LEPELLE NORTHERN WATER

LEPELLE NORTHERN WATER
Water is our passion

TENDER NO: LNW 08/25/26 (Re-Advert of LNW 07/24/25)

PROJECT NAME: REHABILITATION OF 560MM POTABLE WATER PIPELINE, VALVES, FITTINGS AND MANHOLES WITHIN PHALABORWA SCHEME

A CIDB GRADING: 8 ME OR 8 CE OR HIGHER

CLOSING DATE: 30th JANUARY 2026 @ 11:00 AM

ISSUED BY:

LEPELLE NORTHERN WATER

Physical address: 01 Landros Mare Street
Polokwane
0700

Postal address: Private Bag X9522
Polokwane
0700

Tel: 015 295 1800
Fax: 015 295 1931

NAME OF TENDERER: _____

TOTAL AMOUNT: _____ **(incl. VAT)**

CHECKLIST

Please indicate in the column (Completed) Yes or No in writing and sign when completed at the bottom of this page. Failure to complete this checklist may render this Tender as non-responsive.

Position in Document	Description	Complete (Yes / No)	Initial
Schedule A	Compulsory Attendance certificate - Completed and Signed		
Schedule B	Certificate for authority of companies Completed and Signed		
Schedule C	Record of Addenda to tender documents - Completed and Signed		
Schedule D	Plant and Equipment - Completed and Signed		
Schedule E	Completed Relevant work experience carried out		
Schedule F	Completed Tenderer Key		
Schedule G	Company Banking Details - Completed and Signed		
Schedule H	Proof of Financial Spent Capability - Completed and Signed		
Schedule I	Full details of directors / trustees / members / shareholders - Completed and Signed		
Schedule J	Contractors OHS Management system checklist - Completed and Signed		
Schedule K	Contractors Estimated monthly expenditure - Completed and Signed		
SBD 1	Invitation to Tender - Completed and Signed		
SBD 2	Tax Clearance Certificate - Completed and Signed		
SBD 3.1	Pricing Schedule - Completed and Signed		
SBD 4	Declaration of interest - Completed and Signed		
SBD 6.1	Preference Points - Completed and Signed		
C1.1	Form of Offer - Completed and Signed		
C1.2	Contract Data - Completed and Signed		
C1.3	Blasting Indemnity - Completed and Signed		
C1.4	Health and Safety Contract - Completed and Signed		
C2.1	Pricing Data - All items in the Schedule of Quantities priced		
PSVA 13	Valves and fittings technical data sheets completed fully		
	Company registration certificated/ Copy of a sole trader (Copies must be certified)		
Position in Document	**Description**	**Complete (Yes / No)**	**Initial**

	Tax Clearance Certificate/s (Original and Valid)		
	Copies of Identity Documents of Partners and/or Directors (NOT COPIES OF CERTIFIED ID)		
	Letter of Good Standing (COIDA)		
	Signed Joint Venture Agreement		
	CIDB Registration Certificate/s		
	Municipal current rates account not more than three months		
	Printed the Tender Document in accordance with the page color coding		
	Professional Presentation of Tender Proposal (Neatly bounded and file dividers for all the annexure)		

Signed: ..... Date: .....

NUMBER	HEADING	COLOUR
T1.1	Tender Notice and Invitation to Tender	White
T1.2	Tender Data	Pink
T1.3	Standard Conditions of Tender	Pink
T1.4	Preferential Procurement Regulations	Pink
Part T2:	**Returnable Documents**	
T2.1	List of Returnable Documents	Yellow
T2.2	Returnable Schedules	Yellow
Part C1:	**Agreement and Contract Data**	
C1.1	Form of Offer and Acceptance	White
C1.2	Contract Data	White
C1.3	Blasting Indemnity	White
C1.4	OHS Contract	White
C1.5	Inclement Weather	White
Part C2:	**Pricing data**	
C2.1	Pricing Instructions	Yellow
C2.2	Bill of Quantities	Yellow
C2.3	Summary of Schedules	Yellow
Part C3:	**Scope of Work**	
C3.1	Description of Works	Blue
C3.2	Standard Specifications	Blue
C3.3	Technical Specifications	Blue
C3.4	Engineering, Procurement, Construction & Management	Blue
C3.5	HIV/AIDS Requirements	Blue
C3.6	Occupational Health and Safety	Blue
Part C4:	**Site Information**	Green
Part C5:	**Drawings**	Green
Part C6:	**Annexures**	Green

PART T1

TENDERING PROCEDURES

T1.1 TENDER NOTICE AND INVITATION TO TENDER

Lepelle Northern Water invites tenders for Rehabilitation of 560mm Potable Water Pipeline, Valves, Fittings and Manholes project from qualified contractors with experience in the Construction or Refurbishment of Bulk steel water supply pipelines.

It is estimated that tenderers must have a CIDB grading of 8 CE or 8 ME or higher, 7CE PE or 7ME PE will not be considered.

Bid documents will be available on National Treasury E-tender portal from **Friday, 5th December 2025** on E-tender Portal website, from www.etenders.gov.za

Compulsory Briefing Session: **Wednesday, 14th January 2026 at 11h00AM at Phalaborwa Water Treatment Plant, Ba-Phalaborwa Municipality within Mopani District in Limpopo Province, which is situated at coordinates 24°03'57.6"S & 31°08'28.2"E (-24.066007; 31.141166**).

PPE and Identification documents required for entry. No safety shoes and Identity document, no entry.

Site Inspection: Bidders may visit the site for inspections and assessment upon request to LNW via email only if necessary. Request must be sent to LNW at least Five (5) working days prior to intended date of site visit (excluding builder's holidays), The last day for queries is Friday the 23rd January 2026.

Bids are to be completed in accordance with the conditions and rules contained in the bid documents. All documents must be sealed and labeled with the Bid number and description, and placed in the tender box, at the offices of **Lepelle Northern Water in Polokwane situated in No. 1 Landros Mare Street**, not later than **11h00 on Friday, 30th January 2026.**

Bids will be opened on the indicated date and time **11h00am on Friday, 30th January 2026** in public. All bids shall remain valid for a period of **90 days** as from the closing date.

Bid documents which are not received and/or deposited in the tender box before **11h00am** on the closing date will be marked as late bids and shall in terms of the **Procurement Policy of Lepelle Northern Water**, not be considered.

Procurement related enquiries may be directed to **Mmamokgadi Ramanna email: mmamokgadir@lepelle.co.za at 015 295 1800 and Technical related** enquiries may be directed **to Mr. S Ratshibvumo email: shudur@lepelle.co.za at 015 295 1800 from 08h00 to 16h00**. *Bidders are requested to ask if not clear about anything related to the bid.*

The lowest or any bid will not necessarily be accepted and Lepelle Northern Water reserves the right not to consider any bid suitably endorsed or comprehensively completed, as well as the right

to accept a bid in whole or part. Any bidder not contacted within 90-120 days after the closing date must consider their proposal unsuccessful.

T1.1.1. MANDATORY REQUIREMENTS (PRE - QUALIFICATION)

a) Proof of valid CIDB registration with a Grading of 8 CE or 8 ME or Higher, In case of a Joint Venture (JV) bid, the combined grading should be a minimum of 8 CE or 8ME of higher and 7CE PE or 7ME PE will not be considered, the JV Lead partner to be at least one grade below the advertised. This will be verified online.

b) Submission of Two (2) successfully completed relevant projects to the value of not less than **R10 000 000.00** on the **Construction or Refurbishment of Bulk steel water supply pipelines not less than 400mm in diameter and atleast 1km in length** (e.g Steel pumping mains, Steel Gravity mains) with appointment letter and completion certificate or reference letter on client's official letter head as well as completing table under Schedule E. For JV submission a minimum of one partner should submit the proof of Two (2) successfully completed projects. Failure to adhere to the above will lead to disqualification.

c) Fully completed LNW project reference form for the Two (2) successfully completed projects, For JV submission a minimum of one partner should submit the proof of successfully completed projects.

d) The JV agreement for JV partners to be submitted indicating percentage split up to 100% for partners, as well as indicating the lead partner of the JV to render agreement valid.

e) Attendance of compulsory site briefing session, at least one partner to attend in case of a JV.

f) All bid documents must be submitted in hard copy and completed in black ink. No tampering of bid documents with either correction fluid, sticky papers or any other form of bid tempering shall be accepted. All cancellation must be fully singed.

g) Full Completion and signing of SBD 4.

h) Proof of registration on the Central Suppliers Database (CSD). In case of a JV, all partners must submit, proof of CSD registration must be attached. This will be verified online.

i) CSD Tax Compliance (SARS Tax Clearance)

j) Letter of Good standing, COIDA relevant to Construction Works.

k) Company registration documents.

l) Certified valid ID copies of the company shareholders less than 3 months.

m) Municipal current rates account not more than three months old should be submitted.

NB: Failure to comply with any of the above requirements will lead to disqualification from the bid.

T1.1.2. ADMINISTRATIVE COMPLIANCE (Only to be requested from the preferred bidder)

a) The BOQ must be completed in FULL to render the bid complaint. Non-numerical (N/A, Nil or dash (-) or included or incomplete space) completion of BOQ items will be considered non-compliant. The BOQ will be clarified, balanced, and confirmed by the bidder within the required time.

b) Any arithmetic errors, omissions and discrepancies such as BOQ rates and amount figures not tallying to the bottom total or BOQ is left incomplete or omitted in printing and/or submission will be dealt with in line with clause C.3.9 of the CIDB Standard Conditions of Tender contained in annex C of the CIDB Standard for Uniformity.

c) Completion of other SBD forms

NOTES:

a) ***All the above administrative compliance documents will be requested from the preferred bidder if not submitted and completed with the tender document.***

b) ***The JV agreement for JV partners to be submitted indicating percentage split up to 100% for partners to render agreement valid (Point will be allocated as per pro rata(proportional) JV percentage split). This is only applicable on company experience under functionality.***

c) ***Preferred JV bidder will be required to submit a JV bank account and VAT number.***

d) ***The bidders must comply with all terms and condition including requirements as stipulated in the Tender Documents to be evaluated further.***

e) ***LNW is not compelled to accept the lowest or any bid.***

f) ***LNW reserves the right to reduce the scope of works due to budget constraint or reduction of scope by client.***

g) ***Bidders will be subjected to risk assessment, verification, and arithmetic check.***

h) ***LNW reserves the right to verify any information provided by the bidder, falsified and fraudulent reference or experience will lead to disqualification and blacklisting in terms of SCM process in conjunction with legal/law enforcement process.***

T1.1.3. CONTRACT CONDITIONS

a) The contract shall abide by the CIDB B.U.I.L.D standards for Indirect targeting enterprise development and Skills development through infrastructure as per the Government Gazettes of RSA No.48491 of 28 April 2023 and No.36190 of 25 February 2013 respectively where applicable.
b) Should the CIDB B.U.I.L.D standard for Indirect targeting enterprise development be applicable, the contractor will be required to appoint a dedicated enterprise development co-ordinator to form part of the project team.
c) The approved bidder shall under no circumstances interrupt the operations of the plant as a result of his/her activities in, or around the Scheme.
d) Full adherence to the Occupational and Health and Safety Act, Act 85 of 1993 and other applicable Acts will be applicable during the contract.
e) Labour desk to be created for employing local labour. All unskilled labour will be from local communities, skills transfer to be considered and where skilled locals are available, they are to be given first preference.
f) Form of contract shall be GCC 2015.
g) Each of the person listed on functionality must be confirmed as available for the duration of the project and A Signed declaration/employment contract (refer Tender Document for the standard employment contract) by proposed qualifying Contracts Manager, Design Engineer, Site Manager, General Foreman and Safety Manager must be included on their CV's. Should the proposed candidate be not available during construction, a similar replacement or better must be made available immediately and the employer must be notified in advance.
h) LNW reserves the right to verify any information provided by the bidder, falsified and fraudulent reference or experience will lead to disqualification and blacklisting in terms of SCM process in conjunction with legal/law enforcement process.
i) Fixed Performance Guarantee – Tenderer's ability to raise 10% Fixed Performance Guarantee – Bank stamped Letter of Intent to issue guarantee from a Bank registered in terms of the Banks Act (Act No. 94 of 1990)
j) Proof of availability or ready access to working capital of a minimum of R 4 million. The availability or ready access to this working capital shall remain available for the duration of the project until completion, in a form of a credit facility with a bank or bank confirmation letter. No other form of confirmation will be acceptable.
k) The successful bidder will be expected to co-ordinate their works with the contractor to be appointed for the Cathodic Protection Phase 2 project, any delays as a result of non-co-ordination will be borne by the two service providers, not LNW.

Lepelle Northern Water's Tip-off HotLine

Speak out against fraud and corruption
Ethics & fraud hotline Details
Free Call: 0800 113 555
Free Post: BNT165, Advance Call Pty (Ltd),
Brooklyn Square, 0075
Email: LNW@behonest.co.za
Website: www.behonest.co.za

T1.2 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the **CIDB** Standard for Uniformity (SFU) as published in Government Gazette No 42622 of 8 August 2019 and as amended and supplemented by the Tender Data in this Part T1.2. The complete extract entitled "Annex C" of the CIDB Standard for Uniformity as published in Government Gazette No 42622 of 8 August 2019 is bound into Part T1.3 of this document.

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

These Conditions of Tender are furthermore subject to the requirements of the Preferential Procurement Framework Act, 2000: Preferential Procurement Regulations, 2022 published in Government Gazette No. 47452 dated 04 November 2022.

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

Clause	Addition or Variation to Standard Conditions of Tender
C.1.1.1	The employer is **Lepelle Northern Water (LNW)**
C.1.1.3	*Replace the contents of the clause with the following:* "The Employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract, in accordance with the provisions of C.1.5."
C.1.2	The tender documents issued by the employer comprise is a single document which comprises the following: **Part T1: Tendering Procedures** Part T1.1 Tender Notice and Invitation to Tender Part T1.2 Tender Data Part T1.3 Standard Conditions of Tender Part T1.4 Preferential Procurement Regulations **Part T2: Returnable Documents and Schedules** Part T2.1 List of Returnable Documents Part T2.2 Returnable schedules **Part C1: Agreements and Contract Data** Part C1.1 Form of Offer and Acceptance

Clause	Addition or Variation to Standard Conditions of Tender
	Part C1.2 Contract Data Part C1.3 Blasting Indemnity Part C1.4 OHS Contract Part C1.5 Inclement Weather **Part C2: Pricing Data** Part C2.1 Pricing Instructions Part C2.2 Bill of Quantities Part C2.3 Summary of Bill of Quantities Part C2.4 Banking Details **Part C3: Scope of Work** Part C3.1 Description of the Works Part C3.2 Standard Specifications Part C3.3 Technical Specifications Part C3.4 Engineering, Procurement, Construction & Management Part C3.5 HIV/AIDS Requirements Part C3.6 Occupational Health and Safety **Part C4: Site Information** **Part C5: Drawings** **Part C6: Annexures** These shall be read together with any Addenda issued in accordance with Clause C3.2 of these Instructions to Tenderers. Upon receipt of the Tender Documents and prior to the submission of any Tender, the Tenderer shall check the documents issued and the number of pages contained in each document and if any are found to be missing or duplicated or any figure or wording is indistinct the Tenderer shall apply to the Employer at once to have the same rectified. No liability will be entertained by the Employer or the Employer's Agent in respect of errors in any Tender arising out of any matter referred to in this paragraph.
C.1.3.4	*Add the following new clause:* "The Tender documents have been drafted in English. The contract arising from the invitation of tender shall be interpreted and construed in English"
C.1.4	The Employer's Agent is: Name: TBA
C.1.6.3	The two stage-system shall not be applied.

Clause	Addition or Variation to Standard Conditions of Tender
C.2.2	*Add the following to the clause:* Accept that the Employer will not compensate the tenderer for any costs incurred in attending interviews in the office of the employer or the employer's agent (if required).
C.2.5	*Add the following to the clause:* Reference documents include, but are not limited to, the following: • "South African Bureau of Standards: Standardized Specifications for Civil Engineering Construction", (SANS 1200) • "General Conditions of Contract for Construction Works, Third Edition, 2015, displaying (Print 3 or later)" on the frontispiece • "Preferential Procurement Regulations, 2022" published in Government Gazette No 47452 dated 04 November 2022 • "Construction Regulations, 2014" • "Occupational Health and Safety Act", 1993 (Act No. 85 of 1993)
C.2.6	*Add the following to the clause:* Extension of time will only be allowed at the discretion of the Employer in terms of the governing prescripts
C.2.7	The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. Tender documents will not be made available at the site visit or clarification meeting. Detail relating to the collection of tender documents is indicated in the Tender Notice and Invitation to Tender (Section T1.1 of the document). Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list.
C.2.8	*Replace the contents of the clause with the following:* Request clarification of the tender documents, if necessary, by notifying the employer at least ten (10) working days before the closing time stated in Clause C 2.15.
C.2.10.5	*Add the following new clause:* A digital copy of the Bill of Quantities in MS-Excel format may be obtained from the Employer's Agent at the office of the Employer's Agent upon sufficient notice.
C.2.11	*Add the following to the clause*: To correct errors made, draw a line through the incorrect entry and write the correct entry above in black ink and place the full signatures of the authorised signatories next to the correct entry.

Clause	Addition or Variation to Standard Conditions of Tender
	Corrections in terms of price may not be made by means of a correction fluid such as Tippex or a similar product.
C.2.12.1	*Alternative offers shall not be applicable*
C.2.13.1	*Add the following to the clause:* No claim will be entertained for faults in the tender price resulting from any discrepancies, omissions or indistinct figures.
C.2.13.2	*Replace the contents of the clause with the following:* Return all parts of the tender document to the Employer after completion of the relevant sections of the document in their entirety, by writing legibly in black ink. All documents are to be left intact in its original format and no pages shall be removed or re-arranged.
C.2.13.3	Parts of each tender offer communicated on paper shall be submitted as an original, plus one copy in a USB drive.
C.2.13.4	*Add the following to the clause:* Only authorised signatories may sign the original and all copies of the tender offer where required in terms of the tender data 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 certified copy of the Certificate of Incorporation of such company shall, together with 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 **CLOSED CORPORATION** submitting a tender, include a certified copy of the Founding Statement of such corporation, together with 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** submitting a tender, include **a resolution** of each company of the Joint Venture together with a resolution by its members authorising a member of the Joint Venture to sign the documents on behalf of the Joint Venture.
C.2.13.5	The Employer's details and address for delivery of tender offers and identification details that are to be shown on each tender offer package with the name and address of the tender entered on the back of the envelope are: **Location of Tender Box:** Lepelle Northern Water Tender Box

Clause	Addition or Variation to Standard Conditions of Tender
	Physical address: 01 Landros Mare Street, Polokwane, 0700 **Identification details:** **LNW 08/25/26** **Bid Title:** **REHABILITATION OF 560MM POTABLE WATER PIPELINE, VALVES, FITTINGS AND MANHOLES AT PHALABORWA WATER SUPPLY SCHEME**
C.2.13.6	A two-envelope procedure will not be followed.
C2.13.10	*Add the following new clause:* Accept that all conditions, which are printed or written upon any stationary used by the tenderer for the purpose of or in connection with the submission of a tender offer for this Contract, which are in conflict with the conditions laid down in this document shall be waived, renounced and abandoned.
C.2.15.1	The closing time and location for the submission of tender offers are: **Closing date and time:** 30th January 2026 at 11h00 **Identification details:** **LNW 08/25/26** **Location:** Lepelle Northern Water Tender Box, 01 Landros Mare Street, Polokwane, 0700
C.2.16.1	The tender offer validity period is 90 days from closing date. *Add the following to the clause:* This will be subject to extension at the request by Lepelle Northern Water's Accounting Officer, to be considered by the service provider.
C.2.19	Access shall be provided for the following inspections, tests and analysis: Inspection during the Tender site meeting, request to inspect to be made to the employer within the period stipulated on T1.1.

Clause	Addition or Variation to Standard Conditions of Tender
C.3.4	The time and location for opening of the tender offers are: **DATE AND TIME :** 30th January 2026 at 11h00 **IDENTIFICATION DETAILS: LNW 08/25/26** **LOCATION:** Lepelle Northern Water Tender Box 01 Landros Mare Street, Polokwane, 0700 **BID TITLE : REHABILITATION OF 560MM POTABLE WATER PIPELINE, VALVES, FITTINGS AND MANHOLES AT PHALABORWA WATER SUPPLY SCHEME**
C.3.5	A two-envelope procedure will not be followed.

T1.3. STANDARD CONDITIONS OF TENDER

The Standard Conditions of Tender that shall govern, shall be the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity as published in Government Gazette No 42622 of 8 August 2019 as amended and supplemented by the Tender Data in Part T1.2.

The complete extract entitled “Annex C” is bound hereafter into this volume and may not have been edited where found in electronic format by any tender document compiler or tenderer. However, where differences between the original published edition and the edition bound in this document are evident, the original published edition shall govern.

Annex C
(normative)

Standard Conditions of Tender

C.1 GENERAL

C.1.1 Actions

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

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

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

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

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

C.1.2 Tender Documents

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

C.1.3 Interpretation

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

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

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

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

i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially;

ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or

iii) incompatibility or contradictory interests exist between an employee and the tenderer which employs that employee.

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

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

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

C.1.4 Communication and employer's agent

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

C.1.5 Cancellation and Re-Invitation of Tenders

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

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

(b) funds are no longer available to cover the total envisaged expenditure; or

(c) no acceptable tenders are received; or

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

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

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

C.1.6 Procurement procedures

C.1.6.1 General

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

C.1.6.2 Competitive negotiation procedure

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

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

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

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

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

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

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

C.1.6.3.2 Option 2

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

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

C.2 TENDERER'S OBLIGATIONS

C.2.1 Eligibility

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

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

C.2.2 Cost of tendering

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

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

C.2.3 Check documents

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

C.2.4 Confidentiality and copyright of documents

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

C.2.5 Reference documents

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

C.2.6 Acknowledge addenda

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

C.2.7 Clarification meeting

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

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least seven (7) working days before the closing time stated in the tender data.

C.2.9 Insurance

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

C.2.10 Pricing the tender offer

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

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

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

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

C.2.11 Alterations to documents

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

C.2.12 Alternative tender offers

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

that are proposed.

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

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

C.2.13 Submitting a tender offer

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

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

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

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

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

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

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

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

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

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

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

C.2.15 Closing time

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

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

C.2.16 Tender offer validity

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

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

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

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

C.2.17 Clarification of tender offer after submission

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

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

C.2.18 Provide other material

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

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

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

C.2.19 Inspections, tests and analysis

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

C.2.20 Submit securities, bonds, policies, etc.

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

C.2.21 Check final draft

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

C.2.22 Return of other tender documents

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

C.2.23 Certificates

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

C.3 THE EMPLOYER'S UNDERTAKINGS

C.3.1 Respond to requests from the tenderer

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

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

a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;

b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or

c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.3.2 Issue Addenda

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

C.3.3 Return late tender offers

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

C.3.4 Opening of tender submissions

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

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

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

C.3.5 Two-envelope system

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

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

C.3.6 Non-disclosure

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

C.3.7 Grounds for rejection and disqualification

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

C.3.8 Test for responsiveness

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

a) complies with the requirements of these Conditions of Tender,

b) has been properly and fully completed and signed, and

c) is responsive to the other requirements of the tender documents.

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

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,

b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or

c) affect the competitive position of other tenderers presenting responsive it were to be rectified.

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

C.3.9 Arithmetical errors and discrepancies

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

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

a) the gross misplacement of the decimal point in any unit rate;

b) omissions made in completing the pricing schedule or bills of quantities; or

c) arithmetic errors in:

i) line-item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or

ii) the summation of the prices.

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

C.3.9.3 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.

b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

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

C.3.11 Evaluation of tender offers

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

Conditions of tender are by definition the document that establishes a tenderer’s obligations in submitting a tender and the employer’s undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	
Requirement	**Qualitative interpretation of goal**
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes
Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

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

C.3.11.1 General

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

C.3.12 Insurance provided by the employer

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

C.3.13 Acceptance of tender offer

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

a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer’s procurement;
b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial

resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract;

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

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

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

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

C.3.14 Prepare contract documents

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

a) addenda issued during the tender period,

b) inclusion of some of the returnable documents and

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

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

C.3.15 Complete adjudicator's contract

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

C.3.16 Registration of the award

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

C.3.17 Provide copies of the contracts

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

C.3.18 Provide written reasons for actions taken

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

T1.4 PREFERENTIAL PROCUREMENT REGULATIONS

T1.4.1. Supply Chain Management Procedures

Lepelle Northern Water is committed to fair, equitable and transparent supply chain management procedures free of corruption of any nature. Should anybody suspect any irregularity of any sort they are requested to state their concerns in writing to the Chief Executive Officer of Lepelle Northern Water without delay. Should a satisfactory explanation or action not be forthcoming from the Chief Executive Officer the matter should be reported to the office of the Public Protector.

This Request for Proposals has been compiled and approved by the Bid Specification Committee of Lepelle Northern Water established in terms of the Public Finance Management Act and its Regulations.

The bids received will be evaluated by the Bid Evaluation Committee in terms of the bids evaluation criteria described in this document. The Committee will then submit a report on the bids received to the Bid Adjudication Committee.

The Bid Adjudication Committee will make a recommendation to the Accounting Officer or his delegate nominated in writing. The Accounting Officer will either accept the recommendation of the Bid Adjudication Committee or refer it back to the Bid Adjudication Committee for further investigation or award the contract to a different bidder. In the event that the contract is awarded to a different bidder from the one recommended by the Bid Adjudication Committee, the Auditor-General shall be informed of the reasons for the decision.

The above process will, depending upon the complexity of the project and the number of bids received, take between 4 and 6 weeks. Bidders are requested to refrain from making queries on progress and/or from submitting unsolicited information regarding their bids and especially from commenting on other bidders' proposals during this time. Lepelle Northern Water will endeavor to keep bidders informed of the progress of the process

T1.4.2. Evaluation criteria

Preferential Points System will be used to evaluate this bid in line with the Preferential Procurement Policy Framework Act, 2022. Bidders will be evaluated on mandatory requirements first, then functionality, only those qualifying by achieving the minimum cut off point of **70% (35 points)** will be evaluated for administrative requirements. Following administrative compliance evaluation shall be of price and specific goals as the final stage.

This bid will be evaluated and adjudicated according to the following criteria:

Method 4

1. Relevant specifications
2. Value for money
3. Capability to execute the contract
4. LNW SCM Policy
5. PPPFA & associated regulations

The Bid Evaluation Committee will evaluate the received bid in line with the below sequence

T.1.4.2.1. Mandatory Requirements (Pre-Qualification)

Pre-qualification – Only bidders who have adhered or submitted the following documents will be considered for further evaluation, namely:

a) Proof of valid CIDB registration with a Grading of 8 CE or 8 ME or Higher, In case of a Joint Venture (JV) bid, the combined grading should be a minimum of 8 CE or 8ME of higher and 7CE PE or 7ME PE will not be considered, the JV Lead partner to be at least one grade below the advertised. This will be verified online.

b) Submission of Two (2) successfully completed relevant projects to the value of not less than **R10 000 000.00** on the **Construction or Refurbishment of Bulk steel water supply pipelines not less than 400mm in diameter and at least 1km in length** (e.g Steel pumping mains, Steel Gravity mains) with appointment letter and completion certificate or reference letter on client's official letter head as well as completing table under Schedule E. For JV submission a minimum of one partner should submit the proof of Two (2) successfully completed projects. Failure to adhere to the above will lead to disqualification.

c) Fully completed LNW project reference form for the Two (2) successfully completed projects, For JV submission a minimum of one partner should submit the proof of successfully completed projects.
d) The JV agreement for JV partners to be submitted indicating percentage split up to 100% for partners, as well as indicating the lead partner of the JV to render agreement valid.
e) Attendance of compulsory site briefing session, at least one partner to attend in case of a JV.
f) All bid documents must be submitted in hard copy and completed in black ink. No tampering of bid documents with either correction fluid, sticky papers or any other form of bid tempering shall be accepted. All cancellation must be fully singed.
g) Full Completion and signing of SBD 4.
h) Proof of registration on the Central Suppliers Database (CSD). In case of a JV, all partners must submit, proof of CSD registration must be attached. This will be verified online.
i) CSD Tax Compliance (SARS Tax Clearance)
j) Letter of Good standing, COIDA relevant to Construction Works.
k) Company registration documents.
l) Certified valid ID copies of the company shareholders less than 3 months.
m) Municipal current rates account not more than three months old should be submitted.

NB: Failure to comply with any of the above requirements will lead to disqualification from the bid.

This bid will be evaluated and adjudicated according to the following criteria:

Method 4

1. Relevant specifications
2. Value for money
3. Capability to execute the contract
4. PPPFA & associated regulations
5. LNW SCM Policy

T.1.4.2.2. Bid Evaluation Method

Bids will further be evaluated in terms of Method 4:

a) Stage 1: Evaluation on Functionality, Minimum of 70% (35 points) to be scored to be considered responsive.
b) Stage 2: Evaluation on 80/20 or 90/10 preferential points system (Price and specific goals)

a) Stage 1: Evaluation on Functionality

Under functionality, Bidders must achieve a minimum of **70% (35 points)** of functionality to be considered for further evaluation.

EVALUATION PROCESS. All bids duly lodged will be evaluated on functionality as Pre-qualifying criteria. The evaluation criteria and weighting for measuring functionality are indicated. **Criteria**	**Weighting**
1. **Relevant Company Experience**	**24**
Attach proof of successfully completed traceable projects in Construction or Refurbishment of Bulk steel water supply pipelines not less than 400mm in diameter and atleast 1km in length (e.g Steel pumping mains, Steel Gravity mains) • Four (4) projects and above to the value of R10 000 000.00 or above – Twenty-four (24) points • Three (3) projects to the value of R10 000 000.00 or above – Eighteen (18) points • Two (2) projects to the value of R10 000 000.00 or above – Twelve (12) points **Attach signed appointment letter with completion certificate signed by the client or signed appointment letter with reference letter on client's official letter head indicating successfully completed projects for scoring the above points.** **The client /employer contact details should be recent, accurate, contactable, LNW might have further questions for the purposes of scoring the bidder if required, the responsibility remains on the bidder to ensure that the client**	

/employer responds when required to do so. It is advisable to contact previous clients before submitting this bid. **Only relevant projects listed under schedule E will be considered for points scoring.**	
2. Capacity (Proposed key personnel)	**20**
2.1. Detailed CV of Contracts Manager with minimum BSc Eng/BEng/B-Tech Eng Degree or higher in engineering qualification professionally registered as a Pr Eng or Pr Tech Eng with ECSA or with SACPCMP as a PrCPM with experience indicating a role as a Contracts manager or Project Manager on infrastructure projects. **Points will be allocated as follows:** • ***Contracts Manager:*** o *Three (3) and above projects = Six (6) points.* o *Two (2) projects = Three (3) points,* o *One (1) project = Two (2) points.* o *Zero (0) Projects = Zero (0) Points.* **2.2.** Detailed CV of Designer with minimum BSc Eng/BEng/B-Tech Eng Degree or higher in Civil Engineering qualification professionally registered as a Pr Eng or Pr Tech Eng with ECSA with experience indicating a role as a Designer or Design Engineer on water retaining structural projects. **Points will be allocated as follows:** • ***Designer:*** o *Three (3) and above projects = Six (6) points.* o *Two (2) projects = Three (3) points,* o *One (1) project = Two (2) points.* o *Zero (0) Projects = Zero (0) Points.* **2.3.** Detailed CV of **Site Manager** with minimum National Diploma or higher in Civil or Mechanical Engineering qualification and experience in construction site management indicating the role of site agent or site manager on Construction or Refurbishment of Bulk steel water supply pipelines not	

less than 400mm in diameter and at least 1km in length (e.g Steel pumping mains, Steel Gravity mains). **Points will be allocated as follows:** • ***Site Manager:*** o *Four (4) and above projects = Three (3) points.* o *Three (3) projects = Two (2) points.* o *Two (2) projects = One (1) point.* o *Less than Two (2) projects = Zero (0) points* **2.4.** Detailed CV of a **General Foreman** with minimum N6 (NQF Level 5) or higher, with recognized Welding qualifications, must be a coded welder with experience indicating a role as a **Site Foreman: Welding** in Construction or Refurbishment of Bulk steel water supply pipelines not less than 400mm in diameter and at least 1km in length (e.g Steel pumping mains, Steel Gravity mains). **Points will be allocated as follows:** • ***General Foreman:*** o *Four (4) and above projects = Three (3) points.* o *Three (3) projects = Two (2) points.* o *Two (2) projects = One (1) point.* o *Less than Two (2) projects = Zero (0) points* ***2.5.*** Detailed CV of key personnel CV of **Safety Manager** with minimum N6 or higher Certificate in Safety Management or a recognised OHS qualification, registration with SACPCMP as a professional construction health and Safety Manager (PrCHSM) with experience in construction projects of any nature in a role of Safety Officer or Safety Manager. **Points will be allocated as follows:** • **Safety *Officer/* Safety Manager** o *Two (2) and above projects = Two (2) points.* o *One (1) project = One (1) point* o *Zero (0) Projects = Zero (0) Points.* Attach academic qualifications with a CV clearly indicating the role occupied by the individual on the key personnel criteria above, which includes. • Completing Proposed Project Organogram table on Schedule F	

• Certified ID copies of key personnel. • Certified Copies of qualifications of key personnel not older than 6 months. • All international qualifications must be accompanied by South African Qualifications Authority (SAQA) Accreditation, failure to provide SAQA accreditation for international qualifications will result in zero points being scored • Completion of the LNW CV Summary template (refer to annexure A of the Tender Document for the standard LNW CV Summary template) to be completed, any other version of the template other that the attached will not be accepted. • No points will be allocated if any of the above is not adhered to.	
3. Plant & Equipment	**6**
3.1. **Plant & Equipment** - Bidder to provide proof of plant & equipment listed below for the project. For owned equipment proof of ownership to be provided and may be subjected to an inspection at Bidder's premises. For equipment that will be hired, a letter of undertaking to hire out plant and equipment to the bidder from the proposed plant & equipment hire company is required. ***3.1.1. TLB,*** ***3.1.2. Crane Truck or Side Boom,*** ***3.1.3. Tipper Trucks,*** ***3.1.4. Excavator,*** ***3.1.5. Loader*** **Points will be allocated as follows:** o *All Five (5) Plant & Equipment above submitted = Six (6) points.* o *Four (4) of Plant & Equipment above submitted = Five (5) points.* o *Three (3) of Plant & Equipment above submitted = Four (4) points.* o *Two (2) of Plant & Equipment above submitted = Two (2) points.* o *One (1) of Plant & Equipment above submitted = `One (1) point.* o *No Submission = Zero (0) Points.*	
Total Points	**50**

Table 1 : Evaluation Criteria

- Minimum points to be scored is 35 points out of 50 points (70%). Point's allocation for company experience under functionality will be split as per JV agreement (percentage split on company experience).
- Note that, the LNW reserves the right to verify any information provided by the bidder, falsified and fraudulent reference or experience will lead to disqualification and blacklisting in terms of SCM process in conjunction with legal/law enforcement process.

b) Stage 2: Scoring based on price and Preferential points system

NB:NO BIDDER WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE (see definition on SBD 6.1 attached).

Specific Goals	Means of verification	80/20 Points	90/10 Points
SMME (Small Medium Micro Enterprises)	CSD Report	5	2,5
Black women (100% Black women ownership in the company)	CSD Report	5	2,5
Black ownership (100% black ownership in the company)	CSD Report	5	2,5
Black Youth (Minimum of 1 shareholder Black youth ownership in the company)	CSD Report	5	2,5
Total points		**20**	**10**

Table 2 : Preference Points

The points scored by the tenderer in respect of the level of B-BBEE contribution must be added to the points scored for price.

The 80/20 or 90/10 Preferential Point System will be used to evaluate the bid.

Financial offer and Preferential Point System:

a) Score tender evaluation points for financial offer.

b) Confirm that tenderers are eligible for the Preference points claimed, and if so, score tender evaluation points.

c) Calculate total tender evaluation points.

d) Rank tender offers from the highest number of tender evaluation points to the lowest.

e) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

GENERAL CONDITIONS

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

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

To be completed by the organ of state

(*delete whichever is not applicable for this tender*).

a) The applicable preference point system for this tender is the 90/10 preference point system.

b) The applicable preference point system for this tender is the 80/20 preference point system.

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

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

(a) Price; and

(b) Specific Goals.

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	
SPECIFIC GOALS	
Total points for Price and SPECIFIC GOALS	**100**

Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

DEFINITIONS

(a) **"tender"** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;

(b) **"price"** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;

(c) **"rand value"** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

(d) **"tender for income-generating contracts"** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and

(e) **"the Act"** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

POINTS AWARDED FOR PRICE

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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

Note to tenderers: The tenderer must indicate how they claim points for each preference point system on SBD 6.1

PART T2

RETURNABLE DOCUMENTS

T2 RETURBANLE DOCUMENTS & SCHEDULES

T2.1 LIST OF RETURNABLE DOCUMENTS

The tender document must be completed in full. The information the tenderer shall supply in his/her tender or attached to his/her tender shall include, but not be limited to the documents and schedules as set out below.

1. Company registration certificated/ Copy of a sole trader (Copies must be certified)
2. SARS Tax Compliance Pin
3. Copies of Identity Documents of Partners and/or Directors (NOT COPIES OF CERTIFIED ID)
4. Letter of Good Standing (COIDA)
5. Company Profile
6. CIDB Registration Certificate/s
7. B-BBEE Certificate or Sworn Affidavit where applicable.
8. Municipal current rates account not more than three months in arrears should be submitted
9. Central Suppliers Database (CSD) Report
10. Audited or independently reviewed financial statements to verify the financial capability of service providers to carry projects
11. Fixed Performance Guarantee – Tenderer's ability to raise 10% Fixed Performance Guarantee – Bank stamped Letter of Intent to issue guarantee from a Bank registered in terms of the Banks Act (Act No. 94 of 1990)
12. Proof of availability of working capital (R4m).
13. The JV agreement for JV partners to be submitted indicating percentage split up to 100% for partners, as well as indicating the lead partner of the JV to render agreement valid.

T2.2. RETURNABLE SCHEDULES

Schedule A	Compulsory Attendance certificate	*1
Schedule B	Certificate for authority of companies	*1
Schedule C	Record of Addenda to tender documents	*1
Schedule D	Plant and Equipment	*1
Schedule E	Previous relevant work carried out by tenderer	*1
Schedule F	Tenderer Key Personnel and Project Specific Organogram.	*1
Schedule G	Company Banking Details	*1
Schedule H	Proof of Financial Spent Capability	*1
Schedule I	Full details of directors / trustees / members / shareholders	*1
Schedule J	Contractors OHS Management system checklist	*1
Schedule K	Contractors Estimated monthly expenditure	*1
SBD 1	Invitation to Tender	*2
SBD 2	Tax Clearance Certificate	*2
SBD 3.1	Pricing Schedule	*2
SBD 4	Declaration of interest	*1
SBD 6.1	Preference Points	*2

NOTES:
*1 - SCHEDULES/DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES
*2 - SCHEDULES/DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT

SCHEDULE A: CERTIFICATE OF ATTENDANCE OF SITE INSPECTION

NB : ATTENDANCE REGISTER TO BE USED

SCHEDULE B: CERTIFICATE OF AUTHORITY FOR COMPANIES

This Returnable Schedule is to be completed by companies and close corporations. 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**	**C** **Joint Venture**	**E** **Close Corporation**

B.1 Certificate for company

I, ……, managing director of the board of directors of ……..…..
hereby confirm that by resolution of the board taken on ……20….., Mr./Ms ……. , has been duly authorized to sign all documents in connection with this tender and any contract resulting from it on behalf of the company. As witnesses: -

4. ……
…..……...……
Managing director

1. ……
……
Date

B.2. Certificate for Joint Venture

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise Mr./Ms……..., authorised signatory of the company ……., acting in the capacity of lead partner, to sign all documents in connection with the tender offer and any contract resulting from it on our behalf of:

NAME OF FIRM	**ADDRESS**	**AUTHORISING SIGNATURE, NAME & CAPACITY**
Lead partner		

B.3 Certificate for close Corporation

We, the undersigned, being the key members in the business trading as ……..... .....hereby authorise Mr/Ms ……. . , to sign all documents in connection with the tender and any contract resulting from it on our behalf of:

NAME	ADDRESS	SIGNATURE	DATE

NOTE: This certificate is to be completed and signed by all of the key members upon whom rests the direction of the affairs of the Close Corporation as a whole.

SCHEDULE C: RECORD OF ADDENDA TO TENDER DOCUMENTS

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

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

NOTE: Attach additional pages if more space is required.

Signed: ..... Date: .....

Name: ..... Position: .....

Tenderer: .....

SCHEDULE D: PLANT AND EQUIPMENT

The following are lists of major items of relevant equipment that I/we presently own or lease (Attach proof of ownership or rental) 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.

Signed: _____ Date: _____

Name: _____ Position: _____

Tenderer: _____

SCHEDULE E: PREVIOUS RELEVANT WORK CARRIED OUT BY TENDERER

Provide successfully completed traceable projects in the **"Construction or Refurbishment of Bulk steel water supply pipelines not less than 400mm in diameter and atleast 1km in length (e.g Steel pumping mains, Steel Gravity mains)".** Relevant appointment letter complete with completion certificate or reference letter on client official letter head as well as a completed LNW project reference form attached to this document as an annexure must be attached for each project as proof of Company Experience to score points.

Project Description	Contract Value (VAT excl)	Project Duration		Reference		
		Start	Finish	Name:	Organization:	Tel No/Email:

Tenderer : _____

Signature:_____ **DATE:** _____

SCHEDULE F: TENDERER'S KEY PERSONNEL

Bidders are to complete this proposed project organogram table for all proposed key personnel, as well as completing fully the CV template attached as Annexure A of this document for each key personnel.

NAME	ROLE	NQF QUALIFICATIONS

TENDERER: ……

SIGNATURE: ……DATE: ……

SCHEDULE G

FULL DETAILS OF DIRECTORS / TRUSTEES / MEMBERS / SHAREHOLDERS.

Full Name	Identity Number	Personal Tax Reference Number	State Employee Number / Perusal Number

SCHEDULE H

COMPANY DETAIL REGARDING TENDERER / COMPANY / PARTNERSHIP

1. Complete Name : . . . . . .
(Business)

Registered Address : . . . . . .

Registration No. : . . . . . .

Type of Business : . . . . . .

Indicate with an "X"

One-man Business	Partnership	Private Company	Closed Corporation	Joint Venture	Consortium	Others

Date registered : . . . . . .

Tel. No. : (W) Code: . . . . . No.: . . . . . .

Cell No. : . . . . . .

Fax No. : Code: . . . . . No.: . . . . . .

E-mail : . . . . . .

2. AUTHORIZED / CONTACT PERSON

Name : . . . . . .

Title : . . . . . .

3. FINANCIAL DETAIL

(1) Bank detail

Bank : . . . . . .

Branch : . . . . . .

Account Name: . . . . . .

Account No. : . . . . . .

Contact person: . . . . . .

Tel No. : . . . . . .

Fax No. : . . . . . .

SCHEDULE I: CONTRACTORS' OHS MANAGEMENT SYSTEM CHECKLIST

		Yes/No
1.	**OHS Policy and Management**	
1.1	Is there a written company health and safety policy?	☐ ☐
1.2	Does the company have an OHS Management System?	☐ ☐
1.3	Is there a company OHS Management System manual or plan?	☐ ☐
1.4	Are health and safety responsibilities clearly identified for all levels of staff?	☐ ☐
2.	**Safe Work Practices and Procedures**	
2.1	Has the company prepared safe operating procedures or specific safety instructions relevant to its operations?	☐ ☐
2.2	Does the company have any permit to work systems?	☐ ☐
2.3	Is there a documented incident investigation procedure?	☐ ☐
2.4	Are there procedures for maintaining, inspecting and assessing the hazards of plant operated/ owned by the company?	☐ ☐
2.5	Are there procedures for storing and handling hazardous substances?	☐ ☐
2.6	Are there procedures for identifying, assessing and controlling risks associated with manual handling?	☐ ☐
1.	**OHS Training**	
3.1	Is health and safety training conducted in the company	☐ ☐
3.2	Is a record maintained of all training and induction programs undertaken for employees in the company?	☐ ☐
2.	**Health and Safety Workplace Inspection**	
4.1	Are regular health and safety inspections at worksites undertaken?	☐ ☐
4.2	Are standard workplace inspection checklists used to conduct health and safety inspections?	☐ ☐
4.3	Is there a procedure by which employees can report hazards at workplaces?	☐ ☐
5.	**Health and Safety Consultation**	
5.1	Is there a workplace health and safety committee?	☐ ☐

5.2 Are employees involved in decision making over OHS matters? ☐ ☐

5.3 Are there employee elected health and safety representatives? ☐ ☐

4. OHS Performance Monitoring

6.1 Is there a system for recording and analysing health and safety performance statistics? ☐ ☐

6.2 Are employees regularly provided with information on company health and safety performance? ☐ ☐

6.3 Has the company ever been convicted of an occupational health and safety offence? ☐ ☐

7. Health and Safety Plan for this specific contract

7.1 Does your company's health and safety plan contain the following elements? ☐ ☐

a) Description of contract
b) OHS structure for work undertaken under this contract
c) Induction and safety training
d) Safe work practices and procedures for specific work undertaken
e) Risk assessment for specific work undertaken
f) Workplace inspection schedule for duration of contract
g) OHS consultative processes to be followed
h) Emergency procedures for specific contract
i) Incident recording and investigation procedures
j) Health and safety performance monitoring arrangements to be implemented during contract

Signed: ……..

Name: ……

Position:……..

SCHEDULE J
CONTRACTORS' ESTIMATED MONTHLY EXPENDITURE

The tenderer shall state his estimated value of the work to be completed every month, based on his preliminary programme and his tendered unit rates, in the table below.

MONTH NO.		VALUE
1:	R	.....
2:	R	.....
3:	R	.....
4:	R	.....
5:	R	.....
6:	R	.....
7:	R	.....
8:	R	.....
9:	R	.....
10:	R	.....
11:	R	.....
12:	R	.....
13:	R	.....
14:	R	.....
15:	R	.....
16:	R	.....
17:	R	.....
18:	R	.....
		.....
TOTAL	R	

SIGNED ON BEHALF OF TENDERER:

SCHEDULE K: CONTRACTOR LABOUR CONTENT

The tenderer shall complete the table below to reflect the labour force anticipated to be employed on this contract, including labour employed by sub-contractors.

