tenderers must sign and complete the attendance register in the name of the tendering entity.
9	F.2.11	Add the following to this Clause: “In order to correct any errors, or to make alterations, or in the event of a mistake having been made in the Pricing Data, it shall be neatly crossed out in non-erasable ink and all signatories to the tender offer shall initial all such alterations.”
10	F.2.12	Alternative offers will be not be considered
11	F.2.13.1 & F.2.12.3	The original completed tender document (refer Clause F.1.2), excluding Drawings, shall be returned with all the required information supplied, duly completed in non-erasable ink in all aspects. The tender offer shall be submitted complete with one copy of Part 2 of the Tender Portion as well as Part 1 and Part 2 of the Contract Portion.
12	F.2.13.4	Add the following to this Clause:

No	Clause	Wording
		“Only authorised signatories may sign the original and all copies of the tender offer where required in terms of F.2.13.3. In the case of a One-Person Concern submitting a tender, this shall be clearly stated. In case of a Company submitting a tender, include a copy of a resolution by its board of directors authorising a director or other official of the company to sign the documents on behalf of the company. In the case of a Close Corporation submitting a tender, include a copy of a resolution by its members authorising a member or other official of the corporation to sign the documents on each member’s behalf. In the case of a Partnership submitting a tender, all the partners shall sign the documents, unless one partner or a group of partners has been authorised to sign on behalf of each partner, in which case proof of such authorisation shall be included in the Tender. In the case of a Joint Venture / Consortium submitting a tender, include a resolution of each company of the Joint Venture / Consortium together with a resolution by its members authorising a member of the Joint Venture / Consortium to sign the documents on behalf of the Joint Venture / Consortium. Accept that failure to submit proof of authorisation to sign the tender shall result in a tender offer being regarded as non-responsive.”
13	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: Location of tender box: Foyer of the Municipal Offices Kouga Municipality 33 Da Gama Road Jeffrey’s Bay Postal address: Kouga Municipality 33 Da Gama Road Jeffrey’s Bay Identification details: Notice 65/2014: Construction of Kruisfontein Western Outfall Sewer and Associated Works.
14	F.2.13.6	A two-envelope procedure will not be followed.
15	F.2.15	The closing date and time as well as the specified address and location of the tender box for submission of tender offers are stated in the Tender Notice and Invitation to Tender.
16	F.2.13.9	Telephonic, telegraphic, telex, facsimile, e-mailed, posted and late tender offers will not be accepted
17	F.2.14	Add the following to this Clause: “Accept that the employer shall in the evaluation of tenders take due account of the tenderer’s past performance in executing similar works of comparable magnitude and the degree to which the tenderer possesses the necessary technical, financial and other resources to enable him to complete the works successfully within the contract period. Satisfy the employer and engineer as to his ability to perform and complete the works

No	Clause	Wording
		timeously, safely and with satisfactory quality, by furnishing details under Part 2 – Returnable Documents of the Tender Portion. Accept that the employer is restricted in accordance with Regulation 4.(4) of the Constructions Regulations (2003), to only appoint a contractor who he is satisfied has the necessary competencies and resources to carry out the work safely. Accept that submitting inferior and inadequate information relating to health and safety, as required under Clause F.2.23, shall be regarded as justifiable and compelling reasons not to award a contract to a tenderer.”
18	F.2.16	The tender offer validity period is 120 (one hundred and twenty) days.
19	F.2.18.3	Add the following new Clause: “The tenderer shall, when requested by the employer to do so, submit details of all management and supervisory staff that will be employed to manage and supervise the works, including the labour intensive portion of the works, together with satisfactory evidence that such staff members satisfy the eligibility requirements as required under Part 3 of the Contract Portion.”
20	F.2.19	Access shall be provided by the Tenderer to his premises during working hours for inspections, tests and analysis.
21	F.2.22	Return all retained tender documents within twenty eight (28) days after the expiry of the validity period.
22	F.2.23	The tenderer is required to submit with his tender all the documents, schedules and certificates as listed under Part 2 of the Tender Portion.
23	F.2.24	Add the following new Clause: “Accept that no tenderer shall make any attempt, either directly or indirectly, to canvass any of the employer’s officials or the employer’s agent in respect of his tender, after the opening of the tenders but prior to the employer arriving at a decision thereon. No tenderer shall make any attempt to obtain particulars of any relevant information, other than that disclosed at the opening of tenders.”
24	F.2.25	Add the following new Clause: “Accept that the employer is prohibited to award a tender to a person: a) who is in the service of the state; or b) if that person is not a natural person, of which any director, manager, principal shareholder or stakeholder is a person in the service of the state; or c) a person who is an advisor or consultant contracted with the municipality or municipal entity. In the service of the state” means to be: a) a member of: • any municipal council; • any provincial legislature; or • the National Assembly or the National Council of Provinces; b) a member of the board of directors of any municipal entity; c) an official of any municipality or municipal entity; d) an employee of any national or provincial department; e) provincial public entity or constitutional institution within the meaning of the Public

No	Clause	Wording
		Finance Management Act, 1999 (Act No 1 of 1999); f) a member of the accounting authority of any national or provincial public entity; or g) an employee of Parliament or a provincial legislature. In order to give effect to the above, the questionnaire for the declaration of interests in the tender for persons in service of state under Part 2 of the Tender Portion must be completed.” ie. a valid certified B-BBEE Status Level Certificate to be submitted.
25	F.2.26	Add the following new Clause: “Accept that the notes to the employer’s annual financial statements must disclose particulars of any award of more than R 2 000 to a person who is a spouse, child or parent of a person in the service of the state (refer definition under Clause F.2.25), or has been in the service of the state in the previous twelve months, including: a) the name of that person; b) the capacity in which that person is / was in the service of the state; and c) the amount of the award. In order to give effect to the above, the questionnaire for the declaration of interest in the tender of persons in service of state under Part 2 of the Tender Portion must be completed in full and signed.”
26	F.2.28	Add the following new Clause: “Municipal Clearance Billing Certificate Accept that no contract will be awarded to a tenderer who is in arrears for more than three months (or who fails to make suitable arrangements to settle the arrears) in respect of municipal rates and other charges due any municipality. Should the tender amount be more than R 10 million, the period for arrears reduces to one month.”
27	F.3.1.1	Amend the wording “five working days” to read “seven working days.” Working days shall be as per a normal working week, Monday to Friday between the hours of 08h00 and 17h00 and shall exclude all gazetted public holidays as well as the year-end break as defined by SAFCEC.
28	F.3.2	Amend the wording “three days” to read “three working days.”
29	F.3.4.1	The time and place for the opening of valid tender submissions are stated in the Tender Notice and Invitation to Tender.
30	F.3.5	A two-envelope procedure will not be followed.
31	F.3.11.1	Tenders will be evaluated in terms of the Tender Data as well as the Kouga Local Municipality’s latest Supply Chain Management Policy. The method for the evaluation of responsive tenders shall be Method 2: Financial Offer and Preference as described under Clause F.3.11.3.
32	F.3.11.7	The financial offer shall be scored using Formula 2, Option 1 within Table F.1 with the value of W1 = 90.
33	F.3.11.8	Up to 100 minus W1 tender evaluation points will be awarded to tenderers on the basis of the data supplied under Part 2 – Returnable Documents of the Tender Portion. Tender evaluation points will be awarded to responsive tenderers who complete the Preferencing Form MBD 6: Preference Points Claim Form in terms of the Preferential Procurement Regulations 2001 who are found to be eligible for the preference

No	Clause	Wording																				
		claimed. Preference points shall be scored in accordance with the Department: National Treasury’s Revised Preferential Procurement Regulations and the Broad-based Black Economic Empowerment Act. Preference points will be awarded to a tenderer for attaining the B-BBEE Status Level of Contribution in accordance with the table below: <table><tr><th>B-BBEE Status Level of Contributor</th><th>Number of Points</th></tr><tr><td>1</td><td>10</td></tr><tr><td>2</td><td>9</td></tr><tr><td>3</td><td>8</td></tr><tr><td>4</td><td>5</td></tr><tr><td>5</td><td>4</td></tr><tr><td>6</td><td>3</td></tr><tr><td>7</td><td>2</td></tr><tr><td>8</td><td>1</td></tr><tr><td>Non-compliant Contributor</td><td>0</td></tr></table> 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. 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 tender.	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
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																					
34	F.3.13	Replace the entire contents and wording of Clauses F.3.13 e) and F.3.13 f) with the following: “e) complies with all legal requirements, f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest, g) submits an original valid Tax Clearance Certificate issued by the South African Revenue Services or has made arrangements to meet outstanding tax obligations and can provide proof thereof, h) submits a Letter of Intent from an approved insurer undertaking to provide the Performance Guarantee to the pro-forma format provided under Clause C1.3: Form of Guarantee of the Contract Data. i) is registered with and complies with the Construction Industry Development Board’s Regulations in an appropriate Contractor Grading Designation, j) or any of its directors / shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector, k) has not: (i) abused the employer’s Supply Chain Management System, or (ii) failed to perform on any previous contract and has been given a written notice to this effect, l) has completed the Compulsory Enterprise Questionnaire and there are no conflicts																				

No	Clause	Wording
		of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are not permitted to submit tenders or participate in the contract, m) is registered and in good standing with the compensation fund or with a licensed compensation insurer; n) has, in terms of the Construction Regulations (2003) and the Occupational Health and Safety Act (1993), the necessary competencies and resources to carry out the work safely, o) or any of its directors, partners or principals is not in arrears for more than 3 months with municipal rates and taxes and municipal service charges, p) has correctly completed and signed the Form of Offer and Acceptance."
35	F.3.17	The number of paper copies of the signed contract to be provided by the employer is one.

T2 RETURNABLE DOCUMENTS

T2.1 LIST OF 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 evaluating the tenders, some will form part of the subsequent contract, as they form the basis of the tender offer. For this reason, it is very important that tenderers return **all information requested**.

1.	RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES (included hereafter for completion)
T2.2.1	1A: Status of Concern Submitting Tender
T2.2.2	1B: Certificate Authority of Signature
T2.2.3	1C: Certificate of Attendance at Clarification Meeting
T2.2.4	1D: DECLARATION OF INTEREST IN TENDER OF PERSONS IN SERVICE OF STATE
T2.2.5	1E: Declaration of Interest in Tender of Persons in Service of State
T2.2.6	1F: DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES
T2.2.7	1G: Form MBD6: Preference points claim form in terms of the Preferential procurement Regulations 2001 (90/10 Version)
T2.2.8	1H: Schedule of Work satisfactorily carried out by the Tenderer for Private Clients of Organs of State (Organs of State include any Local, Provincial or National Government Authority)
T2.2.9	1I: Schedule of Contracts Awarded to Tenderer by Organs of State (Organs of State include any Local, Provincial or National Government Authority)
T2.2.10	1J: Company Information for Tenderers Greater than R 10 Million
T2.2.11	1K: Certificate of Independent Bid Determination
T2.2.12	1L: Proposed Amendments
2.	RETURNABLE DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES (to be attached with submission)
T2.2.13	2A: Tax Clearance Certificate
T2.2.14	2B: Municipal Billing Clearance Certificate
T2.2.15	2C: B-BBEE Status Level Certificates/Consolidated B-BBEE Scorecard
3.	RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT (to be attached with submission)
T2.2.16	3A: record of Addenda to Tender Documents
T2.2.17	3B: Personnel Schedule
T2.2.18	3C: Declaration Concerning Fulfilment of the Construction Regulations, 2003
T2.2.19	3D: Schedule of Construction Equipment
T2.2.20	3E: Schedule of Proposed Sub Contractors
4.	OTHER SCHEDULES AND DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT

(included hereafter for completion)	
C1.1	FORM OF OFFER AND ACCEPTANCE
C1.2	CONTRACT DATA
C2.2	ACTIVITY SCHEDULE/BILL OF QUANTITIES

T2.2 RETURNABLE SCHEDULES

T2.2.1 1A: STATUS OF CONCERN SUBMITTING TENDER

1. General

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

(Mark the appropriate option below)

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

2. Information To Be Provided

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: a) CIPRO CM 1 - Certificate of Incorporation b) CIPRO CM 29 – Contents of Register of Directors, Auditors and Officers c) Shareholders Certificates of all Members of the Company. No name change certificate or CM9 documentation will be accepted as sufficient proof of registration.
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.
4	<u>Public Company</u> 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.

If the Tendering Entity is a:		Documentation to be submitted with the tender
5	Sole Proprietary or a Partnership.	Copy of the Identity Document of: a) Such Sole Proprietary, or b) Each of the Partners in the Partnership Copy of the Partnership agreement. Sole Propriety or a Partnership-Certified identity document to be submitted
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.) Include *COR39* or documentation that reflects the directorship/shareholding of the entity for entities registered at CIPRO/CIPRA.

3. Registered For Vat Purposes In Terms Of The Value-Added Tax Act, (Act No. 89 of 1991)

(Make an X in the appropriate space below)

Yes	
No	

REGISTRATION NO:

T2.2.2 1B: CERTIFICATE AUTHORITY OF SIGNATURE

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

B.

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:

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

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

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 of 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:

7. *Delete which is not applicable

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

T2.2.3 1C: CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING

This is to certify that (Tenderer)
of.....
..... (address)
was represented by the person(s) named below at the compulsory meeting held for all tenderers at
..... (location) on (date), starting at

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

Particulars of person(s) attending the meeting :

Name		Signature
------	-------	-----------

Capacity	
----------	-------

Name		Signature
------	-------	-----------

Capacity	
----------	-------

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

Name		Signature
------	-------	-----------

Capacity		Date & Time
----------	-------	-------------

T2.2.4 1D: DECLARATION OF INTEREST IN TENDER OF PERSONS IN SERVICE OF STATE

THIS FORM MUST BE COMPLETED IN FULL AND SIGNED. FAILURE TO COMPLY WILL RESULT IN THE TENDER BEING DISQUALIFIED.

(Refer to Clauses F2.26 and F2.27 in the Tender Data)

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.

Yes	
No	

If so, state particulars:

.....

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

.....

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

If so, state particulars:

Yes	
No	

.....

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.

Yes	
No	

If so, state particulars:

.....

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

Yes	
No	

If so, state particulars:

.....

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

Yes	
No	

If so, 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

Tender

T2.2.5 1E: DECLARATION OF INTEREST IN TENDER OF PERSONS IN SERVICE OF STATE

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

Section 1: Name of enterprise:

Section 2: VAT registration number, if any:

Section 3: CIDB registration number, if any:

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

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

Section 5: Particulars of companies and close corporations

Company registration number

Close corporation number

Tax reference number

Section 6: Record of service of the state

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

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

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

Name of sole proprietor, partner, director, manager, principal shareholder or stakeholder	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

* Insert separate page if necessary

Section 7: Record of spouses, children and parents in the service of the state

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

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

Name of spouse, child or parent	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		current	Within last 12 months

* Insert separate page if necessary

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

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

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

T2.2.6 1F: DECLARATION OF TENDERER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

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

ITEM	QUESTION	RESPONSE Tick	
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)	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)	Yes	
		No	
If so, furnish particulars:			

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

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

T2.2.7 1G: FORM MBD6: PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2001 (90/10 VERSION)

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, 2011.

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 R1 000 000.00 (all applicable taxes included); and
- b) The 90/10 system for requirements with a Rand value above R1 000 000.00 (all applicable taxes included).

1.2 The value of this bid is estimated to exceed R1 000 000.00 and therefore the (90/10) 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	90
1.3.1.2 B-BBEE STATUS LEVEL OF CONTRIBUTION	<u>10</u>
Total points for Price and B-BBEE must not exceed	<u>100</u>

1. 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.
2. 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;
- C1.1.1 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

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)
1	10
2	9
3	8
4	5
5	4
6	3
7	2
8	1
Non-compliant contributor	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 10 or 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

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation

- ☐ Company
☐ (Pty) Limited
[TICK APPLICABLE BOX]

9.5 Describe principal business activities

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

9.6 Company classification

- ☐ Manufacturer
☐ Supplier
☐ Professional service provider
☐ Other service providers, e.g. transporter, etc.
[TICK APPLICABLE BOX]

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;
 - (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;
1. restrict the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent 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
2. forward the matter for criminal prosecution

..... SIGNATURE(S) OF BIDDER(S)

WITNESSES:

1.

2.

DATE:.....

ADDRESS:.....

.....

.....

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:

T2.2.8 1H: SCHEDULE OF WORK SATISFACTORILY CARRIED OUT BY THE TENDERER FOR PRIVATE CLIENTS OF 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 myself/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

T2.2.9 1I: SCHEDULE OF CONTRACTS AWARDED TO TENDERER BY ORGANS OF STATE (ORGANS OF STATE INCLUDE ANY LOCAL, PROVINCIAL OR NATIONAL GOVERNMENT AUTHORITY)

In terms of Clause 21(d)(iii) of the Supply Chain Management Policy, the tenderer shall list hereunder, particulars of contracts awarded to him by any Organ of State, during the past 5 years. Any material non-compliance or dispute concerning the execution of any of these contracts must be mentioned: Include only those contracts where the tenderer identified in the signature block below was directly contracted by the Employer. Tenderers must not include services provided in terms of a sub-contract agreement. Where contracts were awarded in the name of a joint venture and the tenderer formed part of that joint venture, indicate in the column entitled "Title of the contract for the service" that the contract was in joint venture and provide the name of the joint venture that contracted with the employer. In the column for the value of the contract for the service, record the value of the portion of the contract performed (or to be performed) by the tender.

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

T2.2.10 1J: COMPANY INFORMATION FOR TENDERERS GREATER THAN R 10 MILLION

1. The tenderer is required by law to prepare annual financial statements for auditing and is therefore requested to provide audited annual financial statements:

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

Indicate whether these have been included in the tender:

YES / NO

2. Does the tenderer have any undisputed commitments for Municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days?

YES / NO

If so, state particulars

.....

Has any contracts been awarded to the tenderer by an organ of state during the past five years?

YES / NO

If so, state particulars

.....

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

YES / NO

If so, state particulars

.....

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

YES / NO

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

.....

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

T2.2.11 1K: CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

.....
(Bid Number and Description)

in response to the invitation for the bid made by:

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

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

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

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
 - 6.
 - (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
7. 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.
8. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - (a) prices;
 - (b) geographical area where product or service will be rendered (market allocation)
 - (c) methods, factors or formulas used to calculate prices;
 - (d) the intention or decision to submit or not to submit, a bid;

- (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
- (f) bidding with the intention not to win the bid.

9. 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.**

10. 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.

11. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

Signed Date

Name Position

Tenderer

T2.2.12 1L: PROPOSED AMENDMENTS

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

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

PAGE	CLAUSE OR ITEM	PROPOSAL

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

T2.2.13 2A: TAX CLEARANCE CERTIFICATE

In terms of Clause 43 of the Municipal Supply Chain Management Policy, tenderers must ensure that they are up-to-date with their payments of latest taxes or last 3 (three) months.

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

The tenderer must attach to this page an original(s) of a valid Tax Clearance Certificate(s).

Note:

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

T2.2.14 2B: MUNICIPAL BILLING CLEARANCE CERTIFICATE

In terms of Clause 38 of the Municipal Supply Chain Management Policy, tenderers must ensure that they are up-to-date with their payments of municipal accounts latest or last three (3) months.

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

These certificates are obtainable from:

Kouga Local Municipality
33 Da Gama Road
Jeffrey's Bay

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

T2.2.15 2C: B-BBEE STATUS LEVEL CERTIFICATES/CONSOLIDATED B-BBEE SCORECARD

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

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

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

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

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

T2.2.16 3A: RECORD OF ADDENDA TO TENDER DOCUMENTS

We confirm that the following communications were received from the Employer 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

T2.2.17 3B: PERSONNEL SCHEDULE

Tenderer to insert number of personnel he proposes employing on this contract		
Job Description	Permanent Staff	Temporary staff from local community
Contract Manager		
Site Agent		
Quantity Surveyor		
Surveyor		
General Foreman		
Foreman		
Concrete Foreman		
Community Officer		
Clerk		
Operator		
Driver		
Bricklayer		
Learner Bricklayer		
Steel fixer		
Watchman		
Gang Boss		
Pipe Layer		
Labourer		
* Other		
* 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

T2.2.18 3C: DECLARATION CONCERNING FULFILMENT OF THE CONSTRUCTION REGULATIONS, 2003

In terms of regulation 4(3) of the Construction Regulations, 2003 (hereinafter referred to as the Regulations), promulgated on 18 July 2003 in terms of Section 43 of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) the Employer shall not appoint a contractor to perform construction work unless the Contractor can satisfy the Employer that his/her firm has the necessary competencies and resources to carry out the work safely and has allowed adequately in his/her tender for the due fulfilment of all the applicable requirements of the Act and the Regulations.

Tenderers shall answer the questions below:

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)**

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 (CVs to be attached):

.....

.....

.....

.....

.....

.....

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

5.

.....

.....

.....

.....

.....

.....

6. List potential key risks identified and measures for addressing risks:
7.

8. 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

YES	<i>(Tick)</i>
NO	

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

1. ID NO:
- (Name in Print):**
2. ID NO:
- (Name in Print):**

T2.2.19 3D: SCHEDULE OF CONSTRUCTION EQUIPMENT

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

(a) Details of major equipment that is owned by and immediately available for this contract.

Quantity	Description, Size, Capacity, etc

Attach additional pages if more space is required.

(b) Details of major equipment that will be hired, or acquired for this contract if my/our tender is acceptable.

Quantity	Description, Size, Capacity, etc

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

T2.2.20 3E: SCHEDULE OF PROPOSED SUB CONTRACTORS

We notify you that it is our intention to employ the following Subcontractors to work on this contract. If we are awarded a contract we agree that this notification does not change the requirement for us to submit the names of proposed Subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

No.	Name and Address of Proposed Subcontractor	Nature and Extent of Work	Previous Experience with Subcontractor
1.			
2.			
3.			
4.			
5.			
6.			
7.			

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 AGREEMENTS AND CONTRACT DATA

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:

CONSTRUCTION OF KRUISFONTEIN WESTERN OUTFALL SEWER AND ASSOCIATED WORKS

The tenderer, identified in the offer signature block, 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.

Signature(s)

Name(s)

Capacity

for the **Tenderer**

Name of Tenderer:

Address of Tenderer:

.....

Signature of witness

Date

2. ACCEPTANCE

By signing this part of this form of offer and acceptance, the employer identified below accepts the tenderer's offer. In consideration thereof, the employer shall pay the contractor the amount due in accordance with the conditions of contract identified in the contract data. Acceptance of the tenderer's offer shall form an agreement between the employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract are contained in

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

Part C2 : Pricing data

Part C3 : Scope of work

Part C4 : Site Information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

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

The tenderer shall, within two weeks after receiving a completed copy of this agreement including the schedule of deviation (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any bonds, guarantees, proof insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data. Failure to fulfil any of the obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the tenderer (now contractor), within five (5) 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.

Signature(s)

Name(s)

Capacity

for the Employer: **Kouga Municipality**
P O Box 21
Jeffreys Bay, 6330

Name and signature of witness.....

Date.....

3. SCHEDULE OF DEVIATIONS

Notes:

1. The extent of deviations from the tender documents issued by the employer before 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, 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 the tender schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

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

4. CONFIRMATION OR RECEIPT

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

the (day) of (month) 20 (year) at

..... (place)

For the Contractor:

.....
Signature

.....
Name

.....
Capacity

Signature and Name of Witness:

.....
Signature

.....
Name

C1.2 CONTRACT DATA

C1.2.1 CONDITIONS OF CONTRACT

The *General Conditions of Contract for Construction Works, Second Edition 2010*, published by the South African Institution of Civil Engineering, Private Bag x200, Halfway House 1685, is applicable to this Contract and is obtainable from www.saice.org.za.

C1.2.2 PART 1: DATA PROVIDED BY THE EMPLOYER

The following contract specific data are applicable to this Contract.

Clause	Item								
1.1.1.15 1.2.1.2	The Employer is the Kouga Municipality The Employer's address for receipt of communications is: Physical address: <table> <tr> <td>Kouga Municipality</td><td>P O Box 21</td></tr> <tr> <td>33 Da Gama Road</td><td>JEFFREYS BAY</td></tr> <tr> <td>JEFFREYS BAY</td><td>6330</td></tr> <tr> <td>6330</td><td></td></tr> </table> Tel: (042) 200 2236 Fax: (042) 086 529 7827 Or: Mr A Perils at Tel: 042 200 2236 e-mail: aperils@kouga.gov.za	Kouga Municipality	P O Box 21	33 Da Gama Road	JEFFREYS BAY	JEFFREYS BAY	6330	6330	
Kouga Municipality	P O Box 21								
33 Da Gama Road	JEFFREYS BAY								
JEFFREYS BAY	6330								
6330									
1.1.1.16 1.2.1.1	The Engineer is Uhambiso Consult (Pty) Ltd The Engineer's address for receipt of communications is: Physical address: 131 Prospect Road, Walmer, Port Elizabeth, 6070:Postal address: PO Box 5632, Walmer, Port Elizabeth, 6065. Telephone: (041) 373 0180 Fax: (041) 373 0102 e-mail: ekriel@uhambiso.co.za								
5.1.1.1	The non-working days are: Sundays. The special non-working days are: public holidays and the year-end break commencing and ending as per the dates published by SAFCEC.								
3.1.3	The Engineer is required in terms of his appointment with the Employer to obtain the following specific approvals from the Employer: - Certify additional costs/expenditure - Taking over of the Works - Determining extension of Time for Completion								
6.2	The Form of Guarantee is to be provided 14 days after acceptance of appointment.								
6.2	The amount of the Guarantee shall be 10% (Ten) percentage of the original Contract Price.								
5.3.1	The documentation required before commencement with Works execution are: Health and Safety Plan, Initial Programme, Security and Insurance.								
5.3.2	The time to submit the documentation required before commencement with Works execution is 14 days.								
8.6.1.1.2	The value of materials supplied by the Employer to be included in the insurance sum is NIL.								
8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is NIL.								
8.6.1.2	A Coupon Policy for Special Risks is to be issued.								

Clause	Item
8.6.1.3	The limit of the liability insurance is R5 000 000,00 for any single claim – the number of claims to be unlimited during the construction and Defects Liability period.
8.6	No additional insurances are required.
6.5.1.2.3	The percentage allowances to cover all charges for the Contractor's and subcontractor's profits, timekeeping, clerical work, insurance, establishment, superintendence and the use of hand tools is 10%, or as provided elsewhere.
5.5	The time for achieving Practical Completion of the whole of the Works is 20 (Twenty) Months.
5.13.1	The penalty for failing to complete the Works within the period specified in the contract is 0.01% of the contract value per day.
1.1.1.26	The Pricing Strategy is Re-measurement Contract.
6.8.2	The value of the certificates issued shall be paid in accordance with the rates submitted and the rates shall not be escalated. Price Adjustment Schedule with the following values: The value of “x” is 0.15 The values of the coefficients are : a = 0.20 Labour] b = 0.35 [Contractor’s equipment] c = 0.30 [Material] d = 0.15 [Fuel] The urban area nearest the site is Port Elizabeth. The base month is <i>the month prior to closing of the tender</i> Data for the Contract Price Adjustment Schedule “L” is the “<u>Labour Index</u>” and shall be the Consumer Price Index for the Eastern Cape where the Site is located and as published in the Consumer Price Index Statistical Release. P0141, Table A of Statistics South Africa. “P” is the “<u>Plant Index</u>” and shall be the Producer Price Index for Civil Engineering Plant – as published in the Statistical News Release P0142.1, Table 12 of Statistics South Africa. “M” is the “<u>Materials Index</u>” and shall be the Producer Price Index applicable to the Building and Construction - Civil Engineering industry as published in the Statistical News Release P0142.1 Table 11 of Statistics South Africa. “F” is the “<u>Fuel Index</u>” and shall be the Producer Price Index for Diesel at wholesale level for the Coast and Witwatersrand area as published in the Statistical News Release P0142.1, Table 12 of Statistics South Africa.
6.8.3	The following are special materials: Not applicable The basis for price adjustment for special materials is as follows: Not applicable
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is 80%.
6.10.3	The percentage retention on the amounts due to the Contractor is 10%.
6.10.3	The limit of retention money is 5% of Contract Price.
6.10.3	A Retention Money Guarantee is permitted.
1.1.1.13	The Defects Liability Period is twelve (12) calendar months.
10	Dispute resolution shall be as stipulated in Clause 10.

Clause	Item
Clauses applicable to EPWP Contracts	
2.6	Variations to the Conditions of Contract are: Add the following at the end of subclause 2.5.1: "2.6.1 The Employer and the Contractor hereby agree, in terms of the provisions of Section 37(2) of the Occupational Health and Safety Amendment Act, 1993 (Act 85 of 1993), hereinafter referred to as 'the Act', that the following arrangements and procedures shall apply between them to ensure compliance by the Contractor with the provisions of the Act: (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. 2.6.2 The Contractor shall furthermore, in compliance with Constructional Regulations 2003 to the Act: (i) Acquaint himself with the requirements of the Employer's health and safety specification as laid down in regulation 4(1)(a) of the Construction Regulation 2003, and prepare a suitably and sufficiently documented health and safety plan as contemplated in regulation 5(1) of the Construction Regulation 2003 for approval by the Employer or his assigned agent. The Contractor's health and safety plan and risk assessment shall be submitted to the Employer for approval within fourteen (14) days after receiving a completed copy of the Agreement and shall be implemented and maintained from the Commencement of the Works. (ii) The Employer, or his assigned agent, reserves the right to conduct periodic audits, as contemplated in the Construction Regulations 2003, to ensure that the Contractor is compliant in respect of his obligations. Failure by the Contractor to comply with the requirements of these Regulations shall entitle the Engineer, at the request of the Employer or his agent, to suspend all or any

Clause	Item
	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."
5.3.1	Add the following to subclause 5.3.1.1 after "... Commencement of the Works,": "Subject to the Contractor having an approved project specific health and safety plan in terms of the Occupational Health and Safety Act 1993: Construction Regulations 2003 and complied with the initial requirements thereof."
5.4.2	Add the following to subclause 5.4.2: "Subject to the Contractor having an approved project specific health and safety plan in terms of the Occupational Health and Safety Act 1993: Construction Regulations 2003 and complied with the initial requirements thereof,"
2.	Add new subclause 2.7: "Applicable labour laws 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 No R63 of 25 January 2002, as reproduced below, shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled or semi-skilled workers. 1 Introduction 1.1 This document 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. 1.2 In this document – (a) "department" means any department of the State, implementing agent or contractor; (b) "employer" means any department, implementing agency or contractor that hires workers to work in elementary occupations on a SPWP; (c) "worker" means any person working in an elementary occupation on a SPWP; (d) "elementary occupation" means any occupation involving unskilled or semi-skilled work; (e) "management" means any person employed by a department or implementing agency to administer or execute an SPWP; (f) "task" means a fixed quantity of work; (g) "task-based work" means work in which a worker is paid a fixed rate for performing a task; (h) "task-rated worker" means a worker paid on the basis of the number of tasks completed; (i) "time-rated worker" means a worker paid on the basis of the length of time worked. 2 Terms of work 2.1 Workers on a Special Public Works Programme (SPWP) are employed on a temporary basis.

Clause	Item
	2.2 A worker may NOT be employed for longer than 24 months in any five-year cycle on a SPWP. 2.3 Employment on a SPWP does not qualify as employment as a contributor for the purposes of the Unemployment Insurance Act 30 of 1966.
	3 Normal hours of work 3.1 An employer may not set tasks or hours of work that require a worker to work– (a) more than forty hours in any week; (b) on more than five days in any week; and (c) for more than eight hours on any day. 3.2 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. 3.3 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. 4 Meal breaks 4.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration. 4.2 An employer and worker may agree on longer meal breaks. 4.3 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 4.4 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.
	5 Special conditions for security guards 5.1 A security guard may work up to 55 hours per week and up to eleven hours per day. 5.2 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. 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. 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”). 8 Work on Sundays and public holidays 8.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.

Clause	Item
	8.2 Work on Sundays is paid at the ordinary rate of pay. 8.3 A task-rated worker who works on a public holiday must be paid – (a) the worker's daily task rate, if the worker works for less than four hours; (b) double the worker's daily task rate, if the worker works for more than four hours. 8.4 A time-rated worker who works on a public holiday must be paid – (a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday; (b) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday. 9 Sick leave 9.1 Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause. 9.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract. 9.3 A worker may accumulate a maximum of twelve days sick leave in a year. 9.4 Accumulated sick leave may not be transferred from one contract to another contract. 9.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave. 9.6 An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave. 9.7 An employer must pay a worker sick pay on the worker's usual payday. 9.8 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 – (a) absent from work for more than two consecutive days; or (b) absent from work on more than two occasions in any eight-week period.⁸ 9.9 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. 9.10A 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 Diseases Act. 10 Maternity leave 10.1 A worker may take up to four consecutive months unpaid maternity leave. 10.2 A worker is not entitled to any payment or employment-related benefits during maternity leave. 10.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work. 10.4 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. 10.5 A worker may begin maternity leave – (a) four weeks before the expected date of birth; or (b) on an earlier date –

Clause	Item
	(i) 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 (ii) if agreed to between employer and worker; or (c) 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. 10.6 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. 10.7 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. 11 Family responsibility leave 11.1 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: (a) when the employee's child is born; (b) when the employee's child is sick; (c) in the event of a death of (i) the employee's spouse or life partner; (ii) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling. 12 Statement of conditions 12.1 An employer must give a worker a statement containing the following details at the start of employment: (a) the employer's name and address and the name of the SPWP; (b) the tasks or job that the worker is to perform; and (c) the period for which the worker is hired or, if this is not certain, the expected duration of the contract; (d) the worker's rate of pay and how this is to be calculated; (e) The training that the worker will receive during the SPWP. 12.2 An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement. 12.3 An employer must supply each worker with a copy of these conditions of employment. 13 Keeping records 13.1 Every employer must keep a written record of at least the following: (a) the worker's name and position; (b) in the case of a task-rated worker, the number of tasks completed by the worker; (c) in the case of a time-rated worker, the time worked by the worker; (d) Payments made to each worker. 13.2 The employer must keep this record for a period of at least three years after the completion of the SPWP. 14 Payment 14.1 An employer must pay all wages at least monthly in cash or by cheque or into a bank account. 14.2 A task-rated worker will only be paid for tasks that have been completed.

Clause	Item
2.8	14.3 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. 14.4 A time-rated worker will be paid at the end of each month. 14.5 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker. 14.6 Payment in cash or by cheque must take place - (a) at the workplace or at a place agreed to by the worker; (b) during the worker's working hours or within fifteen minutes of the start or finish of work; (c) in a sealed envelope which becomes the property of the worker. 14.7 An employer must give a worker the following information in writing: (a) the period for which payment is made; (b) the numbers of tasks completed or hours worked; (c) the worker's earnings; (d) any money deducted from the payment; (e) The actual amount paid to the worker. 14.8 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. 14.9 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 15 Deductions 15.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law. 15.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay. 15.3 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. 15.4 An employer may not require or allow a worker to – (a) repay any payment except an overpayment previously made by the employer by mistake; (b) state that the worker received a greater amount of money than the employer actually paid to the worker; or (c) pay the employer or any other person for having been employed. 16 Health and safety 16.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe. 16.2 A worker must – (a) work in a way that does not endanger his/her health and safety or that of any other person; (b) obey any health and safety instruction; (c) obey all health and safety rules of the SPWP; (d) use any personal protective equipment or clothing issued by the employer; (e) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

Clause	Item
	17 Compensation for injuries and diseases 17.1 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. 17.2 A worker must report any work-related injury or occupational disease to their employer or manager. 17.3 The employer must report the accident or disease to the Compensation Commissioner. 17.4 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. 18 Termination 18.1 The employer may terminate the employment of a worker for good cause after following a fair procedure. 18.2 A worker will not receive severance pay on termination 18.3 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement. 18.4 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 for the balance of the 24-month period. 18.5 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. 19 Certificate of service 19.1 On termination of employment, a worker is entitled to a certificate stating- (a) the worker's full name; (b) the name and address of the employer; (c) the SPWP on which the worker worked; (d) the work performed by the worker; (e) any training received by the worker as part of the SPWP; (f) the period for which the worker worked on the SPWP; (g) any other information agreed on by the employer and worker." Add new subclause 2.8: "Payment for the labour-intensive component of the works Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the scope of work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict."

C1.2.3 PART 2: DATA PROVIDED BY THE CONTRACTOR

Clause	Item
1.1.1.8 1.1.1.9	The Contractor is The Contractor's address for receipt of communications is: Physical address: Postal Address: Telephone: Fax: E-mail:
1.1.1.14	The time for completing the works is 4 (Four) months.
6.10.1.5	The percentage allowances to cover all charges for the Contractor's and subcontractor's profits, timekeeping, clerical work, insurance, establishment, superintendence and the use of hand tools is%.
6.8.3	The rate for special materials, exclusive of value-added tax (VAT) are: Not applicable

OCCUPATIONAL HEALTH AND SAFETY

THIS AGREEMENT made between:

(hereinafter referred to as "the Employer") of the one part, herein represented by :

.....

in his capacity as

AND:

(hereinafter referred to as "the Mandatory") of the other part, herein represented by :

.....

in his capacity as

and being duly authorised to act as Mandatory on behalf of the Contractor;

WHEREAS the Employer is desirous that certain works be constructed, viz **Notice 65/20145:Construction of Kruisfontein Western Outfall Sewer and Associated Works**, has accepted a tender by the Mandatory for the construction, completion and defects correction of such works and whereas the Employer and the Mandatory have agreed to certain arrangements and procedures to be followed in order to ensure compliance by the Mandatory with the provisions of the Occupational Health and Safety Act 1993 (Act 85 of 1993);

NOW THEREFORE THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. The Mandatory shall execute the work in accordance with the contract documents pertaining to this Contract.
2. This Agreement shall hold good from its commencement date, which shall be the date on which the site is handed over to the Mandatory by an order in writing from the Engineer, to either:
 - (a) the date of the Final Approval Certificate issued in terms of clause 5.16 of the General Conditions of Contract 2010 (hereinafter referred to as "the GCC"), as applicable to this Contract, or
 - (b) the date of termination of the contract in terms of clause 9.1 of the GCC.
3. The Mandatory declares himself to be conversant with the following:
 - (a) All the requirements, regulations and standards of the Occupational Health and Safety Act (Act 85 of 1993), hereinafter referred to as "The Act", together with its amendments and with special reference to the following Sections of The Act:
 - (i) Section 8: General duties of employers to their employees;
 - (ii) Section 9: General duties of employers and self-employed persons to persons other than employees;
 - (iii) Section 37: Acts or omissions by employees or mandatories; and
 - (iv) Sub-section 37(2) relating to the purpose and meaning of this Agreement.
 - (b) The procedures and safety rules of the Employer as pertaining to the Mandatory and to all his subcontractors.

4. In addition to the requirements of Clause 6.3 of the General Conditions of Contract and all relevant requirements of the Contract, the Mandatory agrees to execute all the works forming part of this Contract and to operate and utilize all machinery, plant and equipment in accordance with the Act.
5. The Mandatory is responsible for the compliance with the Act by all his subcontractors, whether or not selected and/or approved by the Employer.
6. The Mandatory warrants that all his and his subcontractors' workmen are covered in terms of the Compensation for Occupational Injuries and Diseases Act, 1993 which cover shall remain in force whilst any such workmen are present on site. A letter of good standing from the Compensation Commissioner to this effect must be produced to the Employer upon signature of the agreement.
7. The Mandatory undertakes to ensure that he and/or subcontractors and/or their respective employers will at all times comply with the following conditions:
 - (a) The Mandatory shall assume the responsibility in terms of Section 16.1 of the Occupational Health and Safety Act. The Mandatory shall not delegate any duty in terms of Section 16.2 of this Act without the prior written approval of the Employer. If the Mandatory obtains such approval and delegates any duty in terms of section 16.2 a copy of such written delegation shall immediately be forwarded to the Employer.
 - (b) All incidents referred to in the Occupational Health and Safety Act shall be reported by the Mandatory to the Department of Labour as well as to the Employer. The Employer will further be provided with copies of all written documentation relating to any incident.
 - (c) The Employer hereby obtains an interest in the issue of any formal inquiry conducted in terms of section 32 of the Occupational Health and Safety Act into any incident involving the Mandatory and/or his employees and/or his subcontractors.

In witness thereof the parties hereto have set their signatures hereon in the presence of the subscribing witnesses:

At for and on behalf of the **EMPLOYER** on

this the day of 20.....

SIGNATURE:

CAPACITY:

WITNESSES:

SIGNATURES: (1)

(2).....

NAME: (1).....

(2)

At for and on behalf of the **MANDATORY** on this the

.....day of 20.....

SIGNATURE:

CAPACITY:

WITNESSES:

WITNESSES:

SIGNATURES: (1)

(2)

NAME: (1)

(2)

At for and on behalf of the **MANDATORY** on this the

.....day of 20.....

SIGNATURE:

CAPACITY:

CERTIFICATE OF AUTHORITY FOR SIGNATORY TO AGREEMENT IN TERMS OF OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT NO 85 OF 1993)

The signatory for the company that is the Contractor in terms of the above-mentioned Contract and the Mandatory in terms of the above-mentioned Act shall confirm his or her authority thereto by attaching to this page a duly signed and dated copy of the relevant resolution of the Board of Directors.

An example is given below:

"By resolution of the Board of Directors passed at a meeting held on the day of 20....., Mr/Ms whose signature appears below, has been duly authorised to sign the AGREEMENT in terms of THE OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 of 1993) on behalf of

.....
.....

SIGNED ON BEHALF OF THE COMPANY:

.....

IN HIS/HER CAPACITY AS:

.....

DATE:

SIGNATURE OF SIGNATORY:

WITNESS: 1.

2.

NAME (in capitals):

1.

2.

C2 PRICING DATA

C2.1 PRICING INSTRUCTIONS

1) The Conditions of Contract, the Contract Data, the Specifications (including the Project Specifications) and the Drawings shall be read in conjunction with the Bill of Quantities.

2) The Bill comprises items covering the Contractor's profit and costs of general liabilities and of the construction of Temporary and Permanent Works.

Although the Tenderer is at liberty to insert a rate of his own choosing for each item in the Bill, he should note the fact that the Contractor is entitled, under various circumstances, to payment for additional work carried out and that the Engineer is obliged to base his assessment of the rates to be paid for such additional work on the rates the Contractor inserted in the Bill. Clause 8 of each Standardized Specification, and the measurement and payment clause of each Particular Specification, read together with the relevant clauses of the Project Specifications, all set out which ancillary or associated activities are included in the rates for the specified operations.

3) Descriptions in the Bill of Quantities are abbreviated and may differ from those in the Standardized and Project Specifications. No consideration will be given to any claim by the Contractor submitted on such a basis. The Bill has been drawn up generally in accordance with the latest issue of Civil Engineering Quantities¹. Should any requirement of the measurement and payment clause of the appropriate Standardized or Project Specification(s) be contrary to the terms of the Bill or, when relevant, to the Civil Engineering Quantities, the requirement of the appropriate Standardized, Project, or Particular Specification as the case may be, shall prevail.

4) Unless stated to the contrary, items are measured net in accordance with the Drawings without any allowance having been made for waste.

5) The amounts and rates to be inserted in the Bill of Quantities shall be the full inclusive amounts to the Employer for the work described under the several items. Such amounts shall cover all the costs and expenses that may be required in and for the construction of the work described, and shall cover the costs of all general risks, profits, taxes (but excluding value-added tax), liabilities and obligations set forth or implied in the documents on which the Tender is based.

6) An amount or rate shall be entered against each item in the Bill of Quantities, whether or not quantities are stated. An item against which no amount or rate is entered will be considered to be covered by the other amounts or rates in the Bill.

The Tenderer shall also fill in a rate against the items where the words "rate only" appear in the amount column. Although no work is foreseen under these items and no quantities are consequently given in the quantity column, the tendered rates shall apply should work under these items actually be required.

Should the Tenderer group a number of items together and tender one sum for such group of items, the single tendered sum shall apply to that group of items and not to each individual item, or should he indicate against any item that full compensation for such item has been included in another item, the rate for the item included in another item shall be deemed to be nil.

The tendered rates, prices and sums shall, subject only to the provisions of the Conditions of Contract, remain valid irrespective of any change in the quantities during the execution of the Contract.

7) The quantities of work as measured and accepted and certified for payment in accordance with the Conditions of Contract, and not the quantities stated in the Bill of Quantities, will be used to determine payments to the Contractor. The validity of the Contract shall in no way be affected by differences between the quantities in the Bill of Quantities and the quantities certified for payment. Ordering of materials are not to be based on the Bill of Quantities.

8) For the purposes of this Bill of Quantities, the following words shall have the meanings hereby assigned to them:

Unit: The unit of measurement for each item of work as defined in the Standardized, Project or Particular Specifications

Quantity: The number of units of work for each item

Rate: The payment per unit of work at which the Tenderer tenders to do the work

Amount: The quantity of an item multiplied by the tendered rate of the (same) item

Sum: An amount tendered for an item, the extent of which is described in the Bill of Quantities, the Specifications or elsewhere, but of which the quantity of work is not measured in units

9) The units of measurement indicated in the Bill of Quantities are metric units. The following abbreviations may appear in the Bill of Quantities:

mm = millimetre

m = metre

km = kilometre

km-pass = kilometre-pass

m² = square metre

m²-pass = square metre-pass

ha = hectare

m³ = cubic metre

m³-km = cubic metre-kilometre

kW = kilowatt

kN = kilonewton

kg = kilogram

t = ton (1 000 kg)

% = percent

MN = meganewton

MN-m = meganewton-metre

PC Sum = Prime Cost Sum

Prov Sum = Provisional Sum

10) Expanded Public Works Programme (EPWP) Implications

Those parts of the contract to be constructed using labour-intensive methods have been marked in the Schedule of Quantities or 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 plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters LI are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.

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.

11) The cost of all samples and tests as may be required to ascertain and check the quality of materials and workmanship or any part of the works are deemed to be included in the relevant rates in the Bill of Quantities. The Contractor shall at his/her own expense take levels and prepare cross sections as required for the measurement and computation of excavation and fill quantities etc.

12) Value Added Tax (VAT) shall not be included in the individual rates but is to be added as a total at the end of the summary.

13) All materials to be provided by the Contractor will be SABS, ISO or JASWIC approved where such a specification exists, whether specifically stated in the schedule or not.

14) Where a particular make of item is specified, the words "or similar approved" shall mean approval by the Engineer in writing.

C2.2 ACTIVITY SCHEDULE/BILL OF QUANTITIES

The BOQ must be completed in full using BLACK INK and the summary sheet completed and signed.

The BOQ must also be completed in full on the attached Excel spreadsheet and provided with the tender submission in electronic format.

