



SEKHUKHUNE
District Municipality

Private Bag X8611 Groblersdal 0470, 3 West Street Groblersdal 0470
Tel : (013) 262 7300, Fax: (013) 262 3688
E-Mail : sekinfo@sekhukhune.co.za



LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB SCHEME 1A: CONTRACT A

BID NUMBER: SK8/3/1-49/2024/25

A Tender for Category 8CE or higher CIDB Registered Contractors

MAY 2025

ISSUED BY: Sekhukhune District Municipality Private Bag X8611 Groblersdal 0470 Contact Person: Mr Voster Masemola Supply Chain Management Telephone: (013) 262 7656 Email: masemolav@sekhukhune.gov.za	PREPARED BY: DIGES CONSULTING No. 98 Marshal Street, Polokwane 0750 Tel: 015 291 4151 Fax: 015 291 4167 Email: info@diges.co.za
--	--

Registered Name of Bidder:	
Trading Name of Bidder:	
Registration No. of Entity:	
Postal Address of Bidder:	
Contact Person:	
Tel. No:	E-mail Address:
Cell No.	Fax No:
CIDB CRS Number(s):	
Tender Amount:	
CSD Number:	
 EXPANDED PUBLIC WORKS PROGRAMME Creating opportunities towards human fulfilment	 mig | Municipal Infrastructure Grant

SEKHUKHUNE DISTRICT MUNICIPALITY

LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB SCHEME 1A: CONTRACT A

BID NO. SK8/3/1-49/2024/25

CONTENTS

<u>Part</u>	<u>Description</u>	<u>Colour</u>	<u>Page</u>
T	BID	White	T1.1
	T1 Bidding Procedures	White	T1.1
	T1.1 Invitation to Bid	White	T1.2
	T1.2 Bid Data	Pink	T1.5
	T1.2.1 Conditions of Tender	Pink	T1.6
	T1.2.2 Employer	Pink	T1.6
	T1.2.3 Bid Documents	Pink	T1.6
	T1.2.4 Employer's Agent	Pink	T1.7
	T1.2.5 Tenderer's Obligations	Pink	T1.7
	T1.2.6 Employer's Undertaking	Pink	T1.10
	T2 Returnable Documents	Yellow	T2.1
	T2.1 List of Returnable Documents	Yellow	T2.4
	T2.2 Returnable Schedules	Yellow	T2.6
C	CONTRACT	Yellow	C1.1
	C1 Agreements and Contract Data	Yellow	C1.2
	C1.1 Form of Offer and Acceptance	Yellow	C1.2
	C1.2 Contract Data	Green	C1.7
	C1.3 Appendix to Contract Data	Green	C1.21
	C2 Pricing Data	Yellow	C2.1
	C2.1 Pricing Instructions	Yellow	C2.2
	C2.2 Bills of Quantities	Yellow	C2.6
D	THE WORKS	Blue	D1.1
	D1 Scope of Works	Blue	D1.2
	D2 Site Information	Green	D2.1
	D3 Drawings	White	D2.3

PART B BID

T1 BIDDING PROCEDURES

CONTENTS

Part		Colour	Page
T1.1	Invitation to Bid	White	T1.2
T1.2	Bid Data	Pink	T1.5

T1.1 Tender Notice and Invitation to Tender

SUPPLY CHAIN MANAGEMENT

INVITATION TO BID

MBD1

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE SEKHUKHUNE DISTRICT MUNICIPALITY					
BID NUMBER:	SK8/3/1-49/2024/25	CLOSING DATE:	4 JULY 2025	CLOSING TIME:	11H00
DESCRIPTION	LEBALELO CENTRAL RWS: WATER SUPPLY SUB SCHEME 1A: CONTRACT A				
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT					
Groblersdal Fire Station, R33 Groblersdal 0470					
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO			TECHNICAL ENQUIRIES MAY BE DIRECTED TO:		
CONTACT PERSON	Mr. Voster Masemola		CONTACT PERSON	Mr. Floyd Mashele	
TELEPHONE NUMBER	013 262 7656		TELEPHONE NUMBER	013 262 7535	
FACSIMILE NUMBER			FACSIMILE NUMBER		
E-MAIL ADDRESS	masemolav@sekhukhune.gov.za		E-MAIL ADDRESS	mashelef@sekhukhune.gov.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:	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX] <input type="checkbox"/> Yes <input type="checkbox"/> No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT		[TICK APPLICABLE BOX] <input type="checkbox"/> Yes <input type="checkbox"/> No
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					
1. ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF]		2. ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER 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 Third Edition 2015 (GCC 2015) 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 (MBD7).**

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:

.....

Bid documents are obtainable from the Supply Chain Management Office, Bareki Mall. A compulsory briefing session will be held. Documents can be downloaded online on etender. Bids must be completed in accordance with the conditions attached to the Bid documents and must be sealed and endorsed: Contract (Specify Bid Number:). Bids will be submitted to supply chain offices

Address

Location of tender box.....AB Sikhosana Fire Station
Physical address: R33 Groblersdal

The Council reserves the right to accept or reject any Bid or part thereof:

Municipal Manager: Mr MM Kgwale
LIMPOPO PROVINCE
Corner van Riebeeck and Chris Wiid Street
Groblersdal
0470

Supply Chain Manager
Mr. V Masemola

Chief Financial Officer
Mr. H Nkadimeng

PART T1.2 BID DATA

CONTENTS

Part		Colour	Page
T1.2.1	Conditions of Bid	Pink	T1.6
T1.2.2	Employer	Pink	T1.6
T1.2.3	Bid Documents	Pink	T1.6
T1.2.4	Employer’s Agent	Pink	T1.7
T1.2.5	Bidder’s Obligations	Pink	T1.7
T1.2.6	Employer’s Undertaking	Pink	T1.10

T1.2 BID DATA

T1.2.1 CONDITIONS OF BID

The Conditions of Bid are the Standard Conditions of bid as contained in Annex F of SANS 294: 2004, Construction Procurements Processes, Procedures and Methods, published by Standards South Africa, Private Bag X191, Pretoria 0001, Tel: 012 428 7911.

The standard conditions of bid for procurements make several references to the Bid Data. The Bid Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of bid.

Where applicable, items of data given here below are cross-referenced to the sub clause in the standard conditions of bid to which it applies.

T1.2.2 EMPLOYER (CI. F1.1)

The "Employer" will be the "Sekhukhune District Municipality".

T1.2.3 BID DOCUMENTS (CI. F.1.2)

The bid document issued by the Employer is a **single** document and comprises the following:

Part	Description
T	<u>BID</u>
	T1 <u>Bidding Procedures</u>
	T1.1 Invitation to Bid
	T1.2 Bid Data
	T1.2.1 Conditions of Tender
	T1.2.2 Employer
	T1.2.3 Tender Documents
	T1.2.4 Employer's Agent
	T1.2.5 Tenderer's Obligations
	T1.2.6 Employer's Undertaking
	T1.2.7 Tax Clearance Certificate
	T2 <u>Returnable Documents</u>
	T2.1 List of Returnable Documents
	T2.2 Returnable Schedules
C	<u>CONTRACT</u>
	C1 <u>Agreements and Contract Data</u>
	C1.1 Form of Offer and Acceptance
	C1.2 Contract Data
	C1.3 Appendix to Contract Data
	C2 <u>Pricing Data</u>
	C2.1 Pricing Instructions
	C2.2 Bills of Quantities
D	<u>THE WORKS</u>
	D1 <u>Scope of Works</u>
	D2 <u>Site Information</u>
	D3 <u>Drawings</u>

T1.2.4 EMPLOYER'S AGENT (Cl. F.1.4)

The Employer's agent is: DIGES CONSULTING

Physical address:

98 Marshal Street Polokwane
0750
Tel.: (015) 291 4151
Fax: (015) 291 4167
E-mail: info@diges.co.za

Postal Address:

PO Box 5743
Polokwane North
0750

T1.2.5 BIDDER'S OBLIGATIONS

T1.2.5.1 Eligibility (Cl. F.2.1)

A bid offer may only be submitted if the Bidder satisfies the criteria stated in the Bid Data and if the Bidder, or any of his principals, is not under any restriction to do business with the Employer.

T1.2.5.2 Briefing Session (Cl. F.2.7)

The arrangements for a compulsory briefing session are:

Location: **Meet the representative of the Employer at Ga-Manyaka Community Hall at Ga- Manyaka**

Date: **02 June 2025 starting at 11H:00**

T1.2.5.3 Insurance (Cl. F.2.9)

No insurance cover will be provided by the Employer.

T1.2.5.4 Alternative Bid Offers (Cl. F.2.12)

Unless anything to the contrary has been determined in the Contract Data, a Bidder may, together with his bid for the original designs contained in the contract documents, submit alternative designs and bid offers for consideration. All designs, calculations, drawings and Operation and Maintenance manuals shall be fully endorsed by a third-party registered engineer, accomplished in such specific field of practice and the cost thereof shall be borne solely by the Contractor. Such alternative designs and offers shall be subject to the following conditions and requirements:

a) Bids

An alternative offer or design will be considered only if the bid for the original items has been fully priced and completed. The alternative bid offer is to be submitted in **the same envelope as the main bid offer**, together with a schedule that compares the requirements of the bid documents with the alternative requirements the Bidder proposes. No alternative bid will be considered unless a bid free from qualifications is also submitted.

Unless the alternative offer stipulates to the contrary, it shall be assumed that the period for completion of the Works shall be the same as for the original design.

Designs, calculations, drawings and a modified schedule of quantities (as determined hereafter) in respect of each alternative offer or design shall accompany the alternative bid offer and shall be endorsed fully by a third-party registered engineer, accomplished in such specific field of practice.

b) Preliminary calculations

Preliminary calculations for an alternative design shall be submitted with the bid. Such calculations shall give adequate details so as to enable an assessment to be made of the general efficacy of the design and of its principal elements, also of the degree to which the design prescriptions and codes of the Employer are being complied with. The calculations shall be clear and in a logical sequence and shall clearly reflect all the design assumptions.

c) Preliminary drawings

Preliminary drawings of the alternative designs shall also be submitted with the bid. These drawings shall comprise adequate layout plans, elevations and sections and shall clearly illustrate the general efficacy of the design and its principal elements.

d) Quantities

Each alternative offer shall be accompanied by a modified priced schedule of quantities compiled in accordance with the specifications, in so far as it is applicable, which clearly shows the manner in which the price for the alternative offer has been determined and the items in the original schedule of quantities which fall away or are being changed. In addition to the schedule of quantities, a set of calculations shall be supplied to show how the quantities have been determined. All assumptions in regard to factors which will determine quantities shall be clearly and conspicuously marked by underlining or colouring and shall indicate whether or not the assumptions have been based on information furnished in the Contract Data (with the necessary references).

e) Further details

Should the Employer's Agent find that the calculations and drawings submitted for alternative designs are not complete enough for proper adjudication of the alternative designs, the Employer reserves to itself the right to call on the Bidder to submit such further calculations and drawings as may be required. If such further details are not submitted within ten days of having been requested, the alternative designs will not be given further consideration.

f) Preliminary adjudication of alternative designs

The Employer's Agent will undertake a preliminary scrutiny of any alternative designs for compliance with the specified requirements of the Employer. Should he find any mistakes or unsatisfactory aspects, he may afford the Bidder the opportunity to rectify them within a period to be determined by the Employer's Agent. However, it is emphasized that the preliminary scrutiny of the design and bid by the Employer's Agent, by its very nature, cannot be comprehensive, and no guarantee can be given in this regard that all the mistakes made by the Bidder will in fact be detected. Any correction of such mistakes shall be made with the bid price of the bidder being retained, and, wherever necessary, the priced schedule of quantities for the alternative design shall be adjusted accordingly.

g) Acceptance of alternative design

The Bidder shall note that the acceptance of a bid which includes alternative designs shall mean that the alternative designs have been approved in principle only. If the final calculations, drawings and details do not comply with the specified requirements, such alternative designs may be rejected, unless they are suitably amended by the Bidder so as to be acceptable to the Employer.

h) Final drawings and calculations and the priced schedule of quantities

Where a bid with an alternative design has been accepted, the Contractor shall, not less than two months before he intends starting with the construction of such design, submit to the Employer's Agent a complete set of working drawings, detailed calculations and a complete schedule of quantities, for approval. The schedule of quantities shall be based on the preliminary schedule of quantities, but with the necessary adjustments in quantities and prices and with the bid price for the alternative design being retained.

Within three weeks of having received the above, the Employer's Agent will indicate which drawings, calculations, quantities, prices and other particulars are acceptable to him and which not, with reasons furnished. The Contractor shall then submit to the Employer's Agent in good time any modified drawings and other particulars for approval, for which he will require two weeks. Any delay arising from the fact that the amended particulars do not meet the requirements shall be the responsibility of the Contractor.

No work which will be affected by an alternative design may be commenced, unless the drawings, schedule of quantities and prices for such alternative design have been approved. Should the Contractor fail to modify any drawings, calculations, quantities, prices or any other particulars to the satisfaction of the Employer's Agent, the alternative design will be rejected and the original design shall be constructed for the same amount as has been bided for the alternative design.

i) Responsibility for alternative design

The approval of a design by the Employer's Agent shall not in any way relieve the Bidder of his responsibility to produce a design which conforms in all respects to all the specified requirements and which will be suitable for the purpose envisaged.

Should it appear later during construction or during the maintenance period that the design does not conform to the specified requirements, the Contractor only, shall be liable for any damage arising there from and he shall, at his own expense, do all the necessary work to ensure that the Works conforms to all the specified requirements.

j) Indemnity

Once the alternative design has been approved, the Contractor shall indemnify and hold harmless the Employer, its agents and assigns, against all claims howsoever arising out of the said design whether in contract or delict.

T1.2.5.5 Submitting a Bid Offer (Cl. F2.13.1)

a) Whole of the Works (Cl. F.2.13.1)

Bidders shall offer to provide for the whole of the Works identified.

b) Original bid documents (Cl. F2.13.3)

The original bid document, issued to the Bidder, shall be submitted in its entirety. No copies are required.

c) Marking of Bid Submissions (Cl. F2.13.5)

The complete bid documents shall be enclosed and sealed in a single envelope, marked:

**"BID NO. SK8/3/1-49/2024/25 : LEBALELO CENTRAL REGIONAL WATER SCHEME:
WATER SUPPLY SUB SCHEME 1A: CONTRACT A"**

CLOSING DATE: 04 July 2025 @ 11h00

The Employer's address for delivery of bid offers to be shown on each bid submission package is the Tender Box located at:

Groblersdal Fire Station
29 Van Riebeek Street (R33)
Groblersdal

d) Two envelope system (Cl. F.2.13.6)

A two-envelope procedure will not be followed.

e) Closing time (Cl. F2.15)

The closing time for submission of bid offers is:

11h00

Telegraphic, telephonic, telex, facsimile, e-mail, electronic and late bid offers will not be accepted.

f) Bid offer validity (Cl. F.2.16)

The bid offer validity period is **90 days** after bid closing date.

g) Clarification of bid offer after submission (Cl. F2.17)

Delete the last part of the second sentence, commencing with the word "and". Furthermore, delete the last two sentences of Cl. F2.17.

Add the following sentence:

"The rates stated by the Bidder shall be binding".

h) Provide other Material (Cl. F2.18.1)

Upon request by the Employer, the Bidder shall promptly supply any other material that has a bearing on the bid offer, the bidder's commercial position (including, where applicable, notarized joint venture agreements), referencing arrangements, or samples of materials, considered necessary by the Employer for the purpose of a full and fair assessment. Should the Bidder not provide the information or material called for, by the time for submission stated in the Employer's request, the Employer will regard the bid offer as being non responsive.

T1.2.6 EMPLOYER'S UNDERTAKING

T1.2.6.1 Opening of bid submissions (Cl. F3.4)

The time and location for opening of the bid offers are:

04 July 2025 at 11h00

Location: Groblersdal Fire Station
29 Van Riebeek Street (R33)
Groblersdal

T1.2.6.2 Arithmetical errors (Cl. F.3.9)

Add to paragraphs a), b) and c) of Cl. F.3.9:

- d) The Bidder will be afforded **two days** after being requested by the Employer or Engineer, to revise selected item prices to achieve the bided total of the prices. The bid will be rejected if the Bidder does not correct or accept the correction of his arithmetical errors as described above.

T1.2.6.3 **Evaluation of bid offers** (Cl. F3.11)

The procedure for evaluation of responsive bid offers is Method 4, viz. the case of a financial offer, functionality and preferences. The Financial Offer will be evaluated using Formula 2 Option 1 and MBD 6.1.

The Employer's Preferential Procurement Policy applicable to this bid and based on the Preferential Procurement Policy Act, 2000 (Act No. 5 of 2000) is set out here following:

.....

Definitions

1. In these Regulations, unless the context indicates otherwise, any word or expression to which a meaning has been assigned in the Act must bear the meaning so assigned—

"highest acceptable tender" means a tender that complies with all specifications and conditions of tender and that has the highest price compared to other tenders;

"lowest acceptable tender" means a tender that complies with all specifications and conditions of tender and that has lowest price compared to other tenders;

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

"Rand value" means the total estimated value of a contract in Rand, calculated at the time of the tender invitation;

"specific goals" means specific goals as contemplated in section 2(1)(d) of the Act which may include contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender and disability including the implementation of programmes of the Reconstruction and Development Programme as published in *Government Gazette* No. 16085 dated 23 November 1994;

"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;

"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

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

Application

2. These Regulations apply to organs of state as defined in section 1¹ of the Act.

Identification of preference point system

3. (1) An organ of state must, in the tender documents, stipulate—
- (a) the applicable preference point system as envisaged in regulations 4, 5, 6 or 7;
 - (b) the specific goal in the invitation to submit the tender for which a point may be awarded, and the number of points that will be awarded to each goal, and proof of the claim for such goal.
- (2) 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.

80/20 preference point system for acquisition of goods or services with Rand value equal to or below R50 million

- 4.(1) The following formula must be used to calculate the points out of 80 for price in respect of an invitation for a tender with a Rand value equal to or below R50 million, inclusive of all applicable taxes:

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

Where-

P_s = Points scored for price of tender under consideration;

P_t = Price of tender under consideration; and

P_{\min} = Price of lowest acceptable tender.

- (2) A maximum of 20 points may be awarded to a tenderer for the specific goal specified for the tender.
- (3) The points scored for the specific goal must be added to the points scored for price and the total must be rounded off to the nearest two decimal places.
- (4) Subject to section 2(1)(f) of the Act, the contract must be awarded to the tenderer scoring the highest points.

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

5.(1) The following formula must be used to calculate the points out 90 for price in respect of an invitation for tender with a Rand value above R50 million, inclusive of all applicable taxes:

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

Where-

P_s = Points scored for price of tender under consideration;

P_t = Price of tender under consideration; and

P_{min} = Price of lowest acceptable tender.