The specified minimum target value is 10% of Tendered Sum

TYPE OF LABOUR	MAN-HOURS	TOTAL WAGE COST (EXCL. VAT)
Permanent Labour		
Temporary Labour		
SMME/BEE's Labour		
	TOTAL	
	PERCENTAGE (%)	

Note to tenderer: Labour is defined as hourly paid personnel

SIGNED ON BEHALF OF THE TENDERER:

SBD1

PART A
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (*NAME OF DEPARTMENT/ PUBLIC ENTITY*)					
BID NUMBER:	**LNW 08/25/26**	CLOSING DATE:**30th January 2026**		CLOSING TIME:	**11h00**
DESCRIPTION	**REHABILITATION OF 560MM POTABLE WATER PIPELINE, VALVES, FITTINGS AND MANHOLES AT PHALABORWA WATER SUPPLY SCHEME**				
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT *(STREET ADDRESS)*					
LEPELLE NORTHERN WATER TENDER BOX					
01 LANDROS MARE STREET					
POLOKWANE					
0700					

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO		**TECHNICAL ENQUIRIES MAY BE DIRECTED TO:**	
CONTACT PERSON	**Mr Mmamokgadi Ramanna**	CONTACT PERSON	**Mr Shudu Ratshibvumo**
TELEPHONE NUMBER	**015 295 1800**	TELEPHONE NUMBER	**015 295 1800**
FACSIMILE NUMBER	**N/A**	FACSIMILE NUMBER	**N/A**
E-MAIL ADDRESS	**Mmamokgadir@lepelle.co.za**	E-MAIL ADDRESS	**Shudur@lepelle.co.za**

SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		**OR**	CENTRAL SUPPLIER DATABASE No:	MAAA
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX] ☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	[TICK APPLICABLE BOX] ☐ Yes ☐ No	

[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐Yes ☐No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO
DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?	☐ YES ☐ NO

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW.

PART B
TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:

1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.

1.2. **ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED–(NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.**

1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.

1.4. **THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).**

2. TAX COMPLIANCE REQUIREMENTS

2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.

2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.

2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.

2.5 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.

2.6 WHERE NO TCS PIN IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

2.7 NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER:

……

CAPACITY UNDER WHICH THIS BID IS SIGNED:

……

(Proof of authority must be submitted e.g. company resolution)

DATE:

……...

SBD 2

TAX CLEARANCE CERTIFICATE REQUIREMENTS

i. 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.

2. In order to meet this requirement bidders are required to complete in full the attached 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.

3. 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.

4. 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.

5. In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.

6. 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.

7. 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.

TAX CLEARANCE **TCC 001**

Application for a Tax Clearance Certificate

Purpose

Select the applicable option ..... Tenders ☐ Good standing ☐

If "Good standing", please state the purpose of this application

Particulars of applicant

Name/Legal name (Initials & Surname or registered name)	
Trading name (if applicable)	
ID/Passport no	Company/Close Corp. registered no
Income Tax ref no	PAYE ref no 7
VAT registration no 4	SDL ref no L
Customs code	UIF ref no U
Telephone no CODE - NUMBER	Fax no CODE - NUMBER
E-mail address	
Physical address	
Postal address	

Particulars of representative (Public Officer/Trustee/Partner)

Surname	
First names	
ID/Passport no	Income Tax ref no
Telephone no CODE - NUMBER	Fax no CODE - NUMBER
E-mail address	
Physical address	

Particulars of tender (If applicable)

Tender number

Estimated Tender amount R ,

Expected duration of the tender year(s)

Particulars of the 3 largest contracts previously awarded

Date started	Date finalised	Principal	Contact person	Telephone number	Amount

Audit

Are you currently aware of any Audit investigation against you/the company? YES NO

If "YES" provide details

Appointment of representative/agent (Power of Attorney)

I the undersigned confirm that I require a Tax Clearance Certificate in respect of Tenders or Goodstanding.

I hereby authorise and instruct to apply to and receive from SARS the applicable Tax Clearance Certificate on my/our behalf.

Signature of representative/agent Date C C Y Y — M M — D D

Name of representative/ agent

Declaration

I declare that the information furnished in this application as well as any supporting documents is true and correct in every respect.

Signature of applicant/Public Officer Date C C Y Y — M M — D D

Name of applicant/ Public Officer

Notes:

1. It is a serious offence to make a false declaration.
2. Section 75 of the Income Tax Act, 1962, states: Any person who
   (a) fails or neglects to furnish, file or submit any return or document as and when required by or under this Act; or
   (b) without just cause shown by him, refuses or neglects to-
      (i) furnish, produce or make available any information, documents or things;
      (ii) reply to or answer truly and fully, any questions put to him ...
      As and when required in terms of this Act ... shall be guilty of an offence ...
3. **SARS will, under no circumstances, issue a Tax Clearance Certificate unless this form is completed in full.**
4. Your Tax Clearance Certificate will only be issued on presentation of your South African Identity Document or Passport (Foreigners only) as applicable.

SBD 3.1

PRICING SCHEDULE – FIRM PRICES (PURCHASES)

NOTE: ONLY FIRM PRICES WILL BE ACCEPTED. NON-FIRM PRICES (INCLUDING PRICES SUBJECT TO RATES OF EXCHANGE VARIATIONS) WILL NOT BE CONSIDERED

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of bidder…… Bid number…….....

Closing Time 11:00 Closing date……...

OFFER TO BE VALID FOR…….DAYS FROM THE CLOSING DATE OF BID.

ITEM QUANTITY DESCRIPTION BID PRICE IN RSA CURRENCY NO** (ALL APPLICABLE TAXES INCLUDED)

- Required by: ……
- At: ……
- Brand and model ……
- Country of origin ……..……
- Does the offer comply with the specification(s)?

*YES/NO

- If not to specification, indicate deviation(s)

……

- Period required for delivery
  ……

*Delivery: Firm/not firm

- Delivery basis

  ……

Note: All delivery costs must be included in the bid price, for delivery at the prescribed destination.

** “all applicable taxes” includes value- added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.

*Delete if not applicable

PRICE ADJUSTMENTS

A NON-FIRM PRICES SUBJECT TO ESCALATION

In cases of contracts of 12 months period or more, non-firm prices will be adjusted (loaded) with the assessed contract price adjustments implicit in non firm prices when calculating the comparative prices.

In this contract, price escalations will only be considered in terms of the following formula:

$$P_a = (1 - x)(L\frac{L_t}{L_O} + P\frac{P_t}{P_O} + M\frac{M_t}{M_O} + F\frac{F_t}{F_O} - 1)$$

Where:

Pa = The new escalated price to be calculated.

L = Is the "Labour Index" and shall be the Consumer Price Index for the urban area nearest to the Site, and as published in the Statistical News Release, P0141, Additional Tables: Table 14 "CPI – all items according to area" of Statistics South Africa.

P = Is the "Plant Index" and shall be the Producer Price Index applicable to the appropriate Construction Equipment as published in the Statistical Release P0151, Table 4 of Statistics South Africa.

M **=** Is the "Materials Index" and shall be the Producer Price Index applicable to the appropriate materials as published in the Statistical Release P0151, Table 3 or Table 4 of Statistics South Africa.

F **=** Is the "Fuel Index" and shall be the Producer Price Index for Diesel at wholesale level for the area as published in the Statistical News Release P0151, Table 4 of Statistics South Africa.'

The values of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule with the following values:

The value of "x" is 0.15

The values of the coefficients are:

L = 0.15

P = 0.20

M = 0.55

F = 0.10

The base month shall be taken as 30 days **after** the closing date for tenders.

B PRICES SUBJECT TO RATE OF EXCHANGE VARIATIONS

Please furnish full particulars of your financial institution, state the currencies used in the conversion of the prices of the items to South African currency, which portion of the price is subject to rate of exchange variations and the amounts remitted abroad.

PARTICULARS OF FINANCIAL INSTITUTION	ITEM NO	PRICE	CURRENCY	RATE	PORTION OF PRICE SUBJECT TO ROE	AMOUNT IN FOREIGN CURRENCY REMITTED ABROAD
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		

Adjustments for rate of exchange variations during the contract period will be calculated by using the average monthly exchange rates as issued by your commercial bank for the periods indicated hereunder: (Proof from bank required)

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. BIDDER'S DECLARATION

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest1 in the enterprise, employed by the state? **YES/NO**

2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	**Identity Number**	**Name of State institution**

2.2 Do you, or any person connected with the bidder, have a relationship

1 the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:
……
……

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract? **YES/NO**

2.3.1 If so, furnish particulars:
……..
……..

3. DECLARATION

I, the undersigned, (name)… .....in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

3.1 I have read and I understand the contents of this disclosure;
3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
3.3 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 consortium2 will not be construed as collusive bidding.
3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
3.4 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.
3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring

2 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.

institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

3.6 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.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

…… ……
Signature Date

…… ……
Position Name of bidder

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

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

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

---

1. GENERAL CONDITIONS

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

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

1.2 To be completed by the organ of state

(*delete whichever is not applicable for this tender*).

d) The applicable preference point system for this tender is the 90/10 preference point system.

e) The applicable preference point system for this tender is the 80/20 preference point system.

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

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

(c) Price; and

(d) Specific Goals.

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS

PRICE	
SPECIFIC GOALS	
Total points for Price and SPECIFIC GOALS	**100**

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

1.6 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

2. DEFINITIONS

(f) **"tender"** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;

(g) **"price"** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;

(h) **"rand value"** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

(i) **"tender for income-generating contracts"** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and

(j) **"the Act"** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

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

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

80/20 **or** **90/10**

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

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

3.2.1. POINTS AWARDED FOR PRICE

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

80/20 **or** **90/10**

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:

4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—

(a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or

(b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,

then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

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

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

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

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
SMME (Small Medium Micro Enterprises)	2.5	5		
Black women (100% Black women ownership in the company)	2.5	5		
Black ownership (100% black ownership in the company)	2.5	5		
Black Youth (Minimum of 1 shareholder Black youth ownership in the company)	2.5	5		

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm……

4.4. Company registration number: ……...

4.5. TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

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

i) The information furnished is true and correct;

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;

iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –

(a) disqualify the person from the tendering process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and

(e) forward the matter for criminal prosecution, if deemed necessary.

.....
SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME: .....

DATE: .....

ADDRESS: .....

.....

.....

.....

PART C1

AGREEMENT AND CONTRACT DATA

C1 AGREEMENT AND CONTRACT DATA

C1.1 FORM OF OFFER AND ACCEPTANCE

OFFER

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

Project Name: TENDER NO: LNW 07/24/25 : REHABILITATION OF 560MM POTABLE WATER PIPELINE, VALVES, FITTINGS AND MANHOLES AT PHALABORWA WATER SUPPLY SCHEME

The tenderer, identified in the offer signature block, has examined the documents listed in the Tender Data and addenda thereto as listed in the returnable 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:

……

……..
Rands (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 the Conditions of Contract identified in the Contract Data.

Signature ……

Date ……

Name ……

Capacity ……

FOR THE TENDERER

(Name and address of organization) ……

Name and signature of witness ……

……

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

Part C5: Annexures

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 deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

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

Name ……..

Capacity ……..

FOR THE EMPLOYER

Name and signature of witness …….....

……

Date ……

Schedule of Deviations (To be filled in if there are any Deviations or Alternatives accepted)

1. Subject :_____

   Details :_____

   _____

   _____

2. Subject :_____

   Details :_____

   _____

   _____

3. Subject :_____

   Details :_____

   _____

   _____

4. Subject :_____

   Details :_____

   _____

   _____

5. Subject :_____

   Details :_____

   _____

   _____

By the duly authorised representatives signing this agreement, 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.

(To be signed only if there are any Deviations listed above)

Signature …….. Date ……

Name …….

Capacity …….

FOR THE TENDERER

(Name and address of organization) ……

Name and signature of witness ……

……

Date ……

Signature ……...

Date ……..……..

Name ...……..

Capacity ...……..

FOR THE EMPLOYER

Name and signature of witness …….

…….

Date …….

C1.2 CONTRACT DATA

The General Conditions of Contract for **Construction Works Third Edition (2015)** published by the South African Institution of Civil Engineering, is applicable to this contract. Copies of these General Conditions of Contract may be obtained from the South African Institution of Civil Engineering:

Copies of these General Conditions of Contract may be obtained from the South African Institution of Civil Engineering:

Block 19, Thornhill Office Park
Bekker Street, Vorna Valley,
Midrand.

Private Bag X200,
Halfway House. 1685

Tel: 011-805 5947
Fax: 011-805 5971

C1.2.1 CONTRACT SPECIFIC DATA.

The following contracts data are applicable to this contract:

REFERENCE TO:	CLAUSE.	DATA
Contractor.	1.1.1.9	Bidder
Defect liability Period	1.1.1.13	The defect liability period shall be 12 months.
Due Completion Date	1.1.1.14	The Works shall be completed within 18 calendar months as envisaged by the employer.
Employer.	1.1.1.15	Lepelle Northern Water
Employer's Agent	3.2.1	TBA
Sub-Contracting	4.4	No Works of value more than 25% of contract amount may be sublet to non-HDI Sub-contractor if contract has been obtained with HDI points. Except where the works are specialised upon approval by LNW.
Selection of subcontractors	4.4.1	Where applicable, the subcontracting will be done in line with the CIDB standard for Indirect Targeting Enterprise, The applicable works to be sub-contracted to the service providers of targeted areas/locals withing within the Ba-Phalaborwa Local Municipality where feasible. Targeted and Selected Sub-contractors are to comply with applicable regulations and must

REFERENCE TO:	CLAUSE.	DATA
		be approved by LNW. All subcontracting will be done by the Contractor in consultation with the Employer.
Contract Cessions	5.1	Contract Cessions will be approved by the Employer on this Project as per the National Treasury regulations. Approval on any cession must be granted by LNW before any works is ceded.
Commencement of Contract	5.2	This shall be the date the Employer's Agent issues an instruction to the Contractor to commence with the works, subject to clause 1.1.1.5 being satisfied.
Documentation Required Before Commencement with Works	5.3.1	The Works are to be commenced within twenty-one (21) days of the Commencement Date. The documentation required before commencement with Works execution are: 3. A signed Agreement between the Employer and the Contractor for the Works to be completed by the Contractor in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act (Act No.85 of 1993) and the Construction Regulations promulgated there under (Refer to Clause 4.3). 4. Health and Safety Plan and approved OHS file by the Department of Labor in terms of Construction Regulations 2014 (Clause 4.3) 5. Proof of payment to the Employer, that the Contractor has paid all contributions required in terms of the Compensation for Occupational Injuries and Diseases Act, No. 130 of 1993 (Refer to Clause 4.3). 6. Sub-contracting strategy where applicable including information pertaining to the targeted sub-contractors to be used (names, proven capabilities, project experience and scope of work to be sub-contracted) (clause 4.4.1) 7. Initial Program Clause 5.6 8. Security Clause 6.2 9. Insurance Clause 8.6 10. CVs and qualifications of key staff, and Contractor's project team organogram. Clause 8.6

REFERENCE TO:	CLAUSE.	DATA
Submission of documents required in clause 5.3.1	5.3.2	The time to submit the documentation required before commencement with the Works execution is 21 days except OHS related documents which must be submitted within 7 days.
Time for Completion	5.6.2.1	18 months from date of contract commencement, including Special Non-working days.
Special Non-working days	5.8.1	The special non-working days are public holidays
Penalty for delay	5.13.1	0.03% of the contract value per calendar day and part thereof.
Liability for Any Latent Defects	5.16.3	The latent defect period is 10 years.
Guarantee Sum	6.2.1/6.2.2	The form of security for this contract will be 10% of the contract value, this may be in a form of ; **a)** Performance Guarantee to the value of 10% of the Contract Value, this must either be issued by an insurance company duly registered in terms of the Insurance Act, 2017 or a bank duly registered in terms of the Banks Act, 1990 or **b)** Cash deposit paid to LNW amounting to 10% of the contract value or **c)** Payment reduction against payment certificates amounting to 10% of the value of each certificate or d) a combination of **a)** to **c)**
Contract Guarantee	6.2.3	The performance guarantee shall not have an expiry date. No cancellation shall be implemented without prior written consent by the LNW Chief Executive Officer.
Percentage Allowances	6.5.1.2.3	The percentage allowances shall be 10%.
Contract Price Adjustment	6.8.2	Contact Price Adjustment is applicable.
Special Materials	6.8.3	There are no special materials in this contract.
Materials on Site	6.10.1.5	The percentage limit on materials and plant not yet built into the Permanent Works is 70% of the value of the plant and materials. No upfront payment shall be permitted. Proof of payment and formal cession of the plant and material to LNW will be required.
Retention Money	6.10.3	The percentage retention is 10% in addition to the performance guarantee (Guarantee sum) on each payment certificate and in accordance with LNW requirements.

REFERENCE TO:	CLAUSE.	DATA
		Retention bonds from banks or insurance companies will not be acceptable.
Limit of Retention	6.10.3	The limit of retention money is 10% of the tender sum
Retention Money Guarantee	6.10.5	A Retention Money Guarantee may be required in lieu of retention money.
Variations exceeding 15 per cent	6.11	Delete “15 percent” in this and associated clauses and enter “20 per cent”.
Defects Liability Period	7.8.1	12 Months
Excepted Risks	8.3	The contractor must include in his/her insurance’s risks due to use or occupation by the Employer or Employees of the Employer or agents or other contractors of any part of the Works.
Limit of indemnity	8.4.2	claims unlimited
Insurances	8.6.1	The amount to be included in the sum insured to cover the value of: 100% of the contract value plus (+) 20%.
	8.6.1.1.2	Materials and equipment supplied by the Employer for incorporation into the works is R 0.00 excluding VAT, this material value shall be included when determining the contract sum insured plus 20%.
	8.6.1.3	The limit of the liability insurance required shall not be less than the contract amount. The number of claims during the construction and Defects Liability Period shall be unlimited.
	8.6.1.5	The following additional and varied insurances are required: • CAR & SASRIA should not be less than the contract amount including any variation orders. • The insurance shall be in the joint names of LNW and the bidder. No cancellation or expiry shall be permitted without written instruction by LNW CEO to the insurance company.
Dispute Resolution	10.5.1, 10.5.3	The number of Adjudication Board Members to be appointed: one. Adjudication, Arbitration, and the Court will be acceptable dispute resolution mechanisms

…….. ……..……

Signature Date

…….. ……

Position Name of bidder

C1.2.2 DATA PROVIDED BY THE CONTRACTOR

The Contractor is advised to read the General Conditions of Contract, as specified above, in order to understand the implications of this Data which is required to be completed.

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

REFERENCE TO:	**CLAUSE.**	**DATA**
Contractor.	1.1.1.9	The name of the Contractor is :……
Contractor's Address	1.2.1.2	The address of the Contractor is: Physical address: ……..... ……..... ……..... Postal address: ……..... ……..... ……..... e-mail address: …….....

REFERENCE TO:	CLAUSE.	DATA
		Contact numbers: Corporate: ..... Direct: ..... Mobile: ..... E-mail: .....

…….. ……..……

Signature Date

…….. ……

Position Name of bidder

Note:

i. Failure to complete and sign this section will not necessarily lead to disqualification of the bid, but submission of the bid document shall put into effect the contract data information.

ii. The contractor shall, in the performance of the contract, achieve the Contract Skills Development Goal (CSDG) and. the Contract Participation Goals (CPG) relating to the engagement of targeted enterprises as established in the CIDB's Building, Unity, Implementation, Leadership & Development (B.U.I.L.D) Standards.

C1.2.3 MINISTERIAL DETERMINATION SPECIAL PUBLIC WORKS PROGRAMMES

.

No. 35310

GOVERNMENT GAZETTE, 4 May 2012

DEPARTMENT OF LABOUR

No. R 347 **4 May 2012**

BASIC CONDITIONS OF EMPLOYMENT ACT, 1997,

MINISTERIAL DETERMINATION: EXPANDED PUBLIC WORKS PROGRAMMES

I, Nelisiwe Mildred Oliphant, Minister of Labour, hereby in terms of section 50 of the Basic Conditions of Employment Act, 1997, make a Ministerial Determination establishing conditions of employment for employees in Special Public Works Programmes, South Africa, in the Schedule hereto and determine the second Monday after the date of publication of this notice as the date from which the provisions of the said ministerial Determination shall become binding.

NM Oliphant
Minister of Labour

SCHEDULE

MINISTERIAL DETERMINATION No 3: EXPANDED PUBLIC WORKS PROGRAMMES

Index

1. Definitions

1.1 In this determination –

"expanded public works programme" means a programme to provide public or community assets tor services through a labour intensive programme initiated by government and funded from public resources.

1.2 Without limiting subsection (1), the following programmes constitute expanded public works programmes:

(a) Environment and Culture Sector Programmes including: Working for water, Working for Fire, Working for Wetlands, People and Parks, Working for Energy, Working for Woodlands, Working for Coast, Land care, Working for Waste, Working for Tourism, Investing in Culture Programmes.

(b) Infrastructure Sector Programmes and Projects declared as part of EPWP which may include the construction, rehabilitation and maintenance of: rural and low-volume roads, storm-water drains, water reticulation, basic sanitation, footpaths, sidewalks, bicycle paths, schools and clinics.

(c) Social Sector Programmes including Early Childhood Development, Home, Community Based Care, Community Safety and other community based projects.

(d) All projects and programmes accessing the EPWP wage incentive including those implemented by Non-governmental organisations (NGO) and Community Based Organisations (CBO) and Community Works Programme.

(e) Any other programme deemed to be part of the EPWP as determined by the Department of Public Works.

2. Application

This Determination applies to all employers and employees engaged in expanded public works programmes.

3. The following provisions of the Basic Conditions of Employment Act do not apply to public works programmes:

3.1	Section 10(2)	(Overtime rate)
3.2	Section 14(3) than	(Remuneration required for meal intervals of longer
		75 minutes)3.12 Section 29(h) to (p)
		(Written particulars of employment)
3.13	Section 30	(Display of employee's rights)
3.17	Section 37	(Notice of termination)
3.21	Section 41	(Severance pay)
3.23	Section 51 – 58	(Sectoral Determinations)

4. Conditions

As set out in the Annexure:

ANNEXURE

CONDITIONS OF EMPLOYMENT FOR SPECIAL PUBLIC WORKS PROGRAMMES

1. Introduction

1.1 This document contains the standard terms and conditions for workers employed in elementary occupations on an Expanded Public Works Programme (EPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of an EPWP.

In this document –

(a) "department" means any department of the State, implementing agent of contractor;
(b) "employer" means any department, implementing agency or contractor that hires workers to work in elementary occupations on a EPWP;
(c) "worker" means any person working in an elementary occupation on a EPWP;
(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 EPWP;
(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 EPWP are employed on a temporary basis.

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 for more than eight hour 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. Sick Leave

8.1 Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.

8.2 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.

8.3 A worker may accumulate a maximum of twelve days' sick leave in a year.

8.4 Accumulated sick-leave may not be transferred from one contract to another contract.

8.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.

8.6 An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.

8.7 An employer must pay a worker sick pay on the worker's usual payday.

8.8 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 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.

8.10 A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Disease Act.

9. Maternity Leave

9.1 A worker may take up to four consecutive months' unpaid maternity leave.

9.2 A worker is not entitled to any payment or employment-related benefits during maternity leave.

9.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.

9.4 A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of their child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.

9.5 A worker may begin maternity leave –

(a) four weeks before the expected date of birth;

(b) on an earlier date –

(i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of their 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.

9.6 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. Family responsibility leave

10.1 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 partner, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

11. Statement of Conditions

11.1 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 EPWP.

(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 EPWP.

An employer must ensure that these are explained in a suitable language to any employee who is unable to read the statement. An employer must supply each worker with a copy of these conditions of employment.

12. Keeping Records

12.1 Every employer must keep a written record of at least the following:

(a) the worker's name and position,

(b) Copy of an acceptable worker identification

(c) in the case of a task-rated worker, the number of tasks completed by the worker,

(d) in the case of a time-rated worker, the time worked by the worker,

(e) payments made to each worker.

The employer must keep this record for a period of at least three years after the completion of the EPWP.

Payment

13.

13.1 An employer must pay all wages at least monthly in cash or by cheque or into a back account.

13.2 A task-rated worker will only be paid for tasks that have been completed.

13.3 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

13.4 A time-rated worker will be paid at the end of each month.

13.5 Payment must be made in cash, by cheque of by direct deposit into a back account designated by the worker.

13.6 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.

13.7 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.

13.8 If the worker is paid in cash of by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.

13.9 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.

14. Deductions

14.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.

14.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

14.3 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

14.4 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.

15. Health and Safety

15.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

15.2 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 and health and safety instruction obey all health and safety rules of the EPWP

(c) Use any personal protective equipment or clothing issued by the employer.

(d) Report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

16. Compensation for Injuries and Diseases

16.1 It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on s EPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.

A worker must report any work-related injury or occupational disease to their employer or manager. The employer must report the accident or disease to the Compensation Commissioner.

An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

17. Termination

17.1 The employer may terminate the employment of a worker for good cause after the following a fair procedure.

17.2 A worker will not receive severance pay on termination.

17.3 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.

17.4 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.

17.5 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.

18. Certificate of Service

18.1 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 EPWP on which the worker worked;
(d) the work performed by the worker;
(e) any training received by the worker as part of the EPWP;
(f) the period for which the worker worked on the EPWP; and
(g) any other information agreed on by the employer and worker.

C1.3 BLASTING INDEMNITY

Contract No.

Given by

_____

*Company Registration No. _____

Address

_____

a *Company incorporated with limited liability according to the company laws of the Republic of South Africa, *Partnership, *Close Corporation, *Public Company (hereinafter called the Contractor), represented herein by _____ in his capacity as the Contractor's _____ duly authorised hereto by a resolution of the Contractor dated _____ a certified copy of which resolution is attached to this Indemnity.

WHEREAS the Contractor has entered into a Contract with the **LEPELLE NORTHERN WATER** (hereinafter called the Company) for,

_____

____

and the Company requires this Indemnity from the Contractor

NOW THEREFORE THIS DEED WITNESSETH that the Contractor does hereby indemnify and hold harmless the Company in respect of all loss or damage that may be incurred or sustained by the Company by reason of or in any way arising out of or caused by blasting operations that may be carried out by the Contractor in connection with the aforementioned Contract and also in respect of all claims that may be made against the Company in consequence of such blasting operations, by reason of or in any way arising out of any accidents or damage to persons, life or properly or any other cause whatsoever, and also in respect of all legal or other expenses that may be incurred by the Company in examining, resisting or settling any such claims; for the due performance of which the Contractor binds itself according to law.

THUS DONE AND SIGNED for and on behalf of the Contractor at _____ on the

_____ day of _____ 20____ in the presence of the subscribing

witnesses.

AS WITNESSES

1. _____ _____
SIGNATURE

2. _____ _____
DESIGNATION OF SIGNATORY

*Delete which does not apply

C1.4 HEALTH AND SAFETY CONTRACT: GENERAL INFORMATION

1. The Occupational Health and Safety Act comprises Sections 1 to 50 and all un-repealed regulations promulgated in terms of the former Machinery and Occupational Safety Act No 6 of 1983 as amended, as well as other regulations which may be promulgated in terms of the OHS Act.

2. 'Mandatory' is defined as including an agent, a contractor or a subcontractor for work, but without derogating from his status in his own right as an employer or user of plant and machinery.

3. Section 37 of the Occupational Health and Safety Act potentially punishes employers (principals) for the unlawful acts or omissions of mandataries (contractors) save where a written agreement between the parties has been concluded containing arrangements and procedures to ensure compliance with the said Aid by the mandatory.

4. All documents attached or referred to in the above agreement from an integral part of the agreement.

5. To perform in terms of this agreement mandataries must be familiar with the relevant provisions of the Act.

6. Mandataries who utilise the services of their own mandataries (subcontractors) are advised to conclude a similar written agreement.

7. Be advised that this agreement places the onus on the mandatory to contact the employer in the event of inability to perform as per this agreement. The employer, however, reserves the right to unilaterally take any steps as may be necessary to enforce this agreement.

8. The contractor shall be responsible for the full and proper implementation of the terms and provisions of the Act and its regulations in the area in which the work is to be undertaken by the contractor.

9. The contractor shall be responsible for the well-being, in relation to health and safety, of all persons coming upon or into such area in accordance with that legislation, including the implementation of any directives issued by management of Lepelle Northern Water in this respect.

v) The work to be done is _____

11. The area in which the work is to be conducted is _____

- The contractor shall familiarise himself with such area and all risks existing thereon and undertakes to report to the representative of Lepelle Northern Water any hazard or risk to health and safety which arises during the contract work in the area concerned and over which the contractor may have no control. All necessary and appropriate safety / health equipment shall be issued by the contractor to all persons working on or coming into the area.

C1.4.1 HEALTH AND SAFETY CONTRACT BETWEEN EMPLOYER AND CONTRACTOR IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT NO 85 OF 1993.

Written agreement between Lepelle Northern Water (hereinafter referred to as "the Employer) and _____ (hereinafter referred to as "the mandatory") as envisaged by Section 37(2) of the Occupational Health and Safety Act, No. 85, of 1993 as amended.

I _____ representing _____ (mandatory) do hereby acknowledge that _____ (mandatory) is an employer in its own right and shall be regarded as the employer for purposes of the contract work specified in the body of the principal agreement with duties as prescribed in the Occupational Health and Safety Act, No. 85 of 1993 as amended so as to ensure that all work will be performed or machinery and plant used in accordance with the provisions of the said Act. I furthermore agree to comply with the requirements of the Employer as contained in the Occupational Health and Safety Specification included with the principal agreement and to liaise with the employer should I, for whatever reason, be unable to perform in terms of this agreement.

Signed this _____ day of _____ at _____

Signature on behalf of mandatory _____

Signature on behalf of Employer _____

Compensation Fund Registration No. of mandatory _____

Good Standing Certificate : ☐ yes ☐ no (tick one box)

C1.4.2 OCCUPATIONAL HEALTH AND SAFETY INDEMNITY UNDERTAKING

I, the undersigned:

_____

in my capacity as:

_____

of the firm:

_____

1.0 hereby undertake to ensure that I/my firm and/or employees and/or subcontractors and/or his employees -

1.1 comply strictly with the provisions of the Occupational Health and Safety Act of 1993 (as amended) and/or the regulations promulgated in terms thereof, with specific reference to section 37(2) of the said act, as well as any relevant legislation, in the course of the performance/execution of any service and/or work in, to or on any Lepelle Northern Water buildings, construction sites and/or premises;

1.2 ensure that consultants and/or visitors comply with any instructions and measures relating to occupational health and safety, as prescribed by Lepelle Northern Water; and

1.3 comply strictly with the statutorily prescribed work systems, operational equipment, machinery and occupational health and safety conditions;

2.0 and as an independent employer and contractor, hereby indemnify, in terms of the above undertakings, Lepelle Northern Water -

2.1 in respect of any costs that I/my firm and/or employees and/or subcontractors and their employees may incur of necessity in compliance with the above undertakings; and

2.2 against any claims that may be instituted against Lepelle Northern Water and/or any liability that Lepelle Northern Water may incur, whether instituted and/or caused by me/my firm's employees, agents, consultants, subcontractors and/or their employees and visitors or Lepelle Northern Water clients or neighbours in respect of any incidents related to my/my firm's activities and as a result of which the occupational health and safety of the persons involved have been detrimentally affected; and

2.3 against similar claims that I, managers or directors of my firm may have against Lepelle Northern Water and any damages for which I, managers or directors of my firm hold Lepelle Northern Water liable.

3.0 My firm's compensation commissioner number is and I confirm that my firm and its subcontractors' fees have been paid up and obligations in respect of the compensation commissioner have been complied with and further that I shall furnish proof thereof in writing on request.

4.0 I hereby confirm that I have the authority to sign this indemnity undertaking and that Lepelle Northern Water is not obliged to confirm such confirmation.

Signed at_____ this_____day

Of _____ _____

_____ _____
Signature Capacity

As witnesses:

1 _____ _____
Name Signature

2 _____ _____
Name Signature

C1.5 INCLEMENT WEATHER

No extension of time for completion will be granted on account of normal inclement weather but extension of time shall be determined for abnormal rainfall or wet conditions. The extension request must be in accordance with the formula given below, separately for each calendar month or part thereof. It shall be calculated for the period from the Commencement Date to the Due Completion Date or the date of issue of the Certificate of Practical Completion, whichever is earlier, and excluding the Contractor's year-end recess.

$$V = (N_w - N_n) + (R_w - R_n) / X$$

The symbols shall have the following meanings:

V = Extension of time in calendar days in respect of the calendar month under consideration.

Nw = Actual number of days during the relevant calendar month on which Y mm or more of rainfall has been recorded.

Nn = Average number of days in the relevant calendar month on which Y mm or more of rainfall has been recorded, as derived from the rainfall records provided in the Project Specification.

Rw = Actual rainfall in mm for the calendar month under consideration.

Rn = Average rainfall in mm for the relevant calendar month, as derived from the rainfall records provided in the Project Specifications.

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

For this Contract, X and Y shall have the following values:

X = 20 mm/d Y = 10 mm

Extensions of time for part of a month shall be calculated using pro rata values of Nn and Rn.

The total extension of time shall be the algebraic sum of the monthly totals for the period under consideration, but if the grand total is negative the time for completion shall not be reduced due to abnormal rainfall.

The factor (Nw - Nn) shall be considered to represent a fair allowance for variations from the average number of days during which rainfall exceeds Y mm.

The factor (Rw - Rn)/X shall be considered to represent a fair allowance for variations from the average in the number of days during which rainfall does not exceed Y mm but wet conditions prevented or disrupted work.

The formula does not take account of flood damage, which could cause further or concurrent delays, which shall be treated separately as far as extension of time is concerned.

The figures for Nn and Rn given below are the most suitable figures available and shall be used unless other are agreed at the commencement of the Contract.

The rainfall records from the nearest weather station from the South African Weather Services for the period 1991 to the most recent year available will be obtained, and the monthly averages (N_n and R_n) for this period will be taken as the normal rainfall for the purposes of this Contract.

PART C2

PRICING DATA

C2 PRICING DATA

C2.1 PRICING INSTRUCTIONS

1. Measurement and payment shall be in accordance with the relevant provisions of the SANS Standard Specification, The General Conditions of Contract, the Contract Data, the Scope of Work (including the Specifications), the Site Information and the Drawings are to be read in conjunction with the Bill of Quantities

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

mm	=	millimetre	h	=	hour
m	=	metre	kg	=	kilogram
km	=	kilometre	t.	=	ton (1 000 kg)
m²	=	square metre	No.	=	number
m².pass	=	square metre pass	sum.	=	lump sum
ha	=	hectare	MN.	=	meganewton
m³	=	cubic metre	MN.m.	=	meganewton-metre
m³-km	=	cubic metre-kilometre	PC sum	=	Prime Cost Sum
l	=	litre	Prov sum	=	Provisional sum
kl	=	kilolitre	%.	=	per cent
MPa	=	megapascal	kW	=	kilowatt

3. For the purpose of the 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 SANS Standard Specification, The General Conditions of Contract, the Contract Data, the Scope of Work (including the 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 product of the quantity and the rate tendered for an item.

   Lump 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.

4. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.

5. The quantities certified for payment, and not the quantities given in the Bill of Quantities, shall be used for determining payments to the Contractor. The Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.
6. The prices and rates to be inserted in the Bill of Quantities are to be full inclusive prices for the work described under the several items. Such prices and rates shall cover all costs and expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based, as well as overhead charges and profit. Reasonable prices shall be inserted as these will be used as a basis for assessment of payment for additional work that may have to be carried out.

7. A price or rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no price is entered or where a word or phrase such as “included” or “provided elsewhere” will be accepted as a rate of nil (R0,00) having been entered against such items and covered by the other prices or rates in the schedule.
8. Any work executed to which such a pay item applies, shall be measured under the appropriate items in the Bill of Quantities and valued at a rate of nil (R0,00). The rate of nil shall be valid irrespective of any change in the quantities during the execution of the Contract.
9. The Tenderer shall fill in a rate against all items where the words “rate only” appears in the amount column. The intention is that, although no work is foreseen under such item and no quantities are consequently given in the quantity column, the tendered rate shall apply should work under this item be actually required.

10. Except where rates only are required, the Tenderer shall insert all amounts to be included in his total tendered price in the “Amount” column and show the corresponding total tendered price

11. The Tenderer shall not group together a number of items and tender one rate for such group of items

12. The Tenderer shall not group together a number of items and tender one rate for such group of items.
13. All rates and sums of money quoted in the Bill of Quantities shall be in rands and whole cents. Fractions of a cent shall be discarded.

14. All prices and rates entered in the Bill of Quantities must be **excluding Value Added Tax (VAT)**. VAT will be added last on the summary page of the Bill of Quantities.
15. Should excessively high unit prices be tendered, such prices may be of sufficient importance to warrant rejection of a tender by the Employer.
16. Where the Contractor is required to furnish detailed drawings and designs or other information in terms of the Contract Documents, all costs thereof shall be deemed to have been provided for and included in the unit rates and sum amounts tendered for the items scheduled in the Bill of Quantities, and separate additional payments will not be made.
17. If there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the unit rate shall be corrected. Where there is an obvious gross misplacement of the decimal point in the unit rate, the unit rate as quoted shall govern, and the line item total shall be corrected.
18. The quantities set out in the Bill of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Bill of Quantities.
19. The method of measurement published by:
    - "South African Bureau of Standards: Standardized Specifications for Civil Engineering Construction", (SANS 1200); and/or
    - "South African Bureau of Standards: South African National Standard Set: Construction Works", (SANS 2001); and/or
    - COLTO Standard Specifications for Road and Bridge Works for State Road Authorities (1998 edition); and/or
    - any other project specific specification bound into this document, subject to the variations and amendments contained in section C3.5 shall be applicable to this contract.
20. Payments for items which are designated to be constructed labour-intensively (LI items) 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.

In the event that the LI items are not adding to the targeted Contractors Participation Goal (CPG) the onus is with the Contractor construct other activities labour intensively to reach the targeted CPG goal.

21. The Employer shall determine the amount to be paid for the Contract Participation Goal (CPG) on the contract and this amount shall be stated under the section Enterprise Development as 5% of the overall works in the Final tendersummary section.
22. The works identified for CPG which has been priced in the main BOQ shall be omitted as savings to the employer, and the allowance for CPG shall be utilised for such works.
23. The contractor shall determine the CSDG, expressed in Rand, which shall not be less than the sub-total multiplied by a percentage (%) factor given in **Table 2 of the Standard for the applicable class of construction works.** The percentage (%) factor has been included in the Final Tender Summary section.
24. For all the provisional sums on the BOQ, the Employer's Agent shall have a right to instruct the contractor to obtain at least three (3) quotations from service providers that are independent from the Contractor.

C2.2 BILL OF QUANTITIES

(Please see attached BOQ on the next page)

SUMMARY			
SECTION	**DESCRIPTION**	**AMOUNT**	
SECTION 1	**PRELIMINARY AND GENERAL**		
SECTION 2	**REPAIRS TO 560MM RISING MAIN**		
	SECTION 2A: EARTHWORKS (PIPE TRENCHES) - SANS 1200DB	R	-
	SECTION 2B: MEDIUM PRESSURE PIPELINES - SANS 1200L	R	-
SECTION 3	**VALVE CHAMBERS**	R	-
[a] SUB-TOTAL 1 (SECTION 1+2+3)		**R**	**-**
[b] COMPLIANCE WITH CIDB B.U.I.I.D STANDARDS			
	Allow Amount Contract Participation Goals (CPG) @ 5% of the Contract Amount [5% x (a)] =	R	-
	Allow Amount Contract Skills Development Goals (CSDG) @ 0.25% of the Contract Amount [0.25% x (a)] =	R	-
[c] SUB-TOTAL 2 (SUB-TOTAL 1 + CPG + CSDG)		**R**	**-**
[d] CONTRACT PRICE ADJUSTMENT (CPA) (5% of [c])		R	-
[c] CONTINGENCIES (5% of [e])		R	-
[f] SUB-TOTAL 3 (c] + [d] + [e])		**R**	**-**
[g] VAT (15% of [f])		R	-
TOTAL CARRIED TO FORM OF OFFER AND ACCEPTANCE ([f] + [g])		**R**	**-**

SECTION 1: PRELIMINARY & GENERAL -SANS 1200A / 1200AB						
ITEM No	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SANS1200					
1.1	**PSA 8.3**	**Scheduled Fixed-Time Charge & Value Related Items**				
1.1.1	PSA 8.3.1	Fixed Preliminary and Genaral charges	Sum	1,00		
	SANS 1200AB					
1.1.2	PSAB	Establishing Facilities for Engineer	Sum	1,00		
	SANS 1200A					
	8.3.2.2	**Facilities for Contractor**				
1.1.3	8.3.2.1 c)	Nameboards	Sum	1,00		
1.1.4	a)	Offices and Storage Sheds	Sum	1,00		
1.1.5	b)	Workshops	Sum	1,00		
1.1.6	c)	Laboratories	Sum	1,00		
1.1.7	d)	Living Accomodation	Sum	1,00		
1.1.8	e)	Ablution and latrine facilities	Sum	1,00		
1.1.9	f)	Tools and Equipment	Sum	1,00		
1.1.10	PSA 8.3.2	Plant (All required plant for the duration of the project)	Sum	1,00		
1.1.11	8.3.3	Other Fixed charge Obligations	Sum	1,00		
1.1.12	8.3.4	Removal of Site Establishment	Sum	1,00		
	SANS 1200A					
1.2	**PSA 8.4**	**Scheduled Time Related Items**				
1.2.1	PSA 8.4.1	Time Related Preliminary and General charges	Sum	1,00		
1.2.2	8.4.2.1	Facilities for Engineer	Sum	1,00		
1.2.3	8.4.2.2	**Facilities for Contractor**				
1.2.4	a)	Offices and Storage Sheds	Sum	1,00		
1.2.5	b)	Workshops	Sum	1,00		
1.2.6	c)	Laboratories	Sum	1,00		
1.2.7	d)	Living Accommodation	Sum	1,00		
1.2.8	e)	Ablution & Latrines	Sum	1,00		
1.2.9	f)	Tools and Equipment	Sum	1,00		
1.2.10	g)	Water Suppliers, Electricity and Communications	Sum	1,00		
1.2.11	h)	Dealing With Water	Sum	1,00		
1.2.12	8.4.3	Supervision for Project Duration	Sum	1,00		
1.2.13	8.4.4	Company Costs & Overheads	Sum	1,00		
1.2.14	8.4.5	Other Time Related Obligations	Sum	1,00		
1.2.7	PSA 8.4.5.1	Supervision and Training of Nominated Sub-contractors	Sum	1,00		
1.2.8	PSA 8.4.5.2	Salary for Labour Desk office and Community Liaison officer	Sum	1,00		
1.2.9	PSA 8.4.5.3	Artisans and Skills accredited Training	Sum	1,00		
1.2.10	PSA 8.9	Full compliance wih the environmental management plan (EMP)	Sum	1,00		
1.2.11	PSA 8.8	Full Compliance with all Health and Safety regulations and specifications	Sum	1,00		
1.3	**PSA 8.5**	**Sums Stated Provisionally by Engineer**				
1.3.1	PSA 8.5.1	Cellular communications and data bundles	Prov Sum	1,00	R 24 000,00	R 24 000,00
1.3.2	PSA 8.5.1	Supply of computer, printer and associated equipment to become property of the Engineer at the end of the Contract	Prov Sum	1,00	R 45 000,00	R 45 000,00
1.3.3	PSA 8.6 (a)	Relocation of Existing Services (inclusive all Discussions, Liaison, Labour and Material)	Prov Sum	1,00	R 150 000,00	R 150 000,00
1.3.6	PSA 8.6 (b)	Percentage (%) mark-up on item 1.3.1 to 1.3.3 above for Contractor's overheads, administration charges and profit	%		R 219 000,00	R -
1.4	**PSA 8.6**	**Prime Cost Sums**				
1.4.1	PSA 8.6 (a)	Community Liaison Officers (CLO)	PC Sum	1,00	R 360 000,00	R 360 000,00
1.4.2	PSA 8.6 (a)	Construction Specialist Services (On instruction by LNW)	PC Sum	1,00	R 1 000 000,00	R 1 000 000,00
1.4.3	PSA 8.6 (b)	Percentage (%) mark-up on item 1.4.1 to 1.4.2 above for Contractor's overheads, administration charges and profit	%		R 1 360 000,00	R -
1.5		**Allowance for Contractor's Designs & Construction Drawings**				
1.5.1		Contractor to allow for Contractor's Designs and Construction Drawings inc Shop Drawings for the entire project, c/w sign off by a registered professional with a valid Professional Indemnity.	Sum	1,00		R -
Carried Forward						

Brought Forward						**R -**
1.6	PSA 8.7	(a) Day Works Using The Contractor's Labour force				
1.6.1		1. Labourer	hour	200,00		R -
1.6.2		2. Driver	hour	200,00		R -
1.6.3		3. Operator	hour	200,00		R -
1.6.4		4. Artisan	hour	200,00		R -
1.6.5		5. Welder	hour	200,00		R -
1.6.6		6. Foreman	hour	200,00		R -
1.6.7		7. Security Guard	day	200,00		R -
1.6.8		Medicals entry & Exit	SUM	1,00		R -
1.6.9		PPE	SUM	1,00		R -
1.6.10		Training	SUM	1,00		R -
1.7	PSA 8.7	(b) Day Works Using Contractor's Plant				R -
1.7.1		1. Ldv (1 ton)	hour	200,00		R -
1.7.2		2. Flat Truck (3 to 5 ton)	hour	50,00		R -
1.7.3		3. Tip Truck (10m3)	hour	50,00		R -
1.7.4		4. Backhoe	hour	50,00		R -
1.7.5		4. Backhoe	hour	50,00		R -
1.7.6		5. Trench Vibrating Roller	hour	50,00		R -
1.7.7		7. Air compressor, including all tools (Drills, Jackhammers, etc)	hour	50,00		R -
1.7.8		8. Pump, including all Necessary Hosing and Pipes	hour	200,00		R -
1.7.9		9. Concrete Mixer	hour	20,00		R -
1.7.10		10. Water Truck (10 000 L)	hour	50,00		R -
1.7.11		11. Welding Machine	hour	200,00		R -
1.7.12		12. Flood Lights	hour	200,00		R -
1.7.13		13. Staff Bus	hour	200,00		R -
Total Section 1 Carried to Summary						