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS 1200 A	<u>SECTION A: GENERAL</u>				
	8.3	<u>SCHEDULED FIXED-CHARGE AND VALUE RELATED ITEMS</u>				
1	8.3.1	Contractual requirements	Sum	1.0		
2		Political Riot Insurance	Sum	1.0		
	8.3.2	<u>Establishment of Facilities on Site</u>				
	8.3.2.1	Facilities for Engineer				
3		a) Furnished office as specified per SABS 1200AB Item No. 3.2	Sum	1.0		
4		c) Contract Name boards	Sum	1.0		
5		d) Car port	Sum	1.0		
6		e) Survey equipment and assistants (1 No.)	Sum	1.0		
	8.3.2.2	Facilities for Contractor				
7		a) Offices and storage sheds	Sum	1.0		
8		b) Workshops	Sum	1.0		
9		c) Laboratories	Sum	1.0		
10		d) Living Accommodation	Sum	1.0		
11		e) Ablution and latrine facilities	Sum	1.0		
12		f) Tools and equipment	Sum	1.0		
13		g) Water supplies, electric power and communications	Sum	1.0		
14		h) Dealing with water on site for the duration of the contract	Sum	1.0		
15		i) Access	Sum	1.0		
16		j) Plant	Sum	1.0		
17	8.3.3	Other Fixed Charge Obligations	Sum	1.0		
18	8.3.4	Removal of Site Establishment on completion	Sum	1.0		
	8.4	<u>SCHEDULED TIME RELATED ITEMS</u>				
19	8.4.1	Contractual Requirements	Sum	1.0		
	8.4.2	Operation and Maintenance of Facilities on Site, for Duration of Construction	Sum	1.0		
	8.4.2.1	Facilities for Engineer				
21		a) Furnished office	Sum	1.0		
22		c) Contract Name boards	Sum	1.0		
23		d) Car ports	Sum	1.0		
24		e) Survey assistants	Sum	1.0		
	8.4.2.2	Facilities for Contractor				
25		a) Offices and storage sheds	Sum	1.0		
26		b) Workshops	Sum	1.0		
27		c) Laboratories	Sum	1.0		
28		d) Living accommodation	Sum	1.0		
29		e) Ablution and latrine facilities	Sum	1.0		
30		f) Tools and equipment	Sum	1.0		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
31		g) Water supplies, electric power and communications	Sum	1.0		
32		h) Dealing with water on site for the duration of the contract	Sum	1.0		
33		i) Access	Sum	1.0		
34		j) Plant	Sum	1.0		
35	8.4.3	Supervision for Duration of Construction	Sum	1.0		
	8.4.4	Company and Head Office Overhead Cost for				
36		the duration of the Contract	Sum	1.0		
37	8.4.5	Other Time-Related Obligations	Sum	1.0		
38		Provision of Security Personnel	Month	4.0		
	8.4.6	Standing Time				
		Compensation for delays incurred				
39		a) Plant	Sum/day	5.0		
40		b) Labour	Sum/day	5.0		
41		c) Supervision	Sum/day	5.0		
42		d) Other facilities not covered by (a), (b) and (c)	Sum/day	3.0		
	8.5	PROVISIONAL SUMS				
43	8.5.1	Soil and concrete testing by the Engineer	Prov Sum			3 000.00
44		Overheads charges and profit on item 43 above	%			
45		Allowance for payment of a CLO	Prov Sum			16 000.00
46		Overheads charges and profit on item 45 above	%			
	8.7	<u>DAY WORK (Provisional)</u>				
		NOTE:				
		(i) All rates to be Gross (Mark up, profits under overheads, etc. and all requirements listed in item 8.7 included)				
		(ii) The Tenderer must state the capacity of the Plant that his rate is based on:				
		(iii) Dayworks will apply in quantities. Sub clause 6.5 of the General Conditions of Contract Limiting increases in quantities and/or any Sub items will not apply in day works				
		(iv) Standing time will be taken as 2/3 of the Rate				
	8.7.1	Labour				
47		a) Site Foreman	Hr	10.0		
48		b) Trade Foreman	Hr	10.0		
49		c) Supervisor	Hr	15.0		
50		d) Artisan	Hr	10.0		
51		e) Operator	Hr	10.0		
52		f) Gang Boss	Hr	15.0		
53		g) Leading Hand	Hr	10.0		
54		h) Survey Assistant	Hr	10.0		
55		i) Labourer	Hr	20.0		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
56	8.7.2	Plant a) Track Excavator minimum 20 tons. State make and model	Hr	8.0		
57		b) Track Excavator minimum 40 tons. State make and model	Hr	8.0		
58		c) Backhoe TLB type min. 60kW. State make and model	Hr	8.0		
59		d) Bulldozer (CAT D7 or similar approved - approx. 145 Kw)	Hr	8.0		
60		e) Grader (CAT 140H or similar approved)	Hr	8.0		
61		f) Rubber tyred front-end loader mi. 90kW. State make..... and model	Hr	8.0		
62		g) Pedestrian type vibrating roller (Bomag BW65H or similar approved). State make and model	Hr	8.0		
63		h) Compacting vibrating roller - Single Drum Smooth - Self Propelled - min. 12 tons. State make..... and model	Hr	8.0		
64		i) Compacting vibrating roller - Single Drum Padded or Grid - Self Propelled - min. 12 tons. State make and model	Hr	8.0		
65		j) Compactor (PAN)	Hr	8.0		
66		k) Water cart (9000 litre)	Hr	8.0		
67		l) Water cart (5000 litre)	Hr	8.0		
68		m) Tip-up truck (10 m ³)	Hr	8.0		
69		n) Tip-up truck (6 m ³)	Hr	8.0		
70		o) Compressor: min 250 cfm complete with hand tools and attachments. State make..... and model	Hr	8.0		
71		p) Bakkie (1 ton)	Hr	8.0		
72		q) Cement	Bag	1.0		
73		r) Building Sand	m ³	1.0		
74		s) Crushed Stone (19mm)	m ³	1.0		
75		t) Bricks (ROK's)	No.	100.0		
	8.8	TEMPORARY WORK				
	8.8.2	Accommodation of Traffic Provide and erect warning signs, flag persons, lights, controls for duration of Contract in crossings of roads	Sum	1.0		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
77	8.8.4	Existing Services Excavate by hand in soft material to locate existing services	m ³	10.0		
78	8.8.5	Cost of survey in terms of Land Survey Act a) Locate, record and protect erf boundaries and survey pegs	Sum	1.0		
79		b) Replace pegs recorded as missing at commencement of Contract	No.	5.0		
80	8.8.7	Compliance with OHS Act and Regulations (Including the Construction Regulations 2003) (a) Contractor's initial obligation in respect to the Occupational Health and Safety Act and Construction Regulations, including the preparation of a Health & Safety Plan. Include for responsibilities and duties as Main Contractor dealing with Mechanical and Electrical Contractor, Eskom and all other contractors	Sum	1.0		
81		(b) Contractor's time-related obligations in respect of complying with the Occupational Health and Safety Act and Construction Regulations. Include for responsibilities and duties as Main Contractor dealing with Mechanical and Electrical Contractor, Eskom and all other contractors	Month	4.0		
82		(c) Provision of competent Health & Safety Officer and all other competent staff required	Month	4.0		
83	8.8.8	Compliance with Environmental Requirements NEMA (Act No. 107 of 1995 and ECA No. 73 of 1989) Compile Method Statement and Implementation and Management Plan required in terms of NEMA and ECA. Include for responsibilities and duties as Main Contractor dealing with Mechanical and Electrical Contractor, Eskom and all other contractors	Month	4.0		
84		(b) Contractor's time-related obligations in respect of complying with the NEMA and ECA requirements. Include for responsibilities and duties as Main Contractor dealing with Mechanical and Electrical Contractor, Eskom and all other contractors	Month	4.0		
85		(c) Provision and management of competent staff to monitor, manage and oversee environmental responsibilities	Month	4.0		
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS 1200 C	<u>SECTION C: SITE CLEARANCE</u>				
	8.2.1	Clear and grub				
1		a) Clear site as directed, including spoiling material within the free haul distance of 3km	ha	0.5		
2	8.2.8	Demolish and remove builders rubble, foundations etc and cart to spoil at designated Municipal Dump Site within a free haul distance of 3Km	m³	50.0		
3	8.2.5	Take down existing fences and reinstate on completion of contract. (allow for additional material for reinstatement)	m	20.0		
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS 1200DB	<u>SECTION DB: PIPE TRENCHES</u>				
	8.3.2 a)	Excavation in all materials for trenches backfill, compact and dispose of surplus/unsuitable material, for pipes: Pipes up to 600mm diameter for depths:				
1		Less than 1m deep	m	40.0		
2		Exceeding 1.0 m but not exceeding 2.0 m	m	550.0		
3		Exceeding 2.0 m but not exceeding 3.0 m	m	764.0		
4		Exceeding 3.0 m but not exceeding 4.0 m	m	20.0		
		Extra over item 8.3.2 (a) for excavation in:				
5	b) 8.3.5.1	Hard rock material Provisional)	m ³	50.0		
		Existing Services				
		a) Services that intersect a trench:				
6		Fences	No.	2.0		
7		Pipelines	No.	2.0		
8		Cables	No.	2.0		
	8.3.5.2	b) Services that adjoin a trench:				
9		Fences	m	70.0		
10		Pipeline	m	150.0		
11		Cables	m	20.0		
12	8.3.3.3	Compaction in road reserves	m ³	30.0		
	8.3.4(b)	Temporary Works, control water inflow from manhole 1 to Manhole 4.				
13		(1) Provide equipment	SUM			
14		(2) Operate and maintain	days	50.0		
15		(3) Remove equipment	SUM			
	8.3.6	Finishing				
16	8.3.6.1	Reinstate road surfaces complete with all courses Gravel	m ²	200.0		
17	8.3.7	Accommodation of traffic along Meyer Street and Pieterse Street.	SUM			
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS1200L B	<u>SECTION LB: BEDDING (PIPES)</u>				
	8.2.1	<u>Provision of Bedding from Trench Excavations</u>				
1	8.2.1 (a)	Selected granular material	m ³	50		
2	8.2.1 (b)	Selected fill material	m ³	680		
	8.2.2.3	<u>Provision of Bedding from Commercial Sources</u>				
3	8.2.2.3 (a)	Selected granular material	m ³	370		
4	8.2.2.3 (b)	Selected fill material	m ³	400		
5	8.2.2.3	19mm Crushed stone bedding	m ³	60		
6	8.2.4	Encasing of pipes in 30/19 Mpa concrete	m ³	80.0		
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS 1200LD	<u>SECTION LD: SEWERS</u>				
	8.2.1	Supply, lay, bed and test 600mm x 2.5 RJ Class 100D HDPE (3mm) lined aggregate sewer pipes. (spigot and socket)				
1		0m to 1m deep	m	40.0		
2		Exceeding 1.0 m but not exceeding 2.0 m	m	112.0		
3		Exceeding 2.0 m but not exceeding 3.0 m	m	764.0		
4		Exceeding 3.0 m but not exceeding 4.0 m	m	20.0		
	8.21	<u>Steel Pipeline</u>				
5		Supply, lay and test 600mm nominal bore x 6mm x 6.1m, flanged, SABS 1000-3FF complete with 20mm HDPE liner with 1 side flat and the other side grooved with o- ring, supported on concrete columns at 6m c/c.	m	88.0		
	8.2.3	Sewer Manholes				
		Connecting existing sewer lines to new manholes including of making good to benching				
6		Precast concrete manholes	No	2.0		
7		Brick manholes	No	1.0		
		2000mm diameter dolomitic precast concrete manholes(Type B) complete as shown on drawing No 8202AP-CV07, with cover, for depths:				
		0m - 1.0m	No.	2.0		
8		1.0 m - 2.0 m	No.	3.0		
9		2.0 m - 3.0 m	No	12.0		
10		3.0 m - 4.0 m	No	1.0		
		Reinforced concrete pipe supports as per detail on Drawing No: 8202AP- CV107, including for excavation , formwork, rebar and pipe clamp.				
11		Pipe supports 0- 1m in height	No	10.0		
12		Pipe supports 1- 2m in height	No	6.0		
	8.2.1	Supply, lay, bed and test sewer pipes complete with couplings				
	8.2.1.1	uPVC Pipelines				
		600mm diameter Class 34	m	350.0		
	8,2,2	Sewer Manholes				
		900mm diameter precast concrete manholes complete as shown on the drawings, without covers, for depths:				
13		0.5m - 1.0m	No.	2.0		
14		1.0 m - 2.0 m	No.	2.0		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
		PIPE SPECIALS Supply, lay, joint and maintain pipework specials and fittings including bedding, complete with couplings, bolts, nuts, washers, gaskets and any other items required by the specifications or necessary in the interests of good workmanship. Allow for corrosion protection as specified in the Project Specification and shown on the drawings. Grit Channels:(Drg. No 8202AP-ST-100)				
15		Pipe Tag No GRC01	No	1.0		
16		Pipe Tag No GRC02	No	1.0		
17		Pipe Tag No GRC03	No	2.0		
18		Pipe Tag No GRC04	No	1.0		
19		Pipe Tag No GRC05	No	2.0		
20		Pipe Tag No GRC06	No	2.0		
21		Pipe Tag No GRC07	No	1.0		
22		Pipe Tag No GRC08	No	1.0		
		Night Soil Disposal Facility: (Drg No 8202AP-ST-102)				
23		Pipe Tag No DF01	No	2.0		
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS 1200D	<u>SECTION D: EARTHWORKS</u>				
1	8.3.1.2	Remove topsoil to nominal depth 150mm, stockpile, and maintain to stockpile for later re-use	m ²	120.0		
	8.3.2	BULK EXCAVATION				
2		a) CUT TO STOCKPILE within a free haul distance of 1km,	m ³	500.0		
3		b) CUT TO SPOIL within a free haul distance of 1km	m ³	250.0		
4		c) STOCKPILE TO FILL Fill and compact to 93% MOD AASHTO	m ³	250.0		
	8.3.3	Restricted Excavation				
	8.3.3a)	Excavate in all materials and use for backfill or carting away to spoil areas on site.				
5		Night Soil Bucket discharge channel and platform area	m ³	30.0		
6		Bases for Night Soil canopy	m ³	3.6		
7		Inlet Works channels	m ³	194.0		
8		Bases for Inlet Channel canopy	m ³	3.6		
		Extra excavations in all materials to provide working space around structures				
9		Night Soil Bucket discharge channel and platform area;	m ²	27.8		
10		Bases for Night Soil canopy	m ²	14.5		
11		Inlet Works channels	m ²	207.0		
12		Bases for Inlet Channel canopy	m ²	14.5		
	8.3.3 b) 2)	Extra Over Items 2 to 12 for:				
13		Hard rock material (Provisional)	m ³	10.0		
	8.3.5	Extra excavation in all materials to provide working space for outside formwork:				
14		Around structures	m ²	250.0		
15	8.3.10	Top Soiling areas as directed 100mm thick with material from stockpile	m ²	200		
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS1200 G	SECTION G: CONCRETE (STRUCTURAL)				
		<u>Mass concrete of 20 MPa (19mm coarse aggregate) in:</u>				
1		Thrust, anchor blocks and pipe supports	m ³	6.0		
2		Benching to Grit Inlet Channels	m ³	25.0		
3		Infill as backing to fix Parshall Flume to channel floor and wall	m ³	1.0		
4		Pipe encasings at Grid Inlet Channels	m ³	3.0		
		<u>Strength reinforced concrete of 35 MPa (19 mm coarse aggregate) including concrete curing in accordance with the specification, in:</u>				
5		Floor and upstands of drain area, and channel base, walls and support to grid, of Night Soil Bucket Discharge facility	m ³	15.0		
6		Bases and stub columns to Canopy Shelter at Night Soil Discharge area	m ³	2.5		
7		Base, walls and grid support for Grit Inlet Channels and all chambers and boxes connected to grit Inlet Channel	m ³	66.0		
	8.1.1	<u>FORMWORK</u>				
	8.2.1	<u>Rough formwork to sides of :</u>				
8		50mm Thick blinding layer under base and floor and base of channel of night soil drainage slab (Provisional)	m ²	3.0		
9		50mm Thick blinding layer under base and floor and base of channel of night soil drainage slab (Provisional)	m ²	3.0		
10		50mm Thick blinding layer under base of Grit Inlet channels, chambers and boxes that are part of Inlet Works (Provisional)	m ²	5.0		
11		50 mm Thick blinding layer under inlet and outlets to Emergency Storage Dam, Outlet and Overflow Chamber (Provisional)	m ²	1.0		
12		50 mm Thick blinding layer under bases of Canopy Shelter at Grid Inlet Works (Provisional)	m ²	1.0		
		Pipe encasing at Grid Inlet Channels	m ²	1.0		
	8.2.2	<u>Smooth formwork to sides of :</u>				
13		Perimeter upstand of Night Soil Drain Slab	m ²	19.0		
14		Floor base of inlet grit chamber	m ²	22.0		
15		Walls of Night Soil channel and Grid Inlet Channel, and chambers and boxes linked to the Grid Inlet Channel	m ²	421.0		
16		Cover slab supporting grid at Night Soil Channel and at Grid Channel	m ²	3.0		
17		Bases and stub columns of Canopy Shelter at Night Soil Discharge area	m ²	11.0		
18		Floor base of Inlet Channel and chambers and boxes connected to Inlet Channel	m ²	30.0		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
TOTAL BROUGHT FORWARD							
21	8.4.4	Grid supports at Night Soil Discharge and at Inlet Channels <u>CONCRETE SURFACE FINISHES</u> <u>Wood floated finish to top of:</u>	m²	5.0			
22		150mm thick surface drainage platform at Night Soil Duscharge	m²	28.0			
23		200mm wide perimeter upstand around drainage platform at Night Soil Discharge	m²	5.0			
24		400 mm bases for Canopy Shelter at Night Soil Discharge <u>MILD STELL REINFORCEMENT</u>	m²	1.0			
25		Not exceeding 12 mm diameter	t	0.1			
26		Exceeding 12 mm diameter <u>High tensile rod reinforcement</u>	t	0.1			
27		Not exceeding 12 mm diameter	t	4.0			
28		Exceeding 12 mm diameter	t	4.3			
29		High tensile welded mesh reinforcement Ref 617 <u>CONCRETE SURFACE FINISHES</u> <u>Wood floated finish to top of:</u>	m²	20.0			
30		150mm thick surface drainage platform at Night Soil Duscharge	m²	28.0			
31		200mm wide perimeter upstand around drainage platform at Night Soil Discharge	m²	5.0			
32		400 mm bases for Canopy Shelter at Night Soil Discharge	m²	1.0			
33		250mm thick base of Night Soil Discharge channel	m²	7.8			
34		200mm wide wall of Night Discharge Channel	m²	4.0			
35		250mm thick base of Grid Inlet Channels and all chambers and baxes connected to Inlet Channel	m²	80.0			
35		200mm wide top of walls of channels and all chambers and boxes connected to Inlet Channels	m²	2.0			
36		Top of Grid Support (drainage platform) of Inlet Channels	m²	2.0			
37		400 x 400mm stub columns for Canopy Shelter at Night Soil Discharge	m²	0.8			
38		200mm thick walls of Outlet/Overflow Chamber <u>JOINTS</u> (Formwork, surface finishes, curing, sealant grooves, waterstops and sealants elsewhere measured unless specifically noted)	m²	1.8			
TOTAL CARRIED FORWARD							

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
39		Construction joints in : (Rates for construction joints to include all costs for formwork, stopends, joint preparation for following casts and "Vandex Super" application unless specifically noted. Extra reinforcement at construction joints elsewhere measured) Inlet Channels 250 mm Thick floor and 200mm wide walls of Inlet Channels	m	6.0		
40		Construction joints in : (Rates for construction joints to include all costs for formwork, stopends, joint preparation for following casts and "Vandex Super" application unless specifically noted. Extra reinforcement at construction joints elsewhere measured) Inlet Channels 250 mm Thick floor and 200mm wide walls of Inlet Channels	m	6.0		
41		Concrete Hardstand on terrace at Night Soil Discharge and Inlet Works Saw cut joints	m	10.0		
42		SEALANT GROOVES Alternative cutting of sealant grooves for the installation of two-part polysulphide sealant in place of specified bandage seals 15 x 20 mm Sealant groove to joints in Inlet Channels 250mm floor base and 200mm wide walls	m	18		
43		Stainless steel frame for Stop Logs 500mm wide for opening size 500mm wide x 1.75m high, including all fixings. Refer to detail on Drawing No 8202AP-ST100	No	5.0		
44		Aluminium frame for Stop Log 500mm wide 300mm high. Each Stop Log must have a flexible seal at to top and bottom end to allow stacked Logs to give tight grip. Refer to detail on Drawing No 8202AP-ST100	No	24.0		
45		Cast 400 mm diameter pipe into 200mm thick wall of Night Soil Discharge Channel surface bed	No	2.0		
46		Cast 400 mm diameter pipes into 200mm thick wall of Inlet Channel	No	2.0		
47		Cast 300 mm diameter pipe into 200mm thick wall of Inlet Channel	No	1.0		
48		Cast 150 mm diameter pipes into 200mm thick wall of Inlet Channel	No	2.0		
49		Cast 100 mm diameter pipe into encasings under Inlet Channels	No	2.0		
50		Cast 100 mm diameter pipe into 200mm thick wall of Inlet Channels	No	4.0		
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS1200 H	SECTION H: STRUCTURAL STEELWORK <u>STAINLESS STEEL</u> <u>Supply, fabricate and install the following</u> <u>items complete, including protective</u> <u>treatment and all necessary stainless steel</u> <u>fasteners :</u>				
1		Stainless steel sluice gate only for 1.0m wide channel, including all fixings as per Detail 1 on Drawing 8202AP- ST100	No	1.0		
2		Stainless steel frame only for sluice gate for 1.0m wide channel, including all fixings as per Detail 1 on Drawing 8202AP- ST100	No	2.0		
3		Stainless steel sluice gate only for 1.0m wide channel, including all fixings as per Detail 2 on Drawing 8202AP- ST100	No	1.0		
4		Stainless steel frame only for sluice gate for 1.0m wide channel, including all fixings as per Detail 2 on Drawing 8202AP- ST100	No	2.0		
5		Stainless steel sluice gate only for 1.0m wide channel, including all fixings as per Detail 3 on Drawing 8202AP- ST100	No	1.0		
6		Stainless steel frame only for sluice gate for 0.3m wide and 1.0m deep channel, including all fixings as per Detail 3 on Drawing 8202AU- ST100	No	2.0		
7		Stainless steel sluice gate only for 0.3m wide channel for Division Box. Gate height 1.0m	No	1.0		
8		Stainless steel frame only for sluice gate for 0.3m wide channel for Division Box. Frame height 1.5m	No	2.0		
		<u>HOT DIP GALVANISED MILD STEEL</u>				
9		Grid for night Soil Discharge Channel. Complete installation to be hot dipped galvanised. Include stainless steel fixing bolts, all as shown on Drawing No 8202AU-ST102	No	1		
10		Grid for Inlet Channels. Complete installation to be hot dipped galvanised. Include stainless steel fixing bolts, all as shown on Drawing No 8202AP-ST100	No	1		
11		Drainage Grid for night Soil discharge Channels, including angle iron frame, all as shown on Drawing No 8202AP-ST102, Complete installation to be hot dipped galvanised Canopy at Night Soil Discharge Platform:	No	1		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
12		Canopy: Night Soil Discharge: Complete as detailed on Drawing 8202AP-ST101 . Concrete measured separately. Include for all fixings and finishes; Steel mass: 1,5 ton (all steel to be hot dipped galvanised)	No	1		
13		Canopy: Inlet Channels: Complete as detailed on Drawing 8202AP-ST102 . Concrete measured separately. Include for all fixings and finishes; Steel mass 1,4 ton; (All steel to be hot dipped galvanised)	No	1		
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1		<u>PW: WATERPROOFING (PARTICULAR SPECIFICATION PW)</u> Continuous horizontally placed 250mm ABE durajoint PVC Dumbell waterstop (sole approved waterstop) in construction joints in walls.	m	86		
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

ITEM	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1		PX : SEALANTS (PARTICULAR SPECIFICATION PX) <u>BANDAGE SEALS</u> <u>Sikadur-Combiflex or equal and approved flexible bandage seals with minimum 150 mm geomembrane bandage width x 2 mm minimum thickness installed complete at contraction joints including all preparation, sandblasting, polysulphide filling, bondbreaking tape and protection at :</u> Inlet Channels 250mm floor base and 200mm wide walls	-	-	-	
2		<u>SEALANTS</u> <u>Alternative installation of two-part polysulphide sealant with two-part primer in 15 x 20 mm sealant grooves to contraction joints, including preparation of sealant grooves and placing of bondbreaking tape in :</u> Inlet Channels 250mm floor base and 200mm wide walls	m	6	-	
			m	18		
TOTAL CARRIED FORWARD TO SUMMARY PAGE						

C2.3 SUMMARY PAGE FOR BILL OF QUANTITIES

Section	Description	Amount
A	General	
C	Site Clearance	
D	Earthworks	
DB	Pipe Trenches	
LB	Bedding	
LD	Sewers	
G	Concrete (Structural)	
H	Structural Steel Work	
PW	Waterproofing	
PX	Sealants	
	SUB TOTAL	
	Add: 10% Contingencies	
	SUB TOTAL	
	Add: 14% VAT	
	TOTAL	

C3 SCOPE OF WORK

C3.1 DESCRIPTION OF THE WORKS

C3.1.1 Employer's Objectives

The original Kruisfontein Sewage Treatment Works was constructed in 1995. The original works consisted of 6 ponds. In 2005 a biological filter was constructed and some modifications were made to the ponds.

The existing Kruisfontein WWTW (Waste Water Treatment Works) is totally over loaded and untreated and partially treated sewerage flows into the nearby Seekoei River and from there into the Kromme River and from there into the sea. This uncontrolled pollution poses serious health and environmental threats to not only the communities residing in the Kruisfontein catchment area but also for the neighbouring areas.

The primary aims of the project are to:

- (a) Modify, upgrade and extend the existing Western Sewer Outfall and construct the Inlet chamber and associated pipe work to the existing pond No1.

C3.1.2 Description of Site and Access

The existing Kruisfontein Sewerage Treatment Works is situated approximately 1,2km from Humansdorp. The coordinates of the sewage works are:

Latitude: 34° 01' 30"
Longitude: 24° 44' 30"

Access to the Kruisfontein Sewage Works is via an existing gravel track.

C3.1.3 Overview of the Works

The work to be carried out comprises of the construction of the following Works:

Western Outfall Sewer and associated Works:

A 600mm diameter gravity main shall be laid as a contour sewer to replace the existing sewer that has too capacity. The length of the new Western Outfall Sewer is 1km. Part of the sewer shall be laid above ground level. This section of sewer pipe shall be supported on concrete columns.

The associated works will consist of the Night Soil Discharge Chamber and Inlet Works and screen as well as a 600mm sewer to the existing Pond No1.

C3.1.4 Temporary Works

No temporary works are required.

C3.2 DRAWINGS

C3.2.1 The following drawings are applicable to the contract:

Table 1: Drawings and standard details

Drawing No	Title
8202AP-CV01	Locality Plan: Western Outfall Sewer
8202AP-CV02	Layout Plan: Western Outfall Sewer
8202AP-CV03	Detailed Layout and Longitudinal Section: Western Outfall Sewer (Sheet 1 of 3)
8202AP-CV04	Detailed Layout and Longitudinal Section: Western Outfall Sewer (Sheet 2 of 3)
8202AP-CV05	Detailed Layout and Longitudinal Section: Western Outfall Sewer (Sheet 3 of 3)
8202AP-CV06	Western Outfall Sewer: Type B Manhole: Details (Sheet 1 of 2)
8202AP-CV07	Western Outfall Sewer: Type B Manhole: Details (Sheet 2 of 2)
8202AP-CV08	Western Outfall Sewer: Sewer Pipe Details: Road Crossing and Raised Pipe Details
8202AP/01	Kruisfontein Waste Water Treatment Works: Site Layout
8202AP-ST001	Descriptive Notes and Procedures
8202AP-ST100	Grit Removal Channels: Layout, Plan and Sections
8202AP-ST101	Grit Removal Channels: Canopy over inlet structure: Plan and Elevations
8202AP-ST102	Grit Removal Channels: Disposal Facility for Night Soil Buckets

C3.2.2 The Contractor shall use only the dimensions stated in figures on the Drawings in setting out the Works, and dimensions shall not be scaled from the Drawings, unless required by the Engineer. The Engineer will, on the request of the Contractor in accordance with the provisions of Subclause 5.9.3 of the Conditions of Contract, provide such dimensions as may have been omitted from the Drawings.

C3.2.3 All information in the possession of the Contractor and which is required by the Engineer and/or the Engineer's Representative to complete the as-built / record drawings must be submitted to the Engineer's Representative before a Certificate of Completion will be issued.

C3.3 PROCUREMENT

C3.3.1 Preferential Procurement Procedures

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

C3.3.2 Scope of Mandatory Subcontract Work

15% of the tender value must be subcontracted to the local subcontractors residing within Kouga.

C3.4 CONSTRUCTION

C3.4.1 Works Specification

C3.4.1.1 Applicable SANS standards

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

SABS 1200 A	- GENERAL
SABS 1200 AB	- ENGINEER'S OFFICE
SABS 1200 C	- SITE CLEARANCE
SABS 1200 D	- EARTHWORKS
SABS 1200 DB	- EARTHWORKS (PIPE TRENCHES)
SABS 1200 DE	- SMALL EARTH DAMS
SABS 1200 DK	- GABIONS & PITCHING
SABS 1200 DM	- EARTHWORKS (ROADS, SUBGRADE)
SABS 1200 G	- CONCRETE (STRUCTURAL)
SABS 1200 H	- STRUCTURAL STEELWORK
SABS 1200 HA	- STRUCTURAL STEELWORK (ANCILLARY WORKS)
SABS 1200 L	- PIPELINES
SABS 1200 LB	- BEDDING (PIPES)
SABS 1200 LC	- CABLE DUCTS
SABS 1200 LE	- STORMWATER DRAINAGE
SABS 1200 M	- ROADS (GENERAL)
SABS 1200 ME	- SUBBASE
SABS 1200 MF	- BASE
SABS 1200 MG	- BITUMINOUS SURFACE TREATMENT
SABS 1200 MH	- ASPHALT BASE AND SURFACING
SABS 1200 MJ	- SEGMENTED PAVING
SABS 1200 MK	- KERBING AND CHANNELLING
SABS 1200 MM	- ANCILLARY ROADWORKS
SANS 4427	- HDPE PIPE
SANS 966-1	- UPVC PIPE
SANS 966-2	- MPVC PIPE
SANS 62-1 AND 2	- GMS PIPE
SANS 664	- BALL VALVES
SANS 664-2	- GATE VALVES
SANS 664-3	- RESILIENT SEAL VALVES
SANS 1123	- PIPE FLANGES
SANS 10100	- The Structural Use of Concrete.
SANS 10155	- Accuracy in Buildings
SANS 10164	- The Structural Use of Masonry.
SANS 10163	- The Structural Use of Timber.
SANS 10162	- The Structural Use of Steel.
SANS 1921-1,	- General
SANS 1921-2,	- Accommodation of traffic on public roads occupied by the contractor
SANS 1921-3,	- Structural steelwork
SANS 1921-4,	- Third party management support
SANS 1921-5,	- Earthworks activities which are to be performed by hand

Statutory Regulations: SABS 0400: National Building Regulations

C3.4.1.2 The term “project specifications” appearing in any of the SABS 1200 standardised specifications must be replaced with the terms “scope of work”.

C3.4.1.3 Technical Guidelines for the Design and Construction of Water and Sanitation Infrastructure, Draft 1, 2012

C3.4.2 Variations and Additions to the Standardized Specifications, SABS 1200

The following variations and additions to the SABS 1200 Standardized Specifications referred to in the last clause of Portion 1 will be valid for this Contract. The prefix “PSA” indicates an amendment to SABS 1200 PA, “PSC” to SABS 1200 C, etc. The numbers following these prefixes are the relevant Clause numbers in SABS 1200.

New clauses and payment items not covered by clauses or items in the Standard Specification have been included here and have also been designated with the prefix PS. Such clauses and items have been given a new number following upon the last number used in the particular section of the standard Specifications referred to.

C3.4.2.1 Variations and additions to the Specifications listed are as follows:

SABS 1200 A	- GENERAL
SABS 1200 AB	- ENGINEER'S OFFICE
SABS 1200 C	- SITE CLEARANCE
SABS 1200 D	- EARTHWORKS
SABS 1200 DB	- EARTHWORKS (PIPE TRENCHES)
SABS 1200 DE	- SMALL EARTH DAMS
SABS 1200 DK	- GABIONS & PITCHING
SABS 1200 DM	- EARTHWORKS (ROADS, SUBGRADE)
SABS 1200 G	- CONCRETE (STRUCTURAL)
SABS 1200 H	- STRUCTURAL STEELWORK
SABS 1200 HA	- STRUCTURAL STEELWORK (ANCILLARY WORKS)
SABS 1200 L	- PIPELINES
SABS 1200 LB	- BEDDING (PIPES)
SABS 1200 LC	- CABLE DUCTS
SABS 1200 LE	- STORMWATER DRAINAGE
SABS 1200 M	- ROADS (GENERAL)
SABS 1200 ME	- SUBBASE
SABS 1200 MF	- BASE
SABS 1200 MG	- BITUMINOUS SURFACE TREATMENT
SABS 1200 MH	- ASPHALT BASE AND SURFACING
SABS 1200 MJ	- SEGMENTED PAVING
SABS 1200 MK	- KERBING AND CHANNELLING
SABS 1200 MM	- ANCILLARY ROADWORKS

C3.4.3 Particular / Generic Specifications

The following Particular Specifications are applicable:

PAF: APPLIED FINISHES

PPS: EMBEDDED MEMBRANES

PW: WATERSTOPS

PX: SEALANTS

PDA: MANUFACTURE & INSTALLATION OF STEEL PIPELINES
 PDB: MANUFACTURE & INSTALLATION OF VALVES
 PDE: HEAVY DUTY CORROSION PROTECTION OF STEEL
 PDF: HEAVY DUTY CORROSION PROTECTION TO STEEL – RILSAN COATING
 PPB: BUILDING WORK
 PPBK: BRICKWORK AND MASONRY
 PPBP: PAINTING
 PPB.W: APPLIED FINISHES: SCREEDS AND CEMENT PAVINGS
 PPA: FENCING
 PPC: PAINTING AND PROTECTIVE COATINGS
 PLIC: GUIDELINES FOR THE IMPLEMENTATION OF LABOUR INTENSIVE INFRASTRUCTURE PROJECT UNDER EXPANDED PUBLIC WORKS PROGRAMME (LABOUR INTENSIVE ACTIVITIES)
 PLIC: GUIDELINES FOR THE IMPLEMENTATION OF LABOUR INTENSIVE INFRASTRUCTURE PROJECT UNDER EXPANDED PUBLIC WORKS

C3.4.4 Employment of Local Labour

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

The Contractor shall fill in the form entitled “Key Personnel” in the “Forms to be Completed by the Tenderer”. The data stated on the above-mentioned form will be strictly monitored during the Contract period and any deviations there from shall be subject to the prior approval of the Engineer, which approval shall not be unreasonably withheld.

C3.4.5 Certification by Recognized Bodies

All pipes and fittings to carry the SABS mark or *Agrément Board of South Africa* certification or be on the JASWIC Schedule of Acceptable Pipes and Components.

C3.4.6 Samples

Materials or work which does not conform to the approved samples submitted in terms of Sub clause 7.4.1 of the Conditions of Contract will be rejected. The Engineer reserves the right to submit samples to tests to ensure that the material represented by the sample meets the specification requirements.

The costs of any such tests conducted by or on behalf of the Engineer, the results of which indicate that the samples provided by the Contractor do not conform to the requirements of the Contract, shall, in accordance with the provisions of Sub clause 7.4.4 of the Conditions of Contract, be for the Contractor’s account.

C3.4.7 Construction Equipment

C3.4.7.1 Plant and Equipment provided by the Contractor

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

C3.4.7.2 Plant and Materials provided by the Employer:

None

C3.4.8 Existing Services

All services will be dealt with as set out in SABS 1200A.

C3.4.9 Site Establishment

C3.4.9.1 Services and Facilities provided by the Employer

C3.4.9.1.1 Water Supply

There is no reticulated water supply available on Site.

The Contractor shall obtain water at his own cost and make all arrangements necessary for the supply and distribution required for construction purposes as well as for use in and about his site establishment and for human consumption.

The source of all water utilised for the purposes of the Contract shall be subject to prior approval of the Engineer, which approval shall not be unreasonably withheld.

The Contractor shall comply with all prevailing legislation in respect of drawing water from natural or other sources and shall, when required by the Engineer, produce proof of such compliance. The distribution of water shall be carried out by the Contractor strictly in accordance with applicable laws and regulations.

All water provided by the Contractor for construction purposes shall be clean, free from undesirable concentrations of deleterious salts and other materials and shall comply with any further relevant specifications of the Contract. The Contractor shall, whenever reasonably required by the Engineer, produce test results demonstrating such compliance. Water provided by the Contractor for human consumption shall be wholesome and potable to the satisfaction of the health authorities in the area of the Site.

No separate payment will be made to the Contractor for the obtainment, distribution and consumption of water, the costs of which will be deemed to be included in the Contractor's tendered rates.

C3.4.9.1.2 Electricity Supply

The Contractor shall at his own cost, make all arrangements necessary for the supply and distribution of electrical power required for construction purposes as well as for use in and about his site establishment.

The Contractor shall comply with all prevailing legislation in respect of the generation and distribution of electricity and shall, when required by the Engineer, produce proof of such compliance.

The distribution of electricity shall be carried out by the Contractor strictly in accordance with the applicable laws and regulations.

The Contractor shall provide electricity supply points to the Engineer's office.

No separate payment will be made to the Contractor for the obtainment, distribution and consumption of electricity, the costs of which will be deemed to be in the Contractor's tendered rates and prices.

C3.4.9.1.3 Excrement Disposal

No water-borne sewage or other off-site excrement disposal systems are available in the vicinity of the Site.

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

The Contractor shall further comply with any other requirements in this regard as may be stated in the Contract.

C3.4.9.1.4 Area for Contractor's Site Establishment

The Contractor shall, at his own cost, be responsible for locating and making all arrangements necessary for securing an area suitable to meet his needs in respect of the erection of the Contractor's offices, stores and other facilities, including the facilities to be provided for the Engineer in accordance with the Contract.

Any potential area proposed by the Contractor shall be within reasonable proximity to the Site of the Works and its location shall be subject to the approval of the Engineer, which approval shall not be unreasonably withheld.

C3.4.9.2 Services and Facilities provided by the Contractor

The Contractor shall provide on Site, for the duration of the Contract and for the exclusive use of the Engineer and / or his Representative (as applicable), the various facilities described hereunder. All such facilities shall be provided promptly on the commencement of the Contract and failure on the part of the Contractor to provide any facility required in terms of this specification shall constitute grounds for the Engineer to withhold payment of the Contractor's tendered Preliminary and General items until the facility has been provided or restored as the case may be.

On completion of the contract all facilities provided as set out in the clause shall be removed from site and the site where the contractor's camp was established rehabilitated.

C3.4.9.2.1 Office Accommodation

The Contractor shall provide on the Site **one (1)** office for the exclusive use of the Engineer. Such office shall comply with and be furnished in accordance with the requirements of sub clause 3.2 of SABS 1200 AB. The Contractor shall maintain the office(s) in accordance with the requirements of sub clause 5.2 of SABS 1200 AB.

Such office accommodation shall be provided within the Contractor's site establishment facilities.

The Engineer and the Engineer's Representative shall be allowed free use of survey equipment and assistants to carry out control work as and when required, and the Contractor shall provide all pegs, concrete, tools and other necessary items as well as all necessary labour for excavation, bush clearing, mixing and placing of concrete, as and when required for the control of the setting out of the Works.

C3.4.9.2.2 Carports

The Contractor shall provide on Site **one (1)** carports for the exclusive use of the Engineer, in accordance with the requirements of sub clause PSAB 3.3 of Portion 2 of the Project Specifications.

C3.4.9.2.3 Site Meeting Venue

The Contractor shall provide within his own site establishment facilities, a suitably furnished office or other venue capable of comfortably accommodating a minimum of ten (10) persons at site meetings. The Engineer shall be allowed free use of such venue for conducting any other meetings concerning the Contract at all reasonable times.

C3.4.9.2.4 Contract Name Boards

The Contractor shall provide, erect and maintain TWO contract name board at such positions and locations directed by the Local Municipality, which name board shall, unless otherwise specified elsewhere in the Contract, comply with the recommendations for the standard board of the South African Association of Consulting Engineers, with regard to size, painting, decorating and detail, and the requirements described hereunder.

Each name board shall be made of tempered hardboard with a thickness of at least 12 mm, so braced on the reverse side as to prevent warping and shall be mounted on two or more, as necessary, firmly planted poles. The painting of the boards shall comply with the relevant requirements of CKS 193 and the colours of the plaques shall be an acceptable match to the applicable colours given in SABS 1091.

The Contractor shall keep the contract name boards in good repair for the duration of the Contract and shall remove them on completion of the Contract.

C3.4.9.2.5 Survey Equipment and Assistants

(a) Survey Equipment

The Contractor shall, in accordance with the requirements of SABS 1200 AB (as amended) provide the following survey equipment for the exclusive use of the Engineer and his staff:

- (i) 1 tacheometer with tripod;
- (ii) 1 metric levelling staff with protective cover bag;
- (iii) 1 x 100 metre Stilon tape measure;
- (iv) 1 x hand-held GPS-Garmin 60CS or similar approved.

(b) Survey Assistants

The Contractor shall, in accordance with the requirements of sub clause 5.5 of SABS 1200 AB make available as and when necessary to the Engineer, **two (2)** survey assistants.

C3.4.9.2.6 Telephone Facilities

The Contractor shall, in accordance with the requirements of sub clauses PSAB 4.1 and PSAB 5.4 of the Project Specifications, provide on Site for the duration of the Contract, the following telephone facilities for the use of the Engineer and his Representative:

(a) Telkom telephones

- (i) Number of separate exchange lines (numbers): **Nil (0)**
- (ii) Number of telephone hand-sets required: **Nil (0)**

(b) Cell phones

Number of cell phones required: **Nil (0)**

C3.4.9.2.7 Computer Facilities

Not required.

C3.4.9.2.8 Fax Facilities

Not required

C3.4.9.2.9 Electricity Supply for the Engineer

All electricity supply to the Engineer's office(s) and laboratory (if applicable), whether provided by the Contractor by way of a reticulated supply from a local authority or other authorised electricity supply, or by way of on-site generators, shall be regulated by the Contractor to within limits such as to prevent damage due to fluctuations in the electrical current supply that may occur to any electrical plant and equipment provided by the Contractor or the Engineer.

The Contractor shall be liable for and pay to the Engineer on demand, all costs that the Engineer may incur in the repair or replacement of any electrical equipment provided by the Engineer on the Site. Reliance by the Contractor on the regulation of the electrical supply by the supplier or on current regulators fitted to generators shall not absolve the Contractor of his liabilities in terms of this Sub clause and, where appropriate, the Contractor shall provide and install at his own cost, all such electrical current-regulating equipment as is necessary to prevent damage to the said equipment.

C3.4.9.2.10 Camera

Not required.

C3.4.9.2.11 Site Instruction Book

The Contractor shall keep a triplicate book for site instructions on the Site at all times.

C3.4.9.2.12 Housing for Engineer's Representative

Not required.

C3.4.9.2.13 Site Maintenance

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

C3.4.9.2.14 Notices, Signs, Barricades and Advertisements

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

The Engineer shall have the right to instruct the Contractor to move any sign, notice or advertisement to another position, or to remove it from the Site of the Works if in his opinion it is unsatisfactory, inconvenient or dangerous. Notwithstanding the afore going, the Contractor may, with the prior approval of the Engineer, (which approval shall not be unreasonably withheld), make arrangements with and obtain the acceptance of the occupiers of erven and properties to close off part of a street, road,

footpath or entrance temporarily, provided that the Contractor duly notifies the occupiers of the intended closure and its probable duration, and re-opens the route as punctually as possible. Where possible, such streets, roads, footpaths and entrances shall be made safe and re-opened to traffic overnight. Such closure shall not absolve the Contractor from his obligations under the Contract to provide access at all times.

Barricades, traffic signs, drums and other safety measures appropriate to the circumstances shall be provided by the Contractor to suit the specific conditions.

C3.4.10 Site Usage

C3.4.10.1 Access to Properties

The Contractor shall organise the work to cause the least possible inconvenience to the public and to the property owners adjacent to or affected by the area in which he is working. In this respect the Contractor's attention is drawn to Clause 8 of the Conditions of Contract.

If, as a result of restricted road reserve widths and the nature of the work, the construction of by-passes is not feasible, construction shall be carried out under traffic conditions to provide access to erven and properties.

C3.5 MANAGEMENT

C3.5.1 Generic Specifications

SABS 1200 A of the Standardised Specifications listed in 4.2.1 is applicable to this contract. The variations and additions to this Specification are included in Sub-clause 4.2.3

C3.5.1.4 Planning and Programming

It is a prerequisite of this contract that minimal disruption to the public is ensured and the Contractor shall take this into account when drawing up his programme.

The Contractor shall submit to the Engineer within seven (7) days of the date of the instruction to commence work, a detailed construction programme and method statement as well as a list of the resources available for each works order.

This contract runs for a period of **4 (four) MONTHS** and as such all work must be completed within this period.

Programme

C3.5.2.1 General

The Contractor's programme to be submitted in terms of Clause 5.6 of the Conditions of Contract shall take full account of all matters that may impact on the sequence of executing the various components of the Works and the requisite rate of progress of the Works, as are specified in or reasonably to be inferred from the Contract.

C3.5.2.2 Format

The construction programme to be submitted by the Contractor in accordance with the provisions of Clause 5.6 of the Conditions of Contract shall

- (a) be in the form of a Gantt chart;
- (b) clearly indicate the start and end dates and duration of all construction activities and identify the critical path; and
- (c) take full cognisance of all the Contractor's risks and obligations in terms of the Contract.

The programme and all revisions thereto shall be provided to the Engineer in electronic format using Microsoft Office Project Version 2003 or later.

C3.5.2.3 Failure to Maintain Construction Programme

If the construction programme has to be revised in terms of Clause 5.6 of the Conditions of Contract because the Contractor is falling behind in his programme, the Contractor shall submit a revised programme of how he intends to regain lost time to ensure completion of the Works before the Due Completion Date. Any proposals by the Contractor to increase the tempo of work must incorporate positive steps to increase production either by the provision of 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 Sub clause 9.2 of the Conditions of Contract.

C3.5.2 Quality Control and Workmanship

C3.5.3.1 Testing

C3.5.3.1.1 Contractor to Engage Services of an Independent Laboratory

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

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

For the purpose of this clause, and “independent laboratory” shall mean an “approved laboratory” as defined in Sub clause PSA 7.2 which is not under the management or control of the Contractor and in which the Contractor has no financial interest, nor which has any control or financial interest in the Contractor.

C3.5.3.1.2 Additional Testing Required by the Engineer

In addition to the provisions of Sub clause 5.3.1.1: Contractor to engage services of an independent laboratory, the Engineer shall be entitled at times during the Contract to require that the Contractor arrange with an independent laboratory to carry out any such tests, additional to those described in Sub clause 5.3.1.1: Contractor to engage services of an independent laboratory at such times and at such locations in the Works as the Engineer shall prescribe. The Contractor shall promptly and without delay arrange with the independent laboratory for carrying out all such additional testing as required by the Engineer, and copies of the test results shall be promptly be provided by the Engineer.

C3.5.3.1.3 Costs of Testing

(a) Tests in terms of Sub clause 5.3.1.1: Contractor to engage services of an independent laboratory

The costs of all testing carried out by the independent laboratory in accordance with the requirements of Sub clause 5.3.1.1: Contractor to engage services of an independent laboratory above shall be done by the Contractor and shall be deemed to be included in the tendered rates and prices for the respective items of work as listed in the Schedule of Quantities and which require testing in terms of the Specifications. No separate payments will be made by the Employer to the Contractor in respect of any testing carried out in terms of Sub clause 5.3.1.1: Contractor to engage services of an independent laboratory.

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

(b) Additional Tests required by the Engineer

The costs of any additional tests required by the Engineer in terms of Sub clause 5.3.1.2: Additional testing required by the Engineer shall be reimbursed to the Contractor against substitution of the Provisional Sum allowed therefore in the Schedule of Quantities; provided always that the costs of any such additional tests ordered by the Engineer, the results of which will indicate that the quality of the materials utilised and / or the standard of workmanship achieved are / is not in accordance with the specifications, shall not be reimbursable to the Contractor.

C3.5.3.2 Workmanship

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

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

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

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

C3.5.3 Environment

The Contractor shall comply with the Environmental Specification included in Annexure B. Failure to comply will result in the application of the penalties as stipulated under the Specification.

C3.5.4 Extension of Time Due Abnormal Rainfall

C3.5.5.1 Extension of time in respect of delays resulting from wet climatic conditions on the Site will only be considered in respect of abnormally wet climatic conditions and shall be determined for each calendar month or part thereof, in accordance with the formula given below:

$$V = (Nw - Nn) + (Rw - Rn)/X$$

in which formula the symbols shall have the following meanings:

V = Potential extension of time in calendar days for the calendar month under consideration:

If V is negative and its absolute value exceeds Nn, then V shall be taken as equal to minus Nn.

When the value of V for any month exceeds the number of days in the particular month, V will be the number of days in the month.

N_w = Actual number of days in the calendar month under consideration on which a rainfall of Y mm or more was recorded on the Site

N_n = Average number of days, derived from existing records of rainfall in the region of the Site, on which a rainfall of Y mm or more was recorded for the calendar month.

R_w = Actual rainfall in mm recorded on the Site in an approved rain gauge for the calendar month under consideration

R_n = Average rainfall in mm for the calendar month, derived from existing records of rainfall in the region of the Site

The factor $(N_w - N_n)$ shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall exceeds Y mm.

The factor $(R_w - R_n)/X$ shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall did not exceed Y mm but wet conditions prevented or disrupted work

C3.5.5.2 The rainfall records for Humansdorp are shown under the table below, and the monthly averages (R_n and N_n) for this period shall, for the purposes of this Contract be taken as normal and as the values to be substituted for R_n and N_n in the formula above. The values of X and Y shall be 20 and 10 respectively.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Nn	6.51	6.08	9.57	8.20	8.92	7.66	8.58	9.18	9.10	9.50	9.36	6.27
Rn	45	46	66	56	61	53	59	63	62	65	64	43

C3.5.5.3 The Contractor shall, at his own cost, provide and erect on the Site at a location approved by the Engineer, an approved rain gauge, which shall be fenced off in a manner which will prevent any undue interference by workmen and others. The Contractor shall, at his own cost, arrange for the reading of the rain gauge on a daily basis for the duration of the Contract. The gauge readings, as well as the date and time at which the reading was taken shall be recorded in a separate record book provided by the Contractor for this purpose. All entries in the rainfall record books shall be signed by the person taking the reading and the gauge shall be properly emptied immediately after each reading has been taken. If required by the Engineer, the Engineer shall be entitled to witness the reading of the gauge.

C3.5.5.4 The Contractor's claims in terms of Sub clause 5.12.2.2 of the Conditions of Contract for extension of time in respect of delays resulting from wet climatic conditions on the Site during each month, shall be submitted in writing to the Engineer monthly, provided that:

- (a) the period allowed to the Contractor in terms of Clause 10.1.1.1 of the Conditions of Contract in which to submit his claim for each month shall be reduced to seven (7) days, calculated from the last day of the month to which the claim applies; and
- (b) The 28-day period allowed to the Engineer in terms of Sub clause 10.1.5 of the Conditions of Contract in which to give his ruling on the claim, shall be reduced to fourteen (14) days.

The Contractor's monthly claim shall be accompanied by a copy of the signed daily rainfall readings for the applicable month.

C3.5.5.5 The extent of any extension of time which may be granted to the Contractor in respect of wet climatic conditions (whether normal or abnormal) shall be determined as the algebraic sum of the "V" values for each month between the Commencement Date and the Due Completion Date of the Contract, calculated in accordance with the General Conditions of Contract as revised; provided always that

- (a) rainfall occurring within the period of the Contract's Christmas shut-down period (referred to in Sub clause 1.1.1.12 of the Conditions of Contract) shall not be taken into account in the calculation of the monthly "V" values;
- (b) rainfall occurring during any period during which the Contractor was delayed due to reasons other than wet climatic conditions on the Site, and for which delay an extension of time is granted by the Engineer, shall not be taken into account in the calculation of the month "V" values;
- (c) if the algebraic sum of the "V" values for each month is negative, the time for completion will not be reduced on account of subnormal rainfall, and
- (d) Where rainfall is recorded only for part of a month, the "V" value shall be calculated for that part of the month using pro rata values for Nn and Rn.

C3.5.5.6 The Engineer shall, simultaneous with granting any extension of time in terms of this clause, revise the Due Completion Date of the Contract to reflect an extension of time having been granted in respect of wet climatic conditions, to the extent of the algebraic sum of all the "V" values for all the preceding months of the Contract, less the aggregate of the "Nn" values for the remaining (unexpired) months of the Contract (viz less aggregate of the potential maximum negative "V" values for the remaining Contract Period). Thus, provided that where such period is negative, the Due Completion Date shall not be revised.