(2) A maximum of 10 points may be awarded to a tenderer for the specific goal specified for the tender.

(3) The points scored for the specific goal must be added to the points scored for price and the total must be rounded off to the nearest two decimal places.

(4) Subject to section 2(1)(f) of the Act, the contract must be awarded to the tenderer scoring the highest points.

80/20 preference points system for tenders for income-generating contracts with Rand value equal to or below R50 million

6.(1) The following formula must be used to calculate the points for price in respect of an invitation for tender for income-generating contracts, with a Rand value equal to or below R50 million, inclusive of all applicable taxes:

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

Where-

P_s = Points scored for price of tender under consideration;

P_t = Price of tender under consideration; and

P_{max} = Price of highest acceptable tender.

(2) A maximum of 20 points may be awarded to a tenderer for the specific goal specified for the tender.

(3) The points scored for the specific goal must be added to the points scored for price and the total must be rounded off to the nearest two decimal places.

(4) Subject to section 2(1)(f) of the Act, the contract must be awarded to the tenderer scoring the highest points.

90/10 preference point system for tenders for income-generating contracts with Rand value above R50 million

7.(1) The following formula must be used to calculate the points for price in respect of a tender for income-generating contracts, with a Rand value above R50 million, inclusive of all applicable taxes:

$$P_s = 90 + \frac{P_t - P_{max}}{P_{max}} \times 10$$

Where-

- P_s = Points scored for price of tender under consideration;
- P_t = Price of tender under consideration; and
- P_{max} = Price of highest acceptable tender.

(2) A maximum of 10 points may be awarded to a tenderer for the specific goal specified for the tender.

(3) The points scored for the specific goal must be added to the points scored for price and the total must be rounded off to the nearest two decimal places.

(4) Subject to section 2(1)(f) of the Act, the contract must be awarded to the tenderer scoring the highest points.

Criteria for breaking deadlock in scoring

- 8.(1) If two or more tenderers score an equal total number of points, the contract must be awarded to the tenderer that scored the highest points for specific goals.
- (2) If two or more tenderers score equal total points in all respects, the award must be decided by the drawing of lots

Remedies

9.(1) If an organ of state is of the view that a tenderer submitted false information regarding a specific goal, it must—

- (a) inform the tenderer accordingly; and
- (b) give the tenderer an opportunity to make representations within 14 days as to why the tender may not be disqualified or, if the tender has already been awarded to the tenderer, the contract should not be terminated in whole or in part.

(2) After considering the representations referred to in subregulation (1)(b), the organ of state may, if it concludes that such information is false—

- (a) disqualify the tenderer or terminate the contract in whole or in part; and
- (b) if applicable, claim damages from the tenderer.

Repeal of regulations

10.(1) Subject to this regulation, the Preferential Procurement Regulations, 2017 published in Government No. 40553 of 20 January 2017, are hereby repealed with effect from the date referred to in regulation 11.

(2) Any tender advertised before the date referred to in regulation 11 must be dealt with in terms of the Preferential Procurement Regulations, 2017.

Short title and commencement

11. These Regulations are called the Preferential Procurement Regulations, 2022 and take effect on 16 January 2023.

T1.2.6.4 Acceptance of Bid Offer (Cl. F3.13)

Bid offers will only be accepted if:

- a) the bidder has in his or her possession an original valid Tax Clearance Certificate issued by the South Africa Revenue Services;
- b) the bidder is registered with the Construction Industry Development Board in an appropriate contractor grading designation. A minimum grading of **7CE** is required;
- c) the bidder or any of its principals is not listed on the Register of Bid Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; and
- d) the bidder has not abused the Employer's Supply Chain Management System,
- e) the bidder has not failed to perform on any previous contract.

T1.2.6.5 Provide copies of the Contract Document (Cl. F3.18)

The number of paper copies of the signed Contract to be provided by the Employer to the successful bidder is **one**.

PART T2 RETURNABLE DOCUMENTS

CONTENTS

Part		Colour	Page
T2.1	List of Returnable Documents	Yellow	T2.2
T2.2	Returnable Schedules	Yellow	T2.4

TENDER COMPLIANCE

The tenderer must complete the returnable documents as listed

Generic	Tick if completed
Authority of Signatory (Compulsory)	
Certificate of Authority for Joint Venture (Compulsory where applicable)	
Certified copy of identity documents for directors	
Compulsory Enterprise Questionnaire (Compulsory)	
Copy of Company Registration Documents or CK1 for Close Corporations	
Form of offer to be properly signed (Compulsory)	
Declaration of Interest (MBD4) (Compulsory)	
Preference Points Claim Form (MBD6.1) (Compulsory)	
Rendering of Services (MBD7.2) (Compulsory)	
Declaration of Bidder's Past Supply Chain Management Practices (MDB8) (Compulsory)	
Certificate of Independent Bid Determination (MDB9) (Compulsory)	
<p>MBD5 (Required for evaluation) if tender exceed R10 million. Audited financial statements. if the bidder is required by law to prepare annual financial statements for auditing, their audited annual statements: for the past three year; or; since their establishment if established during the past three years;</p> <p>A certificate signed by the bidder certifying that the bidder has no undisputed commitments for municipal services towards a Municipality or other service provider in respect of which payment is overdue for more than 30 days in accordance with regulation 21 (ii).</p> <p>BIDS LESS THAN 10 million:</p> <p>The Municipal rates for the bidder and its directors in respect of which payment is not overdue for more than 90 days or proof of lease agreement including rates for the landlord. In case where the Company or Director is registered in a rural area where the rates are not paid, please attach proof from Local Authority and Affidavit under oath indicating that there are no municipal rates payable. (Compulsory)</p>	
Valid Tax Clearance Certificate Issued by the South African Revenue Service or PIN issued by SARS	
CSD Registration/CSD Summary Report	
Proof of insurance with a registered financial service provider	
Proof of COIDA (Compulsory)	
Proof of CIDB registration 8CE or Higher) (Compulsory)	

Note:

The meaning of the cursive type of each Form is as follows:

- **Compulsory:** Documentation or Information that must be submitted with the tender.
(Failing to submit any of the document may result in the tender being deemed non-responsive)
- **Required for evaluation:** Additional documentation that is required

Note to tenderer: This form has been created as aid to ensure a tenderer's compliance with the completion of the returnable forms and schedules and subsequent placement in the correct envelope.

FORM NO	FORM DESCRIPTION	TICK IF COMPLETED
A1	ATTENDANCE REGISTER	
A5	TENDERER'S BANK DETAILS AND CREDIT RATING FROM BANK	
A6	CERTIFICATE OF TENDERER'S LITIGATION HISTORY	
A7	SCHEDULE OF CURRENT COMMITMENTS	
A8	CERTIFICATE OF COMPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 AND CONSTRUCTION REGULATIONS, 2014	
A9	CERTIFICATE OF REGISTRATION WITH CIDB	
B1	CONTRACTORS ESTABLISHMENT ON SITE	
MBD 6.1	PREFERENCING SCHEDULE: BROAD-BASED BLACK ECONOMIC EMPOWERMENT STATUS	
C2	PREFERENTIAL PROCUREMENT: SUBCONTRACTING	
D1	SCHEDULE OF WORK EXPERIENCE	
D2	SCHEDULE OF CONSTRUCTION EQUIPMENT	
D3	SCHEDULE OF CONTRACTORS KEY PROJECT MANAGEMENT	
D4	SCHEDULE OF SPECIALIST SUBCONTRACTORS	
D5	INDICATIVE CONSTRUCTION PROGRAMME	
D6	SCHEDULE OF ESTIMATED MONTHLY EXPENDITURE	
E1	QUALITY ASSURANCE	
MBD 7.2	CONTRACT FORM – RENDERING OF SERVICES	

T2.1 LIST OF RETURNABLE DOCUMENTS ATTACHED

T2.1.1 GENERAL

This section refers to documents that are returned with this single document and constitute a Bid. Whilst many of the returnables are required for the purpose of evaluating Bids, some will form part of the subsequent contract, as they form the basis of the Bid offer. It is therefore of paramount importance that Bidders return all information requested.

T2.1.2 RETURNABLE SCHEDULES REQUIRED FOR BID EVALUATION PURPOSES

The returnable schedules, listed herebelow, are contained in Part 2.2 of the Bid document, referenced "Appendix A":

The Bidder **must complete and submit the required proof** of the following returnable documents:

Form	Description	Page
MBD 1	Invitation to Bid	T2.2
MBD 2	Tax Clearance Certificate Requirements (<i>Compulsory</i>)	T2.7
MBD 4	Declaration of Interest	T2.8
MBD 5	Declaration for Procurement above R10 Million (all applicable taxes included)	
	♦ Include audited financial statements for 3 years	
	♦ Submit Proof of Municipal Services not in arrears for more than 30 days	T2.10
MBD 6.1	Preference Points Claim Form in Terms of the Preferential Procurement Regulations 2022	T2.11
MBD 7.2	Contract Form 0 Rendering of Services	T2.19
MBD 8	Declaration of Bidder's Past Supply Chain Management Practices	T2.21
MBD 9	Certificate of Independent Bid Determination	T2.23
A1	Certificate of Attendance at Site Clarification Meeting	T2.26
A2	Certificate of Authority of Signatory (Also JV)	T2.27
A3	Certificate of Registration with the Construction Industry Development Board (CIDB) (attach certificate)	T2.33
A4	Record of Addenda to Bid Documents	T2.38
A5	Form of Intent to Provide a Performance Guarantee	T2.39
A6	Health and Safety Plan : Declaration by Bidder	T2.40
A7	Schedule of Proposed Sub-Contractors	T2.42
A8	Quality Assurance Programme	T2.45
A9	Insurance Statement	T2.46
A10	Financial Information of Bidder	T2.48
A11	Commercial Equity Declaration (BEE)	T2.48
A12	Joint Venture Disclosure Form (where applicable)	T2.51
A13	Proposed Amendments and Qualifications	T2.59
A14	Preliminary Programme and Implementation Methodology	T2.60
A15	Certified Copy of Company Registration Document (<i>Compulsory</i>)	T2.61
A16	Letter of Good Standing (COIDA) (<i>Compulsory</i>)	T2.62

T2.1.3 OTHER DOCUMENTS REQUIRED FOR BID EVALUATION PURPOSES

T2.1.3.1 Tax Clearance Certificate

- a) It is a condition of Bid that any responsive Bidder demonstrates compliance with respect to tax obligations with the SARS, or that arrangements therefore have been made to the satisfaction of the Receiver of Revenue.

- b) The Form, Application for Tax Clearance Certificate (in respect of Bids), must be completed by the Bidder in all respects and submitted to the Receiver of Revenue where the Bidder is registered for income tax purposes. The Receiver of Revenue will then furnish the Bidder with a Tax Clearance Certificate that will be valid for a period six (6) months from date of issue. This Tax Clearance Certificate must be submitted in the original format with the Bid that is before the closing time and -date of the Bid. Failure to submit an original and valid Tax Clearance Certificate may invalidate a Bid.
- c) Each Party to a Consortium/Sub-Contractors must complete a separate Tax Clearance Certificate. Copies of the Application for Tax Clearance Certificate are available at any Receiver's Office.

T.2.3.2.1 Compensation Fund

The Bidder is required to submit with his Bid, proof of registration and good standing with the Compensation Fund.

T2.3.2.3 Contractor Registration

The Bidder is required to submit with his Bid, proof of registration and grading with the Construction Industry Development Board.

T2.1.4 RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT

- a) Curricula vitarum of personnel
- b) Schedule of Proposed Sub-contractors
- c) Schedule of Available Infrastructure, Resources and Experience
- d) Commercial Equity Declaration

T2.1.5 OTHER SCHEDULES AND AFFIDAVITS THAT WILL BE INCORPORATED INTO THE CONTRACT

- a) Offer and Acceptance
- b) Contract Data
- c) Bills of Quantities

PART 2.2 RETURNABLE SCHEDULES

The Bidder **must complete and submit the required proof** of the following returnable documents:

Form	Description	Page
MBD 1	Invitation to Bid	T1.2
MBD 2	Tax Clearance Certificate Requirements (<i>Compulsory</i>)	T2.7
MBD 4	Declaration of Interest	T2.8
MBD 5	Declaration for Procurement above R10 Million (all applicable taxes included)	
	♦ Include audited financial statements for 3 years	
	♦ Submit Proof of Municipal Services not in arrears for more than 30 days	T2.10
MBD 6.1	Preference Points Claim Form in Terms of the Preferential Procurement Regulations 2022	T2.11
MBD 7.2	Contract Form – Rendering of Services	T.2.19
MBD 8	Declaration of Bidder's Past Supply Chain Management Practices	T2.21
MBD 9	Certificate of Independent Bid Determination	T2.23
A1	Certificate of Attendance at Site Clarification Meeting	T2.26
A2	Certificate of Authority of Signatory (Also JV)	T2.27
A3	Certificate of Registration with the Construction Industry Development Board (CIDB) (attach certificate)	T2.33
A4	Record of Addenda to Bid Documents	T2.38
A5	Form of Intent to Provide a Performance Guarantee	T2.39
A6	Health and Safety Plan : Declaration by Bidder	T2.40
A7	Schedule of Proposed Sub-Contractors	T2.44
A8	Quality Assurance Programme	T2.45
A9	Insurance Statement	T2.46
A10	Financial Information of Bidder	T2.47
A11	Commercial Equity Declaration (BEE)	T2.48
A12	Joint Venture Disclosure Form (where applicable)	T2.51
A13	Proposed Amendments and Qualifications	T2.59
A14	Preliminary Programme and Implementation Methodology	T2.60
A15	Certified Copy of Company Registration Document (<i>Compulsory</i>)	T2.61
A16	Letter of Good Standing (COIDA) (<i>Compulsory</i>)	T2.62

TAX CLEARANCE CERTIFICATE REQUIREMENTS

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

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

MBD 4

DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state*.
2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons employed by the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority and/or take an oath declaring his/her interest.
3. **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**
 - 3.1 Full Name:
 - 3.2 Identity Number:
 - 3.3 Company Registration Number:
 - 3.4 Tax Reference Number:
 - 3.5 VAT Registration Number:
 - 3.6 Are you presently in the service of the state?* **YES/NO**
 - 3.6.1 If so, furnish particulars:
.....
.....
 - 3.7 Have you been in the service of the state for the past twelve months? **YES/NO**
 - 3.7.1 If so, furnish particulars:
.....
.....

* MSCM Regulations: "in the service of the state" means to be –

- (a) a member of –
 - (i) any municipal council;
 - (ii) Any provincial legislature; or
 - (iii) the national Assembly or the national Council of provinces;
- (b) a member of the board of directors on any municipality entity;
- (c) an official of any municipality or municipal entity;
- (d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999)
- (e) a member of the accounting authority of any national or provincial public entity; or
- (f) an employee of Parliament or a provincial legislature.

3.8 Do you, have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this? **YES/NO**

3.8.1 If so, furnish particulars

3.9 Are you, aware of any relationship (family, friend, other) between any other bidder and any person employed by the state who may be involved with the evaluation and or adjudication of this bid? **YES/NO**

3.9.1 If so, furnish particulars

3.10 Are any of the company's directors, managers, principal shareholders in service of the state? **YES/NO**

3.10.1 If so, furnish particulars

3.11 Are any spouse, child of parent of the company's directors, managers, principal shareholders of stakeholders in service of the state? **YES/NO**

3.11.1 If so, furnish particulars

CERTIFICATION

I, THE UNDERSIGNED (NAME).....

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT.

I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

Signature

Date

Position

Name of Bidder

MBD 5

DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED)

For all procurement expected to exceed R10 million (all applicable taxes included), bidders must complete the following questionnaire:

1 Are you by law required to prepare annual financial statements for auditing?

1.1 If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.

***YES / NO**

.....
.....

2 Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days?

2.1 If no, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days.

2.2 If yes, provide particulars.

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

3. Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract? ***YES / NO**

3.1 If yes, furnish particulars

.....
.....

* Delete if not applicable

4. Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic?

***YES / NO**

4.1 If yes, furnish particulars

.....
.....

CERTIFICATION

I, THE UNDERSIGNED (NAME)

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT.

I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

MBD 6.1

FORM 19: 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

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

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

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

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	90
SPECIFIC GOALS	10
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

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

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

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

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

$$\begin{array}{ccc} \mathbf{80/20} & \mathbf{or} & \mathbf{90/10} \\ \\ P_{s_{min}} = 80 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right) & \text{or} & P_s = 90 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right) \end{array}$$

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:

$$\begin{array}{ccc} \mathbf{80/20} & \mathbf{or} & \mathbf{90/10} \\ \\ P_{s_{max}} = 80 \left(1 + \frac{P_t - P_{max}}{P_{max}} \right) & \text{or} & P_s = 90 \left(1 + \frac{P_t - P_{max}}{P_{max}} \right) \end{array}$$

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 (80/20 system) (To be completed by the organ of state)	Number of points allocated (90/10 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)
HDI (blacks, indian, coloureds)	12	6		
Woman Ownership of more than 50%	2	1		
Disability of more than 50% (physically impaired)	2	1		
Youth	2	1		
Locality (Within Sekhukhune District Municipality Jurisdiction)	2	1		
Total	20	10		

80/20 points system will be used for bids below R50 000 000.00 and 90/10 for bids above R50 000 000.00. Functionality will form part of the evaluation criteria. Bids will be evaluated in terms of the preferential procurement regulations, 2022 and bidders may claim preference points in terms of specific goals.

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:

.....

FUNCTIONALITY

5	<p>EVALUATIONS OF TENDER OFFERS (Project specific, will be updated after approval from department)</p> <p><u>Prequalification / Quality Criteria</u> Tenderers will be assessed based on the prequalification criteria as set out in the table below. Tenderers scoring less than 70% will be considered non-responsive based on items 1 to 5 below:</p> <ol style="list-style-type: none"> 1. Company Experience 2. Bank Rating 3. Experience Project Personnel 4. Key Personnel 5. Plant and Equipment <p>Tenderers shall fill in the relevant information on the Prequalification / Quality Criteria Schedules in Part T2 and this information shall be used to award points for functionality on the following basis per category:</p>
----------	--

Item 1. COMPANY EXPERIENCE (EXPERIENCE IN SIMILAR PROJECTS)

No. 1	Functionality Criteria – Tender Rating Matrix	A	B	C
		Tenderer rating (score 1-5)	Weighting	Tenders Score (%) = (AxB)/5
	5 or more water supply projects consisting of bulk supply and reservoirs greater than R1.5m construction value successfully completed in last 10years. (As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender).	5	30	
	4 water reticulation projects greater than R1.5m construction value successfully completed in last 10 years. (As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender).	4		
	3 water reticulation projects greater than R1.5m construction value successfully completed in last 10 years. (As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender).	3		
	2 water reticulation projects greater than R1.5m construction value successfully completed in last 10 years. (As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender)	2		
	1 water reticulation projects greater than R1.5m construction value successfully completed in last 10 years. (As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender)	1		

Sekhukhune District Municipality
Lebalelo Central RWS: Water Supply Sub scheme 1A: Contract C
Bid No. SK8/3/1-49/2024/25

Item 2. FINANCIAL REFERENCES

No. 2	Quality Criteria – Tender Rating Matrix		A	B	C
			Tenderer rating (score 1-5)	Weighting	Tenders Score (%) = (AxB)/5
Form A8 (Attach Bank Rating certificate as Proof)	The bank certificate with the original bank stamp and signature. A – rating		5	20	
	The bank certificate with the original bank stamp and signature. B – rating		4		
	The bank certificate with the original bank stamp and signature. C – rating		3		
	The bank certificate with the original bank stamp and signature. D – rating		2		
	The bank certificate with the original bank stamp and signature. E and F rating		1		

N.B: BIDDERS TO SUBMIT PROOF. NON-SUBMISSION WILL RESULT IN LOSS OF POINTS.