SECTION 2: WORKS TO 560MM PIPELINE						
SECTION 2A: EARTHWORKS (PIPE TRENCHES) - SANS 1200DB						
ITEM No	**PAYMENT REF**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
A1	**8.3.1**	**Site Clearance**				
A1.1	8.3.1 (a)	Clear Vegetation and Trees of Girth Up to 1m (4m Wide Strip)	m	9 520,00		R -
A1.2	8.3.1 (b)	Clear Trees of Girth Over 1,0 m and Designated Obstacles	No	9,00		R -
A1.3	PSDB. 8.3.1 (c)	Remove topsoil (strip to 150 mm Deep x 1.5m wide), Stockpile, Prevent Dust Nuisance and Reinstate on Upon Completion	m^2	7 000,00		R -
A2	**8.3.2**	**Excavation**				R -
	8.3.2 (a)	Excavate in all Materials for Trenches, Backfill, Compact and Dispose of Surplus Material with Depth Over and Up to:				R -
A2.1		1.0 m 2.0 m	m^3	12 000,00		R -
A2.2		2.0 m 3.0 m	m^3	4 000,00		R -
	PSDB. 8.3.2	Extra-over Item (a) above for:				R -
A2.6	8.3.2 (b) (2)	Hard Rock Excavation	m^3	100,00		R -
A2.7	PSDB. 8.3.2	Excavate and Dispose of Boulders Class A	m^3	50,00		R -
A2.8	8.3.2 (c)	Excavate and Dispose of Unsuitable Material From Trench Bottom (provisional)	m^3	100,00		R -
A3	**8.3.3**	**Excavation ancillaries**				R -
	8.3.3.1	Make Up Deficiency in Backfill Material (provisional)				R -
A3.1	a)	From Other Necessary Excavations On Site	m^3	500,00		R -
	8.3.3.3.	Compaction in Road Reserves				
A3.2		Under roadways to 93% MOD AASHTO	m^3	100,00		R -
A4	**8.3.5**	**Existing Services that intersect or adjoin Pipe Trench**				R -
A4.1	8.3.5 (a)	Services That intersect a Trench				R -
A4.1.1		1) Stock Fences	No	5,00		R -
A4.1.2		2) Storm Water Pipes	No	1,00		R -
A4.1.3		3) Water Pipes	No	2,00		R -
A4.1.4		4) Overhead Electrical Lines	No	3,00		R -
A4.1.5		5) Overhead Telephone Lines	No	2,00		R -
A4.1.6		6) Gravel Roads	No	5,00		R -
A4.2	8.3.5 (b)	Services That adjoin a Trench				R -
A4.2.1		1) Stock Fence	m	1 000,00		R -
A4.2.2		2) Water / Storm Water Pipes	m	9 500,00		R -
A4.2.3		3) Overhead Electrical Lines	m	1 000,00		R -
A4.2.4		4) Overhead Telephone Lines	m	30,00		R -
A5	**8.3.6**	**Finishing**				R -
A5.1	8.3.6.1	Reinstate Road Surfaces Complete				R -
A5.1.1	8.3.6.1 (a)	Gravel Road Surfaces	m^2	100,00		R -
A5.1.2	8.3.6.1 (b)	Tarred Road Surfaces (30mm thick)	m^2	20,00		R -
A6	**PSDB 8.3.7**	**Accommodation of traffic including bypass and signage**	Sum	1,00		R -
SECTION 2A CARRIED TO SUMMARY : EARTHWORKS (PIPE TRENCHES) - SANS 1200DB						**R -**

SECTION 2B: PIPELINES - SANS 1200L						
B1		**Pipeline Section Replacement**				
B1.1	**8.2.1**	**Steel Pipes**				
B1.1.1		Supply, Lay, Bed, Join and Test 560 ND / 6 mm Wall Thickness Grade X42 Steel Pipes, Pipes are to be continously Welded with Coating and Lining as per **PSCL** Specifications	m	2 000,00		R -
B1.2	**8.2.2**	**Steel Bends**				R -
B1.2.1		Extra-Over for Item B1.1.1 to Supply, Lay, Join, Test and Bed 560 mm ND / 6 mm Wall Thickness Grade X42 Steel Bends with Lining and Coating as per specifications.				R -
B1.2.1.1		0º - 5º	No	8,00		R -
B1.2.1.2		5º - 15º	No	5,00		R -
B1.2.1.3		15º - 45º	No	5,00		R -
B1.2.1.4		45º - 60º	No	5,00		R -
B1.2.1.5		60º - 90º	No	5,00		R -
B2		**Pipeline Repairs**				
B2.1		**Pipe Pieces**				
B2.1.1		Supply, Lay, Join, Test and Bed 560 mm ND / 6 mm Wall Thickness Grade X42 straight Steel pipe piece, 750mm long, c/w stacker rings welded either end (Stackers = 584mm O/D x 10mm thisck x 50mm wide) both ends suitable for welding to replace the couplings with Lining and Coating as per PSCL specifications. Pipe pieces to be specially manufactured to specifed size before delivery to site, ordering a longer section and cutting on site will not be accepted.				
B2.1.1.1		750mm Long, Pipe Pieces (560mm ND), with factory welded stacker rings, 10mm thick x 50mm Wide	No	1 100,00		
B2.1.1.2		Stacker Rings, 584 O/D x 6mm thick x 100mm wide (to be weld on existing pipe on site)	No	2 200,00		
B2.1.1.3		Site Weld Sleeves\collar, 598mm O/D x 6mm Thick x 100mm wide	No	2 200,00		
B3		Cut-in and Connect to Existing Water infrastructure within Stipulated Time Frame including all Pipework as Specified. Inclusive for both Start and End points.	Sum	1,00		
B4		Radiographic Examination and Testing of Pipe Welded Joints	No	250,00		
B5		Provide Pipeline Markers along The Pipeline Route	No	10,00		
SECTION 2B CARRIED TO SUMMARY : PIPELINES - SANS 1200L						R -

SECTION 3: VALVE CHAMBERS							
B4		**VALVE CHAMBERS**					
B4.1		**Demolition of Existing Chambers**					
B4.1.1		Demolish Air Valve Chambers Servicing 560mm Pipeline, incl safe disposal of rubble	No	15,00		R	-
B4.1.2		Demolish Air Isolation Valve & Non Return Valve Chambers Servicing 560mm Pipeline, incl safe disposal of rubble	No	4,00		R	-
B4.2		**New Air Valve Chambers**					
B4.2.1		Air Valve Chamber - **PN25**, Complete as Shown on TYPICAL DRAWING , Construction shop drawing to be finalised by Contractor. Construct Chambers around the pipe, Complete including Excavation, Reinforcement and Concrete Work, Supply Material and install Air Vents, access Ladders, relevant typical drawings attached as a guide, for The Following: **Chamber depth = Fixed at 2m**	No	17,00		R	-
B4.2.2		Extra Over B.4.2.1 for Pipe Specials as Per Typical drawing LNW 08/25/26 -AVC-01, final drawing to be finalised with Contractor,for Supply and installation of Air Valve Chamber pipeworks and specials					
B4.2.2.1	PSPM	**AV 1:** 560mm X 350mm Unequal Tee, **PN25**	No	17,00		R	-
B4.2.2.2	PSPM	**AV 2: 350**mm Blank Flange with 150mm drilled opening with a 150mm Flanged Pipe Section,**PN25**	No	17,00		R	-
B4.2.2.3	PSVA	**AV 3:** 150mm RSV Gate Valve,**PN25**	No	17,00		R	-
B4.2.2.4	PSVA	**AV 4:** 150mm Air Valve, **PN25**	No	17,00		R	-
B4.2.2.5	PSPM	**AV 4: 560**mm Flanged Pipe Section, 1500mm Long, **PN25**	No	17,00		R	-
B4.2.2.6	PSPM	**AV 5**: 560mm Straight pipe, both ends suitable for welding, with Paddle Flange, **PN25**	No	34,00		R	-
B4.3		**Scour Valve Chambers**					
B4.3.1		Scour Valve Chamber for **PN25**, Construct Chambers Complete including Excavation, Reinforcement and Concrete Work, Supply Material and install Air Vents, access Ladders, for The Following: **Chamber depth = 3m**	No	3,00		R	-
B4.3.2		Extra Over B4.3.1 for Pipe Specials for The Scour Valve Chamber					
B4.3.2.1	PSPM	**CSV 1:** 560mm X 350mm Unequal Tee, **PN25**	No	3,00		R	-
B4.3.2.2	PSPM	**CSV 2:** 350mm NB Straight Section, both ends flanged with Paddle flange, **PN25**	No	3,00		R	-
B4.3.2.3	PSVA	**CSV 3:** 350mm Wedge Gate Valve, **PN25**	No	3,00		R	-
B4.3.2.4	PSVA	**CSV 4:** 350mm Dismantling Coupling, **PN25**	No	3,00		R	-
B4.3.2.5	PSPM	**CSV 5:** 350mm Straight Pipe paddle Flange, both ends flanged, **PN25**	No	3,00		R	-
B4.3.2.6	PSPM	CSV 6: 560mm ND Existing Straight pipe Section	No	1,00		R	-
B4.4		**Isolation Valve Chambers**					
B4.4.1		Isolation Valve Chamber for **PN25**, Construct Chambers Complete including Excavation, Reinforcement and Concrete Work, Supply Material and install Air Vents, access Ladders, for The Following: **Chamber depth = 3.3m**	No	3,00		R	-
B4.4.2		Extra Over B4.4.1 for Pipe Specials as Per Drawing 'LNW 08/25/26-IVC-03 for The Isolation Valve Chamber Supply and install the following					
B4.4.2.1	PSPM	IV 1: 560mm ND Straight Section, flanged one end, and weld on the other with Paddle flange, **PN25**	No	6,00		R	-
B4.4.2.2	PSPM	IV 2: 560mm X 560mm x 100mm Unequal Tee, All ends Flanged, **PN25**	No	6,00		R	-
B4.4.2.3	PSVA	IV 3: 550mm Butterfly Isolation Valve, **PN25**	No	3,00		R	-
B4.4.2.4	PSVA	IV 4: 560mm Dismantling Joint, **PN25**	No	3,00		R	-
B4.4.2.5	PSPM	**IV 5:** 100mm Medium Radius Bend, **PN25**	No	6,00		R	-
B4.4.2.6	PSVA	**IV 6:** 100mm Wedge Gate Valve, **PN25**	No	3,00		R	-
B4.4.2.7	PSVA	**IV 7:** 100mm Dismantling Joint, **PN25**	No	3,00		R	-
B4.4.2.8	PSPM	**IV 8:** 100mm ND Straight Pipe Section, **PN25**	No	3,00		R	-
B4.5		**Non Return Valve Chamber**					
B4.5.1		Non Return Valve Chamber for **PN25**, Construct Chambers Complete including Excavation, Reinforcement and Concrete Work, Supply Material and install Air Vents, access Ladders, for The Following: **Chamber depth = 3.3m**	No	1,00		R	-
B4.5.2		Extra Over B4.5.1 for Pipe Specials Non Return Valve Chamber Supply and install the following					
B4.5.2.1	PSPM	560mm ND Straight Section, flanged one end, and weld on the other with paddle flange	No	2,00		R	-
B4.5.2.2	PSVA	560mm Nozzle Type Non Return Valve	No	1,00		R	-
B4.5.2.3	PSVA	560mm Dismantling Joint	No	1,00		R	-
B4.6		**Other Valve Chambers**					
B4.6.1		Relocation of PMC Juction (Junction 42) with all its valves and fittings to a new location, away from the wetland, including connections of all pipelines	Prov Sum	1,00	R 6 000 000,00	R	1 000 000,00
B4.6.2		New Pre-cast ring manhole for the Airvalve near the Phalaborwa WTP Guard House	Prov Sum	1,00	R 350 000,00	R	1 000 000,00
B4.6.3		Allow for overheads, charges and profits on item B4.6.1 to B4.6.2 above	%				
Carried Forward							

Brought Forward						
B4.7		**Refurbishment of Existing Valve Chambers (Those not being demolished)**				
B4.7.1		Refurbishment of existing valves at Phalaborwa 560 Pipelineincluding the required modification of the pipe fittings	Prov Sum	1,00	R 1 000 000,00	R 1 000 000,00
		Allow for overheads, charges and profits on item B4.7.1 above	%			
B4.8		**Anchor, Thrust Blocks, Plinths and Pedestals**				
B4.8.1		Concrete Grade 15/19	m^3	30,00		R -
B4.8.2		Formwork (rough Vertical)	m^2	120,00		R -
B4.8.3		Steel Mesh Ref No 100	m^2	100,00		R -
B4.9		**General**				
B4.9.1		Provide Pipeline Markers along The Pipeline Route	No	50,00		R -
B4.9.2		Radiographic Examination and Testing of Pipe Welded Joints	No	200,00		R -
Total Section 3 Carried to Summary						

C2.3 SUMMARY OF BILL OF QUANTITIES

SUMMARY		
SECTION	**DESCRIPTION**	**AMOUNT**
SECTION 1	**PRELIMINARY AND GENERAL**	R
SECTION 2	**REPAIRS TO 560MM RISING MAIN**	
	SECTION 2A: EARTHWORKS (PIPE TRENCHES) - SANS 1200DB	R
	SECTION 2B: MEDIUM PRESSURE PIPELINES - SANS 1200L	R
SECTION 3	**VALVE CHAMBERS**	R
[a] SUB-TOTAL 1 (SECTION 1+2+3)		**R**
[b] COMPLIANCE WITH CIDB B.U.I.I.D STANDARDS		
	Allow Amount Contract Participation Goals (CPG) @ 5% of the Contract Amount [5% x (a)] =	R
	Allow Amount Contract Skills Development Goals (CSDG) @ 0.25% of the Contract Amount [0.25% x (a)] =	R
[c] SUB-TOTAL 2 (SUB-TOTAL 1 + CPG + CSDG)		**R**
[d] CONTRACT PRICE ADJUSTMENT (CPA) (5% of [c])		R
[c] CONTINGENCIES (5% of [e])		R
[f] SUB-TOTAL 3 (c] + [d] + [e])		**R**
[g] VAT (15% of [f])		R
TOTAL CARRIED TO FORM OF OFFER AND ACCEPTANCE ([f] + [g])		**R**

PART C3

SCOPE OF WORK

C3 SCOPE OF WORK

C3.1 DESCRIPTION OF WORKS

Phalaborwa Water Supply Scheme – Rehabilitation of 560mm Potable Water Pipeline, Valves, Fittings and Manholes complete with the associated equipment and ancillaries. It is essential to note that the works comprises of several disciplines in the built environment namely; civil, structural, and mechanical engineering.

C3.1.1 LOCATION OF WORKS

Location of Site:

The Phalaborwa Scheme is in the Ba-Phalaborwa Local Municipality in the Limpopo Province. The treatment works is located just outside Phalaborwa town, and it is situated at coordinates 24°03'57.6"S 31°08'28.2"E (-24.066007; 31.141166) in Phalaborwa behind the mines and by the banks of the Olifants River.

C3.1.2 OVERVIEW OF THE WORKS

The Phalaborwa Water Treatment Works (WTW) is located in the Ba-Phalaborwa Local Municipality within Mopani District Municipality (MDM) in Limpopo Province. The Phalaborwa WTW has a daily design output of 148 Ml/d.

The Water Supply Scheme provides portable water through various pipelines. One of the pipelines which is a 560mm line has been taken out of operation due to the frequent bursts that are occurring along the pipeline, due to the condition of this 560mm pipeline, the scheme is operating without any potable redundancy, failure to the currently operating piping system will lead to longer downtimes.

The condition assessments to determine the possible causes of the bursts as well as the structural integrity of the line was done (reports attached as Annexure C), this condition assessment report has informed the scope of works for the repairs to the pipeline as well as the specifications as outlined on this document.

a) Pipeline Assessment Report Summary

The condition assessment of this pipeline was conducted through a separate project which was completed in March 2024, the activities which formed part of this assessment includes CCTV, Leak Detection and Metal Loss as well as Coating defect, Soil resistivity, Stray current

analysis, corrosion assessment on valve chambers, Pipe to soil potential and visual assessment of CP structure.

The purpose of this assessment was to identify in detail the cause of the frequent bursts in order to provide a suitable solution.

From the assessment report, it was concluded that ;

- Corrosion effects discovered from the CCTV survey, the pipe joints experiences sever pitting corrosion, mainly due to poor welding and lining.
- Phase array on the pipeline joints shows a loss in wall thickness.
- Visual assessment on the external joints shows that the coating have been completely depleted, The joints are visibly showing significant galvanic corrosion, accelerated by corrosive soils and AC corrosion induction by high voltage Eskom overhead lines.
- Corrosion more likely to happen on the joints and historical data has proven that more water leaks are found on the joints and valve chambers.

It was therefore recommended as follows.

- ECDA be done and design the Cathodic protection & AC mitigation (Separate project).
- Reinstate the cathodic protection system to protect pipelines (Separate project).
- Expose all joints, assess and remedy where welding and coating are compromised (this project).
- Corrosion protection (coating) on all valves in chambers (this project).

C3.1.2.1. Civil, Structural & Mechanical Works

The project entails Civil, Structural and Mechanical works relating to the rehabilitation of an existing pipeline within the existing servitude within the Phalaborwa Water Supply Scheme, the pipeline is a Steel, 9.5 km long, 560mm NB which supplies potable water between the Phalaborwa WTW and PMC Junction, This eventually splits intoe two (2) 450NB Streel Pipelines towards Foskor & PMC reservoirs respectively. The pipe has been experiencing frequent bursts over the years, until it was taken out of commission in 2023, works to be undertaken on the pipeline includes the following.

- Excavation to expose a section of the existing 560mm NB coupled steel pipelines, cutting a section of the pipeline which is approximately 2km long, recovery, loading and transportation of recovered pipe sections and fittings to Phalaborwa Plant.

- Supply, Transportation, Laying, jointing, testing and back filling of a continuously welded 560mm NB Grade X42 steel, approximately 2 km long, with a 6mm thickness replacing the recovered pipe section.
- Supply, and Installation of welded compensation pieces between the old and new pipe sections.
- Demolishing existing reinforced concrete air and scour valve chambers and recovery and transportation to Phalaborwa Plant of recovered fittings. Disposal of rubble at approved dumping sites.
- Excavation to expose sections of the existing 560mm NB coupled steel pipelines, cutting into pipelines either side of the couplings, recovery of couplings and compromised pipe pieces, loading and transportation of recovered couplings and pipe pieces to Phalaborwa Plant.
- Supply, Transportation, Laying, jointing, testing and back filling of pipe pieces including compensation pieces where necessary, replacing the removed couplings on a continuously welded 560mm NB Grade X42 steel
- Lining and Coating of Piping as per the particular Specifications (PSCL) options provided for Corrosion protection on the new and repaired pipe.
- Construction of reinforced concrete valve chambers complete with all valves and pipe specials as per the attached typical layouts, final drawings to be produced as contractor's design by the contractor, these should cover the following:
    - Layers works and Reinforced concrete layouts.
    - Air Valve Chambers: 150 mm ND PN25 double orifice, dual action air release / vacuum break valves.
    - Scour Chambers: 350 mm ND PN25 wedge gate valves complete with pipe fittings.
    - Non-Return Valve chambers: 550 mm ND PN25 Nozzle Type complete with complete with pipe fittings.
    - Layout and longitudinal sections for the new pipeline section
    - Pipe repair detail including pipe reinforcement.
    - The abovementioned drawings shall be reviewed and accepted by LNW's Employer's Agent/Engineer.

C3.1.3 NATURE OF THE WORKS

The Civil & Structural and Mechanical engineering scope of works on the project comprises as follows amongst others;

- Site Establishment and De-Establishment on completion of works
- Accommodation of traffic
- Site Clearance
- Excavation to expose existing coupled steel pipelines joints, cutting into pipelines and recovery of couplings and pipe pieces.
- Demolition of existing reinforced concrete chambers and recovery of valves and fittings.
- Soil erosion protection & mitigation on excavations along pipeline at joints (every 6m for 9.5km)
- Supply, Installation and Commissioning of 560mm NB steel pipes for potable water, including the following.
    - Valves, fittings and other pipe appurtenances
    - Placing, Joining and testing of pipes and specials
    - Pipe bedding & backfilling.
    - Pipe coating and lining for corrosion protection.
- Construction of new in-situ concrete manholes for air valves and scour valves.
- Occupational Health and Safety.
- Environmental management
- Community Liaison and Stakeholder Management.

C3.1.4 CONSTRUCTION PERIOD

The construction period for this project is 18 months.

C3.1.5 GENERAL INFORMATION

C3.1.5.1 Drawings

The are no drawings for this specific project, drawings will be provided by the contractor as workshop drawings from the suppliers/manufacturers for acceptance by the Engineer before commencement of manufacturing or installation. The drawings shall be required for all subtrades.

C3.1.5.2 Power, Water Supply and Other Services

The contractor shall make his own arrangements concerning the supply of electrical power and all other services. No direct payment will be made for the provision of electrical and other services. The cost of providing these services will be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

C3.1.5.3 Contractor's Camp Site and Security

The contractor shall make his own arrangements regarding the establishment of a camp site and housing for his construction personnel and all regulations stipulated by the local authority shall be adhered to.
It is anticipated that the contractor's choice of a camp site will be influenced by the availability of telephone and electrical connections as well as the supply of potable water.
Provision is made in these specifications for the erection of a security fence around the site offices. The contractor shall be responsible for the security of his personnel and constructional plant on and around the site of the works and for the security of his camp, and the employer will consider no claims in this regard.

C3.1.5.4 Additional Requirements for Construction Activities

C3.1.5.4.1 The contractor may not commence constructional activities before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual.

C3.1.5.4.2 The contractor shall submit proposals in connection with directional signs to the engineer for approval.

C3.1.5.5 Programme Requirements for Construction Activities

C3.1.5.5.1 The contractor shall programme his activities to be suitable in terms of his resources to complete the contract inside the stipulated time period.

C3.1.5.6 Construction in Confined Areas

C3.1.5.6.1 It may be necessary for the contractor to work in confined areas. The method of construction in these confined areas depends on the contractor's construction plant. However, the contractor must note that measurement and payment will be in accordance with the specified cross-sections and dimensions, irrespective of the method used to achieve these cross-sections and dimensions, and that the rates and amounts tendered will be deemed to include full compensation for any special equipment or construction methods or for any difficulty encountered in working in confined areas and narrow widths, and at or around obstructions, and that no extra payment will be made nor will any claim for payment be considered on account of these difficulties.

C3.1.6 BARRICADING OF EXCAVATIONS

All excavations in close proximity to pedestrian and vehicular traffic are to be barricaded to the satisfaction of the Engineer. Barricading shall consist of a minimum of two strands of parallel and horizontal wire of at least 2mm gauge, the topmost strand being fixed at least 1m above ground level. These wires shall be fixed to the approved fence posts, which shall be securely fixed in a vertical position.
The visibility of these barricades shall be enhanced by the attachment of high visibility construction tape to the posts and wire strands and by the placing of reflective signing to the Engineer's satisfaction. All costs arising from these requirements are to be included in the tendered rates for excavation.

C3.1.7 CONTINUITY OF WATER SUPPLY

It is an important aspect of this project to keep the plant in operation. Thus, continuous water supply to the final consumer must take preference to any construction action affecting the supply of water, i.e.

- The water supply may only be stopped intermittently (4 hours per day) at a time, but with one week's written notice to the Engineer and his subsequent approval after consulting with the Client prior to a shutdown. The main criteria for consideration will be the percentage of full water capacity of the main service reservoirs.
- The Contractor will have to continually co-ordinate his operation concerning the water availability and usage with the Resident Engineer on site.

C3.1.1.1 CONTRACTOR'S CAMP SITE AND SECURITY

The contractor shall make his own arrangements regarding the establishment of a camp site and housing for his construction personnel and all regulations stipulated by the local authority shall be adhered to.
It is anticipated that the contractor's choice of a camp site will be influenced by the availability of telephone and electrical connections as well as the supply of potable water.
Provision is made in these specifications for the erection of a security fence around the site offices. The contractor shall be responsible for the security of his personnel and constructional plant on and around the site of the works and for the security of his camp, and the employer will consider no claims in this regard.

C3.1.2 ACCOMMODATION OF TRAFFIC

The contractor may not commence constructional activities before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual.
The contractor shall submit proposals in connection with directional signs to the engineer for approval.

C3.1.3 PROGRAMME REQUIREMENTS FOR CONSTRUCTION ACTIVITIES

The contractor shall programme his activities to be suitable in terms of his resources to complete the contract inside the stipulated time period.

C3.1.4 CONSTRUCTION IN CONFINED AREAS

It may be necessary for the contractor to work in confined areas. The method of construction in these confined areas depends on the contractor's construction plant. However, the contractor must note that measurement and payment will be in accordance with the specified cross-sections and dimensions, irrespective of the method used to achieve these cross-sections and dimensions, and that the rates and amounts tendered will be deemed to include full compensation for any special equipment or construction methods or for any difficulty encountered in working in confined areas and narrow widths, and at or around obstructions, and that no extra payment will be made nor will any claim for payment be considered on account of these difficulties.

C3.1.5 BARRICADING OF EXCAVATIONS

All excavations near pedestrian and vehicular traffic are to be barricaded to the satisfaction of the Engineer. Barricading shall consist of a minimum of two strands of parallel and horizontal wire of at least 2mm gauge, the topmost strand being fixed at least 1m above ground level. These wires shall be fixed to the approved fence posts, which shall be securely fixed in a vertical position.
The visibility of these barricades shall be enhanced by the attachment of high visibility construction tape to the posts and wire strands and by the placing of reflective signing to the Engineer's satisfaction. All costs arising from these requirements are to be included in the tendered rates for excavation.

C3.1.6 ENGINEERING

a) DESIGN

- ✓ The service provider/contractor is responsible for the design of works on the pipeline based on the Employer's tender drawings and the set-up to be within specification. The pricing shall include costs for such designs as well as the works to be done based on the designs.
- ✓ The service provider/contractor responsible for the design of the permanent Works as reflected in these Contract Documents unless otherwise stated.
- ✓ The **Contractor** is responsible for the design of the temporary Works and their compatibility with the permanent Works.
- ✓ The **Contractor** shall supply all details necessary to assist the engineer in the compilation of the as-built drawings.

b) CONTRACTOR'S DESIGN

Where contractor is to supply the design of designated parts of the permanent Works or temporary Works, he shall supply full working drawings supported by a professional engineer's design certificate.

c) DESIGN PROCEDURE

The Contractor shall submit his drawings prior to the start of manufacture, as required by the Engineer. All such material shall become the property of the Employer.

All fabrication and installation shall only be to the approved drawings.
All correspondence and submittals shall be prominently identified as relating to the works and shall be submitted under the cover of appropriate letters or transmittal notes in accordance with the correspondence procedures which will be advised by the Engineer after the signing of the Contract. All documentation supplied by the Contractor to the Engineer in hard copy shall also be supplied in electronic format.

The Engineer shall have the right at all reasonable times to inspect at the works of the Contractor or Sub-contractors, or elsewhere, and all drawings of any portion of the works.

Drawings shall bear accepted Contract references using a project title block which will be supplied by the Engineer. Also detailed revision blocks and drawing numbers shall be suffixed accordingly.

d) DRAWINGS

The drawings issued to Tenderers as part of the tender documents must be regarded as provisional and preliminary for the Tenderer's benefit to generally assess the scope of work

The work shall be carried out in accordance with the latest available revision of the drawings to be produced by the contractor and approved by LNW for construction.

At commencement of the contract, the Contractor shall produce copies of the construction drawings and any instructions required for the commencement of the works will be issued by the employer. From time to time thereafter during the progress of the works, the Engineer may request updates to drawings or revisions for construction purposes as may be necessary for adequate construction, completion and defects correction of the Works.

The Contractor is required to compile "As Built" record drawings, which will be submitted to the Employer after completion of the construction. Any information in the possession of the contractor, which the Engineer requires, shall be supplied to the Engineer before a certificate of completion will be issued. No additional payment will be made and the cost related thereto shall be deemed included in the tendered rates for the related items.

C3.1.7 EQUIVALENCY OF STANDARDS AND CODES

Wherever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national, or relate to a country or region, other authoritative standards which ensure an equal or higher quality than the standards and codes specified will be accepted subject to the Engineer's prior

review and written approval. Differences between the standards specified and the proposed alternative standards must be fully described in writing by the Contractor and submitted to the Engineer at least 7 days prior to the date when the Contractor desires the Engineer's approval. In the event the Engineer determines that such proposed deviations do not ensure equal or higher quality, the Contractor shall comply with the standards specified in the documents.

C3.1.8 TEMPORARY ACCOMMODATION

The contractor shall make his own arrangements for accommodation of his workmen and staff. He shall liaise with the relevant authorities and comply with any regulations required. No accommodation will be allowed inside the security area of the purification works.
The contractor's site camp and site accommodation of personnel will be subject to the requirements of the Construction Safety Act of 2003, the requirements of the Employment Act and the Environmental Impact Report.

C3.1.9 HEALTH AND SANITATION

Provide health and sanitation in accordance to the latest safety act regulations. In a similar manner change rooms, shower facilities, site personnel eating facilities with gender separation where required are to be supplied. The contractor shall be responsible for the safe and environmentally acceptable disposal of all rubbish and rubble from the site, accumulated during the construction period. All facilities must comply with the OHS act.
The hygiene measures with regards to the works durations as well the number of personnel to be deployed on site must be seen very seriously by the contractor. Chemical toilets will only be allowed on a temporary basis for use at the furthermost areas of the works, at the work face.
These shall be provided on the following basis:
One per 20 labourers of the Contractor's staff with separate facilities for male and female staff.
The Contractor shall make arrangements for the proper maintenance of these facilities.
Reference is made to the Health and safety act and specific requirements for sanitation The Health and safety requirements are to be the prevailing standards requirements.
The main camp of the contractor will be expected to have container type ablution facilities with combined shower and hand wash facilities. Each chemical facility must be equipped with a hand cleaning facility with soap and paper towel dispenser. All effluent to be collected in containers for disposal of and evacuated timeously off site. Upon appointment and within two weeks a detailed plan must be put in place and submitted for the Engineer approval.

C3.1.10 NOTICE OF COVERING OF WORKS

The Contractor shall give due notice to the Engineer, whenever any work is intended to be covered over with earth or otherwise, in order that the Engineer may examine the work to determine that it is in accordance with the Specification and that its correct dimensions may be ascertained before the work is covered, and in default of such notice being received the work shall be uncovered at the Contractor's expense whenever instructions are given by the Engineer to do so.

C3.1.11 INSPECTION AND REJECTION OF FAULTY WORK

The Engineer or his representative (Resident Engineer) appointed by the Engineer shall have the full power to inspect the work during every stage of its construction, and for that purpose shall have free access to the works at all times. Should any work appear to the Engineer or his representative not be executed in accordance with the Specifications, the same may be immediately rejected, and the Contractor shall forthwith carry out the making good, breaking down and rebuilding where applicable of rejected work at his own expense.
The Engineer or his representative (Resident Engineer) appointed by the Engineer shall not be used as the CONTRACTORS SITE AGENT. The contractor is deemed to have carried out all PROCESS CONTROL before asking for the work to be inspected.
The inspection of all concrete work will be on all stages of the construction and no works will be released for the new stage unless is done so in writing by the Engineer the foundation level, the placing and fixing of steel and the final end product. Settings out and quality of shutters are the responsibility of the contractor and can only be accessed once the end product is built. All inspection call outs (successful or not) will be recorded and must be reported at the site meetings. Both parties must agree all defect lists with a completion date entered into the list for each defect. All site communications are to be confirmed in writing.

C3.1.12 SETTING OUT OF THE WORKS

The Contractor shall set out the works using the various Setting Out Drawings. He will establish a system of setting out and reference pegs encased in concrete, which will be checked by the Surveyor of the Engineer and then maintained and protected for the duration of the contract by the contractor. Should any benchmark be disturbed it will be re-established and verified by the Engineer at the cost of the contractor.
The contractor shall set out the Works relative to the afore-mentioned system of reference pegs in accordance with the positioning and dimensions on the drawings.

C3.1.13 DISINFECTIONS OF THE WORKS

The Contractor shall be responsible for all disinfection of the structures he has worked on.

C3.1.14 FINISHING & TIDYING

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

C3.1.15 DOCUMENTATION

At the conclusion of the commissioning independently from stage and before the takeover by the client, The Contractor shall provide, three sets of documents comprising the following.

- Temporary Operation manuals
- Maintenance manuals

At the conclusion of the works. The Contractor shall provide, three sets of documents comprising the following.

- As-Built drawings of the Contractor designs.
- Simple line diagrams of the security fence to be used for the operations and maintenance (OM) manuals. (Reference no will be the same as per the Engineer drawings). That reference no is to be used at the OM.
- List of specialist tools required.
- List of recommended lubricants.
- Name of the firm, address, contact details i.e. tell, fax, e-mail cell no, web site local and international and contact person.
- South African agent for imported material.
- Technical data. Specifications. Technical brochures. Check lists and manuals for local operators.
- Any manufacturer's data which covers more than one type of installations must be clearly marked to show which data is applicable to the model installed.
- Maintenance instructions. With time related information. i.e. Daily, weekly etc service needed.
- Applicable settings.
- List of available spare parts.
- List of action in case part is not functioning properly.
- Original of certificate of approval, testing, commissioned works.
- Each set of documents must be bound in clearly labelled ring binders.
- Drawings will be folded, placed in plastic wallets and positioned into the binder.
- All contractors drawing must be submitted in Auto CAD format. No hand drawn drawing will be accepted.
- One copy must be submitted to the Engineer for approval prior to the issue of the final sets.

C3.1.16 CONTRACTOR'S CODE OF CONDUCT

Workmen Instant Dismissal

Workmen may be instantly dismissed for the following:
Theft.
Violence with co-workers or supervising staff
Committing a criminal offence and is sentenced to prison without the option of a fine.

Misconduct

Any employee who, within a period of 6 months, receives two written warnings and for the third time is guilty of misconduct as listed below may be dismissed without further notice.

- Insubordination and constant refusal to follow instructions

- Absenteeism for 3 or more days without a valid medical certificate
- Repeatedly coming to work late
- Disruptive behaviour conducive to delays in the work program
- Intimidation of other workers
- Dangerous behaviour
- Use of alcohol or drugs during working hours
- Non-performance
- Abuse or waste of company property
- Continuous absenteeism

C3.1.17 FEATURES REQUIRING SPECIAL ATTENTION

a) EXISTING SERVICES

The Contractor shall be deemed to have made allowance in his tender for the need to protect the existing services from damage and to hand over the completed works with the existing services intact and undamaged.

Notwithstanding the information given herein, the Contractor shall retain full responsibility for establishing the exact positions of the various existing services, which may not be shown on the construction drawings, in advance of the main construction work.
The use of specialised equipment for location of power cables and other services is allowed into the relevant Bill of quantities
All the works areas with known services are to be preceded with thorough investigation with hand excavations and exposure of the services.

b) SURVEY BEACONS

The Contractor's attention is drawn to SABS 1200 A, Clause 5.1.2 - Preservation and Replacement of Beacons and Pegs subject to the Land Survey Act - and to the liabilities of the Employer and the Contractor in this regard.
The Contractor shall locate and mark all existing pegs.
The Contractor shall be held responsible for the maintenance of all the cadastral and benchmark pegs on the site that are recorded as existing at the commencement of construction, and for the placement of any pegs that are found to be missing or disturbed upon the completion of the contract. A Completion Certificate shall only be issued after the Contractor has handed back all the pegs and has submitted a certificate from a registered Land Surveyor to the Engineer stating that all relevant pegs are in their correct positions.
Notwithstanding Clause 8.8.5 of SABS 1200 A, the Contractor shall tender sums for searching for and protecting all pegs. Where pegs have been moved, disturbed or covered on the specific instruction of the Engineer, such pegs shall be reinstated by a registered Land Surveyor and shall be paid for by number reinstated on instruction of the Engineer.

C3.1.18 DAMAGE TO SERVICES AND EXISTING WORKS

a) RESPONSIBILITY OF CONTRACTOR

The Contractor shall be responsible for any damage to existing services and existing works in the execution of this contract and shall reimburse the Owner concerned for any repairs required or compensation for damages awarded. The Contractor's attention is drawn to Clause 3.1.30 and SABS 1200 A, Clause 5.4.

b) NOTIFICATION

The Contractor will be responsible for immediately notifying the Authorities concerned the Employer and the Engineer regarding any damage caused to public services and existing works.

The Engineer's Representative must be notified without delay.

C3.1.19 WORK ON PUBLIC AND PRIVATE PROPERTY

The Contractor shall exercise the greatest care to avoid unnecessary damage to trees, gardens, fences, walls and structures on public and private property, and also strictly supervise the behavior of his workmen.
On completion of the work over or in the vicinity of Local or Tribal Authority or private property, the Contractor shall ensure that anything that may have been disturbed or damaged has been compensated for or reinstated to a condition equal to that which it was before construction commenced and also to the satisfaction of the owner concerned. The materials resulting from any demolition of existing structures shall be the property of the owner.

C3.1.20 REGULATIONS

The Contractor shall in all respects conform to the requirements contained in regulations by higher authorities. Such regulations shall include *inter alia*:

1.) ***National Building Regulations. SABS 400**
2.) Code of Practice for the Wiring of Premises, SABS 0142-1981 as amended.
3.) The Mines and Works Regulations, Government Notice Number R1609 of 1962-09-28, as amended.
4.) ***The Occupational, Health and Safety Act 85/93, as amended**.
5.) The local Municipal Byelaws and Regulations as well as the regulations of the local Supply Authority.
6.) The local Fire Regulations.
7.) The regulations of Telkom.
8.) The standard regulations of any Government Department or public service company where applicable.
9.) The Regulations of Lepelle Northern Water.
10.) The Regulations of Eskom
11.) ***SABS 1200 and the application SABS 0120**.
12.) The construction Regulations of the Construction Industry Development Board (CIDB)

The regulations marked "*" are to be kept on site.
The Contractor shall pay and indemnify the Employer against any fees or charges by law and shall keep the Employer and the Engineer indemnified against all penalties and liabilities of any kind for breach by the Contractor or any of the conditions due by law, except insofar as amended or specifically allowed by the Engineer.

C3.1.21 LABOUR BASED CONSTRUCTION

Employment of local labour
The contractor shall limit the utilisation of permanently employed personnel for the execution of the Works to key personnel, such as contracts manager, site agent, foreman, supervisors, plant operators, material technicians, surveyors, trainers, buyers, storemen and the like should such expertise not be available within the

community. Not less than 70% of the labour employed on site shall be drawn from the community closest to the contract Works.
The contractor, in conjunction and in co-ordination with the local community/Local Authority, will establish a Community Liaison Officer (CLO) within the local community and the Contractor shall apply to the CLO for details of local labourers who are available and shall give preference to the employment of these labourers identified through the CLO.
The employment of labour from outside the local area will only be allowed in the event of:

- The unavailability within the local community of sufficient numbers of local labourers to execute the work,
- The unavailability of required skills within the local community necessary for the execution of specific tasks
- Where the completion period does not permit the creation of the necessary skills through training.

In these cases, the contractor shall prove to the satisfaction of the Employer that he has exercised his best endeavours and taken all reasonable actions to recruit local labour.
The Contractor shall maintain accurate and comprehensive daily records of all labour engaged on the contract and shall submit to the Employer at two weekly intervals detailed labour returns substantiating the actual numbers of labours employed, the amounts actually paid in respect thereof, and details of the various activities undertaken by the labourers.
The Contractor shall employ a Community Liaison Officer (CLO), through the Labour Committee (LC) representing the local community. The CLO and LC shall be the facilitators for all negotiations between the Contractor and the Labourers. An Agreement signed by the LC on behalf of the Labourers shall be given to and accepted by the Contractor and applied without revisions. The Contractor may price to recover his Payment for the CLO in the P & G and where he enters no price; it shall be assumed that the cost of the CLO is included in the other rates.

C3.1.22 ENVIRONMENT AND SAFETY

The Environmental Management Plan (EMP) for the site of the Works has been commissioned by the Client and will be issued to the Successful Contractor.
The Contractor shall comply with all the requirements laid down in the EMP. The Contractor shall take time to acquaint his employees with the provisions, regulations, duties, obligations and prohibitions, and shall accept sole liability for due compliance with the duties, obligations and prohibitions and absolve the Employer from being obliged to comply with the aforesaid duties, obligations and prohibitions.
In case of failure on the part of the Contractor to comply with the requirements of the EMP, the Employer shall be entitled to employ and pay other persons to carry out any remedial work to rectify any consequence resulting from the non-compliance by the Contactor and all cost consequent or incidental thereto shall be borne by the Contractor and shall be recoverable form him by the Employer. If it is not practical to rectify any consequence resulting from the non-compliance of the Contractor with the EMP the Employer will be entitled to impose a penalty on the Contractor which penalty shall be in relation to the expense which the Contractor would have incurred to comply.
The Contractor shall indemnify the Employer and the Engineer against responsibility for damage to the environment on the site of the Works.

C3.1.23 BLASTING INDEMNITY

The Contractor may require blasting the rock from time to time during the implementation of his construction works. The use of a certified Blasting Contractor as sub-contractor is paramount to the safety of the surrounding public, person and property. When blasting in the close proximity of fixed structures, the Contractor shall take full responsibility for any costs related to damage thereof. It is in this context that it is recommended for the Contractor to fully photograph and record structural damage, prior to blasting. The Contractor shall complete the "Blasting Indemnity Form C1.3" included in Part C1of the Contract, before the commencement of the Works.
The Contractor is responsible for compliance with all requirements of the authorities concerned with respect to the safety of the Works labourers and the public. Any negligence or noncompliance on the side of the Contractor shall be sufficient cause for the Employer's Agent to suspend the Works and the Contractor shall have no claim for additional compensation against the Employer in such an event.

C3.1.24 RECORDING OF WEATHER

The Engineer shall adjudge the extent of the delays that are attributable to "abnormal climatic conditions", however, in order to assist him in this regard, the Contractor must erect a rain gauge at the site office to record rainfall figures. The reading of the rain gauge shall be made at 08h00 and 16h00 of each working day of the contract. The records shall be submitted weekly to the Employer's Agent (the Engineer); together with a statement recording the Contractor's opinion of the effect on his programme of any weather condition that he may consider to be abnormal.

C3.1.25 EQUIVALENCY OF STANDARDS AND CODES

Wherever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national, or relate to a particular country or region, other authoritative standards which ensure an equal or higher quality than the standards and codes specified will be accepted subject to the Engineer's prior review and written approval. Differences between the standards specified and the proposed alternative standards must be fully described in writing by the Contractor and submitted to the Engineer at least 7 days prior to the date when the Contractor desires the Engineer's approval. In the event the Engineer determines that such proposed deviations do not ensure equal or higher quality, the Contractor shall comply with the standards specified in the documents.

C3.1.26 FACTORY ACCEPTANCE TESTING

Any imported material and equipment needs to be inspected, checked and tested before shipment. The contractor shall submit a list of all factory acceptance tests to be performed for all critical equipment supplied under the contract.

The Contractor shall prior to shipment, submit to the Engineer all test results on Plant and Material that are to be manufactured or shipped from foreign destination. No material shall on any account be shipped before receiving the Engineer's approval in writing.

C3.1.27 TEST PLAN AND REPORTS

Test reports shall be submitted after the successful completion of each testing phase. The following documents shall be submitted in writing to the Employer:

a) Testing plan

b) Progressive testing reports as detailed in the testing plan

c) Tests on completion

d) Failure investigation reports (where necessary) during defects notification period

C3.2 STANDARD SPECIFICATIONS

C3.2.1. CIVIL ENGINEERING STANDARD SPECIFICATIONS

The standard specifications on which this contract is based are the South African Bureau of Standards Standardised Specifications for Civil Engineering Construction SANS 1200. Although not bound in nor issued with this Document, the following Sections of the Standardised Specifications of SABS 1200 shall form part of this Contract:

The applicable “Standard Specifications” shall be “***Standardized Specifications for Civil Engineering Construction, Series 1200-1986", issued by the South African Bureau of Standards (SANS 1200)*.**

The standardised specifications (SANS 1200) must be read in conjunction with the relevant new SANS 1921 family of standards.

The term “***Project Specifications***” appearing in any of the SANS 1200 standardised specifications is deemed to be equivalent to the term “scope of work” in SANS Specifications. The Contractor shall be in possession of these Standardized Specifications and their related SANS 0120 Code of Practice that apply equally and shall keep a copy of each on site for reference by him and the Engineer for the duration of the Contract and shall bear all expenses in this regard.

For "Workmen's Compensation Act" read "Compensation for Occupational Injuries and Diseases Act, 1993 (Act No.130 of 1993)" wherever it appears. For "Machinery and Occupational Safety Act" and "Mines and Works Act" read "Occupational Health and Safety Act,1993 (Act 85 of 1993)" wherever they appear.

The SANS 1200 Specifications applicable to this Contract are listed under below.

a) SANS 1200 A: General (as applicable)
b) SANS 1200 AA: General (Small Works)
c) SANS 1200 AB: Engineer’s Office
d) SANS 1200 C: Site Clearance
e) SANS 1200 DA: Earthworks (Small Works)
f) SANS 1200 DB: Earthworks (Pipe Trenches)
g) SANS 1200 DM: Earthworks (Roads, Subgrade)
h) SANS 1200 GA: Concrete (Small Works)
i) SANS 1200 L: Medium Pressure Pipelines
j) SANS 1200 LB: Bedding (Pipes)
k) SANS 1200 LG Pipe Jacking
l) SANS 1200 M: Roads (General)

C3.2.2. VARIATIONS AND ADDITIONS TO THE STANDARD SPECIFICATIONS

INDEX

PSA: GENERAL

(Applicable to SANS 1200 A - 1988 as amended 1990)

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 Contract Data (GCC 2015) 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 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 SANS Specifications shall bear the SANS mark, where such a mark is available for the type of product."

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.

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."

ADD THE FOLLOWING SUBCLAUSES:

"PSA 4.2.1 Contractor's Camp

The Contractor's camp shall be kept clean at all times during construction and conform to the requirements and regulations of the Employer, authorities and the applicable Environmental Management Plan.

The Contractor must fence off his construction camp area with 1.8m high diamond mesh fence. All temporary fencing must be removed on completion of the Contract.

The camp may be used for the working hours activities of the Contractor's and the Employer's personnel and for all related facilities required by the Contractor and the Employer such as workshops, stores, testing laboratories, etc. The Contractor's personnel, including bona fide night watchmen, may only sleep within the camp should the Contractor:

- Take all the necessary steps required to comply fully with public legislation and regulations and all specification clauses governing the environment, health, transport, safety and public disturbance impacts of such on-site accommodation;
- Acquire the written permission of the Employer and relevant authority and comply with their requirements.