C3.5.5.7 Any extension of time in respect of wet climatic conditions granted in terms of this clause shall not be deemed to take into account delays experienced by the Contractor in repairing or reinstating as regards damage to or physical loss of the Works arising from the occurrence of abnormal climatic conditions. Extension of time in respect of any such repairs or reinstatement as regards damage shall be the subject of a separate application for extension of time in accordance with the provisions of Clause 5.12 and Clause 10.1 of the Conditions of Contract.

C3.5.5 Payment Certificates

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

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

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

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

C3.5.6 Community Participation

In order to give effect to the need for participation and transparency in the process of delivering services, the community should participate in the decision making process throughout the life of the project. This may be achieved through structured engagement between those responsible for the delivery of the project and the communities affected by the project. A project steering committee (PSC) is to be established as a communication structure that interacts with all parties involved with the project.

A community liaison officer (CLO) will be appointed by the employer.

The contractor shall make use of established community communication channels and shall appoint from among his site personnel a responsible person to participate in the PSC business.

The contractor is encouraged to use the community participation process in order to facilitate harmonious relationships on the project. Some of the elements of construction that should be discussed with the PSC are:

- Recruitment of labour
- Assistance with general community / project liaison

C3.5.7 Trenches

No trenches may be left open during the Contractor's holiday during December and January. All trenches which have been excavated but which have not been finally backfilled and compacted at the commencement of the said holiday period shall be temporarily backfilled and compacted to a standard which will:

- (a) Prevent damage occurring to the trenches or any other part of the Works;
- (b) Prevent damage to or physical loss of the property of any person;
- (c) Eliminate the risk of injury to any person; during the said period.

All costs involved in the temporary backfilling and compaction of such trenches and the subsequent re-opening of the trenches after the holiday period shall be for the Contractor's account.

Trenches shall be completed in sections between isolating valves which includes laying and testing of pipes and fittings, replacement of topsoil, construction of berms where required and spreading of excess materials, before any of the remaining trenches are excavated.

C3.5.8 Construction Regulations, 2003

The Contractor shall be required to comply with the Occupational Health and Safety Act, 1993: Construction Regulations, 2003 (the regulations) as promulgated in Government Gazette No 25207 and Regulation Gazette No 7721 of 18 July 2003. Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

The proposed type of work, materials to be used and potential hazards likely to be encountered on this Contract are detailed in the Project Specifications, Schedule of Quantity and Drawings, as well as in the Employer's health and safety regulations (regulation 4 (1)) of the Construction Regulations 2003, which are bound in the Contract document.

The Contractor shall in terms of regulation 5(1) provide a comprehensive health and safety plan detailing his proposed compliance with the regulations, for approval by the Employer within 7 days of the commencement date of the contract.

The Contractor shall at all times be responsible for full compliance with the approved plan as well as the Construction Regulations and no extension of time will be considered for delays due to non-compliance with the abovementioned plan or regulations.

A payment is included in the Schedule of Quantities to cover the Contractor's cost for compliance with the OHS Act and the abovementioned regulations.

C3.6 VARIATIONS AND ADDITIONS TO THE STANDARDISED SPECIFICATIONS

PSA GENERAL

PSA 1 SCOPE

REPLACE THE CONTENTS OF SUBCLAUSE 1.1, INCLUDING THE NOTES, WITH THE FOLLOWING:

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

PSA 2 INTERPRETATIONS

PSA 2.3 DEFINITIONS

IN THE OPENING PHRASE BETWEEN THE WORDS "specification" AND "the following", INSERT THE WORDS "the definitions given in the Conditions of Contract and".

(a) General

ADD THE FOLLOWING DEFINITIONS:

"General Conditions" and "Conditions of Contract": The General Conditions of Contract specified for use with this Contract, together with the Special Conditions of Contract as applicable.

'Specified': As specified in the Standardized Specifications, the Drawings or the Project Specifications. 'Specifications' shall have the corresponding meaning".

(b) Measurement and Payment

REPLACE THE DEFINITIONS FOR “Fixed charge”, “Time- related charge” AND “Value- related charge” WITH THE FOLLOWING:

“‘Fixed charge’: A charge that is not subject to adjustment on account of variations in the value of the Contract Price or the time allowed in the Contract for the completion of the work. ‘Time-related charge’: A charge, the amount of which varies in accordance with the Time for Completion of the Works, adjusted in accordance with the provisions of the Contract. ‘Value-related charge’: A charge, the amount of which varies pro rata with the final value of the measured work executed and valued in accordance with the provisions of the Contract”.

PSA 2 ABBREVIATIONS

(a) Abbreviations relating to standard documents

ADD THE FOLLOWING ABBREVIATION:

“CKS: SABS Co-ordinating Specification”.

PSA 3 MATERIALS

PSA 3.1 QUALITY

ADD THE FOLLOWING AT THE END OF SUBCLAUSE 3.1:

“All manufactured materials supplied shall be new materials unless the contrary is specified. All materials specified to be in accordance with SABS Specifications shall bear the SABS mark, where such a mark is available for the type of product.”

ADD THE FOLLOWING SUBCLAUSE TO CLAUSE 3:

PSA 3.4 MATERIALS SUPPLIED BY THE EMPLOYER

The Contractor will provide all the material for the contract.

PSA 4 PLANT

PSA 4.1 SILENCING OF PLANT

REPLACE THE CONTENTS OF SUBCLAUSE 4.1 WITH THE FOLLOWING:

“The Contractor’s attention is drawn to the applicable regulations pertaining to noise and hearing conservation, framed under the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) as amended. The Contractor shall at all times and at his own cost, be responsible for implementing all necessary steps to ensure full compliance with such regulations, including but not restricted to the provision and use of suitable and effective silencing devices for pneumatic tools and other plant which would otherwise cause a noise level in excess of that specified in the said regulations. Where appropriate, the Contractor shall further, by means of temporary barriers, effectively isolate the source of such noise in order to comply with the said regulations”.

PSA 4.2 CONTRACTOR’S OFFICES, STORES AND SERVICES

ADD THE FOLLOWING PARAGRAPH BEFORE THE EXISTING FIRST PARAGRAPH IN SUBCLAUSE 4.2:

“The Contractor’s buildings, sheds and other facilities erected or utilised on the Site for the purposes of the Contract shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. as may be required by the Contractor. The facilities shall always be kept in a neat and orderly condition. Provision is made in the Bill of Quantities for breaking down and re-establishment of facilities as work progress. No personnel may reside on the Site. Only night-watchmen may be on the Site after hours”.

DELETE “and first-aid services” IN THE SECOND PARAGRAPH OF SUBCLAUSE 4.2 AND ADD THE FOLLOWING:

“The Contractor shall provide on the Site and in close proximity to the actual locations where the work is being executed, one toilet per 10 workmen, which toilets shall be effectively screened from public view and their use enforced. Such toilets shall be relocated from time to time as the location of the work being executed changes, so as to ensure that easy access to the toilets is maintained. The Contractor shall, where applicable, make all necessary arrangements and pay for the removal of night soil”.

PSA 5 CONSTRUCTION

PSA 5.1 SURVEY

PSA 5.1.2 Preservation and Replacement of Survey Beacons and Pegs subject to the Land Survey Act

DELETE THE WORDS “in the vicinity of boundaries” IN THE SECOND SENTENCE OF SUBCLAUSE 5.1.2 AND REPLACE THE WORDS “under the direction of” IN THE SAME SENTENCE WITH “in consultation and liaison with”.

ADD THE FOLLOWING AFTER THE SECOND SENTENCE OF SUBCLAUSE 5.1.2:

“The Contractor and the Engineer shall record on the said list, their concurrence or disagreement (as the case may be) regarding the completeness and accuracy of the details recorded therein”.

REPLACE THE THIRD SENTENCE OF SUBCLAUSE 5.1.2 WITH THE FOLLOWING:

“At the completion of the Contract, the Contractor shall expose all pegs that were listed at the commencement of the construction as being in order and the Contractor shall arrange with a registered Land Surveyor for the checking of the positions of all such pegs and the replacement of those that the Land Surveyor’s check reveals have become disturbed or damaged. The Contractor shall, as a precedent to the issue of the Certificate of Completion, provide to the Engineer, a certificate from the registered land surveyor, certifying that all the pegs listed at the commencement of construction in accordance with the provisions of this clause, have been checked and that those found to have been disturbed, damaged or destroyed have been replaced in their correct positions, all in accordance with the provisions of the said Act. The costs of all checking, replacement and certification as aforesaid shall be entirely for the Contractor’s account. This, with the provision always that the Contractor shall not be held liable for the cost of replacement of pegs which:

- (a) Cannot reasonably be re-established in their original positions by reason of the finished dimensions of the permanent works, and

- (b) The Contractor can prove beyond reasonable doubt to the satisfaction of the Engineer, were disturbed, damaged or destroyed by others beyond his control”.

PSA 5.2 PROTECTION OF EXISTING STRUCTURES

REPLACE “Machinery and Occupational Safety Act, 1993 (Act No 6 of 1983)” WITH “Occupational Health and Safety Act, 1993 (Act No 85 of 1993), as amended, “AND INSERT THE FOLLOWING AFTER “(Act No 27 of 1956)”: “as amended”.

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

REPLACE THE HEADING AND THE CONTENTS OF SUBCLAUSE 5.4 WITH THE FOLLOWING:

PSA 5.4 LOCATION AND PROTECTION OF EXISTING SERVICES

PSA 5.4.1 Location of Existing Services

Before commencing with any work in an area, the Contractor shall ascertain the present and actual position of all services which can reasonably be expected by an experienced and competent contractor to be present on, under, over or within the Site.

Without in any way limiting his liability in terms of the Conditions of Contract in relation to damage to property and interference with services, the Contractor shall, in collaboration with the Engineer, obtain the most up-to-date plans as are available, showing the positions of services existing in the area where he intends to work. Neither the Employer nor the Engineer offers any warranty as to the accuracy or completeness of such plans and because services can often not be reliably located from plans, the Contractor shall ascertain the actual location of services depicted on such plans by means of careful inspection of the Site.

Thereafter, the Contractor shall, by the use of appropriate methodologies, carefully expose the services at such positions as are agreed to by the Engineer, for the purposes of verifying the exact location and position of the services. Where the exposure of existing services involves excavation to expose underground services, the further requirements as instructed by the Engineer shall apply. Payment shall be made in accordance with appropriate rates or on Dayworks as is appropriate.

The aforesaid procedure shall also be followed in respect of services not shown on the plans but which may reasonably be anticipated by an experienced Contractor to be present or potentially present on the site.

All services, the positions of which have been determined as aforesaid at the critical points, shall henceforth be designated as ‘known services’ and their positions shall be indicated by the Contractor on a separate set of drawings, a copy of which shall be furnished to the Engineer without delay.

As soon as any service which has not been identified and located as described above is encountered on, under, over or within the site, it shall henceforth be deemed to be a known service and the aforesaid provisions pertaining to locating, verifying and recording its position on the balance of the site shall apply. The Contractor shall notify the Engineer immediately when any such service is encountered or discovered on the Site.

Whilst he is in possession of the Site, the Contractor shall be liable for all loss of or damage as may occur to

- (a) known services, anywhere along the entire lengths of their routes, as may reasonably be deduced from the actual locations at which their positions were verified as aforesaid, due cognizance being taken of such deviations in line and level which may reasonably be anticipated, and
- (b) Any other service which ought reasonably to have been a known service in accordance with the provisions of this clause. The Contractor shall also be liable for consequential damage in regard to (a) and (b), whether caused directly by the Contractor's operations or by the lack of proper protection.

No separate payment will be made to the Contractor in respect of his costs of providing, holding available on the Site and utilising the said detecting and testing equipment, nor for any costs incurred in preparing and submitting to the Engineer the Drawings as aforesaid. These costs should be deemed included in the Contractor's other tendered rates and prices included in the Contract.

"Payment to the Contractor in respect of exposing services at the positions agreed by the Engineer and described above will be made under the payment items (if any) as may be provided for in the respective sections of the specifications pertaining to the type of work involved."

PSA 5.4.2 Protection during Construction

The Contractor shall take all reasonable precautions and arrange its operations in such a manner as to prevent damage occurring to all known services during the period which the Contractor has occupation and/or possession of the Site.

Services left exposed shall be suitably protected from damage and in such a manner as will eliminate any danger arising there from to the public and/or workmen, all in accordance with the requirements of the prevailing legislation and related regulations.

Unless otherwise instructed by the Engineer, no services shall be left exposed after its exact position has been determined and all excavations carried out for the purpose of exposing underground services shall be promptly backfilled and compacted. In roadways, the requirements shall be as specified by the Engineer. In other areas compaction is to be to 90% modified AASHTO density.

PSA 5.4.3 Alterations and Repairs to Existing Services

Unless the contrary is clearly specified in the Contract or ordered by the Engineer, the Contractor shall not carry out alterations to existing services. When any such alterations become necessary, the Contractor shall promptly inform the Engineer, who will either make arrangements for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.

Should damage occur to any existing services, the Contractor shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases, the Contractor shall take appropriate steps to minimise damage to and interruption of the service. No repairs telecommunication cables or electric power lines and cables shall be attempted by the Contractor.

PSA 5.7 SAFETY

REPLACE THE CONTENTS OF SUBCLAUSE 5.7 WITH THE FOLLOWING:

“Pursuant to the provisions of the Conditions of Contract, and without in any way limiting the Contractor’s obligations there under, the Contractor shall at his own expense (except only where specific provision (if any) is made in the Contract for the reimbursement to the Contractor in respect of particular items), provide the following:

- (a) Provide to its Employees on the site of the works, all safety materials, clothing and equipment necessary to ensure full compliance with the provisions of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) as amended (hereinafter referred to as the Act) at all times, and shall institute appropriate and effective measures to ensure the proper usage of such safety materials, clothing and equipment at all times;
- (b) Provide, install and maintain all barricades, safety signage and other measures to ensure the safety of workmen and all persons in, on and around the site, as well as the general public;
- (c) Implement on the site of the works, such procedures and systems and keep all records as may be required to ensure compliance with the requirements of the Act at all times;
- (d) Implement all necessary measures so as to ensure compliance with the Act by all subcontractors engaged by the Contractor and their employees engaged on the works;
- (e) Full compliance with all other requirements pertaining to safety as may be specified in the Contract.

The Employer and the Engineer shall be entitled, although not obliged, to make such inspections on the site as they shall deem appropriate, for the purpose of verifying the Contractor’s compliance with the requirements of the Act. For this purpose, the Contractor shall grant full access to the site of all parts of the site and shall co-operate fully in such inspections and shall make available for inspection all such documents and records as the Employer’s and/or Engineer’s representative may reasonably require.

Where any such investigations reveal, or where it comes to the Engineer’s attention that the Contractor is in any way in breach of the requirements of the Act or is failing to comply with the provisions of this clause, the Engineer shall, in accordance with the provisions of Clause 5.11 of the Conditions of Contract, be entitled to suspend progress on the works of any part thereof until such time as the Contractor has demonstrated to the satisfaction of the Engineer, that such breach has been rectified.

The Contractor shall have no grounds for a claim against the Employer for extension of time and/or additional costs if the progress on the works or any part thereof is suspended by the Engineer in terms of this clause, and the Contractor shall remain fully liable in respect of the payment of penalties for late completion in accordance with the provisions of Clause 5.13.1 of the Conditions of Contract should the Contractor fail to complete the Works on or before the specified due completion date in consequence of the suspension.

Persistent and repeated breach by the Contractor of the requirements of the Act and/or this clause shall constitute grounds for the Engineer to act in terms of Sub clause 9.2.1.3 of the Conditions of Contract and for the Employer to cancel the Contract in accordance with the further provisions of the said Clause 9.2.”

ADD THE FOLLOWING SUBCLAUSES TO CLAUSE 5:

PSA 5.8 SITE MEETINGS

The Contractor or his authorised agent will be required to attend regular site meetings, which shall normally be held once a month on dates and at times determined by the Engineer, but in any case whenever reasonably required by the Engineer. Unless otherwise indicated in the Contract, or instructed by the Engineer, such meetings shall be held at the Contractor's offices on the site. At such monthly meetings, matters such as general progress on the works, quality of work, problems, claims, payments, and safety shall be discussed, but not matters concerning the day-to-day running of the Contract."

PSA 5.10 Features requiring Special Attention (New Clauses)

PSA 5.10.1 Founding of Bio Reactor and Sedimentation Tanks

According to the geotechnical report, the soil bearing capacity at founding level is highly variable across the Bio Reactor AND Sedimentation Tanks footprints. The design of foundations has been carried out to an assumed safe bearing pressure of 150 kN/m², as recommended by the Geotechnical Engineer. The actual allowable bearing pressures must however be determined by the Contractor once the bulk excavation has been carried out to founding level. Concrete works must therefore be delayed after final trimming of the floor of the excavation, until the founding surface has been inspected and approved as competent by the Geotechnical Engineer.

Provision is made in the Schedules of Quantities for over-excavation and re-compaction of in-situ material in the excavation should this be deemed necessary by the Geotechnical Engineer.

PSA 5.10.2 Cement Stabilised Sand Backfill at Bio Reactor and Sedimentation Tank Structures

Cement stabilised sand shall comprise Ordinary Portland Cement mixed with selected clean sand from the excavation or other approved source in the proportion of 6% by mass.

Cement stabilised sand must be machine mixed dry and transported to the position of final placement by approved means. Placement and compaction of stabilised sand backfill must be completed within six hours of mixing.

The thickness of layers placed for compaction shall be as specified for sand backfill. The plant and compaction effort applied for compaction shall be as determined for achieving a compaction of 97% Modified AASHTO density on the equivalent clean sand and backfill.

PSA 5.10.4 Backfilling Around Structures

Plant used for the compaction of backfill behind the perimeter walls of the reservoir will be restricted to twin drum vibrating rollers of 600kg maximum mass. Compaction of backfill at all other structures must be carried out by means of vibrating plate compactors.

PSA 5.10.5 Bandage Seals

The following Specification Clauses apply for the installation of the bandage seals at the Bio Reactor and Sedimentation Tanks. Provision is also made in the Schedules of Quantities for pricing the cutting of sealant grooves and the installation of alternative two-part polysulphide sealants at the contraction joints in the surface beds, walls and wall bases of the Bio Reactor and Sedimentation Tanks.

Bandage seals shall be Sikadur-Combiflex flexible "bandage" seals supplied by Sika (Pty) Ltd or an equal and approved patent water retaining structure joint sealing bandage product comprising a fully continuous highly flexible waterproof geomembrane bandage permanently bonded to the concrete substrate with a two component epoxy adhesive, with all components used in the application suited to its purpose. The geomembrane bandage width and thickness must be 150 mm minimum and 2 mm minimum respectively. Approval of any product other than the named Sika product will be subject to proof of compliance with this specification and of the product's successful long term performance in similar applications.

All the bandage seal components must be suitable for contact with potable water.

The bandage seals must be installed by a specialist applicator who can show proven experience of installing the product proposed for use on this Contract. Submit the name of the bandage seal applicator and full details of the product that it is proposed will be installed, to the Engineer for approval at time of tender.

Obtain the Engineer's written approval of the manufacturer's specifications in respect of installation prior to commencing joint sealing and adhere to the approved specifications during installation.

Concrete surfaces to which the bandage seals will be permanently bonded must be prepared by sandblasting over the specified bandage width plus a minimum of 25 mm additional width outside each edge of the bandage. Sandblasting must provide a sharp clean bonding surface with the profile of the exposed fine and coarse aggregate sufficiently deep to ensure that a good key is provided for the adhesive used for bonding the bandage to the concrete.

Commence the bandage seal installation only after all dust generating activities inside the Bio Reactor and Sedimentation Tanks are completed, but install the bandage seal as soon as possible after sandblasting.

All loose or cracked concrete, loose particles of coarse aggregate or joint filler along the lines of the contraction joints must be removed and the sharp edges of the joints must be ground smooth prior to sandblasting. After sandblasting broken or chipped edges of the joints as well as voids along the joint line must be primed and filled with an approved gun grade two-part manganese cured polysulphide sealant finished flush with the concrete surface. Install a 30 mm wide strip of adhesive PVC bondbreaking tape along the joint line after the polysulphide filler has cured and before commencing installation of the bandage seal.

Lap welds at the joints between lengths of the geomembrane bandage strip must be carried out by an approved hot welding process which achieves complete fusion of the bandage material over the full lap interface.

The number of laps in the geomembrane bandage must be kept to a minimum. Laps must be at least 50 mm wide.

Allow for maintaining pressure on the bandage seal for a minimum period of 24 hours after installation by means of clamping.

Finish off the edges of bandage seals with epoxy fillets.

Protect bandage seals after installation. Carry out a detailed inspection of all bandage seals prior to disinfection and water testing of the reservoir to ensure that there are no perforations or other possible defects.

Provide a minimum 5 year guarantee on materials and workmanship for the bandage seal application.

PSA 6 TOLERANCES

ADD THE FOLLOWING SUBCLAUSE TO CLAUSE 6:

PSA 6.4 USE OF TOLERANCES

No guarantee is given that the full specified tolerances will be available independently of each other, and the Contractor is cautioned that the liberal or full use of any one or more of the tolerances may deprive him of the full or any use of tolerances relating to other aspects of the work.

Except where the contrary is specified, or when clearly not applicable, all quantities for measurement and payment shall be determined from the 'authorised' dimensions. These are specified dimensions or those shown on the Drawings or, if changed, as finally prescribed by the Engineer, without any allowance for the specified tolerances. Except if otherwise specified, all measurements for determining quantities for payment will be based on the 'authorised' dimensions.

If the work is constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the calculation of quantities will be based on the 'authorised' dimensions, regardless of the actual dimensions to which the works has been constructed.

When the work is not constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the Engineer may nevertheless, at his sole discretion, accept the work for payment. In such cases no payment shall be made for quantities of work or material in excess of those calculated for the 'authorised' dimensions, and where the actual dimensions are less than the 'authorised' dimensions minus the tolerance allowed, quantities for payment shall be calculated based on the actual dimensions as constructed."

PSA 7 TESTING

PSA 7.1 PRINCIPLES

PSA 7.2 APPROVED LABORATORIES

REPLACE THE CONTENTS OF SUBCLAUSE 7.2 WITH THE FOLLOWING:

"Unless otherwise specified in the relevant specification or elsewhere in the Project Specification, the following shall be deemed to be approved laboratories in which design work, or testing required in terms of a specification for the purposes of acceptance by the Engineer of the quality of materials used and/ or workmanship achieved, may be carried out:

- (a) Any testing laboratory certified by the South African National Accreditation Systems (SANAS) in respect of the nature and type of testing to be undertaken for the purposes of the Contract;
- (b) Any testing laboratory owned, managed or operated by the Employer or the Engineer;
- (c) Any testing laboratory established and operated on the Site by or on behalf of the Employer or the Engineer.
- (d) Any other laboratory that the Engineer approves in his absolute discretion."

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.1 MEASUREMENT

PSA 8.1.1 Method of Measurement, All Sections of the Schedule

DELETE THE WORDS "and South West Africa".

PSA 8.1.2 Preliminary and General Item or Section

PSA 8.1.2.1 Contents

REPLACE THE LAST SENTENCE *OF SUBCLAUSE 8.1.2.1(b) WITH THE FOLLOWING:*

“Separate items will be scheduled to cover the fixed, value-related and time-related components of the Contractor’s preliminary and general costs.”

PSA 8.1.2.2 Tendered Sums

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

“Except only where specific provision is made in the Specifications and/or the Schedule of Quantities for separate compensation for any of these items, the Contractor’s tendered sums under items PSA 8.3 and PSA 8.4 shall collectively cover all charges for:

- risks, costs and obligations in terms of the Conditions of Contract and of this standardized specification;
- head-office and site overheads and supervision;
- profit and financing costs;
- expenses of a general nature not specifically related to any item or items of the permanent or temporary work
- providing such facilities on site as may be required by the Contractor for the proper performance of the Contract and for its personnel, including, but without limitation, providing offices, storage facilities, workshops, ablutions, services such as water, electricity, sewage and rubbish disposal, access roads and all other facilities required, as well as for the maintenance and removal on completion of the works of these facilities and cleaning-up of the site of the Contractor’s establishment and reinstatement to not less than its original condition, and
- Providing the facilities for the Engineer and his staff as specified in the Contract and their removal from the site on completion of the Contract.”

PSA 8.2 PAYMENT

PSA 8.2.1 Fixed-charge and Value-related Items

REPLACE THE CONTENTS OF SUBCLAUSE 8.2.1 WITH THE FOLLOWING:

C3.6PSA 8.2.1.1 Fixed-charge Items

“Payment of fixed charges in respect of item 8.3.1 will be made as follows:

- (a) EIGHTY PER CENT (80%) of the sum tendered will be paid when the facilities have been provided and approved;
- (b) The remaining TWENTY PER CENT (20%) will be paid when the works have been completed, the facilities have been removed and the site of the Contractor’s establishment has been cleared and cleaned to the satisfaction of the Engineer.

No adjustment will be made to the sum tendered in respect of item 8.3.1 should the value of the works finally executed or the time for completion vary in any way from that specified to the tender.

PSA 8.2.1.2 Value-related Items

Payment for the sum tendered under item 8.3.2 will be made in three separate instalments as follows:

- (a) The first instalment, which is 40% of the sum, will be paid when the Contractor has fulfilled all his obligations to date under this specification, the General Conditions of Contract and the Special Conditions of Contract, and when the value of work certified for payment, excluding materials on site and payments for preliminary and general items, is equal to not less than 5% of the total value of the work listed in the Bill of Quantities.
- (b) The second instalment, which is 40% of the sum, will be made when the amount certified for payment, including retention moneys but excluding this second instalment, exceeds 50% of the tender sum.
- (c) The final payment, which is 20% of the sum, will be made when the works have been certified as completed and the Contractor has fulfilled all his obligations to date under this Specification, the General Conditions of Contract and the Special Conditions of Contract.

Should the value of the measured work finally completed be more or less than the tender sum, the sum tendered under item 8.3.2 will be adjusted up or down in accordance with the provisions of Clause 7.8 of the Conditions of Contract, and this adjustment will be applied to the third instalment."

PSA 8.2.2 Time-related Items

REPLACE THE CONTENTS OF SUBCLAUSE 8.2.2 WITH THE FOLLOWING:

"Subject to the provisions of sub clauses 8.2.3 and 8.2.4, payment under item 8.4.1 (time-related item) will be made monthly in equal amounts, calculated by dividing the sum tendered for the item by the tendered Contract period in months, provided always that the total of the monthly amounts so paid for the item is not out of proportion to the value of the progress of the Works as a whole."

PSA 8.3 SCHEDULED FIXED-CHARGE AND VALUE-RELATED ITEMS

REPLACE THE CONTENTS OF SUBCLAUSE 8.3.1 WITH THE FOLLOWING:

PSA 8.3.1 Fixed Preliminary and General Charges.....Unit: Sum

The sums tendered shall include full compensation for all fixed-charge preliminary and general charges as described in sub clause PSA 8.1.2.2. Payment will be made as described in sub clause PSA 8.2.1.1."

PSA 8.3.2 Value-related Preliminary and General Charges.....Unit: Sum

The sums tendered shall include full compensation for all value-related preliminary and general charges as described in sub clause PSA 8.1.2.2. Payment will be made as described in sub clause PSA 8.2.1.2."

PSA 8.4 SCHEDULED TIME-RELATED ITEMS

REPLACE THE CONTENTS OF SUBCLAUSE 8.4 WITH THE FOLLOWING:

PSA 8.4.1 Time-related Preliminary and General Charges.....Unit: Sum

The sum tendered shall include full compensation for all time-related preliminary and general charges as described in subclause PSA 8.1.2.2. Payment will be made as described in subclause PSA 8.2.2.2."

PSA 8.5 SUMS STATED PROVISIONALLY BY THE ENGINEER

REPLACE THE CONTENTS OF SUBCLAUSE 8.5 WITH THE FOLLOWING:

PSA 8.5.1 Works executed by the Contractor.....Unit: Prov Sum

The Contractor will be reimbursed in substitution of the Provisional Sums (if any) allowed in the Schedule of Quantities for work to be executed by the Contractor, in the amounts determined in accordance with the provisions of Clause 6.6 of the Conditions of Contract.”

PSA 8.5.2 Works executed by Employer or Nominated Sub-Contractors

(a) Work to be executed by Employer or a Nominated Subcontractor Unit: Prov Sum

(b) Overheads, charges and profit on items (a) above Unit: % or Sum

Sub items (a) and (b) will be provided in the Schedule of Quantities for the Employer and each different Nominated Subcontract included in the Contract.

The Contractor shall be reimbursed under sub item (a), in substitution of the respective Provisional Sums (if any) allowed in the Schedule of Quantities, the amounts actually paid or payable by the Contractor to the Employer or respective Nominated Subcontractors, in accordance with the provisions of Clause 6.6.1.2 of the Conditions of Contract.

The Contractor shall be paid under sub item (b), either:

(a) where the unit of measurement for sub item (b) was specified as being a percentage, the respective percentage, as stated by the Contractor in its tender, of the amount certified by the Engineer for payment under the related sub item (a), all in accordance with the provisions of Sub clause 6.6.1.2.1 of the Conditions of Contract, or

(b) where the unit of measurement for sub item (b) was specified as being a lump sum, an amount which is in the same proportion to the amount certified for payment under sub item (a) and the tendered lump sum is to the amount of the provisional Sum stated under sub item (a);

provided always that where the Contractor has failed for any reason to insert a percentage or sum (as applicable) for sub item (b) in its tender, or where no provision was made in the tender documents for tenderers to make any such entry, the Contractor will, in accordance with the provisions of Sub clause 6.6.1.2.1, be paid an amount equal to SEVEN AND ONE HALF PER CENT (7,5%) of the amount actually certified by the Engineer for payment under sub item (a).

The percentage or sum (as applicable) paid under sub item (b) as aforesaid, shall be deemed to include for full and final compensation to the Contractor for all costs as may be incurred and all charges and profits associated with the engagement, supervision, administration and management of the Nominated Subcontractor required of him in fulfilling its obligations under the Contract as per the Principal Contractor.”

PSA 8.6 PRIME COST ITEMS

REPLACE SUBCLAUSE 8.6 WITH THE FOLLOWING:

PSA 8.6 PRIME COST SUMS

(a) Description of item to which Prime Cost Sum applies Unit: PC Sum

(b) Charge required by Contractor on subitem (a) above Unit: %

Subitems (a) and (b) will be provided in the Schedule of Quantities for each different item to which a Prime Cost Sum applies.

The Contractor shall be reimbursed under subitem(s) (a) in substitution of the respective Prime Cost Sums included in the Contract, the actual price(s) paid or payable by him in respect of the goods, materials or services supplied, but excluding any charges for the Contractor's labour, profit, carriage, establishment or other charges related to such goods, services or materials.

The Contractor shall be paid under subitem (b), the respective percentage, as stated by the Contractor in his tender, of the amount certified by the Engineer for payment under the related subitem (a). The percentages tendered by the Contractor for each respective subitem (b) included in the Schedule of Quantities shall be deemed to be in full and final compensation to the Contractor in respect of any charge by the Contractor for labour, carriage profit, establishment and for any other charges related to the goods, services or materials supplied under the related subitem (a).

If the Contractor shall have omitted within his tender to insert a tendered percentage under subitem (b), or tendered a zero percentage, the Contractor's tendered rate for subitem (b) shall be deemed to be zero and the Contractor shall not be entitled to any payment under subitem (b).

Note in connection with additional tests required by the Engineer:

When a PC sum is included in the Schedule of Quantities for additional test required by the Engineer, the Contractor shall be responsible for both the cost of normal testing as described in subclause PS 8.2 in portion 1 of the Project

Specifications and for the cost of any additional test that indicates that the specifications have not been complied with."

PSA 8.7 DAYWORK

REPLACE THE CONTENTS OF SUBCLAUSE 8.7 WITH THE FOLLOWING:

"Measurement and payment shall be in accordance with the provisions of Subclause 6.5 of the Conditions of Contract."

PSA 8.8 TEMPORARY WORKS

ADD THE FOLLOWING ITEMS:

PSA 8.9 WAYLEAVE Unit: Sum

The tendered sum shall include full compensation to the Contractor for all the costs involved in obtaining the wayleaves as specified in Portion 1 of the Project Specifications.

PSA 8.10 COMPLIANCE WITH OHS ACT AND REGULATIONS (INCLUDING THE CONSTRUCTION REGULATIONS 2003) Unit: Sum

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, as described in PS 8.7 of Portion 1 of the Project Specifications. The successful tenderer shall provide the Engineer 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.”

C3.6 PSA 8.11 COMPLIANCE WITH NEMA (ACT NO. 107 OF 1998) AND ECA NO 73 OF 1989.....Unit: Sum

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of National Environmental Management Act (Act No. 107 of 1998) and the Environmental Conservation Act, No 73 of 1989. The two Acts” are not necessarily complete requirements and the onus shall remain on the contractor to ensure that all relevant legislation are conformed with.

This sum will be paid to the Contractor in equal monthly amounts subject to proper / substantial compliance.”

PSAB ENGINEER’S OFFICE

C3.6PSAB 3 MATERIALS

C3.6 PSAB 3.1 NAMEBOARDS

Number of Name Boards: ONE

C3.6 PSAB 3.2 OFFICE BUILDING(S)

Number of Office Buildings required: ONE

C3.6 PSAB 3.3 CARPORT

Number of Car Ports required: ONE

C3.6 PSAB 4 PLANT

C3.6 PSAB 4.1 TELEPHONE

REPLACE SUBCLAUSE 4.1 OF SABS 1200 AB WITH THE FOLLOWING:

“No telephone system required by Engineer”

ADD THE FOLLOWING NEW SUBCLAUSES TO CLAUSE 4 OF SABS 1200 AB:

C3.6 PSAB 4.2 COMPUTER EQUIPMENT

“No computer equipment required by Engineer”.

C3.6 PSAB 4.2.2 Computer Software

“No computer software required by Engineer”.

C3.6 PSAB 4.4 SURVEY EQUIPMENT

The Contractor shall provide onsite and make available for the exclusive use of the Engineer and his staff, the survey equipment listed in Portion 1 of the Project Specifications.

All survey equipment provided by the Contractor shall be in good condition, properly calibrated and fit for the purpose.

In addition to survey equipment provided by the Contractor for the exclusive use of the Engineer and his staff, the Contractor shall make available for use by the Engineer, the further survey equipment listed in Portion 1 of the Project Specifications, at all times when such is reasonably required by the Engineer and his staff for the purposes of the Contract.

C3.6 PSAB 4.5 CAMERA

“No camera equipment required by ENGINEER”.

C3.6 PSAB 5 CONSTRUCTION

C3.6 PSAB 5.4 TELEPHONE

REPLACE THE CONTENTS OF SUBCLAUSE 5.4 OF SABS 1200 AB WITH THE FOLLOWING:

C3.6 PSAB 5.4.2 Cellphones

“No cellphone equipment required by Engineer”.

ADD THE FOLLOWING NEW SUBCLAUSES TO CLAUSE 5 OF SABS 1200 AB:

C3.6 PSAB 5.6 COMPUTER EQUIPMENT

“No computer equipment required by Engineer”.

C3.6 PSAB 5.8 SURVEY EQUIPMENT

All survey equipment provided by the Contractor shall be kept fully serviceable at all times by the Contractor. The Contractor shall have any defective equipment repaired or replaced at his own cost within 12 hours after notification by the Engineer’s staff.

Where required by the Engineer, the Contractor shall, at his own cost, promptly arrange for the recalibration of survey equipment provided.”

PSC SITE CLEARANCE

PSC 3 MATERIALS

PSC 3.1 DISPOSAL OF MATERIAL

ADD THE FOLLOWING:

“The Contractor shall obtain his own dumping sites for the disposal of material and all transport costs shall be included in the rates tendered for site clearance.”

PSC 5 CONSTRUCTION

PSC 5.1 AREAS TO BE CLEARED AND GRUBBED

ADD THE FOLLOWING:

“Pipeline routes shall be cleared to a distance of 5m across the pipeline line. Route pegs or markers shall not be destroyed or damaged during clearing operations.”

C3.6PSC 5.2 CUTTING OF TREES

PSC 5.2.3 Preservation of Trees

PSC 5.2.3.2 Individual Trees

REPLACE THE LAST SENTENCE WITH THE FOLLOWING:

“An amount of R1 000,00 will be deducted from moneys due to the Contractor as a penalty for every tree that is damaged or removed unnecessarily.”

PSC 5.5 RECLEARING OF VEGETATION

ADD THE FOLLOWING:

“When areas have to be re-cleared on the written instructions of the Engineer, such reclearing shall be carried out at the Contractor’s own cost and the Contractor is therefore advised not to clear the areas too soon.”

PSC 8 MEASUREMENT AND PAYMENT

PSC 8.2 PAYMENT

PSC 8.2.1 Clear and Grub

REPLACE THE FIRST LINE WITH THE FOLLOWING:

“The area designated by the Engineer to be cleared and grubbed will be measured in square metre to the nearest square metre or,”

PSC 8.2.2 Remove and Grub Large Trees and Tree Stumps.....Unit: No

The tendered rate shall include full compensation for removing large trees and tree stumps of girth over 1.0m and up to and including 2.0m and for loading and transporting the material to spoil sites furnished by the Contractor.”

ADD THE FOLLOWING ITEMS IN SUBCLAUSE 8.2:

PSC 8.2.10 Remove Grassed Topsoil.....Unit: m³

The rate shall cover full compensation for removing grassed topsoil in tuffs to a nominal depth of 150mm. The tuffs need to be maintained until replanting takes place.

PSC 8.2.11 Take Down and Re-erect Existing Fences.....Unit: m

The rate shall cover the cost of taking down the fences, coiling wire, sorting, stacking and guarding all materials, the cost of loading, transporting and off-loading such materials, the cost of re-erecting the fence in its original position using the dismantled material, the cost of temporary bracing of the fencing

sections not taken down and the cost of appurtenant materials that may be required to restore the fence to its original condition before dismantling.

PSC 8.2.12 Remove Topsoil to Spoil Site furnished by Contractor.....Unit: m³

The tendered rate shall include full compensation for removing topsoil to a depth of 150 mm and for loading and transporting the material to spoil sites furnished by the Contractor.”

PSD EARTHWORKS

PSD 2 INTERPRETATIONS

PSD 2.1 SUPPORTING SPECIFICATIONS

REPLACE SUBCLAUSE 2.1.2 WITH THE FOLLOWING:

“PSD 2.1.2 any of the other SABS 1200 specifications may form part of the Contract documents.”

PSD 2.3 DEFINITIONS

REPLACE THE WORD AND THE DEFINITION FOR “Borrow” WITH THE FOLLOWING:

“Borrow Material: Material, other than material obtained from excavations required for the works, obtained from sources such as borrow pits or the authorised widening of excavations. ‘Borrow’ shall have a corresponding meaning.”

REPLACE THE DEFINITION FOR “Specified density” WITH THE FOLLOWING:

“Specified Density: The specified dry density expressed as a percentage of modified AASHTO dry density.”

REPLACE THE DEFINITION FOR “Stockpile” WITH THE FOLLOWING:

“Stockpile (verb): The process of selecting and, when necessary, loading, transporting and off-loading material in a designated area for later use for a specific purpose”

“Commercial Source: A source of material provided by the Contractor, not the Employer, and including any borrow pit, provided by the Contractor

Fill: An embankment or terrace constructed of material obtained from excavations or borrow pits. In roads it includes the earthworks up to the underside of the selected subgrade level.

Fill (material): Material used for the construction of an embankment or terrace

Roadbed: The natural in situ material on which the fill or, in the absence of fill, the pavement layers are constructed”.

PSD 3 MATERIALS

PSD 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES

PSD 3.1.1 Method of Classifying

ADD THE FOLLOWING:

“The classification of material other than ‘soft excavation’ shall be agreed upon before excavation may commence. The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated changes to such an extent that a new classification is warranted for further excavation. Failure on the part of the Contractor to advise the Engineer in good time shall entitle the Engineer to reclassify, at his discretion, such excavated material.”

PSD 3.2.3 Material Suitable for Backfill or Fill against Structures

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

“Material used for backfill behind structures shall generally be the material excavated, subject to the following conditions:

- (a) The material shall not contain an excessive number of stones retained on a 50 mm sieve;
- (b) The material shall not contain large clay lumps that do not break up under the action of the compaction equipment; and
- (c) The liquid limit of the material shall not exceed 40, neither shall the PI exceed 18.”

PSD 3.3 SELECTION

ADD THE FOLLOWING SUBCLAUSE:

PSD 3.3.3 Selection in Borrow Pits and Excavations

“Approval of a borrow area for a certain purpose does not necessarily mean that all the material in that area is suitable for the specified purpose. What it does mean is that the borrow area contains some suitable material. The onus shall rest on the Contractor to ensure that only material that is indeed suitable is removed and used for the specified purpose. When the Contractor has to select excavated material for a specific purpose, the above provisions relating to borrow areas shall apply *mutatis mutandis* to excavations. The Contractor shall not waste or contaminate material that has been selected for a specific purpose.”

PSD 4 PLANT

PSD 4.4 DETECTORS

REPLACE THE CONTENTS OF SUB CLAUSE 4.4 WITH THE FOLLOWING:

“The Contractor shall, for the purposes of detecting and locating underground services in accordance with the provisions of sub clause 5.4 of SABS 1200 A and sub clause 5.1.2 of SABS 1200D, at his own cost, provide and use detecting equipment which is suitable for the detection of underground cables and pipes.”

PSD 5 CONSTRUCTION

PSD 5.1 PRECAUTIONS

PSD 5.1.1 Safety

PSD 5.1.1.1 Barricading and Lighting

REPLACE

“Machinery and Occupational Safety Act, 1983 (Act 6 of 1983)” *WITH* “Occupational Health and Safety Act, 1993 (Act 85 of 1993).”

PSD 5.1.1.2Safeguarding of Excavations

REPLACE

“Machinery and Occupational Safety Act *WITH* “Occupational Health and Safety Act, 1993 (Act 85 of 1993).”

PSD 5.1.1.3Explosives

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

“The Contractor will generally be permitted to use explosives for breaking up hard material during excavations, for demolishing existing structures, and for other purposes where explosives are normally required, subject to the following conditions:

- (a) The Engineer may prohibit the use of explosives in cases where, in his opinion, the risk of injury to persons or damage to property or to adjoining structures is too high. Such action by the Engineer does not entitle the Contractor to additional payment for having to resort to less economical methods of construction.
- (b) The Engineer’s prior written approval shall be obtained for each and every blasting operation. This approval may be withheld if the Contractor does not use explosives responsibly and carefully.
- (c) The Contractor shall comply fully with the requirements of the Explosives Act, 1997 (Act No 83 of 1997) and all other legislation and regulations as may be applicable to blasting and the use of explosives.
- (d) Before blasting is undertaken, the Contractor shall satisfy the Engineer that he has established whether or not the insurers concerned require pre- and post-blasting inspections of buildings and structures within a certain radius of the proposed blasting.
Should such inspections be required, the Contractor shall, together with the Engineer and the insurer, examine and measure the buildings, houses or structures in the vicinity of the proposed blasting site and establish and record, together with the owner, lessee or occupier, the extent ;of any existing cracking or damage before blasting operations commence.
- (e) When there is a possibility of damage to power and telephone lines or any other services or property, the Contractor shall adapt his method of blasting and the size of the charges and shall use adequate protective measures (eg cover-blasting) to reduce the risk of damage.
- (f) All accidents, injury to persons and animals and damage to property shall be reported to the Engineer in detail and in writing as soon as is practicable.
- (g) The Engineer shall be given 24 hours notice by the Contractor before each blasting operation is carried out.
- (h) When blasting to specified profiles, the Contractor shall so arrange the holes and charges that the resulting exposed surfaces are as sound as the nature of the material permits. The Contractor shall make good, at his own expense, any additional excavation necessitated by the shattering of rock in excess of any over break allowances specified in the Project Specifications or given on any Drawing.
- (i) Notwithstanding the Contractor’s compliance with the above provisions, the Contractor shall remain liable for any injury to person and animals and loss of or damage to property occurring as a result of blasting operations.”

PSD 5.1.2 Existing Services

PSD 5.1.2.2 Detection, Location and Exposure

REPLACE THE CONTENTS OF SUBCLAUSE 5.1.2.2 WITH THE FOLLOWING:

“The exposure by the Contractor of underground services, as required in terms of subclause 5.4 of SABS 1200 A (as amended) shall be carried out by careful hand excavation at such positions and to such dimensions as are agreed to by the Engineer.

Unless otherwise instructed or agreed by the Engineer, no service shall be left exposed after its exact position has been determined and all excavations carried out for the purposes of exposing underground services shall be promptly backfilled and compacted to the following densities:

- (a) In roadways: 90% Mod AASHTO density; and
- (b) In all other areas: 93% Mod AASHTO density.

Where hand excavations to expose underground services have to be carried out in roadways, the Contractor shall reinstate the road layerworks in accordance with the provisions of subclause 5.9 of SABS 1200 DB. Payment in respect of exposing the services by means of hand excavation as described above, will be made in accordance with subclause PSD 8.3.8.1. Payment in respect of reinstating layerworks in roadways will be made in accordance with subclause 8.3.6.1 of SABS 1200 DB (as amended).”

PSD 5.1.2.3 Protection of Cables

REPLACE SUBCLAUSE 5.1.2.3 WITH THE FOLLOWING:

“PDS 5.1.2.3 Protection during Construction

Further to the requirements of subclause 5.4.2 of SABS 1200 A (as amended), major excavating equipment and other plant shall not be operated dangerously close to known services. Where necessary, excavation in close proximity to known services shall be carefully carried out with suitable hand tools, excluding picks wherever their use could damage the services. No additional payment will apply to such more difficult work.

Should any service not being a known service be discovered or encountered during the course of the Contract, the Contractor shall, in addition to complying with the requirements of subclause 5.4.2 of SABS 1200 A (as amended), immediately notify the Engineer thereof and implement such measures as will prevent damage of such service or, if it was damaged in the course of discovery, will prevent and minimise the occurrence of any further damage occurring.”

PSD 5.1.2.4 Negligence

DELETE SUBCLAUSE 5.1.2.4.

PSD 5.1.3 Storm water and Groundwater

ADD THE FOLLOWING:

“The Contractor shall, where applicable and at the earliest practicable opportunity, install the permanent drainage specified or shown on the Drawings and shall at his own cost provide the temporary drainage required to protect the works.”

PSD 5.1.5 Reinstatement and Maintenance of Roads

ADD THE FOLLOWING:

“Where crossings have been made, the roads shall be reinstated in accordance with the details specified in sub clause 5.9 of SABS 1200 DB.”

PSD 5.1.6 Road Traffic Control

DELETE THE SECOND SENTENCE OF SUBCLAUSE 5.1.6.

PSD 5.2 METHODS AND PROCEDURES

PSD 5.2.2 Excavation

PSD 5.2.2.1 Excavation for General Earthworks and for Structures

ADD THE FOLLOWING TO PARAGRAPH (b):

“When the nature of the material precludes the above procedure, additional excavations shall be carried out to provide working space for the erection of formwork. In general, payment will be made for excavating a working width of 600 mm, but the Contractor may excavate a greater working width at no additional cost to the Employer.”

REPLACE THE FIRST SENTENCE OF PARAGRAPH (e) WITH THE FOLLOWING

“Where excavations have been carried below the authorised levels, the Contractor shall backfill such excavations to the correct level with approved gravel compacted to 90% of modified AASHTO density or to the density of the surrounding material, whichever is the higher density.

Where excavations for structures have been carried out in hard material, the Engineer may direct that over-excavation be backfilled with weak concrete if there is a danger of settlement or differential settlement of the foundations.

Where the sides of excavations against which concrete is to be cast have been over-excavated or have collapsed partially, the Contractor shall retrim the excavations if necessary and, unless other remedial measures are agreed to by the Engineer, shall cast the concrete for the structure, including the additional concrete that may be required as a result of the over-excavation or partial collapse. The cost of the additional concrete or remedial measures shall be for the Contractor's account.”

PSD 5.2.2.3 Disposal

REPLACE THE SECOND SENTENCE WITH THE FOLLOWING:

“The Contractor shall provide all necessary spoil sites for the spoiling of all surplus and unsuitable materials and shall make the necessary arrangements with the owner of the site where the material is disposed of, and pay all charges and levies as may be applicable for the use of such spoil sites.

Every spoil site provided by the Contractor shall be approved by the local authority in whose area it is located, and the spoiling shall comply with the applicable statutory and municipal regulations as well as the requirements of the owner of the spoil site.

Payment to the Contractor in respect of locating and making arrangements for suitable spoil sites and spoiling material at such sites will be made in accordance with the provisions of subclause PSD 8.3.15.”

ADD THE FOLLOWING SUBCLAUSE IN SUBCLAUSE 5.2.2:

PSD 5.2.2.4 Selection and Stockpiling

“Approval or designation of the material in a particular borrow pit or excavation for a particular purpose does not imply that all the material in the borrow pit or excavation is suitable for the particular purpose to which the said approval or designation relates, nor that all material in the borrow pit or source should be used for the particular purpose. The Contractor shall select suitable material from that borrow pit or source, discard unsuitable material and reserve material for other purposes as necessary.

The Contractor shall organise and carry out his operations in such a manner as will prevent the contamination of suitable embankment and backfill material with unsuitable materials. Any excavated material which becomes, in the Engineer’s opinion, unsuitable for use in embankments or backfill as a result of contamination, shall be disposed of in a manner acceptable to the Engineer and shall be replaced by the Contractor with materials acceptable to the Engineer, all at the Contractor’s cost.

When required, or when ordered by the Engineer, material shall be stockpiled for later use. The additional costs for stockpiling material shall be paid to the Contractor in accordance with the provisions of subclause PSD 8.3.14.”