Item 3. KEY PERSONAL EXPERIENCE & SPECIFIC KNOWLEDGE

Item 3: RELEVANT PERSONAL EXPERIENCE & SPECIAL KNOWLEDGE					
No. 3	Quality Criteria – Tender Rating Matrix		A	B	C
			Tenderer rating	Score	Points obtained
Contract Manager	BSc/B-Tech/National Diploma in civil engineering (Professionally registered with (SACPCMP or ECSA)	12	30		
Site Agent	BSc/B-Tech/National Diploma in civil engineering	8			
Foreman	Diploma or relevant qualification and experience in civil engineering works	6			
Safety Officer	Relevant safety qualification as prescribed by the construction regulation Professionally registered Health and Safety Officer (Pr. CHSO)	4			
		SUB TOTAL:			
Evaluation Criteria		Number of comparable projects involved in with water supply projects with relevant criteria		Points Obtainable	
Contract Manager		0		0	
		1 - 2		4	
		3 – 4		8	
		5 upwards		12	
Site Agent		0		0	
		1 – 2		2	
		3 – 4		4	
		5 upwards		8	
Foreman		0		0	
		1 – 2		2	
		3 – 4		4	
		5 upwards		6	
Safety Officer		0		0	
		1 – 2		1	
		3 – 4		2	
		5 upwards		4	

Please note that the personnel required on this tender shall remain valid for the duration of the project, approval from the department should be sourced for any change in personnel with similar or higher requirements. The personnel required as above should be available for construction and filled out on form D3: Schedule of contractor's key personnel.

N.B: BIDDERS TO SUBMIT CURRICULUM VITAE & CERTIFICATES OF SITE AGENT AND COMPANY PROFILE. NON-SUBMISSION WILL RESULT IN LOSS OF POINTS.

Item 4. PLANT AND EQUIPMENT

No. 4	Quality Criteria – Tender Rating Matrix			A	B	C
				Tenderer rating	Weighting	Tenders Score
	TARGETED GOALS	TENDERED GOAL	POINTS Claimed by tenderer			
	1 x TLB	4			20	
	1 x 20-ton Excavator	6				
	1 x Water Tanker	4				
	1 x Hiab Truck	2				
	1 x Tipper truck	4				
	SUB TOTAL:	20				

N.B: BIDDERS TO SUBMIT VEHICLE/EQUIPMENT OWNERSHIP PROOF OR INTENTION TO HIRE WITH PROOF OF THE OWNER'S DOCUMENTS. NON-SUBMISSION WILL RESULT IN LOSS OF POINTS.

SUMMARY OF QUALITY / FUNCTIONALITY				
CRITERIA		Tendered Goal	Points Claimed by Tenderer	Points Allocated by Client
1.	TABLE 1: COMPANY EXPERIENCE	30		
2.	TABLE 2: BANK RATING	20		
3.	TABLE 3: KEY STAFF EXPERIENCE	30		
4.	TABLE 4: PLANT AND EQUIPMENT	20		
TOTAL FOR QUALITY AND FUNCTIONALITY		100		

Note: Service providers who score less than 70% on functionality will be regarded as non-responsive to this bid

MBD 7.2

CONTRACT FORM - RENDERING OF SERVICES

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SERVICE PROVIDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SERVICE PROVIDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE SERVICE PROVIDER)

1. I hereby undertake to render services described in the attached bidding documents to (name of the institution)..... in accordance with the requirements and task directives / proposals specifications stipulated in Bid Number.....at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the Purchaser during the validity period indicated and calculated from the closing date of the bid.
2. The following documents shall be deemed to form and be read and construed as part of this agreement:
 - (i) Bidding documents, viz
 - Invitation to bid;
 - Proof of tax compliance status;
 - Pricing schedule(s);
 - Filled in task directive/proposal;
 - Preference claim form for Preferential Procurement in terms of the Preferential Procurement Regulations;
 - Declaration of interest;
 - Declaration of Bidder's past SCM practices;
 - Certificate of Independent Bid Determination;
 - Special Conditions of Contract;
 - (ii) General Conditions of Contract; and
 - (iii) Other (specify)
3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the services specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.
4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfillment of this contract.
5. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.
6. I confirm that I am duly authorised to sign this contract.

NAME (PRINT)

CAPACITY

SIGNATURE

NAME OF FIRM

DATE

WITNESSES

1

2

MBD 7.2

CONTRACT FORM - RENDERING OF SERVICES

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I..... in my capacity as.....
accept your bid under reference numberdated.....for the
rendering of services indicated hereunder and/or further specified in the annexure(s).
2. An official order indicating service delivery instructions is forthcoming.
3. I undertake to make payment for the services rendered in accordance with the terms and conditions
of the contract, within 30 (thirty) days after receipt of an invoice.

DESCRIPTION OF SERVICE	PRICE (ALL APPLICABLE TAXES INCLUDED)	COMPLETION DATE	TOTAL PREFERENCE POINTS CLAIMED	POINTS CLAIMED FOR EACH SPECIFIC GOAL

4. I confirm that I am duly authorised to sign this contract.

SIGNED AT ON

NAME (PRINT)

SIGNATURE

OFFICIAL STAMP

--

WITNESSES

1

2

DATE:

MBD 8

**DECLARATION OF BIDDER'S PAST SUPPLY CHAIN
MANAGEMENT PRACTICES**

1. This Municipal Bidding Document must form part of all bids invited.
2. It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
3. The bid of any bidder may be rejected if that bidder or any of its directors have:
 - a) abused the municipality' / municipal entities supply chain management system or committed any improper conduct in relation to such system;
 - b) been convicted for fraud or corruption during the past five years;
 - c) wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
 - d) been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).
4. **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**

Item	Question	Yes	No
4.1	<p>Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector?</p> <p>(Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the <i>audi alteram partem</i> rule was applied).</p> <p>The Database of Restricted Suppliers now resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.</p>	<p>Yes</p> <input type="checkbox"/>	<p>No</p> <input type="checkbox"/>
4.1.1	If so, furnish particulars:		
4.2	<p>Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)?</p> <p>The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.</p>	<p>Yes</p> <input type="checkbox"/>	<p>No</p> <input type="checkbox"/>
4.2.1	If so, furnish particulars:		
4.3	<p>Was the bidder or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years?</p>	<p>Yes</p> <input type="checkbox"/>	<p>No</p> <input type="checkbox"/>

Item	Question	Yes	No
4.3.1	If so, furnish particulars:		
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.4.1	If so, furnish particulars:		
4.5	Was any contract between the bidder and any municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.5.1	If so, furnish particulars:		

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME).....

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS TRUE AND CORRECT.

I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

MBD 9

CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

- 1 This Municipal Tendering Document (MBD) must form part of all tenders¹ invited.
- 2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive Tendering (or tender rigging).² Collusive Tendering is a *pe se* prohibition meaning that it cannot be justified under any grounds.
- 3 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
 - a. take all reasonable steps to prevent such abuse;
 - b. reject the tender of any Tenderer if that Tenderer or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the Tendering process or the execution of the contract.
- 4 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when tenders are considered, reasonable steps are taken to prevent any form of tender-rigging.
- 5 In order to give effect to the above, the attached Certificate of Tender Determination (MBD 9) must be completed and submitted with the tender:

¹ Includes price quotations, advertised competitive tenders, limited tenders and proposals.

² Tender rigging (or collusive Tendering) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a Tendering process. Tender rigging is, therefore, an agreement between competitors not to compete.

MBD 9

CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying tender:

(Tender Number and Description)

in response to the invitation for the tender made by:

(Name of Municipality / Municipal Entity)

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

I certify, on behalf of: _____ that:

(Name of Tenderer)

1. I have read, and I understand the contents of this Certificate;
2. I understand that the accompanying tender will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the Tenderer to sign this Certificate, and to submit the accompanying tender, on behalf of the Tenderer;
4. Each person whose signature appears on the accompanying tender has been authorized by the Tenderer to determine the terms of, and to sign, the tender, on behalf of the Tenderer;
5. For the purposes of this Certificate and the accompanying tender, I understand that the word "competitor" shall include any individual or organization, other than the Tenderer, whether or not affiliated with the Tenderer, who:
 - (a) has been requested to submit a tender in response to this tender invitation;
 - (b) could potentially submit a tender in response to this tender invitation, based on their qualifications, abilities or experience; and
 - (c) provides the same goods and services as the Tenderer and/or is in the same line of business as the Tenderer
6. The Tenderer has arrived at the accompanying tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium³ will not be construed as collusive Tendering.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
- (a) prices;
 - (b) geographical area where product or service will be rendered (market allocation)
 - (c) methods, factors or formulas used to calculate prices;
 - (d) the intention or decision to submit or not to submit, a tender;
 - (e) the submission of a tender which does not meet the specifications and conditions of the tender; or
 - (f) Tendering with the intention not to win the tender.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this tender invitation relates.
9. The terms of the accompanying tender have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to tenders and contracts, tenders 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.

.....
Signature

.....
Date

.....
Position

.....
Name of Tenderer

³ 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.

APPENDIX A1 CERTIFICATE OF ATTENDANCE AT SITE CLARIFICATION MEETING

This is to certify that:

.....(Bidder)
of..... (Address)
.....

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

We acknowledge that the purpose of the meeting was to acquaint ourselves with the Site of the Works and/or matters incidental to doing the work specified in the Bid documents in order for us to take account of everything necessary when compiling our entire Bid submission.

Particulars of person(s) attending the meeting:

Name Signature

Capacity

Name Signature

Capacity

Note: All particulars above this horizontal divide line to be filled in by the Bidder **prior to** signature by Employer's representative.

Attendance of the above persons at the meeting is confirmed by the representative of EVN Africa Consulting Services namely:

Name..... Signature

Capacity..... Date

Time

APPENDIX A2 CERTIFICATE OF AUTHORITY OF SIGNATORY

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

A Company ☐

B Partnership ☐

C Joint Venture ☐

D Sole Proprietor ☐

E Close Corporation ☐

A. Certificate for company

I,, chairperson of the board of directors of
....., hereby confirm that by resolution of the board (copy
attached) taken on 20....., Mr/Ms,
acting in the capacity of, was authorised to sign all
documents in connection with this Bid and any contract resulting from it on behalf of the company.

As witnesses:

1.
.....
Chairman
.....
Print Name
.....
Print Name
2.
.....
Date
.....
Print Name

B. Certificate of partnership

We, the undersigned, being the key partners in the business trading as
....., hereby authorise Mr/Ms, acting in
the capacity of, to sign all documents in connection with
the Bid for Contract, and any contract resulting from it on our
behalf.

Name	Address	Signature	Date

NOTE: This certificate is to be completed and **signed by each and all of the key partners** upon whom rests the direction of the affairs of the Partnership as a whole.

C. Certificate for Joint Venture

We, the undersigned, are submitting this Bid offer in Joint Venture and hereby authorize Mr

Ms, authorised signatory of the firm

....., acting in the capacity of lead partner, to sign all documents in

connection with the Bid offer for Contractand any contract resulting from it on our behalf.

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

Name of Firm	Address	Authorising	
		Signature	Name
Lead Partner			

D. Certificate for sole proprietor

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

As witnesses:-

1.
Signature: Sole Owner

.....
Print Name

.....
Print Name

2.
Date
.....
Print Name

E. Certificate for Close Corporation

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

..... hereby authorise Mr/Ms....., acting in

the capacity of, to sign all documents in connection with

the Bid for Contract and any contract resulting from it on our behalf.

Name	Address	Signature	Date

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

F. COMPULSORY ENTERPRISE QUESTIONNAIRE

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

Section 1: Name of enterprise

Section 2: VAT registration number, if any:

Section 3: CIDB registration number, if any:

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

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

Section 5: Particulars of companies and close corporations

Company registration number

Close corporation number

Tax reference number

Section 6: Record in the service of the state

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

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

If any of the above boxes are marked, disclose the following:

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

*insert separate page if necessary

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

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

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

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

*insert separate page if necessary

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

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

Signed		Date	
Name		Position	
Enterprise name			

SIGNED ON BEHALF OF THE TENDERER:

APPENDIX A3 CERTIFICATE OF REGISTRATION WITH THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD (CIDB)

1. General

The Register of Contractors is established by the Construction Industry Development Board in terms of the CIDB Act 38 of 2000 and Construction Industry Development Regulations as published in Government Gazette number 26427 of 2004.

The Act makes it mandatory for public sector clients to apply this register when considering Bids. Any enterprise that submits a Bid or enters into contract for construction works with the public sector, must be registered.

Once-off joint ventures do not have to register, provided that each partner of the joint venture is separately registered.

2. Status

Bidders shall fill in the following sections of this form, depending on their status:

2.1 Section A

Bidders who have accomplished registration and can provide proof of their grading designation.

2.2 Section B

Bidders who are in the process of registration of an update to an existing registration or a renewal.

2.3 Section C

Bidders who have submitted the first application.

2.4 Section D

Bidders submitting this Bid offer in Joint Venture and can provide proof that each partner of the Joint Venture is separately registered.

Note: Only complete one of Sections A, B, C or D.

SECTION A

I, acting in capacity of
was authorised to sign all documents in connection with this Bid an any contract resulting from it on behalf of
the following entity:
hereby declare that the above mentioned entity has achieved registration with the Construction Industry
Development Board on date and declare that the grading designation is
reflected in the following **symbols** on the registration certificate.

Contract Value	
----------------	--

Type of Work		
--------------	--	--

.....
Signature of Bidder

.....
Signature of Witness

.....
Print Name

.....
Print Name

SECTION B

I, acting in capacity of..... was authorised to sign all documents in connection with this Bid and any contract resulting from it on behalf of the following entity: hereby declare that the above mentioned entity has achieved registration with the Construction Industry Development Board on date furthermore declare that the existing grading designation is:

Contract Value	
----------------	--

Type of Work		
--------------	--	--

and the following update has been applied for:

Amendment of Category Status	
Change of Particulars	
Annual Confirmation of Particulars	
Renewal of Registration	

mark with a "✓"

.....
Signature of Bidder

.....
Signature of Witness

.....
Print Name

.....
Print Name

SECTION C

I, acting in capacity of was authorised to sign all documents in connection with this Bid and any contract resulting from in/on behalf of the following entity: hereby declare that the above mentioned entity has submitted its FIRST APPLICATION FOR REGISTRATION with the Construction Industry Development Board on date

I furthermore accept that failure to achieve registration with the Construction Industry Development Board in a category stipulated in the Bid Data within 10 days from the date of closing this Bid, implies a non-responsive Bid and warrants rejection of the Bid on account of non-compliance with the requirements of the Bid Data.

.....
Signature of Bidder

.....
Signature of Witness

.....
Print Name

.....
Print Name

SECTION D

I, acting in capacity of the LEAD PARTNER in the Joint Venture

..... was authorised to sign all documents in connection with this Bid and any contract resulting from it, hereby declare that each of the Joint Venture is separately registered with the Construction Industry Development Board and declare that the grading designation is reflected in the following **symbols** on the registration certificates:

Name of Lead Partner:

Contract Value

Type of Work

Name of 2nd Partner:

Contract Value

Type of Work

Name of 3rd Partner:

Contract Value

Type of Work

.....
Signature of Bidder

.....
Signature of Witness

.....
Print Name

.....
Print Name

APPENDIX A4 RECORD OF ADDENDA TO BID DOCUMENTS

We confirm that the following communications received from the Procuring Department before the submission of this Bid Offer, amending the Bid Documents, have been taken into account in this Bid Offer:

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

Attach additional pages if more space is required.

Signed Date

Print Name Position

Bidder

APPENDIX A5 FORM OF INTENT TO PROVIDE A PERFORMANCE GUARANTEE

If my/our Bid is accepted, I/we will, when required and within the time stipulated, provide a guarantee of

Insurance Company (name)

(of address)

.....

or

Commercial Bank (Name)

(Branch)

(of address)

.....

to be approved by you, the Employer, for the amount stipulated.

I/we understand that failure to produce an acceptable Performance Guarantee within the stipulated period is a fundamental breach of Contract, entitling the Employer to:

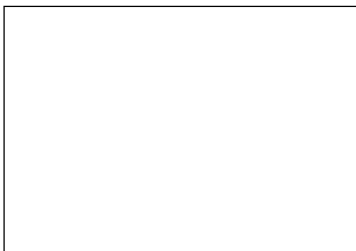
- i) withhold all payments which may be due to the Contractor pending compliance with the stipulated requirements to produce an acceptable Demand Guarantee.
- ii) instruct the Contractor to cease all work pending provision of the Performance Guarantee, and
- iii) cancel the Contract.

Signed Date
(Insurance Company or Bank)

Print Name Position

Signed Date
(Bidder)

Print Name Position



Rubber Stamp of Institution

APPENDIX A6 HEALTH AND SAFETY PLAN: DECLARATION BY BIDDER

I/we declare that we have read and understand the health and safety specifications contained in the Contract Data and undertake to:

- provide and demonstrate to the Employer a suitably and sufficiently documented health and safety plan, which shall be applied from the date of commencement of and for the duration of the construction work,
- appoint a full-time competent employee in writing as the Construction Supervisor from the date of commencement of and for the duration of construction work,
- appoint a full time/part time competent employee in writing as the Construction Safety Officer from the date of commencement of and for the duration of construction work.

I/we undertake to rectify all non-conforming conditions for which we are responsible. I/we accept that, should I/we not rectify these timeously, they will be corrected by the Employer and the cost subtracted from any amounts due to me/us in terms of the Contract Data.

I/we confirm that I/we am/are registered and in good standing with the Compensation Fund and our

registration number is:

alternatively, my/our licensed compensation insurer is:

(Name)

(Address)

.....

To this effect, I/we attach proof of registration and good standing.

I/we certify that to the best of my/our knowledge and belief, the curricula vitae of our proposed key health and safety personnel cited hereinafter correctly describe their qualifications and experience.