Should at any stage of the Contract the Employer and/or the Engineer is of the opinion that the housing of personnel within the camp site of the Contractor is causing disturbance or inconvenience to the nearby residents, then the authority granted by this clause for the Contractor to house personnel on site may be withdrawn, either partially or entirely.

The Contractor shall at all times conform to all requirements contained in law or bylaws, as well as any other requirements set by the controlling local authority.

The Contractor shall water all access roads to the construction camp, as well as working areas used by vehicles inside the camps, twice daily including weekends as required or as may be directed by the Engineer, to prevent dust being churned up by vehicles or wind.

At the completion of the construction work, the Contractor must break down and remove all concrete slabs, etc. in the construction camps and at the batching plant (if applicable), remove all rubble from the camp site and hand back the sites in a clean and tidy condition.

No Completion Certificate shall be issued for the Works unless the site clearing is done to the satisfaction of the Engineer.

PSA 4.2.2 Housing

The Contractor will not be permitted to house any personnel within his camp site unless the Employer approves a written request to this end by the Contractor.

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 5.3 PROTECTION OF EXISTING STRUCTURES

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

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

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

PSA 5.4.1 Location of existing services

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

Without in any way limiting 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 of subclauses 4.4 and 5.1.2.2 of SANS 1200 D (as amended) shall apply.

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

All services, the positions of which have been determined as aforesaid at 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 shall 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 as 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 therefrom 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 of subclause 5.9 of SANS 1200 DB should be observed. 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 of 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 thereunder, 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 (GCC 2015) of the Conditions of Contract, be entitled to suspend progress on the works or any part thereof until such time as the Contractor has demonstrated to the satisfaction of the 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 (GCC 2015) 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 clause 9.2 (GCC 2010) and for the Employer to terminate the Contract in accordance with the further provisions of the said clause 9.2 (GCC 2015)

ADD THE FOLLOWING SUBCLAUSES TO CLAUSE 5:

PSA 5.9 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 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 work 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.

ADD THE FOLLOWING SUBCLAUSE TO CLAUSE 7:

"PSA7.5 SITE INSPECTIONS

All test results obtained by the Contractor in the course of his process control of the Works shall be submitted to the Engineer or his Representative prior to requesting inspection of the relevant portions of the Works. Any request for inspection shall be submitted on the prescribed forms that will be agreed upon once the Contract has been awarded.

PSA7.6 PROCESS CONTROL

The Contractor shall make suitable arrangements for process control prior to commencement with the Works. Should he intend using site personnel for this purpose he shall ensure that suitably trained and competent personnel take charge of the necessary test work, and that the necessary equipment is at their disposal prior to commencement of the Works. Failure to comply with these requirements shall be just cause for the Engineer to order suspension of the Works without additional remuneration, or for him to recommend termination to the Employer in terms of the Conditions of Contract.

PSA7.7 QUALITY ASSURANCE PROGRAMMES

The Contractor shall deliver to the Engineer, for his consideration, quality assurance programmes (as obtained from all the Contractor's proposed suppliers of pipes, valves and specials) prior to the Contractor's appointment of any suppliers.

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".

Add the following paragraph to Sub-clause 8.1.1:

“No measurement and/or payment will be made for overhaul. All haulage shall be regarded as freehaul and the costs thereof shall be deemed to be covered by the relevant
tendered rates in the Bill of Quantities.

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:

(a) risks, costs and obligations in terms of the Conditions of Contract and of this standardized specification;

(b) head-office and site overheads and supervision;

(c) profit and financing costs;

(d) expenses of a general nature not specifically related to any item or items of the permanent or temporary work;

(e) 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

(f) 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:

PSA 8.2.1.1 Fixed-charge items

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

(a) SEVENTY PER CENT (70%) of the sum tendered will be paid when the facilities have been provided and approved;

(b) The remaining THIRTY PER CENT (30%) 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 in the tender.

PSA 8.2.2 Time-related items

REPLACE THE CONTENTS OF SUBCLAUSE 8.2.2 WITH THE FOLLOWING:

"Subject to the provisions of subclauses 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 and 8.3.2 (j) 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 subclause PSA 8.1.2.2. Payment will be made as described in subclause PSA 8.2.1.1.

PSA 8.3.2 Facilities for Contractor

j) Plant

"Plant (All plant required for the entire 18 months duration of the project shall be priced under this item, any standing time allowance for plant will be pro-rated from this item) "

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."

ADD THE FOLLOWING SUBCLAUSE TO CLAUSE 8.4.5:

"PSA8.4.5.1 Supervision and Training of Nominated Sub-Contractors

The Contractor shall provide a rate for supervision and training of nominated sub-contractors under the project. A total of two sub-contractors will be nominated to the main contractor of which the Contractor will be responsible for the following:

- Day to day administration of the sub-contractor;
- Training of the sub-contractor to ensure quality works as per the project specification;
- Payment of monies due to the sub-contractor for works done.

Any matters relating to nominated sub-contractors shall be addressed as per clause 5 of the general conditions of contract.

PSA8.4.5.2 Salary for Labour Desk Officer and Community Liaison Officer

The Contractor shall provide a Sum in Section 1 for a salary to be paid to the Labour Desk Officer and Community Liaison Officer. This amount will also be utilized for payment of the following:

- Payment of any skilled personnel as per instruction of the client. This will include technicians working for the Client, storekeeper, security personnel etc.

PSA8.4.5.3 Artisans and Skills Training

The Contractor shall provide a Sum in Section 1 for payments to be made to specialists for the training of unskilled or semi-skilled persons in industry accredited management and generic skills. An allowance must be made for wages and salaries of such labourers under a separate payment item. Payment to the Contractor will be based on invoices certified by the Engineer and issued by training specialists to the Contractor for work undertaken in terms of this item.

PSA8.4.5.4 Specialized Services

The Contractor shall provide a Sum in Section 1 for the appointment and payment for specialized services. These may include all work required by the following specialists:

- Environmental compliance monitoring by the ECO;

- Acceptance control testing of pipework, coatings and linings"

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 (GCC 2015).

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 tests required by the Engineer, the Contractor shall be responsible for both the cost of normal testing as described in 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 Clause 6 (GCC 2015 of the Conditions of Contract.)"

ADD THE FOLLOWING SUBCLAUSES:

PSA 8.8 COMPLIANCE WITH OHS ACT AND REGULATIONS

(INCLUDING THE CONSTRUCTION REGULATIONS 2014) ..... 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 2014) at all times for the full duration of the Contract. 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."

PSA 8.9 COMPLIANCE WITH ENVIRONMENTAL LEGISLATION

Description of item to which Prime Cost Sum applies..... Unit: Sum

The tendered sum shall include for the full duration of the Contract compliance with Environmental Management Plan (EMP)

PSAB: ENGINEER'S OFFICE

(Applicable to SANS 1200 AB - 1988 as amended 1990)

PSAB 3 MATERIALS

PSAB 3.1 NAMEBOARDS

REPLACE THE FIRST SENTENCE OF SUBCLAUSE 3.1 OF SANS 1200 AB WITH THE FOLLOWING:

"The Contractor shall supply and erect at locations approved by the Engineer, the number of contract nameboards as specified, which, unless otherwise specified in the Contract, shall 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."

PSAB 4 PLANT

PSAB 4.4 SURVEY EQUIPMENT

The Contractor shall provide on site and make available for the exclusive use of the Engineer and his staff, survey equipment

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 as agreed with the RE at all times when such is reasonably required by the Engineer and his staff for the purposes of the Contract.

PSAB 5 CONSTRUCTION

PSAB 5.4 TELEPHONE

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

"PSAB 5.4.1 Telkom telephones

Not Applicable

PSAB 5.4.2 Cellphones

The Contractor shall advise the cellular service provider of any faults which develop in the cellphone service and/or the cellphone handsets and shall, in such circumstances, arrange for the earliest possible restoration of the said service.

The costs of any necessary repairs and/or the replacement of components to the handsets of the cellphones shall be for the Contractor's account.

The Contractor shall ensure that all accounts for cellphone calls and the respective service contracts are promptly paid. The Contractor shall, on production of an itemised statement, be reimbursed only for the cost of the Engineer's cellular telephone calls."

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

"PSAB 5.6 COMPUTER EQUIPMENT

All computer equipment provided 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.

The Contractor shall further provide at his own cost, all paper and black ink cartridges and other consumables reasonably required by the Engineer.

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.

Survey equipment listed below shall be made available and be maintained in good condition for the exclusive use of the Engineer or his Representative for the duration of the Contract. Payment will be made as provided for in the Time Related Items included in Schedule 1.

(a) Automatic surveyor's level complete with tripod and leather carry case such as Zeiss N1-2 or equivalent. 1 No

(b) 20-second tachometer with optical plumbob complete with tripod and leather carry case such as Sokkisha TM20C or equivalent. 1 No.

(c)	Nylon-coated steel surveyor's tape 100m long and 10mm wide. No.	1
(d)	5m long steel tape. No.	1
(e)	5m long three-piece telescopic survey staves (metric double-face) complete with angle bracket level.	1 No
(f)	Survey books: Level. No.	2
(g)	One metre long spirit level. No.	1

PSC: SITE CLEARANCE

(Applicable to SANS 1200 C - 1980 as amended 1982)

PSC 3 MATERIALS

PSC 3.1 Disposal of material

Substitute the first sentence of C 3.1 with the following:

Material obtained from clearing and grubbing and demolition structures shall be disposed of at disposal sites identified by the Contractor off the Site and in a manner approved by the Engineer.

Add the following to C 3.1:

No measurement and/or payment will be made for overhaul. All haulage shall be regarded as freehaul and the costs thereof shall be deemed to be covered by the relevant tendered rates in the Bill of Quantities.

PSC 5 CONSTRUCTION

PSC 5.1 Areas to be cleared and grubbed

Add the following to C 5.1:

"The following areas are to be cleared and grubbed:

i) The route of the pipeline section to be replaced and the area of pipe couplings to be replaced.."

PSC 5.5 Re-clearing of vegetation

Add the following to C 5.5:

"When areas have to be re-cleared on the written instructions of the Project Manager, such re-clearing shall be carried out at the Contractor's own cost and the Contractor is therefore advised not to clear the areas too soon."

PSC 5.8 Demolition of structures

Add the following Sub-clauses to Sub-clause 5.8:

PSC 5.8.1 Demolition of existing valve chambers

Where specified, the Contractor shall demolish existing valve chambers and dispose of the rubble at disposal sites identified by the Contractor off the Site and in a manner approved by the Engineer. Recovered valves and pipe fittings shall be transported to the designated storage place.

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, "

PS C 8.2.8 Demolish and remove structures/buildings and dismantle steelwork

Add the following to C 8.2.8:

PS C 8.2.8.1 Demolition of existing valve chambers

One line item will be scheduled for all the valve chambers to be demolished and will be measured by number. The rate shall include for removing and transporting fittings from the chamber to the designated storage place, all excavation required to demolish the chamber, demolition of the chamber and disposal of the rubble as specified in Clause PSC 3.1, and if required, backfilling of the hole left by the demolition of the chamber.

PSL: MEDIUM PRESSURE PIPELINES

(Applicable to SANS 1200 L - 1983)

PSL 3 MATERIALS

PSL 3 MATERIAL

PSL 3.1 General

Add the following to L 3.1:

Each type of pipe delivered to the Site shall have a length corresponding with the lengths specified on the bill of quantities, with a maximum permissible variation in length of ± 40mm. A pipe that is a shorter or longer than the defined standard will be rejected by the Engineer.

Materials for pipes and fittings to be used for potable water supply shall be non-toxic, shall not support microbial growth and shall not impact taste, odour, turbidity or discoloration to the water after disinfection and washing out of the pipelines.

PSL3.4 STEEL PIPES

Steel pipes shall comply with the following particular specifications in ***Section C3.3***

PSPM: Manufacture, supply and testing of steel pipes.

PSCL Steel Pipes Coating and Lining

PSPS: Steel Pipe Installation

PSVA: Design, Manufacture and Installation of Valves

PSL 4 PLANT

PSL 4.1 Handling and rigging

Add the following to L 4.1:

Pipes and specials shall be protected against damage at all stages from fabrication to delivery. The ends of all pipes and specials shall be protected against denting. The pipes shall be delivered along and as near as possible to the pipeline trench in which they are to be installed.

The Contractor shall unload the pipes from the road vehicle and string them along the trench until they are installed. Some pipes may have to be off-loaded, stacked or obtained from areas some distance from the trench, and the Contractor shall make sufficient allowance in the tendered rates for the transportation and additional handling of the pipes.

Coated pipes shall be moved with the use of sufficiently wide padded slings at least 300mm wide to prevent damage to the coating. Chain slings, hooks, wire ropes, rope slings without canvas covers, belt slings with protruding rivets, and any other equipment that is liable to damaging the coating shall not be used. Spreader beams shall be used for lifting large steel pipes in order to avoid overstressing the pipe and damaging the lining and coating. The length of the spreader beam shall be at least two thirds of the length of the pipe to be lifted. Lifting centres for pipes shall not be more than 6m apart.

To ensure that coated pipes do not bear against each other whilst being transported, use shall be made of resilient material such as dunnage that shall not disintegrate or deteriorate when exposed to the elements for prolonged periods.

The pipes shall be stacked with a minimum clearance of 50mm between adjacent pipe walls. The pipes shall be stacked in manner that limits the loading on the lower layer of the pipes. The Engineer shall reject any pipe showing permanent ovality due to surcharge loading. Stacking of smaller diameter pipes within larger diameter pipes will not be accepted pipes, which are lined and coated unless adequate dunnage is provided to prevent damage to the coating, and lining. Any pipe damaged during handling, haulage, storage or installation shall be repaired as specified or shall be replaced at the Contractor's expense.

For all pipes and fittings with factory applied cement mortar linings, the manufacturer shall provide a polyethylene or other suitable bulkhead on the ends of the pipe and on all special openings to prevent drying out of the lining. Such bulkheads shall be substantial enough to remain intact during transportation and storage until the pipe or fitting is installed.

PSL 5 CONSTRUCTION

PSL 5.1 Laying

PS L 5.1.1 General

Add the following to L 5.1.1:

After the bottom of the trench has been inspected and approved by the Engineer, a 150mm thick layer of loose selected backfill material shall be placed thereon. Except where it is required that flanged pipes should be supported on pedestals, pipes shall be laid in such a manner that the full length of the pipe bear uniformly on the loose material. After the pipes

have been placed in position, the loose material shall be compacted as specified on both sides of the pipes by using hand compaction equipment.

The out of roundness at a plane perpendicular to the pipe axis at any point along the pipeline length shall not exceed 4% of the minimum as laid inside diameter (i.e. + 2% of the nominal internal diameter) after completion of the backfilling and with atmospheric pressure inside the pipe.

Out of roundness being measured as the difference between the minimum and maximum inside diameter of the pipe at a point.

PS L 5.1.2 Damage

Add the following to L 5.1.2:

The work under this project will be carried out in close proximity of existing services. The Contractor shall take note of these existing services and take all necessary precautions while working in the vicinity of these services in order not to damage them. Any damage to existing services shall be repaired or replaced immediately by the Contractor to the satisfaction of the Engineer. The cost of any such repairs will be to the account of the Contractor.

PS L 5.1.3 Keeping Pipelines clean

Add the following to L 5.1.3:

The interior surfaces of all pipes, specials, valves and fittings shall at all times be kept free from dust, silt, foreign matter and access by rodents, animals and birds shall be prevented. Pipes and specials shall not be used as shelters by staff or for the storage of garments, tools, materials, food containers or similar goods. Particular care shall be exercised at all times to prevent faecal contamination of pipe interiors by staff, casual visitors or passers-by.

Metal night-caps approved by the Engineer shall be used to close off all ends of each laid section of pipeline when work is stopped at the end of the day or for longer periods and shall be left on the ends of sections of completed pipework until such sections are connected to the rest of the pipeline.

Notwithstanding the use of night-caps the Contractor shall at his own expense, make good all damage to pipe linings and fittings caused by the ingress of dirty water, silt, sand, debris, vermin, insects and other foreign matter.

The Contractor shall at his own expense and to the satisfaction of the Engineer, clean the interior of the pipeline of such contaminants, failing which, the Engineer may order the Contractor to remove the pipes from the trench and replace them with clean pipes at his own cost.

PSL 5.2.3 Welding (Steel Pipelines of Diameter *500* mm or greater)

Add the following to L 5.2.3:

The Contractor shall use rubber wheeled trolleys to access the inside of pipelines larger than 500mm ND in order to do inside welding, repair joints and linings as well as inspections. Persons entering pipelines shall wear clean, soft soled footwear. Mechanical fans shall be provided inside pipelines to ensure that an adequate air supply is available for those entering the pipelines. Engine driven fans shall be fitted with a flexible exhaust or other suitable methods of keeping exhaust fumes clear of the fresh air."

PSL 5.6 Valve and hydrant chambers

PSL 5.6.1 General

Replace the words "drawing L-1" in the second line with "the typical Drawings".

PSL 5.6.2 Construction of chambers

Replace the words "drawing L-1, L-2 and L-3" *in the fourth line with* "the typical Drawings".

PSL 5.9 Lifting and relaying of existing pipes

Add the following to L 5.9:

"Where new pipes, valves or specials are to be connected to, or inserted into existing mains, the Contractor shall excavate back along the existing main only as far as is necessary in order to complete the connection satisfactorily - he shall ensure that suitable material is carefully placed and properly compacted beneath all existing and new work so that the pipes, specials, etc. are properly bedded on sound material.

Where necessary, the Contractor shall cut the existing pipes so that new valves and/or specials can be installed. Care shall be taken that the lengths cut from existing pipes, etc. are accurate so as to ensure a proper joint when the new material is installed. Similarly, where specials and/or valves are removed from existing pipes, closure pieces shall be accurately cut to length and the gaps properly closed.

Where nominal pipe/fitting sizes are specified and/or shown on the drawing, it shall be the responsibility of the Contractor to confirm the accurate sizes of the pipes involved and to supply the new materials according to these measured sizes."

Where shown on the drawings or where so instructed by the Engineer, the Contractor shall excavate, expose and remove from the ground, existing water pipelines.

If so instructed by the Engineer, the Contractor shall, before commencing with the excavation of the pipeline, expose the pipeline to be removed by means of careful hand excavation at positions agreed with the Project Manager, in accordance with the requirements of Sub-clause PSA 5.4.1.

Thereafter, the existing pipelines to be removed shall be carefully opened up by machine excavation to a depth of not more than 300 mm above the pipes after which the whole pipeline shall be fully exposed by means of careful hand excavation.

The pipes and all specials encountered (eg. bends, valves, valve box covers and the like) shall be removed from the trench in a manner as to avoid causing damage and as approved by the Engineer, cleaned sufficiently as to allow inspection of the pipes and specials by the Engineer and stacked in such a manner as will facilitate the inspection of each pipe and special by the Engineer. The pipes and specials shall be clearly marked to show the position from which they were removed.

Pipes and specials removed shall be transported to the Lepelle Northern Water's Phalaborwa Water Treatment Works, where they shall off-loaded and neatly stacked to the satisfaction of the Engineer. The Contractor shall be responsible for obtaining a written receipt of all pipes so delivered to the Employer's storeyard.

Pipes and specials which are declared by the Engineer as unsuitable for re-use shall be transported to a spoil site and covered with spoil material to a depth of not less than 300 mm.

Add the following new clauses to L 5:

PSL5.11 Pipeline route markers

Pipeline markers shall be installed at the following positions:

- Horizontal bends;
- Servitude boundaries of provincial roads and railway lines;
- Between horizontal bends and valve chambers where distances in between exceed 300m.

"PSL5.12 CONNECTION TO EXISTING PIPEWORK

Following the Engineer's approval the contractor shall make all necessary arrangement with Employer for temporary shutdown of the relevant sections of water supply infrastructure well in advance of the intended date. The contractor shall ensure that all the necessary spares of material standby equipment and lighting as identified in terms of approved methodology are available on site 24 hours prior to commencement of shut down and isolation work. The contractor shall make provision for adequately staffed construction team comprising of day and night shift. The shut down period may not exceed 48 hours including allowance for required time to drain and fill-up of pipeline".

PSL7 TESTING

PSL 7.1 General

Replace the first sentence of L 7.1 with:

Pipes shall be pressure tested in convenient lengths not exceeding 1 000 m. Longer test lengths require the Engineer's approval.

Add the following to L 7.1:

The Contractor must include in his rates for all equipment, anchor or thrust block arrangements and overhead costs necessary for testing.

PSL 7.3 Standard hydraulic pipe test

PSL 7.3.1 Test pressure and time of test

PSL 7.3.1.2 Testing pressure shall be 1.5 times Working Pressure as scheduled or labelled by the manufacturer.

Hydraulic pipe tests shall be carried out in the presence of both the Engineer and the Contractor, and for each test a form shall be completed and certified by both parties, as a record of the test.

PSL 8 MEASUREMENT AND PAYMENT

PSL 8.2.1 Supply, Lay and Bed pipes complete with Couplings ..... Unit : m

ADD THE FOLLOWING:

The price tendered and paid for pipelines of various diameters and types shall include for the supply and installation of all fittings, joints and specials not specifically scheduled.

Payments of pipes laid shall be affected as follows:

a) 90% of the laid rate on successful completion of laying, cutting, jointing and flushing of the line plus selected fill.
b) 100% on successful completion of the hydraulic testing of the line.

Pipe work is to be bedded as indicated on the drawings of in the schedule of quantities.

PSL 8.2.11 Anchor blocks / thrust blocks and pedestals

Insert "concrete" *before* "and" in the last line of the last paragraph of L 8.2.11.

PSL8.2.13 Valve and Hydrant Chambers, etc

ADD THE FOLLOWING:

The rate for construction of valve chambers shall be inclusive of excavation, supply of all materials including concrete, reinforcement air vents, access ladders, as
shown on the typical Drawings for the chamber type and specified depth.

PSLB: BEDDING (PIPES)

(Applicable to SANS 1200 LB - 1983)

PSLB 3 MATERIALS

PSLB 3.2 SELECTED FILL MATERIAL

ADD THE FOLLOWING:

Selected fill material used for bedding shall be stabilised with 5% cement as specified under Sub-clause PSDB 3.5(d).

PSLB 3.4 SELECTION

PSLB 3.4.1 Suitable material available from trench excavation

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

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.1 PRINCIPLES

PSLB 8.1.5 Disposal of displaced material

REPLACE THE CONTENTS OF THIS SUB-CLAUSE WITH THE FOLLOWING:

"Material displaced by the pipeline and by imported material from sources other than trench excavation, shall be disposed of at an approved site furnished by the Contractor. No haulage is payable for such material."

PSLB 8.1.6 Free-haul

REPLACE THE CONTENTS OF THIS ITEM WITH THE FOLLOWING:

“Notwithstanding any clause in any standardized specification in respect of the definition, no payment will be made for overhaul and all transport shall be regarded as freehaul and the costs thereof shall be covered by the relevant tendered rates in the Schedule of Quantities.”

PSLB 8.2 SCHEDULED ITEMS

ADD THE FOLLOWING ITEM:

PSLB 8.2.6 Extra over items 8.2.1 and 8.2.2 for bedding stabilised with 5% cement ……..... …..Unit : m^3

C3.3 PARTICULAR SPECIFICATIONS

INDEX

PARTICULAR SPECIFICATION: PSPM

DESIGN, MANUFACTURE AND SUPPLY OF STEEL PIPES AND FITTINGS

PSPM-1 SCOPE

This specification covers the design, manufacture and supply of bare electric welded low carbon steel pipes and fittings for the conveyance of water at ambient temperatures and at medium pressures.

PSPM-2 SUPPORTING SPECIFICATIONS

SANS 1200	
SANS 62	Steel Pipes and Fittings up to 150mm NB
SANS 719	Electric welded low carbon Steel Pipes for aqueous fluids.
SANS 044	Welding
BS 5354	Steel Pipes and Specials for water and sewage
BS 2633	Class 1 arc welding of ferritic steel pipework for carrying fluids.
API 5L	Line Pipe
API 1104	Standard for welding pipelines and related facilities.

PSPM-3 APPLICATION

This specification contains clauses that are generally acceptable to the design, manufacture and supply of steel pipes, fittings, and specials for pressures up to 3 MPa. The pipe and specials diameter range from 100Ø to 560Ø to be manufactured from Steel Grade X42.

PSPM-4 MATERIALS

Material requirements shall conform to the relevant clauses of SANS 719 being:

- Steel Plate and Strip
- Chemical Composition
- Physical Properties
- Certification

PSPM-5 MATERIAL THICKNESS

Wall thickness shall be as per Table 2 as per SANS 719.

PSPM-6 DIMENSIONAL REQUIREMENTS

Length of standard lengths to be proposed by the Contractor for approval by the Engineer. Other clauses in SANS 7.9 include:

- General
- Random Lengths
- Exact Lengths
- Dimensions
- Table 2 - Preferred nominal bores, outside diameters and wall thickness of pipe.

PSPM-7 WELDING PROCEDURES

The Contractors welding procedures to be reviewed and approved by the Engineer.

PSPM-8 WELD HEIGHTS

Internal Pipe - 1,0mm max External Pipe - 2,0mm max

PSPM-9 STRAIGHTNESS OF PIPE

The deviation of a pipe from a straight line shall not exceed 0,2% of the length of the pipe.

PSPM-10 PIPE ENDS

Pipe ends shall be clean cut, free from burrs and square to the axis of the pipe. Ends prepared for field welding shall be prepared as follows:

Bevel 30 deg + 5 deg

Root face 1,6mm (Min 1,0mm, Max 2mm)

Maximum deviation from squareness to the axis 1,5mm for pipes up to 500mm NB Maximum deviation from squareness to the axis 3,0mm for pipes above 500mm NB

PSPM-11 OUT OF ROUNDNESS / OVALITY

Using any acceptable method to determine the actual minimum and maximum values of the outside diameter (i.e., the measured values corrected when relevant for sag).

Establish that these values do not vary from the nominal diameter by more than 1% or 6mm.

PSPM-12 NON- DESTRUCTIVE TESTING

Pipes up to 560mm O/D (ERW)

Ultra-Sonic inspection shall be performed on 100% of all longitudinal welds Spirally welded pipes

Ultra-Sonic inspections to be performed on 100% of welds. Radiographic Examinations to be performed on all H or Skelp welds OR

Radiographic inspections / examinations (Fluoroscope) to be performed on all spiral welds.

PSPM-13 WELD REPAIRS

The Contractor to submit a repair procedure for approval by the Engineer. All repair welds to be tested Radiographically.

PSPM-14 HYDROSTATIC TESTING

Pipes shall be capable of withstanding, without leaking or bursting at testing of 1.5 times the working pressure unless agreed otherwise by the purchaser / Engineer.

PSPM-15 DESTRUCTIVE TESTS

15.1 Transverse tensile test

From a cold flattened section of pipe, a test specimen shall be cut as per figure 2 of SANS 719. Do not remove weld reinforcement. Determine the ultimate tensile strength (UTS) by the method in SANS 6892-1.

15.2 Root Bend Test (ERW)

From a cold flattened or as cut section of pipe cut a specimen conforming to figure three of SANS 719. Remove the weld reinforcement and file the arises to a radius no exceeding 10% of the thickness of the specimen. Bend through an angle of at least 180 deg. Check for compliance in ref to SANS 719 5.2.2.2.11.

15.3 Flattening Test

Cut a cylindrical test specimen as per figure four of SAN 719. Ensuring that the weld is at the point of maximum bending flatten the specimen between two parallel surfaces until the outside diameter to which the compression is applied is reduced to not more than two thirds of its original value. No cracks shall be visible on the outer surface.

PSPM-16 QUALITY CONTROL PLAN

Prior to commencement of pipe manufacture the contractor shall submit a Quality Control Plan in respect of the specification. The Quality Control Plan to be reviewed by the Engineer and intervention points noted.

PSPM-17 ENGINEERS INSPECTION

Engineers' inspections will be performed in accordance with the agreed intervention points of the Quality Control Plan.

PSPM-18 STEEL PIPE FITTINGS

18.1 Quality Control Plans

Prior to the commencement of fabrication, Quality Control Plans shall be submitted for review and approval by the Engineer. Prior to the

commencement of fabrication, corrosion protection Quality Control Plans shall be submitted for review and approval by the Engineer.

18.2 Welding Procedures

Prior to commencement of welding, Welding Procedures shall be submitted for review and approval by the Engineer.

18.3 Approved Drawings

Prior to the commencement of fabrication all drawings / shop drawings shall be submitted to the Engineer for review and approval.

18.4 Materials

Material Certificates for all pipes and flanges to be compiled in the manufacturing data book.

18.5 Pipe Wall Thickness

The wall thickness of the pipe shall be subject to tolerance of + 10% or - 8% of the actual specified or required thickness.

18.6 Pipe End Preparation for Butt Welding

Pipe ends to be clean cut, free from burrs and acceptably square to axis. Pipe ends prepared for butt welding shall be bevelled 30 deg + 5 deg. A root face of 1mm min 2mm max is required.

18.7 Pipe end Squareness

Squareness of the axis of the pipe shall not deviate from the following:

- Pipes not exceeding 500mm NB - 1,5mm
- Pipes exceeding 500mm Nb - 3mm

18.8 Welding

All circumferential and longitudinal welds shall be subject to 100% Radiographic examinations (API 1104).

All flange and fillet welds shall be subjected to 100% Liquid Penetration Testing (API 1104).

18.9 Weld Repairs

Should a repair be noted after Radiographic or Liquid Penetrant Testing the weld can be repaired as a repair one status providing the same welding process is used for the repair. Should a weld repaired fail examination it will be considered a repair two status which will require a separate WPS for such repair status. Welds failing examination at repair status two will be considered as a cut out and re-weld status.

18.10 Weld Height

Internal weld height - 1mm max

External weld height - 2mm max

PSPM-19 DIMENSIONS

Dimensions of fittings to comply with approved shop drawings and BS 534.

PSPM-20 FLANGES

Flanges to comply with requirements of SANS 1123 up to 560mm NB. Flanges with pressure rating up to 1600 kPa will have flat faced joint faces. Flanges with pressure rating 2500 and 4000 kPa shall have raised faces.

Flanges falling beyond the range of SANS 1123 shall be in accordance with ISO Standard 7005.

PSPM-21 CONTRACTORS MANUFACTURING DATA BOOK

The Contractor shall maintain a data book throughout the process of manufacture. The content / index of the data book shall be submitted to the Engineer for approval. Items presented for final inspections will have data reviewed prior to release.

PSPM-22 ENGINEERS INSPECTIONS

The Engineers inspections will be performed as per the relevant interventions as noted on the agreed Quality Control Plans.

PARTICULAR SPECIFICATIONS: PSCL

STEEL PIPES COATING AND LINING

INDEX

PSCL1: RIGID POLYURETHANE COATING SYSTEM

PSCL-1.1 MATERIAL

The required external coating shall be a two-component liquid applied polyurethane.

PSCL-1.2 COATING SYSTEM PRE - QUALIFICATION

The coating system shall be identified in the Contractors bid with name and product number. The following certified test reports are required to be submitted:

a) Name of Manufacturer
b) Name, use and type of product
c) Type of Polyol
d) Type of Isocyanate
e) Factory of origin
f) Batch or production lot number
g) Pot life
h) Curing times
i) Time at 23 deg +/- 2 deg to achieve shore "D" hardness (ASTM D2240) at cu
j) Composition (FTR fingerprint)
k) Resistance to abrasion

PSCL-1.3 PROCEDURE QUALIFICATION TRIAL (PQT)

The Contractor shall perform a Procedure Qualification Trial (PQT) prior to production coating. The qualification testing shall verify the following properties:

a) Minimum average Dry Film Thickness (1.7 mm) SANS 2808
b) Shore "D" Hardness (ISO 868)
c) Cut Back - 100mm +/- 20mm
d) Holiday Detection- no defects SANS 1217
e) Impact Resistance - 0,6 kgm (ASTM D 2794 f) Pull off Adhesion- (7MPa) SANS 776
g) Cathodic Disbondment 28 day - (18mm ECD) ASTM G 8
h) Dielectric Strength - (15kV /mm) ASTM D 149
i) Flexibility - ASTM D 522a: 1993
j) Elongation - (10%) ISO 527
k) Resistance to Abrasion - (0.08g) ASTM D 4060

PSCL-1.4 QUALITY CONTROL PLAN

Prior to production coating, a Quality Control Plan shall be submitted to the Engineer for approval. The Quality Control Plan shall be sufficiently detailed to indicate for each discipline the required quality control, inspection and testing referring to relevant procedures.

PSCL- 1.5 SURFACE PREPARATION

Prior to grit blasting surfaces to be inspected for oil and grease contamination. Any oil / grease shall be removed by solvent cleaning using water dispersible cleaners. Salt Tests to be performed once per shift in accordance with the requirements of ISO 8502-6 of less than 20mg/m2 equivalent salt mix.

No grit blasting to be undertaken unless the relative humidity is less than 85% and surface temperature is above 3 deg centigrade above the dew point. The Air temperature, humidity, and pipe temperature to be measured at regular intervals during production shift. Grit Blasting shall only be dry blasting techniques.

A surface profile of 50 microns minimum and 100 microns maximum is required. Any loose dust debris to be removed by use of compressed air, brush, or vacuum cleaner. The blasted surface shall be checked for dust contamination in accordance with SANS Method 769 Dust and Debris with a dust rating of less than 2.

PSCL- 1. 6 VISUAL EXAMINATION OF BLAST CLEANED SURFACES

After blasting cleaning all items to be visually examined for manufacturing defects which include irregular weld profile, welding spatter, pitting.

PSCL- 1.7 ELAPSED TIME PRIOR TO COATING

The elapsed time between completion of surface preparation and coating application shall be kept to a minimum. Relative humidity and dew point temperature to be recorded prior to applications.

% Relative Humidity	Elapsed Time (Hours)
85	0,5
80	1,0
70	1,5
60	1,75
50	2,0

PSCL -1.8 COATING APPLICATION

The coating application shall be in accordance with the approved procedures of the approved Procedure Qualification Trial. Heating shall be by heating coils, radiant heaters or hot air to the temperatures approved by the coating manufacturer.

The use of propane torches / gas burners is not recommended. Temperatures to be measured by temperature indicating crayon or infrared / surface temperature gauges. The application of coating shall be as the manufacturers data sheet.

PSCL- 1.9 COATING APPLICATION VISUAL

The coating shall be uniform and free of runs, sagging or lamination

.PSCL- 1.10 COATING THICKNESS

Coating Thickness Required	
Mean (Average)	1.7 mm
Minimum	1.4 mm (No single measurement less than 1,4 mm)
Maximum	2 mm

PSCL- 1.11 ELECTRICAL INSULATION DEFECT TESTING

EID / High Voltage Holiday Detection to be performed at 5kV per 100 microns.

PSCL- 1.12 ENGINEERS INSPECTION

Engineers' inspections will be performed as required in reference to agreed PQT and intervention points as agreed on approved Quality Control Plans.

PSCL-2: THREE LAYER HIGH DENSITY POLYETHYLENE (3LPL) COATING SYSTEM

PSCL-2.1 MATERIAL

The required external Coating shall be a three layer high density Polyethylene system comprising of:

- Fusion Bonded Epoxy layer
- Adhesive layer
- High Density Polyethylene layer

PSCL-2.2 COATING SYSTEM CERTIFICATION REQUIRED

FBE

- Gel and cure times
- Particle size distribution
- Density
- Moisture content
- Infrared scan
- Thermal analysis
- Water absorption
- Shelf life

Adhesive

- Adhesion
- Density
- Tensile Strength
- Elongation
- Melt flow index

Polyethylene

- Density
- Melt flow index

- Melting point
- Shore Hardness
- Elongation
- Tensile Strength
- Moisture Content
- Carbon black content
- Carbon black dispersion

A 1 kg sample of each of each material and batch should be stored in containers at recommended temperature and be available for a period of two years after applications.

PSCL-2.3 PROCEDURE QUALIFICATION TRIAL (PQT)

The Contractor shall perform a Procedure Qualification Trial (PQT) prior to production coating. For the PQT the contractor shall prepare one pipe with FBE coating only and two fully coated pipes unless other preparations are approved by the Engineer.

Requirements of PQT:

Degreasing	
Chloride Test	ISO 8502
Abrasive Blasting	ISO 8051 - Part 1 - Class Sa3
Profile	ISO 8503 - Part 5 - 50 to 100 microns
Degree of Cleanliness	ISO 8502-3 - less than 2
Acid Wash	
FBE Application	325 microns +/- 75 microns
Adhesive layer	250 microns
FBE + Adhesive layer	600 microns +/- 150 microns
Polyethylene Application	3,0mm to achieve total thickness of 3,5mm for pipes above 600mm diameter
Visual Inspection	
Total cut back	150mm
FBE Toe	50mm +/- 10mm
Holiday Test (FBE only)	5v p/micron
Holiday Test (comp coating)	5v p/micron to max 15 kV
Air Entrapment	App B - CAN/CSA-Z245.20
Adhesion -Peel Test 20 deg c	DIN 30670
Adhesion - Peel Test 50 deg C	DIN 30670
Adhesion - Peel Test 80 deg C	ISO 21809-1
Degree of Cure - FBE only	CAN/CSA Z245.20 - 12.7.3

Cathodic Disbondment 20 +/- 3 deg 1,5v 28 days	CAN/CSA-Z245.20 - 21
Water Absorption Test (FBE)	Test Method to be submitted
Hot Water Resistance	Test Method to be submitted
Resistance to indentation	ISO 21809-1
Impact resistance (FBE)	CAN/CSA Z245-20-02
Impact resistance (PE)	ISO 21809-1
Elongation (PE)	DIN 30670
Flexibility Bend Test (FBE)	Test Method to be submitted

PSCL-2.4 QUALITY CONTROL PLAN

Prior to production coating, a Quality Control Plan shall be submitted to the Engineer for approval. The Quality Control Plan shall be sufficiently detailed to indicate for each discipline the required quality control, inspection and testing referring to relevant procedures.

PSCL-2.5 SURFACE PREPARATION

Prior to grit blasting surfaces to be inspected for oil ang grease contamination. Any oil / grease shall be removed by solvent cleaning using water dispersible cleaners. Salt Tests to be performed once per shift in accordance with the requirements of ISO 8502-6 of less than 20mg/m2 equivalent salt mix.

No grit blasting to be undertaken unless the relative humidity is less than 85% and surface temperature is above 3 deg centigrade above the dew point. The Air temperature, humidity, and pipe temperature to be measured at regular intervals during production shift. Grit Blasting shall only be dry blasting techniques.

A surface profile of 50 microns minimum and 100 microns maximum is required. Any loose dust debris to be removed by use of compressed air, brush, or vacuum cleaner. The blasted surface shall be checked for dust contamination in accordance with SANS Method 769 Dust and Debris with a dust rating of less than 2.

PSCL-2.6 VISUAL EXAMINATION OF BLAST CLEANED SURFACES

After blasting cleaning all items to be visually examined for manufacturing defects which include irregular weld profile, welding spatter, pitting.

PSCL-2.7 ELAPSED TIME PRIOR TO COATING

The elapsed time between completion of surface preparation and coating application shall be kept to a minimum. Relative humidity and dew point temperature to be recorded prior to applications.

% Relative Humidity	Elapsed Time (Hours)
85	0,5
80	1,0
70	1,5
60	1,75
50	2,0

PSCL-2.8 COATING APPLICATION

The coating application shall be in accordance with the approved procedures of the approved Procedure Qualification Trial. The application of coating shall be as the manufacturers data sheet.

FBE Layer

- FBE to be applied to a minimum average thickness of 325 microns
- The pipe shall be uniformly heated
- Surface temperature not to exceed 260 deg c.
- Temperature to be measured with approved / calibrated equipment.

Adhesive Layer

- Adhesive layer application to be applied to a minimum average thickness of 250 microns
- Adhesive layer to be applied prior to FBE before gel time of the FBE has expired.

Polyethylene Layer

The Polyethylene layer to be applied to ensure that the total thickness of the 3LPE (FBE + Adhesive + Polyurethane) is min 3.5mm for pipes over 600mm dia.

PSCL-2.9 COATING THICKNESS

Total Coating thickness to be minimum of 3,5 mm for pipes greater than 500mm diameter.

PSCL-2.10 COATING CUT BACK

Polyethylene cut back +/- 120mm. Pipe ends shall be supplied as bare steel free of all coating for a distance of 100mm (+25mm / - 0mm) from the pipe end.

In addition, each pipe shall be left without Polyethylene / Adhesive coating leaving a 20mm exposed FBE toe. The ends of the Polyethylene coating to be bevelled between 35 and 45 degrees.

PSCL-2.11 ELECTRICAL INSULATION DEFECT TESTING

EID / High Voltage Holiday Detection to be performed at 5kV per 100 microns. Maximum 15 kV setting.

PSCL-2.12 ENGINEERS INSPECTION

Engineers' inspections will be performed as required in reference to agreed PQT and intervention points as agreed on approved Quality Control Plans.

PSCL-3: MDPE COATING SYSTEM (XTALENE)

PSCL-3.1 MATERIALS

The required external Coating shall be a Fusion Bonded Medium Density Polyethylene in accordance with AS 4321 Second Edition 2001.

PSCL-3.2 COATING SYSTEM CERTIFICATION REQUIRED

Batch Certificates

Materials in terms of AS 4232 points 4.1 to 4.3.2

PSCL-3.3 PROCEDURE QUALIFICATION TRIAL (PQT)

The Contractor shall perform a Procedure Qualification Trial (PQT) prior to production coating.

Requirements of PQT:

Degreasing	
Chloride Test	ISO 8502
Abrasive Blasting	ISO 8051 - Part 1 - Class Sa3
Profile	ISO 8503 - Part 5 - 50 to 100 microns
Degree of Cleanliness	ISO 8502-3 - less than 2
Visual Inspection	
Total cut back	100mm
Holiday Test	5v p/micron
Thermal Stability	AS4321- 6.1.2.2
Water Absorption	AS4321- 6.1.2.3
Penetration Resistance	AS4321- 6.1.2.4
Tensile Stress at Yield	AS4321- 6.1.2.5
Environmental Stress Crack Resistance	AS4321- 6.1.2.6
Density	AS1193 (ISO 1183)

PSCL-3.4 QUALITY CONTROL PLAN

Prior to production coating, a Quality Control Plan shall be submitted to the Engineer for approval. The Quality Control Plan shall be sufficiently detailed to indicate for each discipline the required quality control, inspection and testing referring to relevant procedures.

PSCL-3.5 SURFACE PREPARATION

Prior to grit blasting surfaces to be inspected for oil ang grease contamination. Any oil / grease shall be removed by solvent cleaning using water dispersible cleaners. Salt Tests to be performed once per shift in accordance with the requirements of ISO 8502-6 of less than 20mg/m2 equivalent salt mix.

No grit blasting to be undertaken unless the relative humidity is less than 85% and surface temperature is above 3 deg centigrade above the dew point. The Air temperature, humidity, and pipe temperature to be measured at regular intervals during production shift. Grit Blasting shall only be dry blasting techniques.

A surface profile of 50 microns minimum and 100 microns maximum is required. Any loose dust debris to be removed by use of compressed air, brush, or vacuum cleaner. The blasted surface shall be checked for dust contamination in accordance with SANS Method 769 Dust and Debris with a dust rating of less than 2.

PSCL-3.6 VISUAL EXAMINATION OF BLAST CLEANED SURFACES

After blasting cleaning all items to be visually examined for manufacturing defects which include irregular weld profile, welding spatter, pitting.

PSCL-3.7 ELAPSED TIME PRIOR TO COATING

The elapsed time between completion of surface preparation and coating application shall be kept to a minimum. Relative humidity and dew point temperature to be recorded prior to applications.

% Relative Humidity	Elapsed Time (Hours)
85	0,5
80	1,0
70	1,5
60	1,75
50	2,0

PSCL-3.8 COATING APPLICATION

The coating application shall be in accordance with the approved procedures of the approved Procedure Qualification Trial. The application of coating shall be as the manufacturers data sheet.

PSCL-3.9 COATING THICKNESS

Reference to Table 1 AS 43211	
Less than 273mm o/d	1,6 mm
273mm to 508mm o/d	1,8 mm
508mm to 762mm o/d	2,0 mm
Greater than 762mm o/d	2,3 mm

PSCL-3.10 COATING VISUAL

The Coating shall be glossy, free from pinholes, excessive orange peel, bubbling or excessive runs or sags.

PSCL-3.11 COATING CUT BACK

MDPE cut back 120mm +/- 20mm

PSCL-3.12 ELECTRICAL INSULATION DEFECT TESTING

EID / High Voltage Holiday Detection to be performed at 5v per micron. Maximum 15 kV setting.

PSCL-3.13 REPAIR LIMITS FOR FB

Reference is made to AS 4321- 2001 7.2 to 8.1. The Contractor shall provide method statements for the various categories of repair for approval by the Engineer.

PSCL-3.14 ENGINEERS INSPECTION

Engineers' inspections will be performed as required in reference to agreed PQT and intervention points as agreed on approved Quality Control Plans.

PSCL-4: POLYMER MODIFIED BITUMEN COATING SYSTEM (BITUGUARD)

PSCL-4.1 STANDARDS

BS 410	Specification for test sieves
BS 1796	Methods using test sieves of woven wire cloth and perforated metal plate
BS 2000	Method of test for petroleum and its products
BS 3900	Methods of tests for paints Part A 6 (EN 535) determination of flow time if paints Part B2 (ISO / DR 1515) Determination of volatile matter / non- volatile matter
BS EN 10300	Steel tubes and fittings for onshore and offshore pipelines Bitumus hot applied materials for external coating
BS 7079	(ISO 8501 - 8504) Preparation of steel substrates before application of paints or related products.
ISO 8501	Pictorial surface preparation standards for the painting of steel surfaces.
ATM D 113-86	Ductility of bituminous materials
ANSIII AWWAC203	Coal Tar Protective Coatings and linings for steel water pipelines- enamel and tape hot applied
SANS Method 772	Blast profile

PSCL-4.2 PRIMER

The primer shall be of a synthetic composition, designed to be used with a specific polymer modified bitumen. The drying rate of the primer shall be suited to the application conditions. The primer to be supplied in new sealed drums.

Characteristics of primer shall have the following:

Characteristic	Requirements	Method of Test
Viscosity at 23°C	35 - 60 seconds	Flow Cup No 4
Volatile Matter	75 (Max % loss by mass)	BS3900 Part A6

PSCL-4.3 POLYMER MODIFIED BITUMEN

A formulated blend of polymer bitumen as per data sheet provided. Limestone or asbestos not permitted.