PSD 5.2.5 Transport for Earthworks

REPLACE THE CONTENTS OF SUB CLAUSE 5.2.5 WITH THE FOLLOWING:

“The transport of all excavated materials, irrespective of the distance and source, shall be deemed to be free-haul, the cost of which is included in the Contractor’s tendered rates and prices for the excavation of the materials. No separate compensation shall apply for the transportation of excavated materials.”

PSD 7 TESTING

PSD 7.2 TAKING AND TESTING OF SAMPLES

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

“The Contractor shall arrange with the approved independent laboratory engaged by the Contractor in terms of sub clause PS 8.2.1 of Portion 1 of the Project Specifications to carry out sufficient test on a regular basis as agreed between him and the Engineer to determine whether the degree of compaction, and, where applicable, the quality of materials used, comply with the Specifications and shall submit the results of these tests to the Engineer in a form approved by him.

The compaction requirements for fills shall be deemed complied with when at least 75% of the dry-density tests on any lot show values equal to or above the specified density and when no single value is more than five percentage points below the specified value.”

PSD 8 MEASUREMENT AND PAYMENT

PSD 8.3 SCHEDULED ITEMS

PSD 8.3.1 Site Preparation

REPLACE SUB CLAUSES 8.3.1.1 AND 8.3.1.2 WITH THE FOLLOWING:

“Where site preparation such as clearing, grubbing, the removal of large trees or the removal and stockpiling of topsoil is required, the provisions and scheduled items of SABS 1200 C shall apply.”

PSD 8.3.2 Bulk Excavation

REPLACE THE CONTENTS OF ITEM WITH THE FOLLOWING:

“(a) Excavate in all materials and use for embankment or backfill as ordered, from:

(1) Necessary excavations.....Unit: m³

(2) Commercial sources.....Unit: m³

The unit of measurement shall be the cub metre measured in place in accordance with sub clause 8.2 of SABS 1200 D.

Separate items will be scheduled for embankments and backfills for different parts of the works.

The tendered rates shall cover the cost of complying with all the precautions required in terms of sub clause 5.1 of SABS 1200 D (as amended), in addition to the cost of excavating in all materials, basic selecting, loading, transporting, off-loading, spreading or backfilling, watering, compacting, final grading, complying with the requirements for tolerances, providing for testing, finishing and tidying, all in accordance with the specifications.

In addition to the foregoing, the tendered rate for sub item (2) shall further include for the cost of royalties (if applicable), whilst the tendered rate for sub item (3) shall also include for the costs of finding a source of suitable material, for making arrangements with the owner of the source, for procuring the material, for the payment of all requisite royalties, charges or damages, and for transporting the material to the site regardless of the distance involved. No payment will be made for the removal of overburden or stockpiling at the commercial source and no extra over payment shall apply for excavating in intermediate, hard or boulder material.”

“(b) Excavate in all materials and dispose.....Unit: m³

The unit of measurement shall be the cubic metre of material excavated, measured in place in accordance with sub clause 8.2 of SABS 1200 D.

The tendered rates shall cover the cost of complying with all the precautions required in terms of sub clause 5.1 of SABS 1200 D (as amended), in addition to the cost of excavating, basic selecting, loading, transporting, off-loading at the spoil site, maintaining and finishing the spoil site, all in accordance with the specifications.

(c) Extra over sub items PSD 8.3.2(a)(1), PSD 8.3.2(a)(2) and PSD 8.3.2(b) for:

(1) Intermediate excavation.....Unit: m³

- (2) Hard rock excavation.....Unit: m³
- (3) Boulder excavation, Class A.....Unit: m³
- (4) Boulder excavation, Class B.....Unit: m³

The rate shall cover the additional cost of the operation enumerated in sub clauses 8.3.2 (a) and 8.3.2 (b) above for any portion of the excavation that is classified as intermediate, hard rock, boulder excavation class A or boulder excavation class B as applicable (See Drawing D-2)".

PSD 8.3.3 Restricted Excavation

REPLACE THE WORDS "in 1 m increments" AT THE END OF THE FIRST SENTENCE OF SUBITEM (a) WITH "in the increments indicated in the Schedule of Quantities".

REPLACE "in 5.2.2.1 – 5.2.2.3 (inclusive)" AT THE END OF SUBCLAUSE (a) WITH "in sub clauses 5.2.2.1 to 5.2.2.5 (inclusive)".

ADD THE FOLLOWING SUB-SUBITEM:

- "(c) Excavate over sub item 8.3.3 (a) for hand excavation.....Unit: m³

This item shall apply to hand excavation ordered by the Engineer or when the Engineer considers that, owing to circumstances, excavation by mechanical excavators is not practicable. It shall not apply to hand excavation for trimming or finishing an excavation made by mechanical means.

The tendered rate shall include full compensation for the additional cost of excavating by means of hand tools."

PSD 8.3.4 Importing of Materials

DELETE SUBITEM (a) OF 8.3.4.

PSD 8.3.6 Overhaul

DELETE SUBCLAUSE 8.3.6

PSD 8.3.8 Existing Services

PSD 8.3.8.1 Location

REPLACE ITEM 8.3.8.1 WITH THE FOLLOWING:

"8.3.8.1 Hand excavation for locating and exposing existing services:

- (a) In roadways.....Unit: m³
- (b) In all other areas.....Unit: m³

The unit of measurement shall be the cubic metre of material excavated, measured in place according to the authorised or actual dimensions of the excavation, whichever is the lesser.

The tendered rates shall cover the cost of excavating in all materials by means of hand tools within authorised dimensions and at locations approved by the Engineer in accordance with the requirements of sub clause PSA 5.4.1 for all precautionary measures necessary to protect the services from damage during excavation and backfilling, and for subsequent backfilling and compacting. Compaction of material in all areas except in roadways shall be to 90% of the modified AASHTO density.

The tendered rate for hand excavation in roadways shall include compensation for compacting excavated or selected backfill material to 93% of modified AASHTO density. Reinstating layerworks and surfacing shall be measured and paid for in terms of SABS 1200 DB.

The tendered rates shall also include for keeping excavations safe, for dealing with surface and subsurface water, for removing surplus excavated material from the site, for transporting all material, and for supplying adequate supervision during both excavation and backfilling operations."

PSD 8.3.12 Road TRAFFIC SIGNS AND MARKINGS

REPLACE THE WORD "Separate" IN THE FIRST SENTENCE OF ITEM 8.3.12 WITH THE FOLLOWING:

"Where the Engineer requires the provision of road traffic signs and/or road markings and/or any other measures additional to those to be provided by the Contractor in accordance with sub clause 5.1.6, separate..."

ADD THE FOLLOWING ITEMS IN SUB CLAUSE 8.3:

PSD 8.3.14 Extra over items PSD 8.3.2(a)(1) and PSD 8.3.3 for temporary stockpiling
.....Unit: m³

The unit of measurement shall be the cubic metre of material from necessary excavations, temporarily stockpiled by the Contractor on the instructions of the Engineer, before being used in embankments or backfill. Measurements shall be taken in compacted embankment or backfill as the case may be.

The tendered rate shall include for the costs, additional to those provided for in PSD 8.3.2(a)(1) and PSD 8.3.3, of off-loading, forming and maintaining the stockpile for as long as is required, reloading and transporting.

Payments to the Contractor under this item will only be made in respect of that material stockpiled on the instructions of the Engineer (which instruction shall state specifically that payments for such stockpiling will be paid for under this item) and no payments will be made to the Contractor under this item in respect of materials stockpiled by the Contractor on his own volition, nor for materials necessarily stockpiled by the Contractor in consequence of the sequence of operations adopted by him in the course of executing the works, whether such stockpiling was avoidable or otherwise."

PSD 8.3.15 Extra over items PSD 8.3.2(b) and PSD 8.3.3 for disposing of spoil material on a site provided by the Contractor.....Unit: m³

The unit of measurement shall be the cubic metre measured in accordance with sub clause 8.2 of SABS 1200 D of surplus and/or unsuitable material disposed of, on the instruction of the Engineer, at a spoil site or spoil sites provided by the Contractor.

The tendered rate shall include full compensation for the additional cost of providing a spoil site or other means of disposing of surplus spoil material, for transporting the material regardless of the distance

involved, for acceptance charges for such material and for all other incidental costs to dispose of the spoil material.”

PSDB EARTHWORKS (PIPE TRENCHES)

PSDB 3 MATERIALS

PSDB 3.5 BACKFILL MATERIALS

ADD THE FOLLOWING PARAGRAPHS TO SUBCLAUSE 3.5:

“(a) Cement-stabilized backfilling

Backfilling shall, where directed by the Engineer, be stabilized with 5% cement. The aggregate shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed with 5% cement and shall be compacted in layers of 100 mm thick to 90% of modified AASHTO density.

(b) Soilcrete backfilling

The aggregate for soilcrete shall be mixed with 5% cement and shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed in a concrete mixer with the cement and enough water to acquire a consistency that allows the mixture to be placed with vibrators to fill all voids between the pipe and the sides of the trench. Shuttering shall be used where necessary.”

PSDB 3.7 SELECTION

REPLACE THE WORDS “if he so wishes” IN THE FIRST LINE OF THE SECOND PARAGRAPH WITH THE WORDS “at his own cost”.

PSDB 5 CONSTRUCTION

PSDB 5.1 PRECAUTIONS

PSDB 5.1.3 Accommodation of Traffic and Access to Properties

REPLACE THE SEMICOLON AND THE WORD “and” AT THE END OF SUBCLAUSE 5.1.3(a) WITH A FULL STOP AND REPLACE ITEM (b) WITH THE FOLLOWING:

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

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

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

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

PSDB 5.2 MINIMUM BASE WIDTHS

REPLACE PARAGRAPH (a) WITH THE FOLLOWING:

"Where two pipes are placed in the same trench, they shall be 300 mm apart and the specified side allowance shall still be applicable."

ADD THE FOLLOWING AFTER PARAGRAPH (b):

"The above is not applicable to trenches for subsurface drains.

Trenches for subsurface drains shall be excavated to the dimensions and gradients shown on the Drawings or directed by the Engineer.

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

PSDB 5.4 EXCAVATION

ADD THE FOLLOWING:

"Except where otherwise specified, trenches shall be of such a depth that the minimum cover over the pipes shall be 700 mm except at road-crossings where the minimum cover shall be 1000 mm".

PSDB 5. BACKFILL

PSDB 5.6.3 Disposal of soft excavation material

REPLACE THE WORKS "unless otherwise required in the project specification." AT THE END OF SUBCLAUSE 5.6.3 WITH:

"...or to spoil in accordance with the requirements of subclause PSD 5.2.2.3, as instructed by the Engineer."

PSDB 8 MEASUREMENT AND PAYMENT

PSDB 8.3 SCHEDULED ITEMS

PSDB 8.3.2 Excavation

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

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

“as specified in the Schedule of Quantities.”

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

ADD THE FOLLOWING AT THE END OF THE EXISTING SUBITEM 2:

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

AND ADD THE FOLLOWING NEW SUBITEMS IN 8.3.2(b):

“(3) Hand excavation where ordered by the Engineer in:

(a) Soft material.....Unit: m³

(b) Intermediate material.....Unit: m³

(c) Hard material.....Unit: m³

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

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

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

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

(4) Backfill stabilized with 5% cement where directed by the Engineer.....Unit: m³

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

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

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

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

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

PSDB 8.3.3 Excavation Ancillaries

PSDB 8.3.3.3 Compaction in Road Reserves

REPLACE THE HEADING OF THIS SUBITEM WITH THE FOLLOWING:

PSDB 8.3.3.3 Compaction in road crossings”

REPLACE THE SENTENCE, “The volume will be measured as specified in 8.2.2, 8.2.3 and 8.3.3.1”, WITH THE FOLLOWING:

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

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

PSDB 8.3.3.4 Overhaul

REPLACE THE CONTENTS OF THIS ITEM WITH THE FOLLOWING:

“Measurement and payment shall be in accordance with sub clause PSD 5.2.5.”

PSDB 8.3.7 Accommodation of traffic

REPLACE THE HEADING AND CONTENTS OF ITEM 8.3.7 WITH THE FOLLOWING:

PSDB 8.3.7 “Accommodation of traffic.....Unit: sum

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

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

The tendered lump sum shall not be adjusted in the even of any extension of time for completion being granted by the Engineer in accordance with Clause 6.6 of the Conditions of Contract.

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

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

PSDB 8.3.8 Replant grass sods over trench backfill.....Unit: m²

“The unit of measurement shall be the square metre measured of grass sods planted in accordance with instruction of the Engineer.

The tendered rate shall include full compensation for the additional cost of providing grass sods, for transporting the grass sods regardless of the distance involved, for acceptance charges for such grass sods and for all other incidental costs to dispose of the spoil material.”

PSDB 8.3.9 Permanent Berms from displaced material.....Unit: m

“The unit of measurement shall be the linear metre of permanent berm constructed measured in accordance with instruction of the Engineer.

The tendered rate shall include full compensation for the additional cost of providing permanent berms, for transporting the material regardless of the distance involved, for acceptance charges for such material and for all other incidental costs to dispose of the spoil material.”

PSDE SMALL EARTH DAMS (SABS 1200 DE)

PSDE 3. MATERIALS

PSDE 3.1.2 CLASSIFICATION FOR EXCAVATION PURPOSES: CLASSES OF EXCAVATION

Intermediate excavations {3.1.2(b)} and boulder excavation Class A {3.1.2(d)} shall be classified as soft excavation {3.1.2(a)} and boulder excavation Class B {3.1.2(e)} shall be classified as {3.1.2(c)}.

PSDE 3.2.1(b) EARTH FILL MATERIALS

The compacted layer thickness of fill used for the construction of the dam embankment must not be more than 150mm. All rock and stones larger than 130mm nominal diameter must be removed from fill material. Topsoil shall not be used as fill material.

PSDE 3.3.1 SELECTION: GENERAL

The Contractor shall take care as not to pollute any useful material from excavations.

PSDE CONSTRUCTION

PSDE 5.1.2 PRECAUTIONS: EXISTING SERVICES (Also see PS.7)

The Contractor must expose all existing services - before commencement of excavations - which has been pointed out to him. No additional payment will be made if any of these services are damaged and any direct or consequential cost due to the damage of existing services will be for the contractor’s account.

The cost for exposing existing services as pointed out to the Contractor on site must be covered by the tender rates for crossing services or working parallel with services. Where there is reason to expect the presence of services, other than that covered under the items “crossing existing services” or “working parallel with existing services” payment will be made for the location of such services as per Payment Clause 8.3.8.1 (c).

PSDE 5.2.1.1 METHODS AND PROCEDURES: CLEARING AND STRIPPING OF SITE

The following areas must be cleared and grubbed:

Anaerobic pond area

PSDE 5.2.1.2 STRIPPING

Stripping of any remaining vegetation shall be done as a separate action and only after clearance of the Site. Stripping shall only be done under specific written instruction by the Engineer. Stripping shall only be ordered over fill areas.

PSDE 5.2.1.3 TOPSOIL

Topsoil shall be removed from the storage reservoir area to a depth specified by the Engineer on Site and stockpiled for re-use to cover the outside areas of the embankments. No other topsoil removal shall be done unless specifically ordered by the Engineer in writing.

PSDE 5.2.2.4 DISPOSAL

Surplus material and material unsuitable for backfill shall be spoiled at off-site spoil sites.

PSDE 5.2.3.1 ALLOWANCE FOR SETTLEMENT

It is expected that the crest of the storage reservoir shall settle somewhat during the construction period and immediately thereafter. To allow for such settlement, the embankment must throughout be raised with 100mm above than what is shown on the drawings.

The cost for the additional fill must be included under the rates under Clause 8.3.5. No separate payment shall be made for this additional fill.

PSDE 5.2.3.2 EMBANKMENT

No grassing of outside embankments of reservoir is required.

PSDE 5.2.3.3.2 (d) WALL DENSITIES

The following densities are required for all fills: Main fill from bulk excavations: 98% Proctor;

PSDE 3.3.1 MOISTURE CONTENT

The Contractor shall arrange for testing of soil from bulk excavations to determine the material's optimum moisture content. Under no circumstances shall material be compacted with the moisture content of the material lower, or higher than the optimum moisture content + 3%.

The Contractor shall ensure that fill material shall not be allowed to dry after having placed. Should any crack appear due to drying out the Contractor shall harrow and recompact at the correct moisture content.

The rates under Clause 8.3.5 must allow for all cost for the above requirement.

PSDE 5.2.5.1 TRANSPORT FOR EARTHWORKS: FREEHAUL

The free haul distance within which the Contractor will be required to move material without separate compensation shall be 2.0 km.

PSDE 5.2.5.2 TRANSPORT FOR EARTHWORK: OVERHAUL

No overhaul will be paid for material transported to any of the Spoil Sites within the 2.0 km free haul distance. Prior written approval from the Engineer is in all cases required before any overhaul will be payable.

PSDE 5.2.3.4 BACKFILLING AROUND STRUCTURES

The tariff for over excavation must allow for the backfilling and compaction with approved material as specified in PSD.5.

PSDE 7.2 TAKING AND TESTING OF SAMPLES

The Contractor shall provide a calibrated Troxler or similar apparatus to the Site for the duration of the earthworks operations for assuring continuous and adequate quality assurance of all compactions.

The following test results must be presented by the Contractor to the Engineer during the course of the construction and before any fill of subsequent layers commences:

- Main Fill: Supply three density tests and moisture tests per 300m³ of fill, or for every 300mm fill of the embankment wall height, whichever is the smallest;

These density tests may be done as follows:

- Density Tests; Density tests (and moisture contents) may be done on Site with Troxler on condition that the apparatus is regularly tested and calibrated by having tests done at the same area by an independent commercial soil laboratory. These independent tests must be done using the sand displacement method. New and fresh MODS must be determined for each test done by the commercial soil laboratory. The Engineer shall have the right to call on such tests by an independent soil laboratory at any time.
- Proctor MODS: All MODS (and optimum moisture contents) must be determined by an independent and approved soil laboratory. Before any fill operation may start, MODS must be available of all materials to be used in fills. Split samples of materials on which MODS have been done must be kept on Site for easy reference.
- Plasticity Index: Contractor shall use the services of an independent and approved commercial soil laboratory for determining PI's of materials.

The Contractor must include the cost for all above requirements under the rates under Clause 8.3.5.

PSDK GABIONS AND PITCHING

PSDK 3 MATERIALS

PSDK 3.1 GABIONS

PSDK 3.1.1 STONE

In addition to clause 3.1.1, stones shall be prismoidal. Rounded, alluvial cobbles and stones will not be permitted.

PSDK 3.1.2 GABION CAGES

Gabions shall be constructed of 2.4 mm diameter PVC covered galvanized wire, gabions having a mesh size of 80 mm x 100 mm, and mattresses a mesh size of 60 x 80 mm.

PSDK 3.1.4 Geotextile

Add the following to Clause 3.1.4:

- “Filter fabric for groundwater drains shall be a non-woven continuous filament, needle punched, spun-bounded polyester geotextile having the following physical characteristics:
- Mass per unit surface 150 g/m² (min)
- Porosity under 0,5 KPa 93%
- Porosity under 200 KPa 82%
- Normal permeability under 2 KPa 3×10^{-3} m/s
- Normal permeability under 200 KPa 7×10^{-4} m/s
- Normal through flow under constant head of 400mm 270 ℓ /m²/s
- Alternatively - for woven filter fabrics the following characteristics shall apply :
- Mass per unit area 270 g/m²
- Water percolation 160 ℓ/m²/s

Composition polypropylene tape and polyethylene monofil.

The material shall be placed as directed and shall not be exposed to direct sunlight for prolonged period.”

PSDK 3.2 PITCHING

PSDK 3.2.1 STONE

In Table 2 amend the thickness of pitching for extra heavy pitching to read “600”.

PSDK 3.2.3 WIRE NETTING

Notwithstanding Clause 3.2.3, gabion cages shall be constructed of 2.4 mm diameter PVC covered galvanized wire, boxes having a mesh size of 80 mm x 100 mm, and mattresses a mesh size of 60 x 80 mm.

PSDK 3.3 RIPRAP (New Clause)

Riprap shall consist of strong durable pieces of approved hard rock, well graded from a maximum dimension of 400 mm to a minimum of 50 mm and free of earth and quarry fines. At least 50% by weight of the riprap shall consist of blocks over 20 kg and with a minimum equivalent spherical dimension of 250 mm.

PSDK 5 CONSTRUCTION

PSDK 5.4 Riprap

Riprap material shall be placed as construction of the embankment proceeds. No compaction is required. Placing shall be carefully controlled to avoid segregation and to produce an even thickness and surface profile.

PSDK 8 MEASUREMENT AND PAYMENT

PSDK 8.2.4 Geotextile

Delete the contents of Clause 8.2.4 and replace with the following:

- “The area measured will be that of the nett area of geotextile used.
- The rate shall cover the cost of supplying geotextile, cutting, waste, placing, joining, overlapping and fastening the geotextile in position.”

PSDM EARTHWORKS (ROADS, SUBGRADE)

PSDM 3 MATERIALS

PSDM 3.1 Classification of Excavation

Clause PSDB 3.1 will apply for this clause.

PSDM 5 CONSTRUCTION

PSDM 5.2.3.3 Treatment of Road Bed

(a) Preparation and Compaction of Road Bed

Add the following:

“Where road bed preparation takes place in sand the in-situ sand layer is to be watered and compacted to 100% Mod. AASHTO density. The surface of the in-situ sand layer is to be firm and smooth in order to receive the subsequent S.S.G. or subbase layer, as the case may be. To this end the Engineer may order that unnecessary construction traffic remain off the finished in-situ sand layer until the subsequent layer has been completed.”

PSDM 5.2.9 Trimming and Grading of Verges

(New Clause)

During the initial earthworks the verge width shall be cut or filled to approximately the final level and shall be kept trimmed and tidy during construction of the works. After completion of the road layers, including the premix surface, and after construction of the necessary kerbs, including the satisfactory backfilling behind the kerb, the verge shall be finished off to the lines and levels shown on the drawings or as specified.

The verge material shall consist of that material which would normally be occurring at that position or depth when in cut and shall not be contaminated by foreign materials such as bricks, basecourse material, horticulturally inferior materials from trench excavations, etc. Verges in fill conditions are to consist of the material as specified for the fills and similarly not be contaminated with foreign materials.

Over those sections of verge where grass is to be planted or where the Engineer deems it necessary to spread topsoil, he may instruct the Contractor at the stage of the major earthworks operation to work to levels altered from those shown on the drawings.

Topsoil may be provided from stockpiles on site in which case the Contractor shall load, transport and spread as ordered by the Engineer. In the case of topsoil provided and

imported by the Contractor the quality of the topsoil shall be approved of by the Engineer beforehand.

The Contractor shall be responsible for taking the necessary precautions and measures to control the dust nuisance which may arise due to his operations on the verge, whether from the natural ground surface or topsoil layer, until the verge is accepted by the Engineer.

PSDM 5.2.10 Dimension and Level Control and Process Control
(New Clause)

The Contractor shall submit to the Engineer records of dimension and level control and/or process control prior to requesting the Engineer to carry out any routine tests and/or inspections.

A sample form can be obtained from the Engineer.

PSDM 5.2.11 Requesting of Tests
(New Clause)

Tests and Inspections of the works will only be carried out by the Engineer once the appropriate test/inspection request forms have been fully completed. Test/inspection request forms can be obtained from the Engineer.

PSDM 8 MEASUREMENT AND PAYMENT

PSDM 8.3.4(a) Cut to Fill, Borrow to Fill

Add to Clause 8.3.4(1) the following:

“Where fill material is borrowed from trench excavations the rate shall include the selection from the sides of trenches, transporting, if necessary, stockpiling, preparing, processing, shaping (including forming side channels and benching if applicable), watering, mixing, compacting to the densities specified and finishing the slopes of fills.”

PSDM 8.3.13 Surface Finishes

Add to Clause 8.3.13 the following Clause (c):

“The major earthworks required to bring the verge to the required level and the additional depth of excavation or reduction in fill height as ordered for the topsoil operation shall be measured and paid for under the appropriate excavation item.

Only the following verge item will be measured and paid for separately.

The unit of measurement for trimming and grading of verges shall be per square metre.

The rate tendered for the above item shall include for all things necessary to complete the work as specified.”

PSDM 8.3.17 Construct Selected Layers using Imported Material Compacted
(New Clause) **to 93% Mod. AASHTO**

The rate shall cover the cost of locating the source, complying with all the relevant precautions required in terms of Clause 5.1, SABS 1200 D, procuring the material, basic selection, transporting from source to point of deposition on the road, spreading, watering, compacting, final grading and complying with the tolerances and testing.

PSG CONCRETE (STRUCTURAL)

PSG 3 MATERIALS

PSG 3.2.1 CEMENT: APPLICABLE SPECIFICATIONS

Replace 3.2.1 with the following:

The standard cement specifications SABS ENV 197-1 and -2: Common cements, and SABS ENV 413-1 and -2: Masonry cement will be applicable to this contract, and the descriptions and types of cements specified, will be based on the designations as defined in these specifications.

In order to meet the durability requirements of this Specification and to implement practical measures to limit the risk of potential alkali-aggregate reaction occurring, the selection of binder in the specified strength concrete mixes in this Contract must be based on SABS ENV 197-1:1992 according to one of the following options :

- i) Use of a Portland-composite Cement (CEM II) in combination with a minimum 20% replacement of cement content by mass of an approved extender (slag or fly ash), either delivered bagged or in bulk by the manufacturer. If this option is selected, the concrete mix design must be based on using an approved non-reactive (in terms of alkali-aggregate reaction) granite coarse aggregate. The Contractor must submit the necessary test results to prove that the aggregate is not reactive.
- ii) Use of Portland Cement (CEM I) in combination with a minimum 20% replacement of cement content by mass of an approved fly ash complying with the chemical and physical requirements of ENV 197-1:1992 and SABS 1491:Part II - 1989.

Supply all cement and other approved binder constituents from the same sources for the duration of the Contract.

Details of the above selected option, as well as of the types and sources of cement and other binder constituents proposed for use on the Contract, must be submitted at tender stage.

The Contractor shall obtain the producer's test certificates for each consignment of PFA, which shall be retained as record documents. These test certificates shall at least show values for Loss on Ignition and Fineness.

In addition test certificates showing compliance with the other specified chemical requirements of PFA, must be made available at a frequency of at least once every three months during the period that the materials are supplied for the Contract.

PSG 3.2.3 STORAGE OF CEMENT AND OTHER BINDER CONSTITUENTS

Add the following:

If a binder constituent is to be blended with cement on site, it shall be stored separately from the cement and shall have separate delivery facilities. If handled in bulk it must be stored in silos (note the possible requirements for greater silo capacity, more efficient filters than for Portland cement and provision for aeration).

Cement and any other binder constituent to be used in concrete for water-retaining structures shall always be stored in a cool environment. It is strongly advised that silos used for storing these materials be painted white to reduce any temperature rise in the stored materials.

Cement or any other binder constituent shall not be kept in storage for longer than 10 weeks without the Engineer's permission.

PSG 3.3 WATER

Add the following:

To limit heat gain in concrete cast in water-retaining structures, the temperature of mixing water must preferably be below 20 °C when added to the concrete mix.

PSG3.4.1 AGGREGATES : APPLICABLE SPECIFICATIONS

Add the following:

Fine and coarse aggregates must fully comply with the requirements of SABS 1083.

Fine aggregate must be clean naturally occurring siliceous sand. The broken shell content determined in accordance with SABS Method 840 must not exceed 30% by mass.

The coarse aggregate shall all be retained on a screen with 4,75 mm nominal aperture size with the exception of dust content, which shall not exceed 0,5% by mass.

The maximum water absorption of the coarse aggregate shall not exceed 1% by mass. Flakiness indices determined in accordance with SABS Method 847 must not exceed 30% in the case of 26,5 mm aggregate size and 25% in the case of 19,0 mm aggregate size respectively.

The 10% "FACT" minimum value for coarse aggregate must be the value for concrete subject to surface abrasion.

The content of chloride ion in the aggregates shall be determined and shall be within the limits specified in SABS 1083. Test results in this regard shall be submitted to the Engineer.

In the case where a Portland-composite Cement (CEM II) will be used in combination with a minimum 20% replacement of cement content by mass of an approved extender (slag or fly ash), proof that the aggregates are non-reactive (in terms of alkali-aggregate reaction) must be supplied in accordance with SABS 1083 Appendix A.2 b). If test results are not available, tests must be carried out in accordance with SABS 1083 Appendix C.2.2 k).

The use of plums will not be permitted in any of the strength concrete specified on the Works.

At tender stage the Contractor shall assure himself by means of tests and test mixes by an accredited laboratory that the fine and coarse aggregates that he intends to use, comply with the specification. The tendered rates shall therefore be deemed to allow for the importation of aggregates, if necessary, that do comply with the Specification.

The Contractor shall be responsible for locating the sources of all aggregates.

Details of the type and source of coarse and fine aggregates to be used on the Contract must be submitted at tender stage.

PSG 3.4.3 STORAGE OF AGGREGATES

Add the following:

The aggregates to be used for water-retaining structures shall at all times be stored in a cool environment and, if at time of mixing, the ambient temperature exceeds 30 °C, only the coarse aggregate shall be sprayed with water to assist cooling. It is advisable that all aggregate stockpiles be shaded from the sun by means of 80% shade netting. The Contractor shall ensure adequate drainage of the coarse aggregate stockpile.

PSG 3.5.1 ADMIXTURES : APPROVAL OF ADMIXTURES REQUIRED

Add the following:

The use of admixtures that improve workability and water retention will be approved subject to compliance with the following standards:

Chemical Admixtures : AASHTO M194 "Chemical Admixtures for Concrete".

Air Entrainment : AASHTO M154 "Air Entrainment Admixtures for Concrete".

No admixtures containing chloride in any form as an active ingredient, will be permitted. The use of air entraining agents and plasticizers with air-entraining properties will not be permitted.

If the Contractor proposes using admixtures in the concrete mix design, the necessary information must be supplied to prove to the satisfaction of the Engineer that the proposed admixtures are non-toxic, are suitable for potable water structures, and will be beneficial and not detrimental to the durability of the concrete.

PSG PLANT

PSG 4.5.1 FORMWORK : DESIGN

Add the following:

At the commencement of the Contract, submit detail proposals for formwork and support work to the Engineer for approval. Design formwork to limit deflection to a value not exceeding 1/360th of the span between supports.

PSG 4.5.3 FORMWORK : TIES

Add the following:

Limit the number of formwork ties through walls to a minimum by selecting formwork systems with large tie spacings.

Use through-ties which can be extracted after casting concrete. Drill out tie-sleeves, sandblast tie-holes and caulk with an approved cementitious non-shrink waterproof mortar well rammed in.

Any ties which are not through-ties and which are approved for elements other than walls, must be provided with the minimum concrete cover specified for reinforcement. Clean pockets by sandblasting and caulk immediately afterwards with an approved epoxy mortar.

PSG 5 CONSTRUCTION

PSG 5.1.2 REINFORCEMENT : FIXING

Add the following:

No welding of reinforcement will be permitted.

PSG 5.1.3 REINFORCEMENT : COVER

Add the following:

The specified concrete cover shall be deemed to apply to main reinforcement bars, secondary reinforcement, tie stirrups, tying-wire knots and wire ends.

The exposure condition on which the 40 mm concrete cover over reinforcement for :

- i) water retaining faces;
- ii) the exposed faces above the waterline; and
- iii) concrete buried below finished ground level has been based, lies in the "severe" category.

Binding wire used for fixing reinforcement must be tightly bound around the nodes at bar intersections with cut ends bent inwards. Only a nominal reduction of the minimum specified cover by a single strand thickness will be allowed for binding wire.

The cover blocks for water-retaining structures shall be manufactured from concrete of grade, durability, density and impermeability at least equal to that specified for the respective elements except that 12 mm stone instead of 19 mm stone shall be used. The size of the cover blocks shall be 60 mm x 60 mm, with a thickness equal to the specified cover. Wires shall be cast into the blocks to enable them to be fixed to the reinforcement. The wires shall be fully galvanised Class A as per SABS 675 - 1993. The wires shall be carefully held in position while the concrete is setting to ensure that all the wires are inserted to a uniform and consistent depth of 50 % of the thickness of the cover block for all the cover blocks.

The concrete shall be thoroughly compacted by means of a vibrator or vibratory table and the blocks shall be protected against early drying and shrinkage due to sun and wind, by being kept continually wet while still in the mould. After the blocks have been removed from the mould they shall be kept in water continuously until being used, and this period shall not be less than 14 days.

A proper mix design for concrete in cover blocks shall be submitted to the Engineer for approval.

PSG 5.1.4 SPLICING OF REINFORCEMENT

Add the following:

Splice lengths for reinforcement in the case of water-retaining structures shall not be less than 55 diameters and in non-water-retaining structures not less than 50 diameters. Where applicable in water-retaining structures, splices shall be staggered so that they are evenly spread throughout the structure.

PSG 5.2.1 FORMWORK : CLASSIFICATION OF FINISHES

Add the following:

Concrete surface finishes must be provided in accordance with the general notes on each of the construction drawings. The durability of concrete surface finishes is of prime importance on the Contract.

Use steel or glass reinforced plastic formwork suitable for providing the surface finish specified for all walls which are exposed or which form part of water retaining elements in the structures.

Take account of the problem of possible crazing of the concrete surface finish occurring with this type of formwork. Select formwork such that surface crazing will not occur.

Provide all exposed external corners of walls, beams, slabs or any other concrete elements not covered by backfill with 20 x 20 mm chamfers.

Formwork panels shall be free from rust, ridges, fins, bulges, imperfections, irregularities, chips and holes. Small approved laminated wooden board inserts and make-ups to steel or glass reinforced plastic formwork may only be used in confined places and the use thereof will be

subject to approval by the Engineer. The concrete surface shall be smooth and free from irregularities, bulges, ridges, imperfections, air bubbles, honeycomb or surface discolourations. Grout checks shall be used at all construction joints and chamfers at all corners.

Joints between panels shall be sealed tightly to prevent local honeycombing or leaching of concrete. Joints between panels shall form straight horizontal and vertical lines which shall be spaced evenly on the formed concrete surface, and shall be even and smooth and require minimal or no finishing. The layout of all formwork panels shall be discussed with the Engineer before application and shall be approved in writing prior to erection of formwork.

Provide sample panels of the specified surface finishes at typical elements constructed as part of the completed Works at the beginning of the Contract for the Engineer's approval. Subject to approval use these sample panels as references for the standard of finishes to be provided on the rest of the Works.

The making good of imperfections defined for smooth surface finish formwork must include filling blowholes with any dimension exceeding 10 mm.

Full payment for formwork will only be made when concrete has been finished to the standard specified.

PSG 5.2.2 PREPARATION OF FORMWORK

Add the following:

All formwork must be treated with a release agent which is compatible with the concrete surface finish specified. Submit details of the proposed release agent to the Engineer for his approval prior to its use on site.

PSG 5.2.5.2 REMOVAL OF FORMWORK

Add the following:

Remove formwork at the earliest time permitted according to Table 2 of SABS 1200-G for Portland Blastfurnace cement in order to limit temperature rise in the concrete due to heat of hydration, but taking prevailing weather conditions and temperatures and the concrete mix's early age strength gain characteristics into account.

PSG 5.5.1.2 CONCRETE CONSISTENCY

Add the following:

Observe the slump limits specified in Table 3 of SABS 1200-G except for slabs where the maximum slump must not exceed 60 mm.

PSG 5.5.1.5 DURABILITY

Add the following:

No reinforced concrete which is exposed or which forms part of a water retaining element may be cast in strength concrete which has a water cement ratio exceeding the specified maximum value in Table 5 of SABS 1200-G for Severe Exposure Conditions or of 0,50 generally or 0,48 for thin sections of dimension 150 mm or less.

Notwithstanding the specified water cement ratio, provide a minimum binder content of 350 kg/m³ for such concrete.

PSG 5.5.1.7 STRENGTH CONCRETE

Add the following:

Due to the design approach and assumptions adopted for this contract, it is of the utmost importance that good strength concrete with consistent quality and composition is used throughout.

Strength concrete must be provided in accordance with the general notes on each of the construction drawings.

Design mix proportions for strength concrete to provide a workable non-bleeding non-segregating mix with a mean concrete strength equal to the specified cube strength plus 1,7 times the standard deviation.

Assume the degree of control of concrete manufacture at the beginning of the Contract is such that the standard deviation will be 0,182 times the specified cube strength. On this basis the target strength for the design mix proportions must be equal to 1,30 times the specified cube strength.

Select high quality aggregates to reduce strength concrete grade 35/19 water demand to 175 litre/m³ maximum. Restrict the maximum cement content of strength concrete mixes to 450 kg/m³.

The concrete mixes used on the Contract must be designed by an accredited concrete laboratory. Characteristics of the fresh concrete must be determined by making trial mixes and sufficient test cubes taken from the trial mixes must be crushed to determine the concrete strength at least at 7 and 14 days. The concrete mix designs and details of the concrete constituents (cement, PFA, slag and aggregates) showing compliance with all the specified requirements, together with the sources of supply of the constituents, must be submitted to and must be formally approved by the Engineer prior to any concrete being cast on site.

Any mix displaying a tendency to "bleed" after placing must be modified to reduce bleeding so that the finishing and curing requirements specified for horizontal or sloping surfaces can be practically implemented.

All possible measures to limit shrinkage must be applied in the concrete mix design.

PSG 5.5.1.8 NO-FINES CONCRETE

New Clause

The Contractor shall be responsible for the design of a no-fines concrete mix on the basis, and within the limitations, of certain parameters specified hereafter:

Classes of no-fines concrete

No-fines concrete shall be classified by the prefix NF and the size of aggregate to be used e.g. class NF-19 means a no-fines concrete with a 19 mm nominal size aggregate.

The volume of aggregate per 50 kg of cement for each class of no-fines concrete shall be as follows:

<u>Class</u>	<u>Aggregate per 50 kg cement</u>
NF 26,5	0,32 m ³
NF 19	0,30 m ³

Aggregates

Aggregate shall be a single-graded aggregate in accordance with SABS 1083, provided that the particle size shall be less than 38 mm and greater than 13 mm. Aggregate shall not contain any dust. Aggregate not complying with these requirements will be summarily rejected.

Cementitious materials

Ordinary Portland cement shall be used in no-fines concrete. The addition of cement extenders will not be permitted.

Cement Paste

The consistency of cement paste shall be such that all aggregate particle surfaces receive a uniform coating. Paste consistency shall be sufficiently viscous as to prevent the flow of paste through the placed concrete.

Strength

Concrete cube strengths at 4 and 28 days shall be 3,0 and 4,0 MPa respectively.

Permeability

Notwithstanding the preceding specifications, it is the Contractor's responsibility to ensure the permeability of the no-fines concrete. The Contractor shall be required to demonstrate the permeability of cast no-fines concrete on request of the Engineer. Any portion of the said no-fines concrete, deemed by the Engineer to be of insufficient permeability, shall be broken out and replaced at the Contractor's expense.

Batching and mixing

Cement shall be measured by mass or full bags of 50 kg each and aggregate shall be measured by volume in approved measuring boxes or barrows.

The quantity of water added shall be just sufficient to form a smooth grout that will adhere to and completely coat each and every particle of aggregate and that is just wet enough to ensure that at points of contact of the aggregate the grout will run together to form a small fillet to bond the aggregate together. The mix shall contain no more than 20 litres of water per 50 kg of cement.

Mixing shall be carried out in an approved batch-type mechanical mixer.

Placing

No-fines concrete shall be placed in accordance with the procedure agreed to by the Engineer. It shall be placed in a single operation in its final position within 30 minutes of mixing.

The concrete shall be worked sufficiently to ensure that it completely fills the space to be concreted and that adjacent aggregate particles are in contact with one another. Excessive tamping or ramming must be avoided and under no circumstances shall the concrete be vibrated.

Use a light compacting roller to consolidate no-fines concrete in surface beds.

Sealing

Within 24 hours after casting no-fines blinding and prior to casting any reinforced concrete over it, seal sides that will eventually be in contact with ground or concrete to be subsequently cast and all top surfaces with a layer not exceeding 6 mm nominal thickness of 1:3 cement mortar. Wood-float top surfaces to form a smooth even surface finished to the tolerances specified for Degree of Accuracy II in terms of Clause 6.2.3.

Protection and Curing

All no-fines concrete shall be protected from the elements and from the ingress of soil, fines or other contaminants that may prejudice permeability. In this regard, the Contractor's attention

is drawn to the special requirements for protecting the no-fines concrete in the reservoir perimeter collector drains shown on the Drawings. The curing of no-fines concrete shall be accomplished in one or more of the following ways:

- Retaining formwork in place.
- Covering exposed surfaces with plastic sheeting laid on top of hessian according to the requirements set out in Clause PSG-24.

No-fines concrete placed during cold weather shall be adequately protected against frost for at least 3 days.

The costs of protection and curing of no-fines concrete must be included in the concrete rates for the various items.

PSG 5.5.3.1 MIXING AT CONSTRUCTION SITE

Add the following:

For all the larger concrete pours, make provision for a standby concrete supply and placing facilities in the event of plant breakdown.

Permission for additional construction joints in the larger concrete pours ($\pm 20 \text{ m}^3$) in water retaining elements, necessitated due to plant breakdown, will not be granted.

PSG 5.5.3.2 READY-MIXED CONCRETE

The use of ready-mixed concrete will be permitted for the construction of the Works, subject to full compliance with the Specifications.

The results of cube tests supplied by the ready-mixed concrete supplier shall not be regarded as part of the Contract quality control system, and the Contractor shall take his own samples of concrete on site and have them tested in accordance with this Project Specification.

PSG 5.5.5 PLACING

Add the following:

The Contractor shall give the Engineer at least 48 hours notice of his intention to cast concrete.

The use of pumped concrete will only be allowed on the Contract subject to the concrete mix's full compliance with this specification and the Engineer's written approval of the proposed procedures for mixing, transport and placement.

The placing and finishing of concrete in horizontal and sloping slabs must be carried out in conjunction with the method of curing specified so as to eliminate plastic settlement and plastic shrinkage cracking.

Allow for carefully controlled re-vibration of concrete in all cases where plastic settlement cracking is a potential danger.

In order to be effective, re-vibration must be done at as late a stage as possible. As a guide, re-vibration must be done while the concrete is sufficiently plastic to not leave a hole or sign of vibrator penetration once the vibrator has been withdrawn from the concrete.

All re-vibration is to be done in the presence of the Resident Engineer at a time agreed by him.

Allow for finishing concrete at as late a stage as possible and for immediately following up with the application of the specified curing compound in all cases where plastic shrinkage cracking is a potential danger.

PSG 5.5.7 CONSTRUCTION JOINTS

Add the following:

In elements of water retaining structures approval may not be granted for construction joints in positions other than those indicated on the construction drawings.

Where horizontal or sloping construction joints occur on exposed surfaces, provide joints with a straight edge formed with a timber batten fixed to the formwork at the level where concreting will be terminated so that a neat finish is obtained.

Cast concrete against formwork stop-ends which have been approved by the Engineer at vertical or sloping construction joints.

Within 24 hours of the previous concrete pour, the full surface area of the concrete at all construction joints in structural elements in contact with water, exposed above water or buried underground must be sandblasted or waterblasted under high pressure to remove all laitance and fine particles to a depth of at least 10 mm and to expose a complete mosaic of clean, coarse aggregate embedded in sound concrete. All loose material must be removed prior to resuming concreting. The Contractor shall ensure that the green concrete is not damaged or disturbed during the preparation of the joint and that waterstops are not damaged.

After the reinforcement for the next pour has been fixed and the formwork erected, the construction joint shall be cleaned thoroughly with a pressurised water jet. The joint shall then be wetted continuously with water for 24 hours to completely saturate the concrete immediately before new concrete is cast. Before the new concrete is cast all excess water shall be removed from the construction joint and the new concrete shall be cast directly onto the prepared surface.

Where so indicated on construction drawings resume concreting at construction joints within the time period specified.

The length of construction joints will be measured on the centrelines of walls. Where construction joints have not been measured, their costs including the application of Vandex Super, where specified, must be allowed for in the rates for concrete and formwork.

PSG 5.5.16 DESIGNATED CONTRACTION JOINTS

New Clause

Provide contraction joints in accordance with the details shown on the construction drawings.

Protect prepared bearing surfaces to prevent damage during construction.

Glue the joint filler to the face of the first concrete section cast with a contact adhesive applied over the full contact area so that no displacement of the joint filler can occur before or during concreting.

Check that the contact adhesive is compatible with the other joint materials used and apply the adhesive strictly in accordance with the manufacturer's specifications. Protect the joint filler to prevent damage during construction.

Where indicated paint butting faces at contraction joints with an approved bituminous bond breaking paint with a dry film thickness of not less than that specified on the construction drawings.

PSG 5.5.17 SEALANT GROOVES

New Clause

Cut sealant grooves of the dimensions indicated with a diamond saw after completion of concreting at the positions indicated on the construction drawings. Slightly tapered hard-wood formers may also be used to form sealant grooves, but only at other specific positions indicated on the construction drawings (eg grooves at sides of walls and at slab soffits).

Sealant grooves shall have sharp-edged, even, vertical, or slightly tapered sides in sound concrete and be of consistent width and depth. The bottom of the groove shall be plane and reasonably uniform. Where this condition has not been achieved the bottom of the groove must be rendered plane by installing back-up sealant to the Engineer's approval.

Remove all laitance on the top surfaces at horizontal or sloping slabs by grinding concrete over a strip 100 mm wide prior to cutting sealant grooves. Grind concrete so that the edges of grooves fall in the same plane as that of adjoining slab or wall surfaces on either side of the groove. Where suspect concrete, chipping or spalling occurs at sides of sealant grooves, dress up and re-nose edges with epoxy mortar in accordance with the Engineer's instructions.

The concrete surfaces of sealant grooves in the surface bed, walls, wall bases, channels and walkway slabs to which the specified sealants will be bonded must be sandblasted to provide a sound, clean, sharp bonding surface.

Sealant grooves must be completely dry and thoroughly cleaned prior to sealant application. Test for the presence of moisture by covering prepared lengths of sealant groove with 250 micron black polythene sheet of minimum dimensions 500 x 500 mm taped to the concrete surface and left overnight. The concrete will be accepted as dry if there is no condensation evident when the sheet is lifted first thing on the following morning.

PSG 5.5.8 CURING AND PROTECTION

Add the following:

Particular attention must be paid to curing concrete properly. Horizontal and sloping slab and wall base elements must be cured by applying curing compound, covering exposed surfaces with protective polythene sheeting laid on top of hessian to completely enclose the cast element within 2 hours after finishing and then also keeping the concrete surfaces under the sheeting continuously wet by means of an irrigation type mist spraying system or by flooding the areas to be cured with a hosepipe for the specified curing period.

The vertical sides of columns must be cured by applying curing compound within 1 hour after stripping formwork and immediately afterwards enveloping the element with polythene sheeting laid on top of hessian and then keeping the concrete surfaces under the sheeting continuously wet by saturating the hessian at the tops of the columns with a hosepipe for the specified curing period.

The vertical and sloping sides of wall elements must be cured by applying curing compound within 1 hour after stripping formwork and then keeping the concrete surfaces continuously wet by means of an irrigation type mist spraying system. Sprayers shall be spaced at such intervals to ensure that the whole concrete face is wetted.

The irrigation type mist spraying system shall be controlled by an automatic timer with the capacity to activate the system for any chosen time period at any chosen time intervals, such that curing will be continuous over week-ends, public holidays and builders holidays.

Sprayers shall be spaced at such intervals as to ensure that the whole area of concrete is wetted. The design of the system shall be submitted to the Engineer for his approval.

Should the existing water pressure on site be insufficient, a pump must be installed to operate the mist spraying system and the Contractor must allow for this in his tendered rates and prices.

The duration of water application and the intervals of application must be determined on site by the Contractor and approved by the Engineer, such that the areas to be cured are kept continuously wet. The duration and intervals of spraying water must be adjusted to allow for adverse conditions such as high temperatures and/or dry, windy conditions.

The curing compound must be of an approved reflective type complying with the requirements of ASTM C 309-74 "Liquid Membrane forming Compounds for Curing Concrete" Type 2 and must be applied to provide a full even coverage:

- i) Using suitable spray equipment for walls and columns
- ii) By roller on the top horizontal and sloping surfaces of slabs, wall bases and other similar elements.

Use clear polythene sheeting of not less than 250 micron thickness for covering concrete and overlaying hessian after applying curing compound. Both the polythene sheeting and hessian must be in sound condition without tears or holes and must be effectively secured in position so that they cannot be lifted free of the concrete surface by wind.

Retain the polythene sheeting and hessian in position and continue applying water to keep the concrete surfaces to be cured continuously wet for a minimum curing period of 10 days after the date of application of the curing compound.

The Contractor shall also ensure that the concrete shall not be exposed to thermal shocks during the first 28 days after casting and he shall take the necessary, additional precautionary measures to shield the concrete with plastic sheets or hessian during extreme warm, cold, dry or windy weather conditions. Hessian shall be wetted should the conditions necessitate this.

Curing shall be done in such a manner as not to cause staining, contamination or marring of the surface of the concrete.

Concrete that has not been cured in compliance with this specification may not be accepted for purposes of full payment.

PSG 5.5.9.2 ADVERSE WEATHER CONDITIONS

Replace first sentence of clause with the following:

Irrespective of the ambient temperature, the temperature of concrete when placed shall not be allowed to exceed 25 °C.

PSG 5.5.10 CONCRETE SURFACES

Add the following:

Except where otherwise specified, provide exposed horizontal or sloping top surfaces of wall bases and slabs with a wood-floated surface finish.

The top surfaces of all walls must be steel floated.

The exposed top surfaces and edges of walls must be finished to the tolerances specified for Degree of Accuracy I in terms of Clause 6.2.3.

Slabs to be provided with a finishing screed and concrete which is buried underground must be tamped in accordance with Clause 5.5.10.1.

Where wood-floating is specified, the surface must first be tamped in accordance with Clause 5.5.10.1. After the concrete has hardened sufficiently, it must be wood-floated to a uniform surface free of trowel marks.

Where steel-floating is specified the same procedure as specified for wood-floating must be followed, except that, when the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, the surface must be steel trowelled under firm pressure to produce a dense smooth uniform surface free from trowel marks.