Signed Date

Print Name Position

Bidder

Curriculum Vitae of Construction Safety Officer

Name:	Date of Birth:
Profession:	Nationality:
Qualifications:	
Professional Registration Number:	
Name of Employer (Firm):	
Current Position:	Years with the firm:
Employment Record: (List in chronological order stating with earliest work experience)	
Experience Record Pertinent to Required Service in Health and Safety	
Certification I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience.	
..... [Signature of person named in schedule]	Date:

APPENDIX A7 SCHEDULE OF PROPOSED SUB-CONTRACTORS

We notify you that it is our intention to employ the following Sub-Contractors for work in this contract.

If we are awarded a contract we agree that this notification does not change the requirement for us to submit the names of proposed Sub-Contractors in accordance with requirements in the Contract for such appointments.

	Name and Address of Proposed Sub-Contractor	Nature and Extent of Work	Previous Experience with Sub-Contractor
1.			
2.			
3.			
4.			
5.			
6.			

Signed Date

Print Name Position

Bidder

SUB-CONTRACTING UNDERTAKING

LETTER OF UNDERTAKING TO PERFORM AS A SUB-CONTRACTOR
(Copy as many as necessary)

Contract Number:

From: (Name and address of Sub-contractor)

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

To: (Name and address of Contractor)

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

The undersigned undertakes to *perform work/provide services/supply goods in connection with the above Contract as a *close corporation/sole proprietor/partnership/company and is prepared to perform in connection with the above-named Contract as Sub-contractor to the Contractor, the following *work/provide the following services/supply the following goods:

***(delete that which is not applicable)**

.....
.....

for an estimated amount of R.excluding VAT, subject to the terms of any agreement made between us for the purpose of the Contract which agreement shall include the General Conditions of Contract and relevant Special Conditions that govern this Contract.

Signature:

Name:

Designation:

Date:

who duly warrants that he/she is authorised to sign this letter.

SUB-CONTRACTING UNDERTAKING

LETTER OF UNDERTAKING TO PERFORM AS A SUB-CONTRACTOR
(Copy as many as necessary)

Contract Number:

From: (Name and address of Sub-contractor)

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

To: (Name and address of Contractor)

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

The undersigned undertakes to *perform work/provide services/supply goods in connection with the above Contract as a *close corporation/sole proprietor/partnership/company and is prepared to perform in connection with the above-named Contract as Sub-contractor to the Contractor, the following *work/provide the following services/supply the following goods:

*(delete that which is not applicable)

.....
.....

for an estimated amount of R. excluding VAT, subject to the terms of any agreement made between us for the purpose of the Contract which agreement shall include the General Conditions of Contract and relevant Special Conditions that govern this Contract.

Signature:

Name:

Designation:

Date:

who duly warrants that he/she is authorised to sign this letter.

APPENDIX A8 QUALITY ASSURANCE PROGRAMME

Bidder to submit details here below of his Quality Assurance Policy whereby he shall demonstrate that he has the following:

- a) An Operating Quality Management System based on SABS/ISO 9001: 2000 international standards, if not, state alternative.
- b) Proof of Quality Assurance Co-ordination.
- c) Proven technical capabilities and resources to ensure Quality Management.
- d) A recent assessment/audit report on his Quality Management and Quality Control System(s).

Contractor's details with respect to items a), b), c) and d):

Signed Date

Print Name Position

Bidder

APPENDIX A9 INSURANCE STATEMENT

BIDDER'S DECLARATION OF INSURANCES

I/We hereby declare that the insurances enumerated below have been effected by me/us.

I/We further declare that all premiums in respect of the insurances are fully paid up to date.

Cover Effected	Insurer and Policy Number	Expiry Date	Limits of Indemnity / Sums Insured	Deductibles
Contractor's All Risks				
Occupational Injuries and Diseases				
Unemployment Insurance				
Motor Vehicle Insurance				
Other:				

We submit herewith a letter of good standing from the Workman's Compensation Commissioner in respect of Occupational Injuries and Diseases Insurance.

Signed Date

Print Name Position

Bidder

APPENDIX A10 FINANCIAL INFORMATION OF BIDDER

This information sheet has to be filled in by the financier of the Bidder, duly signed and stamped on behalf of the financial institution he represents.

Bidder / Bid Details

Name of Bidder :

Bank Account Number:

Bid Amount:

Performance Guarantee will be provided by this Bank: YES ☐ NO ☐

If yes, state amount of Performance Guarantee: R

Financial Institution

Name the Branch of Commercial Bank:

Name & Tel. No. of Bank Manager:

I / We acting on behalf of the above Commercial Bank confirm that

..... (Bidder)

has operated an account with us for the last..... years.

We have been requested to provide a bank rating based in relation to the financial capability of the Bidder, taking into account directives set out in the following two tables.

BANK RATING	
Bank Code	Description of Bank Code
A	Undoubted good for the amount of enquiry
B	Good for the amount of enquiry
C	Good for the amount quoted if strictly in the way of business
D	Fair trade risk for amount of enquiry
E	Figures considered too high
F	Financial position unknown
G	Occasional dishonours
H	Frequent dishonours

The value on which our Bank Rating of the Bidder is based is R.....

(in wordsonly)

The Bank Rating is code:

Signature: Manager Financial Institution

Print Name

Date

RUBBER STAMP OF INSTITUTION

APPENDIX A11 COMMERCIAL EQUITY DECLARATION

A11.1 General

The Employer considers the information contained in this Declaration as a material aspect of the Contract. Should there, during the duration of either the bid enquiry or contract, be any significant change in the equity situation of the Bidder, the Employer shall immediately be notified and the Employer will, in terms of the Contract Data, exercise its rights.

A11.2 Name of Bidder

A11.3 Type of enterprise e.g. Sole Proprietor, Partnership, CC, Pty, JV, etc.

A11.4 Details of Firm:

Name of Company:

Street Address:

Postal Address:

Tel. Number: (Code) (Number)

Fax Number: (Code) (Number)

Contact Person:

Company Registration No.

Income Tax Registration No.

VAT Registration No.

Number of years in Business:

Founding Date of Firm:

A11.5 List all equity owners

Name	M/F	PDI (Y/N)	D (Y/N)	% Equity owned	ID Number

Attached registration documents and shareholders agreements.

PDI (Previously Disadvantaged Individuals). If disabled indicate under D.

A11.6 Did the enterprise exist under a previous name? (Tick one box)

☐ Yes ☐ No

If yes:

What was its previous name?

Why did it change its name?

List the previous owners/partners/directors

.....

.....

A11.7 Identify by name, status and length of service, those individuals in the enterprise (including owners) responsible for day-to-day management and business decisions.

Financing decisions	Name	Status (Yes/No)*			Length of service (years)
		PDI	Women	Disabled	
Cheque signing					
Signing and co-signing of loans					
Acquisition of lines of credit					
Demand & Retention Guarantees					
Major Purchases or acquisitions					
Signing contracts					

Management decision	Name	Status (Yes/No)*			Length of service (years)
		PDI	Women	Disabled	
Estimating					
Marketing and sales operations					
Hiring & firing of management personnel					
Hiring & firing of non-management personnel					
Supervision of office personnel					
Supervision of field/production activities					

*State Yes or No

Attach separate list, if necessary.

Sekhukhune District Municipality
Lebalelo Central RWS: Water Supply Sub scheme 1A: Contract A
Bid No. SK8/3/1-49/2024/25

I (1), and (2)..... (names),
hereby certify that, to the best of our knowledge, the information, facts and representations are correct and
that we are duly authorised to sign on behalf of the Bidder.

Date:

Signature: (1)..... (2)

APPENDIX A12 JOINT VENTURE DISCLOSURE FORM

Employer:

Contract Number:

NOTE 1 This form need only be completed in the event of a Joint Venture submitting this Bid.

NOTE 2 Fill in all the information requested in the spaces provided. Attach additional sheets if required.

NOTE 3 Provide a copy of the Joint Venture agreement. Demonstrate that the partners to the Joint Venture share in the ownership, control, management responsibilities, risks and profits of the Joint Venture. The Joint Venture agreement shall include specific details relating to:

- a) the contributions of capital and equipment;
- b) portions of the Contract to be performed by the partner's own resources; and
- c) portions of the Contract to be performed under the supervision of each partner.

NOTE 4 Provide copies of all written agreements between partners concerning the Joint Venture, including those that relate to ownership options and to restrictions/limits regarding ownership and control.

A12.1 Joint Venture Particulars

Name

Postal Address

Physical Address

Telephone No.

Fax No.

Name of Authorized Representative

A12.2 Identity of Partner No. 1

Name

Postal Address

Physical Address

Telephone No.

Fax No.

Contact Person

A12.3 Identity of Partner No. 2

Name

Postal Address

Physical Address

.....

Telephone No.

Fax No.

Contact Person

A12.4 Identity of Partner No. 3

Name

Postal Address

Physical Address

.....

Telephone No.

Fax No.

Contact Person

A12.5 Description of the Role of the Partners in the Joint Venture

Partner No. 1

.....

Partner No. 2

.....

Partner No. 3

.....

A12.6 Ownership of the Joint Venture

i) Ownership percentage(s)

Partner No. 1	.....	%
Partner No. 2	.....	%
Partner No. 3	.....	%

ii) Partner percentage in respect of:

a) Profit and loss sharing	Partner No. 1	.....	%
	Partner No. 2	.....	%

	Partner No. 3	_____	%
b) Initial capital contribution	Partner No. 1	_____	%
	Partner No. 2	_____	%
	Partner No. 3	_____	%
iii) Anticipated ongoing contributions:	Partner No. 1	_____	
	Partner No. 2	_____	
	Partner No. 3	_____	
iv) Contributions of equipment (specify types, quality and quantities of equipment) to be provided by each partner:			
Partner No. 1	_____		

Partner No. 2	_____		

Partner No. 3	_____		

A2.7 Recent contracts performed by partners in their own right or as partners in other Joint Ventures

a) Partner No. 1

i) _____

ii) _____

iii) _____

iv) _____

v) _____

b) Partner No. 2

i) _____

ii) _____

iii) _____

iv) _____

v) _____

c) Partner No. 3

- i)
- ii)
- iii)
- iv)
- v)

A12.8 Control and participation in the Joint Venture

(Identify by name and firm those individuals who are, or will be, responsible for, and have authority to engage in the relevant management functions and policy and decision making, indicating any limitations in their authority, for example, co-signature requirements and monetary limits).

a) Joint Venture cheque signing

b) Authority to enter into contracts on behalf of the Joint Venture

c) Signing, co-signing or collateralizing of loans

d) Acquisition of lines of credit

e) Acquisition of demand bonds

f) Negotiating and signing of labour agreements

A12.9 Management of the performance of the Contract

(Fill in the name and firm of the responsible person)

a) Supervision of field operations

b) Major purchasing

c) Estimating

d) Technical management

A12.10 Management and control of the Joint Venture

a) Identify the managing partner

b) What authority does each partner have to commit or obligate the other to financial institutions, insurance companies, suppliers, Sub-Contractors or other parties participating in the performance of the contemplated works:

Partner No. 1

Partner No. 2

Partner No. 3

c) Describe the management structure for the joint venture's work under this Contract:

Management Function / Designation	Name	Partner

A12.11 Personnel

a) State the approximate number of operative personnel (by trade/function/discipline) needed to execute the Joint Venture Contract.

Trade/function/discipline	Number

b) State the number of operative personnel to be employed on the Contract who are currently in the employ of partners:

- c) State the number of operative personnel who are not currently in the employ of the respective partners and shall be engaged on the project by the Joint Venture:
- d) State the name of the individual who shall be responsible for hiring Joint Venture employees:
- e) State the name of the partner who shall be responsible for the preparation of Joint Venture payrolls:

A12.12 Services

List the firms who provide the following services:

Service	Name	Contact Person	Tel. No.
Accounting			
Auditing			
Banking			
Insurance			
Legal			

A12.13 Control and structure of the Joint Venture

Briefly describe the manner in which the Joint Venture is structured and controlled.

The undersigned warrants that he/she is duly authorised to sign this Joint Venture disclosure form and affirms that the foregoing statements are correct and include all the material information necessary to identify and explain the terms and operations of the Joint Venture and the intended participation of each partner in the undertaking

The undersigned further covenants and agrees to provide the Employer with complete and accurate information regarding actual joint venture work and the payment therefore, and any proposed changes in any provisions of the Joint Venture Agreement, and to permit the audit and examination of the books, records and files of the Joint Venture, or those of each partner relevant to the Joint Venture, by duly authorized representatives of the Employer.

Duly authorized to sign on behalf of:

(the Joint Venture)

Signature: Print Name:

Name:

Address:

Sekhukhune District Municipality
Lebalelo Central RWS: Water Supply Sub scheme 1A: Contract A
Bid No. SK8/3/1-49/2024/25

Tel. No.

Date:

Duly authorized to sign on behalf of:

.....
(Partner No. 1)

Signature: Print Name:

Name:

Address:

Tel. No.

Date:

Duly authorized to sign on behalf of:

.....
(Partner No. 2)

Signature: Print Name:

Name:

Address:

Tel. No.

Date:

Duly authorized to sign on behalf of:

.....
(Partner No. 3)

Signature: Print Name:

Name:

Address:

Sekhukhune District Municipality
Lebalelo Central RWS: Water Supply Sub scheme 1A: Contract A
Bid No. SK8/3/1-49/2024/25

Tel. No.

Date:

APPENDIX A13 PROPOSED AMENDMENTS AND QUALIFICATIONS

Should the Bidder desire to make any departures from or modifications to the "Bid" or "Contract", or to qualify his Bid in any way, he shall set out his proposals clearly hereunder or alternatively state them in a covering letter attached to his Bid and referred to hereunder, failing which the Bid will be deemed to be unqualified.

Page	Item Clause	Details	Cost Involved (R)

Signed Date

Print Name Position

Bidder

APPENDIX A14 PRELIMINARY PROGRAMME AND IMPLEMENTATION METHODOLOGY

Provide the information.

APPENDIX A15 CERTIFIED COPY OF COMPANY REGISTRATION DOCUMENTATION

Provide the information.

APPENDIX A16 LETTER OF GOOD STANDING (COIDA)

Provide the information.

PART C CONTRACT

PART C1 AGREEMENTS AND CONTRACT DATA

CONTENTS

Part		Colour	Page
C1.1	Form of Offer and Acceptance	Yellow	C1.2
C1.2	Contract Data	Green	C1.6
C1.3	Appendix to Contract Data	Green	C1.22

C1.1 FORM OF OFFER AND ACCEPTANCE

C1.1.1 OFFER

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of construction works viz.:

**LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB SCHEME 1A:
CONTRACT A**

BID NO:SK8/3/1-49/2024/25

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

By the representative of the Bidder, deemed to be duly authorized, signing this part of this Form of Offer and Acceptance, the Bidder offers to perform all of the obligations and liabilities of the 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

.....

..... (amount in words); R..... (amount 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 Bidder before the end of the period of validity stated in the Bid Data, whereupon the Bidder becomes the party named as the Contractor in terms of the Conditions of Contract identified in the Contract Data.

For the Bidder

.....
(Name and address of organization)

Signature(s)

Print Name(s)

Capacity

Signature of witness Date:

Print Name

Important Note

This page to be duly completed by the **Bidder** before submitting the Bid.

C1.1.2 ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer accepts the Bidder'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 Bidder's Offer shall form an agreement between the Employer and the Bidder upon the terms and conditions contained in this Agreement and in the Contract that is the subject of this Agreement.

The terms of the contract are contained in

Part 1 : Agreements and Contract Data (which include this Agreement)

Part 2 : Pricing Data

Part 3 : Scope of Work

Part 4 : Site Information

and drawings and documents or parts thereof, which may be incorporated by reference into parts 1 to 4 above.

Deviations from and amendments to the documents listed in the Bid Data and any addenda thereto, as listed in the Bid Schedules, as well as any changes to the terms of the Offer agreed by the Bidder and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this Schedule, which shall be duly signed by the authorized representative(s) of both parties.

The Bidder shall, within 7 days of 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 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 the obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Bidder receives one fully completed copy of this original document, including the Schedule of Deviations (if any). Such date shall be confirmed in a manner that can be read, copied and recorded and shall be accepted by the contracting parties as the Commencement Date. This Agreement shall constitute a binding contract between the parties.

For the Employer:

.....
(Name and address of organization)

Signature(s)

Print Name(s)

Capacity

Signature of witness: Date:

Print Name

C1.1.3 **SCHEDULE OF DEVIATIONS**

The extent of deviations from the bid documents issued by the Employer before the bid closing date is limited to those permitted in terms of the Conditions of Bid.

A Bidder's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid, be the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here.

Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the bid documents, and which it is agreed by the Parties becomes an obligation of the contract, shall also be recorded here.

Any change or addition to the bid documents arising from the above agreements and recorded here, shall also be incorporated into the final Contract Document.

3.1	Subject	.....
	Details	.....
3.2	Subject	.....
	Details	.....
3.3	Subject	.....
	Details	.....

By the duly authorized representatives signing this Schedule of Deviations, the Employer and the Contractor agree to and accept the foregoing Schedule of Deviations as the only deviations from and amendments to the documents listed in the Bid Data and addenda thereto as listed in the Bid Schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the Bidder and the Employer in concluding this process of offer and acceptance; in witness thereof the parties hereto have caused this Agreement to be executed.

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

Employer

Bidder

Signed by:
Print Name:
Capacity:
Address:
.....

Signed by:
Print Name:
Capacity:
Address:
.....

for and on behalf of the **Employer** in the presence of

for and on behalf of the **Bidder** in the presence of

Witness:
Print Name:

Witness:
Print Name:

Date : Date :

C1.1.4 CONFIRMATION OF RECEIPT

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

the(day)

the(month)

20 (year)

at(place)

For the Contractor:
Signature

.....
Print Name

.....
Capacity

Signature and name of witness:
.....
Signature

.....
Print Name

PART C1.2 CONTRACT DATA

CONTENTS

Part		Colour	Page
C1.2.1	Conditions of Contract	Yellow	C1.7
C1.2.2	Amplifications of the General Conditions Contract	Green	C1.7
C1.2.3	Data Provided by Contractor	Green	C1.14
C1.2.4	Priority of Documents	Green	C1.14
C1.2.5	Labour Intensive Conditions of Contract	Green	C1.14
C1.2.6	Minimum Number of Workers	Green	C1.21
C1.2.7	Participation of Small, Medium and Micro Enterprises (SMME's)	Green	C1.21

C1.2 **CONTRACT DATA**

C1.2.1 **CONDITIONS OF CONTRACT**

The conditions of contract are the General Conditions of Contract for Construction Works (3rd Edition 2015) published by the South African Institute of Civil Engineering, Private Bag X200, Halfway House, 1685, tel 011 805 5947.

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

Where applicable, items of data given herebelow are cross-referenced to the subclause in the General Conditions of Contract to which they apply.