PSCL-4.4 FILLER GRADINGS

- Method of test to BS 1796 modified to use the metric sieves specified in BS 410

- Passing 90 microns - not less than 93%
- Passing 250 microns - not less than 99%

PSCL-4.5 PROCEDURE QUALIFICATION TRIAL (PQT)

The Contractor shall perform a Procedure Qualification Trial (PQT) prior to production coating.

Requirements of PQT:

Degreasing	
Chloride Test	ISO 8502
Abrasive Blasting	ISO 8051 - Part 1 - Class Sa3
Profile	ISO 8503 - Part 5 - 50 to 100 microns
Degree of Cleanliness	ISO 8502-3 - less than 2
Visual Inspection	
Total cut back	100mm
Holiday Test	5v p/micron
Softening Point	ASTM D36
Penetration @ 25°C	ASTM D5
Density @ 25 °C	BS 4147
Viscosity at 170° C	Brookfield
Viscosity at 190° C	Brookfield
Filler Content	BS 4147
Impact @ - 10°C	BS 4147
Peel Test @ 25°C	3.0 / 3.0
Peel Test @ 40°C	3.0 / 3.0
Sag 80°C	BS 4147
Ageing Test	Phoenix
Bend Test	BS 4147

Test plates shall be cleaned to abrasive blasting to grade Sa 3. (SANS Method 772).

Impact test requires a plate of 12.7mm thick and a single impact on each quarter of the plate.

PSCL-4.6 COATING APPLICATION

The coating application shall be in accordance with the approved procedures of the approved Procedure Qualification Trial. The application of coating shall be as the manufacturers data sheet.

PSCL-4.7 SURFACE PREPARATION

Prior to grit blasting surfaces to be inspected for oil ang grease contamination. Any oil / grease shall be removed by solvent cleaning using water dispersible cleaners. Salt Tests to be performed once per shift in accordance with the requirements of ISO 8502-6 of less than 20mg/m2 equivalent salt mix.

No grit blasting to be undertaken unless the relative humidity is less than 85% and surface temperature is above 3 deg centigrade above the dew point. The Air temperature, humidity, and pipe temperature to be measured at regular intervals during production shift. Grit Blasting shall only be dry blasting techniques.

A surface profile of 50 microns minimum and 100 microns maximum is required. Any loose dust debris to be removed by use of compressed air, brush, or vacuum cleaner. The blasted surface shall be checked for dust contamination in accordance with SANS Method 769 Dust and Debris with a dust rating of less than 2.

PSCL-4.8 VISUAL EXAMINATION OF BLAST CLEANED SURFACES

After blasting cleaning all items to be visually examined for manufacturing defects which include irregular weld profile, welding spatter, pitting

.PSCL-4.9ELAPSED TIME PRIOR TO COATING

The elapsed time between completion of surface preparation and coating application shall be kept to a minimum. Relative humidity and dew point temperature to be recorded prior to applications.

% Relative Humidity	Elapsed Time (Hours)
85	0,5
80	1,0
70	1,5
60	1,75
50	2,0

PSCL-4.10 PRIMING

Within 4 hrs of grit blasting primer shall be applied as per manufactures recommendations. The primer shall be applied to a dry, clean and dust free surface and thereafter shall be kept free from moisture and other contaminants. Primer to be applied at a temperature of + 15°C.

PSCL-4.11 EXTERNAL COATING APPLICATION

After priming the coating shall be applied through coating facilities approved by the coating supplier. The facility shall coat the pipe including log or spiral weld with a 50 mm wide strip of polymer modified bitumen.

PSCL-4.12 COATING THICKNESS

The coating thickness including outer wrap shall have an average thickness of not less than 5,5mm. Particular coating thickness of 5mm above spiral weld is required.

PSCL-4.13 COATING CUT BACK

PMB cut back 120 mm +/- 20 mm

PSCL-4.14 ELECTRICAL INSULATION DEFECT TESTING

EID / High Voltage Holiday Detection to be performed at 5v per micron. Maximum 15 kV setting.

PSCL-4.15 REPAIR LIMITS FOR PMB

Although the polymer modified bitumen has excellent self-healing properties, damage caused by transportation of the pipes or pipe installation may occur. A repair method statement to be forwarded by the Contractor for Engineers approval.

PSCL-4.16 ENGINEERS INSPECTION

Engineers' inspections will be performed as required in reference to agreed PQT and intervention points as agreed on approved Quality Control Plans.

PSCL-5: TWO LAYER GRE COATING SYSTEM (Stopaq or Similar)

PSCL-5.1 MATERIAL

Corrosion preventing primary coating consisting of a cold applied, non-cross linked, non- crystalline, monolithic viscous pure polyisobuten polymer based, prefabricated wrap coating with cold flow, self-healing, visco elastic properties. Mechanical protective outer layer consisting of layers of Glass Fiber Reinforced Epoxy coating.

PSCL-5.2 COATING SYSTEM PRE - QUALIFICATION

- Name of Manufacturer
- Name, use and type of product
- Factory of origin
- Batch certificates
- Material certificates

PSCL-5.3 PROCEDURE QUALIFICATION TRIAL

- Minimum average thickness of primary coating (0,85mm)
- Minimum average thickness of GRE (1,0mm)
- Impact resistance at min 15 Joule
- Adhesion to substrate – ISO2109:3 2016 Annex H
- Peel Test – Cohesive separation – ISO 21809:3
- Cathodic Disbondment Test (ASM G95,2 G42)
- Indentation Resistance (EN 12068 Annex G)

PSCL-5.4 QUALITY CONTROL PLAN

Prior to production coating, a Quality Control Plan shall be submitted to the Engineer for approval. The Quality Control Plan shall be sufficiently detailed to indicate for each discipline the required quality control, inspection and testing referring to relevant procedures.

PSCL- 5.5SURFACE PREPARATION

Prior to grit blasting surfaces to be inspected for oil and grease contamination. Any oil / grease shall be removed by solvent cleaning using water dispersible cleaners. Salt Tests to be performed once per shift in accordance with the requirements of ISO 8502-6 of less than 20mg/m2 equivalent salt mix.

No grit blasting to be undertaken unless the relative humidity is less than 85% and surface temperature is above 3 deg centigrade above the dew point. The Air temperature, humidity, and pipe temperature to be measured at regular intervals during production shift. Grit Blasting shall only be dry blasting techniques.

A surface profile of 50 microns minimum and 100 microns maximum is required. Any loose dust debris to be removed by use of compressed air, brush, or vacuum cleaner. The blasted surface shall be checked for dust contamination in accordance with SANS Method 769 Dust and Debris with a dust rating of less than 2.

PSCL- 5. 6 VISUAL EXAMINATION OF BLAST CLEANED SURFACES

After blasting cleaning all items to be visually examined for manufacturing defects which include irregular weld profile, welding spatter, pitting.

PSCL- 5.7ELAPSED TIME PRIOR TO COATING

The elapsed time between completion of surface preparation and coating application shall be kept to a minimum. Relative humidity and dew point temperature to be recorded prior to applications.

% Relative Humidity	Elapsed Time (Hours)
85	0,5
80	1,0
70	1,5
60	1,75
50	2,0

PSCL -5.8 COATING APPLICATION

The coating application shall be in accordance with the approved procedures of the approved Procedure Qualification Trial. Heating shall be by heating coils, radiant heaters or hot air to the temperatures approved by the coating manufacturer.

The use of propane torches / gas burners is not recommended. Temperatures to be measured by temperature indicating crayon or infrared / surface temperature gauges. The application of coating shall be as the manufacturers data sheet.

PSCL- 5.9 COATING APPLICATION VISUAL

The coating shall be uniform and free of runs, sagging or lamination.

PSCL- 5.10 COATING THICKNESS

Coating Thickness required	
Mean (Average)	1.85 mm
Minimum	1.85 mm
Maximum	Not Recorded / Known

PSCL- 5.11 ELECTRICAL INSULATION DEFECT TESTING

EID / High Voltage Holiday Detection to be performed at 10kV.

PSCL- 5.12 ENGINEERS INSPECTION

Engineers' inspections will be performed as required in reference to agreed PQT and intervention points as agreed on approved Quality Control Plans.

PSCL-6: SOLVENT FREE EPOXY – LINING AND COATING

PSCL-6.1 MATERIAL

Materials shall be as noted in SANS 1217 Type 1B Point 2.

PSCL-6.2 COATING SYSTEM PRE - QUALIFICATION

The lining system shall be identified in the Contractors bid with name and product number. The following certified test reports are required to be submitted:

a) Name of Manufacturer
b) Name, use and type of product
c) Factory of origin
d) Batch or production lot number
e) Pot life
f) Curing times

PSCL-6.3 PROCEDURE QUALIFICATION TRIAL (PQT)

The Contractor shall perform a Procedure Qualification Trial (PQT) prior to production coating. The qualification testing shall verify the following properties:

Sample or Pipe Number /Plate Number	
Batch Number Details of Surface Preparation	Certificate
Details of Surface Preparation	SANS 12994-4
Date and time of application	Record
Dry Film Thickness Testing	SANS 4.2.4
EID Testing	SANS 4.2.6
Adhesion Testing	SANS Table 1 - ASTM D 4541
Impact Resistance	SANS Table 1 - ASTM D 2794
Resistance to water Immersion in water at 50°C for 7 days	SANS 5.7
Dielectric Strength	SANS 5.9
Resistance to abrasion	ASTM D 4060
Cathodic Disbondment 28 day period at 23° C	ASTM G 8 ASTM D 4060
Flexibility of material	13.1.1 0f ASTM D 522A

PSCL-6.4 QUALITY CONTROL PLAN

Prior to production lining, a Quality Control Plan shall be submitted to the Engineer for approval. The Quality Control Plan shall be sufficiently detailed

to indicate for each discipline the required quality control, inspection and testing referring to relevant procedures.

PSCL-6.5 SURFACE PREPARATION

Prior to grit blasting surfaces to be inspected for oil ang grease contamination. Any oil / grease shall be removed by solvent cleaning using water dispersible cleaners. Salt Tests to be performed once per shift in accordance with the requirements of ISO 8502-6 of less than 20mg/m2 equivalent salt mix.

No grit blasting to be undertaken unless the relative humidity is less than 85% and surface temperature is above 3 deg centigrade above the dew point The Air temperature, humidity, and pipe temperature to be measured at regular intervals during production shift. Grit Blasting shall only be dry blasting techniques.

A surface profile of 50 microns minimum and 100 microns maximum is required. Any loose dust debris to be removed by use of compressed air, brush, or vacuum cleaner. The blasted surface shall be checked for dust contamination in accordance with SANS Method 769 Dust and Debris with a dust rating of less than 2.

PSCL-6.6 VISUAL EXAMINATION OF BLAST CLEANED SURFACES

After blasting cleaning all items to be visually examined for manufacturing defects which include irregular weld profile, welding spatter, pitting.

PSCL-6.7 ELAPSED TIME PRIOR TO LINING

The elapsed time between completion of surface preparation and lining application shall be kept to a minimum. Relative humidity and dew point temperature to be recorded prior to applications.

% Relative Humidity	Elapsed Time (Hours)
85	0,5
80	1,0
70	1,5
60	1,75
50	2,0

PSCL-6.8 LINING APPLICATION

The lining application shall be in accordance with the approved procedures of the approved Procedure Qualification Trial. Temperatures to be measured by temperature indicating crayon or infrared / surface temperature gauges. The application of lining shall be as the manufacturers data sheet.

PSCL-6.9 LINING APPLICATION VISUAL

The coating shall be uniform and free of runs, sagging or lamination.

PSCL-6.10 LINING THICKNESS

Lining Thickness required	
Mean (Average)	600 microns
Minimum	500 microns
Maximum	700 microns

PSCL-6.11 ELECTRICAL INSULATION DEFECT TESTING

EID / High Voltage Holiday Detection to be performed at 5kV per 100 microns.

PSCL-6.12 ENGINEERS INSPECTION

Engineers' inspections will be performed as required in reference to agreed PQT and intervention points as agreed on approved Quality Control Plans.

PARTICULAR SPECIFICATION: PSPS

STEEL PIPELINE INSTALLATION

PSPS 1 SUPPORTING SPECIFICATIONS

SANS 1200

SANS 62 Steel Pipe and Fittings up to 150mm

SANS 719 Electric Welded Low Carbon Steel Pipes for Aqueous Fluids SANS 044 Welding

BS 5354 Steel Pipes and Specials for Water and Sewage

API 5L Line Pipe

API 1104 Standards for Welding Pipelines and Related Facilities SANS 1217 Production of Painted and Powder coated Steel Pipes

SANS 1117 Plastic Wrappings for the Protection of Steel Pipelines

PSPS 2 STORAGE HANDLING AND TRANSPORT OF PIPES, SPECIALS AND FITTINGS

PSPS 2.1 General

2.1.1 Where the supply and delivery of pipes, specials, fittings, valves, other materials and equipment are not included in the pipeline construction contract, the Contractor shall be responsible for:

2.1.1.1 The storage care and insurance of pipes, specials, fittings, valves and other materials and equipment supplied under separate contracts as soon as these have been delivered to site.

2.1.1.2 The receipt, provision of craneage and labour for the off-loading of valves, materials and equipment (excluding pipes, specials and fittings) at the store or alongside the pipeline trench.

2.1.1.3 The provision of suitable access along the pipeline route and within the pipeline servitude for the purpose of off-loading pipes, valves, etc and including:

a. Benching along mild side slopes

b. Handling and stringing of pipes, specials and fittings at very steep inclines where the pipe supplier will stack the pipes, specials and fittings either at the top or the bottom of these inclines.

The pipe supply contractor will be responsible for the off-loading of pipes, specials and fittings on site.

2.1.1.4 Whenever suitable access to the pipeline servitude is not available, the Contractor shall provide and maintain access as instructed by the Engineer.

2.1.2 The Engineer shall be afforded every opportunity of inspecting such materials on their arrival at Site prior to them being off-loaded. If their condition is unacceptable to the Engineer on arrival, the Contractor shall remove them forthwith from the Site and replace such materials at his own cost and to the satisfaction of the Engineer.

2.1.3 Spare pipes shall be stacked where indicated by the Engineer and the damaged reflective coating, shall be repaired.

PSPS 2.2 Transport

Pipes and specials shall only be transported on properly constructed or adapted vehicles containing correctly shaped and padded cradles or with strong, sawdust filled bags separating pipes and vehicle body as well as individual pipes from each other. Special care shall be taken with the transport of all coated steel pipes as damaged coating might be subject to rejection in terms of Clause 2.1.2

PSPS 2.3 Handling

2.3.1 Pipes, specials and fittings shall not be subjected to rough handling at any time. Under no circumstances shall same be dropped during loading or off-loading or be allowed to collide with each other.

2.3.2 Coated steel pipes shall only be lifted be means of broad slings at least 500mm wide support area of pipes up to 500mm NB and 1 000mm wide support area for larger pipes per 12 m length of pipes, or as approved by the Engineer. If more than one pipe is joined, multiple slings shall be used to spread support.

PSPS 2.4 Storage

2.4.1 Pipes shall generally be distributed and stored as closed as possible to the laying position in order to minimise double handling. Where pipes are strung alongside he trench, they should be placed on the side away from excavated material.

2.4.2 Where pipes, specials and fittings are to be stockpiled in bulk storage yards, the Contractor shall make his own arrangements for a suitable area which shall meet with the Engineer’s approval. The stockpiling area shall be adequately fenced and protected by a lockable gate and a watchman shall be maintained at all times.

2.4.3 Pipes and specials shall be strung or stock piled on level, well drained ground in a manner such that they will not be in contact with the ground, tree stumps, or other sharp objects and all vegetation and other combustible material shall be completely removed to at least 5 metres from the nearest pipe or special

2.4.4 Coated steel pipes shall always be supported on a sufficient number of approved soft bolsters to prevent damage or permanent deformation of coatings. Coated pipes shall not be stacked more than two pipes high, each layer separated by bolsters.

2.4.5 The number of layers of bare steel pipes in a stockpile shall not exceed:

$$N = \frac{1\,730 \times Y \times t}{(D-t)^2}$$

Where:

N = Permissible number of layers

Y = Minimum yield stress of steel in MPa

t = Wall thickness in mm

D = Outside diameter in mm

2.4.6 Each class and size of pipe shall be stored separately in its own stockpile.

2.4.7 All rubber rings or other materials which will deteriorate under the action of sunlight, ozone or inclement weather, shall be stored in permanent shade in lockable weatherproof sheds. Welding and the running of welding machines and electric machinery shall not be permitted in or near places where rubber or plastic products are stored and care shall be taken at all times to prevent contamination of these products by oil or other petroleum derived solvents.

2.4.8 Valves shall be stored in orderly groups on prepare floors to prevent damage, distortion or corrosion of flanges or working parts. All metal valves may be stored in the open but full protection shall be afforded to valves with non-metallic seals or working parts. Under no circumstances shall valves be stored in direct contact with the ground.

PSPS 2.5 Record of Material on Site

2.5.1 The Contractor shall keep and maintain a complete and comprehensive record of each pipe, special and fitting delivered to Site. The record shall at least denote the reference number, size, pressure class, location in the pipeline, date condition of delivery and the location of delivery and the location of storage. Copies of the record shall be submitted to the Engineer at the end of each month or whenever requested by the Engineer.

2.5.2 Where pipes, specials and fittings are delivered without reference numbers, same shall be provide by stencilling, labelling or other methods approved by the Engineer.

PSPS 2.6 Repairs

2.6.1 The Contractor shall be responsible for the repair of all defects in pipes, specials, etc, delivered to and accepted on site.

2.6.2 the Contractor shall inspect the coating and linings of all factory coated and lined steel pipes and special as follows:

(i) Epoxy Lining: Shall be inspected in accordance with SANS 1217.

(ii) The Contractor to forward repair procedures for the particular coating approved.

Areas which cannot be tested whilst pipes are supported on cradles or otherwise, shall be tested whist pipe is suspended above the trench immediately prior to laying. Defective areas of linings and coatings shall be marked when detected and shall be repaired, the Engineer's approval, with material specified respectively for the original and/or coating. Repaired linings and coatings shall be inspected and re-tested after repair and shall have the same properties as specified for the original ones.

2.6.3 Repairs to dented steel pipes and special shall only be attempted if he dimensions between the lowest point of a dent and the original pipe contour is less than 2% of the outside diameter of the pipe or special for pipes and specials up to 558,8mm OD and 1% of the outside diameter for larger pipes and specials. Repair of these minor dents shall b done as approved by the Engineer and all such repairs shall be tested by the application of a dye penetrant to detect cracks or laminations in the metal.

2.6.4 Dents in steel pipes and specials of which the depth exceed the above limits and any dents which contain scratches or grooves r which affect the curvature of the pipe barrels at welds shall be cut out by cutting of a length of pipe barrel long enough to eliminate the defect. Damaged sections shall be replaced in accordance with the Engineer's instructions. The ends of pipes intended for field welding shall be rechambered to 30˚ + 5˚ with width of root face 1,6mm + 0,8mm.

PSPS 2.7 Maintenance of Cleanliness

2.7.1 End covers to pipes and specials shall be kept firmly in position until installation of same in the trench.

2.7.2 The interior surfaces of all pipes, specials, valves and fittings shall at all times be kept free from dust, silt, foreign matter and access for rodents, animals and birds shall be prevented. Pipes and specials shall not be used as shelters by staff or the storage of garments, tools, materials, food containers or similar goods. Care shall be exercised at all times to prevent faecal contamination of pipe interior by staff, casual visitors or passers-by.

PSPS 3: LAYING AND JOINTING OF PIPES AND SPECIALS

PSPS 3.1 General

3.1.1 Pipelines shall be laid to straight grades between vertical bends and shall be, within the specified tolerances, to the routes and levels indicated on the approved working drawings.

3.1.2 Pipes shall be laid free cold stresses. No deflections shall be taken in curvature of pipes, but shall be taken with approved prefabricated bends with exceptions as hereinafter specified.

3.1.3 All deflections under 6˚ of the axis of pipelines with flexible joints may be made by spreading the defection over not less than 5 number of joints, provided, provided always that the deflection in any one joint does not exceed those recommended by the manufacturer of the joint after allowance for pipe settlement, heave or other ground or pipe movements.

3.1.4 All deflection in the axis of butt welded steel pipelines of under 11.25˚or les shall be made by scarfing the end of the two pipes to be joined so that the maximum scarf in any one pipe ill be 5,63˚. Where the total deflection is 3˚ or less, the scarfing may be made in one pipe end only. Ends to be scarfed to be carefully and accurately marked and then either machine cut or machine planed. Hand planning shall not be permitted. After scarfing, the pipe end shall be re-chamfered as described in clause 4.15 of SANS 719. The minimum gap between pipe end root faces before welding shall be 1,5mm and the maximum gap shall be 3,0mm. After scarfing all pipe ends shall be thoroughly cleaned before the field weld is carried out.

3.1.5 Except where otherwise provided for, the Contractor shall supply all bolts, nuts, washers, gaskets and other jointing materials for complete installation of pipelines including all specials, fittings, valves, meters, etc.

3.1.6 The tolerances allowable for the installation of pipes and specials shall be the same as those laid down for the manufacture thereof.

PSPS 3.2 SPECIALS

3.2.1 Fabrications

3.2.1.1 All special shall be fabricated, lined and coated where applicable, in the pipe suppliers works with all flanges and openings protected as specified.

3.2.1.2 Except where otherwise approved by the Engineer in writing, the following field welding will be permitted; tie-ins, the attachment of flanges where the exact position and alignment of same are dependent o site conditions e.g. closure pieces an d branches for air and access tees. Scour vales tees shall, however, be manufactured in the factory, pre-aligned to the gradients as indicated on the drawings.

3.2.2 Installation

3.2.2.1 Bends

Bends shall be installed true to line, level and deflection and shall be anchored in concrete where required to counteract thrust. Bends shall normally be supplied with “centre planes” marked with two small punch marks close to both ends of the bends to facilitate correct positioning of the bends in laying.

3.2.2.2 Tees

Tees for air valves shall be installed with branch barrels vertical. Tees for scour valves shall be installed with branch barrels horizontal or at the gradients as indicated on the drawings. Tees for off-takes shall be installed a shown on the drawings.

3.2.2.3 Flanges

All flanges shall be installed with bolt holes off-centre and symmetrically off-set from the vertical centre lines of the flange. Flanges shall be installed truly square to the axis of the pipe.

3.2.2.4 Insulated Flanged Joints

Insulated joints shall be provided and installed by the Contractor where specified or instructed by the Engineer. The Contractor shall supply all materials, labour and equipment and shall complete and prove that each insulated joint after installation in the pipeline ha a resistance well in excess of the resistance to earth of the pipeline on both sides of the insulating joint.

3.2.2.5 Dismantling Joints/Flanged Adapters

Dismantling joints shall be installed where indicated on the drawing or instructed by the Engineer. These will normally be provided to

facilitate the removal of vales or similar fittings from the pipeline. The Contractor shall supply and install dismantling joints with due regard to their pressure rating and mating flanges. The hydraulic pressure restraining tie-bolts shall be carefully installed to tie the pipework across the dismantling joint. Dismantling joint shall be watertight.

3.2.2.6 Thrust Flanges

Where thrust flanges are to be installed on site as for anchoring pipes on steep slopes etc. these flanges shall be supplied by the Contractor split in two equal segments, undrilled with outer perimeter unmachined.

At the point of installation of the thrust flange the pipe coating shall be stripped of the pipe for a distance of 300mm. The flange segments shall be double fillet welded to the pipe barrel around the full circumference and also along both sides of the slit which shall be chamfered for welding. After welding, the coating and lining of the pipe shall be made good.

3.2.2.7 Temporary Closure Pipes

Temporary Closure pieces of the same standard, diameter and wall thickness as the main pipeline shall normally e jointed with flanges and/or flexible couplings, excepts where otherwise specified or instructed by the Engineer.

3.2.2.8 Access Equal-Tees

Access equal-tees shall be required where butt welded pipelines are to be lined in-situ with concrete. These tee shall be spaced throughout the pipeline in accordance with requirements of lining operations. Tees shall be of he same standard, diameter and wall thickness as the pipeline.

PSPS 3.3 MINOR CONNECTIONS AND OFF-TAKES

3.3.1 General

A considerable number of small connections for scours may be installed during the laying of the pipeline but the position of these will only be fixed on site. Typical assemblies of complete minor off-takes are shown on the tender drawings and these consist of branches with an isolating valve fitted in the pipeline, stop cocks, manholes around valves, all in accordance with approved drawings. All off-takes shall terminate at pipeline servitude boundaries.

3.3.2 Steel Pipelines

The contractor shall strip area of pipe coating of 300 x 300 mm. A hole of the required size shall then be cut through the pipe wall in the crown of the pipe and in the centre of the stripped area. A standard boss with female thread of the required size shall be welded over the hole onto the pipe surface using a full fillet weld along the boss perimeter. After removal of welding slag, weld spatter and all foreign matter, the coating and lining shall be made good. The connection shall be off-set from any weld n the pipe barrel. Where the location from the boss in relation to pie ends or access tees is such that it would be difficult to make good linings, a 200mm nominal bore off-take tee with flange shall be welded onto the pipe barrel.. The standard boss shall be provided on a blank flange and the assembly bolted onto the off-take tee.

PSPS 3.4 INSTALLATION OF VALVES

3.4.1 The mass of valves shall at no time be carried by the pipe, the flange or the coupling and valve chamber floor shall preferably be cast complete with valve stools and support immediately after installation of valves and meters. Stools shall not be permitted to carry the mass of a valve until at least 7 days after castings the concrete. Alternatively, prefabrication and welding of pipe and vale supports shall comply with the requirements of SANS 10044 Part III and shall be fabricated to the Engineer’s approval. Supports shall be welded to pipe only where specified and linings of pipe and specials shall be made good after welding.

3.4.2 Valves and meters requiring special adjustment after installation shall be adjusted and commissioned by the respective suppliers or agents after installation.

3.4.3 Butterfly valves shall be installed with the blade seal retaining ring facing upstream.

PSPS 3.5 FIELD WELDING

3.5.1 All field welding shall only be done by welders who satisfy the requirements of API 1104 and who have been tested at the Contractor’s expense by an independent testing authority.

3.5.2 Before any welding of pipeline materials commences, the qualification of welders shall been approved, all detailed welding procedure specifications with weld diagrams required for their completion shall have been submitted for approval in a neat form, and the welding procedure qualification tests shall have been successfully concluded all in accordance with the relevant standard specifications.

Sufficient records shall be kept by the Contractor to ensure that all field welds can be subsequently identified with the welder concerned.

3.5.3 No welding shall be carried out during rain or high wind or under dusty conditions unless the welder, the weld area and the weld are adequately protected and sheltered.

3.5.4 Only welding rods which have been kept dry and uncontaminated shall be used.

3.5.5 Welding rods shall be of a grade and quality such that he chemical composition of weld metal and parent metal is similar.

3.5.6 Initially 100% of the site welds of each welder shall be examined radiographically in accordance with API 1104. When a 100% success rate of at least ten consecutive welds are achieved by a welder, the frequency of testing may be reduced to 10%.

When a weld defect occurs again, the previous ten welds of the welder must also be radiographically examined and the frequency of further tests shall immediately increase to 100%. Any defect in the previous ten welds will activate the testing of ten further welds until a 100% success rate of the ten welds is achieved. The testing rate may always be reduced to 10% after a 100% success rate of ten consecutive welds.

PSPS 3.6 STEEL PIPELINES

3.6.1 General

The out of roundness at a plane perpendicular to the pipe axis at any point along the pipeline length shall not exceed 4% of the minimum as laid inside diameter (i.e. +2% of the nominal internal diameter) after completion of the backfilling and with atmospheric pressure inside the pipe.

Out of roundness being measured as the difference between the minimum and maximum inside diameter of the pipe at a point.

3.6.2 Butt Welded Pipelines

3.6.1 Pipes and specials too be joined by field welding shall be supplied with ends bevelled for welding.

3.6.2 Field welding of joints shall conform to API 1104.

3.6.3 Before welding of joints proceed, pipe ends shall be completely circular and properly mated up by means of backing rings. At least 4 tack welds equally spaced around the pipe perimeter shall be applied to maintain the root gap and position of the pipe for completion of welding. A protective plastic or rubber sheet shall furthermore be

placed over the coating adjacent to the joints to protect same from damage caused by welding spatter.

3.6.4 Root welds shall thereafter be carried out followed by successive filler passes, and capper passes, all in accordance with the approved welding procedure. Wherever it is possible to have entry into a pipe, inside welds shall be applied first. The inner weld bead shall not extend more than 1 mm into the bore of a pipe or special.

3.6.5 Horizontal weld seams or spiral weld seams at pipe ends shall be placed near the horizontal diameter of the pipe or special and shall be staggered so that the circumferential distance between longitudinal or spiral welds intersecting the same circumferential butt weld, is not less than 90 mm nor more than 130 mm apart.

3.6.6 Defects caused by stray welding arc flashes, weld spatter etc. shall be removed by grinding provided that pipe wall thicknesses are not reduced to less than the specified minimum thicknesses, otherwise the portion containing the defect shall be cut out and repaired.

3.6.7 During welding of pipes with organic linings, mats of thick rubber felt other suitable material shall be placed along the pipe invert to protect the pipe lining for the full distance from the point of access up to the point of weld or weld inspection.

The mats shall be of sufficient with and shall cover a sufficiently wide are of pipe invert to protect the lining against damage due o access by staff, equipment, inspectors or fall out from arc weld. Workmen shall wear soft rubber soled shoes before entering lined pipes.

3.6.8 Care shall be taken not to stroke arcs on epoxy lined areas and protective tapes, if any, at ends of epoxy lined pipes shall only be removed immediately prior to welding.

3.6.9 Pipes may be welded together alongside the edge of the trench. For factory lined and coated pipes, the maximum length so welded together shall be such that:

(a) The pipe can be subsequently stored, lifted or handled without damage to linings or coatings.

(b) The out of roundness at a plane perpendicular to the pipe axis at any point along pipe length during storage, lifting or handling does not exceed 4% of the minimum inside diameter. Out of roundness being measured as the difference between the minimum and maximum inside diameter of the plane at the point.

(c) Safe and easy access to internal tie-in welds are assured for staff and inspectorate with equipment.

(d) The maximum length does not exceed 36 metres.

3.6.10 Snaking into the trench of butt welded sections of pipe shall be permissible for bare steel pipes, subject to approval by the Engineer of a complete and comprehensive method statement submitted by the Contractor and provided that the out of roundness as defined and measured above during stage of the snaking operation, does not exceed 4% of minimum internal diameter.

3.6.11 The linings and coatings of pre-lined and coated pipes jointed together outside the trench shall be made good at these joints outside the trench.

PSPS 3.7 PIPELINES WITH FLEXIBLE COUPLINGS

3.7.1 Joints by flexible couplings shall be made only in their final position. Before assembling the joint, care shall be taken to ensure that pipe ends are clean and free from burrs and ridges. Such burrs and ridges shall be removed if present and linings and/or coatings made good where damaged. Pipe ends shall be mated carefully before joints are made. Pipe ends shall be concentric and perfectly lined up and the coupling shall not be relied upon to line up or to support the pipe.

3.7.2 Joints shall be made and couplings assembled to the manufacturer's instructions. Bolts shall be placed with bolt heads alternately pointing in opposite directions.

3.7.3 Two-thirds (2/3) of the number of coupling bolts, equally spaced, shall first be partially tightened up in a regular sequence, using a short spanner. The remaining bolts shall then be similarly tightened. After checking the coupling alignment, the bolts shall then be finally tightened evenly and in a regular sequence by means of a torque wrench.

3.7.4 Where couplings without central registers are used, precautions shall be taken to ensure that the pipe ends are apart by the same distance as if a coupling with central register had been used and the couplings shall carefully be centred over the pipe ends.

PSPS 3.8 Flanged Joints

3.8.1 Flanges shall be truly parallel with all bolts evenly firm before being finally drawn up with torque wrenches to watertightness. Taper gauges shall be used to check that there is a uniform gap before and after final tightening up of bolts. Bolts shall be tightened in an approved sequence with bolts equally spaced and at opposite ends tightened equally first.

3.8.2 The Contractor shall ensure that the correct jointing materials, i.e gaskets, bolts and nuts are available when required. Only correct diameter and lengths of bolts and studs shall be used. Flat washers shall be used under all nuts. The length of bolts and sus shall be such that at least two threads protrude from the nut when fully tightened. The threads of bolts, studs and nuts shall be thoroughly cleaned and then coated with a graphite/grease compound immediately prior to assembly.

3.8.3 Flanged fittings shall be so installed that there are no stresses induced into the pipework, specials or fittings by forcing ill fitting units into position or by bolting up flanges with faces not uniformly in contact with their gaskets over their whole faces.

PSPS 3.9 MAINTENANCE OF CLEANLINESS DURING LAYING

3.9.1 The interior of pipes shall be perfectly clean before being laid the Engineer may instruct pipe interiors to be cleaned or washed before the pipes are lowered into the trench. All brushes, trowels, welding rod stumps, pieces of mortar, dust and all foreign matter shall be removed from pipes immediately after laying. Once a section of pipeline has been cleared, it shall be sealed off and shall not be entered again unless permitted by the Engineer in writing.

3.9.2 The Contractor shall at his own expense make good any damage to valves and fittings or clogging of off-takes or malfunctioning of fittings which result from his failure to keep the pipeline in a thoroughly clean condition.

PSPS 3.10 NIGHT-CAPS

3.10.1 Metal night-caps shall be used to close off all ends of each laid section of pipework is stopped at the end of the day or for longer periods and shall be left on the ends of sections of completed pipework until such sections are tied-in with the remainder of the completed pipeline. The night- caps shall consist of a steel plate welded into a half coupling which must be provided with a sufficient number of lugs to secure the ring and gasket and shall be strong enough to withstand external water and earth pressure in the event of flooding or collapse of earth and the joint shall be watertight.

3.10.2 The Contractor shall also, at his own expense blank-off all air valves and off-takes with 6mm thick blank flanges which shall be bolted with at least four bolts to tee flanges or shall be fixed to plain ended tee branches by half couplings welded to the blank flanges. These shall be watertight and shall not be removed until the valves or other fittings are about to be fitted.

3.10.3 Notwithstanding the use of night-caps the Contractor shall at his own expense make good all damage to pipe linings and fittings caused by the ingress of dirty water, silt, sand, debris, vermin, insects and other foreign matter. The Contractor shall at his own expense and to the satisfaction of the Engineer clean the interior of the pipeline of such contaminants.

PSPS 3.11 PREVENTION OF FLOTATION

3.11.1 Pipes to be encased in concrete shall be prevented from flotation during concreting operations. Apart from this special case during concreting operations, the Contractor shall prevent the flotation of pipework due to stormwater or groundwater entering the trench before backfilling has been completed.

3.11.2 Methods adopted to prevent floatation shall not damage coatings or linings and shall be approved by the Engineer. Notwithstanding this the Contractor shall at his own expense repair all damage to pipework caused by flotation and/or by the methods adopted to prevent it.

PSPS 3.12 REPAIRS TO FACTORY APPLIED COATINGS AND LININGS

3.12.1 For the repair of damages to factory applied Coatings caused by transport, handling and storage the contractor shall submit a repair procedure with method statement for the particular pipe coating supplied.

- The repair procedure shall be in accordance with the manufacturers data sheets. All areas of damages to be assessed for size and category of repair.
- Large areas of damage may require full circumferential tape wrapping with approved tape wrap system.
- The repair of mechanical damages with the use of the tape patches will not be permitted.
- All repairs undertaken shall be subject to visual examination and witness of holiday detection by the Engineer / Appointed inspectorate.
- The Contractor shall keep a record of all repairs on a suitable format approved by the Engineer appointed inspectorate.

PSPS 3.13 REPAIRS TO FIELD WELDED JOINTS

3.13.1 Coatings Repairs / Making good of coatings at field joints shall be with a cold applied tape system. The following systems will be considered.

Stopaq Visco Elastic Tape System

Canusa Visco Elastic Tape System

Denso Visco Elastic Tape System Bitumen Tape System Butyl Tape System

The application of approved Tape Wrap System shall be as the manufacturers data sheets. The contractor shall keep application records on an approved format which shall included:

- Field Weld Number
- Chainage
- Batch number of material
- Date of Surface Preparation
- Date of Application
- Visual Inspection
- Thickness Testing
- Holiday Detection

3.13.2 Internal Linings

Repairs / making good epoxy linings shall be with a two part “squish pack” compatible to the factory applied epoxy.

The application of repair materials shall be as per the manufacturers data sheets.

The contractor shall keep application records on an approved format which shall include:

a) Field Weld Number
b) Chainage
c) Batch number of material
d) Details of Surface preparation which shall include:
    - Preparation / feathering of edges of factory applied Epoxy
    - Grit blasting of field joint
    - Dust and Debris comparisons
    - Surface Profile
    - Date of application
    - Dry Film Thickness Testing
    - EID Testing

All testing t be performed in accordance with SANS 1217.

PSPS 3.14 HYDROSTATIC TESTING

3.14.1 General

Pipelines shall be hydrostatically tested as pipe laying proceeds and after installation of all valves, specials and fittings

The Contractor shall be responsible for providing all water required for testing, the source of which shall be subject to approval by the Engineer.

The Length of pipeline to be tested in one operation shall be as approved by the Engineer.

Where the Method of test is in any way in variance to this specification, the Contractor shall submit a detailed method statement to the Engineer and no test shall proceed before approval of such method statement by the Engineer.

3.14.2 Test Pressures

Test pressures shall be as indicated on the drawings. Test pressures shall generally be 1,25 times the pipeline design pressure for design pressures up to and including 3,2 MPa and 1,1 times the design pressure for higher pressure. Design pressure shall be taken as the maximum pressure to which pipelines might be subject under all conditions of operation and shall include allowance for transient pressures.

Test pressure over any length or section of pipeline under test, taking possible differences in elevation along the pipeline into account, shall be such that the test pressure at any point along the section is not less than 1.1 times nor greater than 1,40 times the design pressure at these points.

3.14.3 Leakage Rates

Leakages of a pipeline under test, taken as the aggregate quantity of water added over a 24 hour period to reinstate required test pressure, shall not exceed quantities equivalent to the following:

Prestressed and reinforced concrete pipeline – 1/3 000 of the volume of water in the section under test.

Steel pipelines with flexible joints – 1/3 500 of the volume of water in the section under test.

Steel pipelines with welded joints – 1/4 000 of the volume of water in the section in the section under test.

The leakage rate at any one joint in the section under test shall not exceed the following:

Q = Allowable leakage in 24 h of pipeline under test in litres/20N

Where:

Q = Leakage rate in litres/hour

N = Number of joints in section under test

3.14.4 State of Valves during Test

The state of valves during the test shall be as follows:

- In-line isolating valves open, except where used to isolate s test length.
- Scour isolating valves closed except as specified
- Off-take isolating valves closed.
- Where two scour valves are provided in series at scour valve chambers the downstream scour valves open.
- Air valve isolating valves open.
- By-pass isolating valves to in-line isolating valves and non-return valves closed.

The Contractors shall be permitted to test against a closed in-line isolating valve. He should bear in mind however that valve gates and seals are not expected to close drop tight at differential pressures exceeding the design pressure of the valve. Design pressures of valves shall be equivalent to a pipeline field test pressure. No relaxation of specified leakage rates shall be permitted due to leaks past gates, blades or seals of isolating valves.

3.14.5 Method of Testing

The Contractor shall provide an approved test pump, an accurate water meter, sealed pressure gauge and autographic pressure recorder, tested and certified by an independent testing organisation, an all other equipment, materials and labour required for the test.

The section of pipeline to be tested shall be clean and closed off as the ends by isolating valves, end caps or approved end-closure pieces. Free ends shall be firmly strutted against solid supports or thrust blocks designed to withstand safely 2 times the calculated end thrust under maximum test pressure. It shall be incumbent on the Contractor to establish the need for blank flanges or isolating valve flanges in order to limit leakage rates pats gates, blades and seals.

Testing water may be introduced at any air valve within the portion of the pipeline under test. A test manifold shall be placed between the selected air valve and its isolating valve. The manifold shall be provided with three branches, each fitted with drop-tight valves. The main branch shall be sized to suit the Contractor’s test pump

connection. The two smaller branches shall not be less than 12mm nominal bore fitted with heavy duty needle valves and reducers to suit pressure gauge connections.

A pressure gauge and an autographic pressure gauge respectively shall be connected to each of the smaller branches. A water meter carrying a valid calibration certificate shall be installed between the pump and test manifold. The Contractor shall accurately determine the reduced level at the autographic pressure gauges and enter this level on the recorder chart.

The Contractor shall also enter the reduced level of the highest and lowest invert of the section under test on the recorder chart.

The section of pipeline to be tested shall be slowly filled with clean water quality to the Engineer's approval, great care being exercised to remove all air from the pipeline. The section of pipeline under test shall be completely filled with water and kept full for not less than 7 days in the case of prestressed and concrete pipelines, not less than 3 days in the case of steel pipelines with concrete linings and not less than 1 hour in the case of unlined steel pipelines or steel pipelines with linings other than concrete.

During this initial filling stage, the pipeline joints and all specials, fittings and valves shall be visually inspected for visible leaks and same rectified before proceeding with the test.

After the specified absorption period and with the pipeline full of water, the autographic recorder shall be put into operation at least 15 minutes before pressurisation of the pipeline commences. Water shall be added until the required test pressure is whereupon the valve on the test manifold shall be closed and sealed. The reading on the water meter shall be recorded.

The pressure shall be maintained for one hour and if a pressure drop occurs, more water shall be added to reinstate the test pressure and the valve closed again. The quantity of water added shall be measured by recording the readings before and after pumping.

This procedure shall be repeated for a period of 24 hours, with water added at hourly intervals where necessary to reinstate pressure and water meter readings recorded. At the end of the 24 hours period, the aggregate quantity of water required to reinstate pressure over 24 hours shall be determined.

The Contractor shall give the Engineer 48 hour's written notice of this intention to commence pressure testing and the Engineer may attend and supervise all or any part of tests. All records, recording

charts and the attached duly competed hydrostatic test certificate shall be handed to the Engineer as soon as test over any section have been completed.

All valves, specials, fittings and exposed joints, shall be inspected visually during the 24 hours pipeline test and all visible signs of leaks, sweating and distress shall be reported and attended to without delay.

Immediately after completion of the prescribed 24 hours hydrostatic test, all air valves shall be tested in turn before test pressure in the pipeline in released. Each air valve shall be isolated and the drain plug removed. The air valve balls or floats and any actuating linkage shall work freely without restraint. The isolating valve shall be checked for leakage before replacing the plug. Finally, the automatic resealing of the air valves shall be checked by re-opening the isolating valve.

After completing of test on air valves, the section of pipeline under test shall be completely refilled with water, if necessary, any pressurised to static head shown on the drawings. Each scour valve shall be checked by opening isolating valves and sleeve valves where applicable for a duration sufficient to check the complete opening and closing cycles. If necessary, the pipeline shall be refilled after each individual test and re-pressurised to static pipeline head in order to test all scours within the section under test.

3.14.6 Remedial Measures

Should the maximum leakage limits as specified be exceeded, the Contractor shall determine the position and cause of the leaks and shall take remedial measure at his own expense and to the satisfaction of the Engineer to stop such leaks and ensure the specified degree of water tightness.

Under no circumstances shall peening be permitted as a means for stopping leaks, nor shall the pipeline be allowed to remain under extended period of pressure to allow self-sealing with or without sealing aids in the test water. Any leakages from valves not supplied under this contract and which cannot be easily stopped by gland adjustment will be the responsibility of the valve supplier. The Contractor shall in the case of latter event occurring provide and install blank flanges to seal off leaks and to allow testing operations to proceed or to be speeded-up. The supply and installation of these blank flanges shall be coved by a variation to the contract at the rates indicated in the Bill or Schedule of Quantities.

If during the Defect Notification or Liability Period, as applicable, the number of leaks and other defects is considered by the Engineer to be more than could reasonably be expected from a well laid pipeline operating under normal conditions, he may order the Contractor to re-test parts or the whole of the pipeline at the Contractor's own expense and no claims for escalation in costs or for whatever other reasons the Contractor might consider to submit claims shall be considered, except where such re-tests are the result from damages caused to the pipeline by the Employer.

PSPS 3.15 CONTRACTORS QUALITY MANUAL / QUALITY CONTROL PLANS

The Contractor shall submit a Quality Manual / Quality Control Plan that should at least contain the following for review and approval by the engineer.

- Welding Procedures
- Inspection and Test Plan / Quality Control Plan for pipe installation
- Inspection and Test Plan / Quality Control Plan for external coating at field joints
- Inspection and Test Plan / Quality Control Plan for internal lining at field joints
- Data Sheets for external coating medium at field joints
- Data Sheets for internal lining medium at field joints
- Method statement for the repair of factory applied coatings
- Method statement for the repair of factory applied linings
- Method statement for Hydraulic testing
- Control Document for Materials receipt
- Control Document for Holiday Detection prior to pipelay
- Control Document for Holiday Detection prior to backfill
- Control Document for Welding of field joints'
- Control Document for NDE requests
- Control Document for filed joint coatings
- Control Document for filed joint linings
- Control Document for chainage records
- Control Document for pressure test record

PSPS 3.16 INSPECTIONS

3.16.1 Radiographic Examinations shall be performed on the first ten production welds of each elder / operator.

If consistent results are obtained (no welding repairs) the Engineer may consider a reduction in examination frequency.

Should the frequency of Radiographic Examinations be reduced and weld repairs occur the frequency shall be increased.

All field welds will be visually examined externally / internally.

Fillet welding on site will be examined by Liquid Penetrant or Magnetic Particle test methods.

All coatings and linings of field joints will be examined by the Engineer or appointed inspectorate for compliance to the Inspection and Test Plan / QCP's.

The Contractors data books will be reviewed on a weekly basis

PARTICULAR SPECIFICATION

PSVA: DESIGN, MANUFACTURE AND INSTALLATION OF VALVES

PSVA 1 SCOPE

This specification deals with the supply and delivery of the following types of valves for controlling the flow and pressure of treated and untreated water at temperatures not exceeding 50º C in small and large diameter medium pressure pipelines:

a) Wedge type Gate Valves
b) Butterfly Valves
c) Non-Return Valves
d) Air Valves

PSVA 2 APPLICABLE SPECIFICATIONS, STANDARDS AND DEFINITIONS

PSVA 2.1 SUPPORTING SPECIFICATIONS

Where this specification is required for a project, the following codes, specifications and standards shall, inter alia, form part of the contract document:

a) DWS 2510
b) SANS 1123
c) SANS 664
d) BS 5155
e) ISO
f) DIN
g) ANSI

When reference is made to a code, specification or standard, the reference shall be taken to mean the latest edition of the code, including addenda, supplements and revisions thereto.