PSG 5.5.11 CONCRETE : WATERTIGHT CONCRETE

Add the following:

All water retaining elements constructed in reinforced concrete under this Contract must be watertight in terms of the requirements of the water tests described in the Project Specification. Watertightness must be achieved without the addition of supplementary cement plaster, coatings or membranes. Ensuring watertightness is the exclusive responsibility of the Contractor and he shall take all the measures deemed necessary to achieve this. All remedial work that has to be undertaken to ensure watertightness shall be for the Contractor's own account.

PSG 5.5.14 DEFECTS

Add the following:

Any defects in the concrete or surface finishes must be inspected by the Engineer immediately after stripping of formwork. Remedial work to defects, where authorised by the Engineer, must be carried out strictly in accordance with his directives.

Make good localised minor imperfections (e.g. blowholes, small recesses, etc) by rubbing in a stiff 1:2 cement mortar immediately after stripping of formwork. Isolate repair areas and apply curing compound and the curing membrane around them in accordance with the specified curing procedures. Complete repair work and apply the curing compound and curing membrane over repair areas within 24 hours of stripping formwork.

Carry out all other remedial work in dry conditions after the concrete is fully cured. Cut out all defective material, clean contact surfaces to which new concrete will be bonded by sandblasting and effect repairs using either epoxy mortar with an appropriate two part epoxy primer or concrete and a wet to dry epoxy adhesive, depending on the extent of the defect.

All epoxy resin compounds used in repair work must be approved by the Engineer and applied strictly in accordance with the manufacturer's specification. All repair materials shall be equivalent to the concrete to be repaired in respect of thermal properties and structural elasticity. Take care to match the colour of repair work with existing concrete where repair work will be permanently exposed.

PSG 5.5.18 CONCRETE : ITEMS BUILT INTO WATER RETAINING STRUCTURES

New Clause

The building in of items, such as puddle pipes etc. into water-retaining structures may be executed in either of the following ways, viz:

- (a) the items shall be positioned prior to construction of the relevant part of the water retaining structure and subsequently cast in simultaneously with the concreting of the specific part of the water-retaining structure; or
- (b) recesses or holes may be blocked out in or through the relevant part of the water-retaining structure, and the item may then be positioned afterwards and grouted or concreted in, in an approved manner.

In the case of (b) above where pockets were left for the later casting in of items, the following procedure shall be followed:

The old concrete surface shall be prepared by sandblasting as described for normal construction joints in Clause 5.5.7 prior to the installation of the pipework or other items to be cast in. Immediately prior to casting concrete, the surfaces shall be finally cleaned with a pressurised water jet and then coated with an approved acrylic polymer bonding agent. The pocket shall be filled with the same type and strength of concrete as the original type. After removal of the shutters, the exposed surfaces of the new concrete must be cured in accordance with the requirements of Clause 5.5.8.

The Contractor's attention is drawn to the fact that the decision as to which alternative to adopt is solely his and that finally the works shall be completed as specified and as detailed on the drawings with particular reference to the following:

- Some components with long delivery periods supplied under this Contract, may have to be built in at a later stage.
- Water-retaining structures shall be fully watertight, especially around cast in items, and no leaks or damp areas will be allowed.
- The concrete of the water-retaining structure around the built-in item shall be free of any honeycombing, shall have an acceptable smooth finish and the colour of the whole relevant part shall be uniform.
- Pipes passing through water-retaining structures shall be properly aligned as specified and as detailed on the drawings, and valve stems intended to be vertical shall, for example, be 100 % vertical in both planes.
- Notwithstanding the above, the contents of Clause 5.5.7 shall apply to all works in connection with items built into water-retaining structures.

Where pipes or other items have to be built into existing water-retaining structures, the existing concrete shall be cut out carefully to obtain sufficient space to install the items according to the requirements in respect of opening position and conditions relating to cutting procedures specified by the Engineer. Prior to commencing cutting concrete, the edges of the new opening must be defined by saw cutting to a depth of 20 mm to provide a clean joint line. On completion of the cutting, the installation and building in of the items shall then proceed as described above in this Clause.

PSG 6.2.3(a) (3) PERMISSIBLE DEVIATIONS : REINFORCEMENT COVER

Replace with the following:

The permissible deviation for cover to reinforcement shall be $-0 +10$ mm irrespective of the Degree of Accuracy.

PSG 7.2.1 TESTING: GENERAL

Add the following:

Provide a slump cone with baseplate and tamping rod on site. Standard slump cone tests will be carried out on a regular basis as part of the testing program to control the quality of concrete on the site.

The acceptance of concrete quality will be based on a statistical analysis of concrete test cube 28 day compressive strengths for each grade of strength concrete specified for the Works.

The performance of each grade of strength concrete will initially be assessed by carrying out a statistical analysis on 30 test cube results. Concrete sampling to accumulate this number of results will be carried out at an accelerated rate so that the appraisal of the performance of each grade of strength concrete in relation to the specified requirements can be made early in the Contract.

Subject to approval of each grade of strength concrete on this basis, concrete quality will be monitored for the balance of the Contract by statistical analyses carried out on the test results of concrete cubes for each grade of concrete according to the specified sampling rates.

The purpose of testing samples of all the concrete used in the structures is to ensure that the mix proportions and the degree of control of concrete quality existing on the site are suitable for the various grades of strength concrete required and are so maintained.

PSG 7.1.2 FREQUENCY OF SAMPLING

Add the following

Take a sample of concrete as actually placed in the structure at the point of discharge from the mixer at random on three separate occasions during each of the first 5 days of using that mix on site.

Each sample for initial sampling during the first occasions that a mix is used on site shall comprise three test cubes, one of which must be tested at 7 days and the other two at 28 days.

Each sample for subsequent testing shall comprise four test cubes, one of which must be tested at 7 days and the other three at 28 days. Samples for subsequent testing shall be taken at a rate by volume of not less than one sample per 20 m³ of concrete cast or, in the event of smaller volumes, at least one sample on each day that concrete of a particular grade is made.

Notwithstanding this schedule, arrange the exact details of numbers of samples to be taken with the Engineer at commencement of construction. Make 150 mm test cubes in all cases.

Supply the necessary moulds and cubes under the supervision of the Engineer who has the right to reject any moulds which in his opinion will not give cubes which are true. Supply sufficient moulds to make the daily quota of cubes.

PSG 7.2.1 TESTING: GENERAL

Add the following:

Make, cure and test all test cubes in accordance with the requirements of SABS Standard Methods 863 and 864.

Cure test cubes in an approved curing tank provided on the site and deliver them to an independent laboratory as approved by the Engineer for testing not less than 24 hours in advance of the specified time for testing.

Keep accurate records of the exact position in the structure of the concrete batch represented by the test cube.

Allow for all costs connected with quality control sampling and testing of concrete, as described in this section of the Project Specification, in the relevant strength concrete rates.

PSG 7.3 ACCEPTANCE CRITERIA FOR STRENGTH CONCRETE

Add the following to clause 7.3.3:

The cube results for each grade of strength concrete (tested at the specified age) will be grouped in batches of thirty in chronological order as they become available and analysed statistically by the Engineer who will calculate the mean strength and the standard deviation.

If the mean strength less 1,7 times the standard deviation thus calculated be not less than the specified cube strength, the concrete represented by that batch of test results shall be deemed to comply, provided always that no single cube result is less than ninety percent (90%) of the specified cube strength.

Modify the mix represented by the applicable results of the test cubes if they fail to meet requirements.

Raise the mean strength of the concrete work already cast containing the mix under consideration to an acceptable level by recommencing curing in a manner to be prescribed for a period determined by the Engineer.

In addition, re-prop suspended work and/or delay the application of finishes and other superimposed loads in the Engineer so orders.

In addition, drill and test cores to prove that the concrete attains the strength required during the period of additional curing if the Engineer so orders.

If any single cube result is less than ninety percent (90%) of the specified cube strength, then the section of the concrete represented by the cube in the structure will be subject to rejection at the Engineer's discretion after the results of surface tests are known or after the results of tests on samples bored out from the concrete are available or after a loading test on the structure has been performed.

The Engineer may approve slight adjustments to the mix if the mean strength of the cube tests minus 1,7 times the standard deviation exceeds the specified cube strength by more than 10% by either reducing the cement content or increasing the water/cement ratio, provided that no detrimental change in the conditions of control exercised during manufacture and delivery of the concrete takes place.

In order to comply with the durability requirements of the concrete, increased water/cement ratios for adjusted concrete mixes shall not exceed the maximum values stipulated in the Project Specification for strength concrete mixes nor shall the maximum water requirement of 175 litres per cubic metre of concrete be exceeded or the minimum cement content be reduced below 350 kg/m³ for strength concrete.

The Contractor will bear the expense of any additional testing, curing and propping ordered by the Engineer in the event of non-compliance. No delay will be considered due to these causes.

PSG 8.1.2.2 and 8.1.2.3 REINFORCEMENT : MEASUREMENT

Replace 8.1.2.2 and 8.1.2.3 with:

Reinforcement quantities are measured for bar diameters smaller or equal to 12 mm and greater or equal to 16 mm for both mild steel and high-tensile steel reinforcement.

PSG 8.1.2.2 and 8.1.2.3 REINFORCEMENT : MEASUREMENT

Replace 8.1.2.2 and 8.1.2.3 with:

Reinforcement quantities are measured for bar diameters smaller or equal to 12 mm and greater or equal to 16 mm for both mild steel and high-tensile steel reinforcement.

PSH STRUCTURAL STEEL (SABS 1200H)

PSH 5.7 STRUCTURAL STEEL: ACCESS LADDERS, METAL WALKWAYS AND LOCKING BARS

Add the following:

Fabricate locking bars and fixings from Grade 350WA steel flat in accordance with the details shown on the construction drawings.

Metal walkways shall be Rectagrid type RS40 super pressure locked grating or similar approved with bearer bars not less than 25 x 4,5 mm and transversal bars not less than 7 mm round sections. Bearer and transversal bars shall be set at 40 mm centres with square openings.

All welds to access ladders shall be 6 mm minimum fillet welds. All other unspecified welds in Grade 350WA steel shall be 6 mm minimum fillet welds. Exposed welding shall be ground down flush.

All handrail sections shall be jointed with internal ferrules and self-tapping screws.

Provide stainless steel fixing bolts, washers and nuts, where applicable, for the installation of the access ladders and all walkways and structural steel supporting members.

PSH 5.3.9 PROTECTIVE TREATMENT :

Add the following:

Where so indicated on the drawings, carry out hot dip galvanising in accordance with the Standard Specification for structural steelwork.

Preliminary Requirement:

All fabrication, drilling of holes and deburring shall be completed before galvanising. Welds on flanges shall be cleaned of all splatter, slag, etc.

Galvanising:

The steelwork shall be pretreated and galvanised in accordance with specification SABS 763-1967 and/or 934-1969.

Painting:

Thoroughly degrease the galvanised surfaces by means of a suitable degreaser applied with a bristle brush. Hose down with fresh water and allow to dry.

Apply, preferably by spray, one coat of Self-Etching Zinc Chromate Wash Primer to a dry film thickness of 8-13 micrometres.

Apply by brush, flow or dipping 3 coats of Epoxy Tar coating (Black or Brown) to give a minimum dry film thickness of 100 micrometres per coat. Black shall be the final coating. Consecutive coats shall be applied within 24 hours of each other, but the minimum overcoating time will be dependent on the ambient temperature, humidity, etc.

PSH 5.4 SETTING OUT:

Add the following:

All dimensions and levels affecting structural steelwork erection and position must be checked on site. The Contractor shall be responsible for the correct fitting of the component parts of the steelwork, positions of holding down bolts, etc.

PPHA STRUCTURAL STEEL SUNDRY ITEMS (SABS 1200HA)

PPHA.1 GRADE OF STEEL (Sub clause 3.1.1)

Structural cold-formed steel work to be to Grade A43A or 43B with the minimum properties as tabled in Table B-2 of SABS 0162-1982.

Structural hot-rolled steel work to be to Grade 300W with the minimum properties as tabled in “Steel design date: No. 6” of the South African Rolled Steel Producers Coordinating Council and the South African Institute of Steel Construction.

PPHA.2 SHOP DRAWINGS (Sub clause 5.1.2)

The Contractor is to provide shop details.

Steel work generally of welded construction with site connections bolted:

- All holes 18 dia. For M16 bolts
- All gussets ex 8mm
- All welds, 6mm fillet

The Engineer must be notified, (at least 72 hours before hand) of the completion of the fabricated steel work at the Contractor’s workshops, to enable him to make an inspection if he so desires. The fabricated steel work, thus to be inspected shall be in its prepared specified state immediately before the application of prime coat painting.

PPHA.3 WELDING (Sub clause 5.3.4)

Delete this clause in its entirety and add the following clause:

Welding shall be done in accordance with the relevant requirements of SABS 0162 – 1993 BS5135 – 1974 and AWS.D.1.1 – 90 (American Welding Society).

Welding shall be Grade B welding. The qualification of welders shall be in accordance with the relevant clauses of the above standards, and specifically SABS 044 1983 Part III and shall be Grade I welders. Grade 2 welders shall be permitted only with Engineer’s approval.

The Contractor shall provide evidence, acceptable to the Engineer, that welding procedures and welders have been tested in accordance with the requirements of AWS D1.1.

PPHA.4 PROTECTIVE TREATMENT (Sub clause 5.3.9)

PPHA.4.1 Shop Painting

- a) Steel work after fabrication shall be wire brushed to a finish equal to or better than Grade St3 or SIS 05 59 00.
- b) Within 4 h after the completion of wire brushing, paint all structural steelwork with Epoxy Resin paint, all as shown on drawings. Painting shall be applied in workshop by spraying to a final thickness of not less than 300 micron.

PPHA.4.2 Painting after erection

After the erection of steelwork, all chips or scratch marks shall be made good with brush applied Epoxy paint.

PPHA.4.3 Galvanising

Where galvanizing is specified it shall be carried out by hot dip process to provide a minimum mass of zinc coating of 650g/m^2 in accordance with SABS 763-1977 Clause 4.3.1 Table 2. Exposed threads to be treated with zinc based paint.

PSGB CONCRETE (ORDINARY BUILDINGS) (SABS 1200 GB)

MATERIAL

PSGB.1 Cement: Applicable Specifications (Clause 3.2.1)

No ordinary Portland Cement with a Sodium monoxide content (calculated as $\text{Na}_2\text{O} + 0,658 \text{ K}_2\text{O}$) that exceeded 0,6% may be used in reinforced concrete, unless it is used together with an approved coarse aggregate that has through testing proved that it is non-reactive towards a potential alkali-aggregate reaction. Sulphate resistant or Low Alkaline Portland Cement that complies to the above criteria may be used with any approved aggregate.

Supply all cement of a specific type from a single source for the duration of the contract.

PSGB.2 Cement: Storage of Cement (Clause 3.2.3)

Cement may not be stored for periods of longer than 10 weeks without the Engineer's approval.

PSGB.3 Aggregates (Clause 3.4)

Fine and coarse Aggregate must comply to the requirements of SABS 1083.

Fine aggregate must be clean silicate sand that occurs naturally. The broken shell content as determined by SABS Method 840 may not exceed 30% by mass.

The coarse aggregate must all remain on the 4, 75 mm sieve, the dust content excluded. The maximum dust allowed content will be 0,5% by mass. The flakiness index determined as per SABS Method 847 may not exceed 30% for 26,5 mm aggregate and 25% for 19,0 mm aggregate.

The 10 percent "FACT" minimum value for the coarse aggregate must be the value of the concrete subjected to surface friction.

The use of "Plums" will not be allowed in any strength concrete.

CONSTRUCTION

PSGB.4 Concrete: Quality: Concrete Consistency (Clause 5.5.1.2)

Provide a standard slump cone with a baseplate and ram rod on site. Standard slump tests must be performed at regular intervals as part of the control to ensure the provision of a good quality concrete. Slump for water retaining structure to be between 30 and 60mm.

PSGB.5 Concrete: Quality: Durability (Clause 5.5.1.5)

No reinforced concrete that are exposed or that forms a part of a water retaining element may have a water content that are more than the smallest value as indicated in Table 5 for concrete mixes for Severely Exposed Conditions, or be greater than 0,50.

PSGB.6 Concrete: Quality: Concrete: Strength (Clause 5.5.1.7)

Strength concrete must be provided according to the general notes as described on the drawings.

Design the mix proportions of strength concrete to provide a workable, non-bleeding, non-segregating mix with an average concrete strength of that of the prescribed cube strength plus 1,64 times the standard deviation.

Assume that the level of control over the concrete batching will be such that the standard deviation at the beginning of the contract will be 0,182 times the prescribed cube strength. The target strength of the design mix will therefore be 1,30 times the prescribed cube strength.

Any mix that shows a tendency to bleed after placement must be adjusted to restrict bleeding so as to ensure that concrete curing of horizontal and slanted surfaces can be practically be achieved.

PSGB.7 Concrete: Construction Joints (Clause 5.5.7)

Where applicable provide construction joints at positions as indicated on the drawings.

PSGB.8 Concrete: Concrete Surfaces (Clause 5.5.10)

Concrete surfaces such as blinding, and benching must be finished off with a straight edge to provide a reasonable finish. This finish is not measured or paid separately but is part of the rate of the concrete.

(i) Wood Finish

Where a wood float finish is specified or listed, the surface must be finished off as specified in sub clause 5.5.10.1 of SABS 1200G, and after the concrete had sufficiently hardened, the concrete must then be finished off to form a uniform surface that are free of trowel marks. The finished surface must only be floated to the extend as to provide uniform surface finish.

(ii) Steel float finish

Where a steel float finish has been specified or listed, the surface must be prepared in the same manner as for a wood float finish, except that after the moisture layer has disappeared and the concrete has sufficiently hardened to avoid the movement of cement foam at the surface, the surface must then be floated with a steel float on which only sufficient pressure is exerted to ensure a dense, smooth and uniform surface that is free from trowel marks.

PSL MEDIUM-PRESSURE PIPELINES

PSL 3 MATERIAL

PSL 3.2 AC Pipes and Specials

AC pipes and specials of diameter 300mm and less are to be bitumen dipped as specified in Appendix C of SABS 1223-1985- - " Fibre Cement Pressure Pipes and Couplings".

PSL 3.3 CI Pipes Fittings and Specials

Add: " All cast iron fittings to be lined with cement mortar or coated with Rilsan or fusion-bonded epoxy".

PSL 3.8.1 AC Pipes

Delete the second sentence and replace by : "All jointing shall be with AC sleeve type couplings unless otherwise ordered or shown on the Drawings".

Add: " The shortest length of pipe which may be used in the pipeline is 0,5m, thus the shortening of an adjacent pipe may be necessary so as to ensure compliance with the position of the specials. When pipes of 1,0m or less, in length, are used they shall be jointed by means of C.I. short collar detachable couplings".

Add : "The maximum length of pipe which may be used in the pipeline is 4,0m".

PSL 3.8.3 Flanges and Accessories

Add to Clause 3.8.3 :

"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. Drilling shall conform to BS4504 Table 16/11".

PSL 3.8.4 Loose Flanges

With regard to Clause 3.8.4 the following standard shall apply :

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

PSL 3.9.6	Corrosive Soil Add to Clause 3.9.6 : "The soil within the 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 Clause and replace by : "Two types of valves are acceptable: a) Wedge gate type valve, b) Resilient seal gate type valve. Valves shall comply with the requirements of SABS 664-1989 as amended, and shall bear the SABS quality mark. A test certificate as per Clause 3.5.20 of compliance with SABS 664 will be acceptable. Valves shall display the following features; • A minimum of 250 microns coating of fusion bonded epoxy or Rilsan Nylon 11. • Class 16 • Anti-clockwise closing • Non- rising spindle type with cap. • May have spigotted, socketted or flanged end connections. When flanged valves are specified, the drilling shall be to Table 16/11 of BS 4504". • In the case of resilient seal valves, valve gates shall be fully EPDM rubber lined, internally and externally and the spindle shall be Grade 316 Stainless Steel or equivalent with a double o-ring seal."
PSL 3.11.6	Surface Boxes Delete the contents of this Clause and replace by : "For non-trafficked areas, surface boxes are to be the thermoplastic type as per Engineer's Department Standard Detail Drawing No PSL 2/1. For trafficked areas surface boxes are to be cast iron type as per Engineer's Department Standard Detail drawing no. PSL 2/2".
PSL 3.12 (New Clause)	Hydrants 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 5 PSL 5.1.1	CONSTRUCTION General Add to Clause 5.1.1 "The centre 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/mPVC pipelines the pipe shall be laid to within 2,0m of the connection point. For HDPE pipelines the Contractor is to lay at least 300mm 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 5.1.4	Depths and Cover

Unless otherwise shown on the drawings or instructed by the Engineer, cover to pipes shall be as follows :-

During Construction :

Where construction traffic is liable to cross over pipes, they shall be laid so that there is not less than 0,75m of cover over the pipe. Road crossings shall be constructed after the construction of the road layers has reached the stage where 0,75m cover is available.

Pipes beneath Verges and Open Spaces :

The tops of pipes beneath verges shall be not less than 0,75m and not more than 1,25m below the final verge level.

Supply Connection :

The tops of pipes shall not be less than 450mm and not more than 600mm below the final road surface.

Pipes beneath existing roadways:

The tops of pipes beneath a road shall not be less than 1m and not more than 1,25m below the road level.

PSL 5.2

Joining Methods

Fusion butt-welding

a) Interpretation

This section shall cover the butt-welding of plastic pipes, which shall involve the heating of two pipe ends to fusion temperature and then subsequently joining the two ends by the application of force.

b) Equipment

The basic parts of the equipment shall be:

- i) Planning Tool: used to face pipe ends.
- ii) Heating Plate: used to melt pipe ends.
- iii) Frame: holds on to the pipes to be joined. It has hydraulic cylinders which apply pressure to the pipe joints.
- iv) Hydraulic Unit: has the hydraulic pump, tank, pressure gauges, directional valves, pressure regulation valves.
- v) Data Logger: records pertinent process data such as time, pressure and temperature. The data logger ensures that every joint is made properly.

c) Site Preparation

The technician shall ensure that the machine is situated in a dry area, before welding is commenced. The equipment shall not be exposed to rain.

No welding shall be executed during rain, unless an outdoor roofing structure is provided to protect the equipment and process from rain. The technician shall ensure that the equipment does not sit on wet ground.

d) Pipe Preparation

Pipe ends to be joined shall be dry and free from foreign particles.

e) Welding Procedure

Pipes shall not be welded in trenches or other excavation or underground structures.

Securely fasten the pipes to be joined to the welding tool. The pipes must be attached square to the axial direction:

- i) *Face the pipe ends.* The process shall be complete when the shavings are continuous in length and are equal in thickness. The faced ends shall be moved to touch each other in order to check for square-ness. The technician shall not touch the faced ends at this point in order to prevent contamination.
- ii) *Drag force shall be accounted.* Heating pressure and soak pressure have to be as recommended by the manufacturer (typically 0.16N/mm²). On the site however, long lengths of pipes being connected one by one presents varying levels of drag force. Thus, the technician shall compensate the drag force so that the effective welding or soaking pressure is maintained as recommended by the manufacturer. It is important that this pressure is attained. Volume reduction of plastic in its solidification from the melted state would lead to cavitations (air pockets) in the joint if the proper level of welding pressure is not reached.
- iii) *Melt the pipe interfaces.* Follow the recommended heating times from the manufacturer. Generally, a set level of bead height must be attained for a given pipe wall thickness. Bead height may vary from 0.5mm to more than 5mm. The recommended heating pressure is 0.16N/mm² (effective). Again, effective means that drag forces must be compensated.
- iv) *Soak the pipe ends in heat.* When the designated heating time is up, the high pressure is relieved, but the pipes remain in contact with the heating plate. Heat soak time typically varies from 5 seconds to several minutes. Heat soak pressure is about 0.02 N/mm² effective.
- v) *Changeover time.* After the pipes have been properly soaked, the pipes shall be immediately joined together. There is a changeover time, which refers to the maximum amount of time the pipes can be exposed to the atmosphere while removing the heating plate and moving the pipe ends together. Again, follow the recommended changeover time of the manufacturer of the welding equipment.
- vi) *Cooling.* After following the correct elapsed time for heating, soaking, and changeover, the pipe ends shall be pressed together at an effective pressure of 0.15 N/mm² or as recommended by the manufacturer. Cooling time under pressure varies from 6 minutes to 80 minutes. Failure to follow the correct cooling times may lead to the formation of air pockets in the joint.

f) Quality Butt-Welds

A successful weld shall be a joint equal or exceeding the strength of the pipe itself. Thus, a hydrostatic pressure test of the pipe with the joint shall rather first lead to a failure in the pipe section and not in the joint section.

All external and internal beads, protruding more than 2mm, at the fusion welded joints shall be removed, prior to pipe installation, by a technique approved by the Engineer.

g) Technician Qualification

Fusion joint shall **ONLY** be performed by technicians trained in the use of the fusion equipment, and with minimum 3 years of active experience with the specific pipe material.

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 Clauses 5.6.1 and 5.6.2 the references 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
 "Delete the contents of this clause and replace by : "The disinfecting of the pipelines will be undertaken by the Municipal Water Division after they have connected the new reticulation".
- 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 100mm."
- 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 Clause 7.3.1.1: "The Contractor's test equipment shall be connected directly to the flange of a hydrant tee- not through the hydrant's screwed outlet - or through a specially adapted end cap or a short, discardable pipe. Alterations may have to be made to the Contractor's test equipment to allow the placing of a Water Division's "in-line" check pressure gauge. If necessary, this will be requested by the 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 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 HDPE pipes and Class C AC pipes; 1,8 MPa for Class 12 - uPVC and Class 12 HDPE pipes and Class D AC pipes."
- Delete Clause 7.3.1.3 and 7.3.1.4.
- Add to Clause 7.3.1.5 ; "Water used by the Contractor to fill the reticulation and during testing shall be water drawn from the Municipal mains and transported in a clean container. A metered connection may be installed by the Water Division upon the request of the Contractor and upon the payment of the prescribed fee. The bleeding off of air trapped within the reticulation shall only be carried out via the hydrants, erf connections or at the prescribed connection points to the existing reticulation by :
- (1) a bleeder system fitted to the end caps, or
 - (2) a bleeder system fitted to a short length, say 500mm, of a pipe included at the end of the new reticulation.
- 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 Clause (a) the figure of "0,075" and replace by :
 "0,0161 for Class C, AC pipes
 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, mPVC, AC 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 shall be at his expense."

PSL 7.3.4 Witnessing of a Successful Leakage Test by an Official of The Water Division
(New Clause)

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 Municipal 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 Defects Liability 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 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."

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 will be allowed in the Schedule of Quantities for the connection to existing mains by the Municipal Water Division after acceptance of the reticulation.

PSLB BEDDING (PIPES)

PSLB 3 MATERIALS

PSLB 3.1 SELECTED GRANULAR MATERIAL

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

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

Selected granular material shall be a granular, free-draining, non-cohesive material with a grading analysis that shows 100% passing a 9.5 mm sieve and less than 5% passing a 0.425 mm sieve. The Compactability Factor shall not exceed 0.4 ”

PSLB 3.2 SELECTED FILL MATERIAL

Where rock or expansive clay is encountered in the trench bottom, the material in the selected fill blanket shall be selected granular material.

PSLB 3.3 BEDDING

ADD THE FOLLOWING:

“uPVC and HDPE pipes are deemed to be flexible pipes for the purposes of this sub clause.”

PSLB 3.4 SELECTION

PSLB 3.4.1 Suitable material available from trench excavation. Notwithstanding any references to the contrary in Clause 3.4, the Contractor is required to use selective methods of excavating. The Contractor shall selectively remove and keep separate topsoil, unsuitable material, and material suitable for reuse as backfill, selected fill, selected granular material or for other use as ordered by the Engineer.

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

PSLB 5.2 PLACING AND COMPACTING OF RIGID PIPES

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 AND CLASS C BEDDING

Concrete stormwater pipes shall be bedded as specified for rigid pipes with Class C bedding unless otherwise shown on the drawings or ordered by the Civil Engineer.

PSLB 5.2.2 CLASS B BEDDING

1. The dimension “x” for all rigid and flexible pipes (except for HDPE connections) as referred to in drawing LB-1 and LB-2 shall be 150 mm.
2. The dimension “x” for HDPE erf connections shall be 100 mm.

PSLB 5.3 PLACING AND COMPACTING OF FLEXIBLE PIPES

All PVC-U and HDPE water pipes, sewers and erf connections shall be classified as flexible pipes.

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.1 PRINCIPLES

PSLB 8.1.5 Disposal of Displaced Material

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

“Material displaced by the pipeline and by imported material from sources other than trench excavation, shall be disposed of at an approved site furnished by the Contractor. No haulage is payable for such material.”

PSLC CABLE DUCTS

PSLC 2 INTERPRETATIONS

PSLC 2.4 ABBREVIATIONS

Replace the term “GPO” with “Telkom”.

PSLC 3 MATERIALS

PSLC 3.1 DUCTS

Notwithstanding this clause, the following pipes shall be used for cable ducts:

Electricity ducts shall be PVC-U class 51 sewer pipes which shall comply with the relevant requirements of SABS 791, completely with end caps and draw wires.

Irrigation ducts shall be an approved smooth bore, black, HDPE cable conduit, complete with push fit couplings, rubber sealing rings, end caps and draw wires.

Data and communication ducts shall be smooth bore, green, approved HDPE cable conduit, complete with push fit couplings, rubber sealing rings, end caps and draw wires.

PSLC 3.2 BEDDING

Bedding shall comply with PSLB 3.1.

PSLC 3.3 BACKFILL

Material used for backfill of trenches under carriageways shall be subbase quality material that complies with Clause 3.2.1 of SABS 1200 ME.

PSLC 5 CONSTRUCTION

PSLC 5.1 EXCAVATION OF TRENCHES

PSLC 5.1.1 TRENCH WIDTHS AND DEPTHS

Ducts shall be installed at the positions shown on the drawings, according to Drawing LC-1 of SABS 1200LC, unless shown otherwise on the drawings, or as ordered by the Civil Engineer. Ducts shall be installed across carriageways at right angles to the centerline of the road. All ducts across carriageways shall have a minimum cover of 1.0 m between the finished road surface and the crown of the duct. Ducts shall extend beyond the back of the kerb, walkway or edge of road, as applicable, by a minimum of 1.0 m.

Where ducts are installed in areas other than road carriageways, the minimum cover shall be as stated in Clause 5.1.1.2.

In the case of electricity ducts for high tension electricity cables, the base width of the trench shall be the diameter of the duct with 150 mm side allowance, subject to a minimum base width of 500 mm. Where two or more ducts are laid in the same trench, the minimum base width shall be the sum of the diameters plus 150 mm side allowance and a minimum spacing of 100 mm between ducts.

PSLC 5.3 DUCT LAYING

PSLC 5.3.3 DRAW WIRE

The Contractor shall install 3 mm nominal diameter wires in all ducts.

PSLC 5.3.4 DRAW PITS

The connection of the cable duct to the draw pit shall be properly sealed to prevent the ingress of water or sand into the draw pit.

PSLC 5.3.5 SEALING OF DUCTS (New Clause)

The ends of ducts shall be sealed to prevent the ingress of sand, dirt and water during construction, completion of the duct. This shall be carried out by placing end caps onto the open ends of the pipe.

The ends of electricity ducts shall be sealed with approved end caps.

PSLC 5.6 LAYING OF CABLES WITH OTHER SERVICES

Where communication ducts are laid alongside water pipelines, a minimum clearance of 500 mm between the pipe / duct shall be maintained.

Where communication ducts and low voltage electricity cables are to be laid alongside each other in the same trench, a minimum clearance of 300 mm shall be maintained between the ducts.

PSLC 5.7 CROSSINGS OF COMMUNICATION AND ELECTRICITY DUCTS

Notwithstanding Clause 5.7, the distance between communication and electricity ducts/cables shall be the maximum possible, but not less than 300 mm in all directions. Where this cannot be achieved, then 50 mm thick, Grade 20MPa/13 mm concrete slabs shall be inserted between the ducts.

PSLC 5.10 POSITION TO BE MARKED

Marking of ducts is required on both sides of the carriageway.

The position, type and number of all ducts shall be marked by imprinting a letter "E", "W", "T", "C" for electricity, water, Telkom and communication services respectively, into the wet concrete of extruded or insitu kerbs and channels directly above the end of each duct or group of ducts. The imprint shall be 5 mm deep and 100 mm high. After the letters have been printed, the number of ducts laid shall be painted next to the symbol. The symbol and number shall be painted with an approved red paint. The letter and number shall be painted with an approved red paint.

Where there is no kerb or channel, or where precast kerbs are used, the duct shall be marked with a Grade 20MPa/19mm concrete marker 150 mm x 150 mm x 300 mm long with the appropriate letter imprinted on the square face. The marker shall be placed hard up against the edge of the road surface, level with the verge.

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

PSLD SEWERS

PSLD 1 SCOPE

Add to sub-clause 1.1 : "Drawings Numbered LD-2 to LD-8 are replaced by the PEM Standard Detail Drawings"

PSLD 3 MATERIALS

PSLD 3.1. Pipes, fittings and joints

Sewers shall be constructed in pipe materials shown on the drawings:

- uPVC: PVC-U Class 34 (heavy duty – minimum hoop stiffness 300kPa) pipes and fittings.
- Concrete: 2.5 RJ Class 100D (spigot and socketed) with 3mm HDPE
- Steel: Robor steel polypipe or similar approved : 600mm nominal bore x 6mm x 6.1m, flanged, SABS 1000-3 FF complete with 20mm HDPE liner with 1 side flat and other side grooved with o-ring. HDG (Hot dipped galvanized) pipes to be coated with a duplex system with a minimum DFT 105 µm

PSLD 3.5.1 Bricks

Delete in the first line "general purpose (Special) burnt" and replace by "facing (28 MPa min. strength) that complies with SABS 227."

PSLD 3.5.2 Precast Concrete Sections

Joints between concrete chamber sections shall be sealed as shown on the drawings.

"Dolomitic aggregate shall be used in the manufacture of the chamber sections, leveling rings and roof slabs."

PSLD 3.5.3 Prefabricated A.C. Manholes

Delete the contents of sub-clause 3.5.3 and replace with the following :

"These will not be permitted."

PSLD 3.5.4

Concrete

Dolomitic aggregate is required for cast in situ concrete.

PSLD 3.5.7

Step Irons

Delete the contents of sub-clause 3.5.7 and replace with the following :

"Step irons in manholes are not required."

PSLD 3.5.8

Manhole covers and frames

Type 1A lockable polymer concrete manhole covers and frames, which comply with the requirements of SANS 1882: 2003, shall be used in all areas unless noted otherwise on the drawings or details.

PSLD 5 CONSTRUCTION

PSLD 5.4.1

Connection into Existing Manholes

(New Clause)

An appropriate item has been allowed in the Schedule of Quantities to cover all costs connected with the making of this connection.

PSLD 5.6.1

General

Delete in Sub-clauses (a) and (b) the word "brick" and replace by "cast in situ concrete."

Delete in sub-clause (d) "Drawings LD....." and replace by "Municipal Standard Details Drawings".

PSLD 5.6.2.3

Benching

Delete "1:3 cement mortar" and replace by "concrete topping consisting of 1 part cement, 2 parts sand and 3 parts 7 mm concrete stone, by mass. The sand proportion may be varied between 1 1/2 and 2 1/2 to obtain ideal workability."

PSLD 5.6.7

Cast in Situ Concrete Manholes

Refer to Municipal Standard Detail Drawings for details.

20 MPa strength concrete shall be used. Aggregate size may be 19 mm or 13 mm to suite Contractor. Dolomitic aggregates are required.

When the concrete is mixed on site, an approved rotary mixer, suitable in size for a batch containing cement in increments of one sack of 50 kg, shall be used. The Contractor's method of batching of the ingredients shall be to the approval of the Engineer's Representative. Samples of the materials to be used shall be submitted for approval. The proportions of cement, coarse and fine aggregate and water necessary to produce the 20 MPa concrete shall be determined and submitted to the Engineer's Representative together with the results of compressive strength tests, before the Contractor will be allowed to use site mixed concrete in the construction of manholes.

The Contractor shall bear the costs of determining the proportions of the mix and making and testing cubes for this purpose. If the Contractor submits reliable test records of concrete made from the same materials and mix proportions which he proposes to use, then the Engineer may waive all or part of the strength tests required

above to verify that the concrete mix design which the Contractor proposes to use is satisfactory.

The Contractor shall carry out his own testing during the construction of the Works to ensure that the concrete being used complies with the Specification. The Engineer's Representative shall carry out such test check testing as he requires and the Contractor shall render any assistance necessary in taking of samples and the carrying out of tests.

All concrete being placed shall be vibrated by means of approved vibrators. Curing shall be by means of the application of a natural resin based liquid curing compound complying with ASTM C309-74. When the surface to be cured is to receive further concrete it shall be cured with water only, by sprinkling, spraying or ponding such as to maintain it in a continuously wet condition.

If the concrete is found to be cracked, honeycombed, soft or defective in any way, or if cube test strength results do not comply with the requirements, then the concrete shall be rejected. Rectification shall be by removal of the defective portion and replacement with sound concrete.

If the manhole is constructed in more than one lift the construction joint formed shall in addition to being prepared as specified in sub- clause 5.4.5.4 of SABS 1200 GA, be reinforced with 8 No 12 mm diam. x 300 mm long mild steel dowel bars, cast in to a depth of 150 mm, placed centrally in the joint face and equally spaced about the circumference.

PSLD 5.6.8
(New Clause)

Finished Cover Levels

Unless otherwise ordered or dimensioned explicitly on the working drawings, the level of the top surface of the cover shall be

- flush with the final surface of a carriageway, footway or any paved areas
- 50 mm above the surface of a grassed or gravelled verge, or service lane
- 250 mm above the finished ground level for manholes situated at the midblock of private or municipal property.
- 500 mm above ground level in undeveloped open space.

PSLD 5.6.9

Rectification of Infiltration of Water

Any infiltration visible in the manhole channels, pipe ends or benching shall be rectified by demolishing the base and rebuilding. Rectification of infiltration through the walls and/or joints may be attempted only by externally applied measures, failing which the manhole shall be demolished and rebuilt.

PSLD 5.9
PSLD 5.9.1

CONNECTING SEWERS

Location and Details

Delete the words "Drawing LD-7 or Drawing LD-8" as applicable and replace by :

"The relevant Municipal Standard Detail Drawings."

PSLD 5.9.2	<u>Marker Posts</u> Marker posts are not required
PSLD 5.9.3	<u>Recording Location</u> Add : "The information required under this clause shall be shown on form PEM 3849(8/88) obtainable from the Engineer's Representative.
PSLD 5.9.4 (New Clause)	<u>Connection of New to Existing Reticulation</u> The contractor shall under no circumstances connect the new reticulation into the existing without the prior written instruction of the Engineer. This instruction will only be given after acceptance, by the Engineer, of the sewer lines and manholes of the new reticulation upstream of the connection point. Connections will usually be made just prior to the start of the Defects Liability Period.
PSLD 6 TOLERANCES	
PSLD 6.2	OVERALL CENTRE-LINE CONTROL AND MANHOLE LOCATION Delete in second line " ± 300 " and replace by " ± 100 ". Manhole positions, as shown on the drawings, are critical. Any required deviation by the Contractor, in excess of the tolerance, must be authorized by the Engineer.
PSLD 6.3	<u>Manhole Invert Levels</u> Delete in second line " ± 50 mm" and replace by " ± 25 mm where vitro clay pipes are being used".
PSLD 6.4	<u>Alignment and grade between manholes</u> Replace "5%" in 6.4(a)(1) with "3%, where vitro clay pipes are being used".
PSLD 6.6 (New Clause)	AS-BUILT INFORMATION The Contractor shall submit "As-Built" levels, distances between manholes and the grades of pipelines for which he requires payment at the time he submits his monthly payment claim. A sample form is obtainable from the Engineer.
PSLD 7 TESTING	
PSLD 7.1	GENERAL
PSLD 7.1.6	Delete wording of sub-clause (c) and replace by : "A torch and mirror test shall be carried out on all pipe lengths, in both directions".
PSLD 7.2.1	<u>Air Test</u> Delete the table of 7.2.1(a) and replace by : "The air test shall comply with the requirements of NBRI-X/BOU of April 1976 also described in the Vitrified Clay Pipe Manual of 1978, page 29. For vitrified clay pipes the air test shall be carried out on saturated pipes and shall comply with the requirements of NBRI-X/BOU 2-34 also described in Vitrified Clay Pipe Manual of 1978, page 29, or else the contents of 7.2.1(a) and 7.2.1(b) apply".
PSLD 7.2.6	<u>Watertightness of Manholes</u> Especially in areas where the water table is low a test, as detailed hereafter, to verify the watertightness of any manhole may be requested by the Engineer's Representative.

Infiltration : The excavation surrounding the manhole shall be flooded to approximately the top of wall level and this depth of water maintained for at least 48 hours. The manhole will have satisfied the test requirements provided there is no sign of infiltration of water.

Exfiltration : The manhole shall be filled with water to the top of its wall level and this depth maintained for at least 24 hours. Water may be added to maintain this level.

At the end of the subsequent 24 hour period the drop in water level is to be measured. The manhole will have satisfied the test requirement provided the drop is less than 75 mm per metre in depth of the manhole measured from channel invert to the original height of the water. At the discretion of the Engineer's Representative a shorter testing time, minimum 3 hours, will be allowed in which case a 'drop in level' pro rata to the time tested ,shall be used.

PSLD 7.2.7
(New Clause)

Torch and Mirror Test

For the pipeline to be acceptable the visibility of the plug/reflector shall be at least 50% of its area.

PSLD 7.2.8
(New Clause)

Acceptance Criteria

The acceptance of the pipe length or manhole shall depend upon whether it satisfies the criteria set out in SABS 1200 LD clauses 6, 7 and the PS clauses above.

Where pipes other than vitro clay pipes are laid, only tests carried out on the pipelines after completion of the backfilling to ground level (excluding surface restoration) and completion of the construction of manholes to roof height, including benching, will be considered for acceptance purposes.

In the case where vitro clay pipes are being laid, no pipelines are to be covered prior to inspection and approval by the Engineer. Once the pipeline has been laid and bedded in the compacted bedding cradle (to half pipe) between control points, the Engineer must be called out to inspect the installation. The Contractor is to provide the necessary equipment in order for the Engineer to adequately assess that the pipeline has been laid to the specified tolerances. Further, an air test, in accordance with the specifications, is to be conducted and witnessed by the Engineer prior to the placing of the Fill Blanket.

PSLD 8 MEASUREMENT AND PAYMENT

PSLD 8.2.1

Supply, Lay, Joint, Bed and Test Pipeline

Add : "The measured quantity of completed pipe length will only be included in the payment certificate when the pipeline has satisfied the test after the completion of the backfill to ground level - See PSLD 7.2.8. Prior to this, payment will be made as materials on site."

PSLD 8.2.3

Manholes

Delete : "Separate items will of 0,5m" and replace by "Manholes and backdrops will be measured per number of each type of standard depth of 1,5m metres. Extra over or extra under items will be included in the schedules for the cumulative sum of variations in depth from the standard depth.

Delete reference to "short pipes" - the full length of piping is to be measured under the item "Supply, lay and test piping"

The tendered rate shall also provide for the supply, laying, jointing of channels as for a 'through manhole'. An extra over item will be scheduled for additional channels and associated work in branch manhole.

PSLD 8.2.6(a) Erf Connections (Types stated) Unit:..No.

Replace the contents of clause 8.2.6 with the following:

"Separate items will be scheduled for each type of 2,3 metre long sewer erf connection, as shown on the Municipal Standard Detail Drawings.

The rate shall cover the cost of additional excavation in all materials, backfilling, bedding, disposal of surplus material, and the supply and laying of the Y-junction and the connection pipeline to 1 metre within the erf."

PSLD 8.2.6(b) Extra-Over Item 8.2.6 for additional length of pipe Unit:.m
(New Clause)

Where the length of sewer erf connection exceeds 2,3m, an extra-over item shall be scheduled for each type. The rate shall cover the cost of additional excavation in all materials, backfilling, bedding, disposal of surplus material, and the supply and laying of additional connection pipeline.

PSLD 8.2.13 Watertightness of Manholes
(New Clause)

Payment will be made on a daywork basis for only those costs of carrying out the initial tests which showed the manhole to be acceptable. The costs of a failed test and the subsequent test/tests to prove watertightness will not be recoverable.

PSLE STORMWATER DRAINAGE

PSLE 3 MATERIALS

PSLE 3.4.1 Bricks

Delete the first sentence, and replace with the following:

"Bricks used in stormwater structures shall be:

Burnt clay engineering bricks, having a nominal compressive strength of 28 MPa, and complying with the requirements of SABS 227.

PSLE 3.5.9 Composite Drainage System
(New Clause)

The fin drain system shall consist of a geonet drainage core and geopipe enclosed within a geotextile filter jacket. The fin drain shall be supplied prefabricated with geopipe for assembly on site. The fin drain shall have a minimum flow capacity of 0,19 ℓ/s per metre (hydraulic gradient of unity and a pressure of 10 KPa) and shall not decrease in thickness by more than 20% under confining pressure of 10 kPa.

(a) Geonet Drainage Core

The core shall be non-coroding, rot-proof and manufactured from low density polyethylene with minimum characteristics as follows:-

Mass	:	822 g/m ²
Thickness	:	5mm
Tensile Strength	:	2,4 kN/m
Discharge capacity	:	3,0 ℓ/sec under 100 kPa at a hydraulic gradient of unity

(b) Drainage Pipe

The geopipe to be used in conjunction with the prefabricated fin drain shall be manufactured from high density polyethylene with not less than 60% of the surface perforated.

PSLE 5 CONSTRUCTION

PSLE 5.2.2 Pipe Culverts

Add: "Pipes with ogee joints, where they pass under roads and also on curved pipelines in verges, shall be wrapped with two layers of hessian soaked in cementitious grout. The wrapping shall be 400mm wide and placed centrally over each joint.

Unless otherwise stated in the Schedule of Quantities or indicated on the drawing, pipes with ogee joints shall be used.

Butt ended pipes will not be permitted.

Lifting holes should be suitably closed off to prevent the ingress of soil".

PSLE 5.5.6 Benching

Delete "granolithic plaster" and replace by "concrete topping consisting of a 1:2:3 cement, sand and 7mm stone mix by weight. The sand proportion may be varied between 1,5 and 2,5 to obtain ideal workability.

PSLE 5.8 Installation of Composite Drainage System
(New Clause)

The geopipe shall be placed at the bottom of the geonet with the channel section of the geopipe as the invert of the drain.

The geotextile filter jacket shall then be wrapped around the geopipe and stapled/joined at 300mm intervals. The complete system shall then be placed in the trench ensuring that during backfilling the fin remains vertical.

PSLE 6.6 Pipes into Manholes/Catchpits
(New Clause)

Pipes may protrude up to 300mm into a manhole/catchpit. This relaxation will only be permitted if the pipe does not have to be cut. The "dead space" formed at the end of the manhole is to be suitably benched off to prevent the collection of silt and rubbish.

PSLE 6.7 "As-Built" Details
(New Clause)

The Contractor shall submit as-built levels, distances between manholes and the grades of pipelines for which he requires payment, at the time he submits his monthly payment claim. A sample form is obtained from the Engineer.

PSLE 8 MEASUREMENT AND PAYMENT

PSLE 8.2.8 Supply and Install Manholes, Catchpits, etc.

Delete the words "but excluding excavation and backfilling, which will be measured separately" and replace with "including dealing with any excavation in all materials

(including disposal of surplus) which is additional to that measured under the item for pipe trench excavation (see subclause 8.2.3 of SABS 1200 DB)".

PSLE 8.2.13 Composite Drainage System Unit : m
(New Clause)

The composite drain will be measured linearly on slopes overall as laid. No deductions will be made for specials, but deductions will be made for the internal length of manholes. Separate items will be scheduled for different diameters of pipes, where relevant.

The rate shall cover the cost of providing the composite drain and the cost of laying, bedding, backfilling, jointing and making connections into manholes.

PSLE 8.2.14 Breaking into existing manholes
(New Clause)

The rate shall include for all labour and materials required for breaking into, laying of pipe, benching where necessary and making good around the pipe and all necessary reinstatement around the manhole on completion of the connection.

PSM ROADS (GENERAL)

PSM 6 TOLERANCES
PSM.6.4 Level Control of Road Layers
(New Clause)

The Contractor shall submit at the time of requesting acceptance of a road layer a record of the surface levels of that section, taken at meterage intervals to coincide with the level pegs. A sample form is obtainable from the Engineer.

PSM 7 TESTING
PSM 7.1 General

Add: "The random sampling method of TMH 5, for the spotting of positions, for field density testing will not necessarily be applied by the Engineer's Representative. Density testing shall be carried out where, in his opinion, the density of the compacted layer is suspect. The Contractor shall present the full width of the layer, between the stated linear stake values, for acceptance. Only in exceptional cases will partial widths of layer be accepted for testing."

PSM 7.3 Routine Inspection and Testing

Add to Clause 7.3.2: "The request for acceptance of a layer shall be submitted in writing, specifying the exact location of the section and type of layer. On receipt of all these details the Engineer's Representative will arrange for the necessary inspections and tests to satisfy himself that the road layer complies. Testing will be carried out as expeditiously as possible, and the results will be available within 48 hours of receipt of test request. The Contractor shall backfill the test holes left in the layer with a similar material to that of the layer tested and compact the material to a similar density. Concrete shall not be used."

PSM 8 MEASUREMENT AND PAYMENT
PSM 8.2 Inspection and Testing of a Road Layer
(New Clause)

The cost of refilling and compacting the density test holes shall be included in the rate tendered for the construction of that layer.

PSME SUBBASE

PSME 3 MATERIALS

PSME 3.2.1 Subbase Material

With reference to Clause d(ii) and d(iii), the regional factor for the Metropole shall be taken as 0,6.

PSME 5 CONSTRUCTION

PSME 5.4.1 Placing

The subbase layer shall be 150mm thick unless shown otherwise on the drawings.