C1.2.2 **AMPLIFICATIONS OF THE GENERAL CONDITIONS OF CONTRACT**

C1.2.2.1 **General**

The following clauses amplify the General Conditions of Contract and highlight areas in this document that require specific attention.

C1.2.2.2 **Data Provided by the Employer**

- Defects Liability Period (CL 1.1.1.13)

The Defects Liability Period is **12 calendar months** calculated from the date of the Certificate of Completion.

- Time for Practical Completion (CL1.1.1.14)

This clause shall apply *mutatis mutandis* to any portion or phase of the Works that may be described in the scope of Works or in the Contract Data or agreed subsequently between the Contractor and the Employer and committed to writing.

The time for achieving Practical Completion is **48 weeks** calculated from the Commencement Date.

- Employer (CL 1.1.1.15)

The Employer is: **Sekhukhune District Municipality**

- Pricing Strategy (CL 1.1.1.26)

The pricing strategy is the **Re-measurement Strategy**. See Employer's Undertaking B1.2.6.2 on page B1.9.

- Delivery of Notices to the Employer (CL1.2.1.2)

The Employer's address for receipt of communications is:

Postal: PO Box 8611, Groblersdal 0470
Telephone: 013 262 5549
Facsimile: 013 262 2542

- Engineer (CL. 1.1.1.16)

'Engineer' means any Director or Associate or Professional Engineer, appointed by a Director of DIGES CONSULTING, to fulfil the functions of the Engineer in terms of the Contract Data.

- Delivery of Notice to Engineer (CL 1.2.1.2)

The Engineer's address for receipt of communications is:

Postal: PO Box 5743, Polokwane North, 0750

Telephone: (015) 291 4151

Facsimile: (015) 291 4167

E-mail: info@diges.co.za

- Subcontracting (CL 4.4)

Delete the contents of Clause 4.4 and insert:

"The Contractor shall not subcontract more than **30 per centum** of the value of the Contract."

- Information in respect of Construction Equipment (CL 4.9.1)

The Contractor shall deliver to the Engineer, on a monthly basis, a detailed inventory of Construction Equipment kept on Site, full particulars given for each day of the month. Distinction shall be made between Owned Equipment and Hired Equipment as well as Equipment in working order and Equipment out of order. Such inventory shall be submitted by the seventh day of the month following the month to be reported.

- Information in respect of Employees (CL 4.10.2)

The Contractor shall deliver to the Engineer, on a monthly basis, a return in detail of supervisory staff and the number of categorized classes of labour employed each day for the said period by the Contractor for execution of the Contract. Such return shall be submitted by the seventh day of the month following the month to be reported.

- Contractor's Superintendence (CL 4.12)

Add the following sub-clause 4.12.4 to Clause 4.12:

"Where a form is included in the Appendix to the Contract Data for this purpose, the Bidder shall fill in the name of the person he proposes to entrust with the post of Contractor's Site Agent on this Contract in the space provided therefor. Previous experience of this person on work of a similar nature during the past five (5) years is to be entered in the list.

The Contractor's Site Agent shall be on Site at all times when work is being performed.

The person as approved of by the Engineer in writing shall not be replaced or removed from Site without the written approval of the Engineer."

- Documentation required before Commencement with Works Execution (CL 5.3.1)

The documentation required before commencement with Works execution are:

- a) Health and Safety Plan (refer to CL 4.3)
- b) Initial Programme (Refer to CL 5.6)

c) Security (Refer to CL 6.2.1 and CL 6.2.3)

d) Insurance (Refer to CL 8.6)

- Time to Submit the Documentation (CL 5.3.2)

The time to submit the documentation required before commencement with Works execution is **14 days**.

- Access Not Exclusive (CL 5.4.2)

The access and possession of the Site shall not be exclusive to the Contractor as other construction services might be executed concurrently by independent Contractors or bodies under separate Contracts entered into with the Employer.

The other Works which will be in progress or come into operation during the progress or tenancy of this Contract are likely to include, but are not limited to the following:

-
.....
-
.....

The Contractor shall ensure that neither his operations nor his employees shall interfere with or hinder the operations of the Employer or of other Contractors and he shall indemnify the Employer against all claims arising through default of this requirement.

The Contractor shall hand over portions of the Site of Works (whether completed or not), or completed portions of Works, to these Contractors when required by the Employer. The Contractor shall cause no interference with or delays in the execution of these Contracts.

No discount or commission for the Contractor is allowed on these contracts and it will be assumed that he has fully allowed in the Contract Price for the presence of these contractors on Site. Any service rendered or assistance given by the Contractor to these contractors save as are contained in the Works Specifications, shall be for their accounts only and the Employer shall in no way be responsible to the Contractor for any payments in this respect.

The Contractor shall protect all existing services and all work being carried out and structures being erected on the Site by other contractors. Any damage caused to these services or structures or any obstructions or hindrance caused to other contractors by the Contractor and claims arising there from will be the sole responsibility of the Contractor.

Any repair work shall be carried out at the Contractor's expense, in conformity with the Works Specifications.

The same obligations shall be imposed on the Employer and on other Contractors in respect of the Works being executed under this Contract.

- Programme (CL 5.6)

Add the following sub-clause 5.6.6 to Clause 5.6:

“Failure on the part of the Contractor to deliver to the Engineer, the

- programme of the Works in terms of Clause 5.6.1 and
- supporting documents in terms of Clause 5.6.2

within the period stated in the Contract Data, shall be sufficient cause for the Engineer to retain 25 per centum of the value of the Fixed Charge and Value-related items in assessment of amounts due to the Contractor, until the Contractor has submitted aforementioned first Programme of the Works and Supporting Documents”.

- Non-working Days (CL 5.8.1)

- a) The non-working days are Sundays.
- b) The special non-working days are statutory public holidays and the year end break commencing on 13 December and ending on 5 January.

- Contractor’s Designs and Drawings (CL 5.9.7)

Add to Clause 5.9.7 the following:

“All designs, calculations, drawings and operation and maintenance manuals shall be fully endorsed by a third party registered engineer, accomplished in such specific field of practice and the cost thereof shall be borne solely by the Contractor.

Once the alternative design has been approved, the Contractor shall indemnify and hold harmless the Engineer, the Employer, their agents and assigns, against all claims howsoever arising out of the said design, whether in contract or delict”.

- Extension of Time Arising from Abnormal Rainfall (CL 5.12)

Add the following to sub-clause 5.12.2.2:

“The extension of time to be allowed due to abnormal rainfall shall be calculated separately for each calendar month or part thereof in accordance with the following formula:

$$V = (Nw - Nn) + \left(\frac{Rw - Rn}{x} \right)$$

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

Nw = Actual number of days during the calendar month on which a rainfall of 10 mm or more has been recorded

Nn = Average number of days for the calendar month on which a rainfall of 10 mm or more has been recorded, as derived from existing rainfall records

Rw = Actual recorded rainfall for the calendar month

Rn = Average rainfall for the calendar month, as derived from existing rainfall records

The rainfall records which shall be accepted for calculation purposes are based on records taken from South African Atlas of Climatology and Agrohydrology (WRC K5/1489) based on this project site.

Month	Average rainfall for calendar month Rn	Average number of days for calendar month on which a rainfall of 10 mm or more were recorded Nn
	(mm)	(days)
January	84	2.7
February	69	2.1
March	49	1.6
April	26	0.9
May	12	0.4
June	5	0.2
July	2	0.1
August	6	0.2
September	14	0.5
October	45	1.4
November	87	2.8
December	93	3.2

The factor $(N_w - N_n)$ shall be considered to represent a fair allowance for days during which rainfall exceeds 10 mm and the factor $(R_w - R_n)/x$ shall be considered to represent a fair allowance for those days when rainfall does not exceed 10 mm but wet conditions prevent or disrupt work.

The total extension of time shall be the algebraic sum of all monthly totals for the contract period, but if the algebraic sum is negative the time for completion shall not be reduced due to subnormal rainfall. Extensions of time for a part of a month shall be calculated using pro rata values of N_n and R_n ."

- Penalty for Delay (CL 5.13.1)

The penalty for failure to complete the Works is 0.05 percent of Contract Price per calendar day.

- Latent Defect Period (CL 5.16.3)

The latent defect period is **10 years**.

- Delivery of Security (CL 6.2.1)

The type of security required for the due performance of the Contract shall be restricted to one of the following:

Cash deposit of **10 (ten) per centum of the Contract Sum**,

or

Performance Guarantee of **10 (ten) per centum of the Contract Sum**, issued by a Commercial Bank registered in the Republic of South Africa,

or

Performance Guarantee of 10 (Ten) per centum of the Contract Sum, issued by an Insurance Company registered in terms of the Short-term Insurance Act (Act 53 of 1998).

Whenever a Joint Venture constitutes the contracting party (Contractor) to this Contract, the Performance Guarantee shall be issued on behalf of the Joint Venture.

- Contractor Failing to Select or Provide Security (CL 6.2.2)

Delete the entire contents of Clause 6.2.2 and replace with:

“Failure to deliver an acceptable security as selected in the Contract Data within the stipulated period is a fundamental breach of Contract”.

- Variations (CL 6.3)

Omit the words “Provided that” under Clause 6.3.2 and omit Clause 6.3.2.1.

- Dayworks (CL 6.5.1.2.3)

The percentage allowance to cover overhead charges is **15 (fifteen) per centum**.

- Contract Price Adjustment (CL 6.8.2)

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

x = 0.10
a = 0.15
b = 0.2
c = 0.55
d = 0.1

- The applicable area is **Limpopo Province**.
- The applicable industry for the Producer Price Index for materials is **Civil Engineering Materials Index**
- The applicable area for the Producer Price Index for fuel is **Witwatersrand**.
- The base month is **the month prior to closing date of bid**.
- In case where the Contractor is on penalties, the previous month indices before penalties will be used up until completion certificate.

- Variation in Cost of Special Materials (CL 6.8.3)

Price adjustments for variations in the costs of special materials **are not permitted**.

- Interim Payments (CL 6.10)

Add to the end of Clause 6.10.1 the following paragraph:

“The Contractor shall complete the ‘Contractor’s Monthly Report Schedule’, which pro forma documentation is obtainable from the Engineer. Pursuant to Sub-Clause 6.10.1.8, these, duly signed by all concerned, together with the Contractor’s statement and a VAT invoice in original format are to be submitted to the Engineer. Issue by the Engineer to the Employer and Contractor of any signed payment certificate is conditional to this information being fully endorsed, accurately and timeously submitted to the Engineer”.

Add to the end of Clause 6.10.2 the following paragraph:

“All documentary evidence of such materials shall be unambiguous with respect to ownership having fully passed to the Contractor on or before the date of submittal of the Contractor’s monthly statement.

Should the Contractor fail to supply unambiguous documentary evidence, he shall, prior to submittal of his monthly statement, deliver to the Employer a Guarantor Guarantee in the form contained in the Appendices to the Contract Data."

- Percentage Limit on Plant and Materials (CL 6.10.1.5)

The percentage limit on Plant and Materials not yet built into the Permanent Works is **80 (eighty) per centum**.

- Retention Money (CL 6.10.3)

The percentage retention on amounts due to the Contractor is **10 (ten) per centum**.

The limit of retention money is **10 (ten) per centum** of the Contract Sum.

- Insurances (CL 8.6)

Delete sub-clause 8.6.7 and substitute with:

"Failure on the part of the Contractor to effect and keep in force any of the insurances referred to in Clause 8.6.1 and its sub-clauses, is a fundamental breach of Contract, entitling the Employer to cancel the Contract by due notice in terms of Clause 9.2."

- Special Risks Insurance (CL 8.6.1.2)

A Coupon Policy for Special Risks **is required**.

- Liability Insurance (CL 8.6.1.3)

The limit of indemnity for liability insurance required is **R10 000 000.00**.

- Insurance of Materials Supplied by the Employer (CL 8.6.1.1.2)

The insurance amount to cover the value of Plant and Materials, supplied by the Employer for incorporation in the Works and not included in the Contract Sum, is **NIL**.

- Insurance to Cover Professional Fees (CL 8.6.1.1.3)

The insurance amount to cover professional fees, not included in the Contract Sum, payable in respect of the repair or reinstatement of damage to the Works, is **NIL**.

- Cancellation of the Contract (CL9)

Alter the numbering of:

Clause 9.1.5 to 9.1.6 to clause 9.1.6 and 9.1.7 respectively.

Insert the following new clause 9.1.5.

"The Employer shall be entitled to cancel the Contract, at any time for the Employer's convenience, by giving written notice of such cancellation to the Contractor. The termination shall take effect 28 days after the later of the dates which the Contractor receives this written notice or the Employer returns the Demand Guarantee.

The Employer shall not cancel the Contract under this sub-clause in order to execute the Works himself or to arrange for the Works to be executed by another contractor.

This restriction on the Employer shall lapse 18 months after the date of receipt by the Contractor of cancellation in terms of this sub-clause".

- Dispute Resolution (CL 10.5.2)

Dispute resolution shall be referred to **ad-hoc adjudication**.

- Disagreement with ad-hoc Adjudicator's Decision (CL 10.6.1)

Should either of the contracting parties disagree with any decision of the ad-hoc adjudicator, such matter shall be referred to litigation for **court judgement**.

C1.2.3 DATA PROVIDED BY THE CONTRACTOR

C1.2.3.1 Contractor (CL 1.1.1.9)

The legal name of the Contractor is:

C1.2.3.2 Delivery of Notices to the Contractor (CL 1.2)

The Contractor's address for receipt of communication is:

Postal:

Telephone:

Fax:

E-Mail:

Important Note

Paragraphs 2.3.1 and 2.3.2 hereabove to be duly completed by the **Bidder before submitting the Bid**.

C1.2.4 PRIORITY OF DOCUMENTS

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purpose of interpretation, the priority of the documents shall be in accordance with the following sequence:

- a) The Form of Offer and Acceptance.
- b) Amplifications of the General Conditions of Contract within the Contract Data.
- c) Additional special conditions or amendments to the General Conditions of Contract within the Contract Data.
- d) The General Conditions of Contract.
- e) The Specifications, Drawings, Schedules and other documents forming part of the Contract (in that order) contained in the Scope of Work and the Site Information.

If any ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

C1.2.5 LABOUR INTENSIVE CONDITIONS OF CONTRACT

C1.2.5.1 Payment for the labour-intensive component of the Works

Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the scope of work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict.

"Any dispute between the Contractor and labourers, regarding delayed payment or default in payment of fair wages, if not resolved immediately may compel the Employer to intervene. The Employer may, upon the Contractor defaulting payment, pay the moneys due to the workers not honoured in time, out of any moneys due or which may become due to the Contractor under the Contract."

C1.2.5.2 Applicable labour laws

The Ministerial Determination, Special Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice N° R63 of 25 January 2002, as reproduced below, shall apply to works described in the scope of work as being labour intensive and which are undertaken by unskilled or semi-skilled workers.

C1.2.5.3 Introduction

C1.2.5.3.1 This document contains the standard terms and conditions for workers employed in elementary occupations on a Special Public Works Programme (SPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of EPWP.

C1.2.5.3.2 In this document –

- a) "department" means any department of the State, implementing agent or contractor;
- b) "employer" means any department, implementing agency or contractor that hires workers to work in elementary occupations on an 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.

C1.2.5.4 Terms of Works

C1.2.5.4.1 Workers on a EPWP are employed on a temporary basis.

C1.2.5.4.2 A worker may NOT be employed for longer than 24 months in any five-year cycle on a EPWP.

C1.2.5.4.3 Employment on a EPWP does not qualify as employment as a contributor for the purposes of the Unemployment Insurance Act 30 of 1966.

C1.2.5.5 Normal Hours of Work

C1.2.5.5.1 An employer may not set tasks or hours of work that require a worker to work–

- a) more than forty hours in any week
- b) on more than five days in any week; and
- c) for more than eight hours on any day.

C1.2.5.5.2 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.

C1.2.5.5.3 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.

C1.2.5.6 Breaks

- C1.2.5.6.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.
- C1.2.5.6.2 An employer and worker may agree on longer meal breaks.
- C1.2.5.6.3 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.
- C1.2.5.6.4 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.

C1.2.5.7 Special Conditions for Security Guards

- C1.2.5.7.1 A security guard may work up to 55 hours per week and up to eleven hours per day.
- C1.2.5.7.2 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.

C1.2.5.8 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.

C1.2.5.9 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").

C1.2.5.10 Work on Sundays and Public Holidays

- C1.2.5.10.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.
- C1.2.5.10.2 Work on Sundays is paid at the ordinary rate of pay.
- C1.2.5.10.3 A task-rated worker who works on a public holiday must be paid –
- a) the worker's daily task rate, if the worker works for less than four hours;
 - b) double the worker's daily task rate, if the worker works for more than four hours.
- C1.2.5.10.4 A time-rated worker who works on a public holiday must be paid –
- a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;
 - b) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

C1.2.5.11 Sick Leave

- C1.2.5.11.1 Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.
- C1.2.5.11.2 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.
- C1.2.5.11.3 A worker may accumulate a maximum of twelve days' sick leave in a year.
- C1.2.5.11.4 Accumulated sick-leave may not be transferred from one contract to another contract.
- C1.2.5.11.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.

- C1.2.5.11.6 An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.
- C1.2.5.11.7 An employer must pay a worker sick pay on the worker's usual payday.
- C1.2.5.11.8 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.
- C1.2.5.11.9 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.
- C1.2.5.11.10 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 Diseases Act.
- C1.2.5.12 Maternity Leave**
- C1.2.5.12.1 A worker may take up to four consecutive months' unpaid maternity leave.
- C1.2.5.12.2 A worker is not entitled to any payment or employment-related benefits during maternity leave.
- C1.2.5.12.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.
- C1.2.5.12.4 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 her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.
- C1.2.5.12.5 A worker may begin maternity leave –
- a) four weeks before the expected date of birth; or
 - 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 her unborn child; or
 - ii) if agreed to between employer and worker; or
 - c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.
- C1.2.5.12.6 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.
- C1.2.5.12.7 A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the SPWP on which she was employed has ended.
- C1.2.5.13 Family responsibility leave**
- C1.2.5.13.1 Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances -
- a) when the employee's child is born;
 - b) when the employee's child is sick;
 - c) in the event of a death of –
 - i) the employee's spouse or life partner;
 - ii) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.
- C1.2.5.14 Statement of Conditions**
- C1.2.5.14.1 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.

C1.2.5.14.2 An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.

C1.2.5.14.3 An employer must supply each worker with a copy of these conditions of employment.

C1.2.5.15 Keeping Records

C1.2.5.15.1 Every employer must keep a written record of at least the following –

- a) the worker's name and position;
- b) in the case of a task-rated worker, the number of tasks completed by the worker;
- c) in the case of a time-rated worker, the time worked by the worker;
- d) payments made to each worker.