PSVA 2.2 DEFINITIONS

For the purposes of this specification the definitions and abbreviations given in the applicable specifications listed in PSVA 2.1 above:

a) Face to face dimensions: The distance between the two planes perpendicular to the body axis located at the extremities of the body and ports.

b) Nominal pressure (PN): All pressure units throughout the valve specification will be recorded in kPa taking into account the following:
   - The maximum allowable working pressure depends upon the materials, design and working temperature and shall be selected from the pressure/temperature rating tables in the appropriate standards.
   - It is designated by PN followed by the allowable working pressure.
   - This definition is in accordance with ISO 7268.

c) Nominal size (DN): A numerical designation of size that is common to all components in a piping system other than components designated by outside diameters. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions in mm.

PSVA 3 DEVIATIONS

The Employer shall not permit any substitution or deviation from the requirements of this Specification without prior approval. Any substitution or deviation from the original Specification shall be submitted to the Engineer for approval. Deviation shall only be considered during the tender stage of the project.

PSVA 4 QUALITY CONTROL

PSVA 4.1 QUALITY MANAGEMENT SYSTEM

The valve manufacturer and all manufacturing subcontractors shall have a Quality Management System in accordance with ISO 9001, which shall be certified by a recognised certification authority or body. Proof of ISO 9001 certification for the valve manufacturer and all subcontractors shall be provided at time of tender.

PSVA 4.2 RESPONSIBILITY FOR QUALITY

The manufacturer shall implement a comprehensive Quality Control programme and accept full responsibility for the quality of his workmanship and material used, irrespective of any quality surveillance that may be carried out by the Engineer or his appointed representative.

In keeping with the principles contained in the abovementioned code of practice, the manufacturer or any nominated or approved subcontractor(s) shall :

a) Be responsible for compliance with all the clauses of this specification in every respect;

b) Carry out all inspections and tests called for in the specification in the presence of the Engineer or his appointed representative. The cost of these inspections and tests shall be included in the tender price; and

c) Draft a quality control plan for manufacture indicating all the intended stages of testing during manufacture, cleaning, preparation and application of the corrosion protection system specified, as well as hold points for independent quality surveillance.

PSVA 4.3 NOTICE OF INSPECTION

The Engineer shall be notified at least seven days in advance, or as otherwise agreed, of impending inspections or when cleaning and first coating are to be carried out as well as for witnessing the points in terms of the agreed Quality Control Plans.

PSVA 4.4 SUBMISSION FOR APPROVAL

The following shall be submitted to the Engineer, including data sheets where applicable, for approval before work is started:

PSVA 4.4.1 Manufacture

a) Drawings, including general arrangement and detailed drawings;
b) Programme;
c) Quality control plan;
d) Draft Operational and Maintenance Manual.

PSVA 4.4.2 Corrosion protection

a) Programme;
b) Quality control plan;
c) Details of blast materials;
d) Details of coating products;
e) Details of pickling and passivating products.

PSVA 4.4.3 Manufacture and corrosion protection programme

The manufacture and corrosion protection programmes shall state the time and place when the following will be conducted :

a) Inspection of material;
b) Hydrostatic testing of uncoated castings, pipes and fittings;
c) Manufacture of components;
d) Fettling or dressing;
e) Degreasing;
f) Water soluble salts test;
g) Blast cleaning and application of first coat;
h) Application of intermediate and final coats;
i) Commencement of site repairs.

PSVA 4.5 SUBSTANDARD QUALITY CONTROL

All material, certification and records of the manufacturer shall be subject to examination by the Engineer.

This shall include the checking and testing of equipment. If any deviation is found, additional testing and quality surveillance shall be carried out.

If the additional testing confirms inaccurate quality control by the manufacturer, all work shall be stopped and shall only proceed after remedial action has been implemented.

PSVA 4.6 ACCESS FOR SURVEILLANCE

For the purpose of carrying out surveillance, the Engineer or his representative shall be granted access to any part of the manufacturer's premises relevant to the work being carried out, at any reasonable time.

PSVA 4.7 COST OF QUALITY CONTROL

The cost of quality control shall be included in the tender price. When surveillance results in rejection of the lot or when notice by the manufacturer results in a fruitless trip, the cost shall be recovered from the Contractor appointed under the Contract.

If additional inspections, tests and analyses requested by the Engineer prove that the manufacture and/or corrosion protection is in accordance with the specifications, the costs of the inspections and/or tests including transport and accommodation, if applicable, shall be paid by the Employer. Should however the additional investigations prove that the manufacture and/or corrosion protection is not in accordance with the specifications, the cost shall be recovered from the Contractor.

The Employer shall have the right, without prejudice to any other legal remedy, to deduct such costs from payments due to the Contractor under the Contract.

PSVA 4.8 NON-COMPLIANCE WITH THE SPECIFICATIONS

Valves, associated equipment, materials and corrosion protection that do not confirm to the requirements of this Specification shall be rejected.

Such rejected valves, associated equipment, materials and/or corrosion protection shall be held at the cost of the Contractor who shall, when called upon, and at his own cost, repair the defects or corrosion protection according to the Contract.

Failing satisfactory repair of rejected valves, associated equipment, materials and/or corrosion protection, the valves, associated equipment and materials shall be returned to the Contractor, as applicable, at his cost and risk without any opportunity to substitute the rejected equipment. Alternative valves, associated equipment or materials may be purchased by the

Employer at the Contractor's expense or an approved contractor may be appointed to repair the valves, associated equipment, materials and/or corrosion protection.

PSVA 4.9 FINAL ACCEPTANCE

No valves, associated equipment or materials shall be accepted nor be delivered to site unless all Quality Control requirements have been complied with.

PSVA 4.10 QUALITY CONTROL RECORDS

PSVA 4.10.1 Coating and material records

Quality control, material and coating records for all stages of the work, i.e. batch numbers of materials used, environmental conditions and all test data shall be recorded on the approved Quality Control Plan for manufacturing and corrosion protection.

Certificates for all materials used shall also be required.

PSVA 4.10.2 Data sheets, specifications and codes of practice

The Manufacturer shall have available the latest issues of the following :

a) A copy of this Specification;

b) Relevant Standard Specifications and Codes of Practice;

c) Data sheets for materials used.

PSVA 4.10.3 Quality control records

Accurate and detailed quality control records shall be kept by the Contractor for all stages of the manufacture and supply of the valves and associated equipment and materials.

All quality control records shall be available for inspection by the Engineer or his representative.

Incomplete, inaccurate or inadequate records shall be regarded as non-compliance with the specifications.

The collection of documents for each valve or item or equipment shall be collated and bound in a logical manner and retained by the Contractor as proof of quality achieved. These shall be available on demand for quality control and payment releases. No payment for any valve shall be made unless the quality control records have been made available to the Engineer. The records shall be handed over to the Engineer on completion of the Contract or bound into the Operation and Maintenance manuals where such manuals are supplied.

PSVA 4.11 QUALITY SURVEILLANCE BY THE ENGINEER

PSVA 4.11.1 Inspection by the Engineer

Inspection of valves and equipment shall be carried out by the Engineer, his representative or a nominated and approved inspection authority at the manufacturer's and corrosion protection applicator's works.

Inspection by the Engineer, his representative or a nominated and approved inspection authority shall in no way relieve the manufacturer or Contractor of any of their obligations to design, manufacture and supply valves and equipment of the quality and workmanship required in terms of the Contract.

PSVA 4.11.2 Independent surveillance

The Engineer may employ an independent, technically qualified person or organisation to carry out quality surveillance of the work on his behalf.

The inspection authority has the right to inspect any item covered in the Contract at any stage of execution of the Contract.

Where imported valves or supplies are to be inspected before shipment, the Contractor shall notify his suppliers abroad of the conditions applicable to inspections and also request them to notify the Engineer when consignments are ready so that arrangements can be made for the required inspections.

PSVA 4.11.3 Material tests

The manufacturer's material test data certification and quality records shall be subject to examination by the Engineer or his representative. Reasonable samples of the cleaning and coating materials shall be provided for testing at the Engineer's discretion.

Rejection of the materials shall place a hold on the use of the materials of the same batch number and any components that have already been cleaned / coated with rejected material shall be reworked at no additional cost to the Employer.

PSVA 4.11.4 Destructive testing

The Engineer or his representative may carry out reasonable destructive tests to ascertain compliance with the corrosion protection specifications. Areas thus damaged shall be repaired by the Manufacturer / Contractor to the satisfaction of the Engineer at no additional cost.

PSVA 5 GENERAL CONDITIONS AND REQUIREMENTS

PSVA 5.1 NOMINAL PRESSURE

Each valve is assigned a nominal pressure (PN) in kPa and shall be tested in accordance with these specified pressures.

PSVA 5.2 MINIMUM PRESSURE RATING

1 000 kPa is considered to be the lowest acceptable pressure rating for any valve irrespective of lower system pressures.

PSVA 5.3 DESIGN LIFE

All valves and appurtenant fittings shall be designed for a useful life of forty-five (45) years under the operating conditions specified in the Project Specification.

PSVA 5.4 GUARANTEE

All valves shall be guaranteed against faulty design, materials and workmanship for a minimum period of ten (10) years from date the Completion Certificate, unless otherwise specified. During this period the Contractor shall attend to and rectify at his own cost any defects that can be attributed to faulty design, materials and workmanship. Normal wear and tear shall be excluded.

PSVA 5.5 FLANGES

Unless specified under the Project Specification, all valves shall be double flanged and drilled off centre to SANS 1123. Flange thickness shall be in accordance with BS 4504 for cast iron valves and SANS 1123 for fabricated valves.

Should a required flange size fall beyond the range of SANS 1123, mating dimensions shall be in accordance with BS 4504.

Flanges with a pressure rating between 1000 - 1600 kPa shall have flat joint faces machined in accordance with the above SANS or BS specifications. Flange pressure ratings that exceed 1600 kPa shall incorporate an “O” ring sealing arrangement. Details of the proposed “O” ring groove shall be furnished at the tendering stage for consideration.

Flange sizes exceeding and including DN 1500 shall however incorporate an “O” ring sealing arrangement irrespective of pressure rating.

The periphery of all flanges shall be machined to the correct outside diameter dictated by the flange pressure rating. Flanges for pipes and fabricated valves shall be machined on both faces.

All holes, shall be drilled perpendicular to the face and spot machined on the bolt head / nut bearing faces.

Sufficient clearance shall be allowed between the body and flange to enable flange bolts to be removed or tightened. Tapped holes shall only be permissible where stiffening ribs or shaft bosses interfere with bolts.

One flange of the valve body shall be clearly marked, identifying the respective pressure rating (Refer to Paragraph 5.12).

PSVA 5.6 JOINTING MATERIAL AND FASTENERS

Valves shall be supplied complete with bolt units, consisting of a standard length bolt, nut and two washers. The stud unit, where applicable, shall be supplied with a standard length stud, nut and washer. A washer shall be fitted under all bolt / screw heads and nuts.

The shortest standard bolt or stud that protrudes beyond the nut by a minimum of two threads when the assemblies are fully tightened shall be used. The same applies to stud units. The amount by which the bolt or stud protrudes beyond the nut shall therefore not exceed 10mm plus 2 threads. Care shall be taken to ensure that the correct bolt length is used taking into account the actual flange thicknesses on the particular installation.

Where hot dip galvanised bolts are used, the bolts may not be cut, after galvanising, to comply with the abovementioned length specification.

The manufacturer shall specify a fastening sequence for bolts (if applicable) and the torque settings (in Nm) for all bolts. These torque settings and

fastening sequences shall be included in the Operation and Maintenance Manual.

In addition each valve shall be supplied with full-face gaskets or "O" rings for joining up to adjacent flanges.

Depending on the valve location in a piping system and the atmospheric conditions, the following specifications will apply:

a) Black bolted units to SANS 135;
b) Precision bolted units to SANS 136;
c) Galvanised bolted units to SANS 763;
d) Stainless steel bolted units to DIN 931;
e) Stainless steel set screws to DIN 933.

For all valve components, i.e. bonnet covers, glands etc., drilled holes for bolts shall be perpendicular to the flange face.

All bolts and stud units shall be the same length and appropriate size. When required by the Project Specification, isolating bolt units shall be supplied with bolt, nut, two washers, an isolating sleeve and two isolating washers.

PSVA 5.7 CONTACT BETWEEN DISSIMILAR METALS

The Contractor shall ensure that metals and alloys are compatible or are adequately protected if, in the galvanic series, there is more than 0,3 Volt difference in the galvanic potential.

PSVA 5.8 VALVE SUPPORTS AND LIFTING

Valves of DN 400 and larger shall have supporting feet cast integrally with the valve body.

Each valve over DN 300 or 100 kg mass, shall have two eye bolts of the required strength securely attached to the valve body to facilitate easy handling during transport and installation.

PSVA 5.9 BYPASSES

Where specified in the Project Specification, valves shall be fitted with bypasses and bypass valves. Piping shall be flanged.

Bypasses shall be bolted to the valve body and not to the adjoining pipe work. Piping and fittings shall be hot dipped galvanised after fabrication.

PSVA 5.10 WELDING

Welding shall be in accordance with BSS 2633 and BSS 5135 for mild steel and BSS 4677 for corrosion resistant steel.

Welding of flanges shall be in accordance with BSS 806 Type 6.

Weld strength shall be at least 90 % of that of the plate calculated on the original measured thickness of the plate before welding.

The welding process used should limit heat input to a minimum and can include manual metal arc (MMA) and metal inert gas (MIG).

PSVA 5.11 PRESSURE GAUGES

Where specified in the Project Specification, valves shall be fitted with glycerine filled pressure gauges complete with separate stainless steel isolating ball cocks. The pressure gauges shall in general conform to SANS 1063.

The gauge face shall have a minimum diameter of 100mm with black lettering and needle on a white background. A red line or needle shall indicate the maximum safe working pressure, where applicable. Pressure gauges shall be calibrated in increments of 5 % of the full scale reading. The normal working pressure shall give a reading of between 50 and 75 % of the full scale.

PSVA 5.12 MARKING

PSVA 5.12.1 General

Each valve shall be clearly marked in accordance with the requirements of BS 5418.

PSVA 5.12.2 Body marking

All valve bodies shall be permanently and indelibly marked (cast in 15mm minimum lettering size on castings or welded on fabricated valves) as follows:

a) Nominal size (DN in mm);

b) Nominal pressure (PN in kPa);

c) Arrow to indicate the direction of flow;

d) The contract number plus identification number to identify each individual valve;

e) Material of construction.

The above markings shall be legible after painting.

In order to facilitate identification at the factory and at site, all valve bonnets, gates, discs, doors, etc. shall be permanently marked (cast in or welded on in 15mm minimum lettering) with the contract number and an identification number for each individual valve.

In addition to the above, one flange for a flanged valve shall be clearly marked with a single set of machined notches (at least 3mm wide, 3mm deep and the length of the notch to suit the width of the flange). For wafer type valves, the width and depth of the notch shall be identical to that of the flanged valves. The length of the notch however shall be 8mm long for the following operating pressures:

a) One notch - 1000 kPa
b) Two notches - 1600 kPa
c) Three notches - 2500 kPa
d) Four notches - 4000 kPa

PSVA 5.12.3 Identification plate markings

Identification plate markings shall be hard-stamped, printed or engraved on a stainless steel nameplate fitted to the valve with stainless steel screws. If necessary a boss / raised face shall be cast as part of the body to fit the nameplates.

a) Information listed on a name plate shall be as follows:
b) Manufacturer's name or trade mark;
c) Nominal size (DN);
d) Contract number;
e) Nominal pressure (PN) in kPa;
f) Serial number;
g) Item number;
h) Material, disc/gate and body;
i) Date of manufacture;
j) Mass of valve in kg;
k) BS/SANS specification.

PSVA 5.12.4 Position indicators

Position indicating plates shall be embossed to clearly show the fully open and closed positions as well as the ¼, ½, and ¾ intermediate positions.

Electronic position indicators are preferred. Full details must however be supplied with the offer. Special valve position indicators, calibrated in the specified increments of the valve opening, shall be designed, supplied and installed as required in the Project Specification.

The indicator system shall be accurately installed and calibrated to give true linear indication of the valve opening. Calibration of the indicator scale shall be done in- situ and directly recorded against the actual valve operation.

All pulleys, brackets, pins, cables, counterweights, sleeves, indicator gears and fasteners shall be of stainless steel 304 or better.

PSVA 5.13 PRESSURE TEST REQUIREMENTS

Valves shall be pressure tested by the manufacturer to prove that all the fully assembled valves are capable of functioning satisfactorily under the specified operating conditions.

All materials and workmanship shall be the best of their respective kinds and shall be subjected to the tests prescribed in the latest amendments of the relevant SANS or BS Specifications.

All final product testing shall be carried out to the methods and tolerances specified in the relevant SANS or BS Specifications.

The supplier shall bear the cost of carrying out the tests prescribed by the codes.

PSVA 5.13.1 Pressure testing

Test flanges shall be used, tapped holes in valve bodies are unacceptable. Tie-bolts or other forms of restraint applied across the blank flanges for the testing of flanged valves shall not be permitted.

Note :

a) No valve undergoing pressure testing shall be subject to shock loading.

b) Valves and connections shall be purged of air prior to pressure testing.

PSVA 5.13.2 Test fluid

The test fluid for all pressure tests shall be either water with the addition of a suitable inhibitor, or another liquid whose viscosity at ambient temperature is equal to or less than that of water.

PSVA 5.13.3 Test procedures

General

Test pressures shall be maintained for not less than a two minute duration or as otherwise specified by the Engineer and the valves shall be watertight in all respects.

Structural and seat test shall be executed on both sides of double seated valves i.e. gate valves.

All valves, completely assembled, shall be pressure tested by the manufacturer in accordance with Table 1.

TABLE 1 : APPLICABILITY OF PRESSURE TESTS

TEST	SERVICE APPLICATION		
	TIGHT SHUT-OFF	LOW LEAKAGE	REGULATING
Structural			
(i) Body	√	√	√
(ii) Disc strength	√	√	N/A
Seat/Seal	√	√	N/A

Structural test

All structural tests shall be done at 1.5 x maximum permissible working pressure at ambient temperature.

Seepage past gland seals during structural tests shall not be cause for rejection, provided that the gland seals are watertight when the internal pressure is reduced to the maximum permissible working pressure at ambient temperature.

Body

Testing shall be carried out before valves are coated or lined with materials that are capable of sealing against leakage. Both ends of the body shall be blanked off so that the valve is subjected to the full pressure stresses in all directions induced by the test pressure.

The valve disc shall be in the open or partially open position during the test. There shall be no visually detectable leakage through the shell of the valve during the test period.

Disc / Gate strength

The valve shall be closed in the normal manner, and the test pressure applied to one side of the disc with the other side open to atmosphere. There shall be no visible evidence of structural damage to or deformation of the disc or of leakage through the disc during the test duration.

Seat / Seal test

Each assembled valve shall be subjected to open-end tests for leakage up to 1.1 x the permissible working pressures at ambient temperature. Valves shall be drop tight over the complete range of pressures. Valves with symmetrical seatings shall be tested in either direction.

The maximum permissible leakage shall be as given in Table 2.

TABLE 2 : TEST PRESSURE LEAKAGE RATES

VALVE TYPE	LEAKAGE RATE
Tight shut-off	Rate 3 * : No visible leakage for duration of test.
Low leakage	Rate 1 : 0.1 mm^3/s x DN

* Leakage rates are defined in BS 5146 : Part 2.

PSVA 5.13.4 Hydraulic testing

Before dispatch to site, valves shall be tested at the manufacturers' works in accordance with the requirements of Table 3 below, as applicable.

The Engineer may request that certain testing procedures be witnessed. In such case, the Contractor shall ensure that at least 48 hours written notice be given to the Engineer to enable the tests to be witnessed.

TABLE 3: HYDRAULIC TEST REQUIREMENTS

Class & Working Pressure (MPa)	Test Pressure on Body (MPa)	Test Pressure Gate/Disk (MPa)	Droptight Pressure (MPa)	Applicable Standard
Wedge Gate and Resilient Seal Valves				
Class 10	2,0	1 ,5 up to 450Ø	1,0	SANS 664
Class 16	3,2	2,4 up to 450Ø	1,6	
Class 25	5,0	3,7 up to 450Ø	2,5	
Class 40				
Butterfly Valves				
Class 10	1,5	1,5	1,1	BS 5155
Class 16	2,4	2,4	1,75	
Class 25	3,7	3,7	2,75	
Class 40				
Non-Return (Check) Valves				
Class 10	1,5	1,0	N/A	SANS 1551
Class 16	2,4	1,6	N/A	
Class 25	3,7	2,5	N/A	
Class 40			N/A	

PSVA 5.13.5 Test certificates

All valves must be supplied with hydraulic test certificates. In the case of valves smaller than 350mm diameter, a certificate for the batch, if more than one valve is ordered, will be acceptable.

The test certificates for individual valves shall have a specific code / number which relates to the same code / number on the valve;

(a) contain a statement by the manufacturer that the valve(s) have been tested in accordance with this standard; and

(b) state the actual pressures and medium used in the test.

PSVA 5.13.6 Anti-static

Valves designated as anti-static shall have electrical continuity between shaft, disc and body when tested in accordance with A.2 of BS 5146 : Part 1.

PSVA 5.14 FUNCTIONAL TEST REQUIREMENT

The manufacturer shall do a functional test on each valve. This shall consist of taking the valve through one complete cycle, from fully closed to fully open and back. The manufacturer shall take particular note that the valve position indicator is correctly calibrated.

PSVA 5.15 EQUIPMENT DRAWINGS

The Contractor shall submit drawings for the following purposes :

- Tendering;
- Manufacture for approval;
- Installation for approval;
- As-build records.

No valve shall be supplied prior to the Engineer approving the manufacturing drawings. Any valve supplied before the drawings are approved, shall be at the Contractor's risk.

PSVA 5.16 OPERATING AND MAINTENANCE MANUALS

Five copies of Operating and Maintenance Manuals shall be supplied. A Draft copy of the manual shall be submitted for approval before the final copies are submitted.

PSVA 5.16.1 Contents

The purpose of these documents is to simultaneously provide a permanent and accurate record of all the equipment provided as well as a usable guide in simple language covering operating, maintenance and fault finding procedures.

PSVA 5.16.2 Binding

The manuals shall be securely bound in A4 size, hard backed plastic / waterproof 4- ring binders, with clear pockets on the spine and front cover for the insertion of title slips, giving the Contract Number, Scheme, Dam and a description of the equipment supplied.

Drawings larger than A3 size, index and other title pages shall be contained in separate plastic pockets, bound in the appropriate section.

PSVA 5.16.3 Layout

The sections shall be separated by plastic dividers, clearly and visibly marked to match the index, and shall be set out as follows:

(a) Title page
(b) Index
(c) Specification and Technical Schedules
(d) General description with test certificates and final test certificate relating to any tests carried out;
(e) Operating Instructions: These shall be clear, concise and easy to follow and must include, where applicable, pre-start, safety and shut-down procedures;
(f) Routine maintenance and lubricating schedule;
(g) Fault diagnosis and repair procedure;
(h) Detailed schedule of plant components giving materials, corrosion protection, part numbers, etc.;
(i) Spare parts list: Suppliers / Agents details must be provided;
(j) Drawings. They shall include: general arrangements, assembly drawings, hydraulic and electrical diagrams, parts and material list in A3 and flow discharge curves. Suppliers / Agents ORIGINAL brochures and instrumental literature shall also be incorporated in the manual.

PSVA 5.17 HANDLING AND TRANSPORT

The Contractor is responsible for the safe and undamaged delivery of equipment.

After final product inspection and approval, the valve and related fittings shall be securely packed to prevent damage in transit.

In order to protect the corrosion protection (lining), the ends of valves and fittings shall be securely blanked off with sturdy blank flanges which shall be clearly marked:

“DO NOT REMOVE UNTIL FINAL INSTALLATION”

Plastic sheeting will not be acceptable.

Bolts and other small parts shall be sewn up in strong bags and crated. The bags shall be tagged using metallic tags and indicate the following information:

(a) Manufacturer's identification and contract number;
(b) Part numbers;
(c) Description;
(d) Sizes; and
(e) Quantities.

Each bag shall have the delivery address listed on a separate metallic tag.

The use of ropes, wire or chains for lifting without suitable padding is strictly forbidden. For transport or storage purposes, balks of timber shall be used

to support the components on any surface and separate them from each other.

Precaution shall be taken to support and chock the equipment to prevent movement when loading onto vehicles. Components shall be firmly lashed or chained with padded lashing supported on sawdust bags. The area of padded surfaces shall be adequate to prevent damage to coatings.

The Site Engineer shall be notified of the delivery date and of any requirements regarding off loading and storage at site.

For site delivery, the transportation and supervision during off-loading will be the responsibility of the Contractor. The final inspection and acceptance of equipment supplied will be undertaken on site after off-loading has been completed. Any damage that occurs during the handling, assembly and storage of equipment at the Manufacturer / Contractor's works, including transportation to site, shall be repaired by the Contractor at his own cost, in accordance with the valve specification and to the satisfaction of the Engineer.

PSVA 6 WEDGE GATE VALVES

PSVA 6.1 GENERAL

Gate valves shall be of the resilient seal or wedge-gate type, the gates of which shall be completely clear of the waterway in the fully open position. Unless otherwise specified, the gate valves shall be of the non-rising spindle type. The valves shall be capable of withstanding the nominal pressure (PN) and specified test pressures from both sides. The gate shall operate satisfactorily under the specified conditions.

In specific circumstances the valves have to be drilled to suit existing equipment and details thereof will be supplied in the Project Specification.

Gate valves shall be of the nominal bore, class, type and working pressure as detailed in the Bill of Quantities and shall comply with the following detailed requirements:

PSVA 6.2 MANNER OF OPERATION

PSVA 6.2.1 Valve rotation

Unless otherwise specified in the Project Specification, the valve shall be closed by turning the spindle anti-clockwise when viewed from above the spindle.

In the case of valves fitted with a reduction gearbox, the geared spindle shall rotate as specified above. The valve gearbox, were applicable, shall not be mounted directly onto the stuffing box but shall be mounted on suitable supporting brackets.

The direction of opening of the valve shall be clearly indicated on the bonnet of the valve.

PSVA 6.2.2 Sealing ability

Valves are to seal drop tight at the pressures specified in Table 2: Hydraulic Test Requirements.

PSVA 6.2.3 Spindle

Valves shall be of the non-rising spindle type.

PSVA 6.2.4 Opening and closing torque

All valves shall be designed to be opened or closed against an unbalanced head equal to the maximum rated working pressure of the valve or a lower pressure if so stated in the Project Specification. The torque required to open or close a valve as stated above shall not exceed the following:

- 100 Nm in the case of valves up to 300 mm ND.
- 300 Nm in the case of valves over 300 mm ND.

PSVA 6.2.5 Spindle cap

Valves shall, unless otherwise specified herein, the Drawings or the Bill of Quantities, be fitted with a spindle cap which is locked to the valve spindle by means of a 12mm set screw.

PSVA 6.3 THRUST BEARINGS

Gate valves with a nominal bore of 225mm or larger shall be fitted with ball-bearing type thrust faces above and below the spindle thrust collar. The thrust faces shall be housed in a sealed grease packed enclosure. It will be considered an advantage if these thrust faces can be re- greased with the valve under pressure.

All gate valves shall be fitted with a back seal to permit the replacement of the stem seals under pressure.

PSVA 6.4 GLAND PACKING

Spindle seals may be of the stuffing box and gland or O-ring type.

PSVA 6.5 SEAT RINGS

Valves of nominal bore up to and including 300mm shall have seating rings pressed into undercut recesses, machined into both gate and body in such a manner that the permanent distortion of the seating ring prevents them from becoming loose.

PSVA 6.6 CONSTRUCTION MATERIALS

All materials used in the construction of gate valves shall comply with the requirements of SANS 191 and SANS 664 as relevant.

For gate valves for working pressure up to 1,6MPa and over DN 50 but not exceeding 600mm the valve body shall be of cast iron and shall comply with the relevant requirements of SANS 664.

For gate valves for working pressure over 1,0MPa and of diameter exceeding DN 600 the valve body shall be of cast steel and shall comply with the relevant requirements of SANS 191.

Valve trim shall be either manufactured from Copper alloy or Stainless steel as per Appendix D of SANS 664.

All copper/zinc alloys used shall be dezincification resistant. Galvanised fittings shall not be used on any part of a valve. The supplier shall provide full details of materials used for the valve construction.

PSVA 6.7 END CONNECTIONS

Gate valves shall be provided with double flanged or double spigotted or double socketed end connections, as detailed.

PSVA 6.7.1 Flanged valves

Unless otherwise specified in the Project Specification, valve flanges shall be drilled off centre to the specified pressure table and in accordance with the requirements of the latest revision of SANS 1123. Tapped holes are unacceptable except where stiffening ribs interfere with bolting. The front faces of all flanges shall be fully machined.

Flanged valves shall be supplied complete with all jointing material such as gasketing, bolts, nuts and washers necessary for both flanges. Bolts are to be of such length that, when the valve is bolted to a steel flange with thickness as per 854504, between zero and two threads protrude past the nut.

PSVA 6.7.2 Spigotted and socketed valves

The ends of Spigotted and Socketed valves shall be machined to be compatible with CID or COD fibre cement pipes, uPVC or GRP pressure piping as specified in the Scope of Work or in the Bill of Quantities. End connection dimensions shall be compatible with SANS 1223, SABS 966 and SANS 997.

PSVA 6.8 WEDGE-GATE VALVES

PSVA 6.8.1 Gate and guides

Channel guides on the body and the shoes on the gate shall be as deep and as long as necessary to support and minimise shudder of the gate in any position during its travel.

Shoes shall be accurately fitted in the guides so as to ensure that sealing rings do not make contact before the gate is seated and that the gate is centralised when seated.

The sliding surfaces between the shoe and the channel shall be constructed from acceptable dissimilar materials.

With the valve fully open, at least half of the shoe shall be supported by the guides.

Jacking screws shall be provided to prevent over travel of the gate when closed. The design of the gate and guides shall be such that both pressure and/or flow may be applied from either side of the gate.

Gate valves of nominal bore not exceeding 300mm shall be capable of being installed in any position.

PSVA 6.8.2 Stems

The stem thrust collar shall bear against a ball thrust bearing of approved design, details of which shall be furnished at tendering stage.

PSVA 6.8.3 Sealing faces

Body and gate seals shall be of such design and construction that will prevent seals becoming loose and prevent water passing behind seals under all conditions of operation and test. This feature must be proven at tendering stage by suitable drawings and documentation.

The leading edges of the sealing rings shall be slightly chamfered.

PSVA 6.8.4 Position indicators

All valves of DN 300 and larger shall, except where otherwise specified, be fitted with mechanical indicators to show the position of the gate.

PSVA 6.8.5 Gate and body marks

One face of the gate shall be marked, corresponding to a similar mark on the body, to ensure correct replacement after dismantling. The marks shall be visible and clear after coating.

PSVA 6.9 RESILIENT SEAL GATE VALVES

PSVA 6.9.1 Body and guides

The valve body shall incorporate a straight unobstructed body passage without pockets and shall have inclined seats and prominent gate guides to eliminate deposits in the valve body. The guides shall be as deep and as long as possible, but not protruding into the flow path to offer support in all gate positions.

The rubber coated gate shoes shall accurately fit the body guide profile to allow smooth operation of the gate with minimal shudder.

PSVA 6.9.2 Gate

The gate shall be accurately moulded and completely encapsulated in rubber to ensure drop tightness over the valve pressure range. The rubber coated gate shall be designed to offer an equal distribution of sealing pressure in all directions with a capacity to accept foreign matter up to 1mm in particle size.

PSVA 6.9.3 Stem

A corrosion resistant stem seal arrangement shall include a scraper ring to prevent the ingress of foreign matter. A stem thrust collar shall be installed between anti- friction materials to ensure low operating forces.

PSVA 6.9.4 Sealing faces

Body and gate seals shall be of such design and construction that will prevent seals becoming loose and prevent water passing behind seals under all conditions of operation and test. This feature must be proven at tendering stage by suitable drawings and documentation.

PSVA 6.9.5 Position indicators

All valves of DN 300 and larger shall, except where otherwise specified, be fitted with mechanical indicators to show the position of the gate.

PSVA 6.9.6 Gate and body marks

One face of the gate shall be marked, corresponding to a similar mark on the body, to ensure correct replacement after dismantling. The marks shall be visible and clear after coating.

PSVA 7 BUTTERFLY VALVES

PSVA 7.1 GENERAL

Butterfly valves shall be manufactured to the nominal bore, class, and working pressure as detailed in the Project specification or Schedule of Quantities and shall comply with the following requirements:

Butterfly valves shall be either of the seal in body or the seal in disc type as detailed in the Project specification or Schedule of Quantities. Butterfly valves with nominal bore not exceeding 450mm shall be of the wafer or flanged type as specified in the Project Specification. Valves larger than 450mm ND shall be of the flanged type.

All seal in disc Butterfly valves shall be of the double eccentric, bi-directional, full- bore and “tight shut off” type. Manufacturers shall certify that seal in disc valves are of the double eccentric design. All butterfly valves shall seal and be pressure tested from both directions.

The maximum flow rate in the valves shall not exceed 7 m/s unless otherwise specified. The maximum permissible flow rates through the valves at the respective maximum differential pressure across the valve shall be quoted. No cavitation in the fully open position shall be accepted and the tenderer must state the head loss for the specified flow rates in his covering letter.

Butterfly valves shall be generally in accordance with BS 5155. Face-to-face shall be in accordance with BS 5155 for pressures up to and including PN 25, whilst for PN 40 face-to- face may be to DIN 3202.

PSVA 7.2 MANNER OF OPERATION

PSVA 7.2.1 General

Butterfly valves shall be operated by hand or by electric actuator as specified. Actuator mounting flanges shall conform to ISO 5211.

The valves shall be capable of closing under the maximum head and maximum specified flow rate. The valves shall be capable of operating in any position without variation of the disc position or flutter.

There shall be no interference in the water flow pattern through a valve, i.e. the disc stop mechanism shall not impede the flow pattern. No cavitation in the fully open position shall be accepted.

Discs shall close with a positive action with no possibility of slamming shut during any stage of the closing operation. All valves shall be installed in a position that allows the valve to operate along the horizontal axis. The lower portion of the disc shall open towards the downstream side of the valve i.e. in the direction of flow.

PSVA 7.2.2 Valve rotation

Unless otherwise specified in the Scope of Works, butterfly valves shall, where applicable, be closed by turning a handwheel clockwise when seen from above the spindle.

The direction of opening of the valve shall be clearly indicated on the actuator of the valve. A robust cast iron or steel indicator shall be provided to indicate the position of the valve.

PSVA 7.2.3 Opening and closing torque

The opening or closing torque on the handwheel, where fitted in accordance with the requirements of the Scope of Works, shall not exceed 300N when operating against an unbalanced head equal to the maximum rated working pressure of the valve or when operating against a lower pressure where so stated in the Scope of Works.

PSVA 7.2.4 Sealing ability

Butterfly valves shall seal drop tight from both sides at all pressures up to the maximum rated working pressure of the valve.

PSVA 7.3 DESIGN

PSVA 7.3.1 Body

The hubs for the shaft-bearings and the gearbox mounting flanges shall form an integral part of the valve body. A 10 millimetre wide and 5 millimetre deep drain groove shall be machined in the gearbox mounting flanges to release any seepage water in the event of shaft seal failure.

PSVA 7.3.2 Shafts

The valve shall be suitable for installation with the shaft in any position.

Shafts can be either continuous or a stub-shaft design configuration. Stub-shafts shall extend into the disc hub for a distance of at least 1.5 x shaft diameter and shall not protrude from the hubs i.e. exposing the shafts.

The shaft shall have a splined or square shaft connection to the disc and shall be of single piece construction, supported both at the bottom and top of bearings and isolated from the liquid being conveyed through the valve. Shafts may also be attached to the blade by means of keys, at the Engineer's discretion. Shaft fixing by means of dowel or taper pins shall not be accepted.

O-ring seals shall be used only as dust seals and not as primary sealing devices..

The shaft connection shall be designed to transmit shaft torque equivalent to at least 75% of the torsional strength of the shaft.

The shaft shall be positively connected inside the disc. The control shaft shall be connected to the spindle by means of a through-bolt.

PSVA 7.3.3 Disc

The disc shall be a single casting or fabrication with a smooth continuous surface.

The disc of seal in body valves shall be of hydrofoil section with a smooth continuous surface and shall be manufactured in 316L stainless steel.

The maximum combined stresses in the disc shall not exceed 20% of the minimum yield stress of the material used, when an unbalanced (differential) pressure equal to the maximum rated working pressure of the valve is applied to either side of the valve.

The disc shall be connected to the shaft by means of corresponding splines or square shaft. Keys may be accepted at the Engineer's discretion but pins, bolts or other devices shall not be accepted.

PSVA 7.3.4 Seal retaining rings

Stainless steel seal retaining rings shall be coated to reduce galvanic corrosion. Any recess for the retaining ring in the disc or body shall be coated and the retaining rings assembled whilst the coating is still wet. The coating may be brush applied 2- pack epoxy approximately 150 DFT or FBE. The recess for the retaining ring/s in the blade or body shall be coated in accordance with the corrosion protection specifications, or the seal face shall be assembled with a coat of wet solvent free epoxy.

PSVA 7.3.5 Seats and seals

Preference shall be given to a resilient seal arrangement that is removable, replaceable and adjustable in situ from the down stream side of the valve without having to remove the valve from the pipeline.

The resilient seals shall have non-weathering, non-sticking, long life properties and shall be compatible with the quality of the water to be conveyed. Resilient seals shall be continuously molded soft seals without joints. Glued seals are not acceptable.

The edge of the seal retaining groove in the disc shall be stainless steel 304L deposit welded before machining for an O-ring or music note type seal.

Sealing faces in the body, weld deposited or replaceable, shall be accurately machined and polished and shall provide adequate “lead in’ for the resilient seal to open and close on the stainless steel seat only.

The mounting flange of a removable seat in the body shall either be stainless steel deposit welded and machined level with the seat, or the seat ring shall be manufactured to cover the seat mounting flanges.

The seat and seal shall be of a design preventing them from becoming loose and obviate water seepage under the seals or seats during all conditions of operation and testing.

PSVA 7.3.6 Body liner

The body liner of seal in body valves shall be of the full body liner type with an EPDM liner and shall be either removable or vulcanised, as detailed in the Project Specification.

PSVA 7.3.7 Bearings

Self lubricating sleeve type bearings (bronze backed) or bushes shall be fitted into the hubs of the valve body. Each valve shall be fitted with at least one adjustable thrust bearing or spacer disc set to hold the disc securely concentric with the body or seat.

PSVA 7.3.8 Lubrication

All points on the valve requiring lubrication shall be fitted with nipples suitable for grease gun application.

PSVA 7.3.9 Limit stops

Butterfly valves shall be fitted with adjustable mechanical limit stops to limit disc movement at the fully open and fully closed positions.

PSVA 7.3.10 Position indicators

A robust cast iron or steel indicator shall be provided to accurately indicate the position of the valve.

PSVA 7.3.11 Hand wheels

Unless otherwise specified, all Butterfly valves shall be fitted with gearbox actuators and with robust, solid disc type handwheels. The ring and spokes of the handwheel, where fitted, shall be cast or fabricated from material with a diameter of not less than 20mm. The direction of closing shall be marked on the hand wheel.

Maximum hand wheel dimensions shall be as follows:-

PN16

100 NB to 300 NB – Maximum diameters may not exceed 250mm 400 NB to 1000 NB - Maximum wheel diameters may not exceed 400mm

PN25

100 NB to 200 NB – Maximum wheel diameters may not exceed 250mm, 250 NB to 800 NB

– Maximum wheel diameters may not exceed 400mm, 900 NB and 1000 NB – Maximum diameters may not exceed 500mm Note:

Under no circumstances may the hand wheel diameters exceed those specified. Maximum rim pull on the hand wheel may not exceed 300 Newton.

PSVA 7.3.12 Gearboxes

Gearboxes shall be of the self locking worm and gear type with zero backlash. Gears shall be precision machined to ensure compliance in this regard.

Worm shafts shall be fitted with roller thrust bearings to ensure minimal operating effort and smooth rotary action of the input shafts.

Gearboxes shall be packed with approved water resisting grease. The enclosure shall conform to a minimum of IP67 to prevent the ingress of water and debris into the gearbox housing.

Gearboxes shall in all instances be sized for fitting of actuators and shall be provided with ISO mounting pads for direct actuation. Actuator mounting flanges shall conform to ISO 5211.

To prevent over travel of the valve blade in the open or closed position, all valves shall have adjustable mechanical stops incorporated in the gearbox. End stops shall be of the travelling nut type enabling precise setting of the disc open/closed positions.

Gearbox orientation shall be such that the gearboxes do not foul adjacent pipe work. The Contractor shall confirm gearbox orientation with the Engineer before placing any orders.

Full details of gearboxes in the form of a general arrangement drawing or certified catalogue information must be provided with the tender.

PSVA 7.3.13 Corrosion protection coating

The inside and outside of the valve body shall be either Rilsan coated (min. DFT 300 micron) or FBE coated (min DFT 250 micron) or an alternative coating approved by the Engineer.

PSVA 7.4 CONSTRUCTION MATERIALS

Butterfly valves shall be constructed generally in accordance with BS 5155. Valve components, unless otherwise specified in the Scope of Work, shall be constructed of the material specified in Table 4.

TABLE4: MATERIAL SPECIFICATIONS

COMPONENT	MATERIAL TYPE	MATERIAL SPECIFICATION
Body	Sg Iron Cast Steel	BS 2789 Gr 420 / SABS 936 SG 42 ASTM A216 WCB SANS 1431 Gr 300WA
Disc	Sg Iron Cast Steel Stainless steel	BS 2789 Gr 420 / SABS 936 SG 42 ASTM A216 WCB / BS 970 Part 4, Gr 304 S15
Body Seat	Stainless Steel	BS 970 Part 4, Gr 304 S15
Blade / Seal	Elastomer	EPDM 750 A
Seal Retaining Ring	Stainless Steel	BS 970 Part 4, Gr 304 S15
Shafts	Stainless Steel	BS 970 Part 4, Gr 431 S29
Shaft Bearings / Bushes	Phosphor Bronze Sleeve Type PTFE Backed / Self Lubricating	BS 1400 PB1C (Cu, Sn10, P) Bronze Backed (DUB) GLACIER DU
Shaft Seals	Radial Lip Seal / Cup Seal / O- Ring Seal Elastomer	NITRILE / VITON NBR
Idle Shaft Thrust Bearing/Spacer Disc	Phosphor Bronze	BS 1400 PB1C (Cu, Sn10, P) (for vertical installations)
External Fasteners	Stainless Steel	ASTM A193 Gr B8M, ASTM A439 Gr D2
Internal Fasteners	Stainless Steel	ASTM A193 Gr B8M, ASTM A439 Gr D2

The supplier shall provide full details of materials used in the valve construction.

PSVA 7.5 ACTUATORS

Butterfly valves with a nominal bore not exceeding 150mm may be operated directly or by actuator as specified in the Scope of Works.

Butterfly valves exceeding 150mm nominal bore shall be operated by hand (geared actuator), electric, pneumatic or hydraulic actuator as specified in the Scope of Works conforming to the following requirements:

a) Actuators shall not be an integral part of the main valve body but shall be a separate unit bolted to the main body in such a manner that water leaking past the main shaft seal is prevented from entering the actuator;

b) Actuator mounting flanges shall conform to ISO 5211;

c) Positive, adjustable, limit stops shall be provided to prevent over opening or over closing of the valves;

d) All actuators are to be geared such that the valve cannot be opened or closed in less than 3 minutes unless otherwise stated in the Project specification;

e) Hand operated actuators with a gear ratio of 2 : 1 or lower shall be provided with an easily replaceable shear key to prevent damage to the valve if excessive force is applied on the hand-wheel in the fully open or closed position;

f) Actuators shall be of such a design that the disc will be held in any fixed position for an extended period of time;

g) Electrically operated actuators shall be fitted with a hand operated override for use in case of power failure;

h) Pneumatic and hydraulically operated actuators operation details shall be as specified in the Scope of Works.

PSVA 7.6 END CONNECTIONS AND JOINTING

Valves shall be either double flanged or wafer type as scheduled.

PSVA 7.6.1 Flanged valves

Unless otherwise specified in the Scope of Works, flanges shall be drilled off centre and in accordance with the requirements of SANS 1123.

Tapped holes are unacceptable except where stiffening ribs interfere with bolting. The front faces of all flanges shall be fully machined.

Flanged valves shall be supplied complete with all jointing material such as gaskets, bolts, nuts and washers necessary for both flanges.

Bolts are to be of such length that, when the valve is bolted to or between steel flanges with thickness as per SANS 1123, between zero and two threads protrude past the nut.

PSVA 7.6.2 Wafer valves

The dimensions of wafer valves shall be such that the valves may be fitted between flanges complying with the dimensions set out in SANS 1123 for the pressure table scheduled.

PSVA 7.7 DATA PACKS

All valves shall be supplied with comprehensive Data Packs containing the following:

a) Actual mill material certificates for all components;
b) Coating certificates indicating details of coating type used and results of actual thickness tests conducted to conform to minimum coating requirements as specified. (This may include Pin Hole Detection)
c) Pressure test certificates for the body and seal;
d) As built general arrangement drawings of the valve and gearbox;
e) Operating and Maintenance manuals.

PSVA 7.8 WARRANTY

All valves supplied must include a 15-year warranty, fair wear and tear excluded and the company tendering must submit information to substantiate their claim that such a guarantee is possible and will be honoured. Details of contactable references that can verify the service backing and performance of the valves offered must be provided.

PSVA 8 NON-RETURN VALVES

PSVA 8.1 GENERAL

The Non-return valves for this project shall be Nozzle Type check valve designed, manufactured and tested in accordance with relevant local or international specifications.

Non-return valves shall be of the nominal bore, class, and working pressure as detailed in the Bill of Quantities.

Unless otherwise indicated in the Scope of Works, non-return valves with nominal bore not exceeding 300mm may be of the sloping seat single swing door type or spring assisted single or multiple door type.

PSVA 8.2 MANNER OF OPERATION

Non-return valves shall close at such a rate and in such a manner as to impose a minimum water hammer on the pipeline.