PSME 6 TOLERANCES

PSME 6.1 Dimensions, Levels, etc.

PSME 6.1.1 General

Add the following to Clause 6.1.1:

“For layers, constructed of subbase quality material, on which the bituminous surface will be placed, the tolerance for dimensions and level shall be as set out in SABS 1200 MF Clauses 6.1.2 to 6.1.6 inclusive.”

PSMK KERBING AND CHANNELLING

PSMK 3 MATERIALS

PSMK 3.2.1 General

Delete the contents of Clause 3.2.1 and replace with the following:

“Refer to the Municipal Standard Detail Drawings for kerb and channel details.”

PSMK 3.8 Curing Compound

Add to Clause 3.8:

“and be a resin based white pigmented type.”

PSMK 3.9 Bedding Material

Delete the contents of Clause 3.9 and replace by the following:

“Either a 1:8 cement sand mix shall be used or if the layer is more than 30mm thick a strength concrete of Grade 20.”

PSMK 5 CONSTRUCTION

PSMK 5.1 Excavation and Bedding

Delete the first paragraph viz. “Trenches for grade.”

PSMK 5.2 Precast Concrete Kerbing and Channelling

Add in second line “10mm to” before “50mm”.

Delete in the last paragraph from “the kerbs shall” to “15 MPa and.”

PSMK 5.2.1 Precast Concrete Kerbing and Cast-in-situ Concrete Channelling (New Clause)

After the precast kerbs have been laid the formwork for the channelling shall be set up. Expansion joints shall be allowed for at approximately 8 metres intervals, i.e. opposite the joint between the kerbs. The principles of Clause 5.4 shall apply to the construction of cast-in-situ channelling.

PSMK 5.8 Machine-Laid Cast-In-Situ (Extruded) Kerbing and Channelling

Before commencing kerb laying on the site, the first 50m length of kerb and channel to be constructed shall be regarded as trial kerb and channel. The Contractor shall demonstrate in the trial length the methods he proposes to use for the construction of the kerb and channel, including joints, texturing, the achievement of a smooth surface and dense fully compacted concrete. It may be constructed either in the recognised position in a road or elsewhere on the site in which case it shall be demolished, broken out and removed at the Contractor's expense.

The trial kerb and channel shall be constructed with the plant and equipment to be used on the works and the equipment's motion forwards and the handwork carried out on the extruded section shall be so controlled and used as to produce a kerb and channel to the shape, lines and levels specified.

The time taken to lay the test strip shall be recorded, which in the event of acceptance, shall be used to calculate a rate of extrusion which shall not be exceeded without the permission of the Engineer.

If the concrete in the trial strip fails to meet the test requirements, the Contractor may, at his own cost, cut further cores from the kerb and or channel up to a maximum of one core per 100m length. The strengths obtained on such cores, together with those tested on the instruction of the Engineer, shall be used to test compliance with the strength requirements.

The Contractor may, unless advised of any deficiencies in the trial kerb and channel, proceed with kerbing as soon as acceptable core test results are obtained.

In the event of deficiencies in the trial kerb and channel, the Contractor shall, at his own expense, demolish the rejected sections and remove to the designated tip site and repeat the 50m long trial strip. This process shall be continued until the Contractor has produced kerb and channel in accordance with this specification. He may then proceed with kerb and channel construction proper. Any unacceptable trial length shall be broken out and removed to spoil, at the Contractor's expense before any subsequent trial length is permitted to commence.

Core test holes shall be filled with 30 MPa concrete mixed with a suitable adhesive compound.

No other means of testing the concrete will be considered and any kerb or channel not complying with all the requirements of the specification shall be broken out, removed to spoil and replaced at the Contractor's own expense.

The Contractor shall ensure that no change of circumstances or conditions is made to jeopardise the quality of the kerb and channel under construction. If, in the opinion of the Engineer, this does occur, he may order the construction of a further trial length of 50m of kerb and channel in accordance with the requirements of this specification. Work on the kerb and channel proper shall not proceed until a trial strip has been constructed in accordance with the requirements of this specification. No claims for delays will be considered by the Engineer on account of further trial lengths of kerbing being ordered.

PSMK 5.8.3 Subbase Preparation (Extruded Kerbing)

Delete in the first line from: "500mm beyond" to "as relevant" and replace by "150mm beyond the back face of the kerb." Note this dimension applies to the compaction width required for the road layer.

PSMK 5.13 Junction with existing Kerb And Channel
(New Clause)

The Engineer's Representative shall state in each case the length of existing kerb and channel to be removed. The exposed road layer surface shall be made good before proceeding.

PSMK 6 TOLERANCES

PSMK 6.1 Concrete Kerbing and Channelling

Delete in Clause (b)(1) the allowance of "0, - 10" and replace by " ± 10 " and add to wording "provided the layer thicknesses are not prejudiced."

PSMK 7 TESTING

PSMK 7.2.2.2 Alternative Test

Delete in Clause 7.2.2.2 all references to cubes and cube testing.

Add to second line of Clause 7.2.2.2 after "SABS Method 865" the following: "The numerical value of the compressive strength of the core used for adjudication shall be that value determined in accordance with Clause 6.3 of SABS Method 865."

Delete in fourth line of Clause 7.2.2.2: "22 MPa (i.e. less than 25 - 3 MPa)" and replace by: "20 MPa".

PSMK 8 MEASUREMENT AND PAYMENT

PSMK 8.1.1 Basic Principles

Delete the second sentence of Clause 8.1.1 and replace by: "Deduction from the linear length of the kerbing will be made for transition kerb and channel, catchpit structures and motor-slopes. These items will be measured separately."

PSMK 8.2.3 Variation of Tests on Extruded Kerbing

Add: "If the coring and testing is carried out via the Municipal Road Laboratory the Contractor will be debited with the cost of the test when the measured compressive strength is less than 20 MPa."

PSMK 8.2.6.1 Ancillaries

Add to Clause 8.2.6.1: "The unit of measurement of the 2 metre length of kerb and channel transition between mountable and barrier type kerb and channel and between mountable or barrier type and the precast support kerb at the catchpit shall be per number."

PSMK 8.2.13 Junction with Existing Kerb and Channel
(New Clause)

The unit of measurement for tying new kerb and channel into existing shall be per metre and shall include for all labour and materials necessary to comply with Clause PSMK 5.13 and to complete the junction.

PSMK 8.2.15 Motor Slopes
(New Clause)

- a) Standard Residential Motor slopes, with 3m ramps, as detailed on Drawing No PSMK 7/6.....No
- b) Extra-over for additional ramp width.....m

The rate shall cover the cost of supplying subbase quality material from commercial sources, placing to the required levels, watering and compacting to 95% Mod. AASHTO density, supplying and placing the concrete, forming of joints, screeding and finishing to the required levels.

PSMK 8.2.16 Pedestrian Ramps
(New Clause)

- a) Pedestrian Ramps, with floated concrete finish, as shown
on Drawing No PSMK 7/7..... No
- b) Pedestrian Ramps, with “bubble block”, as shown on
Drawing No PSMK 7/7 & 7/8..... No

The rate shall cover the cost of supplying subbase quality material from commercial sources, placing to the required levels, watering and compacting to 95% Mod. AASHTO density, supplying and placing the concrete, forming of joints, screeding and finishing to the required levels.

C3.7 PARTICULAR SPECIFICATION

PPP GENERAL

PPP 1.1 GENERAL DESCRIPTION OF WORKS

See Section C3.2 The Works.

PPP 1.2 DESCRIPTION OF SITE AND ACCESS

See Section C3.2 The Works.

PPP 1.3 CONTRACTOR'S PERFORMANCE

The Contractor shall carry out all work entrusted to him under this Contract in an efficient, thorough and workmanlike manner in accordance with good workmanship and to the satisfaction of the Engineer's Representative. He shall ensure that disturbance to the surrounding environment is kept to a minimum.

PAF APPLIED FINISHES

PAF 1 SCREED AND CEMENT PAVINGS

PAF 1.1 Materials

Portland cement: to SABS 471 "Portland Cement and Rapid Hardening Portland Cement."

Coloured cements: to SABS 471 "Portland Cement and Rapid Hardening Portland Cement."

Lime: to SABS 523 "Limes for Use in Building," plastic hydrated Type A2P.

Fine aggregate: to be approved river or pit sand or crushed stone or gravel. To be hard and clean and free from adherent coatings and clay balls or pellets. It shall not contain deleterious matter likely to adversely affect the hardening, strength, durability or appearance of the screed or paving, nor cause corrosion or efflorescence. Otherwise to be to SABS 1083 "Aggregates for Concrete" and in addition at least 97% of any sample measured by mass to pass a 2 360 micron sieve and the percentage that passes a 75 micron sieve when tested in accordance with SABS 1083 not to exceed 7,5%. Where the requirements for fineness modules cannot be met, obtain approval before proceeding.

Water: clean and fresh to B.S. 3148 "Tests for Water for Making Concrete."

PAF 1.2 Mix Proportions

Proportions of mixes given are by volume. Measure mortar constituents using clean gauge boxes made to size to suit volumes required.

Overfill gauge boxes and strike off excess material with straight edge.

Use plasticers, waterproofing agents, pigments and other additives strictly in accordance with Engineer's instruction or approval, or as stated on the Drawings or described in the Particular or Project Specification.

PAF 1.3 Cement Mix

Unless otherwise shown on the Drawings or stated in the Particular or Project Specification cement and sand screeds and pavings are to be composed of one part cement to three parts of sand.

PAF 1.4 Granolithic Mix

Plain granolithic is to be composed of two parts cement, one part coarse sand and three parts fine crushed clean granite chippings. Limestone or shale chippings are not acceptable.

PAF 1.5 Special Mix

To be as stated on the Drawings or described in the Particular or Project Specification.

PAF 1.6 Mixing

Mix materials by mechanical mixer or by hand on a clean level banker board. Add water only after thoroughly mixing of dry ingredients.

Mix thoroughly so that all individual constituents are incorporated evenly, but do not overmix when using plasticisers.

Keep mixer clean at all times and discharge mortar onto a clean level banker board.

Use mortar within about one hour of discharge from mixer at normal temperatures.

In no case must the mortar be used after the initial set has taken place. Reconstitution of mortar will not be permitted.

PAF 1.7 Workmanship Generally

Operatives must be skilled in laying screeds and pavings.

Lay finishing screeds and pavings when all other internal work is completed as far as possible.

Protect all existing work and approaches with boards, dust sheets, or other suitable means.

Do not lay screeds when air temperature is below 3°C on a falling thermometer of 1°C on a rising thermometer, or while any base surface remains frozen.

After compaction prevent rapid drying out.

Protect freshly laid screeds from damage by rain, sun, wind or any other cause.

PAF 1.8 Surface Preparation

Cut out all cracks and loose or hollow portions of old concrete base and make good.

Clean all background surfaces thoroughly to remove all dirt, dust, rust and oil.

PAF 1.9 Bonding to hardening concrete

Hack concrete base thoroughly to remove all laitance and to expose as much clean coarse aggregate as possible. Wash away all loose concrete and leave clean.

Wet base 24 hours before laying screed or paving and remove surplus water.

Brush neat cement slurry into surface 20 minutes before laying screed or paving, or apply approved bonding agent in accordance with manufacturer's recommendations.

PAF 1.10 Monolithic bonding to green concrete

While still green, brush base with a stiff broom to remove all laitance and loose aggregate and to provide a key.

Lay screed or paving within 3 hours of the laying of the base concrete.

PAF 1.11 Laying screeds and pavings

Where screed is to be laid monolithically on fresh concrete base lay screed within 24 hours of laying base concrete.

Where screed is to be bonded to hardened concrete and is 40mm thick or less lay in one course well bonded to base.

Where screed is to be bonded to hardened concrete and is more than 40mm thick lay screed in two courses, with lower course well bonded to base and thicker than upper course, and neither course less than 20mm thick. Compact lower course immediately before placing upper course.

Form movement joints in screed over movement joints in base, using joint filler placed to full depth and finished flush with surface.

Compact material thoroughly for full depth. Do not bring excessive laitance to the surface, and remove any which appears. Do not wet surface.

Prevent damage to electric conduits or heating cables. Do not wheel barrows over exposed screed pavings, conduits or cables, etc. Tip screed material onto bankers and spread carefully in same direction as cable runs.

PAF 1.12 Tolerances

Tolerances for floor screeds and pavings to be:

Level: $\pm 15\text{mm}$

Plane: 5mm maximum under a 3m straight edge placed with both ends on the surface of the screed.

Do not leave low spots between drainage outlets.

PAF 1.13 Surface finishes

Trowel or float surface of screeds to be a standard compatible with the finishing material to be laid on them.

Hand trowel skirtings coved to floor, and stair risers, treads and strings to a finish compatible with the adjacent floor.

Finish surface of cement and granolithic pavings with a steel float shortly after compaction is completed. Do not bring excessive laitance to the surface and remove any that appears. Do not wet surface. Repeat trowelling process at least three times at intervals within 10 hours of laying. Do not sprinkle cement onto surface.

Make good all defective work in screeds before applying finishes.

PAF 1.14 Curing and surface treatment

Immediately after laying, protect surface from wind, draughts and strong sunlight.

Cover surface as soon as it is sufficiently hardened with either:

- canvas, straw mats, or a 50mm layer of damp sand, kept damp, or
- waterproof sheeting kept in close contact with surface

Leave for not less than 7 days in normal weather conditions and not less than 14 days when temperature is below 3°C.

Do not heat screed or building artificially during first 4 to 6 weeks after laying; then raise temperature slowly.

Clean surface of finish before application of surface hardener, by wetting with soap-suds and scrubbing with wire brush and fine steel wool 7 to 10 days after laying. Mop up and scrub with fibre brush and clean water. Allow to dry.

Apply proprietary surface hardener or sealer as provided for on the Drawings or in the Particular or Project Specification, in accordance with manufacturer's recommendations.

PAF 2 CEILING AND WALL PLASTERING

PAF 2.1 Materials

Portland cement: to SABS 471 "Portland Cement and Rapid Hardening Portland Cement."

Portland blast furnace cement: to SABS 626 "Portland Blast Furnace Cement."

Coloured cements: to SABS 471 "Portland Cement and Rapid Hardening Portland Cement."

Lime: to SABS 523 "Limes for Use in Building," plastic hydrated Type A2P.

Fine aggregate: to be approved river or pit sand or crushed stone or gravel. To be hard and clean and free from adherent coatings and clay balls or pellets. It shall not contain deleterious matter likely to adversely affect the hardening, strength, durability or appearance of the plastering nor cause corrosion or efflorescence. Otherwise to be in SABS 1083 "Aggregates for Concrete" and in addition at least 97% of any sample measured by mass to pass a 2 360 micron sieve and the percentage that passes a 75 micron sieve when tested in accordance with SABS 1083 not to exceed 7,5%. Where the requirements for fineness modules cannot be met, obtain approval before proceeding.

Ready-mixed lime and sand: to BS 4721 "Ready-mixed Lime : Sand for Mortar."

Gypsum plaster: to be "Cretestone" or "Glastone" as manufactured by Gypsum Industries or other equal and approved.

Water: clean and fresh to BS 3148 "Tests for Water for Making Concrete."

Precast gypsum cove cornices: to SBAS 622 "Gypsum Cove Cornice."

Expanded steel lathing: to BS 1369 "Metal Lathing for Plastering."

Steel wiring netting: to BS 1485 "Galvanised Wire Netting."

Building paper: to Bs 1521 "Waterproof Building Papers."

Steel clout nails: to SABS 820 "Mild Steel Nails" galvanised to SABS 935 "Hot-dip (galvanised) Zinc Coatings on Steel Wire."

Galvanised steel wire staples: to BS 1494 "Fixing Accessories for Building Purposes."

Tying wire: 1,2mm diameter annealed steel wire, galvanised to SABS 935 "Hot-dip (galvanised) Zinc Coatings on Steel Wire."

Cement, lime and gypsum plasters are to be delivered to the site in the manufacturer's original branded and sealed bags and used immediately after opening.

PAF 2.2 Storage and handling of materials

Store cement, lime and gypsum plaster separately by different types, off the ground, in a dry, well ventilated space.

Ensure that sufficient supplies of sand are available for uniformity of unpainted finishes.

Use cement in rotation within three months of delivery.

Do not use gypsum plaster after three months from date of manufacture unless tested and found in good condition.

Avoid contamination of one type of plaster by another.

PAF 2.3 Mix proportions

Class	Cement	Lime	Sand
E	4	0	
F	3	1	
G	2	2	15 - 20
H	1	3	
J	0	4	
Special	As per Drawings Particular or Specification or Project		

Proportions of mixes given for cement-lime-sand plasters are by volume.

Bulking of sand has been allowed for.

Measure plaster constituents using clean gauge boxes made to size to suit volumes required.

Overfill gauge boxes and strike off excess material with straight edge.

Use plasticers, waterproofing agents, pigments and other additives strictly in accordance with the Engineer's instruction or approval, or as stated on the Drawings or described in the Particular or project Specification.

Dry admixtures to be dissolved in mixing water for each batch of plaster.

Gypsum plaster to be mixed to the proportions recommended by the manufacturer.

PAF 2.4 Mixing

Mix materials by mechanical mixer or by hand on a clean level banker board. Add water only after thorough mixing of the dry ingredients.

Mix plaster thoroughly so that all individual constituents are incorporated evenly, but do not overmix plaster containing plasticisers.

Keep mixer clean at all times.

Discharge plaster onto a clean level banker board or into barrows.

In no case must the plaster be used after the initial set has taken place. Reconstitution of plaster will not be permitted.

Do not use admixtures without prior approval.

Mix constituents with the minimum amount of water to provide the consistence required.

PAF 2.5 Mixing sequences

Cement-sand plaster: mix cement with dry sand then add water.

Cement-lime putty-sand plaster: mix cement with sand dry and add lime putty and water.

Cement-lime-sand plaster: mix cement with lime and sand, then add water.

White plaster: mix as specified using white cement and sand of approved colour.

Coloured plaster: mix as specified using colouring pigment.

Gypsum plaster: mix in accordance with the manufacturer's recommendations.

PAF 2.6 Workmanship generally

Provide sample panels (minimum one meter square) of coloured and textured coatings and obtain approval of colour and texture before starting work

Approved samples to be the control standard for the remainder of the work.

Do not commence any plastering until all superimposed and dead loads have had time to effect primary settlement of the background structure.

Do not begin coating work until all required openings, chases or other opertures have been cut, all pipes, fixtures, fixing pads and plugs have been fixed and making good has been completed.

Protect all existing work and approaches with boards, dust sheets, etc. All dropping on to finished work to be cleaned off immediately.

Protect all concrete surfaces from contamination by gypsum plaster.

Ensure that all plant and tools are kept clean and free from the previous mixes.

Do not work when air temperature is below 3°C on a falling thermometer or 1°C on a rising thermometer or while any coating material or background remains frozen.

Prevent excessively rapid or localised drying out.

Make good defective or damaged coatings before starting decoration.

Finish surfaces to the following tolerances:

- Level: $\pm 15\text{mm}$.
- Plumb in any storey height: 15mm
- Plane: 3mm maximum under a straight edge 1800mm long placed with both ends on face of plaster.

PAF 2.7 Background preparation

Hack off excess mortar projections and concrete fins, etc.

Before applying single coat thin wall plasters of less than 2mm thickness, prepare surfaces by filling holes, scratches and voids with finishing plaster.

Remove efflorescence, laitance, dirt and other loose material by thoroughly dry brushing.

Remove all traces of mould oil, paint, grease, dirt and other materials incompatible with plaster work by scrubbing with water containing detergent.

Treat organic growths with fungicide to manufacturer's recommendations and brush off.

Ensure effective key for plaster by one of the following methods:-

- Hack surfaces thoroughly and evenly to depth of 3mm for at least a third of the area.
- Rake out joints in brickwork to a depth of not less than 15mm.
- Apply bonding agent to surfaces in accordance with manufacturer's recommendation.
- Flick onto surfaces a spatterdash coating of cement-sand 1:1,5 - 2, and leave rough. Keep wet with fine-waterspray until set and allow to harden before applying undercoat.

PAF 2.8 Dubbing out

If necessary to correct inaccuracies, dub out in thickness' of not more than 10mm in same mix as first coat. Allow to dry out before next coat is applied. Cross scratch surface of each coat immediately after set.

Dubbing out will not be permitted on smooth dense concrete surfaces.

PAF 2.9 Applying internal plaster

Apply one coat cement plaster to a minimum of 12mm thick, and two coats cement plaster to a minimum of 20mm thick.

Apply each coat firmly to achieve good adhesion and rule to even surface.

Apply each coat at full thickness, to each wall and ceiling surface in one continuous operation.

Cross scratch all undercoats to provide key for next coat.

Conduits bedded in undercoat are to be covered with 90mm wide jute scrim bedded in finishing coat mix, pressed flat and trowelled in. Do not lap ends of scrim.

Apply all proprietary and special purpose plasters in accordance with manufacturer's recommendations.

Work undercoat well into interstices of metal mesh to obtain maximum key.

Apply subsequent coats of gypsum and lightweight plasters as soon as undercoat has set, is firmly bonded to background and had developed reasonable suction.

Allow cement based undercoats to dry out thoroughly to ensure that drying shrinkage is substantially complete before applying subsequent coat.

Do not allow coats of anhydrous gypsum plaster to dry out before setting is complete. Do not allow coats to remain damp after setting.

Where angle beads are not specified, form angles with rounded arris.

PAF 2.10 Finishes to internal plaster

Smooth finish: finish to a smooth trowelled surface, free from blemishes. Do not use water brush or excessive trowelling.

Wood float finish: finish with a dry wood float as soon as wet sheen has disappeared from surface to give an even overall texture.

Rough textured finish: finish with a cork or carpet float to provide a rough but even open-textured surface.

PAF 2.11 Moulded work

Fix prefabricated gypsum plaster mouldings to solid background by drilling, plugging and nailing with 38mm small headed galvanised clout nails at 300mm centres.

Fix prefabricated gypsum plaster mouldings to rigid sheet backgrounds with approved adhesive.

Mitre prefabricated gypsum plaster mouldings to required angles using a fine-toothed saw. Finish cut edges by lightly sand-papering to a smooth finish.

Do not plaster over prefabricated gypsum plaster mouldings.

Form skirtings in cement-sand 1:3, true to line and level to approved contours.

Bed plaster ventilator grilles level in finish coat and fix true to line.

PAF 2.12 Applying external plaster

Applying External Plaster

Work undercoat well into interstices of metal mesh to obtain maximum key.

Apply undercoats to uniform thickness. If thickness is greater than 15mm, apply in two coats of equal thickness.

Apply undercoats with trowel by throwing. Leave rough and open, and cross scratch without penetrating coat, to provide key for hand applied finishing coat.

Level undercoats to receive stipple finish with straight edge and rub lightly with wood float. Do not scratch.

Wet undercoat thoroughly while applying stipple finish.

Leave each coat for at least 24 hours, or longer in cold, wet conditions before applying next coat.

Prevent each coat from drying out too rapidly. If necessary spray with water in hot weather.

Brush down each undercoat to remove dust and loose particles and wet thoroughly before application of next coat.

Apply finishing coat from top to bottom to give surfaces without joints. If joints are unavoidable position to approval.

PAF 2.13 Finishes to external plaster

Plain Finish:

Apply to a uniform thickness with laying trowel.

Finish with wood or other suitable faced float to give an even texture.

Do not overwork surface or use steel trowel to finish. Do not apply water to final coat while working up. Do not draw excessive laitance to surface.

Scraped Finish:

Apply to a uniform thickness with a laying trowel. After coat has set but before it is too hard, expose aggregate by scraping surface skin to approved texture.

Rough Stipple Finish:

Spatter onto undercoat a 1:3 cement-sand mortar with block brush or stippling machine to an even texture and leave as cast.

Smooth Stipple Finish:

Spatter onto undercoat a 1:3 cement-sand mortar with block brush or stippling machine to an even texture and trowel with wood float to produce smoothed stipples.

PPS PLASTIC SHEETING

PPS 1. EMBEDDED MEMBRANES

PPS 1.1 Materials

Polyethylene sheets: to S.A.B.S. 952 "Polyethylene Sheet."

P.V.C. sheets: to be as stated on the drawings, specified in the Project Specification or described in the Schedule of Quantities and to be obtained from an approved manufacturer.

PPS 1.2 Storage

Store sheets under cover on end on a clean, dry and level surface.

PPS 1.3 Laying

Lay sheets on clean, dry base.

Protect sheets and prevent puncturing before or during laying of subsequent covering.

Ensure that permanent covering is laid as soon as possible after laying sheets.

PW WATERPROOFING

PW 1 WATERSTOPS

PW 1.1 Materials

Waterstops are to comply with the following Standard Specifications :

Rubber Waterstops: to CKS 388 "Rubber waterstops".

PVC waterstops: to CKS 389 "Flexible polyvinyl chloride waterstops".

Rubber waterstops shall be manufactured by the moulding of a high grade virgin natural rubber compound which will meet the specified performance requirements.

PVC waterstops shall be manufactured by the extrusion of an elastomeric plastic compound consisting of virgin polyvinylchloride and additional resins, plasticisers, stabilisers or other materials needed to ensure that the material, when compounded, will meet the specified performance requirements.

The amount of filler in the PVC waterstop shall not exceed 20% by mass.

The name of the waterstop supplier and full details of the waterstops that it is proposed will be installed, shall be submitted to the Engineer for approval at time of tender.

Submit to the Engineer for approval prior to its use anywhere on the Contract all available details of the physical and chemical properties of the materials, together with the results of performance tests done by an independent testing laboratory.

Waterstops must comply in every respect with the Engineer's requirements in regard to type, material, minimum dimensions, tolerances, number of lobes, etc.

PW 1.2 Storage

Waterstops must be stored under cover to provide protection against possible damage from UV radiation.

PW 1.3 Factory made inserts

Install all necessary factory made intersection pieces so as to create a fully continuous seal. Provide full continuity of lobes by mitreing in preformed intersection pieces for rubber waterstops and where intersection pieces are available for PVC waterstops or by hot vulcanising where special intersection pieces have to be made in the factory for PVC waterstops.

PW 1.4 Jointing

Weld joints in running lengths and between straight lengths and intersection pieces by hot vulcanising in accordance with the manufacturer's instructions. Limit the number of joints to the absolute minimum and, as far as possible, vulcanise joints at the factory. Site hot vulcanisation will be permitted only when authorised by the Engineer for butt joints between straight lengths of waterstops of similar type. Jointing other than by hot vulcanising will not be permitted. Ensure that hot vulcanised joints are not brittle and that they are capable of achieving not less than 50% of the tensile strength properties of the finished waterstop.

PW 1.5 Fixing

Clean all waterstops before casting into concrete and ensure that they are not contaminated with anything likely to interfere with the quality and curing of the concrete in contact with them.

Unless otherwise shown, place waterstops symmetrically about the centre line of the construction or movement joints.

Firmly fix waterstops in their correct positions by approved means to ensure that they are accurately cast in and not displaced during concreting.

PW 1.6 Protection

Exercise particular care not to damage waterstops left projecting from construction, contraction and movement joints prior to being finally cast in.

Where PVC rearguard waterstops will be left exposed for a period in excess of 60 days, make provision for protecting them from UV radiation by painting.

PW 2 WATER TEST

PW 2.2 Water test

All structures shall be tested for water tightness.

Final certification for the completion of the work will be subject to the Engineer's approval of the results of water tests conducted on the structures and the observed performance of the structure under the conditions specified, all as described in this Particular Specification.

The quality of concrete, surface finishings and jointing in the structure shall be of such a standard that the structure shall be completely watertight on completion of the Works. No specialised treatment of concrete surfaces or other remedial work of any description deemed necessary to waterproof the structure will be permitted without the Engineer's prior written consent.

For the purpose of inspection during the water test a restriction is placed on the Contractor in respect of backfilling adjacent to the structure. No backfilling above the top of the structure's perimeter wall base may be undertaken before the Engineer has certified in writing that the water test has passed in respect of the requirements of the visual inspections for leakage.

Both visual inspections and water loss tests will be required to establish the structure's watertightness.

Where water loss tests have to be carried out, construct an accurate device for measuring the true water level inside the structure and securely fix it at a point easily accessible for taking readings. Obtain the Engineer's approval of the proposed construction, fixing and location prior to manufacture.

Incorporate the following features in the measuring device:

- i) A stilling basin effectively restricting and damping movement of the water at point of measurement in relation to the main body of water.
- ii) A scale for taking direct readings of water level.
- iii) A reference surface on top of the stilling basin constructed so that direct measurements can be taken of fluctuations in water level using a vernier caliper.

Carry out the water tests as follows for the structure:

- i) Fill the structure to the normal top water level indicated on the Engineer's drawings. Maintain this water level, if necessary by filling from time to time, for an absorption period to be agreed with the Engineer. The absorption period shall not exceed 7 days.
- ii) If applicable, effectively seal all ventilators and manholes except as required for temporary access for measuring water level.
- iii) At the end of absorption period adjust the water level and, at a time convenient to all parties, record the level on the measuring apparatus. Record the water loss at 24 hour intervals over a test period of four days. Check that there is no ingress of water from the inlet pipes or from any other source. Also check that there is no leakage from the eg scour/outlet pipe because valve seals are not seating snugly.

During the period of monitoring water losses for the water test also measure evaporation losses at two representative measuring points at the water surfaces inside (or inside a close by structure) the structure. The apparatus used for measuring evaporation must comprise an evaporation drum with a minimum water depth of 1.0 m securely fixed inside the structure with its water level within 25 mm of the water level of the structure to be tested and a

freeboard to the rim of the drum not greater than 50 mm above the water level of the structure to be tested. The means employed to measure changes in the water level inside the evaporation drum must be the same as those specified for the measuring device for the water test itself. The details of the evaporation apparatus and methods of fixing and taking readings must be approved by the Engineer.

If there is no ground water present, the Engineer may also instruct that the flow from the underdrains (if applicable) be monitored to establish the total water loss over the 96 hour period of the water tests. This measurement shall then be included as a further criterion to determine whether the water test has been successful according to the 96 hour water loss permitted.

PW 2.3 Water test acceptance criteria

A water test shall be considered successful if:

- i) After 96 hours the recorded total water loss does not exceed a value of 6 mm;
- ii) No visual signs of dampness or leakage are evident on the exposed surfaces of the containing walls of the structure or at the joint between its wall and wall base on completion of the test.

Evaporation losses will be taken into account in establishing the total water loss.

PW 2.4 Remedial measures

In the event of leakage occurring, as determined by the Engineer from a visual inspection or from the losses recorded during the water test, define the defects causing leakage and empty the structure. Immediately remedy these defects in order to effectively waterproof the structure.

The remedial measures applied must be approved by the Engineer who shall have the right to reject any repair procedure he considers incompatible with the standards set out in this specification.

Acceptance of a repaired structure shall be dependent on the Engineer's approval of the remedial works and the final success of a repeated watertest.

PW 2.8 Availability of water for testing

Effluent from the last pond may be used for the water testing of structures.

Practically, observe a maximum rate for the filling of the Bio Reactor and Sedimentation Tanks of 1 metre rise in water level per day.

The cost of filling the structures with effluent from the last pond shall be for the Contractor's account in full.

In the event of the water test failing, the Contractor shall bear all costs connected with emptying, the remedial works necessary to effect watertightness, refilling and retesting. The Contractor shall similarly bear full responsibility for any delay to the Contract due to these causes.

PX SEALANTS

PX 1 Materials

Sealants are to comply with the following Standard Specifications:

Two Component Manganese Cured Polysulphide (gun grade): to SABS 110 "Sealing compounds for the building industry, two component, polysulphide base".

Two Component Polyurethane (gun grade, Ether or approved equivalent cured): to SABS 1077 "Sealing compounds for the building and construction industry, two component, polyurethane base."

Hot Applied Joint Sealants: to BS 2499 "Hot applied joint sealants for concrete pavements".

PX 2 Bond Breaker

Use adhesive backed PVC bond breaking tape suitable for use with polysulphide and polyurethane sealants.

Use adhesive backed heat resistant tape suitable for use with hot applied joint sealants.

PX 3 Back-up Material

Back-up material and preformed joint filler shall be non-staining and compatible with the sealant and primer and of suitable density and elasticity to support the sealant according to joint configuration, water pressure and other conditions to which the sealant will be subjected.

Back-up material shall be a non-absorbent material.

PX 4 Primer

Use a two-component primer compatible with the polysulphide or polyurethane sealant specified.

Use a single-component primer compatible with the hot applied joint sealant specified.

PX 5 Approval

Submit full details of the sealant system proposed to the Engineer for approval, which approval must be obtained in writing prior to any component of the system being installed.

PX 6 Sealant Applicator

The sealant applicator shall be defined as the party responsible for sealant installation.

Polysulphide and polyurethane sealant shall only be installed by a sealant applicator who is a specialist sub-contractor approved by the Engineer based on his qualifications to execute the work, previous experience and demonstrated performance on similar applications.

Where the sealant applicator is a sub-contractor he shall inspect all joints and sealant grooves to be sealed and shall furnish the Contractor with written acceptance of each section of the work prepared for sealing if he has not carried out such preparatory work himself. In the absence of this written acceptance, commencement of sealant installation by the sealant applicator shall similarly bind him as though written acceptance of the preparatory work had been furnished.

PX 7 Preparation

Prepare all joints to receive sealant as indicated on the drawings or to configuration and detail as specified by the Engineer. Install joint sealants only when the Engineer has inspected the sealant grooves and has confirmed approval in writing that the concrete at the joints has been

adequately cured, is clean and dry and that the joint and sealant groove has been properly prepared for sealant installation.

Follow the manufacturer's instructions regarding preparation for sealant grooves, priming and installation. Ensure that grooves are free from dust, oil, grease, water, etc, before applying primer and sealant. Clean grooves by sand-blasting to provide a sharp firm key on the surfaces to which the sealant will be bonded. Compressed air used for sand-blasting, blowing out of dust, drying, etc, shall be completely oil-free.

Proceed with sealant installation immediately after sand-blasting.

Ensure that each batch of sealant arriving on site is accompanied by a manufacturer's certificate confirming that the batch complies with the SABS specification for polysulphide and polyurethane sealants or complies with the British Standard Specification for Hot Applied Joint Sealants.

Strictly observe the manufacturer's instructions for priming and sealant installation particularly with regard to times for drying, curing and pot life for the particular product. Observe correct heating temperatures for Hot Applied Joint Sealants.

Install sealant after the insertion of back-up material, if required, bond breaker tape, priming and the mixing or heating of the sealant in the prescribed manner. Install polysulphide and polyurethane sealants under pressure with a suitable sealant gun. The equipment used shall provide sufficient pressure to completely fill the sealant groove.

Use suitable melting/pouring equipment for installing Hot Applied Joint Sealants.

If required, tool the sealant to ensure an air-free seal and to provide maximum bond to the adhesion surface to which the sealant is applied. When tooling sealants use tooling solution recommended by the manufacturer.

Clean adjacent surfaces of sealant or other soiling arising from sealant installation as the work progresses. Use the solvent or cleaning materials and methods recommended by the sealant manufacturer.

Scrap hot poured sealant material that has been heated and allowed to cool below an acceptable level.

Retain wet samples of polysulphide and polyurethane sealants in sealed tins for testing and keep check lists of all completed work in detail including sealant and primer batch numbers and location of sealant and primer batches installed in the structure as directed by the Engineer.

Protect completed joints likely to be damaged by further construction operations in a manner approved by the Engineer.

Any completed sealing work that is to be concealed by further work shall be inspected by the Engineer and approved by him before it is covered or before further work is commenced.

PX 8

Testing

Where so instructed by the Engineer, submit samples of the sealant and primer batches as installed to an approved independent authority. If required, obtain samples of sealant and primer representative of the batches of material designated for installation sufficiently early so

that they can be forwarded and tested and the test results can be made available prior to sealant installation.

PPC PAINTING AND PROTECTIVE COATINGS

PPC.1 Paintwork

PPC.1.1 Materials

The paints to be used shall be of an approved manufacturer and brand and shall comply with the relevant SABS Specification.

All coats to be compatible and from the same manufacturer and applied in accordance with the manufacturer's instructions. Barrier coat(s) to be generally of a different colour from the primer and finishing coats.

PPC.1.2 Workmanship

PPC.1.2.1 Preparation, Application and Handling

After sand blasting and before steelwork is delivered to site it must be inspected and approved by the Engineer. The Contractor must notify the Engineer in writing when the steelwork is ready for inspection.

(i) Surface Preparation: Paint shall not be applied over any surface containing traces of grit, grease, oil, etc, loose rust, loose millscale or corrosion products of any kind.

- The grades of surface preparation viz blast-cleaning and wire brushing mentioned in this specification refer to the Swedish Code of Practice SIS 055900-1967. This latter code is accepted by SABS as a South African standard for surface preparation.
- All air used for blast-cleaning or spraying shall be free from all traces of water and oil.
- When blast-cleaning, a satisfactory blast profile (i.e. anchor pattern) shall be achieved. A maximum profile of 75 micro-metres shall be allowed. If the abrasive used for blast-cleaning is sand, then it shall be free of clay.

(ii) Coating Application:

All metal surfaces to which paint is applied shall be moisture dry. Paint surfaces which are to be over-coated shall be hard dry before over-coating, unless the specification states otherwise.

- Prior to painting all traces of soluble salts and corrosive air-borne contaminants shall be thoroughly washed from the surface. Once dried the surface shall be immediately repainted.
- Unless otherwise stated, no paint shall be applied within 50 mm of areas which are to be welded.
- Welds and adjacent parent metal shall be deslagged, inspected and approved and all spatter shall be removed prior to painting.
- The weld area shall be abrasive blasted and / or ground and all contaminants, such as flux, weld spatter, etc, shall be removed prior to painting. It is recommended that the weld area then be flushed with fresh water and be allowed to dry before receiving the full specified paint system.
- Surfaces which are to rest on concrete or other floors shall receive the full paint system prior to erection.
- Areas where the paint coating has been damaged during transportation, erection or by any means whatever, shall be repaired as follows:

Rust spots shall be removed from damaged areas by means of wire brush or emery paper and the surrounding paint to damaged areas which is still intact shall be feathered for a distance of 20 mm beyond the damaged area.

Spot priming shall consist of all of the coats previously applied, and shall overlap the damaged area by 20 mm.

NOTE: THE ABOVE METHOD OF REPAIRING DAMAGED AREAS DOES NOT APPLY TO SOLVENTLESS EPOXY COATINGS

- Where the shop coat is allowed to age for a few months before painting, light sanding or rubbing with steel wool or scrubbing with clean water, using a bristle brush, is strongly recommend.
- Mating or contact surfaces shall be protected from corrosion by ensuring that the two surfaces brought into contact with each other shall be prepared and primed in accordance with the specification. The primed surfaces shall be brought together while the paint is still wet.
- Areas which will be inaccessible after erection shall receive the full specified coating system. This applies particularly to back-to-back angles, purlins, flange faces, etc.
- Where specified, steel embedded within concrete shall not be oiled or painted except to within 50 mm of the concrete / air interface.
- All sharp edges and cut ends shall receive the specified dry film thickness of paint.
- The Contractor shall ensure that the manufacturer's recommended thinners are used for any particular paint.
- The Contractor shall satisfy himself that the final finishing coat obliterates (i e hides) the previous coat. Should he have any objections, these, together with his recommendations, shall be submitted to the Engineer in writing.
- Paint dry film thicknesses shall be measured using a non-destructive thickness gauge such as the MIKROTEST or equivalent.
- The Engineer shall use his discretion in deciding on the tolerances to be allowed.
- The paint manufacturer's instructions shall be strictly adhered to.

PPC.2 Hot Dip Galvanising

PPC.2.1 Generally

Where hot dip galvanising is specified, indicate all necessary vent and drain-holes on shop drawings submitted for approval. Pre-clean welds to remove all slag, spatter and other deposits. Mask contact surfaces to H T F G connections during galvanising, or grit blast after galvanising.

Make good damage to metal coatings using zinc rich primers, such that the original thickness of metal coating is restored.

Clean steelwork of all scale, rust, slag, paint, oil, grease, moisture and other impurities by immersion in a hot sulphuric acid bath following local blast cleaning where necessary. Thereafter wash the steel and dip in a strong solution of zinc-ammonium chloride.

Dip steelwork in a hot zinc bath as per SABS 763-1966 and /or 934-1969. The minimum zinc coating as specified by this standard is to be deposited unless the Engineer specifically requires otherwise.

Carry out subsequent etching, painting, handling, storage and bolt treatment in compliance with SABS 763-1966 and / or 934-1969.

PPC.3 Paint and Coating Systems

PPC.3.1 Painting and Galvanised Steelwork

Preliminary Requirements:

All fabrication, drilling of holes and deburring shall be completed before galvanising. Welds on flanges shall be cleaned of all splatter, slag, etc.

Galvanising:

The steelwork shall be pretreated and galvanised in accordance with specification SABS 763-1967 and / or 934-1969.

Painting:

Thoroughly degrease the galvanised surfaces by means of a suitable degreaser applied with a bristle brush. Hose down with fresh water and allow to dry.

Apply preferably by spray, one coat of SELF ETCHING ZINC CHROMATE WASH PRIMER to a dry film thickness of 8 – 13 micrometers.

Apply by brush, flow or dipping 3 coats of EPOXY TAR coating (Black or Brown) to give a minimum dry film thickness of 100 micrometers per coat. Black shall be the final coating. Consecutive coats shall be applied within 24 hours of each other, but the minimum over-coating time will be dependent on the ambient temperature, humidity, etc.

PPA FENCING

PPA.1 SCOPE

This Specification covers all work concerned with the construction and erection of various types of fences, including accessories and erection requirements for material. Fences are required for the Borehole Pump Stations.

PPA.2 MATERIAL

PPA.2.1 POSTS, STAYS, STANDARDS AND DROPPERS

Posts, stays, standards and droppers shall be of the type and size as indicated on the drawings. Where steel sections are shown, these shall comply with the requirements of CKS 82. All posts, stays, standards and droppers shall be medium duty hot dipped galvanised. Standards shall be 2,50kg/m Y-sections. Droppers shall be 0,56kg/m ridge back pattern. All tubular sections shall be provided with a footplate and pressed steel cap.

PPA.2.2 BOLTS FOR STAYS

All the necessary bolts, together with nuts and washers shall be supplied with each post and the coating and corrosion protection will be similar than that specified for the posts.

PPA.2.3 WIRE

- Smooth wire shall comply to SABS 675 and shall be of the types specified below.
- Straining wire shall 4.00mm diameter heavy duty galvanised wire.
- Fencing wire shall be high tensile grade 2.24mm diameter wire heavy duty galvanised.
- Tying wire shall be 2.50mm diameter steel heavy duty galvanised wire for tying fencing to standards and droppers and 1.6mm steel heavy duty galvanised wire for tying netting and mesh to fencing wire.

PPA.2.4 DIAMOND MESH

Diamond mesh (chain link fencing) shall comply with the requirements of CKS 229. The width shall be as shown on the drawings and the edge finish shall be both clinched or barbed. The nominal diameter of the wire shall be 2.5mm and the mesh shall be 64mm x 64mm. The wire shall be galvanised to SABS 675 Class Medium Duty.

PPA.2.5 GATES

Gates shall be manufactured to the dimensions shown on the drawings. Gates shall be complete in every respect including hinges, washers, bolts and locking chain attached to gate.

PPA.2.6 GENERAL REQUIREMENTS

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

All work specified on the drawings or in the Schedule of Quantities will form part of the rates so specified. This will imply that excavation of holes for poles, etc. and the supply, mixing and placement of concrete will form part the rate for that particular item as specified in the Schedule of Quantities.

The Contractor shall, on completion of the each section of the fence, remove all cut-offs and other loose material, netting or wire so as not to create a hazard to grazing animals or a nuisance to land owners.

PPB BUILDING WORK

PPB 1 GENERAL

Refer any discrepancies to the Engineer in writing prior to commencement of work.

Obtain the Engineer's written authorization for all amendments prior to commencement of work.

No drawing is to be scaled. Figured Dimensions to be used at all times.

Unless otherwise stated Permissible Deviation (PD) will be to Degree of Accuracy II in terms of the relevant section of SABS 1200 Standard Specifications.

The Contractor is to locate and identify existing services on site and to protect them throughout the duration of the works.

The Contractor shall at all times observe proper and adequate safety precautions on the Site.

PPB 2 EARTHWORKS

Earthworks to be in accordance with SABS 1200 D.

Approved selected cohesionless backfill around columns and walls, above bases and beneath surface beds, must be compacted to a minimum density of 100% Mod AASHTO in layers not exceeding 200mm thick unless noted otherwise.

C3 7 PPB 3 CONCRETE

Concrete, formwork and reinforcement to be in accordance with SABS 1200 G.

Cement to comply with the requirements of SABS ENV 197-1. Use CEM 1 32,5 or higher.

For exposed concrete, and concrete on or below ground, the total alkali content (i.e.) the product of the Na O-equivalent of the cement and the cement content of the concrete) must be limited to a maximum 2,1 kg/m of concrete, if such concrete is made with alkali-reactive aggregates.

Required characteristic concrete strength at 28 days (unless noted otherwise):

Unreinforced concrete (e.g. mass concrete, blinding & strip footings)	15MPa/25 Aggregate, except if otherwise specified
Bases and foundation beams (Non-aggressive soil)	5MPa/25 Agg.
Concrete surface beds	30MPa/19 Agg.
Columns	30MPa/19 Agg.
Suspended beams and slabs	30MPa/19 Agg.
Maximum free water/cement ratio for durability purposes:	
Exposed concrete & concrete on ground	0.46
Protected concrete	0.62

The Contractor is to submit his proposed mix designs to the Engineer for approval prior to construction commencement.

Ground slabs to be cast on selected clean cohesionless material, compacted to 100% Modified AASHTO density. Slabs to be cast in approximately square panels not exceeding 12 m² in area. All joints to be positioned and formed in accordance with detail drawings.

Final founding levels of strip footings and bases to be determined on site by the Engineer.

Minimum concrete cover to any reinforcing bar, including links, to be as tabulated below unless noted otherwise:

Concrete in contact with the ground	50mm
Slab top surface:	
External, unplastered	40mm
External, plastered	30mm
Internal	20mm
Slab soffits	20mm
Beams, columns and walls:	
External, unplastered	40mm
External, plastered	30mm
Internal	20 mm

Provide all exposed concrete corners with 25 mm x 25 mm chamfers.

All concrete to be cured by an approved method for at least 7 days after final set of concrete. The Engineer may adjust the curing period depending on weather conditions.

Shutter removal and propping procedures to be discussed with and approved by the Engineer.

PPBK BRICKWORK AND MASONRY

PPBK 1 Bricks and Blocks

Clay Bricks: to SABS 227 "Burnt Clay Masonry Units".

Calcium silicate bricks: to SABS 285 "Calcium Silicate Masonry Units".

Cement bricks: to SABS 987 "Cement Bricks". Concrete bricks: to SABS 527 "Concrete Building Blocks".

Excluding clauses 4.1 (dimensions) and 4.6 (strength). Dimensions to clause 3.2 of SABS 285 "Calcium Silicate Masonry Units" and minimum strength as in the table below.

Class	Compressive strength (MPa)	
	Average of 12 units	Individual
A	7	5,5
B	10,5	8,5
C	14	11,0
D	21	17,0

Clay fibre bricks: to SABS 35 “Fire Clay and Silica Refractories”.

Silica bricks: to SABS 35 “Fire Clay and Silica Refractories”.

Fixing bricks to C K S 175 “Fixing Bricks”.

Concrete blocks (precast solid or hollow, high or low density aggregated, aerated): to SABS 527 “Concrete Building Blocks”.

Calcium silicate blocks: to SABS 285 “Calcium Silicate Masonry Units”.

Gypsum blocks: to SABS 52 “Gypsum Blocks”.

Hollow clay blocks: to SABS 52 “Hollow Clay Building Blocks”.

Airbricks: to BS 493 “Air Bricks and Gratings for Wall Ventilation”.

PPBK 2 Pipes

Concrete pipes for refuse chutes: to SABS 677 “Concrete Non-Pressure Pipes”.

Concrete pipes for refuse chutes: to SABS 559 “Vitrified Clay Sewer Pipes and Fittings.”

Clay flue Linings and terminals: to BS 1181 “Clay Flue Linings and Flue Terminals”.

PPBK 3 Bricks and Blocks Reinforcement

Reinforcement: Wire mesh to SABS 1024 “Welded Steel Fabric for Concrete Reinforcement”, galvanized to SABS 935 “Hot Dip (galvanized) Zinc Coatings on Steel Wire”.

PPBK 4 Damp-Proof Courses

Bitumen damp-proof course: to SABS 248 “Bitumen Damp-proof Courses”.

Polyethylene damp-proof course: to SABS 952 “Polyethylene Sheet”.

Copper damp-proof course: to BS 743 “Materials for Damp-proof Courses”, coated with bitumen both sides.

Lead damp-proof course: to BS 743 “Materials for Damp-proof Courses”, coated with bitumen both sides.

PPBK 5 Wall Ties

Metal ties for cavity walls: to SABS 28 “Metal ties for Cavity walls”.

PPBK 6 Mortars

Portland cement: to SABS 471 “Portland Cement and Rapid Hardening Portland Cement”.

Portland blast furnace cement: to SABS 626 “Portland Blast Furnace Cement”.

Lime: to SABS 523 “Limes for Use in Building”.

Fine aggregate: to SABS 1083 “Aggregate for Concrete” and in addition at least 97% of any sample measured by mass to pass a 2360 micron sieve and the percentage that passes a 75 micron sieve when tested in accordance with SABS 1083 not to exceed 7,5%. Where the requirements for fineness modulus cannot be met, obtain approval before proceeding.

Water: clean and fresh to BS 3148 “Tests for Water for Making Concrete”.