C1.2.5.15.2 The employer must keep this record for a period of at least three years after the completion of the SPWP.

C1.2.5.16 Payment

C1.2.5.16.1 An employer must pay all wages at least monthly in cash or by cheque or into a bank account. The minimum wage for unskilled workers shall be based on a minimum labour rate of R220.00 per day.

C1.2.5.16.2 A task-rated worker will only be paid for tasks that have been completed.

C1.2.5.16.3 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.

C1.2.5.16.4 A time-rated worker will be paid at the end of each month.

C1.2.5.16.5 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

C1.2.5.16.6 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.

C1.2.5.16.7 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.

C1.2.5.16.8 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it

C1.2.5.16.9 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.

C1.2.5.17 Deductions

C1.2.5.17.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.

C1.2.5.17.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

C1.2.5.17.3 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.

C1.2.5.17.4 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.

C1.2.5.18 Health and Safety

C1.2.5.18.1 Employers must take all reasonable steps to ensure that the working environment is healthy & safe.

C1.2.5.18.2 A worker must:

- a) work in a way that does not endanger his/her health and safety or that of any other person;
- b) obey any health and safety instruction;
- c) obey all health and safety rules of the EPWP;
- d) use any personal protective equipment or clothing issued by the employer;
- e) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

C1.2.5.19 Compensation for Injuries and Diseases

C1.2.5.19.1 It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on a EPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.

C1.2.5.19.2 A worker must report any work-related injury or occupational disease to their employer or manager.

C1.2.5.19.3 The employer must report the accident or disease to the Compensation Commissioner.

C1.2.5.19.4 An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

C1.2.5.20 Termination

C1.2.5.20.1 The employer may terminate the employment of a worker for good cause after following a fair procedure.

C1.2.5.20.2 A worker will not receive severance pay on termination.

C1.2.5.20.3 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.

C1.2.5.20.4 A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

C1.2.5.20.5 A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

C1.2.5.21 Certificate of Service

C1.2.5.21.1 On termination of employment, a worker is entitled to a certificate stating –

- a) the worker's full name;
- b) the name and address of the employer;
- c) the SPWP on which the worker worked;
- d) the work performed by the worker;
- e) any training received by the worker as part of the EPWP;
- f) the period for which the worker worked on the EPWP;
- g) any other information agreed on by the employer and worker.

C1.2.6 MINIMUM NUMBER OF WORKERS

“The Contractor shall indicate in his program the number of unskilled labour per item in the program over the contract period (but not necessarily for the whole contract period).

C1.2.7 PARTICIPATION OF SMALL, MEDIUM AND MICRO ENTERPRISES (SMME's)

The Contractor shall engage targeted local enterprises directly in the performance of the contract in accordance with SANS 1914-1: 2002.

PART C1.3 APPENDIX TO CONTRACT DATA

CONTENTS

Part	Colour	Page
C1.3.1 Performance Guarantee	Green	C3.2
C1.3.2 Performance Guarantee for Materials and Equipment not yet Built into the Works	Green	C3.3

C1.3.1 PERFORMANCE GUARANTEE

(Not to be completed at bid stage)

To:(whom the Contract defines as the Employer)

Address:
.....
.....

DEFINITIONS AND DETAILS

“Guarantor” means:

Physical address:

“Employer” means:

“Contractor” means:

“Engineer” means:

“Works” means:

“Site” means:

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

The description of the Contract is:
.....
.....

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

Amount in words:

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

Amount in words:

“Expiry Date” means: The date of issue by Engineer of the Certificate of Completion of the works

PERFORMANCE GUARANTEE

1. The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
2. The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.
3. The Guarantor hereby acknowledges that:
 - 3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;
 - 3.2 its obligations under this Performance Guarantee are restricted to the payment of money.
4. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
 - 4.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 4; or
 - 4.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 4; and
 - 4.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
5. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 shall not exceed the Guarantor's maximum liability in terms of 1.
6. Payment by the Guarantor in terms of 4 shall be made within seven (7) calendar days upon receipt of the first written demand by the Employer.
7. Payment by the Guarantor in terms of 4 will only be made against the return of the original Performance Guarantee by the Employer.
8. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
9. The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
10. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
11. This Performance Guarantee, with the required demand notices in terms of 4 shall be regarded as a liquid document for the purposes of obtaining a court order.
12. Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Sekhukhune District Municipality
Lebalelo Central RWS: Water Supply Sub scheme 1A: Contract A
Bid No. SK8/3/1-49/2024/25

Signed at

Date

Guarantor's signatory (1)

.....
Print Name

.....
Capacity

Guarantor's signatory (2)

.....
Print Name

.....
Capacity

.....
Witness signatory (1)

.....
Print Name

.....
Witness signatory (2)

.....
Print Name

PERFORMANCE GUARANTEE FOR MATERIALS AND EQUIPMENT NOT YET BUILT INTO THE WORKS

(Not to be completed at bid stage)

To:

.....

.....

(hereinafter referred to as the Employer)

re: Performance Guarantee in respect of the project :

Contract No. :

For construction of :

Contractor :

I/We, the undersigned,

.....

and

.....

of

.....

(hereinafter referred to as the "Bank")

address:

.....

.....

and acting on behalf of the Bank have been informed that
(hereinafter called "the Contractor") is your contractor under such Contract and wishes to receive payment in respect of manufacture or partial manufacture of equipment and/or materials brought in a ready state for despatch to the construction site, whether temporarily stored in the warehouse of the Contractor or on the Construction Site, for which the Contract requires him to obtain a guarantee.

We hereby irrevocably undertake to pay you, the Employer, any sum or sums not exceeding in total the amount of R..... (in words only) the "Guaranteed Amount" upon receipt by us of your demand in writing and your written statement stating:

- that the Contractor has failed to deliver such equipment and/or materials when required or instructed to do so.

The Bank's liability under this guarantee is principal in nature and is not subject to the Contract. The Bank's liability shall not be reduced, or in any way be affected by any alteration of the terms of the Contract, or any other arrangements made between the Employer and Contractor.

The Bank will pay on demand and will not determine the validity of the demand or the correctness of the amount demanded, or become party to any claim or dispute of any nature which any party may allege. The Bank will pay the amount demanded into the bank account to be notified by the Employer.

This guarantee is neither negotiable nor transferable, is restricted to the payment of a sum of money only and is limited to the Guaranteed Amount.

This guarantee will lapse sixty (60) days after all the said equipment and/or materials have been built into the Works unless the Bank is, before the expiration date, advised in writing by the Employer of his intention to demand payment for such equipment and/or materials.

This original guarantee must be returned to the Bank by the Employer or the Employer's duly authorised agent either:

- on expiry of the guarantee; or
- against payment of the Guaranteed Amount.

This guarantee shall be governed by the law of the Republic of South Africa.

The Bank chooses as its domicilium citandi et executandi for the purpose of the service of all notices and legal processes the following address:

THUS DONE AND SIGNED AT ON 20.....

In the presence of the following:

AS WITNESSES:

on behalf of the Bank and duly authorised thereto

1.

1.

.....
Print Name

.....
Print Name

and

on behalf of the Bank and duly authorised thereto

2.

2.

.....
Print Name

.....
Print Name

PART C2 PRICING DATA

CONTENTS

Part		Colour	Page
C2.1	Pricing Instructions	Yellow	C2.1
C2.2	Bills of Quantities	Yellow	C2.6

C2.1 PRICING INSTRUCTIONS

C2.1.1 GENERAL

The pricing instructions describe the criteria and assumptions which will be assumed in the Contract that the Tenderer has taken into account when developing his prices. The Bills of Quantities record the Contractor's rates for providing supplies, services, engineering and construction works in accordance with the Scope of Work.

The terms of payment and the provisions for price adjustment, if applicable, are established in the Contract Data. These items are not described in the Pricing Data.

The Tenderer's obligations in pricing the tender offer and the Employer's undertakings in the checking and correction of arithmetical errors are dealt with in the Standard Conditions of Tender contained in Annexure F of SANS 294, as amended in and read in conjunction with the Tender Data.

C2.1.2 DOCUMENTS MUTUALLY EXPLANATORY

The documents forming the Contract are to be taken as mutually explanatory of one another. The Bill of Quantities forms an integral part of the Contract Documents and shall be read in conjunction with the Tender Data, Contract Data, Scope of Work, Site Information General and Special Conditions of Contract, the Specifications and the Drawings.

C2.1.3 DEFINITIONS

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

Unit	:	The unit of measurement for each item of work as defined in the Scope of Work and Site Information.
Quantity	:0000	The number of units of work for each item.
Rate	:	The payment per unit of measurement at which the Contractor contracts to do the work.
Amount	:	The product of the quantity and the rate tendered for an item.
Sum	:	An amount contracted for an item, the extent of which is described in the Bill of Quantities, the specifications or elsewhere but the quantity of work of which is not measured in any units.

C2.1.4 DESCRIPTIONS

Descriptions in the Bill of Quantities are abbreviated and comply generally with those in the Standardised Specifications. Clause 8 of each Standardised Specification, read together with the relevant clauses of the Scope of Work, set out what ancillary or associated activities are included in the rates for the operations specified. Should any requirements of the measurement and payment clause of the applicable Standardised Specification, or the Scope of Work, conflict with the terms of the Bill, the requirements of the Standardised Specification or Scope of Work, as applicable, shall prevail.

C2.1.5 REFERENCES

The clauses in a specification in which further information regarding the schedule item can be obtained appear under "Reference clause" in the Bill. The reference clauses indicated are not necessarily the only sources of information in respect of scheduled items. Further information and specifications may be found elsewhere in the contract documents. Standardised

Specifications are identified by the letter or letters which follow SANS in the SANS 1200 series of specifications, eg. G for SANS 1200 G.

C2.1.6 UNITS OF MEASUREMENT

The units of measurement indicated in the Bill of Quantities are metric units.

The following abbreviations are used in the Bill of Quantities:

%	=	per cent
h	=	hour
ha	=	hectare
kg	=	kilogram
kl	=	kilolitre
km	=	kilometre
km-pass	=	kilometre-pass
kW	=	kilowatt
l	=	litre
m	=	metre
mm	=	millimetre
MN	=	meganewton
MN-m	=	meganewton-metre
MPa	=	megapascal
m ²	=	square metre
m ³	=	cubic metre
m ³ -km	=	cubic metre-kilometre
m ² -pass	=	square metre-pass
no	=	number
PC sum	=	Prime Cost sum
Prov Sum	=	Provisional Sum
sum	=	lump sum
t	=	ton (1 000 kg)

C2.1.7 NET MEASUREMENTS

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

C2.1.8 QUANTITIES

The quantities set out in the Bill of Quantities are the estimated quantities of the Contract Works, but the Contractor will be required to undertake whatever quantities may be directed by the Engineer from time to time. The Contract Price for the completed contract shall be computed from the actual quantities of work accepted and certified for payment.

C2.1.9 CURRENCY

All rates and sums of money quoted in the Bill of Quantities shall be in Rand and whole cents. Fractions of a cent shall be discounted.

C2.1.10 VALUE ADDED TAX

Value Added Tax shall be excluded from the rates and sums contracted for the various items of work included in the Bill of Quantities. VAT will be added as a single entry to the summary.

C2.1.11 RATES AND PRICES

C2.1.11.1 General

- a) The Contractor must price each item in the Bill of Quantities in BLACK INK. Reproduced computer printouts of the Bills of Quantities will not be acceptable.
- b) The rates and prices to be inserted in the Bill of Quantities shall cover all the services and incidentals for the work described under the several items. Such prices and rates shall cover all costs and expenses that may be required 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.
- c) Where the Contractor is required to furnish detailed drawings and designs or other information in terms of the Contract Data, all costs thereof shall be deemed to have been provided for and included in the unit rates and sum amounts contracted for the items scheduled in the Bill of Quantities. Separate additional payments will not be made.
- d) A price or rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bill. The Contractor will not be paid for items against which no rate or lump sum has been entered in the Bill of Quantities.
- e) Should the Contractor group a number of items and contract one lump sum for such group of items, this single lump sum shall apply to that group of items and not to each individual item.
- f) Should the Contractor indicate against any item that compensation for such item is included in another item the rate for the item included in another item shall be deemed nil.
- g) A submission may be regarded as non-responsive if any rates or lump sums in the Bill of Quantities are, in the opinion of the Employer, unreasonable or out of proportion.

C2.1.11.2 "Rate Only" Items

The Contractor shall fill in a rate (in the rate column) against all items where the words "rate only" appear in the Amount column, which rate will constitute payment for work which may be done in terms of this item. Such "rate-only" items are used where it is estimated that little or no work will be required under the item or where the item is to be considered as an alternative to another item for which a quantity is given.

C2.1.11.3 Arithmetic

Excepting where Sum Amounts are required or where Provisional Sums have been indicated, the Contractor shall enter an applicable rate in the Rate Column of the Bill of Quantities for each scheduled item. He shall also enter an appropriate sum in the Amount column for each scheduled item, by determining in the applicable line item the product of the Quantity and the Unit Rate.

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

- b) If a bill of quantities (or schedule of quantities or schedules of rates) applies and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.
- c) Where there is an error in the total of the prices, either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if a bill of quantities applies) to achieve the tendered total of the prices.
- d) The tenderer will be afforded **two days**, after being requested by the Employer or Engineer, to revise selected item prices to achieve the Tendered total of the prices. The tender may be rejected if the Tenderer does not correct or accept the correction of his arithmetical errors as described above.

C2.1.12 VARIATION IN TEXT

No alteration, erasure or addition is to be made in the text of the Bill of Quantities. Should any alteration, erasure or addition be made, it will not be recognized; the original wording of the Bill of Quantities will be adhered to.

PART C2.2 BILLS OF QUANTITIES

PROJECT NO.	SUMMARY SCHEDULE OF QUANTITIES	
A	LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A	
SECTION REFERENCE	DESCRIPTION	AMOUNT
A1	PRELIMINARY AND GENERAL - FIXED CHARGE AND VALUE RELATED OBLIGATIONS	
A2	PRELIMINARY AND GENERAL - TIME RELATED OBLIGATIONS	
A3	PRELIMINARY AND GENERAL - PROVISIONAL SUMS	
A4	PRELIMINARY AND GENERAL - DAYWORKS	
A5	PRELIMINARY AND GENERAL - TEMPORARY WORKS	
TOTAL	SCHEDULE A	
B1	EARTHWORKS FOR PIPE TRENCHES	
B2	PIPE BEDDING	
B3	MEDIUM PRESSURE PIPELINES, STEEL PIPES ON COCRETE SUPPORTS, STORAGE AND ANCILLARIES	
B4	BOREHOLE H12-3077	
B5	BOREHOLE H12-3095	
B6	BOREHOLE H12-3079	
B7	BOREHOLE H12-3084	
B8	BOREHOLE H12-2164	
B9	BOREHOLE H12-3087	
B10	BOREHOLE H12-2168	
B11	BOREHOLE BH12-1827	
B12	BOREHOLE BH12-2152	
B13	BOREHOLE H12-3086	
TOTAL	SCHEDULE B	
TOTAL ESTIMATED VALUE OF CONSTRUCTION WORK (A+B):		
CONTINGENCIES AMOUNT (10%):		
SUBTOTAL AMOUNT:		
VALUE ADDED TAX [15%]:		
TOTAL ESTIMATED CONSTRUCTION AMOUNT:		

		SCHEDULE OF QUANTITIES			CONTRACT No.:	SECTION No.:
		LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			A	A1
ITEM No.	PAYMENT REF	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
A1	SANS 1200A	PRELIMINARY AND GENERAL - FIXED CHARGE AND VALUE RELATED OBLIGATIONS				
1,1		Contractual Requirements:				
1.1.1	8.3.1	Fixed charge contractual requirements.	Sum	1,00		
1.1.2		Value related contractual requirements.	Sum	1,00		
1,2	8.3.2	Facilities for Engineer:				
1.2.1		Furnished office - 1 No.	No	1,00		
1.2.2		Name boards	Sum	2,00		
1.2.3		Provision of survey equipment.	Sum	1,00		
1,3		Facilities for Contractor:				
1.3.1		Offices and storage sheds	Sum	1,00		
1.3.2		Workshops	Sum	1,00		
1.3.3		Laboratories	Sum	1,00		
1.3.4		Living accommodation	Sum	1,00		
1.3.5		Ablution and latrine facilities	Sum	1,00		
1.3.6		Tools and equipment	Sum	1,00		
1.3.7		Water supplies, electric power and communications	Sum	1,00		
1.3.8		Dealing with water	Sum	1,00		
1.3.9		Access	Sum	1,00		
1.3.10		Plant	Sum	1,00		
1.3.11		Materials on site storage and protection.	Sum	1,00		
1.3.12		Accommodation of traffic.	Sum	1,00		
1,4	8.3.4	Removal of Site Establishment:	Sum	1,00		
1,5		Occupational H&S				
1.5.1		Provision of Health and Safety	Sum	1,00		
		PRELIMINARY AND GENERAL - FIXED CHARGE AND VALUE RELATED OBLIGATIONS				

	SCHEDULE OF QUANTITIES LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A	CONTRACT No.:	SECTION No.:
		A	A2

ITEM No.	PAYMENT REF	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
----------	----------------	-------------	------	----------	------	---------

A2	SANS 1200A	PRELIMINARY AND GENERAL - TIME RELATED OBLIGATIONS				
2,1	8.4	Contractual Requirements:				
2.1.1	8.4.1	Time related contractual requirements.	Month	12,00		
2,2	8.4.2.2 PSA2.1	Facilities for Engineer:				
2.2.1		Furnished office - 1 No.	Month	12,00		
2.2.2		Survey assistants and material.	Month	12,00		
2,3		Facilities for Contractor:				
2.3.1		Offices and storage sheds.	Month	12,00		
2.3.2		Workshops.	Month	12,00		
2.3.3		Laboratories.	Month	12,00		
2.3.4		Living accommodation.	Month	12,00		
2.3.5		Ablution and latrine facilities.	Month	12,00		
2.3.6		Tools and equipment.	Month	12,00		
2.3.7		Water supplies, electric power and communications.	Month	12,00		
2.3.8		Dealing with water.	Month	12,00		
2.3.9		Access.	Month	12,00		
2.3.10		Plant.	Month	12,00		
2,4	8.4.3	Supervision for Duration of the Contract:	Month	12,00		
2,7	8.4.5	Environmental Management:	Month	12,00		
		PRELIMINARY AND GENERAL - TIME RELATED OBLIGATIONS				