PSVA 8.3 MATERIAL

Item Name	Material	Description	EN Standard
Inlet Body	GGG 40	Ductile Iron	EN-GJS-400-15
	GGG 50		EN-GJS-500-7
Outlet Body	GGG 40	Ductile Iron	EN-GJS-400-15
	GGG 50		EN-GJS-500-7
Disc	GGG 40	Ductile Iron	EN-GJS-400-15
	GGG 50		EN-GJS-500-7
	304	Stainless Steel	G - X6CrNi 18-9

	316	Casting	G - X6CrNiMo 18-10
	CC 331G-GS	Aluminium Bronze	CuAl10Fe2-C
Ring	NBR - EPDM	Rubber	-
Bolts Nuts	Galvanized	Steel	-
	A2 - A 4	Stainless Steel	-
Shaft	420	Stainless Steel	X20Cr13
	304		X5CrNi 18-10
	316		X5CrNiMo17-12-2
Bearing	Rg 5	Bronze	G-CuSn5Zn5Pb5-C
Spring	301	Stainless Steel	X 12 CrNi 17-7
Body Seat	316 L	Stainless Steel Welding	12072
	CuAl8	Aluminium Bronze Welding	14640 S Cu 6100
Disc Seat	316 L	Stainless Steel Welding	12072
	CuAl8	Aluminium Bronze Welding	14640 S Cu 6100
Coating	WRAS approved fusion bonded epoxy 300 microns dft as standard		

PSVA 8.4 END CONNECTIONS AND JOINTING

Valves shall be double flanged be drilled off centre and in accordance with the requirements of the Table 2500 in the latest edition of SANS 1123

PSVA 9 AUTOMATIC CONTROL VALVES

PSVA 9.1 GENERAL

Automatic Control valves shall be used for the following applications:

- Pressure reducing valve
- Pressure sustaining valve
- Check valve
- Flow control
- Level Control
- Pump Control
- Altitude valve

Automatic Control valves shall be hydraulically operated, pilot actuated for the specified application as given in the Bill of Quantities.

The design of the valve shall be of two components, namely a single cast body and an elastomeric liner.

PSVA 9.2 MANNER OF OPERATION

Automatic control valves shall not chatter or slam under low flow conditions. Accurate pressure and flow control shall be obtained under all flow conditions.

Pressure reducing valves shall lower downstream pipeline pressure to a pre-determined pressure, at all flow rates regardless of changes in inlet pressure.

The valve shall be pilot-controlled by means of a double-acting diaphragm valve.

PSVA 9.3 CONSTRUCTION MATERIALS

Automatic control valves shall be constructed using materials as follows.

Body: Ductile Iron, Austenitic Cast Iron or Cast Steel – Rilsan Coated (min. DFT 300 micron) or FBE (min DFT 250 micron)

Liner: EPDM, 70 durometer

Liner retainer: Stainless Steel grade 316

Pilot Body: ASTM B62 Bronze

Wetted Parts: Stainless steel grade 316 Control fittings

Control fittings: Brass

All copper/zinc alloys used must be dezincification resistant.

No galvanised fittings shall be used on any part of a valve in contact with the water.

PSVA 9.4 FLANGE DRILLING

Flanges to automatic control valves shall be drilled in accordance with SANS 1123.

PSVA 10 AIR VALVES

PSVA 10.1 GENERAL

Air valves shall fulfil the following operational functions:

- High volume air discharge during pipeline while filling;
- Large and small orifice ;
- Pressurized air release from a full operating pipeline;
- High volume air intake to prevent negative (vacuum) pressures induced while draining pipeline;
- High volume air intake to prevent negative (vacuum) pressures induced by transient pressures.
- Air valves shall have a cast SG iron body. Stainless steel fabricated body valves shall not be permitted

PSVA 10.2 MANNER OF OPERATION

Prior to the ingress of water into the air valve chamber when the pipeline is being filled, air valves shall vent through the large orifice up to a transient pressure rise of 2 x valve rated pressure.

Air valves shall not exhibit leaks of weeping of water past the large orifice seal for an operating pressure range from 0.5 bar to 2 x rated working pressure.

The valve shall respond to the presence of air by discharging air through the small orifice at any pressure from 0.5 bar to the rated pressure. The valve shall remain leak tight in the absence of air.

The valve shall react immediately to the pipeline drainage or water column separation by the full opening of the large orifice to allow unobstructed air intake at the lowest possible negative internal pipeline pressure. The valve shall not slam.

PSVA 10.3 DESIGN

PSVA 10.3.1 Large diameter air valves

Large diameter air valves shall be of the compact single chamber design with solid cylindrical HDPE control floats housed in a cylindrical stainless steel body with flanged inlet and outlet stainless steel orifice plates secured by means of stainless steel tie rods.

The valve shall incorporate an automatic air release “Anti-Shock” and vacuum break features to prevent pipeline damage resulting from high induced transient pressure surges to 2 x valve rated working pressure.

The intake orifice area shall be equal to the nominal size of the valve.

Large orifice sealing shall be affected by the flat face of the control float seating against a Nitrile rubber O-ring housed in a dovetail groove circumferentially surrounding the orifice or the sealing of a ball against a supported sealing ring.

Discharge of pressurised air shall be controlled by the seating and unseating of a small orifice nozzle on a natural rubber seal fixed into the control float.

Flanged ends shall be supplied complete with the required number of stainless steel screwed studs, including nuts, washers and jointing gaskets.

Note that alternate designs may be considered if their performance is equivalent and they have a price advantage.

PSVA 10.3.2 Small diameter air valves

Small diameter air valves shall be capable of exhausting large volumes of air at controlled rates without slam and be able to exhaust small volumes of air while under pressure. These valves shall be available with stainless steel of nylon reinforced bodies with a small orifice of at least 12mm^2 and a large orifice of at least 800 mm^2.

PSVA 10.4 CONSTRUCTION MATERIALS – LARGE DIAMETER AIR VALVES

Body:	Ductile or SG iron
Dirt screen:	Stainless steel grade 304
Floats:	HDPE , Stainless Steel or similar
Orifice Plate ends:	Stainless steel grade 304
Small orifice nozzle:	Stainless steel grade 304
Joint Gaskets:	EPDM
Seat seals:	EPDM

PSVA 10.5 TESTING

All air release valve shall be subject o the following test procedures:

- High pressure strength and leak test where the valve shall be filled with water and pressurised to 2 x rate pressure. The pressure shall be maintained for a minimum of two minutes without any leaking, weeping or sweating.
- Low head, low pressure leak test where the valve shall be filled with water and pressurised to a maximum of 0.5 bar using a visible water column. The valve shall be rejected should leak tightness not be maintained for a minimum of two minutes.
- A vacuum break test (drop test) shall be performed by filling the valve with water, pressurised to the rated pressure and then isolated. Pressurised air shall be admitted into the valve while maintaining the pressure in the valve to a minimum of 2 bar above the rated pressure. The “Drop Test” is carried out by slowly bleeding the pressure in the valve until the rated pressure is

reached. Should the float not drop to release the pressurised air, the valve will be rejected.

PSVA 11 ITEMS APPLICABLE TO ALL VALVES

PSVA 11.1 JOINTING MATERIAL

Gaskets shall be made from asbestos-free gasket material and made in accordance with BS 281 Grade B with a minimum thickness of 3,0 mm.

PSVA 11.2 CORROSION PROTECTION COATING

All valve components manufactured from mild steel or ductile iron shall be internally and externally coated with a heavy duty corrosion protection system such as Rilsan coating or FBE.

PSVA 11.3 PREVENTION OF ELECTROLYSIS

Where the construction of the valve is such that it is impossible to avoid dissimilar metals of which the potential difference exceeds 0,3 volts, suitable insulation material shall be used on the contact faces between such dissimilar metals.

PSVA 11.4 TOLERANCES

PSVA 11.4.1 Body Dimensions

The dimensions of the body of each valve and its component parts shall comply with the relevant tolerance requirements of Table below and of the applicable standard specification for the valve.

Face-to-face dimensions mm	Tolerance mm
Up to and including 200	+/- 1
Above 200 up to and including 400	+/- 2

PSV 11.4.2 Flanges and couplings

Flanges shall be subject to the following tolerances:

Outside diameter of flange: ± 3 mm

Thickness of flange: ± 1 mm

Diameter of bolt circle: ± 1 mm

Couplings shall be subject to the tolerances specified in the appropriate standard specification.

PSVA 11.4.3 Commissioning

After commissioning each valve shall perform in the manner, and within the limits and tolerances required in terms of the Project Specification.

PSVA 11.5 DELIVERY

Valves are to be delivered to and off-loaded at a site specified in the Project Specification by the valve supplier unless otherwise indicated in the Project Specification.

The cost of such delivery and off-loading is to be included in the cost of the valves.

PSVA 12 MEASUREMENT AND PAYMENT

The manufacture, testing, supply, delivery, installation and commissioning of all valves shall be scheduled separately per valve type, size, working pressure and other relevant data.

The rate shall include for the cost of manufacture, quality control, supply, testing (where applicable), corrosion protection, crating, delivery and off-loading on site, storage and fixing in position as directed, commissioning, including all bolts, gaskets and accessories as required.

PSVA 13 VALVES AND FITTINGS TECHNICAL DATA SHEETS

PSVA 13.1 Wedge Gate Valves (Scour)

WEDGE GATE VALVE	
ID Item	**Specification**
1.Type	
2.End Connection	
3.Body	
4.Bonnet	
5.Stuffing box yoke	
6.Gland	
7.Handwheel	
8.Gate Rings	
9.Stem	
10.Jointing	
11.Packing	
12.Pressure rating	
13.Nominal Size	
14.Face to Face distance	
15.Flange Thickness	
16.Corrosion Protection	
17.Number of holes/size	
Supplier Name and Location Address	

PSVA 13.2 Wedge Gate Valves (Air Valves)

WEDGE GATE VALVE	
ID Item	**Specification**
1.Type	
2.End Connection	
3.Body	
4.Bonnet	
5.Stuffing box yoke	
6.Gland	
7.Handwheel	
8.Gate Rings	
9.Stem	
10.Jointing	
11.Packing	
12.Pressure rating	
13.Nominal Size	
14.Face to Face distance	
15.Flange Thickness	

16.Corrosion Protection	
17.Number of holes/size	
Supplier Name and Location Address	

PSVA 13.3 Nozzle Non Return Valve

NOZZLE NON-RETURN VALVE	
ID Item	**Specification**
1.Type	
2.End Connection	
3.Body	
4.Bonnet	
5.Stuffing box yoke	
6.Gland	
7.Handwheel	
8.Gate Rings	
9.Stem	
10.Jointing	
11.Packing	
12.Pressure rating	
13.Nominal Size	
14.Face to Face distance	
15.Flange Thickness	
16.Corrosion Protection	
17.Number of holes/size	
Supplier Name and Location Address	

PSVA 13.4 Air Valves

AIR VALVE S	
ID Item	**Specification**
1.Type	
2.End Connection	
3.Body	
4.Bonnet	
5.Stuffing box yoke	
6.Gland	
7.Handwheel	
8.Gate Rings	
9.Stem	
10.Jointing	
11.Packing	

12.Pressure rating	
13.Nominal Size	
14.Face to Face distance	
15.Flange Thickness	
16.Corrosion Protection	
17.Number of holes/size	
Supplier Name and Location Address	

C3.4 ENGINEERING, PROCUREMENT, CONSTRUCTION & MANAGEMENT

C3.4.1. Planning and Programming

The Contractor shall ensure that:

a) They is well informed with regard to the Employer's overall implementation programme for construction and investigative projects and makes available resources as required to efficiently complete required services

b) They compiles designs, documentation, reports and drawings timeously as not to unnecessarily delay the implementation of the construction or investigative projects.

c) The programme shall at minimum contain the following:

d) Time Scale (minimum): Days, where the project period does not exceed three months. Weeks, where the project period exceeds three months.

e) Time Scale (maximum): Months, where the project period does not exceed one year. Years, where the project period exceeds one year.

f) Tasks: All construction tasks and activities shall be shown. Where phases or stages are anticipated, this shall be the highest level of division and all tasks related to the successful accomplishment of that phase of the project shall be grouped. Resources allocation and task dependency shall be indicated.

g) Multiple Project Programming: Where multiple projects are part of the same Contract documentation, the Contractor shall provide a programme per project. However, where interdependency exists the programmes shall be integrated, but divided on the highest level per project followed subsequently by further divisions per phase or stage.

h) Start and Finish Dates: All tasks shall have specific start and finish dates.

i) Critical Path: All tasks forming the programme line that will establish any delays in the overall project period shall be clearly indicated and an indication of their sensitivity characteristics shall be provided.

j) Progress Tracking: The Contractor shall be required to periodically (at minimum of a monthly basis) indicating the project progress per task graphically and on a percentage basis.

k) Non-working Time: All South African public holidays, weekends and the local traditional annual builder's break (as identified in the contract data) shall be incorporated in the programme.

The Contractor's Programme shall include:

a) Dates for submission (by the Contractor) of designs and or design documents.

b) Dates for ordering of special and/or long delivery items.

c) Dates for issue of or approval of drawings for planning purposes.

d) Dates for issue of or approval of drawings for manufacture and construction purposes requiring the approval of the Engineer.

e) Dates for the placement of orders for material, receipt of material,

fabrication and manufacture, works (factory) testing, shipment, erection and commissioning.

f) Dates showing start and completion of site construction of each section and each major component of the permanent works.

g) Dates showing the delivery of all built-in steelwork, anchor bolts, etc.

h) Dates for start and completion of Engineering Design (including allowances for review/approval by the Engineer).

i) Dates for submittal and acceptance of drawings.

j) Dates for submittal of operation and maintenance manuals.

k) Dates for submittal of commissioning check lists and detailed commissioning schedules for acceptance (3 months before the commencement of commissioning).

l) Dates for submittal of commissioning check lists and detailed schedules of approval (3 months before the commencement of commissioning).

m) Dates for submission of complete schedules for all manufactured items.

n) Dates for Test on Completion as defined in the Contract Data.

Activities shall be timed in week units except for commissioning or similar detailed programmes, which shall have activities, specified in days. Activities on which it is intended to operate multiple shift working shall be clearly defined.

Method and resources statements are required for all critical items to prove that the period allocated to them fits the overall programme and that the Contractor's plant and labour are consistent with the time allowed. Critical items shall include (as a minimum) all reinforced, structural steelwork, pipework, tie-ins to existing services and specialist work.

The Contractor shall update and revise the Programme once a week or when required by the Engineer. The submission to and acceptance by the Engineer of such updated and revised Programme, shall not relieve the Contractor of any of his duties or responsibilities under the Contract and existing laws.

C3.4.2 Software Application for Programming

Only the "***Microsoft Project***" software package will be accepted.

The Contractor shall make the programme available in MS Project format and in print version. The Contractor shall also ensure that all necessary hardware and software in this regard are available at all times on site and that at least one member of the permanent site staff is competent on their operation.

C3.4.3 Sequence of the Works

Whenever work being done by other Contractors is contiguous or related to the Works included in this Contract, the sequence of handling the *Works* shall be such that the least delay possible will result to each Contractor and such sequence may be determined by the Engineer. The Engineer will establish the respective rights of the various interests involved in order to secure the completion of the various portions of the Works in general harmony.

The Contractor shall be responsible for the co-ordination and proper execution of the Works, including co-ordination with other Contractors and organizations to the extent specified in the Contract Documents. The Contractor shall, as specified in the Contract Documents, afford all reasonable opportunities for carrying out their work to:

a) any other Contractors employed by the Employer,

b) the staff and workmen of the Employer, and

c) the staff and workmen of any legally constituted public authorities who may be employed in the execution on or near the site of any work not included in the Contract, which the Employer may require.

The Contractor shall obtain, co-ordinate and submit to the Engineer for his information all details (including details of work to be carried out off the Site) from Sub-contractors. The Contractor shall be responsible for the locations of their work or materials, in order to ensure that there is no conflict with the work of other Sub-contractors, the Contractor or other Contractors.

The Contractor shall give the works the constant attention necessary to facilitate the progress thereof and shall cooperate with the Engineer and other Contractors in every way possible.

C3.4.4 Methods and Procedures

C3.4.4.1. Monthly Reports

The Contractor shall prepare and submit to the Engineer within 15 days after the first day of every month a written progress report together with a monthly progress schedule summarising the progress of the various sections of the work both at the place of manufacture and at site. Three (3) copies of the monthly progress report shall be submitted in accordance with the correspondence procedures.

Such progress reports shall indicate accurately the status of different activities covering design, material procurement, manufacture, works (factory) tests, shipping, erection, testing and commissioning and shall be related to key dates identified in the programmes referred to in the *conditions of contract*.

The report shall also include data on labour strength and equipment employed. The programme submitted with the monthly report shall show cumulative progress towards scheduled completion, expressed as a percentage, of all items shown in the contract schedule.

The reports shall indicate the degree of criticality on each section of the Work, together with the slippage or impending slippage on any key event and shall be directly related to the contract schedule and supporting detail programmes for sections of work.

The monthly progress report shall be in the format acceptable to the Engineer and written in the English language and shall include:

a) Photographs and detailed descriptions of progress, including each stage of design (if applicable), procurement, manufacture, delivery to the Site, construction, erection, testing and commissioning.

b) Charts showing the status of construction documents, drawings, purchase orders, manufacture and construction.

c) For the manufacture of each main item of plant and materials, the name of manufacturer, manufacture location, percentage progress, and the actual or expected dates of commencement of manufacture, Contractor's inspections, tests and delivery.

d) Records of personnel and Contractor's equipment on the Site.

e) Copies of quality assurance documents, test results and certificates of materials.

f) Safety statistics, including details of any hazardous incidents and

activities relating to environmental aspects and public relations; and

g) Comparisons of actual and planned progress, with details of any aspects which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome such aspects.

h) Financial status of Contract.

C3.4.4.2 Weekly Reports

The Contractor's Site Manager shall prepare a weekly summary report covering all the site activities and submit it to the Engineer. This report shall include projected work activities for at least 2 weeks ahead of those being reported upon. In addition, this report shall include a weekly site labour return giving imported and local labour and each Sub-Contractor's labour, broken down into trades. Full details of site labour disputes (or off site disputes affecting the Contract) shall be reported to the Engineer immediately. The weekly statement shall give details of all construction plant machinery, offices and materials. The Contractor shall submit three (3) copies of weekly report to the Engineer which shall include.

a) Summary of progress.

b) Potential problems and proposed solutions.

c) Project schedule update.

d) Project permit status.

e) Construction photographs.

f) Status of orders and procurement.

g) Drawing list.

h) Plant test schedule.

i) Construction schedule (critical path method, S-curve).

The Contractor shall submit to the Engineer a weekly return detailing the numbers of the various classes of workmen employed by him on the Site, the plant and Contractor's equipment on the Site or on order and any other information that may reasonably be required.

C3.4.4.3 Detailed programme and progress reports

Detailed monitoring of the progress of the Contract by the Contractor is to be achieved by the use of critical path network planning and review techniques.

Following approval of the Programme, the Contractor shall submit within thirty (30) days, detailed programmes for all work to be executed during the Contract. These programmes, which shall embrace design, supply, manufacture and site construction shall be based on the Contract Programme and be used as target programmes and may be subject to revision. Further detailed programmes for progressive stages of the Contract shall be prepared by the Contractor as required by the Engineer.

The Contractor shall, whenever required by the Engineer, also provide in writing for his information a general description and drawing or sketch of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works.

The Contractor shall plan in detail his section of the work by the use of bar charts to record progress of the design, manufacturing and delivery elements and by the use of the critical path network procedure for work on site. The issue and approval of drawings shall be covered in detail by the use of appropriate check points in the detailed programme, including

in particular design information interface events with others. The manufacturing work shall be broken down into check points in the detailed programme. The manufacturing work shall be broken down into sufficient detail for the information supplied to relate correctly to the erection detailed programme on which the activity durations shall not exceed four weeks. Activities shall cover all aspects for which the Contractor or his Sub-contractors are responsible and also indicate site access, points at which terminals and access will be available to or required from others and services required from the Employer.

The Contractor shall ensure that the resources required to meet these programmes are available to him and his Sub-contractors. A table shall be prepared indicating the expected level of each type of resource for the duration of the site work.

The detailed programmes must be analysed by the Contractor, either manually or by computer, and three copies of the following tabulations presented:

a) A schedule tabulated in order of increasing total float showing for each activity:
   (i) event numbers,
   (ii) brief description of activity and responsibility,
   (iii) duration,
   (iv) early and late starting and finishing dates,
   (v) total float.

b) A schedule tabulated in order of early start date by total float for eight weeks ahead of the 'up-date' date. The information given in this schedule shall be the same as that indicated above.

All programmes and progress reports shall be provided by the Contractor in a form acceptable to the Engineer. Full access shall be made available to the Engineer to visit the Contractor's and Sub-contractor's works to verify the status of design and manufacture.

Other requirements in respect of programmes are given in the Conditions of Contract.

C3.4.4.4 Progress Meetings

The Contractor will be required to attend regular formal construction progress meetings with the Engineer during manufacture and on site. The site meetings will also involve the other Contractors so that the progress of construction both on this Contract and the entire Project may be reviewed. Such meetings may be monthly and may require the up-dating of the Contractor's Contract and detailed Programmes, in which case three copies of the up-dated programme shall be submitted to the Engineer within 7 days of the agreed up-dating.

The Contractor shall also attend informal weekly meetings with the Engineer on site and provide a weekly estimate of the work anticipated on each work section.

The updated programme, if necessary, after reconciliation and incorporation of changes, shall become the new basis for further execution of the Works without any modification of the Contract's completion date. The updating of the programme shall not give rise either to any extension of time or to any entitlement for any additional payment.

C3.4.4.5 Interface Meetings

The Contractor shall hold regular interface meetings with all other contractors who may be performing work on behalf of the Employer and with representatives of the Employer involved with the activities related to or in the vicinity of the works to be performed under this Contract. The purpose of the interface meetings shall be to ensure that the work the Contractor is performing on the project is efficiently and effectively co-ordinated without duplication or miscommunication and that there is full compatibility between sections that are designed and constructed by the various contractors.

C3.4.4.6 Quality plans and control

a) General

The Contractor shall have a well-organized Quality Management System (QMS) based on ISO 9001 Series) to assure that items and services, including subcontracted items and services, comply with the Works Information.

This clause specifies the minimum requirements necessary to ensure that proper attention is given to the materials used, the standard of workmanship, the manufacturing and construction processes, and the quality of all components.

The Contractor shall include in all his orders to Sub-contractors a note stating that materials and plant covered are subject to inspection by the Engineer.

b) Quality Control and Assurance System

All design, manufacturing, processing, testing and inspection operations affecting the plant or material shall be governed by Quality Assurance procedures in accordance with the directives of the ISO 9001 standards while the production and installation shall be governed by quality assurance procedure in accordance with the directives of the ISO 9002 standards or equivalent. These may be subject to surveillance by the Engineer.

A tentative QMS procedures shall be submitted together with the tender and shall meet the requirements stated in the Design Procedure. Within thirty (30) days of the Commencement Date, the Contractor shall submit six (6) copies of his complete quality control and assurance procedures, manuals for review and acceptance by the Engineer.

The manual shall include pro-forma checklists for all requirements of the Contractor's quality control and assurance program and those called for in the Works Information.

The Quality Control and Assurance System to be submitted shall include but not necessarily be limited to the following:

a) Programme requirements for materials and plant procurement and manufacture with description of design control, purchased material

control, quality verification tools, manufacturing control, materials and components selection, handling and packaging, etc.

b) Programme requirements for plant production with detailed description of Quality Assurance organization of the Contractor, Quality Assurance Functions and Procedures and Performance Monitoring.

c) Quality Assurance Programme Tests with detailed description of the test procedures to be conducted.

In addition to the requirements of these ISO Standards or their equivalents the Contractor shall:

a) Establish procedures for adequate planning and resourcing of all quality related activities including the preparation of quality plans.

b) Establish measures for the identification and control of items throughout all stages of the Contract. This shall include measures to maintain traceability as identified in agreed quality plans.

c) Arrange for the protection of quality of the product to include delivery to the specified destination.

d) Control their measuring and test equipment in accordance with established procedures for measurements and calibration systems and ensure that such equipment that may be used by Sub-contractors to verify work is similarly controlled.

Where any site installation and/or test and commissioning work is involved, the Contractor shall prepare contract specific quality assurance procedures in agreement with the Engineer prior to commencements of such works.

The Contractor shall be responsible for specifying the quality assurance requirements to his Sub-contractors, for approving Sub-Contractors quality assurance programme and for ensuring compliance with the requirements.

The Contractor shall ensure that all appropriate technical information is extracted from the Contract documents and specifications and passed on to the Sub-contractors.

The Contractor shall ensure that all computer systems and software to be utilized on the project is qualified for the application under consideration and such qualification is documented.

c) Quality Management Audit

The Contractor shall carry out periodic assessments of the adherence to the Quality Plan and Quality Control Plans by senior qualified staff who are not normally employed on the Site. The Engineer and/or his representative shall be invited to attend at the periodic assessments meeting and be afforded the opportunity to report on the implementation of the Quality System at the Site. The assessment reports shall be copied to the Engineer.

d) Corrective Actions

The Contractor's quality assurance programme shall provide for prompt detection and correction of all events and conditions adversely affecting quality, including failures, malfunctions, incidents, trends, deficiencies, deviations, non-conformances, and defective materials.

The Contractor shall establish and maintain methods for verifying and determining the cause of an adverse condition and for initiating necessary improvement and corrections to preclude repetition. Quality trends shall be analysed to furnish a basis for improvement in work performance. The Contractor's corrective action system shall extend to the performance of other participating Contractors and Sub-contractors when necessary and shall provide for the interchange of corrective action information. Identification of the adverse condition, its cause, and the corrective action taken shall be recorded and reported to appropriate levels of management.

The Contractor shall establish and implement procedures for reporting, verifying, analysing, and correcting failures, including those that occur during development and qualification testing. The procedure shall provide assurance that the cause and mode of each failure are determined that the potential safety and availability implication is evaluated, and that corrective action is taken.

A failure report shall be prepared to identify the failed item and its origin or source of manufacture and shall describe the failure, the test status at time of failure, and the probable cause and mode of failure, and recommended corrective action.

Failure to conform to the specified requirements will result in the issuing by the Engineer of a Corrective Action Request. Failure to rectify the deficiencies covered by a Corrective Action Request within the period stated will result in the Engineer invoking the provisions of GCC.

e) Design revision and substitution of Material

Any revision affecting the design and manufacturing of the Works, or any substitution of materials that is deemed necessary shall be notified by the Contractor to the Engineer for the latter's review and approval.

f) Contractor's responsibility

Acceptance by the Engineer of the Contractor's quality assurance programme, quality plans and inspection and test plans, or of those of his Sub-contractors will not relieve the Contractor of his obligation to provide goods and services which meet the requirements of the Contract.

g) Environment

The Contractor shall strictly comply with the requirements of the EMP issued for this Works. He shall be liable for any damages/destruction to the environment including penalties that will be imposed by the relevant government agency arising from non-compliance of the requirements of EMP occasioned in any manner by his acts or neglect, or his agents, employees, or workmen in the execution of the works.

h) Accommodation of traffic on public roads occupied by the Contractor

The Contractor shall draft a traffic accommodation plan and submit to the Engineer prior to commencement of work on any road. The approval by the Engineer shall not relieve the Contractor of any of his responsibilities or obligation.

i) Other Contractors on site

The Contractor needs to take note that other contractors may also be working on the same site and allow therefore in his planning/work scheduling.

j) Testing, completion, commissioning and correction of defects

The Contractor shall be responsible for conducting all testing as described herein. Work under this section shall include all labour, materials, and support services required to completely test all hardware and software. If a type of equipment does not meet the specifications or requirements as stated in these Specifications or the System Design Document, it shall be the Contractor's responsibility to correct the problem in all units of that equipment furnished, at no additional cost to the Employer.

All of the components, sub-systems, interfaces and systems processes constituting the works shall be tested individually and together to demonstrate that they meet the contract requirements and provide a system that functions in accordance with the contract.

The Contractor shall be responsible for the performance of all of the tests described below to satisfy the objectives of each testing phase as determined by the Engineer. The Employer shall have the right to witness any and all tests. Test plans shall be submitted to the Engineer a minimum twenty-one (21) days prior to the planned start of testing. Testing shall not commence until the plans have been approved.

Unless otherwise specified, all test plans shall include at a minimum the following:

a) Overview of test including test objectives
b) Pass/fail criteria
c) Traceability matrix listing of all requirements and specifications from the Contract that are included/to be verified in the test and their cross-reference to the Specifications and System Design Document.
d) Test setup and test measuring equipment (including descriptive diagrams)
e) Listing of tools, test applications, simulators, etc. required to perform the test
f) Entry/start-up conditions
g) Exit/closing conditions
h) Test procedures and scripts to be executed
i) Test recording form
j) Test comments form
k) Signatures and verification form

The Employer reserves the right to direct at no additional cost, the following changes to the test plans:

a) The addition of procedural changes and other reasonable tests to reasonably assure System performance and conformance;
b) Investigation into any apparent troubles or anomalies with respect to the System;
c) An audit of all test reports and verification of any or all previous tests and Measurements.

The Contractor shall provide written notification of readiness to test for all required test stages a minimum of two (2) weeks in advance of the testing.

Upon successful completion of any test, the Contractor shall prepare and submit within two (2) weeks a report summarizing the results with relevant test records appended. All such test reports will be reviewed by the Engineer.

The Contractor shall develop and maintain a standard set of regression tests for each device or subsystem. Regression tests shall be run for any affected device or subsystem in the event that any testing is halted and restarted in accordance with the requirements of the defect resolution.

k) Training

The Contractor needs to take note that the Employer aims to use the infrastructure contracts to expose students from various institutions to construction activities as part of their training programme. Full support needs to be provided by the Contractor in this programme to obtain maximum benefits for the students allocated to the contract.

The Contractor shall be responsible to train the Employer's designated personnel according to the requirements specified herein. The Contractor shall be responsible for the supply of all training materials including, at a minimum:

a) Training setups of equipment, including mounting and all power supplies and simulators required to simulate normal operation.
b) Instructor guides.
c) Student guides.
d) Operations manuals.
e) Training presentations.
f) Training handouts.
g) Quick reference guides.
h) Interactive videos or demonstrations.
i) Course and instructor comments sheets

l) A Training Program shall be developed and submitted a minimum forty-five (45) days before delivery of training materials that describes:

a) Each course to be conducted.
b) An overview of delivery methods for each course, including hands-on and group work experience.
c) The course objectives for trainees.
d) An evaluation plan, including criteria for success of the course, based upon the goals and objectives, and evaluation steps and instruments to be employed.
e) A proposed schedule for each class, keyed to the installation process and constrained by availability of trainees away from regular duties.
f) A plan for developing or customizing course material.
g) Resumes of personnel proposed to be trainers for each class, demonstrating that they are experienced, effective training professionals.

Training shall include course development, providing instructors, and supplying all handouts, materials, classroom aids, etc. required to conduct the training. Training shall take place at the site facilities. Practical training on equipment shall occupy a significant portion of all training classes. The training presentations and material shall be in English.

m) Recording of weather

The Contractor shall be permitted to take his own rainfall measurements on site subject to the Engineer's approval, but access to the measuring gauge(s) shall be under the Engineer's control. The Contractor is to provide and install all the necessary equipment for accurately measuring the rainfall as well as to provide, erect and maintain a security fence plus gate, padlock and keys at each measuring station, all at his own cost.

C3.5 HIV/AIDS REQUIREMENTS

C3.5.1 SCOPE

This specification contains all requirements applicable to the Contractor for creating HIV/AIDS awareness amongst all of the Workers involved in this project for the duration of the construction period, through the following strategies:

- Raising awareness about HIV/AIDS through education and information on the nature of the disease, how it is transmitted, safe sexual behaviour, attitudes towards people affected and people living with HIV/AIDS, how to live a healthy lifestyle with HIV/AIDS, the importance of voluntary testing and counselling, the diagnosis and treatment of Sexually Transmitted Infections and the closest health Service Providers
- Informing Workers of their rights with regard to HIV/AIDS in the workplace
- Providing Workers with access to condoms and other awareness material that will enable them to make informed decisions about sexual practices

C3.5.2 DEFINITIONS AND ABBREVIATIONS

C3.5.2.1 Definitions

Service Provider: The natural or juristic person recognised and approved by the Lepelle Northern Water as a specialist in conducting HIV/AIDS awareness programmes.

Service Provider Workshop Plan: A plan outlining the content, process and schedule of the training and education workshops, presented by a Service Provider which has been approved by the Representative/Agent.

Worker: Person in the employ of the Contractor or under the direction or supervision of the Contractor or any of his Sub-contractors, who is on site for a minimum period of 30 days in all.

C3.5.2.2 Abbreviations

HIV	:	Human Immunodeficiency Virus
AIDS	:	Acquired Immune Deficiency Syndrome
STI	:	Sexually Transmitted Infection

C3.5.3 BASIC METHOD REQUIREMENT

The Contractor shall, through a Service Provider, conduct onsite workshops with the Workers.

The Service Provider shall develop and compile a Service Provider Workshop Plan to be presented at the workshops and which will be best suited for this project to achieve the specified objectives with regard to HIV/AIDS awareness.

The Service Provider Workshop Plan shall be based on the following information provided by the Contractor:

- Number of Workers and Sub-contractors on site
- When new Workers or Sub-contractors will join the construction project
- Duration of Workers and Sub-contractors on site
- How the maximum number of Workers can be targeted with workshops
- How the Contractor prefers workshops to be scheduled, *e.g.* three hourly sessions per Worker, or one 2.5 hour workshop per Worker
- Profile of Workers, including educational level, age and gender (if available)
- Preferred time of day or month to conduct workshops
- A Gantt chart reflecting the construction programme, for scheduling of workshops
- Suitable venues for workshops The Contractor shall submit the Service Provider Workshop Plan for approval within 21 days after the tender acceptance date. After approval by the Lepelle Northern Water Representative/Agent, the Contractor shall make available a suitable venue that will be conducive to education and training.

The Service Provider Workshop Plan shall address, but will not be limited to the following:

3.1 The nature of the disease;

3.2 How it is transmitted;

3.3 Safe sexual behaviour;

3.4 Post exposure services such as voluntary counselling and testing (VCT) and nutritional plans for people living with HIV/AIDS;

3.5 Attitudes towards other people with HIV/AIDS;

3.6 Rights of the Worker in the workplace;

3.7 How the Awareness Champion will be equipped prior to commencement of the HIV/AIDS awareness programme with basic HIV/AIDS information and the necessary skills to handle questions regarding the HIV/AIDS awareness programme on site sensitively and confidentially;

3.8 How the Service Provider will support the Awareness Champion;

3.9 Location and contact numbers of the closest clinics, VCT facilities, counselling services and referral systems;

3.10 How the workshops will be presented, including frequency and duration;

3.11 How the workshops will fit in with the construction programme;

3.12 How the Service Provider will assess the knowledge and attitude levels of attendees to structure workshops accordingly;

3.13 How the video will be used;

3.14 How the Service Provider will elicit maximum participation from the Workers;

3.15 A questions and answers slot (interactive session)

The Service Provider Workshop Plan shall encompass the Specific Learning Outcomes (SLO) as stipulated.

C3.5.4 HIV/ AIDS AWARENESS EDUCATION AND TRAINING

4.1 **Workshops**

The Contractor shall ensure that all Workers attend the workshops.

The workshops shall adequately deal with all the aspects contained in the Service Provider Workshop Plan. A video of HIV/AIDS in the construction industry, which can be obtained from all Offices of the Lepelle Northern Water, is to be screened to Workers at workshops. In order to enhance the learning experience, groups of not exceeding 25 people shall attend the interactive sessions of the workshops.

4.2 **Recommended practice**

4.2.1 Workshop Schedule

Presenting information contained in the Service Provider Workshop Plan can be divided in as many workshop sessions as deemed practicable by the Contractor, provided that all Workers are exposed to all aspects of the workshops as outlined in the Service Provider Workshop Plan. Breaking down the content of information to be presented to Workers into more than one workshop session however, has the added advantage that messages are reinforced over time while providing opportunity between workshop sessions for Workers to reflect and test information. Workers will also have an opportunity to ask questions at a following session.

4.2.2 Service Providers

A database of recommended Service Providers is available from all Offices of the Lepelle Northern Water.

4.2.3 HIV/AIDS Specific Learning Outcomes and Assessment Criteria

Workers shall be exposed to workshops for a minimum duration of two-and-a-half hours. In order to set a minimum standard requirement, the following specific learning outcomes and assessment criteria shall be met

4.2.3.1 UNIT 1: The nature of HIV/AIDS

After studying and understanding this unit, the Worker will be able to differentiate between HIV and AIDS and comprehend whether or not it is curable. The Worker will also be able to explain how the HI virus operates once a person is infected and identify the symptoms associated with the progression of HIV/AIDS.

Assessment Criteria:
1. Define and describe HIV and AIDS
2. List and describe the progression of HIV/AIDS

4.2.3.2 UNIT 2: Transmission of the HI virus

After studying and understanding this unit, the Worker will be able to identify bodily fluids that carry the HI virus. The Worker will be able to recognise how HIV/AIDS is transmitted and how it is not transmitted.

Assessment Criteria:
1. Record in what bodily fluids the HI virus can be found
2. Describe how HIV/AIDS can be transmitted
3. Demonstrate the ability to distinguish between how HIV/AIDS transmitted and misconceptions around transmittance of HIV/AIDS

4.2.3.3 UNIT 3: HIV/AIDS preventative measures

After studying and understanding this unit, the Worker will comprehend how to act in a way that would minimise the risk of HIV/AIDS infection and to use measures to prevent the HIV virus from entering the bloodstream.

Assessment Criteria:
1. Report on how to minimise the risk of HIV/AIDS infection
2. Report on precautions that can be taken to prevent HIV/AIDS infection
3. Explain or demonstrate how to use a male and female condom.
4. List the factors that could jeopardize the safety of condoms provided against HIV/AIDS transmission

4.2.3.4 UNIT 4: Voluntary HIV/AIDS counselling and testing

After studying and understanding this unit, the Worker will be able to recognise methods of testing for HIV/AIDS infection. The Worker will be able

to understand the purpose of voluntary HIV/AIDS testing and pre- and post-test counselling.

Assessment Criteria:
1. Describe methods of testing for HIV/AIDS infection
2. Report on why voluntary testing is important
3. Report on why pre- and post-test counselling is important

4.2.3.5 UNIT 5: Living with HIV/AIDS

After studying and understanding this unit, the Worker will be able to recognise the importance of caring for people living with HIV/AIDS and be able to manage HIV/AIDS.

Assessment Criteria:
1. List and describe ways to manage HIV/AIDS
2. Describe nutritional needs of people living with HIV/AIDS
3. Describe ways to embrace a healthy lifestyle as a person living with HIV/AID
4. Explain the need for counselling and support to people living with HIV/AIDS

4.2.3.6 UNIT 6: Treatment options for people with HIV/AIDS

After studying and understanding this unit, the Worker will be familiar with the various treatments available to HIV/AIDS infected or potentially HIV/AIDS infected people.

Assessment Criteria:
1. Discuss anti-retroviral therapy
2. List methods of treatment to prevent HIV/AIDS transmission from mother-to-child
3. Describe the need for treatment of opportunistic diseases for people living with HIV/AIDS
4. Describe post exposure prophylactics.

4.3 Displaying of plastic laminated posters and distribution of information booklets

The Contractor shall obtain a set of four laminated posters conveying different key messages and information booklets, which are available from Offices of the Lepelle Northern Water.

The above-mentioned posters and information booklets have been prepared to raise awareness and to share information about HIV/AIDS and STI's.

Posters or display stands shall be displayed on site as soon as possible, but not later than 14 days after the date of site handover.

Posters shall be displayed in areas highly trafficked by Workers, including toilets, rest areas, the site office and compounds.

The posters on display must always be intact, clear and readable.

Information booklets must be distributed to all Workers as soon as possible, but not later than 14 days after site handover, or as soon as the Worker joins the site.

5. PROVIDING WORKERS WITH ACCESS TO CONDOMS

The Contractor shall provide and maintain condom dispensers and make both male and female condoms, complying with the requirements of SABS ISO 4074, available at all times to all Workers at readily accessible points on site, for the duration of the contract. The Contractor may obtain condom dispensers from the Department of Health and condoms may be obtained from the Local Clinic or the Department of Health.

At least one male and one female condom dispenser and a sufficient supply of condoms, all to the approval of the Representative/Agent, shall be made available on site within 14 days of site hand over. Contractors should note that arrangements to obtain condoms from the Department of Health Clinics prior to site hand over may be necessary, to ensure that condoms are available within 14 days of site handover.

Condoms shall be made available in areas highly trafficked by Workers, including toilets, the site office and compounds.

C3.6.5 ENSURING ACCESS TO HIV/AIDS TESTING AND COUNSELLING FACILITIES AND TREATMENT OF SEXUALLY TRANSMITTED INFECTIONS (STI)

The Contractor shall provide Workers with the names of the closest Service Providers that provide HIV/AIDS testing and counselling and Clinics providing Sexually Transmitted Infection (STI) diagnosis and treatment. Information on these Service Providers and Clinics must be displayed on a poster of a size not smaller than A1 in an area highly trafficked by Workers.

C3.5.6 APPOINTMENT OF AN HIV/AIDS AWARENESS CHAMPION

Within 14 days of site handover the Contractor shall appoint an Awareness Champion from amongst the Workers, who speaks, reads and writes English, who speaks and understands all the local languages spoken by the Workers and who shall be on site during all stages of the instruction period.

The Contractor shall ensure that the Awareness Champion has been trained by the Service Provider on basic HIV/AIDS information, the support services available and the necessary skills to handle questions regarding the HIV/AIDS programme in a sensitive and confidential manner.

The Awareness Champion shall be responsible for:

7.1 Liaising with the Service Provider on organizing awareness workshops;
7.2 Filling condom dispensers and monitoring condom distribution;
7.3 Handing out information booklets;
7.4 Placing and maintaining posters

C3.5.7 MONITORING

The Contractor shall grant to the Representative/Agent reasonable access to the construction site, in order to establish that the Contractor complies with his obligations regarding HIV/AIDS awareness under this contract.

The Contractor must report problems experienced in implementing the HIV/AIDS requirements to the Representative/Agent.

C3.6 OCCUPATIONAL HEALTH AND SAFETY

C3.6.1 GENERAL

C3.6.1.1 Tender Document

This document is the pre-contract Health and Safety Specification which must be used by the Principal Contractor and Sub Contractors appointed by the Principal Contractor to compile Health and Safety Plans for this project and forms part of the tender documentation.

The Principal Contractor and Sub Contractors' particular attention is drawn to this specification whereby

"Upon award of the contract, the contractor is to assume and adopt the function and duties of the Principal Contractor as set out in the Construction Regulations 2003 No. R. 1010 promulgated 18 July 2003."

The health and safety specifications outlined herein must be taken into account and due allowance made within the pricing of appropriate items contained within the specification. Where the tenderer is of the opinion that a requirement is missing or is not adequately specified then this shall be drawn to the Client attention during the tender period. In the absence of any direction to the contrary, the tenderer shall as part of the tender submission, set out the details of such discrepancy together with the costs associated therewith, separately identified and included within the tender figure.

C3.6.1.2 Principal Contractor

The successful tenderer will on signing of the contract for:

Project Name: REFURBISHMENT OF CATHODIC PROTECTION SYSTEMS WITHIN PHALABORWA SCHEME.

be required to fulfil the function and duties of the Principal Contractor as set out in the Construction Regulations 2003 No. R.1010 promulgated 18 July 2003.

C3.6.1.3 Start of Construction Phase

The construction phase shall not commence until the Principal Contractor's Health and Safety Plan was considered and approved by the Client and Design Team. The Client shall discuss and negotiate with the Principal Contractor the contents of the Health and Safety Plan submitted by the Principal Contractor before finally approving it for implementation.

The construction phase shall not commence until written permission is received from the Client. In this respect the Client may rely on the advice of the Technical Team as to the adequacy and comprehensiveness of the Plan offered by the Principal Contractor.

In preparing their detailed Health and Safety Plan based on the relevant sections of this Health and safety Specifications supplied to them by the Client, contractors must allow for the adoption of safe working procedures and co-ordinate and rationalize activities to avoid controllable hazards arising due to clashes of activities.

C3.6.2 SUB-CONTRACTORS, SUPPLIERS & DESIGNERS

The Principal Contractor shall ensure that all direct appointments in connection with this project include provisions for the compliance of his sub-contractors, suppliers and designers, etc, with the relevant provision of the Occupational Health and Safety Act (Act 85 of 1993) and it's Regulations, in particular the Construction Regulations 2003 No. R. 1010 promulgated 18 July 2003.

C3.6.2.1 liaison

The Principal Contractor shall together with all his appointees, liaison with the Client as required under the Regulations and agrees procedures for the transfer of relevant Information in respect of designs and in connection with the preparation of the Health and Safety File.

C3.6.2.2 Advice

The tenderer shall, as part of the tender submission, indicate where advice will or may be required of the Client in respect of the competence of the tenderer's designers and the adequacy of resources allocated or to be allocated by them.

C3.6.2.3 Undertaking by Principal Contractor and Sub-Contractors appointed by the Principal Contractor.

The Principal Contractor as well as Sub-Contractors appointed by him / her shall undertake in writing to ensure that the provisions of the Occupational Health and Safety Act (Act 85 of 1993) and it's Regulations, in particular the Construction Regulation of 2003 No. R 1010 and any amendments or re-enactments thereto are complied with.

The attached Occupational Health and Safety provisions undertaking form for the Principal Contractor shall be completed and signed by the Project Manager of the company / firm awarded the tender.

Client's Occupational Health and Safety Agent: To be appointed

C3.6.3 INFORMATION REQUIREMENTS

The contractor must provide the following information.

C3.6.3.1 General

- The Principal Contractor / Sub-Contractor shall have an OHS Policy in accordance with the OHS(Occupational Health and Safety Act, Act 85 of 1993) and include a copy of the Policy in the Health and Safety Plan to be submitted by the Principal Contractor / Sub-Contractor.

- The Principal Contractor / Sub-Contractor shall promptly display a copy of the Company's OHS Policy on the OHS Notice Board for the duration of the contract and include it into information provided to persons at the contract OHS induction.

- The Principal Contractor shall develop a Contract specific OHS Management Commitment Statement based on the Company's OHS Policy.

- The Principal Contractor's Project Managing shall sign the Commitment statement and prominently display a copy on the OHS Notice Board for the duration of the contract. A copy of the Commitment Statement shall be included in information provided to persons at the Contract OHS induction and a copy shall also be supplied to each sub-contractor.