PPBK 7 Mortar Mixes

Mortar shall be one of the following classes as specified in Chapter 8, Regulation 13 of the Standard Building Regulations published by the SABS, and shall comply with the requirements relating to its classes:

Class A – Minimum compressive strength 10,5 MN /m² at 28 days

Class B – Minimum compressive strength 4,9 MN /m² at 28 days
Class C – Minimum compressive strength 1,4 MN /m² at 28 days
Class D – Minimum compressive strength 0,5 MN /m² at 28 days

Unless otherwise stated on the drawings or provided for in the Particular or Project Specification the respective classes shall be used in accordance with Clause 5 of the above Regulation.

Measure mortar constituents using clean gauge boxes made to size to suit volumes required.

Overfill gauge boxes and strike off excess material with straight edge.

Use plasticisers, waterproofing agents, pigments and other additives strictly in accordance with Engineer's instruction or approval or as stated on the Drawings or described in the Particular or Project Specification.

Dry admixtures to be dissolved in mixing water for each batch of mortar.

PPBK 8 Mortar Mix Consistencies

Mortar generally: mix constituents with the minimum amount of water to provide the consistency required.

Semi-dry mortar: mix constituents and add sufficient water to form a crumbly consistence.

Slurry: mix constituents and add water to form a slurry of creamy consistence.

Grout: mix constituents and add water to form a liquid grout.

PPBK 9 Mortar Mix Sequences

Cement-sand mortar: mix cement with dry sand then add water.

Cement-lime putty-sand mortar: mix cement with sand dry and add lime putty and water.

Cement-lime sand mortar: mix cement with lime and sand then add water.

White mortar: mix as specified using white cement and sand of approved colour.

Coloured mortar: mix as specified using colouring pigment. Do not use admixtures without prior approval.

PPBK 10 Mortar Mixing

Mix mortar by mechanical mixer or by hand on a clean level banker board.

Mix mortar thoroughly so that all individual constituents are incorporated evenly, but do not overmix mortars containing plasticisers.

Keep mixer clean at all times and discharge mortar onto a clean level banker board.

Use mortar within about one hour of discharge from mixer at normal temperatures.

In no case must the mortar be used after the initial set has taken place. Reconstitution of mortar will not be permitted.

PPBK 11 Samples and Panels

Submit 6 samples of each type of brick and block and obtain approval before placing orders with suppliers.

Prepare sample panels 1 m x 1 m approximately for each type of facing brickwork including jointing or pointing, and obtain approval before proceeding.

PPBK 12 Handling of Bricks etc.

Unload and handle bricks or blocks without soiling, chipping or other damage.

Unload and handle packaged bricks with proper mechanical plant damage.

Stack bricks and blocks on level hardstanding. Protect from inclement weather.

Wet clay bricks and blocks to the minimum necessary to prevent mortar drying out prematurely. Calcium silicate and concrete bricks or blocks should not be wetted.

PPBK 13 Protection

Protect freshly laid work during interruption through rain, and at the completion of each day's work.

Keep facework clean during construction and until practical completion. Turn back scaffold boards at night and during heavy rain. Rubbing to remove stains will not be permitted.

PPBK 14 Laying

Do not use clay bricks, which are less than 6 weeks old from the kiln.

Distribute facing bricks of varying colour evenly throughout the work so that no patches appear. Mix different deliveries, which vary in colour to avoid horizontal stripes.

In all load bearing walls lay single frog bricks with frog uppermost, double frog bricks with deeper frog upper-most and fill all frogs with mortar.

Carry up work including both skins of cavity work with no portion more than 1,5m above another at any time, raking back between levels.

Lay bricks on a full bed of mortar and fill all joints. Make bed and vertical joints of equal consistent thickness.

Gauge brick courses as shown on the drawings or as per instructions of the Engineer.

Lay solid blocks on a full bed of mortar with joints filled solid to a consistent thickness not more than 12 mm.

Lay hollow blocks on a full bed of mortar but do not fill hollows in blocks. Joints to be of a consistent thickness not more than 12 mm.

Build brickwork and blockwork to the following tolerances:

Setting out dimension:	± 15 mm
Level of bed joints:	± 15 mm
Plumb of walls in any storey height:	15 mm

Use templates for forming openings in facework where doors and windows are not to be built in.

Use templates for forming lift shafts accurately at each floor level.

Fill between joints and rafters at floor levels and eaves.

For treatment between brickwork/blockwork and structural soffits refer to drawings.

For fair-faced work select bricks and blocks with perfect arises and flat surfaces and lay with faces in line.

Build in necessary fixing bricks, blocks, lugs or cramps etc. for trims and for components.

PPBK 15 Bonding

Lay bricks throughout the work with the cross joints in any course not less than a quarter of a brick from those in the course below.

Block bonding: bond new brickwork to existing work in blocks not more than 300mm high.

English bond: lay with alternate courses of headers and stretchers.

Flemish bond: lay in staggered courses with alternate headers and stretchers in each course.

English garden wall bond: lay with 3 courses of stretchers with a half brick lap and 1 course of headers.

Heading bond: lay with headers only each course with a quarter brick lap.

Stretcher bond: lay with stretchers only in each course and half brick lap. Except in the case of a half brick wall provide ties as for "Cavity Work".

PPBK 16 Cavity Work

Keep cavity and ties free from mortar and debris with battens or other suitable means.

Clean the bottom of the cavity through holes as necessary. Make good all holes.

Seal with 1,6 mm shaped galvanized mild steel sheet all cavities, which are to be spanned with in-situ concrete.

Cavities filled with concrete to levels shown on drawings to have top surface sloping to the exterior.

Provide wall ties of the type and material stated on the drawings or described in the Particular or Project Specifications and spaced as per the following Table:

Cavity width	Horizontally	Vertically
50 – 75 mm	900 mm	450 mm
76 – 100 mm	750 mm	450 mm
101 – 150 mm	450 mm	450 mm

Provide additional ties around openings every 300mm vertically. Unless otherwise shown, close jambs and sills to openings in cavity walls with solid brickwork, and provide damp-proof course.

Form weep holes in vertical joints at approximately 800 mm intervals at the base of the cavity and over external openings.

PPBK 17 Jointing and Pointing

Joints, which are not to be visible in the finished work to be struck off with a trowel as the work proceeds.

Flush joints: finish joints as the work proceeds with all voids filled to provide a smooth surface flush with the brick or block face.

Weathered joints: finish mortar joints to a trowelled weathered joint as the work proceeds.

Keyed joints: finish mortar joints to a keyed joint of approved profile as the work proceeds.

Flush pointing: rake out joints to a depth of 20 mm as the work proceeds. Point to a flush finish with mortar of approved colour in a continuous operation as scaffolding is taken down.

Weather pointing: rake out joints to a depth of 20 mm as the work proceeds. Point to a weathered profile with mortar of approved colour in a continuous operation as scaffolding is taken down.

Keyed pointing: rake out joints to a depth of 20 mm as the work proceeds. Point to a keyed finish with mortar of approved colour in a continuous operation as scaffolding is taken down.

Rake out mortar joints to a depth of 12 mm in brickwork to be plastered.

Strike off and leave rough joints in blockwork to be plastered.

PPBK 18 Bagging

Bagged finish: rub down to an even surface with net sacking adding mortar as in wall to fill joints and crevices.

PPBK 19 Brick Reinforcement

Flush up brickwork with mortar to an even bed with frogs filled and lay reinforcement where shown on drawings. Keep back 20 mm from face of brickwork and complete mortar joint to normal thickness.

PPBK 20 Arches

Turn arches over timber centres using special shaped bricks on facework.

PPBK 21 Fire Bricks

Lay fire bricks in accordance with the manufacturer's recommendations.

PPBK.22 Building In

Components: build in sills, copings, lintels, steps and other components using mortar similar to that in adjacent walls.

Flues: build in throat units, flue linings and terminals free from voids and restrictions parged to provide a smooth and even flow for the flue gases.

Refuse chutes: build in as the work proceeds to provide a smooth and even interior surface free from voids and restrictions.

Doors and windows: build in doors and window frames as the work proceeds and bed in mortar similar to that in adjacent work.

Padstones: bed padstones in mortar similar to that in adjacent walls to give level top surface.

Wall plates: bed solid in mortar.

Airbricks: build in necessary air bricks complete with insect proof screen.

PPBK 23 Damp-proof Courses

Fill frogs and flush up brick-work to an even bed using mortar, as for brickwork, to receive horizontal flexible damp-proof courses. Lay damp-proof course horizontally stepped up to the interior in continuous strip with 150 mm laps in length and full laps at angles. Complete joint to normal thickness.

Keep leading edge of flexible damp-proof course in facing work 10 mm back from face of brickwork.

Provide flexible damp-proof course extending 100 mm beyond end of lintels and sloping to weepholes over all openings in cavity walls.

Provide flexible damp-proof course to jambs of openings in cavity walls fully lapped with horizontal damp-proof courses at head and sill. Provide flexible damp-proof course under jointed sills turned up at back and ends.

PD LABOUR INTENSIVE METHODS

PD 1 EMPLOYER'S OBJECTIVES

The employer's objective is to create temporary jobs and elementary skills from unemployed persons from Kruisfontein villages.

Labour-intensive works comprise the activities described in the Labour-Intensive Specification. Such works shall be constructed using local workers who are temporarily employed in terms of this scope.

PD 2 EXTENT OF THE WORKS

Labour-intensive works

Labour-intensive works comprise the activities described in the Labour-Intensive Specification. Such works shall be constructed using local workers who are temporarily employed in terms of this scope of work.

LABOUR INTENSIVE COMPETENCIES OF SUPERVISORY AND MANAGEMENT STAFF

Established contractors shall only engage supervisory and management staff in labour intensive works who have either completed, or for the period 1 April 2004 to 30 June 2005, are registered for training towards, the skills programme outlined in Table 1.

Emerging contractors shall have personally completed, or for the period 1 April 2004 to 30 June 2005 be registered on a skills programme for the NQF level 2 unit standard. All other site supervisory staff in the employ of emerging contractors must have completed, or for the period 1 April 2004 to 30 June 2005 be registered on a skills programme for, the NQF level 2 unit standards or NQF level 4 unit standards.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Stormwater Drainage	} any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Foreman/ supervisor	4	Implement labour Intensive Construction Systems and Techniques	This unit standard must be completed, and
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Stormwater Drainage	} any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Site Agent / Manager (i.e the contractor's most senior representative that is resident on the site)	5	Manage Labour Intensive Construction Processes	Skills Programme against this single unit standard
Details of these skills programmes may be obtained from the CETA ETQA manager (e mail:gerard@ceta.co.za , tel: 011-265 5900)			

EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR-INTENSIVE WORKS
1.1 Requirements for the Sourcing and Engagement of Labour 1.1.1 unskilled and semi-skilled labour required for the execution of all labour intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour. 1.1.2 The rate of pay set for the SPWP is R 150 per task or per day. <i>(Insert value determined by public body in terms of clause 2.2 of these Guidelines)</i> 1.1.3 Tasks established by the contractor must be such that: a) the average worker completes 5 tasks per week in 40 hours or less; and b) The weakest worker completes 5 tasks per week in 55 hours or less. 1.1.4 The Contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 1.1.3. 1.1.5 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 1.1.6 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 35; 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. 1.2.3 Contract Participation Goals 1.2.3.1 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. 1.2.3.2 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. 1.2.4 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. 1.2.5 Variations to SANS 1914-5 1.2.5.1 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. 1.2.5.2 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.

The cost of the formal training of targeted labour, will be funded by the local office of the

Department of Labour. This training will take place as close to the project site as practically possible. The contractor must access this training by informing the relevant regional 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 and the Department of Public Works (Fax: 012 3258625/ EPWP Unit, Private Bag X65, Pretoria 0001) must be furnished with a copy of this request.

1.3.3 The contractor shall do nothing to dissuade targeted labour from participating in training programmes and shall take all reasonable steps to ensure that each beneficiary is provided with two days of formal training for every 22 days worked.

1.3.4 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 1.3.3 above.

Proof of compliance with the requirements of 1.3.2 to 1.3.4 must be provided by the Contractor to the Employer prior to submission of the final payment certificate

GENERIC LABOUR INTENSIVE SPECIFICATION

(This specification must be incorporated in the Scope of Works without amendment or modification. When SANS 1921-5, *Construction and management requirements for works contracts Part 5: Earthworks activities which are to be performed by hand*, is published, the earthworks portions of this generic specification must be replaced with a reference to SANS 1921-5 and its associated specification data)

Scope

This specification establishes general requirements for activities which are to be executed by hand involving the following:

- a) Excavation of foundation trenches having a depth of less than 1.5 metres
- b) Removal of existing fence
- c) Placing bedding, selected and main fill to pipe trenches;
- d) Gabion work;
- e) Mixing of concrete
- f) Masonry work
- g) Site clearing and levelling

Precedence

Where this specification is in conflict with any other standard or specification referred to in the Scope of Works to this Contract, the requirements of this specification shall prevail.

Hand Excavateable Material

Hand excavateable material is material:

a) Granular Materials:

- i) whose consistency when profiled may in terms of table 1 be classified as very loose, loose, medium dense, or dense; or
- ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;

b) Cohesive Materials:

- i) whose consistency when profiled may in terms of table 1 be classified as very soft, soft, firm, stiff and stiff / very stiff; or

- ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100mm;

Note: 1) A boulder, a cobble and gravel is material with a particle size greater than 200mm, between 60 and 200mm.

- 2) A dynamic cone penetrometer is an instrument used to measure the insitu shear resistance of a soil comprising a drop weight of approximately 10 kg which falls through a height of 400mm and drives a cone having a maximum diameter of 20mm (cone angle of 60° with respect to the horizontal) into the material being used.

Table 1: Consistency of Materials when Profiled

GRANULAR MATERIALS		COHESIVE MATERIALS	
CONSISTENCY	DESCRIPTION	CONSISTENCY	DESCRIPTION
Very loose	Crumbles very easily when scraped with a geological pick.	Very soft	Geological pick head can easily be pushed in as far as the shaft of the handle.
Loose	Small resistance to penetration by sharp end of a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30-40 mm; can be moulded by fingers with some pressure.
Medium dense	Considerable resistance to penetration by sharp end of a geological pick.	Firm	Indented by thumb with effort; sharp end of geological pick can be pushed in upto 10 mm; very difficult to mould with fingers; can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of geological pick; requires many blows for excavation.	Stiff	Can be indented by thumb-nail; slight indentation produced by pushing geological pick point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumb-nail with difficulty; slight indentation produced by blow of a geological pick point.

Trench Excavation

All hand excavateable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

Compaction of Backfilling to Trenches (Areas not Subject to Traffic)

Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100mm. Each layer shall be compacted using hand stampers

- to 90% Proctor density;
- such that in excess of 5 blows of a dynamic cone penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10mm and contains no isolated boulders, or

- c) such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

Excavation

All hand excavateable material including topsoil classified as hand excavateable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The excavation of any material which presents the possibility of danger or injury to workers shall not be excavated by hand.

Clearing and Grubbing

Grass and small bushes shall be cleared by hand.

Shaping

All shaping shall be undertaken by hand.

Loading

All loading shall be done by hand, regardless of the method of haulage.

Haul

Excavation material shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

Offloading

All material, however transported, is to be off-loaded by hand, unless tipper-trucks are utilised for haulage.

Spreading

All material shall be spread by hand.

Compaction

Small areas may be compacted by hand provided that the specified compaction is achieved.

Grassing

All grassing shall be undertaken by sprigging, sodding, or seeding by hand.

Stone Pitching and Rubble Concrete Masonry

All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must to be collected, loaded, off loaded and placed by hand.

Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m.

Grout shall be mixed and placed by hand.

Manufactured Elements

Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320kg. In addition the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper hand hold on them.

PD 3 LOCATION OF WORKS

The project is situated in the Kruisfontein within the Humansdorp town area.

PD 4 TEMPORARY WORKS

No temporary works are required.

PD 5 MEASUREMENT AND PAYMENT

The requirements of the applicable SABS 1200 Specification and/or Project Specification shall apply except where superseded by this Particular Specification.

PD 6 PENALTY FOR NON-COMPLIANCE

Should the Contractor during the execution of the Work reserved for labour intensive execution:

a) use unspecified plant; or

b) contravene the requirements of Particular Specification PD;

then the Contractor shall pay to the Employer the penalty as set out hereunder and the Employer may without prejudice to any other method of recovery deduct the amount of such penalty from any monies in the hands due or which may become due to the Contractor.

a) R1 000.00 per occurrence; plus

b) 15% of the value of work so executed calculated as the product of the quantity (calculated by the Engineer) and the applicable tendered rate.

C4 SITE INFORMATION

C4.1 SCOPE

The documentation included in this section describes the site as at the time of tender to enable the tenderer to price his tender and to decide upon his method of working and programming.

Only actual information about physical conditions on the site and its surroundings has been included in this section and interpretation is a matter for the tenderers.

C4.2 SUBSOIL INVESTIGATIONS, BOREHOLE RECORDS AND TEST RESULTS

Trial holes shall be dug along the route of the new Western Outfall Sewer (see attached report "Annexure D")

C4.3 REPORTS OBTAINED BY THE EMPLOYER CONCERNING THE PHYSICAL CONDITIONS WITHIN THE SITE OR ITS SURROUNDINGS INCLUDING MAPPING, HYDRO-GRAPHIC DATA, AND HYDROLOGICAL INFORMATION

(a) Route of the new Western outfall Sewer:

The Western Outfall Sewer runs in a north to south direction through Kruisfontein village, with the upper end of the sewer outfall starting at the Youth Camp and the lower end at the existing inlet works of the Kruisfontein WWTW.

Only the southern portion of the existing Western Outfall sewer shall be upgraded under this Contract. Most of this section runs across privately own farmlands. The northern part of the Western Outfall Sewer that needs to be replaced runs across a built-up area and formal streets.

(b) WWTW Site:

The original Kruisfontein Sewage Treatment Works consisted of a pond system and was constructed in 1995. The pond system was further extended some years later.

The current Kruisfontein Sewerage Works comprises of the following treatment facilities:

- (a) Night soil discharge facility;
- (b) Pond system that consist of:
 - two primary ponds;
 - one secondary pond;
 - two tertiary ponds;
 - one maturation ponds;
- (c) Bio Filter (not in use);
- (d) Bio Filter Feed Pump Station (not in use);
- (d) Chlorination Plant;

Pipework was installed to allow for part of effluent from secondary pond to be returned to the Bio Filter via an existing pump station. This pump station is currently not operative.

Effluent from Tertiary Pond No 2 is chlorinated and discharged into the maturation (retention) pond. This system is mostly not operative. The effluent from the Retention Pond is discharged across the old n2 road into a privately owned irrigation dam.

C4.4 REFERENCES TO PUBLICLY AVAILABLE INFORMATION ABOUT THE SITE AND ITS SURROUNDINGS SUCH AS PUBLISHED PAPERS AND INTERPRETATIONS OF THE GEOTECHNICAL INVESTIGATION

Not applicable.

C4.5

INFORMATION ABOUT PIPED AND OTHER SERVICES BELOW THE SURFACE OF THE SITE FOR CONTRACTS INVOLVING GROUND WORKS, AND ABOUT HOOK-UP AND BOUNDARY DETAILS FOR CONTRACTS WITH PLANT INTERFACES, IN ADDITION TO ANYTHING ABOUT THE PHYSICAL SITE WHICH IMPACTS UPON THE CONTRACT

(a) Along route of Western Outfall Sewer Main:

The new Western Outfall Sewer connects at two separate positions to the existing Western Sewer pipe work. The northern end of the new Western Outfall Sewer connects to the existing 160mm diameter sewer near the T- intersection between Meyer and Julie streets. The second connection is at Peterson Street where the new Western Outfall sewer connects to the existing 160mm diameter Central Outfall Sewer.

The northern part of the new Western Outfall Sewer crosses a number of existing water and sewer pipelines.

The new Western Outfall sewer shall be laid at 2m (centre to centre) from the existing western outfall sewer. The new pipeline shall be generally laid at shallower depths than the existing sewer pipe.

The existing pipeline shall remain in use and must be protected until the new outfall sewer has been fully commissioned. The Contractor must therefore organise, plan and manage all operations to ensure that the existing sewer pipe is protected from any damage during the construction of the new pipeline.

A short section of the new Western Outfall Sewer shall be laid above ground. This section of the pipeline shall be supported on concrete columns.

The northern section of the new Western Outfall Sewer runs along and crosses over existing tarred roadways. The construction of the sewer crossings shall be done in two sections to allow for continuous vehicular traffic along the roads.

The southern +/- 0,9km of the Western Outfall Sewer shall be laid across private farmland. The Contractor shall be obliged in terms of the Contract to make proper provisions to secure that no cattle stray from the farmland through openings made in fence lines under the Contract.

(b) At WWTW Site:

The following pipe work exists on the WWTW. All these pipes must be regarded as being active and in use.

- (a) 160mm diameter sewer inlet;
- (b) Pipe work linking the ponds;
- (c) Pipe work from the existing chlorination facility;
- (d) Pipe work from the reticulation pump station;
- (e) Effluent pipeline that runs across old N2 road;

C4.6

INFORMATION ABOUT ADJACENT BUILDINGS AND STRUCTURES, AND ABOUT EXISTING BUILDINGS AND STRUCTURES ON THE SITE (RESTRICTIONS FOR HEAVY LOADS ETC.)

(a) Western Outfall Sewer:

The northern part of the route of the new Western Outfall Sewer runs through a built up residential area and the southern section runs across a ploughed privately owned farmland.

Sections of the new northern sewer runs across tarred roadways and shall intersects with underground water, sewer, storm water, electrical and telephone services.

(b) WWTW Site:

There are exiting residential building along part of the perimeter fence of the Kruisfontein WWTW.

C4.7

ATMOSPHERIC AND ENVIRONMENTAL CRITERIA

The Contractor must comply with the environmental requirements stated under Clause PSA 8.9 and Clause 3.5.1.8 under Part 3: C3.

C5 APPENDIX A: HEALTH AND SAFETY SPECIFICATION

PS10.1 General statement and Interpretations

Occupational Health and Safety Act, Act 85 of 1993 shall apply to this Contract. The Construction Regulations promulgated on 18 July 2003 and incorporated into the said Act by Government Notice R. 1010, published in Government Gazette 25207 apply to any person involved in construction work. These regulations are hereinafter referred to as “the Construction Regulations” and the said Act as “the Act”.

Construction work is defined as:

“Any work in connection with: -

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

The Contractor shall ensure that all employees and visitors are informed, instructed and trained regarding safety conditions on site. All employees will carry proof of this induction on their persons while employed on site in the form of identification cards. The identification cards shall also serve as proof of induction training received.

PS10.1.1 Health and Safety Specifications and Plans to be submitted at tender stage

(a) Employer's Health and Safety Specification

The Employer's Health and Safety Specification will be included in the tender documents as part of the Project Specifications.

(b) The Contractor's Health and Safety Plan

The successful Tenderer shall, on receipt of notification that he has been awarded the contract, submit without delay his own documented Health and Safety Plan for the execution of the work under the contract. His Health and Safety Plan must at least cover the following:

- (i) a proper risk assessment of the works, risk items, work methods and procedures in terms of Regulations 7 to 28;
- (ii) Pro-active identification of potential hazards and unsafe working conditions;
- (iii) Provision of a safe working environment and equipment;
- (iv) Statements of methods to ensure the health and safety of subcontractors, employees and visitors to the site, including safety training in hazards and risk areas (Regulation 5); monitoring health and safety on the site of works on a regular basis, and keeping of records and registers as provided for in the Construction Regulations; details of the Construction Supervisor, the Construction Safety Officers and other competent persons he intends to appoint for the construction works in terms of Regulation 6 and other applicable regulations; and details of methods to ensure that his Health and Safety Plan is carried out effectively in accordance with the Construction Regulations 2003.

The Contractor's Health and Safety Plan will be subject to approval by the Employer, or amendment if necessary, before commencement of construction work. The Contractor will not be allowed to commence work, or his work will be suspended if he had already commenced work, before he has obtained the Employer's written approval of his Health and Safety Plan.

Time lost due to delayed commencement or suspension of the work as a result of the Contractor's failure to obtain approval for his safety plan, shall not be used as a reason to claim for extension of time or standing time and related costs

PS10.1.2 The Contractor shall ensure that all employees and visitors are informed, instructed and trained regarding safety conditions on site. All employees will carry proof of employment on their persons while employed on site in the form of identification cards. The identification cards shall also serve as proof of induction training received.

PS10.1.3 Should the Contractor at any stage in execution of the Works -

- a) fail to implement or maintain his health and safety plan;
- b) execute construction work which is not in accordance with his health and safety plan; or
- c) act in any way which may pose a threat to the health and safety of persons, **the Employer will stop the Contractor AT HIS/HER OWN COSTS** from executing construction work.

PS10.1.4 The Contractor shall provide proof of this registration and good standing with the Compensation Fund or with a licensed compensation insurer when submitting a tender. Tenders without this will be regarded as non-responsive.

PS10.1.5 The Contractor shall, in submitting his tender, demonstrate that he has made provision for the cost of compliance with the specified health and safety requirements, the Act and the Construction Regulations.

PS10.1.6 The Contractor shall consistently demonstrate his competence and adequacy of resources to perform the duties imposed on the Contractor in terms of this Specification, the Act and the Construction Regulations.

PS10.2 Indemnity of Employer and his Agents

- a) The annexure to this Contract Document contain a "Mandatory Form of Authority and Agreement in terms of Section 37(2) of the Occupational Health and Safety Act, No. 85 of 1993" which agreement shall be entered into and duly signed by both the Employer and Contractor prior to commencement with work. A copy of the signed agreement shall be included in the Contractor's health and safety plan.
- b) Any acceptance, approval, check, certificate, consent, examination, inspection, instruction, notice, observation, proposal, request, test or similar act by either the Employer, any of his agents or the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, the Act and the Construction Regulations, including responsibility for errors, omissions, discrepancies and non-compliances.

PS10.3 Scope

PS10.3.1 The specification as set out in this Portion is known as the Health and Safety Specification for the Construction work to be carried out by the Principal Contractor as per regulations of the Construction Regulations July 2003.

Information herein addressed might affect the Health and Safety of employee's or persons carrying out the construction work as per this tender document.

The Contractor shall ensure that it is fully conversant with the requirements of this Specification.

This Specification is not intended to supersede the Act nor the Construction Regulations. Those sections of the Act and the Construction Regulations, which apply to the scope of work to be performed by the Contractor in terms of this Contract, continue to be a legal requirement of the Contractor. The principal Contractor will be appointed in writing to be in overall control of the Construction site.

PS10.3.2 A Health and Safety Plan shall be compiled by the Principal Contractor and contractors that is specific to the work performed on site and the relevant conditions on site.

The H&S Plan shall be submitted to the Client's Agent for approval before any site activities will commence.

A Health and Safety file must be compiled and submitted by the Principal Contractor and Contractors to the Client or the Client's Agent containing all the relevant documentation as required by this specification and terms of the provisions of this Specification, the Act and the Construction Regulations.

The H&S file shall contain items as described elsewhere in this specification. A lever arch file shall be used with a clear index and dividers. Numbering of items shall be done clearly with numbers as specified elsewhere.

The file shall be available at all times and kept on site and made available for inspection by an Inspector, Client, Client Agent or Principal Contractor.

PS10.3.3 Provision for costs in respect to Health and Safety in the tender shall be tendered for in the Schedule of Quantities. The Tendered price is fixed. A provisional sum will be included in the schedule of quantities to make provision for an approved H&S Service Provider to assist the contractor in performing the H&S activities required by law.

Provision shall be made for a full time Health and Safety Officer on site to monitor all Health and Safety Activities. The H&S Officer shall be qualified in Occupational Health and Safety Services with at least three years experience in SHE Management.

The Safety Officer shall be in possession of qualifications in:

- Advanced Risk Assessments
- Legal Compliance Auditing
- Incident Management
- Construction Regulations implications

The Health and Safety Plan provided for by the principal Contractor may be adjusted by the Client to suit the requirements. The approved Health and Safety Plan will be implemented on the construction site. The Health and Safety Plan of the Principal Contractor shall include all relevant Health and Safety Plans of Contractors (Sub-Contractors). The Contractor shall, throughout execution of the Contract, ensure that all sub-contractors have similar Health and Safety Plans in place which must be available on site.

PS10.3.4 The following paragraphs summarize the Health and Safety Activities to be performed by the Contractor. (Terms and definitions in the following paragraphs are explained elsewhere in this specification)

PS10.3.4.1 The following activities shall be strictly performed by the Contractor on acceptance of the tender and before commencement of any work on the construction site. (Terms and definitions in the following paragraphs are explained elsewhere in this specification)

The contractor will only be allowed to start working once the submitted Health and Safety plan are approved by the client or the client's agent.

A prior Risk Assessment shall be done on site before the commencement of work by a competent Risk Assessor.

The Risk Assessment shall:

Address hazards on site and hazards related to the type of work performed. Possible consequences of these hazards,

- Refer to legislative requirements concerning these hazards on the construction site
- Calculate the value of the risk associated with the hazard by an approved method taking into consideration the probability of occurrence, the degree of injury, lost time, production costs, and influence on the environment and frequency of occurrence.

The outcome of the Risk Assessment will determine:

- Protective equipment to be issued,
- Type of training required,
- Type and number of Safe Work Procedures to be introduced to workers in the form of Toolbox Talks

Protective clothing as determined by the Risk Assessment shall be issued and the employees shall sign the issue register to indicate the type and number of equipment received by each employee.

No work shall commence on the construction site prior to induction training of all employees intended to work on site.

Training shall be done by a competent Health and Safety Induction Trainer. Proof of training in the form of a register signed by the trained employees shall be kept in the H&S file. The contents of the training shall also be displayed in the H&S file.

Appointments of people/workers related to Health and Safety as required by law and the Risk Assessment shall be done prior to the commencement of any work. Letters of appointment shall be kept in the H&S file for inspection by the Client, Agent or any Inspector.

Medical Fitness Certificates shall be obtained for the workers/operators as determined by the Risk Assessment.

PS10.3.4.2 During the construction period

The Contractor shall ensure that all employees and visitors are informed, instructed and trained regarding safety conditions on site. All employees will carry proof of this induction on their persons while employed on site in the form of identification cards. The type of additional training required on this project will be describe elsewhere

Notification of Construction work shall be done to the Department of labour within 7 days from Follow-up Risk Assessments shall be done during the construction period as and when the scope of work changes indicating new introduced hazards.

Additional appointments shall follow as required by the Risk Assessment.

PS10.3.4.3 Should the Contractor at any stage in execution of the Works -

- fail to implement or maintain his health and safety plan;
- execute construction work which is not in accordance with his health and safety plan; or
- act in any way which may pose a threat to the health and safety of persons,
- The Employer will stop the Contractor AT HIS/HER OWN COSTS from executing construction work.

PS10.3.5 The Employer will take reasonable steps to ensure that the Contractor's Health and Safety plan is implemented and maintained. The steps taken will include periodic audits at intervals once every month.

PS10.3.6 Upon completion of the Works, the Contractor shall hand over a consolidated Health and Safety file to the Client.

PS10.4 Health and Safety Program/File

The following documentation shall be in the Health and Safety File:

- A1 Copy of Construction Regulations – July 2003.
- A2 Copy of Tender Documentation followed by the Health and Safety Plan or the specific project.
- A3 Copy of all Drawings – Schematics, Detail Drawings, As-Build Drawings etc.
- A4 Copy of Notification of Construction work to the Department of Labour.
- A5 Company Safety Policy – To be signed by the Chief Executive Officer of the Company.
- A6 Organogramme indicating site specific organizational structure with reference to requirements of the construction regulations.
- A7 Proof of Registration with Compensation Fund of Principal Contractor and Contractors.
- A8 All Risk Assessments done before and during the Construction period.
- A9 Letters of Appointment.

The following appointments are required for the project. Deviations will only be allowed with the approval of the Agent. Appointment of an employee for more than one responsibility will be allowed and shall be approved by the Agent.

Basic Appointments:

- Appointment of Principal Contractor by Client.
- Appointment of Contractors (Sub Contractors) by Principal Contractor (where applicable)
- Appointment of Construction Work Supervisor (full time employee on site)
- Appointment of Assistant Construction Work Supervisor (full time employee on site if required)

Appointments of Specialists (Refer to a Specialist Company):

- Appointment of Safety Officer
- Appointment of an SHE Coordinator
- Appointment of Risk Assessment Officer
- Appointment of a Health and Safety Induction Trainer

Appointments of full time employees on site:

- Appointment of a SHE Representative (Competent employee to control/monitor all H&S activities).
- Appointment of an Accident and Incident Investigator.
- Appointment of the Safety Committee Members (Employees actively involved in H&S).
- Appointment of an Excavation Inspector.
- Appointment of Construction Vehicle and Mobile Plant Inspector.
- Appointment of Construction Vehicle and Mobile Plant Operators.
- Appointment of Concrete Mixer Operator (if required).
- Appointment of Hand Tool Inspector.
- Appointment of a Portable Electrical Equipment Inspector.
- Appointment of a Ladder Inspector (If ladders are used).
- Appointment of a Hygiene and Facility Inspector (Ablutions and eating places).
- Appointment of Fire Equipment Inspector.
- Appointment of Fire Team Members (employees trained in fire fighting awareness).
- Appointment of First Aid Equipment Inspector.
- Appointment of First Aid Team Members (employees trained in first aid awareness)

A10 List of Contractors (Sub-Contractors)

A11 List of Local Labours

A12 The contents of all Training Material used on site eg. Formal training Informal training
Toolbox talks

A13 Safe Work Procedures

A14 Registers as required

A15 Emergency telephone numbers to be displayed on the back of the file

PS10.5 Notification of Construction Work – Regulation 3 of the Construction

Regulation – July 2003

The Employer will appoint the Contractor in writing for execution of the Works. The Contractor shall accept its appointment under the terms and Conditions of Contract. The Contractor shall sign and agree to those terms and conditions and shall, before commencing work, notify the Department of Labour of the intended construction work in terms of Regulation 3 of the Construction Regulations. The Contractor shall submit the notification in writing prior to commencement with work. The annexure to this Contract Document contain a “Mandatory notification of construction work in terms of regulation 3 of the construction regulations (2003) of the Occupational Health and Safety Act no 85 of 1993” which shall be filled in by the contractor and forwarded to the Department of Labour. A copy of this notification shall be included in the Contractors Health and Safety file.

The Principal Contractor must notified the Provincial Director of:

- Construction work on a form similar to Annexure A in the Construction Regulation 2003 of the Occupational Health and Safety Act and Regulations.
- A copy of the notification form must be available on site for inspection by an Inspector.
- The notification shall be done within 7 days after site establishment.

PS10.6 Safety Officer

Due to the nature of the activities on site it is required to appoint a fulltime Health and Safety Officer. The Contractor shall forward a CV of the Safety Officer to the Agent.

The H & S Officer shall be qualified in Occupational Health and Safety Services with at least three years experience in SHE Management.

The Safety Officer shall be in possession of qualifications in:

- Advanced Risk Assessments
- Legal Compliance Auditing
- Incident Management
- Construction Regulations implications

The Safety Officer shall be employed by the Principal Contractor on a full time basis for the duration of the project.

The functions of the Safety Officer will be to monitor all H&S Activities on site on a daily basis.

Risk Assessments shall be done by the Safety Officer on all site activities before commencement.

The Risk Assessment shall be approved by the Agent before commencement of the activity

PS10.7 Contractor’s SHE Representative

Before commencing work, the Contractor shall designate a competent Safety, Health and Environmental representative (SHE Rep) who shall be acceptable to the Agent, to represent and act for the Contractor. The Contractor shall inform the Agent in writing of the name and address of the Contractor’s SHE Rep and of any subsequent changes in the name and address of the SHE Rep, together with the scope and limitations of the SHE Rep’s authority to act for the Contractor. The Contractor’s SHE Rep shall make available to the Employer an all-hours telephone number at which the SHE Rep can be contacted at any time in the event of an emergency involving any of the Contractor’s employees, or other persons at the Works.

PS10.8 Supervision of Construction Work– Regulation 6

The Principal Contractor as well as his Contractors (Sub Contractors) shall appoint full time employees in writing as the construction supervisors.

PS10.9 Risk Assessment – Regulation 7

The Principal Contractor as well as all other Contractors shall appoint a competent person in writing to carry out a risk assessment before any construction work is started.

The Risk Assessment shall form part of the Health and Safety Plan.

The Risk Assessment shall include:

- Identification of risks and hazards.
- Possible consequences
- A documented plan of safe procedures to mitigate, reduce or control the risks and hazards. (SAFE WORK PROCEDURES AND PROTECTIVE CLOTHING)
- A monitoring plan
- A review plan

Copies of the risk assessment shall be available on each site for inspection.

All employees shall be informed, instructed and trained by an appointed competent person regarding all hazards and work related procedures.

No employee shall enter the premises without induction training.

All employees on site shall be in the possession of a certificate of Health and Safety induction training.

The contents of the induction training shall be in writing and kept in the safety file.

PS10.10 Local Services

Contractor must establish all local services in area of excavations.

Plan of local services shall be documented in the Health and Safety file.

Local services include:

Telkom, Gas, Water, Electricity Supplies and other similar services.

PS10.11 Safe Working Loads

The Contractor shall ensure that -

- a) The safe working loads of hoists, load-bearing beams and cranes are prominently displayed at all times.
- b) The safe working loads are not exceeded under any circumstances.
- c) All lifting gear is marked with a unique identity number and recorded in register.

PS10.12 Machine Guarding

All power tools and machinery driven by belts, gears, ropes, chains, couplings and similar drives shall be adequately guarded. The Contractor shall prohibit the use of any equipment with a damaged, missing or inadequate guard.

PS10.13 Construction Vehicles and Mobile Plant – Regulation 21

The Contractor shall ensure that drivers of motor vehicles are in possession of a driver's licence, valid for the class of vehicle which they are required to drive, and shall produce the licence on request.

The Contractor shall not permit any driver to be in control of a vehicle at the Works while under the influence of alcohol, drugs or other substance.

All vehicles of the Contractor shall display a name board bearing the Contractor's name. Hired vehicles shall bear an identifying sticker.

A register shall be kept of workers operating construction vehicles and mobile plant.

The register shall contain proof of training of operators to operate construction vehicles and mobile plant, certification of competency and authorization of operators to operate machinery, vehicles or plant.

Names of operators and their relevant training with date and time stamps together with name of course instructor shall be kept in the Health and Safety File on site.

Physical and psychological fitness shall be proved by way of a medical certificate of fitness of the said operators before allowing operators to operate machinery, vehicles or plant.

The Health and Safety File shall include the written training material offered to operators for the different construction vehicles and mobile plant.

Each and every driver shall be trained on risks involved and safety procedures.

All construction vehicles and mobile plant must be of acceptable design and construction and used according to their design.

All construction vehicles and mobile plant must be maintained in good working order.

A register of all vehicles and plant shall be kept on site together with names of operators responsible for each.

The register shall report all maintenance activities performed on these vehicles and plant as well as signatures certifying the condition of the vehicles as in a good working order.

All requirements on the vehicles and mobile plant with regard to safety and health shall be inspected and certified.

These requirements include:

- a) Portable fire extinguishers mounted in specified positions on construction vehicles – 9kg dry powder fire extinguisher
- b) Safety belts and harnesses
- c) Inspection for leaking fuel or gasses which can cause a fire hazard
- d) Safe and suitable means of access
- e) Adequate signalling or other control arrangements to guard against the dangers relating to movement of vehicles and plant.

Attention must be paid to

- i) Turn indicators
- ii) Stop lights x 2 – where poor visibility conditions warrant
- iii) Reverse siren or acoustic device
- iv) Tail lights
- v) Head lights x 2 – where poor visibility conditions warrant
- vi) Rotating amber flashing light with lens heights of at least 200mm and an output of at least 100Watt on roof or other visible position

- vii) Warning boards mounted at least 1.5m above ground level to be clearly visible.
- viii) Inspections of appropriate structures fitted to protect the operator from falling material or from being crushed should the vehicle or mobile plant overturn
- x) Appropriate seats must be firmly secured and adequate in number on vehicles used to transport employees

During use of Construction vehicles or mobile plant the following rules shall be adhered to:

1. Construction vehicles or mobile plant must be prevented from falling into excavations, water or any other area lower than the working surface. This protection must consist of adequate edge protection eg. guard rails and/or crash barriers.
2. No person shall be allowed to or require to ride on any Construction Vehicle or Mobile Plant in a position otherwise than a safe place provided for on the construction vehicle or mobile plant as designed for that purpose.
3. The construction site must be organized in such a way that as far as is reasonable practical, pedestrians and vehicles can move safely and without risks to health and safety.
4. Traffic routes shall be of sufficient size, sufficient in number and in suitable positions to be used safely by construction vehicles, mobile plant and pedestrians.
5. Each and every traffic route shall be indicated by suitable signs for reasons of safety and health.
6. No tools and/or material shall be transported in the same compartment as the operators/drivers/employees unless the said are secured against movement during transportation.
7. All Construction Vehicles and Mobile Plant left unattended at night adjacent to a freeway in normal use or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, in order to identify the location of vehicles or plant.
8. Bulldozers, scrapers, loaders and other similar mobile plant are, when being repaired or when not in use, fully lowered or blocked with controls in a neutral position, motors stopped and brakes set.
9. Reflective indicators must be provided to workers in the form of reflective yellow jackets or vests as specified and worn by workers working on/or adjacent to public roads.

PS10.14 Signs and Notices

The use of colour codes, symbolic signs and notices are means of communication whereby information is visually conveyed to people and also provides early warning of dangers.

Safety signs provide for immediate recognition of danger, information, actions allowed or not allowed and procedures that have to be done.

There are 5 types of safety signs:

1. Black triangle on yellow background=> WARNING
2. Red (round) on white background => PROHIBITORY
3. White on blue background => MANDATORY
4. White on green background => INFORMATION
5. Red (square) on white background => FIRE

The following signs shall be provided for on the site:

Traffic control signs	ROAD CLOSED DETOUR DIRECTION ARROWS
Warning signs	DANGER - MEN AT WORK
Prohibitory signs	NO ENTRY
Fire	POSITION OF EQUIPMENT ARROWS
First Aid	INFORMATION SIGNS

All signs shall be new or in good condition and approved by the Engineer.

All temporary signs shall be mounted on portable supports to facilitate moving.

Defective or missing items shall be replaced immediately.

All signs shall be inspected at least twice a day .

Signs to be displayed will be determined by the H&S Plan and the Risk Assessments.

Compulsory signs will include:

Prohibited area – TR208

Men at work – TW 336

A H&S board will be displayed at the entrance with all the relevant H&S instructions and symbols eg:

Construction Site – No Entry

Hard hat area

Safety shoes shall be worn

The size of the board shall be at least 1.5m wide by 1.2m high

PS10 15Excavation Work – Regulation 11

Excavation:

Definition: A space made by digging.

1. An excavation could be a hole or trench of any size and shape.
2. A Risk Assessment must be done prior to making an excavation.
3. The following must be taken into consideration when doing the Risk Assessment:
 - ⇒ Depth of the excavation
 - ⇒ Length of the excavation
 - ⇒ Existing services
 - ⇒ Barricading and demarcation

Depth of the excavation:

1. Should an excavation be more than chest deep (1.5m), it must be adequately shored or braced.
2. Slopes or trenches shall be as flat as possible, 1 x vertical to 2 x horizontal must be considered maximum for dry conditions. In wet conditions either a much lower slope shall be used, or if space is a constraint, shoring and de-watering shall be applied.

A competent person shall be appointed to supervise excavation work.

Stability evaluation of ground must be done and a certificate shall be issued.

A plan for prevention of persons being trap due to collapse shall be provided by Contractor.

The design of shoring shall be documented by Contractor in the Health and Safety file as provided by the competent designer of shoring.

The maximum loading of sides of an excavation must be documented in a usable format. If adjacent structures and buildings are present and can be affected a design and construction of supporting details shall be represented.

Provision shall be made for access routes to the excavation. Routes must not be more than 6 meters away from worker.

Contractor must establish all local services in area of excavations.

Plan of local services shall be documented in the Health and Safety file.

Local services include:

Telkom, Gas, Water, Electricity Supplies and other similar services.

Inspection shall be done on all bracing and shoring on a

- daily basis
- prior to each shift
- after every blasting operation
- after an unexpected fall of ground
- after substantial damage to supports
- after rain

An inspection register shall be completed by the Excavation Inspector during each and every inspection.

Barricading and Demarcation:

- Excavations shall be fenced at least 1 meter high and as close to the excavation as possible, when accessible by public or other employees, or adjacent to public roads or thoroughfares.
- Protection around excavations must be in the form of a physical barrier, to prevent persons from falling into the excavation.
- Excavations must be provided with clearly visible boundary indicators and illuminated at night or where/when visibility is poor.
- Precautionary measures in terms of confined spaces must be met and employees must be declared fit and not claustrophobic.
- Explosives regulations must be adhered to if explosives are required to carry out the excavation. Competent persons with blasting certificates must be in charge.
- Warning signs must be posted next to an excavation in which persons are working or carrying out inspections or tests.

PS10 16 Barricading and Demarcation

The construction site shall be barricaded completely to prevent pedestrians and vehicles to enter the construction area.

Protection around the site must be in the form of a physical barrier and appropriate signage, to prevent public from entering the area.

It is advised to use 1.2m high Dayglo Mesh (barrier netting) to prevent pedestrians on pavements from entering the construction area.

PS10 17 Ladders

You are only to use ladders that are undamaged and are of sound construction.

Ladders must be placed on a register and inspected on a monthly basis by an appointed person.

Ladders are to be secured during use. If it is necessary to use a ladder before it can be secured, a second person must hold it steady at all times. Place the ladder's feet on a level base. (wooden blocks or bricks are not to be used).

Ladders are not to be used as scaffolds or work platforms.

When used as access to trenches and work areas, the ladder must extend one meter above the step off point and be placed at an angle where the base of the ladder is one quarter of the ladder height away from the base of the structure, and must be fitted with non-skid devices.

Ladders must not be used nearer than 3m to any exposed electrical power source and never in substations or on electrical installation work.

Ladders are not to be used in a horizontal position.

Maintain 3-point contact by keeping two hands and one foot or two feet and one hand on the ladder at all times.

Do not carry objects in your hands while on a ladder.

Ladders must be fitted with non-skid devices at the bottom ends and hooks or similar devices at the upper ends.

Ladders with damaged stiles, or damaged or missing runs should never be used.

Ladders must never be fastened together to increase the reach.

Wooden ladders must never be painted.

PS10 18 Concrete Mixers – Regulation 18

The Contractor shall ensure that all concrete mixers are operated and supervised by a competent person who has been appointed in writing.

The Contractor shall ensure that all devices to start and stop the concrete mixers are provided and that these devices are:

1. Placed in an easily accessible position; and
2. Constructed in such a manner to prevent accidental starting

All dangerous moving parts of a mixer must be placed beyond the reach of persons by means of covers.

No person shall be permitted to remove or modify any guard or safety component unless authorized to do so by the appointed person

A Contractor shall ensure that all persons authorized to operate the concrete mixers are fully:

1. Aware of all dangers involved in the operation thereof
2. conversant with the precautionary measures to be taken in the interest of health and safety

No person supervising or operating a concrete mixer shall authorize any other person to operate the plant, unless such a person is competent to operate such machinery.

PS10 19 Scaffolding – Regulation 14

All scaffolding must be in compliance to SABS 085.

A competent person shall be appointed in writing to supervise the erection of all scaffolding operations.

The Scaffolding erector shall have the required accredited qualifications for scaffold erecting.

A competent scaffold inspector shall be appointed in writing to inspect the erected scaffolds and shall not be the same person as the erector.

An Inspection Register on scaffolding shall be kept in the Health and Safety File.

A copy of SABS 085 as amended shall be available on site and kept in the Health and Safety File.

PS10 20House Keeping and Construction Sites – Regulation 25

The Contractor shall at all time carry out the Works in a manner to avoid the risk of bodily harm to persons or risk of damage to any property. The Contractor shall take all precautions, which are necessary and adequate to eliminate any conditions, which contribute to the risk of injury to persons or damage to property. The Contractor shall continuously inspect all work, materials and equipment to discover and determine any such conditions and shall be solely responsible for the discovery, determination and elimination of such conditions.

During the period of this Contract, the Contractor shall be responsible for the safe storage of all materials and equipment required for execution of the Contract, and for disposal of all non-usable waste material in an orderly manner.

All materials, whether stored on the construction site or within the Contractor's designated area, shall be stored neatly and safely to prevent possible injury to any personnel. The material shall be stored to facilitate safe access to, and removal of the material from the storage area.

Any flammable material, such as paint, diesel fuel and oil, shall be stored in lockable non-combustible structures, which shall be clearly marked to indicate the hazardous nature of the materials stored within. The flammable materials stores shall be located in safe areas away from hazardous surroundings and adequate and suitable fire-fighting equipment shall be provided within easy reach of the materials stores.

Loose material need for use shall not accumulate so as to obstruct means of access to and egress from the workplace.

Scrap and waste shall not be allowed on site and must be removed daily.

The construction sites adjacent to build up area or public way shall be effectively fenced and controlled with access points.

Diesel stored on site shall be stored in containers located in a dedicated area. The area shall be surrounded by a band wall with contents to be 110% of the contents of the diesel containers.

PS10 21Stacking and Storage on Construction Sites – Regulation 26

A competent person shall be appointed in writing with the duty of supervising all stacking and storage of material on site.

Adequate storage areas shall be provided which includes demarcated areas.

All storage areas shall be kept neat and under control.

PS10 22Fall Protections – Regulation 8

A contractor shall ensure-

- a) The designation of a competent person, responsible for the preparation of a fall protection plan;
- b) The fall protection plan contemplated in paragraph (a) to be implemented, amended where and when necessary and maintained as required;
- c) Steps to be taken in order to ensure the continued adherence to the fall protection plan.

The fall protection plan contemplated in sub-regulation (1), shall include-

- a) A risk assessment of all work carried out from an elevated position which shall include the procedures and methods used to address all the risks identified per location;
- b) The processes for evaluation of the employees' physical and psychological fitness necessary to work at elevated heights.

- **Safety Harness:**

The wearing of an approved type of safety harness fitted with a shock absorber and correctly secured to any approved anchorage, is compulsory for personnel working at heights.