		SCHEDULE OF QUANTITIES			CONTRACT No.:	SECTION No.:
		LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			A	A3
ITEM No.	PAYMENT REF	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
A3	PSA6	PRELIMINARY AND GENERAL - PROVISIONAL SUMS				
3,1	PSA6.3	Community Liaison Officer:				
3.1.1		Provision for the employment of CLO.	Prov.Sum	1,00	120 000,00	120 000,00
3.1.2		Overheads, charges and profit on item 3.1.1.	%		120 000,00	
3,2		PSC Attendance at Site Meeting:				
3.2.1		Provision for the attendance of 10 PSC members	Prov.Sum	1,00	38 400,00	38 400,00
3.2.2		Overheads, charges and profit on item 3.2.1.	%		38 400,00	
3,3	PSA6.4	Training:				
3.3.1		Provision for training.	Prov. Sum	1,00	250 000,00	250 000,00
3.3.2		Overheads, charges and profit on item 3.3.1.	%		250 000,00	
3,4	PSA6.9	Relocation/Protection of Existing Services:				
3.4.1		Provision for relocation/protection of existing services.	Prov. Sum	1,00	150 000,00	150 000,00
3.4.2		Overheads, charges and profit on item 3.4.1.	%		150 000,00	
3,5	PSA6.6	Routine Tests required by Engineer:				
3.5.1		Provision for routine tests.	Prov. Sum	1,00	200 000,00	200 000,00
3.5.2		Overheads, charges and profit on item 3.5.1.	%		200 000,00	
3,6		Occupational Health and Safety Audits:				
3.6.1		Provision for Occupational Health and Safety audits on site.	Prov. Sum	1,00	150 000,00	150 000,00
3.6.2		Overheads, charges and profit on item 3.6.1.	%		150 000,00	
3,7	PSA6.3	Student Training				
3.7.1		Provision for Student Training	Prov.Sum	1,00	90 000,00	90 000,00
3.7.2		Overheads, charges and profit on item 3.6.1.	%		90 000,00	
3,8	PSA6.3	Safety Representative				
3.8.1		Provision for the employment of Safety Representative	Prov.Sum	1,00	120 000,00	120 000,00
3.8.2		Overheads, charges and profit on item 3.8.1.	%		120 000,00	
TOTAL CARRIED TO SUMMARY						

		SCHEDULE OF QUANTITIES			CONTRACT No.:	SECTION No.:
		LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			A	A4
ITEM No.	PAYMENT REF	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
A4	SABS 1200A	PRELIMINARY AND GENERAL - DAYWORKS				
5,1	8.7 PAA- 5	Labour - Normal Working Hours: [Provisional]				
5.1.1		Skilled Labour (Artisan).	hr	180,00		
5.1.2		Semi-skilled Labour.	hr	160,00		
5.1.3		Unskilled Labour.	hr	240,00		
5.1.4		Foreman.	hr	160,00		
5.1.5		Extra-over rate for items 5.1.1 to 5.1.4 for work during non working hours.	hr	100,00		
5,2		Materials: [Provisional]				
5.2.1		Allowance for Materials used under Dayworks.	Prov.Sum	1,00	200 000,00	200 000,00
5.2.2		Overheads, Handling and all Charges on Item 5.2.1.	%		200 000,00	
5,3	8.7	Plant - Heavy Equipment: [Provisional]				
	PAA	<i>(Plant shall not be more than 3 years old or have more than 3000 hrs logged. Operator to be qualified and competency certified.)</i>				
5.3.1		Excavator - Size Cat 225.	hr			Rate Only
5.3.2		Excavator - TLB.	hr			Rate Only
5.3.3		Grader 140G or similar.	hr			Rate Only
5.3.4		Front end loader - bucket capacity ≤ 1.5 m3.	hr			Rate Only
5.3.5		Front end loader - bucket capacity ≤ 1.5 m3.	hr			Rate Only
5.3.6		Tip truck - 5 m3 capacity.	hr			Rate Only
5.3.7		Tip truck - 10 m3 capacity.	hr			Rate Only
5.3.8		Vibratory compaction roller - 13.5 ton.	hr			Rate Only
	8,7 PAA	Transport cost per any unit of plant to deliver to site and remove from site for items 5.3.1 to 5.3.8	Sum			Rate Only
5,4	8.7 PAA	Plant - Small Equipment: [Provisional]				
5.4.1		Pedestrian roller - BW90 or similar.	hr			Rate Only
5.4.2		Vibratory plate compactor.	hr			Rate Only
5.4.3		Vibratory rammer.	hr			Rate Only
		PRELIMINARY AND GENERAL - DAYWORKS				

A5	8.8	PRELIMINARY AND GENERAL - TEMPORARY WORKS			
5,1		Access Roads to the Works.			
5.1.1		Provision and maintenance of construction access to sites, camp or pipeline routes as required by the contractor.	Sum	1,00	
		PRELIMINARY AND GENERAL - TEMPORARY WORKS			

		SCHEDULE OF QUANTITIES			CONTRACT No.:	SECTION No.:
		LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			A	B1
ITEM No.	PAYMENT REF	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B1	SABS	EARTHWORKS FOR PIPE TRENCHES				
1,1	1200C	Site Clearance:				
1.1.1	8.2.1 a)	Clear vegetation, 800 mm wide. (Provisional)	m3	9 358,50		
1.1.2	8.2.2	Clear trees of girth over 1.0 m.	No.	50,00		
1,2	SABS 1200 DB PSDB	Excavation using Plant:				
1.2.1	8.3.2	Excavate in all materials for trench depths up to 1700 mm, 600 mm wide.	m	62 390,00		
1.2.2	8.3.2	Extra-over items 1.2.1 for excavation in intermediate material.	m	300,00		
1.2.3	8.3.2	Extra-over items 1.2.1 for excavation in rock. (Provisional)	m ³	25 455,12		
1.2.4	8.3.2	Excavate and dispose of unsuitable material from trench bottom.	m ³	467,93		
1,3	8.3.2	Excavation using Labour Intensive Methods:				
1.3.1		Extra-over Item 1.2.1 for excavation in soft material using labour intensive methods.	m	467,93		
1.3.2		Extra-over Item 1.2.4 for excavation in intermediate material using labour intensive methods.	m ³	70,19		
1.3.3	8.3.2	Extra-over Item 1.2.6 for excavate and dispose of unsuitable material using labour intensive methods.	m ³	70,19		
1,4		Backfill and Compaction:				
1.4.1	8.3.2 b)	Backfill and compact trenches using labour intensive methods.	m ³	18 717,00		
1.4.2	8.3.2 b)	Backfill road crossings using a commercial type G7 material compacted to 95% Mod. AASHTO density.	m ³	748,68		
1,5	8.3.3	Excavation Ancillaries;				
1.5.1		Make up deficiency in backfill material from borrow pits. Free-haul is 5.0 km.	m ³	374,34		
1.5.2		Pipe protection installed at 300 mm below top of finished backfill level using 3 strips of danger tape.	m	290,00		
1.5.3		Opening and closing designated borrow pits.	Pov. Sum	1,00	350 000,00	350 000,00
1.5.4		Compaction within road reserve to 90 % of Modified AASHTO density clause 5.7.1.	m ³	120,00		
1.5.5		Compaction within road reserve to 98 % of Modified AASHTO density, as per clause 5.7.2.	m ³	120,00		
1,6		Overhaul:				
1.6.1		Overhaul in excess of the free-haul of 5.0 km.	m ³ -km	1 500,00		

1,7	8.3.5	Existing Services: expose and protect				
1.7.1		Services that intersect a trench.	No.	50,00		
1,8	8.3.6	Finishing:				
1.8.1		Gravel	m ²	120,00		
1,9		Horizontal Directional Drilling				
1.9.1		Horizontal Directional Drilling Establishment				
1.9.1.1		Fixed charges for one site	No.	4,00		
1.9.1.2		Time-related charges for drilling operations for one site	No.	4,00		
1.9.2		Excavation and backfilling				
		Excavate for pipes at the horizontal directional drilling face (including removal and disposal of surplus excavated material within a 0,5 km radius of the working area) in material that is:				
1.9.2.1		Soft material	m ³	500,00		
1.9.2.2		Intermediate material	m ³	500,00		
1.9.2.3		Hard Pickable Soil	m ³	500,00		
1.9.3		Supply of pipes to be installed				
1.9.3.1		900 mm dia. SC Type, designation 100D with R37	m	60,00		
1.9.3.2		900 mm dia. SC Type, designation 100D with R37	m	60,00		
1.9.3.3		900 mm dia. SC Type, designation 100D with D4220	m	60,00		
1.9.3.4		900 mm dia. SC Type, designation 100D with D4220	m	60,00		
1.9.4		Grouting: Injection of cement/sand grout, mix ration ..., where ordered				
		Provide equipment and remove on completion				
1.9.4.1		Operate equipment	Days	4,00		
1.9.4.2		Materials	Daywkm ³ /kg	4,00		
1.9.5		Standing time for pipe jacking gang complete with equipment (where approved)	hours	8,00		
1.9.6		Supply, lay and bed on a Class B bedding sleeve pipes to be laid in open trench:				
1.9.6.1		900 dia precast concrete pipe class 100 D with ogee joints	m	60,00		
1.9.6.2		Skids to support pipe in 900mm dia sleeve as per detail dwg	No.	128,00		
		EARTHWORKS FOR PIPE TRENCHES				

C2.14

		SCHEDULE OF QUANTITIES		CONTRACT No.:		SECTION No.:	
		LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A		A		B3	
ITEM No.	PAYMENT REF	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS	
B3	SANS 1200L PSL	MEDIUM PRESSURE PIPELINES, STEEL PIPES ON COCRETE SUPPORTS, STORAGE AND ANCILLARIES					
3,1	8.2.1	Supply, Lay and Bed Upvc, HDPE and Steel Pipes Complete:					
3.1.1		75mm uPVC medium pressure pipes - Class 12	m	19 820,00			
3.1.2		90mm uPVC medium pressure pipes - Class 12	m	1 520,00			
3.1.3		110mm uPVC medium pressure pipes - Class 12	m	5 860,00			
3.1.4		160mm HDPE medium pressure pipes - Class 16	m	760,00			
3.1.5		200mm HDPE medium pressure pipes - Class 16	m	13 350,00			
3.1.5		250mm HDPE medium pressure pipes - Class 16	m	720,00			
3.1.6		315mm HDPE medium pressure pipes - Class 16	m	19 110,00			
3.1.7		400mm HDPE medium pressure pipes - Class 16	m	1 250,00			
3.1.8		200mm Diameter Steel pipe on concrete supports	m			Rate Only	
3.1.9		315mm Diameter Steel pipe on concrete supports	m	400,00			
3.1.10		400mm Diameter Steel pipe on concrete supports	m	400,00			
3,2	8.2.3	Fittings and Specials - uPVC Lying Bends:					
		(Extra-over rate to Items 3.1.1 to 3.1.6.)					
3.2.1		75 mm uPVC:					
3.2.1.1		uPVC bends less than 25 degree angle.	No.	250,00			
3.2.1.2		uPVC bends with 45 degree angle.	No.	85,00			
3.2.1.3		uPVC bends with 90 degree angle.	No.	85,00			
3.2.2		90 mm uPVC:					
3.2.2.1		uPVC bends less than 25 degree angle.	No.	15,00			
3.2.2.2		uPVC bends with 45 degree angle.	No.	15,00			
3.2.2.3		uPVC bends with 90 degree angle.	No.	15,00			
3.2.3		160 mm uPVC:					
3.2.3.1		uPVC bends less than 22.5 degree angle.	No.			Rate Only	
3.2.3.2		uPVC bends with 45 degree angle.	No.			Rate Only	
3.2.3.3		uPVC bends with 90 degree angle.	No.			Rate Only	
3.2.4		315 mm uPVC:					
3.2.4.1		uPVC bends less than 22.5 degree angle.	No.			Rate Only	
3.2.4.2		uPVC bends with 45 degree angle.	No.			Rate Only	
3.2.4.3		uPVC bends with 90 degree angle.	No.			Rate Only	
		CARRIED FORWARD					

		BROUGHT DOWN				
3,4	8.2.3 PSL 8	Specials and Fittings - Cast Iron Equal Tees:				
		<i>(Bitumen dipped and LYNG sockets on all sides all to SABS 546 and SABS 966.)</i>				
3.3.1		75 mm dia.	No.	125,00		
3.3.2		110 mm dia.	No.	25,00		
3.4.1		160 mm dia.	No.			Rate Only
3.4.3		200 mm dia	No.			Rate Only
3,5	8.2.3 PSL 8	Specials and Fittings - Hydrant Tees:				
		<i>(Cast iron hydrant tees, Bitumen dipped and LYNG sockets to SABS 546 and SABS 966 with flanged branch, 80 mm dia, drilled to SABS 1123, Table 16.)</i>				
3.3.1		75 mm dia.	No.			Rate Only
3.3.2		90 mm dia.	No.			Rate Only
3.4.1		110 mm dia.	No.			Rate Only
3.4.3		160 mm dia	No.			Rate Only
3,6	8.2.3 PSL 8	Specials and Fittings - Cast Iron Scour Tees:				
		<i>(Cast iron scour tee, Bitumen dipped and LYNG sockets to SABS 546 and SABS 966 with flanged branch, 100 mm dia, drilled to SABS 1123, Table 16.)</i>				
3.6.1		110 mm dia.	No.	5,00		
3.6.2		160 mm dia.	No.	5,00		
3,7	8.2.3 PSL 8	Specials and Fittings - Cast Iron End Caps:				
3.7.1		110 mm dia.	No.			Rate Only
3.7.2		200 mm dia.	No.			Rate Only
3,8	8.2.3 PSL 8	Specials and Fittings - Cast Iron Reducers:				
		<i>(Bitumen dipped, spigot and socket and socketed cast iron reducers all to SABS 546 and SABS 966.)</i>				
3.8.1		160 mm x 110 mm dia. [S]	No.	2,00		
3.8.2		110mm x 90mm dia. [S]	No.			Rate Only
		CARRIED FORWARD				

		BROUGHT DOWN				
3,9	8.2.3 PSL 8	Specials and Fittings(PN16) - Flang Adaptors:				
		<i>(Bitumen dipped and LYNG sockets to SABS 546 and SABS 966 with flange drilled to SABS 1123, Table 16.)</i>				
3.9.1		110mm dia.	No.			Rate Only
3.9.2		160 mm dia.	No.			Rate Only
3.9.3		200 mm dia.	No.			Rate Only
3.10	8.2.3 PLK	Specials and Fittings - Isolating Valves: PN16: Install and test as per specification on dwg No. LCRWS/STD-18				
		<i>(Flanged RSV isolating valves. Valves to be non-rising spindles with cap top.)</i>				
3.10.1		75 mm dia.	No.	150,00		
3.10.2		110mm dia.	No.	30,00		
3.10.3		160mm dia.	No.	5,00		
3.10.4		200mm dia.	No.	5,00		
3.10.5		250mm dia.	No.	5,00		
3.10.6		315mm dia.	No.	5,00		
3.10.7		350mm dia.	No.			
3.10.8		400mm dia.	No.	4,00		
3.10.9		450mm dia.	No,			Rate Only
3,11	8.2.3 PSL 8	Specials and Fittings - Socketed Valves:				
		<i>(Socket ends RSV isolating valves. Valves to be non-rising spindles with cap top.)</i>				
3.11.1		200mm dia. Class 16	No.			Rate Only
3.11.2		315 mm dia. Class 16	No.			Rate Only
3.11.3		400 mm dia. Class 16	No.			Rate Only
3,12	8.2.3 PSL 8	Specials and Fittings - Air Valve: PN16: Installing and testing air valve assemblies as per drawing LCWS/STD-15&16				
		<i>(Vent O' Mat SERIES RBX with screwed BSP male inlet, or similar. Complete with flange, barrel nipple, and 50 mm gate valve)</i>				
3.12.1		50 mm Air Valve	No.	30,00		
3,14	PSL7	Valve Chambers as per typical details on specification drawings No. LCRWS/STD- 15,16& 18:				
3.14.1		Precast Valve chamber - 1200 mm x 2400 mm x 1400 mm depth, complete including excavation, materials, plant, labour and incidentals, as per detail drawings.	No.	30,00		
3.14.2		Extra-over Item 3.14.1 for depth increments of 250 mm.	No.	5,00		
		CARRIED FORWARD				

		BROUGHT DOWN				
3,15		New connections to existing infrastructure				
3.15.1		New connections to existing infrastructure	Prov Sum	1,00	420 000,00	420 000,00
		Mark-up on item 5.1	%		420 000,00	
3,16	PSL8	Hydraulic Pipe Testing:				
3.16.1		Hydraulic Pipe Testing irrespective of Pipe Size	sum	1,00		
3,17	PSL8	Disinfecting Pipe Works.				
3.17.1		Disinfecting Pipeworks irrespective of Pipe Size	sum	1,00		
3,18	SABS 1200L	Thrust Blocks as per typical details on specification drawings No. LCRWS/STD-36 &37 :				
3.18.1	8.2.11	Excavation.	m ³	50,00		
3.18.2		Formwork.	m ²	40,00		
3.18.3		Concrete. [Class 20/19 MPa]	m ³	15,00		
3,19		Pipe Works Ancillaries:				
3.19.1		550 mm x 550 mm Fabricated manhole cover with frame, galvanised.	No.	15,00		
3.19.2		Access ladder - 304 SS, galvanised.	No.			Rate Only
3.19.3		Concrete pipe line markers as per details.	No.	150,00		
3,20		Supply, Lay and Bed Ductile Iron Pipes (PN16) Complete:				
3.20.1		400 mm Diameter	m			Rate Only
3.20.2		450 mm Diameter	m			Rate Only
3,21	1200GA 8.2.13	Concrete works				
3.21.1		Install 100mm thick, Grade 20 reinforced concrete (mesh s193) on upper level of pipe trenches	m3	65,00		
3,22	1200LF	Provision of Yard Connections: Supply, lay, joint and test complete yard connections as shown on dwg. No.LCRWS/STD-53				
3.22.1		Provision of Yard Connections, 25mm equal tee, valve box and connection to yard standpipe and install, test and commission of yard standpipe inclusive of concrete trough and soakaway	No.	2 500,00		
		MEDIUM PRESSURE PIPELINES, STEEL PIPES ON COCRETE SUPPORTS, STORAGE AND ANCILLARIES				

	SCHEDULE OF QUANTITIES LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			CONTRACT No.:	SECTION No.:
				A	B4
ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B4	BOREHOLE H12-3077				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	New borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 01.	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps; 28l/s, head 70m				
4.2.1	Supply and install 37kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 18kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-01 complete with flow meter, non-return and pressure gauge, pressure switch and no flow switch				
4.3.1	100mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=28l/s)				
4.3.2	Supply and install new 100mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new BP90M Element or equivalent	No	1,00		
4.3.3.1	Supply and install new 100mm BP65H Element or equivalent	No			Rate Only
4.3.4	Supply and install complete 100mm heavy duty galvanised columns	No	20,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy duty cast iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 37kw, 3phase	No	1,00		
4.4.2	Supply and install 18kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three-phase electricity power line, complete with a 50kVa transformer and Eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	300 000,00	300 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		300 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