C3.6.3.2 Management

- of the personnel and management systems to be put in place to prepare, manage, implement, conduct and monitor the Health and Safety Plan for the project.

Broadly speaking your:

- Organization's internal structure that establishes SHE (Safety, Health and Environmental) ROLES, RESPONSIBILITIES, ACCOUNTABILITIES, and REPORTING RELATIONSHIPS,

- SHE (Safety, Health and Environmental) PLANS, POLICIES, PROCEDURES, DIRECTIVES and STANDARDS that provide instructions as to how activities and functions are to be carried out,
- SHE (Safety, Health and Environmental) CONTROLS, INSPECTIONS, REVIEWS, etc. built into construction operations to ensure that performance is consistent with SHE (Safety, Health and Environmental) objectives and requirements,

- SHE (Safety, Health and Environmental) COMMUNICATION MECHANISMS for collecting, handling and reporting information.

In other words, Management Systems that specifies WHO is going to do WHAT, WHERE, WHEN, WHY and HOW.

- Details of relevant qualifications and experience held by the persons nominated above, including recent health and safety education and training undertaken.

- Procedures for determining the competence of contractors engaged on the project, whether employed by the contractor directly or by others, to fulfill their duties under the Construction Regulations 2003 (No. R.1010 Promulgated 18 July 2003)

C3.6.3.3 HAZARD IDENTIFICATION, RISK MANAGEMENT AND CONTROL

- The Principal Contractor / Sub-Contractor shall detail and implement procedures that will identify hazards, assess risks and determine suitable control measures as they arise throughout term of the contract. These procedures shall both comply with and be implemented and managed in accordance with the specification.

- The Principal Contractor / Sub-Contractor shall detail and implement procedures that ensure control measures are evaluated for effectiveness and modified as necessary. The evaluation procedure shall detail the responsibilities, timelines and records that will be kept as part of the process.

- Where Risk is controlled through administrative control measures, the Principal Contractor / Sub-Contractor shall ensure that the administrative measures are:

a) Clearly documented and those personnel responsible for implementation and management are explicitly defined;

b) Understood by all relevant personnel through training and assessment;

c) Implemented as documented and promptly reviewed for effectiveness following initial implementation;

d) Amended and authorised as required;

e) Adequately supervised, managed and audited to ensure continuing compliance;

f) Available at all times wherever the measures are being implemented.

❖ Any piece of plant or equipment not complying with the specification shall cease operation until the Principal Contractor / Sub-Contractor can demonstrate to the satisfaction of the Client / Client's Agent that the piece of non-conforming plant or equipment conforms to these requirements.

C3.6.3.4 Health and Safety Plan

The Principal Contractor / Sub-Contractor shall develop a Health & Safety Plan to reflect variations in design or changes in site conditions and liaise with the Client / Client's Agent.

The Principal Contractor shall develop this Heath and Safety Plan so that it:

a) Incorporates the contractor's approach to managing the construction work to ensure the health and safety of all persons carrying out the construction work and all persons who may be affected by their work.

b) Includes the risk assessments prepared by all Contractors under their duties set out in the Construction Regulations 2003 and any other relevant legislation (i.e. the OHS Act and Regulations, etc).

c) Includes the arrangements for ensuring that, where appropriate or specifically requested, all Contractors / Sub-Contractors prepare suitable and sufficient method statements for their construction works which incorporate adequate measures for ensuring the health and safety of all persons who may be affected by these works.

d) Incorporates the common arrangements for site safety, statutory notices and registers etc.

e) Includes the site rules to be adopted for controlling the risks to health and safety during the construction phase(s) or the project.

f) Includes reasonable arrangements for monitoring compliance with health and safety legislation and site rules.

g) g)Includes reasonable measures to ensure co-operation between all Contractors and Sub-Contractors in respect of health and safety provisions and prohibitions.

h) Includes the steps to be taken to ensure that only authorised persons are allowed into any premises or parts of the site / premises where construction work is being carried out.

i) Includes arrangements for emergency procedures.

j) Includes arrangements for ensuring that, so far as is reasonably practicable, every Contractor and Sub-Contractor is provided with comprehensible information about the risks to health and safety of that Contractor / Sub-Contractor, or of any employees or other persons under their control, arising out of the construction works, including the emergency procedures

k) Includes details of the arrangements for ensuring, so far as is reasonably practicable, that the employees or other persons under the control of any Contractor / Sub-Contractor, and any visitors to the site, receive adequate information about the risks to their health and safety arising out of the construction works and, where necessary, adequate training to carry out their work in a safe and healthy manner.

l) Includes arrangements for providing all persons at work on the site and visitors to the site with the opportunity and means of discussing and offering advice on health and safety issues relating to the construction works.

m) Includes arrangements for the reporting of any accidents, injuries or dangerous occurrences, including conforming with the statutory requirements.

n) Can be modified as the work proceeds to take account of any information received from Contactors / Sub-Contractors, any experience gained during the course of the project or any changes necessary as a result of unforeseen circumstances or alterations to the design.

C3.6.3.5 PROGRAMME

A time estimate required by the contractor to implement the Health & Safety Plan sufficiently for works to commence on site.

C3.6.3.6 Cost

A detailed breakdown of costs allowed in the contractor's tender for preparing, managing, implementing and monitoring the Health and Safety Plan, and for complying with the requirements imposed on the Principal Contractors under the Construction Regulations of 2003(No. R. 1010 Promulgated 18 July 2003).

C3.6.4 GENERAL SITE SAFETY

C3.6.4.1 Safety training & education

The Principal Contractor shall detail the OHS competencies and training received by its contract management personnel.

The Principal Contractor's Health and Safety Plan shall have a detailed register of the skills and competencies for all personnel for the activities that the personnel will undertake under the contract. (E.g. Mobile plant operators, crane operators etc.)

The Principal Contractor shall demonstrate and maintain documentary evidence of competencies on site for the duration of the contract.

C3.6.4.2 Induction Training

The Principal Contractor / Sub-Contractor shall develop and detail a Site Induction Training Programme as part of the Occupational Health and Safety Plan to be submitted to the Client prior to commencement of construction that includes as a minimum:

a) Training related to hazards likely to be encountered on Site and control measures that have been developed in response to these hazards;
b) Roles and Responsibilities;
c) The requirements of the Health and Safety Plan submitted and approved
d) Address the identified issues in the Fire Safety, Emergency, Evacuation and Rescue Plan to ensure that all Site personnel are aware of procedures in the event of an incident or emergency occurring;

The Principal Contractor / Sub-Contractor shall evaluate all persons undertaking the site Induction Training through a written test to ensure that inductees have an understanding of the OHS (Occupational Health and Safety) requirements for the contract. The written tests shall be signed and dated by the person undertaking the induction training to attest to their understanding and be retained by the Principal Contractor / Sub-Contractor as a record that the training has been completed.

C3.6.4.3 Induction training for specified work

The Principal Contractor / Sub-Contractor shall conduct Site Specific Occupational Health and Safety Induction Training for all personnel, the Client and all visitors not escorted on Site by inducted persons.

The Principal Contractor / Sub-Contractor shall evaluate all persons undertaking the Site Induction Training through a written test to ensure that inductees have an understanding of the OHS (Occupational Health and Safety) requirements for the contract. The written tests shall be signed and dated by the person undertaking the induction training to attest to their understanding and be retained by the Principal Contractor / Sub-Contractor as a record that the training has been completed.

C3.6.4.4 Recording & reporting of injuries

Make arrangements for all contractors to report accidents, ill health and dangerous occurrences notifiable to the Department of Labour under Section 24 of the OHS Act (Occupational Health and Safety Act, Act 85 of 1993) (Reporting to DOL (Department of Labour) Inspector regarding certain incidents).

All lost time incidents associated with the contract works or reportable as defined by **Section 24** of the OHS Act shall be immediately reported to the Client.

The Principal Contractor / Sub-Contractor shall provide a detailed report of all accidents / incidents, including events that could have become lost time incidents were it not for fortuitous circumstances to the Client within 5 days of the incident occurring. The Principal Contractor / Sub-Contractor shall provide copies of all reports and information associated with the incidents to the Client. Copies of reports must be placed on the Health and Safety File.

Where the Principal Contractor / Sub-Contractor has been:

• Served with a prohibition, contravention or improvement notice under the OHS Act; or
• Required to comply with any order issued by an inspector for the Department of Labour;

- The Principal Contractor / Sub-Contractor shall immediately supply a copy of that notice, order or notification to the Client.

- Where the Principal Contractor / Sub-Contractor have been served with a summons or is convicted of any offence in relation to occupational health and safety, the Principal Contractor / Sub Contractor shall immediately supply a copy of that summons to the Client.

- The Principal Contractor / Sub-Contractor shall detail the reporting and investigation procedures for incident investigation. The procedures shall include the investigating officer responsible and the time limits imposed for reporting and investigating the incident and to implement corrective action in a timely manner so as to prevent a recurrence.

- The client may participate in or undertake an investigation into the incident, injury or illness at its discretion and the Principal Contractor / Sub-Contractor shall cooperate with and provide assistance to the investigation organized and undertaken by the Client.

C3.6.4.5 First Aid

- Establish and implement a first-aid programme to provide emergency treatment to victims of accidents, chemical substances or excessive exposure to toxic substances.

  The programme shall include:

  • proper first aid facilities administered by qualified personnel,
  • first-aid boxes,
  • first-aid room, where there are 500 or more workers on site,
  • training and re-training of first-aiders,
  • first-aid treatment procedures,
  • standard procedures,
  • special procedures, e.g. for poisoning,
  • maintenance of first-aid facilities

- All first-aid provisions shall comply with the OHS Act (Act 85 of 1993)

C3.6.4.6 Fire protection and prevention

- Appropriate measures must be taken to avoid the risk of fire.
- Sufficient and suitable storage must be provided for flammable liquids, solids and gases.
- Smoking must be prohibited and notices in this regard must be prominently displayed in all places containing readily combustible or flammable materials;
- Combustible materials must not accumulate on the construction site.
- Welding, flame cutting and other hot work may only be done after the appropriate precautions have been taken to reduce the risk of fire.
- Suitable and sufficient fire-extinguishing equipment must be placed at strategic locations and such equipment must be maintained in good working order.
- A sufficient number of workers must be trained in the use of fire-extinguishing equipment.

C3.6.4.7 Site Emergency Procedures

The Principal Contractor / Sub-Contractor shall establish an Emergency Evacuation and Rescue plan.

The plan shall include the following detail:

- The role and responsibility of every individual in the work area on fire safety emergency evacuation and rescue;
- General work area precautions, fire prevention, detection, protection and warning alarm systems;

- Fire fighting and rescue equipment including types of fire extinguishers;
- Fire safety measures for Site accommodation;
- Escape and communication;
- Fire brigade access, facilities and coordination;
- Fire drills and training including the use of fire fighting equipment;
- Material storage including flammable liquids, gasses and waste;

The Principal Contractor / Sub-Contractor shall ensure that all procedures, precautionary measures and safety standards stipulated in the Plan are communicated, implemented and complied with by all workers including other interfacing contractors on Site.

The Principal Contractor / Sub-Contractor shall practice their emergency preparedness within six (6) weeks of the commencement of work and at least four (4) monthly intervals thereafter.

The Principal Contractor / Sub-Contractor shall review and ensure the adequacy of the Plan as the work progress.

The Principal Contractor / Sub-Contractor shall conduct monthly checks on fire fighting equipment and test alarms and detection devices installed on Site and document findings in a register which shall be on site at all times for inspection.

The Principal Contractor / Sub-Contractor shall conduct weekly inspections of escape routes, fire brigade access, fire fighting facilities and working areas to ensure that the requirements stipulated in the Fire Safety, Emergency, Evacuation and Rescue Plan are complied with. All

inspection records shall be documented in registers and kept in the Health and Safety file for inspection at any time.

C3.6.4.8 Housekeeping

Suitable housekeeping must continuously be implemented on the construction site, including:

- proper storage of materials and equipment
- removal of scrap, waste and debris at appropriate intervals;

Loose materials shall not be placed or allowed to accumulate on the site so as to obstruct access and egress from workplaces and passageways.

C3.6.4.9 Stacking & Storage

- Adequate storage areas are must be provided.
- Storage areas must be kept neat and under control.

C3.6.4.10 Illumination

Provide adequate artificial lighting when work is carried out after dark or inside buildings.

C3.6.4.11 Sanitation / Hygiene

Provision of site hygiene facilities:

- One sanitary facility for every 30 workers.
- Adequate washing facilities.
- One shower facility for every 15 workers.

Drying sheds, huts, rooms or other accommodation for sheltering during bad weather, storing clothes and taking meals. Facilities should include tables and chairs, suitable means for boiling water and a supply of wholesome drinking water.

The contractor shall provide reasonable and suitable living accommodation for the workers at construction sites which are remote from their homes and where adequate transportation between the site and their homes, or other suitable living accommodation, is not available.

C3.6.4.12 Personal Protective Equipment

The Principal Contractor / Sub-Contractor shall provide and maintain suitable PPE (Personal Protective Equipment) for all employees employed on the Site.

The Principal Contractor / Sub-Contractor shall ensure that such PPE comply with the requirements of the OHS Act (Occupational Health and Safety Act, Act 85 of 1993).

The Principal Contractor / Sub-Contractor shall also ensure that all equipment is properly used by his / her employees during the course of their work.

The Principal Contractor / Sub-Contractor shall record all issues of all equipment to his / her employees in documented registers and such registers shall be kept in the Health and Safety File on site and made available for inspection at all times.

The Principal Contractor / Sub-Contractor shall provide the Client / Client's Agent with a colour code by which employees will be identified with regard to occupations, responsibilities, accountabilities, reporting relationships and access to different locations on site. (e.g. hard hats, overalls).

PPE shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards.

All personal protective equipment shall be of safe design and construction for the work to be performed.

C3.6.4.13 Permit to Work Requirements

Institute a "hot work" permit system in respect of:

- metalwork flame cutting,
- site welding,

C3.6.4.14 Lock-Out

Institute a "Lock-out" procedure in respect of controlling energy so as to prevent unexpected operation or activation of machinery or equipment. This procedure must include a written policy, specific procedures, rules and supervisory follow-up, covering the positive locking of switches and valves to ensure that alterations, maintenance, set-up and or other work can be performed safely.

C3.6.4.15 Monthly Health and Safety Audits

The Principal Contractor shall carry out monthly Health and Safety Audits on the measures contained within his / her Health and Safety Plan submitted to the Client as well as Health and Safety Plans submitted by Sub-Contractors appointed by the Principal Contractor to demonstrate that the required level of health and safety are being achieved and maintained and compile a full report to the Client on such audit.

The Client will audit the Principal Contractor as well as his / her Sub-contractor's Health and Safety Plans from time to time and will advise the Principal Contractor of any matter with which he / she is not satisfied and the Principal Contractor shall take such steps as are necessary to satisfy the Client.

The Client will carry out such audits as he / she considers necessary but not less than monthly.

The Principal Contractor shall make available, specialist personnel as the Client may consider necessary for the performance of such audits.

The Principal Contractor shall develop and maintain an Audit Schedule that details the audits planned to be undertaken by the Principal Contractor of the work under the contract, including sub-contractors, for the duration of the contract. The Audit Schedule shall form part of the Health and Safety Plan that needs to be submitted by the Principal Contractor.

Audit reports shall detail the scope of the audit, the audit questions and the audit findings.

The Client shall be promptly provided with copies of all audit reports together with other documentation to show that all matters raised have been appropriately addressed.

Unless otherwise directed by the Client the Principal Contractor / Sub-Contractor shall undertake its initial OHS Audit within 4 weeks of commencement of work. The Principal Contractor / Sub-Contractor shall undertake subsequent OHS Audits at a frequency not less than once every 3 months.

All Principal Contractor's OHS Audits shall include an assessment of Sub-Contractor compliance with the approved OHS Plan.

C3.6.4.16 Management Review

The Principal Contractor shall undertake an independent review of the Health and Safety Plan for the contract in accordance with the requirements of the OHS Act, relevant Regulations and in particular the Construction Regulations 2003.

A review shall be undertaken 3 months after commencement of the contract and every 6 months thereafter for the duration of the contract.

Following the completion of the review, the Principal Contractor shall submit a written report that details the suitability, adequacy and effectiveness of the OHS Plan and to certify that the Site procedures, practices and operations are in accordance with the contract.

C3.6.4.17 Provision of Information

- Provide Sub-Contractors appointed by him / her with the relevant sections of the Health and Safety specifications pertaining to the construction work which has to be performed.
- Where changes are brought to the design and construction, provide sufficient information and appropriate resources to the Sub-Contractor to execute the work safely.
- Discuss and negotiate with Sub-Contractors the contents of the Health and Safety Plan / Plans submitted by them and finally approve such plans for implementation.
- Ensure that copies of Health and Safety plans compiled by the Principal Contractor and his / her Sub-Contractors are available on request to an employee, DOL Inspector, contractor, Client.
- The Principal Contractor / Sub-Contractor shall detail procedures that will ensure that personnel are suitably consulted and communicated with during the planning and application of work activities associated with the contract.

- The Principal Contractor / Sub-Contractor shall detail the procedures for the identification, assessment and control of hazards associated with the day-to-day work activities. These procedures shall include requirements for consultation with personnel involved in the work activity.

- The Principal Contractor / Sub-Contractor shall have procedures for ensuring that OHS information is communicated to and from its personnel. The Principal Contractor / Sub-Contractor shall hold OHS meetings with all personnel or their representatives at the site on a weekly basis.

- Minutes shall be recorded for all OHS meetings and posted on OHS notice boards within 48 hours of the meeting.

- The Principal Contractor / Sub-Contractor shall maintain at the Site an OHS Notice Board located in a prominent position and accessible to all personnel, for the distribution of OHS information.

- The Principal Contractor / Sub-Contractor shall as a minimum, establish and implement procedures for reporting relevant and timely information with regard to OHS Performance and incidents.

- The Principal Contractor / Sub-Contractor shall establish, implement and maintain a controlled copy of all Contract OHS documentation on Site.

- Where the Principal Contractor / Sub-Contractor's Health and Safety Plan references other documentation including the contract, the Principal Contractor / Sub-Contractor shall ensure that section and clause numbers are clearly denoted in its Health and Safety Plan. All documentation referenced in the Health and Safety Plan shall be available on Site for the duration of the contract.

- Ensure that Health and Safety Files kept by Sub-Contractors appointed by the Principal Contractor is kept on site and made available to an inspector, Client.

- Hand over a consolidated health and safety file to the Client upon completion of construction work, including all drawings, designs, materials used and other similar information concerning the completed structure.

- In addition to the Health and Safety File compile a comprehensive and updated list of all contractors on site accountable to the Principal Contractor as well as the agreements between the parties and the type of work done by them.

C3.6.4.18 Stop the Execution of Construction Work

Stop any construction / construction related work conducted by any person on the construction site, which is not in accordance with the Principal Contractor's health and safety plan and or the health and safety plans of Sub-Contractors which possess a threat to the health and or safety of persons.

C3.6.4.19 Handing over of Project Health and Safety File

- Hand over a consolidated health and safety file to the Client upon completion of construction work, including all drawings, designs, materials used and other similar information concerning the completed structure.

- In addition to the Health and Safety File compile and hand over a comprehensive and updated list of all contractors on site accountable to the Principal Contractor as well as the agreements between the parties and the type of work done by them.

C3.6.4.20 Records and Records Management

- The control of records shall be in accordance with the Principal Contractor's / Sub-Contractor's approved Health and Safety Plan for the contract.

- Records shall be registered, ordered and retained on Site in the Health and Safety File for the duration of the contract.

C3.6.5 CHEMICAL HAZARDS

The following construction materials and substances to be used in the works have been identified as potentially posing special health and/or safety hazards during the project:

NOTE:

The above mentioned is not a definitive list of all potential harmful products. Other materials and substances commonly used during construction may also present health or safety hazards, however, it is deemed that these should be familiar to the average competent Contractor as part of routine risk and OHSH (Occupational Health, Safety and Hygiene) assessments and are therefore not included here.

Adopt all precautionary measures provided by manufacturers for storage, use and application of specified materials.

Data sheets for these, and any other materials that will be used for the works, are to be obtained by the contractor from the manufacturers.

C3.6.6 SAFETY HAZARDS

C3.6.6.1 Tools

C3.6.5.1.1 Hand tools

- Employers shall not issue or permit the use of unsafe hand tools.
- Wrenches, including adjustable, pipe, end, and socket wrenches shall not be used when jaws are sprung to the point that slippage occurs.
- Impact tools, such as drift pins, wedges, and chisels, shall be kept free of mushroomed heads.

- The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight in the tool.

C3.6.6.2 Portable Electrical Tools

No person shall use a portable electric tool with an operating voltage which exceeds 50 to earth unless –

- it is connected to a source of electrical energy incorporating an earth leakage protection device which meets the requirements of section 36 of the OHS Act or,
- it is connected to a source of high frequency electrical energy derived from a generator which is used solely for supplying energy to such portable electric tool and which arrangement is approved by the chief inspector; or
- it is clearly marked that it is constructed with double or reinforced insulation.

Portable electric tools, together with its flexible cord and plug shall be maintained in a serviceable condition.

C3.7.7 EXCAVATIONS

- The contractor shall ensure that all excavation work is carried out under the supervision of a competent person who has been appointed in writing.
- The contractor shall evaluate the stability of the ground before excavation work begins.
- The Contractor shall take suitable and sufficient steps in order to prevent any person from being buried or trapped by a fall or dislodgement of material in an excavation;
- The contractor shall not permit any person to work in an excavation which has not been adequately shored or braced.
- Shoring and bracing may not be necessary where-

- the sides of the excavation are sloped to at least the maximum angle of repose measured relative to the horizontal plane; or
- such an excavation is in stable material:
- Provided that-

➢ permission being given in writing by the appointed competent person upon evaluation by him or her of the site conditions; and

➢ where any uncertainty pertaining to the stability of the soil still exists, the decision from a professional engineer or a professional technologist competent in excavations shall be decisive and such a decision shall be noted in writing and signed by both the competent person and a professional engineer or technologist, as the case may be;

- Take steps to ensure that the shoring or bracing is designed and constructed in such manner rendering it strong enough to support the sides of the excavation in question;

- Ensure that no load, material, plant or equipment is placed or moved near the edge of any excavation where it is likely to cause its collapse and thereby endangering the safety of, any person, unless precautions such as the provision of sufficient and suitable shoring or bracing are taken to prevent the sides from collapsing;

- Cause convenient and safe means of access to be provided to every excavation in which persons are required to work and such access shall not be further than 6m from the point where any worker within the excavation is working;

- Cause every excavation, including all bracing and shoring, to be inspected-

  - ✓ daily, prior to each shift;
  - ✓ after every blasting operation;
  - ✓ after an unexpected fall of ground;
  - ✓ after substantial damage to supports; and
  - ✓ after rain,

- by a competent person in order to pronounce the safety of the excavation to ensure the safety of persons, and those results are to be recorded in a register kept on site and made available to an inspector, client, client's agent, contractor or employee upon request;

- Cause every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered, to be-

  - adequately protected by a barrier or fence of at least one meter in height and as close to the excavation as is practicable; and
  - provided with warning illuminants or any other clearly visible boundary indicators at night or when visibility is poor
  - Cause warning signs to be positioned next to an excavation within which persons are working or carrying out inspections or tests.

C3.6.8 FORMWORK & SUPPORT WORK

The contractor shall ensure that-

- all formwork and support work operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose;
- all formwork and support work structures, are adequately designed, erected, supported, braced and maintained so that they will be capable of supporting all anticipated vertical and lateral loads that may be applied to them and also that no loads are imposed onto the structure that the structure is not designed to withstand.
- The designs of formwork and support work structures are done with close reference to the structural design drawings and where any uncertainty exists, the structural designer should be consulted.
- All drawing pertaining to the design of formwork or support work structures are kept on the site and are available on request by an inspector, contractor, client, client's agent or employee.
- All equipment used in the formwork or support work structure are carefully examined and checked for suitability by a competent person, before being used.
- All formwork and support work structures are inspected by a competent person immediately before, during and after the placement of concrete or any other imposed load and thereafter on a daily basis until the formwork and support work

structure has been removed and the results have been recorded in a register and made available on site.

- If, after erection, any formwork and support work structure is found to be damaged or weakened to such a degree that its integrity is affected, it shall be safely removed or reinforced immediately.
- Adequate precautionary measures are taken in order to-
- Secure any deck panels against displacement, and
- Prevent any person from slipping on support work or formwork due to the application of formwork or support work release agents.
- The health of any person is not affected through the use of solvents or oils or any other similar substances.
- Upon casting concrete, the support work or formwork structure should be left in place until the concrete has acquired sufficient strength to support safely, not only its own weight but also any imposed loads and not removed until authorization has been given by a competent person.
- Provision is made for safe access by means of secure ladders or staircases for all work to be carried out above the foundation bearing level.

- All employees required to erect, ,move or dismantle formwork and support work structures are provided with adequate training and instruction to perform these operations safely
- The foundation conditions are suitable to withstand the weight caused by the formwork and support work structure and any imposed loads, such that the formwork and support work structure are stable.

C3.6.9 CONSTRUCTION VEHICLES

The contractor shall ensure that all construction vehicles and mobile plants-

- are of an acceptable design and construction;
- are maintained in a good working order;
- are used in accordance with their design and the intention for which they were designed, having due regard to safety and health;

i. have received appropriate training and been certified competent and been authorised to operate such machinery; and
ii. are physically and psychologically fit to operate such construction vehicles and mobile plant by being in possession of a medical certificate of fitness;

- have safe and suitable means of access;
- are properly organized and controlled by providing adequate signaling or other control arrangements to guard against the dangers. relating to the movement of vehicles and plant, in order to ensure their continued safe operation;
- are prevented from falling into excavations, water or any other area lower than the working surface by installing adequate edge protection, which may include guardrails and crash barriers;
- where appropriate, are fitted with structures designed to protect the operator from falling material or from being crushed should the vehicle or mobile plant overturn;

- are equipped with an electrically operated acoustic signaling device and a reversing alarm;
- are on a daily basis inspected prior to use, by a competent person who has been appointed in writing and the findings of such inspection is recorded in a register.

The contractor shall furthermore ensure that-

- no person rides or be required or permitted to ride on any construction vehicle or
  - mobile plant otherwise than in a safe place provided thereon for that purpose;
- every construction site is organized in such a way that pedestrians and vehicles can move safely and without risks to health;
- the traffic routes are suitable for the persons using them, sufficient in number, in suitable positions and of sufficient size;
- every traffic route is, where necessary indicated by suitable signs.
- 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 the vehicles or plant;
- 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;
- whenever visibility conditions warrant additional lighting, all mobile plant are equipped with at least two headlights and two taillights when in operation;
- tools and material are secured in order to prevent movement when transported in the same compartment with employees;
- vehicles used to transport employees have seats firmly secured and adequate for the number of employees to be carried; and
- when workers are working on or adjacent to public roads, reflective indicators are provided and worn by the workers.

C3.6.10 ELECTRICAL INSTALLATIONS

- Before construction commences and during the progress thereof, adequate steps must be taken to ascertain the 'presence of and guard against danger to workers from any electrical cable or apparatus.
- All parts of electrical installations and machinery must be of adequate strength to withstand the working conditions on construction sites;
- In working areas where the exact location of underground electric power lines unknown, employees using jackhammers, shovels or other hand tools which may make contact with a power line, must be provided with insulated protective gloves or otherwise that the handle of the tool being used is insulated;
- All temporary electrical installations must be inspected at least once a week and electrical machinery on a daily basis before use on a construction site by competent persons and the records of these inspections must be recorded in a register to be kept on site.
- The control of all temporary electrical installations on the construction site must be designated to a competent person who has been appointed in writing.

C3.6.11 USE & STORAGE OF FLAMMABLE LIQUIDS

- Where flammable liquids are being used, applied or stored it must be done in such a manner that would cause no fire or explosion hazard, and that the workplace is effectively ventilated:

- Provided that where the workplace cannot effectively be ventilated-

i. every employee involved is provided with a respirator, mask or breathing apparatus of a type approved by the chief inspector, and
ii. steps are taken to ensure that every such employee, while using or applying flammable liquid, uses the apparatus supplied to him or her;

- No person smokes in any place in which flammable liquid is used or stored, and the contractor shall affix a suitable and conspicuous notice at all entrances to any such areas prohibiting such smoking;
- Flammable liquids on a construction site is stored in a well-ventilated reasonably fire resistant container, cage or room and kept locked with proper access control measures in place;
- An adequate amount of efficient fire-fighting equipment is installed in suitable locations around the flammable liquids store with the recognized symbolic signs;
- Only the quantity of flammable liquid needed for work on one day is to be taken out of the store for use;
- All containers holding flammable liquids are kept tightly closed when not in actual use and, after their contents have been used up, to be removed from the construction site and safely disposed of;
- Where flammable liquids are decanted, the metal containers are bonded or earthed;
- No flammable material such as cotton waste, paper, cleaning rags or similar material is stored together with flammable liquids.

C3.6.12 WELDING & CUTTING

No contractor shall require or permit welding or flame cutting operations to be undertaken, unless –

- the person operating the equipment has been fully instructed in the safe operation and use of such equipment and in the hazards which may arise from its use;
- effective protection is provided and used for the eyes and respiratory system and, where necessary, for the face, hands, feet, legs, body and clothing of persons performing such operations, as well as against heat, incandescent or flying particles or dangerous radiation;
- leads and electrode holders are effectively insulated; and
- the workplace is effectively partitioned off and where not practicable all other persons exposed to the hazards are warned and provided with suitable protective equipment.

No contractor shall require or permit electric welding to be undertaken in wet or damp places, inside metal vessels or in contact with large masses of metal, unless –

- the insulation of the electrical leads is in a sound condition;

- the electrode holder is completely insulated to prevent accidental contact with current-carrying parts;
- the welder is completely insulated by means of boots, gloves or rubber mats; and

- at least one other person who has been properly instructed to assist the welder in case of an emergency is and remains in attendance during operations

No contractor shall require or permit welding, flame cutting, grinding, soldering or similar work to be undertaken in respect of any tube, tank, drum, vessel or similar object or container where such object or container –

- is completely closed, unless a rise in internal pressure cannot render it dangerous; or
- contains any substance which, under the action of heat, may –
  i. ignite or explode; or
  ii. react to form dangerous or poisonous substances,

Where hot work involving welding, cutting, brazing or soldering operations is carried out at places, other than workplaces which have been specifically designated and equipped for such work, the employer shall take steps to ensure that proper and adequate fire precautions are taken.

C3.6.13 BLASTING & USE OF EXPLOSIVES

C3.6.13.1 Safety distances

The contractor shall –

- apply the safety distances for the respective categories of explosives as stipulated in Annexure 1 of the Explosives regulations;
- where less than five kilograms of explosives is used, apply to the chief inspector of occupational health and safety for a determination of a safety distance which the employer shall enforce;

C3.6.13.2 Supervision of Explosives

In order to ensure that the provisions of the Act and it's regulations in relation to explosives workplaces are complied with, the contractor shall in writing appoint a competent and certified person in a full-time capacity to be explosives manager in respect of every workplace where explosives are being used, tested, stored or manufactured:
The contractor shall appoint one or more persons, who are suitably qualified and experienced, as authorized supervisors to assist the explosives manager.

The contractor shall ensure that –

- the explosives manager
  a. approves in writing the rules, methods, materials, equipment and tools to be used in the danger area;
  b. ensures that ail persons under his or her control are informed of the hazards related to their tasks and are thoroughly trained in safe work procedures, in particular with respect to shock, friction risk of fire, or static electricity, and are familiar with the requirements of the Explosives regulations
  c. prescribes all protective clothing and equipment to be used in the danger area

d. ensures that the processes and equipment specified in schedule licences are safe and appropriate for the manufacturing processes envisaged for the workplace.

- the supervising official
  a. is at all times in a position to exercise control over the operations
  b. reports without delay to the explosives manager any plant or
  c. equipment under his or her control that has or may have posed a risk:
  d. ensures that all rules implemented in the interest of health and safety are at all times complied with;
  e. stops all work involving explosives if he or she becomes aware of any risk posed to the health and safety of persons.

C3.6.13.3 Safe Handling of Explosives

The contractor shall ensure that –

- all explosives or ingredients thereof are at all times free of foreign material;
- all reasonable precautions are taken to prevent the spillage of explosives;
- cleaning procedures in the case of a spillage of explosives are prescribed in writing by the explosives manager: Provided that where no cleaning procedures have been prescribed any unusual spillage of explosives shall be reported immediately to the supervising official:
- all waste, paper, timber, rags, cotton and similar materials that have been in contact with explosives or an ingredient of an explosive are disposed of in a manner prescribed in writing by the explosives manager: Provided that at the end of the working day all waste and floor sweepings from danger areas shall be deposited in the designated places;
- the explosives or partly mixed explosives are conveyed as soon and as carefully as possible and taking such precautions and in such a manner as will effectively guard against any accidental ignition or explosion
- only containers provided for the conveyance of explosives are used for transporting explosives or partly mixed explosives and that such containers are at all times kept clean, free from grit and in a good state of repair:
- vehicles containing explosives are left unattended only in designated places

The contractor shall ensure that –

- all material, equipment, tools or similar articles used in a danger area are decontaminated after such use, and that no person makes use of any such article that has not been decontaminated after use in a contaminated area;
- the certification of the decontamination process is certified and approved by the explosives manager or a person authorized by the explosives manager.

- Unless permission has been granted by the chief inspector of occupational health and safety, no contractor shall use –

- explosives in workplaces other than explosives workplaces approved by the chief inspector of occupational health and safety;
- any explosives for which no provision is made in Explosives regulations.

No contractor shall allow unauthorized access to such explosives or bury, dump, hide or abandon any explosives.

No contractor shall use any explosive material for blasting purposes unless

- he or she is in possession of a written permission issued by or under the authority of the chief inspector of occupational health and safety;
- he or she is undergoing training while using such blasting material under the immediate and constant supervision of a person who is in possession of permission

C3.6.13.4 Dangerous Areas

The contractor shall ensure that entry and exit from danger areas is only permitted

- at the permanent authorized point of entry or exit: Provided that entry or exit at any other point may be authorized by the explosives manager or a person authorized by him if the authorized gatekeeper has been informed thereof;
- for persons and vehicles authorized thereto by the explosives manager or a person authorized by him:
- to visitors under escort by an authorized person who is aware of the hazards attached to the danger area.

The contractor shall keep a register of the entries and exits and that register shall be available on the premises for inspection by an inspector.

No person shall –

- enter the danger area with –
  a. tobacco;
  b. matches, cigarette lighters or other devices capable of generating heat or spark sources;
  c. intoxicating liquor or narcotics;
  d. food, medicine or drinkable fluids: Provided that authorization to enter with such articles may be granted by the explosives manager for purposes of consumption in licensed mess rooms and smoking areas: Provided further that special rules for the control of such consumption and smoking, approved by the chief inspector of occupational health and safety shall be made in writing and shall be enforced by the employer, self-employed person or user; or
  e. radio transmitters or cellular telephones; or

The contractor shall ensure that hazard warning signs are clearly displayed at the entrance to any danger area.

C3.6.14 VESSELS UNDER PRESSURE

C3.6.14.1 Manufacturer's Data Plate

Every user of a boiler or pressure vessel shall cause a manufacturer's plate with the following minimum particulars to be securely fixed in a conspicuous place to the shell of every such a boiler or pressure vessel:

a) Name of manufacturer;
b) country or origin;

c) year of manufacture;
d) manufacturer's serial number;
e) name, number and date of the standard of design;
f) design gauge pressure in Pascal's; (design pressure)
g) maximum permissible operating pressure in Pascal's;
h) operating temperature;
i.) capacity in cubic meters; and
j) mark of an approved inspection authority.

No person shall remove such a manufacturer's plate or willfully damage or alter the particulars stamped thereon.

C3.6.14.2 Portable Gas Containers

No user shall use or require or permit a portable gas container to be used, and no user shall fill, place in service, handle, modify, repair, inspect or test any portable gas container, other than in compliance with standards incorporated into the Vessels under Pressure regulations.

C3.6.14.3 Hand -held Fire extinguishers

No user shall use, require or permit the use of a hand held fire extinguisher unless designed, constructed, filled, recharged, reconditioned, modified, repaired, inspected or tested in accordance with a safety standard incorporated into the Vessels under Pressure regulations. No person shall fill, recharge, recondition, modify, repair, inspect or test any hand held fire extinguisher unless a holder of a permit issued by the South African Bureau of Standards in terms of SABS 1475.

C3.6.14.4 Gas Fuel use, Equipment and Systems

No person shall handle, store or distribute a gas fuel in any manner, including the filling of a container, other than in accordance with a health and safety standards.

C3.6.14.5 Inspection and Test

Any user of a boiler or pressure vessel shall cause, where reasonably practicable, such a boiler or pressure vessel, including the appurtenances and automatic controls and indicators, to be subjected to an internal and external inspection, and a hydraulic pressure test to 1.25 times the maximum permissible safe operating pressure as the case may be –

- by an approved inspection authority before commissioning after installation, re-erection or repairs;
- by a person appointed in writing by the user and who is competent to do such inspections and tests by virtue of their training, knowledge and experience in the operation, maintenance, inspection and testing of a boiler or pressure vessel within 36 months from the date of the previous internal and external inspection and hydraulic pressure test: Provided that where a pressure vessel is not subjected to corrosion, the

user may dispense with the internal inspection and hydraulic pressure test subject to the written approval of an approved inspection authority:

Provided further that an inspector may require a specific boiler or pressure vessel to be inspected or tested more frequently or permit a specific boiler or pressure vessel to be inspected or tested less frequently:

C3.6.14.6 Recordkeeping

Any user of a vessel under pressure shall keep on his premises a record which shall be open for inspection by an inspector in which the results of inspections, tests, modifications and repairs shall be recorded, dated and signed by the competent person.

C3.6.14.7 Maintenance

No user shall use, cause or permit a vessel under pressure or gas fuel system, including all automatic controls, indicators and appurtenances, to be used unless it is at all times maintained in a safe working condition and the efficiency thereof is proved by regular testing.

No user shall use or cause or permit a vessel under pressure to be used unless it is kept clean and free from any:

- carbonized oil or other inflammable material which may ignite under working conditions;
- material which may cause corrosion; or
- material which is liable to chemical reaction which may cause an uncontrolled rise in pressure.

C3.6.15 PHYSICAL HAZARDS

C3.6.15.1 Ergonomics

- Ensure that assigned tasks do not exceed the limits of the performance capacities of the worker.
- Prevent injury or any detrimental effects to the health of the worker
- Provide that tasks and working conditions will not lead to impairments.

C3.6.15.2 Noise

No contractor shall require or permit an employee to work in an environment in which he is exposed to an equivalent noise level equal to 85 dB(A) or higher. The contractor shall reduce the equivalent noise level to below 85 dB(A) or, where this is not reasonably practicable, he shall reduce the level to as low as is reasonably practicable and take all reasonable steps to isolate the source of the noise acoustically. Where the equivalent noise level in any workplace cannot be reduced to below 85 dB(A) the contractor shall –

- prohibit any person from entering a noise zone unless such person wears hearing protectors.

The contractor shall provide, free of charge, hearing protectors to each employee who works in or, to any person who is required or permitted to enter a noise zone, and no contractor shall require or permit any person to work in or enter such noise zone, and no person shall work in or enter such noise zone, unless he wears such hearing protectors in the correct manner: Provided that where the

equivalent noise level to which employees are exposed, is such that the attenuation of the hearing protectors does not reduce the said noise to below 85 dB(A) the employer concerned shall limit the time during which employees work in that noise zone in such a way that they are not exposed to an equivalent noise level equal to 85 dB(A) or higher.

The contractor shall properly instruct any person who is required to wear hearing protectors in the use of such protectors and inform him of noise zones where the wearing thereof is compulsory.
The contractor shall –

- ensure that every employee employed in a noise zone is subjected to audiometric examinations conducted in accordance with section 7 of SABS 083, by an audiometrist approved by the chief inspector;
- keep records of the results of each audiometric examination and make such records available for inspection by an inspector if he so requires; and

- keep such records for a minimum period of 30 years after termination of employment: Provided that if the employer ceases activities all such records shall be forwarded to the regional director.

C3.6.15.3 Vibration

Whole-body vibration occurs when the body is supported on a surface which is vibrating (e.g., when sitting on a seat which vibrates, standing on a vibrating floor or recumbent on a vibrating surface). Whole-body vibration occurs in all forms of transport and when working near some industrial machinery.

Hand-transmitted vibration is the vibration that enters the body through the hands. It is caused by various processes where vibrating tools or work pieces are grasped or pushed by the hands or fingers. Exposure to hand-transmitted vibration can lead to the development of several disorders.

C3.6.16 SITE WIDE ELEMENTS

C3.6.16.1 Site Access and Egress

- Access to the site will involve crossing the public footpath.
- Store materials and plant away from means of access for the general public and occupants.
- Remove rubbish and demolition materials regularly. Do not allow to accumulate on flat roofs.
- Maintain free access through designated means of escape at all times
- Agree with the Client / Client's Agent delivery points for materials before commencing works.

C3.6.16.2 Visitors to the site

- All visitors to report to the Principal Contractor's reception area for OHS Induction training.
- All visitors to sign the visitor's registration document.
- All visitors to be provided with a Visitors Permit to enable them to access the construction site.
- All un-inducted visitors must be accompanied on the construction site by an inducted person.
- No visitors shall be allowed to access the construction site without wearing the necessary PPE.

C3.6.16.3 Deliveries

Access will involve crossing the public footpath.

C3.6.16.4 Emergencies

Ensure that there are adequate escape routes and that they are kept clear at all times.

C3.6.16.5 Location of Temporary Site Accommodation

See Site Lay-out Plan.

C3.6.16.6 Location of Materials unloading and storage

Materials are to be unloaded and stored in locations which will not in any way affect access or egress to the site nor the works.

C3.6.16.7 Traffic and Pedestrian Routes

The road, public footpaths and access way are to be kept open at all times. All necessary signage and barriers are to be put in place to protect pedestrians at the site entrance and access and egress points.

C3.6.16.8 Safety

- Ensure that all employees are aware of the Health and Safety policy and put into place arrangements to ensure that all visitors and workers new to the site are aware of the site safety provisions.
- Locate underground electricity cables, mark and take precautions to avoid.
- Ensure that cartridge operated tools are operated by trained personnel and in accordance with the maker's instructions that the gun is cleaned regularly and kept in a secure place when not in use.
- Protect people who may be exposed to health risks arising from hazardous substances.

C3.6.17 CONTINUING LIAISON

The procedures for consideration and evaluation of the health and safety implications of Contractor designed elements of the works must follow the recognised principles of prevention and protection and take account of the issues highlighted in this OHS Specification.

The following information is to be submitted by the Contractor to the Client / Client's Agent in sufficient time to allow adequate consideration by the Client / Client's Agent and, where appropriate, the design team, and the provision of relevant information to those persons affected by the works, prior to the commencement of the relevant works:

- Suitable and sufficient information to demonstrate that health or safety issues have been adequately considered.
- Risk assessments.
- A list of health and/or safety hazards identified which cannot be designed out.
- A list of any materials or substances which are specified or inherent in the design which is potentially hazardous to health and/or safety.

C3.6.17.1 Unforeseen Eventualities

The following action is to be taken in the event of unforeseen eventualities arising during the construction stage of the project which require significant design changes, or affect the resources required to carry out the work without risk to health and/or safety, or have other health or safety implications.

The Client / Client's Agent and, where possible, the Principal Contractor are to be advised as soon as possible.

Full details of the relevant health and safety issues involved are to be reviewed with the Client / Client's Agent and Principal Contractor as soon as possible.

Full details of any revised designs, risk assessments and identified hazards and/or hazardous materials and substances are to be issued to the Client / Client's Agent and Principal Contractor in sufficient time to allow for the revision of the Health and Safety Plan and notification of all persons affected by the health and/or safety implications of the changes prior to the commencement of the affected works.

C3.6.17.2 Site Liaison

Liaise with all other contractors and implement any agreed changes to the Health and Safety Plan arising from such liaison. Set up regular training for all operatives including induction training for all staff upon arrival to site.

C3.6.17.3 Health and Safety File

Provide the Planning Supervisor with any relevant information which the contractor believes should be incorporated into the Health and Safety File.

C3.6.17.4 Design Development

Provide the Client with all design information prepared by sub-Contractors.

Arrange liaison meetings with sub-contractors to discuss and review health and safety issues arising from the sub-contractors' designs.

C3.6.18 CONCLUSION

The hazards listed above were identified posing potential threats to the health and or safety of persons that will work on the contract. Although every effort were made to ensure that every possible hazard was identified the Employer cannot guarantee this, therefore it is imperative for the contractor to conduct a comprehensive risk identification and hazard assessment in order to make certain that all hazards are identified.

C3.6.19 MANAGEMENT

Management of the works

The management of the site shall be in accordance with the provisions of the SANS Standard Specification for Road and Bridge Works for State Authorities (1998 edition).

C4 SITE INFORMATION

C4.1 LOCATION OF SITE

The Phalaborwa Scheme is in the Ba-Phalaborwa Municipality within the Mopani District Municipality (MDM) in Limpopo Province. The GPS coordinates of the plant are: 24°03'57.6"S 31°08'28.2"E (-24.066007; 31.141166). Bidders are permitted to visit the site for detailed assessment of the site. **Phalaborwa Scheme is a National Key point; therefore, an appointment is to be made with the technical personnel of LNW via email and an ID shall be presented at the gate before entry.**

The site map is attached hereunder.

C5 DRAWINGS

LIST OF TYPICAL DRAWINGS FOR THIS PROJECT

Drawing Number	Description
P560-LNW-0001	Typical Scour Valve Detail
P560-LNW-0002	Typical Air Valve Detail
P560-LNW-0003	Typical Isolation Valve Detail

C6 ANNEXURES

The following list of Annexures is attached to this tender document.

ANNEXURE A : LNW CV Template

ANNEXURE B: LNW Project Reference Template

ANNEXURE C: 560mm Potable Water Pipeline Condition Assessment Report.

ANNEXURE D: CIDB B.U.I.L.D CSDG Pro-Forma Documents

- Form A1 List of Recognised Skills Development Agencies
- Form A2 Baseline Training Plan
- Form A3 Project Interim Report
- Form A4 Supervisor Agreement
- Form A5 Project completion report

ANNEXURE E: CIDB B.U.I.L.D CPG Pro-Forma Documents

- Form ED 105P Project Interim Report
- Form ED 104P Enterprise Development Declaration
- Form ED 1010P Project Completion Report