Safety harnesses must be worn where a leaning bar cannot be installed, where handrails are not available, in instances where there is a risk of injury due to falling, and generally whenever work is undertaken at a height of more than “a person’s height”.

Where roof work is undertaken, harnesses must be attached to a lifeline or other substantial support.

The single support waist type safety belts should not be used; therefore a full parachute type harness of an approved type is required.

It is the contractor’s responsibility to train his employees on the correct use of harnesses.

Safety belts may only be used as a fall restraint and not as a fall protection device.

- **Identify Risks:**

Lanyards must be used to attach tools and equipment used in elevated positions.

Scaffolding where possible must be provided.

On windy/rain days, special precautions are to be taken especially when working with loose roof sheets.

Walking on asbestos roofs is prohibited unless supporting ladders or crawl boards are placed thereupon.

Consult your supervisor in that area if in any doubt.

PS10 23Structures – Regulation 9

1. A contractor shall ensure that:

- a) all reasonable practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work: and
- b) No structure or part of a structure is loaded in a manner which would render it unsafe.

2. The designer of a structure shall:

- a) Before the contractor is put out to tender, make available to the Client all relevant information about the design of the relevant structure that may affect the pricing of the construction work;
- b) inform the contractor in writing of any known or anticipated dangers or hazards relating to the construction work, and make available all relevant information required for the safe execution of the work upon being designed or when the design is subsequently altered;
- c) Subject to the provisions of paragraph (a) and (b) ensure that the following information is included in a report and made available to the contractor-
 - (i) a geo-science technical report where appropriate;
 - (ii) the loading of the structure is designed to withstand; and
 - (iii) the methods and sequence of construction process;
- d) not including anything in the design of the structure necessitating the use of dangerous procedures or materials hazardous to the health and safety of persons, which could be avoided by modifying the design or by substituting materials;
- e) take into account the hazards relating to any subsequent maintenance of the relevant structure and should make provision in the design for that work to be performed to minimize the risk;

- f) carry out sufficient inspections at appropriate times of the construction work involving the design of the relevant structure in order to ensure compliance with the design and a **record** of those inspections is to be kept on site;
 - g) Stop any contractor from executing any construction work which is not in accordance with the relevant design;
 - h) conduct a final inspection of the completed structure prior to its commissioning to render it safe for commissioning and issue a completion certificate to the contractor; and
 - i) Ensure that during commissioning, cognizance is taken of ergonomic design principles in order to minimize ergonomic related hazards in all phases of the life cycle of a structure.
4. A contractor shall ensure that all drawings pertaining to the design of the relevant structure are kept on site and are available on request by an inspector, contractors, client, client's agent or employee.
 5. Any owner of a structure shall ensure that inspections of that structure upon completion are carried out periodically by competent persons in order to render the structure safe for continued use: Provided that the inspections are carried out at least once every six months for the first two years and thereafter yearly and records of such inspections are kept and made available to an inspector upon request.
 6. Any owner of a structure shall ensure that the structure upon completion is maintained in such a manner that the structure remains safe for continued use and such maintenance records shall be kept and made available to an inspector upon request.

PS10 24 Formwork & Support Work – Regulation 10

A competent person shall be appointed in writing to supervise all formwork and support work.

The name and address of such a person shall be included in the Health and Safety Plan of the Principal Contractor.

The contractor must ensure that all formwork and support work structures are adequately designed, erected, supported, braced and maintained so that they will be able to support all anticipated loads.

All drawings pertaining to formwork and support work must be kept on site and available for inspection by an inspector, contractor, client, client's agent or employee.

All formwork and support work must be inspected and checked for suitability by a competent person under the following conditions:

1. Before use
2. During placement of concrete or any other imposed load
3. After placement of concrete or any other imposed load
4. On a daily basis after placement of concrete until the structure is removed.
5. Ensure that concrete gains sufficient strength before the support work is removed.

Record must be kept of these inspections.

Weakened formwork or support work must be immediately reinforced.

Deck panels must be secured against displacement.

Persons must be prevented from slipping on support work.

Persons must not be affected by the use of solvents or any other similar substances.

Safe access must be provided for all support work.

Employees involved must be adequately trained and instructed to perform the work in a safe manner.

Foundations of formwork must be adequate to sustain the applied load.

PS10 25 First Aid

PS10.25.1 Safety Notice Board

The Contractor shall provide a Safety Notice Board where safety notices, site regulations concerning safe working practices and information on the location of the nearest first aid station, can be conspicuously displayed to all staff. The size of the notice board shall be at least 600 mm x 800 mm.

PS10.25.2 First Aid Equipment

The Contractor shall provide for its employees a stretcher for emergencies and an approved first aid box.

The first aid box shall be checked weekly by a responsible person, who shall be appointed by the Contractor, and a record shall be kept of the contents. Any deficient medical supplies shall be promptly replenished by the Contractor.

PS10.25.3 Hazard Notices

The Contractor shall display hazard notices in all areas where hazardous conditions prevail or may occur.

PS10.25.4 Reporting of Incidents and/or Injuries

All incidents in respect of damage to Works, property or machinery, or injury to persons, shall be reported by the Contractor's SHE Rep by the quickest means possible.

A mandatory incident report form, containing full details of the incident, shall be completed and submitted to the Site Agent within twenty four (24) hours of the occurrence of the incident.

PS10 26 Fire Precautions on Construction Sites – Regulation 27

A register shall be kept on all Acetylene and Oxygen cylinders used on the site.

Condition of components, sub-components and safety components (e.g. Flame back arrestors) shall be listed in the register and signed by the construction supervisor at regular intervals as required with time and date stamp.

Acetylene, Oxygen and LP Gas cylinders shall be stored in suitable places to minimize the risk of fire.

Suitable storage to be provided for flammable liquids, e.g. petrol, diesel, paint, thinners.

Smoking shall be prohibited in the workplace and notices posted accordingly.

Suitable and sufficient fire fighting equipment shall be placed in strategic positions in the work place. (On vehicles and other positions as deemed necessary).

A register shall be kept on type and number of equipment for each site in the Health and Safety File.

A competent person shall inspect all fire fighting equipment.

A sufficient number of employees shall be trained in the use of fire fighting equipment.

A register shall be kept in the Health and Safety File on site with names of employees and type of fire fighting training completed with date.

Suitable signs shall be erected in work places indicating escape routes. Escape routes shall be kept clear. Evacuation plans shall be in Health and Safety File as part of Induction Training.

Combustible materials shall not accumulate on site.

PS10 27 Construction Welfare Facilities – Regulation 28

On each site where existing facilities are not present, at least one sanitary facility shall be erected for every 10 workers, one shower for every 15 workers, a changing facility for each sex and sheltered eating areas.

Separate toilets shall be erected for each sex.

Mobile toilets with bucket system shall be installed at the site.

Cleaning of buckets shall be arranged with the City Council. To be at least once every three days.

PS10 28 Toxic Materials

The Contractor shall exercise all necessary care in the handling of toxic compounds and shall be able to identify the major chemical components in the event of medical treatment being required.

PS10 29 Hazardous Chemicals and Materials

- a) The Contractor shall provide suitable and adequate protective equipment when work in an area where hazardous chemicals and materials are being used.
- b) The Contractor shall ensure that its employees have familiarised themselves with the hazardous material data sheets applicable to the specific site as well as the location of fire fighting equipment, safety showers/baths and other washing facilities, prior to commencement of work.

PS10 30 Commissioning and Safety Precautions

The Contractor shall ensure that wherever repairs, adjustments or any other work are undertaken on any plant or machinery, the power supply is switched off, disconnected or the plant / machinery disengaged until the work or repairs have been completed.

PS10 31 Electrical Installations and Machinery on Construction Sites – Regulation 22

Before construction commences or any other related works and during the progress thereof adequate steps must be taken to establish the presence of and guard against any danger to the workers in respect to electrical cables or apparatus.

In areas where it cannot be established where electrical devices are, the employees must use tools of which the handles are insulated or rubber insulated gloves.

Any temporary electrical installation set up by the principal contractor or contractor must be inspected at least once a week by a competent person. The inspections shall be recorded in a register and kept in the Health and Safety File.

When working on or next to live electrical Machinery the Principal Contractor or Contractor must provide insulated stands, trestles and mats.

When Distribution Boards are removed the incoming power supplies shall be cut by the client's authorized Electrician. The incoming electricity supply feeder shall be earthed by a suitable earth wire or spike to prevent cable of becoming live during the installation of new Distribution Boards.

No person shall continue with wiring of premises unless the supply to the premises has been rendered dead and the above effective measures have been taken to ensure that such cables remain dead. When rewiring of premises is done the feeder breakers at the other end of the supply cables shall be locked out and the cable earthed to prevent any injury to workers by Electrical Shock.

A register shall be kept on site in the Health and Safety File indicating all signatures of competent persons switching electricity supply on or off with time and date stamps.

No person shall use or permit to use a portable electric load operating at a voltage exceeding 50V to earth unless it is connected to a source of electrical energy incorporating an earth leakage protection device.

A register shall be kept on site in which all daily checks of portable electric tools are performed and signed by the responsible person. Checks shall include condition of plug top, power cord, on-off switch and insulation condition of electric tool. All tools shall be numbered and entered accordingly into the register. Condition of tools as listed in the register shall be inspected and signed by the construction supervisor at regular intervals as required by the nature of the equipment.

PS10 32 Registers Required on Site

PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

- Personal Protective Clothing and Equipment issued

MACHINERY

- Daily Checklist - Compaction Machinery – Bowmag
- Daily Construction Vehicle Pre-ignition Checklist – Tractors
- Daily Construction Vehicle Pre-ignition Checklist – TLB
- Operators on Construction Vehicles and Mobile Plant Training and Fitness Register

EQUIPMENT

- Ladder Inspection Register

TOOLS

- Monthly Checklist on Hand Tools
- Monthly Checklist on Portable Electrical Equipment

HOUSE KEEPING

- Daily Stacking Inspection Register
- Daily Scaffold Inspection Register
- Daily Formwork Inspection Register
- Daily Excavations Inspection Register with specific reference to barricading
- Monthly Environmental Checklist and Deviation
- Monthly Hygiene Facility Inspection Register – Mobile Ablutions and Eating areas
- Incident Register (Injury/ occupational disease record book (Recording and investigation of incidents)
- Motor Vehicle Accident Report

FIRE

- Fire Extinguishing Equipment Register
- Register of Trained Employees in Fire Fighting
- Fire Awareness Attendance Training Register

FIRST AID

- First Aid Box and Equipment Checklist
- Register of Trained Employees in Basic First Aid
- First Aid Awareness Attendance Training Register

TRAINING

- Induction Training Attendance Registers
- Toolbox talks Training Attendance Registers
- Community Training Attendance Registers

PERMITS

- Lock-out Request Forms (Water and Electricity)
- Lock-out Permits (Water and Electricity)

INSPECTIONS

- SHE Coordinator Inspection Register – Monthly checklist and deviations
- Minutes of Safety Committee Monthly meetings

PS10 33 Safe Work Procedures Required in Health and Safety File

- Stacking of material
- Working with angle grinders
- Excavating of trenches
- Loading and transport of material
- Working with cement and concrete mixers
- Driving company vehicles
- Approaching Construction Vehicles
- Maintaining Scaffolding
- Form work repair guide
- Roof work
- Correct use of Fire Extinguishers
- Engaging and working with Contractors
- Heat Stress
- Electrical Safety
- Maintenance of Ladders
- Silica
- Trenches and open excavations

PS10 34 Written Training Course Material to be Filed in Health and Safety File

- Induction Training (Workplace awareness)
- Training of operators on Construction Vehicles and Mobile Plant
- First Aid Awareness
- Fire Fighting Awareness
- Toolbox talks on Hand Tools
- Toolbox talks on Stacking of material
- Toolbox talks on Roof work
- Toolbox talks on Maintaining Scaffolding
- Toolbox talks on Approaching Construction Vehicles
- Toolbox talks on Driving company vehicles
- Toolbox talks on Working with cement and concrete mixers
- Toolbox talks on working with angle grinders
- Toolbox talks on Excavating of trenches
- Toolbox talks on Machine Guarding
- Toolbox talks on Hand Tool Accidents
- Toolbox talks on Ten Commandments of Safety
- Toolbox talks on Fire prevention
- Toolbox talks on lifting materials by hand
- Toolbox talks on safe loading
- HIV Training Unit 1 - The Nature of HIV/Aids
- HIV Training Unit 2 - Transmission of the HI virus
- HIV Training Unit 3 - HIV/AIDS preventative measures
- HIV Training Unit 4 – Voluntary HIV/AIDS counselling and testing
- HIV Training Unit 5 – Living with HIV/AIDS
- HIV Training Unit 6 – Treatment options for people with HIV/AIDS
- HIV Training Unit 7 – The rights and responsibilities for workers in the workplace with regard to HIV/AIDS

- Toolbox talks on Environmental influences
- PS10 35 Training Courses to be Presented

PHASE 1

- Toolbox talks on the functions of the SHE Representative
- Induction Training (Workplace awareness) - Ten Commandments of Safety
- Training of the Community on Construction Workplace Hazards
- HIV Training Unit 1 - The Nature of HIV/Aids
- Toolbox talks on Environmental Awareness

PHASE 2

- Training of Operators on Construction Vehicles and Mobile Plant
- First Aid Awareness
- Fire Fighting Awareness
- Toolbox talks on Hand Tools and Hand Tool Accidents
- Toolbox talks on Stacking of material
- Toolbox talks on Roof work
- Toolbox talks on Driving company vehicles
- Toolbox talks on working with angle grinders
- Toolbox talks on Excavating of trenches
- Toolbox talks on Working with cement and concrete mixers
- Toolbox talks on Approaching Construction Vehicles
- Toolbox talks on Maintaining Scaffolding
- Toolbox talks on Machine Guarding
- Toolbox talks on lifting materials by hand
- Toolbox talks on Safe Loading
- Toolbox talks on Safety Signs
- HIV Training Unit 2 - Transmission of the HI virus
- HIV Training Unit 3 - HIV/AIDS preventative measures
- HIV Training Unit 4 – Voluntary HIV/AIDS counselling and testing
- HIV Training Unit 5 – Living with HIV/AIDS
- HIV Training Unit 6 – Treatment options for people with HIV/AIDS
- HIV Training Unit 7 – The rights and responsibilities for workers in the workplace with regard to HIV/AIDS
- Toolbox talks on Environmental Awareness

PS10 36 Equipment on Site

First Aid Kit (basic)

Stretcher

Fire Extinguishers

PS10 37 Personal Protective Clothing

The Contractor shall provide the necessary personal protective clothing for its employees in hazardous areas, appropriate to the nature of the hazard.

PS10.37.1 Hard Hats

All employees of the Contractor shall wear hard hats in areas where appropriate hazard notices are displayed. The Engineer shall have the right to ban certain colours if they are similar to the Employer's identifying colours. Hard hats shall not be painted or otherwise defaced.

PS10.37.2 Eye Protection

Suitable eye protection shall be worn in areas where appropriate hazard notices are displayed, or when grinding, chipping, breaking, drilling, arc-welding, cutting with oxy-acetylene equipment or similar activities are taking place.

PS10.37.3 Hearing Protection

Suitable hearing protection shall be worn in areas where appropriate hazard notices are displayed.

PS10.37.4 Foot Wear

All employees of the Contractor shall wear undamaged, laced-up safety boots or safety shoes, suitable for the intended purpose, in prescribed areas where appropriate hazard notices are displayed.

PS10.37.5 Gloves

All employees of the Contractor shall wear suitable protective gloves in areas where appropriate hazard notices are displayed, or when handling hot or hazardous materials or chemicals.

PS10.37.6 Clothing

All employees of the Contractor shall wear suitable protective clothing when working in proximity of machinery, power tools, hazardous materials or chemicals.

Proposed Personal Protective Equipment required on this project:

	TYPE	WHEN TO WEAR
1.	Hard Hats	Always
2.	400mm Shoulder Length PVC Gloves	Working with cement
3.	Plastic Trousers	Working with cement
4.	Safety Goggles	Grinding, Cutting Cement
5.	Gumboots	Working in water
6.	Welding helmet	Welding
7.	Gas welding safety goggles	Gas welding
8.	Safety shoes	Off loading and positioning of materials
9.	Dust Masks	Grinding
10.	Ear Muff	Grinding
11.	Leather apron	Welding/ gas welding

C6 APPENDIX B: ENVIRONMENTAL SPECIFICATION

1. MATERIALS

1.1 MATERIALS HANDLING, USE AND STORAGE

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications.

Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

All manufactured and/ or imported material shall be stored within the Contractor's camp, and, if so required by the Project Specification, out of the rain. All lay down areas outside of the construction camp shall be subject to the Engineer's approval.

Imported gravel, fill, soil and sand materials shall be free of weeds, alien invasive seed matter, plant material, litter and contaminants and shall be obtained from sources approved by the Engineer. A Method Statement detailing the source and methods to ensure compliance with this specification shall be submitted to the Engineer.

The Method Statement shall cover applicable details with regard to:

- Construction procedures;
- Materials and equipment to be used;
- Getting the equipment to and from Site;
- How the equipment/ materials will be moved while on Site;
- How and where materials will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Compliance/ non-compliance with the Specifications; and
- Any other information deemed necessary by the Engineer.

1.2 STOCKPILING

Any stockpiling of gravel, cut, fill or any other material including spoil shall be in areas approved by the Engineer within the defined working area.

The Contractor shall ensure that the material does not blow or wash away. If the stockpiled material is in danger of being washed or blown away, the Contractor shall spray it with Dustex or cover it with a suitable material, such as hessian or plastic. Stockpiles of topsoil shall not be covered with plastic.

No stockpiling of any material shall be allowed within the 100m of any residential areas or 20m of any "no go" area.

1.3 SOLID WASTE MANAGEMENT

No on-site burning, burying or dumping of any waste materials, litter or refuse shall occur. The Contractor shall provide vermin and weatherproof bins with lids of sufficient number and capacity to store the solid waste produced on a daily basis. The lids shall be kept firmly on the bins at all times.

Bins shall not be allowed to become overfull and shall be emptied at least once a day. The waste from bins may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof, and which the Engineer has approved.

Recyclable waste shall be disposed of into separate skips/bins and removed off-site for recycling. All solid waste shall be disposed of offsite at an approved landfill Site. The Contractor shall supply the Engineer with the appropriate disposal certificates.

The Contractor must facilitate the re-use of cleared trees and bush (e.g. by allowing controlled wood cutting and removal of wood). Cleared vegetation may only be burnt when no other form of re-use (e.g. chipping or composting) is practical or economical. Burning of cleared vegetation may only take place in a safe area (e.g. borrow pit) after permission has been obtained from all the relevant authorities and the Fire Department has been informed. The Contractor must ensure that cleared trees and wood are removed from the Site within 45 days of Site clearance.

The Contractor shall submit a solid waste management Method Statement to the Engineer.

1.4 WATER USE

All source of water for construction purposes must be approved by the Engineer in writing before any such sources can be used to obtain water.

1.5 HAZARDOUS SUBSTANCES

The transportation and handling of hazardous substances must comply with the provisions of the Hazardous Substances Act (Act No.187 of 1993) and associated regulations as well as SABS 0228 and SABS 0229. The Contractor shall also comply with all other applicable regional and local legislation and regulations with regard to the transport, use and disposal of hazardous substances. Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDSs shall be followed in the event of an emergency situation. The Contractor shall be responsible for the training and education of all personnel on Site who will be handling hazardous materials about their proper use, handling and disposal.

If potentially hazardous substances are to be stored or used on Site, the Contractor shall submit a Method Statement to the Engineer detailing the substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

1.6 CONTAMINATED WATER

Potential pollutants of any kind and in any form shall be kept, stored, and used in such a manner that any escape can be contained and that the water table is not endangered. Water containing such pollutants as chemicals, washing detergents, sewerage, fuels, paints and solvents and hydrocarbons shall be contained and discharged into an impermeable storage facility for removal from the site or for recycling. This particularly applies to runoff from fuel depots/workshops/truck washing areas. The Contractor may direct contaminated water into a sewerage main, provided that authorisation has been obtained from the local authority and that the Engineer has provided written permission for this action.

Wash down areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted. The Contractor shall notify the Engineer immediately of any pollution incidents on Site.

The Contractor shall submit a Method Statement to the Engineer detailing how the contaminated water will be managed on Site.

1.7 CEMENT AND CONCRETE BATCHING

The proposed location of batching areas (including the location of cement stores and sand and aggregate stockpiles) shall be indicated on the Site layout plan and approved by the Engineer. Batching areas shall not be located within 150m of the nearest river or any “no go” areas, unless written approval has been granted by the Engineer.

All wastewater generated from the operation and cleaning of concrete batching equipment and other sources of concrete shall be passed through a concrete wastewater settlement system as depicted in the appropriate drawing. The water from this system shall not be allowed to flow into any “no go” area or water course but must permeate through the ground before it reaches any such water course. The accumulated sludge in the settlement system must be regularly cleaned out and appropriately disposed of as solid waste.

The Contractor shall ensure that minimal water is used for washing of concrete batching equipment.

Used cement bags shall be disposed of in weatherproof bins on site to prevent the generation of windblown cement dust and the bags from blowing away.

During construction, the contractor must ensure that concrete is mixed on mortar boards, all visible remains of concrete are removed and disposed of as waste and that all surplus aggregate is removed.

A Method Statement detailing all actions to be taken to comply with the cement and batching requirements shall be submitted to the Engineer.

2. PLANT

2.1 FUEL (PETROL AND DIESEL) AND OIL

2.1.1 Fuel Storage

Fuel can be stored on site. The location of the fuel storage area will be approved by the Engineer and will be situated at least 100m away from any major drainage systems, residential areas or “no go” areas. All necessary approvals with respect to fuel storage and dispensing shall be obtained from the appropriate authorities. Symbolic safety signs depicting “No Smoking”, “No Naked Lights” and “Danger” conforming to the requirement of SABS 1186 shall be prominently displayed in and around the fuel storage area. There shall be adequate fire-fighting equipment at the fuel storage area.

The Contractor shall ensure that all liquid fuels and oils are stored in tanks with lids, which are kept firmly shut and under lock and key at all times. The capacity of the tank shall be clearly displayed and the product contained within the tank clearly identified using the emergency information system detailed in SABS 0232 part 1. Fuel storage tanks shall have a capacity not exceeding 9000 litres and shall be kept on site only for as long as fuel is needed for construction activities, on completion of which they shall be removed.

Tanks on site shall not be linked or joined via any pipe work, but shall remain as separate entities. The tanks shall be situated on a smooth impermeable base with a bund. The volume inside the bund shall be 110% of the total capacity of the largest storage tank. The base may be constructed of concrete, or of plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The impermeable lining shall extend to the crest of the bund. The floor of the bund shall be sloped to enable any spilled fuel and/or fuel-contaminated water to be removed. Appropriate material, approved by the Engineer that absorbs/ breaks-down or encapsulates minor hydrocarbon spillage and which is effective in water shall be installed in the sump.

The tanks and bunded areas shall be covered by a roofed structure, as detailed in the appropriate drawing, to prevent the bunded area from filling up with rain water. This structure shall be constructed in such a way, and to the approval of the Engineer, to ensure that it is not dislodged by wind. If any water

does collect in the bunded area it shall be removed within a day of this occurring and taken off Site to a disposal site approved by the Engineer, and the material that absorbs/ breaks-down or encapsulates minor hydrocarbon spillage shall be replenished.

Only empty and externally clean tanks may be stored on the bare ground. Empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.

Adequate precautions shall be provided to prevent spillage during the filling of any tank and during the dispensing of the contents. The dispensing mechanism for the fuel storage tanks shall be stored in a waterproof container when not in use.

A Method Statement shall be submitted to the Engineer detailing the design, location and construction of the fuel storage area as well as for the filling and dispensing from storage tanks and for the type of absorbing/ breaking-down or encapsulating material to be used.

2.1.2 Refuelling

Where reasonably practical, plant shall be refuelled at a designated re-fuelling area/depot or at a workshop as applicable. If this is not reasonably practical then the surface under the refuelling area shall be protected and appropriately bunded against pollution to the reasonable satisfaction of the Engineer prior to any refuelling activities.

If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used, and the drum shall not be tipped in order to dispense fuel. The Contractor shall ensure that the appropriate fire-fighting equipment is present during refuelling operations.

The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials shall be able to handle a minimum of 200 l of hydrocarbon liquid spill. Prior to any refuelling or maintenance activities, the Engineer must approve this material.

2.1.3 Used Oil and Hydrocarbon Contaminated Materials

Used oil shall be stored at a central location on Site prior to removal off Site for disposal at an approved disposal or recycling site.

Old oil filters and oil, petrol and diesel-soaked material shall be treated as hazardous waste. The Contractor shall remove all oil, petrol, and diesel-soaked sand immediately and shall dispose of it as hazardous waste or treat it on site with material that breaks-down or encapsulates such spillages as approved by the Engineer.

2.2 ABLUTION FACILITIES

Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited other than at the facilities provided. The Contractor shall provide the necessary ablution facilities for all his personnel prior to the commencement of work and shall ensure that his personnel make use of the facilities.

Toilet facilities shall be supplied by the Contractor for the workers at a ratio of at least 1 toilet per 15 workers in areas approved by the Engineer. Every 1-man urinal will be taken as supplying the equivalent of 5 men in addition to the 15 men per toilet on site. No toilets will be erected within 100m of any residential areas, within 20m of the edge of the Site, within 50m of any "no go" areas or any major drainage systems. Toilets shall be situated within 200m of any area where work is taking place in numbers sufficient to meet the ratio depicted above for the workers in the area. Mobile toilets (e.g. trailer mounted) should be considered for Sites, where workers may be expected to cover large distances every day.

The facilities shall be maintained in a hygienic state and serviced regularly. Toilet paper shall be provided. Temporary/ portable toilets shall be secured to the ground to prevent them toppling due to wind or any other cause, to the satisfaction of the Engineer.

Discharge into the environment and burial of waste is strictly prohibited. The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the Site. Toilets shall be emptied before the Contractors' holidays or any other temporary site closure.

2.3 EATING AREAS

The Contractor shall designate eating area/s, subject to the approval of the Engineer. No cooking is allowed outside of the Contractor's camp area on Site.

At meal times all workers must eat in designated eating areas. More than one area may be required for large Sites. These areas shall have shade for the workers. The eating areas may be in existing structures or in temporary/ transportable structures that shall be well constructed using wood or metal for the frame and screened on the top and sides with shade cloth/ canvas or other material to the satisfaction of the Engineer. These areas shall be well demarcated and in locations approved by the Engineer and shall not be within 100m of any "no go" areas or any major drainage systems, on or adjacent to the Site.

Sufficient bins shall be present in these areas. All disposable food packaging must be disposed of in the bins after every meal.

The feeding or leaving of food for animals is strictly prohibited.

2.4 SITE STRUCTURES

All site establishment components (as well as equipment) shall be positioned to limit visual intrusion on neighbours and the size of the land area disturbed. The type and colour of roofing and cladding materials to the Contractor's temporary structures shall be selected to reduce reflection.

The Contractor shall supply and maintain adequate and suitable sheds for the storage of materials. Sheds for the storage of materials that may deteriorate or corrode if exposed to the weather shall be weatherproof, adequately ventilated and provided with raised floors.

2.5 LIGHTS

The Contractor shall ensure that any lighting installed on the Site for his activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area.

2.6 WORKSHOP, EQUIPMENT MAINTENANCE AND STORAGE

Where practical, all maintenance of equipment and vehicles on Site shall be performed in a workshop. If it is necessary to do maintenance outside of the workshop area, the Contractor shall obtain the approval of the Engineer prior to commencing such activities. No maintenance, including emergency maintenance, of plant can take place within 50m of any "no go" area or drainage system.

The Contractor shall ensure that in his workshop and other plant maintenance facilities, including those areas where, after obtaining the Engineer's approval, the Contractor carries out emergency plant maintenance, there is no contamination of the soil or vegetation. The workshop shall have a smooth impermeable (concrete or thick plastic covered with sand) floor. The floor shall be bunded and sloped towards an oil trap or sump to contain any spillages. When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. Drip trays shall also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles).

All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the Site.

The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. All washing shall be undertaken in the workshop or maintenance areas, and these areas must be equipped with a suitable impermeable floor and sump/oil trap. The use of detergents for washing shall be restricted to low phosphate and nitrate containing and low sudsing-type detergents.

A Method Statement must be submitted to the Engineer detailing the design of the bunding of the workshop and how run-off from the workshop will be managed as well as how drip trays used under plant will be managed.

2.7 NOISE

The Contractor shall take precautions to minimise noise generated on Site (e.g. Install and maintain silencers on machinery).

The Contractor shall comply with the Noise Induced Hearing Loss Regulations published under the Occupational Health and Safety Act.

Appropriate directional and intensity settings are to be maintained on all hooters and sirens.

No amplified music shall be allowed on Site. The use of radios, tape recorders, compact disc players, television sets etc shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range. The Contractor shall not use sound amplification equipment on Site unless in emergency situations.

2.8 DUST CONTROL

The Contractor shall be responsible for the continued control of dust arising from his operations. The Contractor shall inform the Engineer 48 hours in advance of anticipated 'unavoidable' dust generating activities. The Contractor shall take all reasonable measures to minimize the generation of dust as a result of construction activities to the satisfaction of the Engineer. Appropriate dust suppression measures include: spraying or dampening with water, using a commercial dust binder (such as Hydropam or Dustex), rotovating straw bales, planting of open cleared space and the scheduling of dust-generating activities. If the conditions are such that the Contractor cannot satisfactorily dampen the dust, then the Engineer may halt operations until such time as the conditions are more suitable for lower dust generating construction.

Damping of all gravel haul and access roads with water must be ongoing and special attention must be given to roads close to residential areas. Should dust still be a problem on any specific road, the allowable speed will be reduced to 20km/h. If dust is still a problem the road should be treated with a commercial dust binder, as required, to form a cohesive layer that will control the dust on the road.

Areas that are to have the topsoil stripped for construction purposes must be limited and only stripped when work is about to take place.

Other activities and situations that may result in a dust nuisance include: site clearance and other earth moving operations, open cleared space, stockpiles of topsoil or sand and activities associated with concrete batching plants.

A Method Statement detailing how dust will be managed for different operations on the site must be submitted to the Engineer for his approval before any work that could result in dust being generated is undertaken.

3. CONSTRUCTION

3.1 METHOD STATEMENTS

The following Method Statements, as well as any required by the Project Specification, shall be provided by the Contractor and submitted with the tender for reviewing prior to the awarding of a Contract.

3.1.1 Solid Waste Management

Expected solid waste types, quantities, methods and frequency of collection and disposal as well as location of disposal sites.

3.1.2 Contaminated Water

Methods of minimising, controlling, collecting and disposing of contaminated water.

3.1.3 Contractors SHE Officer

The name and letter of appointment of the Contractors SHE Officer must be given to the Engineer and the terms of reference for the work to be undertaken by the SHE Officer must be detailed including time on site, CV, roles and responsibility, interaction with the Contractor and environmental offices, etc.

3.1.4 Site Division

The location, layout and method of establishment of the construction camp (including all buildings, offices, lay down yards, vehicle wash areas, fuel storage areas, batching areas and other infrastructure required for the running of the project).

3.1.5 Emergency Procedures

Emergency procedures for fire and accidental leaks and spillages of hazardous substances (including fuel and oil). Include details of risk reduction measures to be implemented including fire fighting equipment, fire prevention procedures and spill kits (materials and compounds used to reduce the extent of spills and to breakdown or encapsulate hydrocarbons).

Other Method Statements that will be required during the course of construction are to be provided by the Contractor a minimum of 20 days prior to commencement of the works or activities to which they apply (no work can commence on site before these Method Statements have been approved).

3.1.6 Importing of Material

Detail the source of any gravel, soil, aggregate or sand imported onto site and precautions taken to ensure no vegetative contamination.

3.1.7 Hazardous Substances

Details of any hazardous substances / materials to be used, together with the transport, storage, handling and disposal procedures for the substances.

3.1.8 Cement and Concrete Batching

Location, layout and preparation of cement/ concrete mixing areas including the methods employed for the mixing of concrete and particularly the containment of runoff water from such areas and the method of transportation of concrete.

3.1.9 Fuel Storage and Use

The design, location and construction of the fuel storage area as well as for the filling and dispensing from storage tanks.

3.1.10 Workshop and Drip Trays

Location, layout, design and pollution control for Workshop as well as management of drip trays under plant.

3.1.11 Dust

Details on the methods for managing dust on the site.

3.1.12 Environmental Awareness Training

Number, dates, trainer and logistics for the initial awareness courses for the Contractor's employees and for the management Staff.

3.1.13 Access Routes

Details, including a drawing, showing where and how the access points and routes will be located and managed.

Any additional Method Statements as required by the Engineer or the Project Specification must be provided by the Contractor. The Contractor shall not commence the activity until the Method Statement has been approved in writing and shall, except in the case of emergency activities, allow a period of 20 working days for approval of the Method Statement.

The Engineer may require changes to a Method Statement if the proposal does not comply with the specification or if, in the reasonable opinion of the Engineer, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted by the Specifications or any legislation.

Approved Method Statements shall be readily available on the Site and shall be communicated to all relevant personnel and subcontractors. The Contractor shall carry out the Works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract. No claim for delay or additional cost incurred by the Contractor shall be entertained due to inadequacy of a Method Statement.

Details of the following appointments are required within 7 days of commencing work on site.

3.1.14 Assistants to the Contractor's SHE Officer

The name and appointment letter of the three assistants to the Contractor's SHE Officer must be given to the Engineer and the work to be undertaken by these assistants must be detailed including time allocated to these roles and their responsibility and interaction with the Contractor's SHE Officer.

3.1.15 Fire Officer

The name and appointment letter of the Fire Officer must be given to the Engineer.

3.2 CONTRACTOR'S SHE OFFICER AND ASSISTANTS

The Contractor shall appoint a Contractor's SHE Officer who shall be responsible for undertaking a daily site inspection to monitor compliance with this Specification and the relevant Project Specification. The Contractor shall submit the name of the Contractor's SHE Officer as well as a Method Statement detailing his CV, roles and responsibilities to the Engineer for his approval before work can commence on site.

The Contractor will also appoint reliable staff, who will assist and report to the Contractor's SHE Officer, to the following positions:

- Litter Assistant to ensure that the site is cleaned every day and that dustbins are not overflowing and litter does not blow off the site into the surrounding areas.
- Hydrocarbon and Contaminated Water Assistant to ensure that any hydrocarbon spills or leaks are dealt with immediately, vehicles are not leaking hydrocarbons on site, there is no pollution of any water course/ drainage system on or adjacent to site due to any construction activities, all stationary plant has bunds around them that are kept in good working order, the fuel storage and refuelling area is free of spills and leaks of hydrocarbons and any other issues to do with

hydrocarbon house keeping on site. He will also ensure that no contaminated water is escaping onto the site and that the toilets are kept in a clean and good working condition.

- Demarcation and Dust Assistant to ensure that all fencing and demarcation is in place when it is required and that such fencing or demarcation is in good order on a daily basis. This person will also be responsible to ensure that excessive dust is not generated from the construction area and will ensure that the roads are watered and other areas dampened where necessary and any other actions taken to limit dust generation from site.

These appointments will be made within the first 7 days of work commencing on site and will be given to the Engineer in writing.

3.3 ENVIRONMENTAL AWARENESS TRAINING

Environmental awareness training courses shall be run for all personnel on site. Two types of course shall be run, one for the Contractor's and Subcontractor's management and one for all site staff and labourers. Courses shall be run in the morning during normal working hours at a suitable venue provided by the Contractor. All attendees shall remain for the duration of the course and sign an attendance register on completion that clearly indicates participant's names, a copy of which shall be handed to the Engineer.

The size of each session shall be limited to 30 people. The Contractor shall allow for sufficient sessions to train all personnel. Subsequent sessions shall be run for any new personnel coming onto site. A Method Statement with respect to the organisation of these courses shall be submitted.

Notwithstanding the specific provisions of this clause it is incumbent upon the Contractor to convey the sentiments of the EMP to all personnel and Subcontractors involved with the Works.

3.3.1 Training Course for Management and Foremen

The environmental awareness training course for management shall include all management staff and foremen. The course, which will be presented by the Engineer's SHE Coordinator, will be of approximately one-hour duration. The initial course shall be undertaken not less than 7 days prior to commencement of work on site. Subsequent courses shall be held as and when required.

3.3.2 Training Course for Site Staff and Labour

The environmental awareness training course for site staff and labour shall be presented by the Contractor's SHE Officer from material provided by the Engineer unless otherwise required by the Project Specification. The course will be approximately one-hour long. The course shall be run not more than 7 days after commencement of work on site with sufficient sessions to accommodate all available personnel. Subsequent courses shall be held as and when required.

3.4 SITE DIVISION

The Contractor shall restrict all his activities, materials, equipment and personnel to within the area specified.

A Method Statement detailing the location, layout and method of establishment of the construction camp (including all buildings, offices, lay down yards, vehicle wash areas, fuel storage areas, batching areas and other infrastructure required for the running of the project) shall be submitted to the Engineer. No accommodation for any staff is permitted on the Site.

3.5 SITE DEMARCATION

As required by the Project Specification, the Contractor shall erect and maintain permanent and / or temporary fences of the type and in the locations directed by the Engineer. Such fences shall, if so specified, be erected before undertaking designated activities.

3.6 "NO GO" AREAS

If so required by the Project Specification, certain areas within or next to the Site shall be "no go" areas. The Contractor shall ensure that, insofar as he has the authority, no person, machinery, equipment or materials enter the "no go" areas at any time.

3.7 ACCESS ROUTES/ HAUL ROADS

On the Site and, if so required by the Project Specification, within such distance of the Site as may be stated, the Contractor shall control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and that all relevant laws are complied with. In addition, such vehicles and plant shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site. On gravel or earth roads on Site and within 500m of the Site, the vehicles of the Contractor and his suppliers shall not exceed a speed of 45 km/hr or as directed by the Engineer.

The Contractor shall supply the Engineer with a Method Statement detailing the location and management of all access points and roads.

3.8 CONSTRUCTION PERSONNEL INFORMATION POSTERS

The Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with the Environmental Specifications. Construction personnel information posters shall be laminated and erected in all eating areas, workshops and site offices. The Contractor shall ensure that the construction personnel information posters are not damaged in any way, and shall replace them if any part becomes illegible.

Examples of these posters will be supplied to the Contractor by the Engineer in electronic format.

3.9 FIRE CONTROL

The Contractor shall take all the necessary precautions to ensure that fires are not started as a result of his activities on Site. No open fires shall be permitted on the Site, with the exception of burning of cleared vegetation after approval by the Engineer and relevant authorities. Any fires that occur shall be reported to the Engineer immediately. Smoking shall not be permitted in those areas where there is a fire hazard. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to support the rapid spreading of an initial flame.

The Contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedures to be followed. The Contractor shall forward the name of the Fire Officer to the Engineer for his approval within 7 days of being on site.

The Contractor shall ensure that there is basic fire-fighting equipment available on Site at all times. This shall include at least rubber beaters when working in urban open spaces and natural areas, and at least one fire extinguisher of the appropriate type when welding or other "hot" activities are undertaken. The Contractor shall be liable for any expenses incurred by any organisations called to assist with fighting fires that were started as a result of his activities or personnel, and for any cost relating to the rehabilitation of burnt areas, or consequential damages.

3.10 EMERGENCY PROCEDURES

Emergency procedures, including the names and contact details of responsible personnel and emergency services shall be made available to all staff and shall be clearly displayed at relevant locations at the Site.

The Contractor shall advise the Engineer of any emergencies on Site, together with a record of action taken, within 24 hours of the emergency occurring.

Telephone numbers of emergency services shall also be posted conspicuously in the Contractor's office near the telephone.

The Contractor shall submit a Method Statement covering the procedures for the following emergencies:

3.10.1 Fire

The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it. The Contractor shall ensure that his employees are aware of the procedures to be followed in the event of a fire.

3.10.2 Accidental Leaks and Spillages

The Contractor shall ensure that his employees are aware of the procedures to be followed for dealing with spills and leaks, which shall include notifying the Engineer and the relevant authorities. The Contractor shall ensure that all the necessary materials and equipment for dealing with spills and leaks are available on Site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Engineer.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained.

The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/ breakdown or where possible, be designed to encapsulate minor hydrocarbon spillages. The quantities of such materials shall be able to handle a minimum of 200 ℓ of hydrocarbon liquid spill.

Any spills must be cleared and the contaminated soil/sludge disposed of in an appropriate manner, approved by the Engineer, or at a licensed hazardous waste disposal site.

3.11 COMMUNITY RELATIONS

If so required by the Project Specification, the Contractor shall erect and maintain information boards in the positions, quantities, designs and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the Engineer.

The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself and note the date and time that the complaint was resolved.

The Engineer shall be responsible for responding to queries and/or complaints and may request assistance from the Contractor's Management Staff.

3.12 PROTECTION OF NATURAL FEATURES

The Contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the Site for survey or other purposes unless agreed beforehand with the Engineer.

Any features affected by the Contractor in contravention of this clause shall be restored / rehabilitated to the satisfaction of the Engineer.

The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, and open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

3.13 PROTECTION OF FLORA AND FAUNA

Except to the extent necessary for the carrying out of the Works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted.

The search and rescue of rare, endemic or endangered species prior to Site clearance must be carried out in accordance with the Vegetation Specifications. The removal and stockpiling of topsoil must also be carried out in accordance with the Vegetation Specifications.

Trapping, poisoning and/or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site.

3.14 STORMWATER MANAGEMENT

Natural run-off must be diverted to stormwater drains where these are available. The Contractor shall take appropriate measures to prevent sand, silt and silt-laden waters from entering stormwater drains, or any surface water course. The Contractor shall take reasonable measures to control the erosive effects of stormwater runoff particularly where excavation and construction activities form temporary channels.

Suitable energy breaking devices, cut-off drains, diversions and retention ponds shall be employed to ensure that storm water runoff from the Site is dissipated and does not exceed the capacity of the surrounding stormwater system and excessive suspended solids are settled before they enter the stormwater system or any surface water course.

If required in the Project Specification, the Contractor shall submit a Method Statement to the Engineer detailing how stormwater will be managed on Site.

3.15 EROSION AND SEDIMENTATION CONTROL

The Contractor shall take all reasonable measures to limit erosion and sedimentation due to construction activities and shall, in addition, comply with such detailed measures as may be required by the Project Specification.

Where erosion and/or sedimentation, whether on or off the Site, occurs despite the Contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the Engineer. Where erosion and/or sedimentation occurs due to the fault of the Contractor, rectification shall be carried out to the reasonable requirements of the Engineer and at the expense of the Contractor.

3.16 AESTHETICS

The Contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area

3.17 RECREATION

If so required by the Project Specification, the Contractor shall take measures to reduce disruption to recreational users of the area abutting the Site.

3.18 TEMPORARY SITE CLOSURE

If the Site is closed for a period exceeding 5 days, the Contractor's SHE Officer in consultation with the Engineer shall carry out the following checklist procedure and ensure that the following conditions pertain and report on compliance with this clause:

3.18.1 Fuels / Flammables / Hazardous Materials Stores

- Fuel stores are as low in volume as practicable.
- There are no leaks.
- The outlet is secure and locked.
- The bund is empty.
- Fire extinguishers are serviced and accessible.
- The area is secure from accidental damage through vehicle collision and the like.
- Emergency and contact numbers are available and displayed.
- There is adequate ventilation in enclosed spaces.

- There are no stores or containers within the 1:50 year flood line.

3.18.2 Safety

- Site safety checks have been carried out in accordance with the Occupational Health and Safety Act (No. 85 of 1993) prior to site closure.
- An inspection schedule and log for use by security or contracts staff is developed.
- All trenches and manholes are secured.
- Applicable notice boards are in place and secured.
- Emergency and Management contact details are prominently displayed.
- Security personnel have been briefed and have the facilities to contact or be contacted by relevant management and emergency personnel.
- Night hazards such as reflectors, lighting, traffic signage etc have been checked.
- Fire hazards identified and the local authority notified of any potential threats e.g. large brush stockpiles, fuels etc.
- Pipe stockpiles are wedged / secured.
- Scaffolds are secure.
- Structures vulnerable to high winds secure.

3.18.3 Erosion

- Wind and dust mitigation measures such as straw, brush packs, irrigation etc are in place.
- Excavated and filled slopes and stockpiles are at a stable angle and capable of accommodating normal expected water flows.
- Re-vegetated areas have a watering schedule and the supply to such areas is secured.
- There are sufficient detention ponds or channels in place.

3.18.4 Water Contamination and Pollution

- Hazardous fuel stores are secure.
- Cement and materials stores are secure.
- Toilets are empty and secured.
- Refuse bins are empty and secured.
- Bunding is clean and treated with appropriate material that will absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage.
- Drip trays are empty & secure.

3.19 PROTECTION OF ARCHAEOLOGICAL AND PALAEOLOGICAL SITES

If any possible paleontological/archaeological material is found during excavations, including shell middens, Stone Age tools, fossil bones and other artefacts, graves and wrecked vessels, the Contractor shall stop work immediately and inform the Engineer. The Engineer will inform the South African Heritage Resources Agency (SAHRA) and arrange for a palaeontologist/archaeologist to inspect, and if necessary excavate, the material, subject to acquiring the requisite permits from SAHRA.

The Contractor must comply with all requirements stipulated in the General Authorisation and issued by DEDEAT.

4. MEASUREMENT AND PAYMENT

4.1 BASIC PRINCIPLES

Except as noted below and in the Project Specification as Scheduled Items, no separate measurement and payment will be made to cover the costs of complying with the provisions of this Specification and such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting his Tender.

4.2 SCHEDULED ITEMS

4.2.1 Protection of Stock Piles from Blowing or Washing Away:

The spraying or covering of stockpiles, including the supply of the spray or cover material, as required, shall be measured as a lump sum.

4.2.2 Storage of Fuel and Oils:

The supply, construction, installation, transport, upkeep and removal of all facilities required for storage and management of fuel and oils will be measured as a lump sum.

4.2.3 Cement Laden Water Management:

The supply, construction, installation, transport, upkeep and removal of all facilities required for the management of wastewater from concrete operations will be measured as a lump sum.

4.2.4 Contaminated Water Management:

The supply, construction, installation, transport, upkeep and removal of all facilities required for managing contaminated water will be measured as a lump sum.

4.2.5 Storm Water Management:

The supply, construction, installation, transport, upkeep and removal of all facilities required for managing storm water run-off from the site will be measured as a lump sum.

4.2.6 Bunding and Management of Run-off from Workshop Areas and Supply of Drip

Trays for Stationary and "Parked" Plant:

The supply, construction, installation, transport, upkeep and removal of all facilities required for bunding and managing the run-off from workshop areas as well as all drip trays required will be measured as a lump sum.

4.2.7 Dust Management:

The supply, application, transport, upkeep and removal of all materials required to ensure that dust is adequately controlled will be measured as a lump sum.

4.2.8 Fire Control:

The supply, transport, upkeep and removal of all material required for fire control will be measured as a lump sum.

4.2.9 Provision of Venue and Staff Attendance at the Environmental Awareness

Training Course:

The provision of a venue and staff attendance at the environmental training course will be measured as a lump sum.

The sum shall cover all costs incurred by the Contractor in providing the venue and facilities as detailed in the Specifications and in ensuring the attendance of all relevant employees and sub-contractors and their employees, at the training.

4.2.10 Eating Areas:

The supply, construction, installation, transport, upkeep and removal at the end of the construction of all eating areas structures shall be measured as a sum.

4.2.11 Ablutions:

The supply, maintenance, regular emptying and removal of toilets shall be measured as a sum.

4.2.12 Site Demarcation:

The supply, installation and removal at the end of the construction of all temporary fences shall be measured by length for each type of fence scheduled.

4.2.13 Construction Personnel Information Posters:

The supply, installation and removal at the end of the construction of all construction information posters shall be measured by number of posters for each type of poster scheduled.

4.2.14 Solid Waste (including Hazardous Waste) Management:

The supply of bins and skips as well as transport of waste to appropriate waste disposal facilities shall be measured as a sum.

4.2.15 Spill Kits

The supply, use and replenishment of spill kits, to be used at fuel storage areas and refuelling areas shall be measured as a sum.

4.2.16 Method Statements: Additional Work:

No separate measurement and payment will be made for the provision of Method Statements but, where the Engineer requires a change beyond the requirements of the Specification on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the environment, then any additional work required, provided it could not reasonably have been foreseen by an experienced Contractor, shall be valued in accordance with the Contract document.

A stated sum is provided in the Schedule of Quantities to cover payment for such additional work.

4.2.17 Work "required by the Project Specification":

Where a clause in this Specification includes a requirement as "required by the Project Specification", measurement and payment for compliance with that requirement shall be in accordance with the relevant measurement and payment clause related to the Project Specification.

Drawing No	Title
8202AP-CV01	Locality Plan: Western Outfall Sewer
8202AP-CV02	Layout Plan: Western Outfall Sewer
8202AP-CV03	Detailed Layout and Longitudinal Section: Western Outfall Sewer (Sheet 1 of 3)
8202AP-CV04	Detailed Layout and Longitudinal Section: Western Outfall Sewer (Sheet 2 of 3)
8202AP-CV05	Detailed Layout and Longitudinal Section: Western Outfall Sewer (Sheet 3 of 3)
8202AP-CV06	Western Outfall Sewer: Type B Manhole: Details (Sheet 1 of 2)
8202AP-CV07	Western Outfall Sewer: Type B Manhole: Details (Sheet 2 of 2)
8202AP-CV08	Western Outfall Sewer: Sewer Pipe Details: Road Crossing and Raised Pipe Details
8202AP/01	Kruisfontein Waste Water Treatment Works: Site Layout
8202AP-ST001	Descriptive Notes and Procedures
8202AP-ST100	Grit Removal Channels: Layout, Plan and Sections
8202AP-ST101	Grit Removal Channels: Canopy over inlet structure: Plan and Elevations
8202AP-ST102	Grit Removal Channels: Disposal Facility for Night Soil Buckets
8202AP-ST105	Division Chambers: Plan Layout and Sections