	SCHEDULE OF QUANTITIES LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			CONTRACT No.:	SECTION No.:
				A	B5
ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B4	BOREHOLE H12-3095				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	New borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 02	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps; 13l/s, head 80m				
4.2.1	Supply and install 15kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 11kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-02 complete with flow meter, non return and pressure gauge, pressure switch and no flow switch				
4.3.1	80mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=13l/s)				
4.3.2	Supply and install new 80mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new BP90L Element or equivalent	No	1,00		
4.3.3.1	Supply and install complete 100mm heavy duty galvanised columns	No			Rate Only
4.3.4	Supply and install complete 80mm heavy duty galvanised columns	No	17,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy duty cast iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 15kw, 3phase	No	1,00		
4.4.2	Supply and install 11kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three phase electricity power line, complete with a 25kVa transformer and Eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	250 000,00	250 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		250 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

	SCHEDULE OF QUANTITIES LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			CONTRACT No.:	SECTION No.:
				A	B6
ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B4	BOREHOLE H12-3079				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	New borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 01	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps; 20l/s, head 70m				
4.2.1	Supply and install 22kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 18kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-01 complete with flow meter, non return and pressure gauge, pressure switch and no flow switch				
4.3.1	100mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=20l/s)				
4.3.2	Supply and install new 100mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new BP90L Element or equivalent	No	1,00		
4.3.3.1	Supply and install new 100mm BP65H Element or equivalent	No			Rate Only
4.3.4	Supply and install complete 100mm heavy duty galvanised columns	No	20,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy duty cast iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 22kw, 3phase	No	1,00		
4.4.2	Supply and install 18kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three phase electricity power line, complete with a 50kVa transformer and Eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	300000	300 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		300 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

SCHEDULE OF QUANTITIES LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			CONTRACT No.:	SECTION No.:	
			A	B7	
ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B4	BOREHOLE H12-3084				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	Existing borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 02	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps; 10l/s, head 40m				
4.2.1	Supply and install 11kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 5.5kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-02 complete with flow meter, non return and pressure gauge, pressure switch and no flow switch				
4.3.1	80mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=10l/s)				
4.3.2	Supply and install new 80mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new BP65L Element or equivalent	No	1,00		
4.3.3.1	Supply and install new 800mm BP16H Element or equivalent	No			Rate Only
4.3.4	Supply and install complete 80mm heavy duty galvanised columns	No	20,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy duty cast iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 11kw, 3phase	No	1,00		
4.4.2	Supply and install 5.5kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three phase electricity power line, complete with a 25kVa transformer and Eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	250000	250 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		250 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

SCHEDULE OF QUANTITIES			CONTRACT No.:		SECTION No.:
LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			A		B8
ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B4	BOREHOLE H12-2164				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	New borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 01	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps, 25l/s, head 35m				
4.2.1	Supply and install 37kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 11kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-01 complete with flow meter, non return and pressure gauge, pressure switch and no flow switch				
4.3.1	100mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=25l/s)				
4.3.2	Supply and install new 100mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new BP90M Element or equivalent	No	1,00		
4.3.3.1	Supply and install new 100mm BP90I Element or equivalent	No			Rate Only
4.3.4	Supply and install complete 100mm heavy duty galvanised columns	No	40,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy duty cast iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 37kw, 3phase	No	1,00		
4.4.2	Supply and install 11kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three phase electricity power line, complete with a 50kVa transformer and Eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	300000	300 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		300 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

SCHEDULE OF QUANTITIES			CONTRACT No.:	SECTION No.:	
LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			A	B9	
ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B4	BOREHOLE H12-3087				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	New borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 02	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps; 9.0l/s, head 35m				
4.2.1	Supply and install 11kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 15.0kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-02 complete with flow meter, non return and pressure gauge, pressure switch and no flow switch				
4.3.1	80mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=9l/s)				
4.3.2	Supply and install new 80mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new BP65L Element or equivalent	No	1,00		
4.3.3.1	Supply and install new 65mm BP65M Element or equivalent	No			Rate Only
4.3.4	Supply and install complete 80mm heavy duty galvanised columns	No	20,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy duty cast iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 15kw, 3phase	No	1,00		
4.4.2	Supply and install 18kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three phase electricity power line, complete with a 25kVa transformer and eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	250000	250 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		250 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

	SCHEDULE OF QUANTITIES LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			CONTRACT No.:	SECTION No.:
				A	B10
ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B4	BOREHOLE H12-2168				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	New borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 02	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps; 12l/s, head 84m				
4.2.1	Supply and install 18kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 18.0kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-02 complete with flow meter, non return and pressure gauge, pressure switch and no flow switch				
4.3.1	80mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=12l/s)				
4.3.2	Supply and install new 80mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new BP65L Element or equivalent	No	1,00		
4.3.3.1	Supply and install new 65mm BP165H Element or equivalent	No			Rate Only
4.3.4	Supply and install complete 80mm heavy duty galvanised columns	No	28,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy duty cast iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 18kw, 3phase	No	1,00		
4.4.2	Supply and install 15kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three phase electricity power line, complete with a 25kVa transformer and eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	250000	250 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		250 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

	SCHEDULE OF QUANTITIES LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			CONTRACT No.:	SECTION No.:
				A	B11
ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B4	BOREHOLE BH12-1827				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	Existing borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 02	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps; 8.0l/s, head 58m				
4.2.1	Supply and install 11kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 15kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-02 complete with flow meter, non return and pressure gauge, pressure switch and no flow switch				
4.3.1	80mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=8.0l/s)				
4.3.2	Supply and install new 80mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new 80mm BP65L Element or equivalent	No	1,00		
4.3.3.1	Supply and install new 100mm BP65H Element or equivalent	No			Rate Only
4.3.4	Supply and install complete 80mm heavy duty galvanised columns	No	23,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy duty cast iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 11kw, 3phase	No	1,00	16 706,63	
4.4.2	Supply and install 15kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three phase electricity power line, complete with a 25kVa transformer and eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	250000	250 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		250 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

	SCHEDULE OF QUANTITIES LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			CONTRACT No.:	SECTION No.:
				A	B12
ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNTS
B4	BOREHOLE BH12-2152				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	Existing borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 02	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps; 8.0l/s, head 60m				
4.2.1	Supply and install 11kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 15kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-02 complete with flow meter, non return and pressure gauge, pressure switch and no flow switch				
4.3.1	80mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=8.0l/s)				
4.3.2	Supply and install new 100mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new 80mm BP65L Element or equivalent	No	1,00		
4.3.3.1	Supply and install new 100mm BP65H Element or equivalent	No			Rate Only
4.3.4	Supply and install complete 80mm heavy duty galvanised columns	No	22,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy duty cast iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 11kw, 3phase	No	1,00		
4.4.2	Supply and install 15kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three phase electricity power line, complete with a 25kVa transformer and Eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	250000	250 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		250 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

SCHEDULE OF QUANTITIES			CONTRACT No.:		SECTION No.:
LEBALELO CENTRAL REGIONAL WATER SCHEME: WATER SUPPLY SUB-SCHEME 1A: CONTRACT A			A		B13
ITEM No.	DESCRIPTION	UNIT	QUANTIT Y	RATE	AMOUNTS
B4	BOREHOLE BH12-3086				
	BOREHOLE PUMPS AND APPURTENANCES				
4,1	Existing borehole Installation				
4.1.1	Pumphouse				
4.1.2	Supply material and erect concrete pump house as shown on Dwg No. LBCRWS/STD-04, 05, 06, 07, 08 & 02	Sum	1,00		
4.1.3	Supply material and erect palisade fencing as shown on Dwg No. LCRWS/STD-54.	m	40,00		
4,2	Electric Motor Control Panel				
	Supply and install control panel with all fittings required to operate pumps and motors efficiently, including 0-20 second delay timer and 0-24 hour timer according to DWS specifications				
	Positive Displacement Pumps; 8.0l/s, head 68m				
4.2.1	Supply and install 11kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No	1,00		
4.2.1.1	Supply and install 15kw control panel complete with liquid level control (or no flow), pressure switch, lightning protection, auto/manual, volt and amp meter and cabling to electric motor, no flow switch and pressure switch	No			Rate Only
4,3	Supply and install borehole discharge pipework as shown on drawing No. LCRWS/STD-02 complete with flow meter, non return and pressure gauge, pressure switch and no flow switch				
4.3.1	80mm dia pipework	sum	1,00		
	Supply and install new positive displacement pump, complete with columns (shafts, bobbins, spacers, sockets etc), discharge head (pulleys, V-belts, base plates), motor mount bracket, bolts and nuts (Q=8.0l/s)				
4.3.2	Supply and install new 80mm positive displacement pump head-Heavy Duty, complete drive and discharge head with pulley and top rod	No	1,00		
4.3.3	Supply and install new 80mm BP65L Element or equivalent	No	1,00		
4.3.3.1	Supply and install new 100mm BP65H Element or equivalent	No			Rate Only
4.3.4	Supply and install complete 80mm heavy duty galvanised columns	No	23,00		
4.3.5	Supply and install spacer box	No	1,00		
4.3.6	Supply and install Vee belt 17x11625mm	No	2,00		
4.3.7	Supply and install probe pipe including cable tyre flex	sum	1,00		
4,4	3 Phase Electric Motors				
	Supply and install 380/220 V, 4 pole electrical motor with heavy-duty cast-iron frame, to run @ 1445 RPM				
4.4.1	Supply and install 11kw, 3phase	No	1,00		
4.4.2	Supply and install 15kw, 3phase	No			Rate Only
4,5	Pump house security				
4.5.1	Install motion sensor security system with remote sms sending facility of upto 8 designated persons	sum	1,00		

4,6	TESTING AND COMMISSIONING				
4.6.1	Testing and commission borehole installation including pumps, motors, control system, pressure gauges, water meters, valves. Testing to be inclusive of pump operators training in the operation and maintenance of the installed equipment. Training to be signed off by the Engineer and the Contractor to issue Training certification to the Pump Operators Operation and maintenance manuals to be handed over to the Client during Training of the Operators	sum	1,00		
4,7	Electricity Supply				
4.7.1	Eskom Supply material and erect a three phase electricity power line, complete with a 25kVa transformer and eskom meter box and power cable to control panel, to the new boreholes	Prov Sum	1,00	250000	250 000,00
4.7.2	Mark-up on item 4.2.4 (a)	%		250 000,00	
	BOREHOLE PUMPS AND APPURTENANCES				

PART D SCOPE OF WORK

CONTENTS

<u>Item</u>	<u>Page</u>	<u>Topic</u>
D1.		DESCRIPTION OF THE WORKS
		D1.2
	D1.1	Employer's Objectives
	D1.2	Overview of the Works
	D1.3	Extent of the Works
	D1.4	Location of the Works
	D1.5	Temporary Works
D2.		ENGINEERING
		D1.3
	D2.1	Design Services and Activity Matrix
	D2.2	Employer's Design
	D2.3	Drawings
D3.		PROCUREMENT
		D1.4
	D3.1	Preferential Procurement
	D3.2	Subcontracting
D4.		CONSTRUCTION
		D1.5
	D4.1	Works Specifications
	D4.2	Plant and Materials
	D4.3	Construction Equipment
	D4.4	Existing Services
	D4.5	Site Establishment
	D4.6	Site Usage
	D4.7	Permits and Way Leaves
	D4.8	Alterations, Additions, Extensions and Modifications to Existing Works
	D4.9	Water for Construction Purposes
	D4.10	Survey Control and Setting Out of the Works
D5.		MANAGEMENT
		D1.9
	D5.1	Management of the Works
	D5.2	Health and Safety

D1 SCOPE OF WORK

D1. DESCRIPTION OF THE WORKS

EQUIPPING OF BOREHOLES, ELECTRIFICATION, CONSTRUCTION OF PUMPING MAINS TO THE GA-KGWETE BOOSTER PUMP STATION, GRAVITY MAINS FROM THE 5.5ML COMMAND RESERVOIR TO VILLAGE SERVICE RESERVOIRS, AND WATER RETICULATION WORKS WITHIN THE SEKHUKHUNE DISTRICT MUNICIPALITY

D1.1 Employer's Objectives

The Works comprises the following:

a) Boreholes Equipping, Security and Pumping Mains

Equipping and electrification of 10 high yield boreholes

- Equip (with positive displacement pumps) and energise boreholes at Thokwane, Dithobeleng and Masete Aquifers
- Install new concrete Pumphouses, Remote Security System (Alarm and infra-red motion sensor with capacity to send messages to 8 numbers), security fencing and telemetry linked to the booster pump station.
- New Eskom powerlines, transformers, meter boxes and power cables to pump control panels.
- New pumping mains from boreholes to new booster pumping station sump, gravity mains and water reticulation
 - ✓ 75mm diameter uPVC pipeline Class 12, 19 820m
 - ✓ 90mm diameter uPVC pipeline Class 12, 1 520m
 - ✓ 110mm diameter uPVC pipeline Class 12, 5 860m
 - ✓ 160mm diameter HDPE pipeline Class 12, 760m
 - ✓ 200mm diameter HDPE or similar approved pipeline Class 12, 13 350m
 - ✓ 250mm diameter HDPE or similar approved pipeline Class 12, 720m
 - ✓ 315mm diameter HDPE or similar approved pipeline Class 12, 19 110m
 - ✓ 400mm diameter HDPE or similar approved pipeline Class 12, 1 250m
- Provision of Yard Connections; 2500

D1.2 Overview of the Works

Tenders are invited for the supply, delivery, installation, commissioning of the Works.

D1.3 Extent of the Works

The work required to be done by the Contractor, comprises the execution of Civil Work and includes:

- a) Establishment of the Contractor's camp and facilities
- b) Excavation to designated levels
- c) Trimming and finishing of construction site
- d) Removal of site establishment

D1.4 Location of the Works

Refer to the Locality Map.

Location Data:

Settlement/Village	Position (decimal degrees)	
	Latitude	Longitude
Ga-Mashishi	24.451459°	30.107097°
Ga-Masete	24.442124°	30.128332°
Ga-Maapea/Mpheti	24.495756°	30.153278°
Ga-Manyaka	24.469144°	30.113200°
Ga-Selala	24.497458°	30.137903°

D1.5 Temporary Works

The Contractor has no responsibility for construction of temporary works.

D2. ENGINEERING

D2.1 Design Services and Activity matrix

- a) The Contractor has no responsibility for design of permanent works.
- b) The Contractor has no responsibility for design of temporary works.

D2.2 Employer's Design

The Employer's design of the Works is complete.

Construction drawings for the Works are complete.

As-built drawings will be compiled by the Employer, however it is to be noted that it remains the duty of the Contractor to timeously convey any information in his possession which may prove necessary for the Engineer to compile the as-built drawings.

D2.3 Drawings

D2.3.1 Drawings Prepared by Contractor

None required.

D2.4.2 Drawings Prepared by the Employer

The drawings prepared by the Employer comprise the following:

a) **Drawings issued separately**

The Contractor will be supplied with one full scale print of each construction drawing free-of-charge. Further copies will be charged for at ruling rates.

Any information in the possession of the Contractor, which is necessary for the resident engineer for completing of his as-built drawings, shall be supplied to the resident engineer before a certificate of completion will be issued.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the Engineer. The Engineer will supply any figured dimensions which may have been omitted from the drawings.

b) **Drawings Included in the Document**

See Part D2 last page D2.5.

D3. PROCUREMENT

D3.1 Preferential Procurement Procedure Requirements

The Employer's preferential procurement policy applicable to this Contract is set out in Part B1.2, item B1.2.6.3 c) of the Tender Document and MDB6.1.

D3.1.1 Applicable Specification

The South Africa National Standards SANS 1914 - 5 : 2002 Edition 1 specification shall apply to the Contract.

a) **Definition of Targeted Labour**

South African Citizens who:

- have not been employed for more than 100 days during the year preceding their engagement on the Contract; and
- reside within the boundaries of Greater Tubatse Local Municipality

b) **Weighting Factor (Clause 3.3.1)**

The weighting factor for all cases shall be unity.

c) Targeted Labour Engagement

Targeted labour shall be engaged on the following aspects of the Contract:

<u>Activity</u>	<u>Target area</u>
Site Clearance	Clearing of pipeline route
Excavation	Chamber and reservoir sites
Backfilling	Chambers and pipelines

D3.2 Subcontracting

D3.2.1 Mandatory subcontract works

This project does not provide for any mandatory subcontract works.

D3.2.2 Preferred subcontractors/suppliers

This project does not require the appointment of a specialist sub-contractor.

D3.2.3 Subcontracting procedures

Should the Contractor intend to employ subcontractors for execution of portions of the Works, the relevant information shall be submitted per Appendix A7 of Portion 1, Part 2, Section 2 of this document, for consideration of the Employer.

D4. CONSTRUCTION

D4.1 Works Specifications

D4.1.1 Applicable SANS Standardised Specifications

The applicable standardised specifications for this Contract shall be the following:

SANS 1200	A	-	General
SANS 1200	C	-	Site Clearance
SANS 1200	D	-	Earthworks
SANS 1200	G	-	Concrete
SANS 1200	HC	-	Corrosion Protection
SANS 1200	HE	-	Structural Steelwork
SANS 1200	L	-	Medium Pressure Pipeline
SANS 1200	LB	-	Bedding

D4.1.2 The following variations to standardised specifications and additional clauses are applicable to this Contract and are contained in the "Annexure to the Scope of Work".

PSA	General
PSAB	Engineer's Office
PSC	Site Clearance
PSDA	Earthworks (Small Works)
PSDB	Earthworks (Pipe Trenches)
PSG	Concrete (Structural)
PSH	Structural Steelwork
PSHC	Corrosion Protection of Structural Steelwork
PSL	Medium Pressure Pipelines
PSLB	Bedding

D4.1.3 Particular Specifications

The following Particular Specifications are applicable to this Contract and are contained in the “Annexure to the Scope of Work”.

PA	Trimming of Site
PB	Building Work
PBC	Centrifugal Pumpsets
PBD	Drilling, Testing and Cleaning of Boreholes
PBE	Equipping of Boreholes
PD	Maintenance
PE	Contingencies
PG	Electrical Installation for Borehole Pumps
POHAS	Occupational Health and Safety

D4.2 Plant and Materials

All materials used in the Works shall, where such mark has been awarded for a specific type of material, bear the SANS mark.

D4.3 Construction Equipment

The contractor's equipment for construction shall be adequate for the purpose required, of modern design and in good condition to carry out the works expeditiously. Should the Engineer be of the opinion that the equipment in use is in any way unsuitable for carrying out the works in a manner or at a rate commensurate with the requirements of the contract, he shall have the right to call on the Contractor, at any time during the progress of the works, to provide such additional or improved equipment as may be necessary to meet these requirements.

The Employer makes no provision in this contract for financial assistance to the Contractor for the acquisition of plant, machinery and equipment.

D4.4 Existing Services

D4.4.1 Care of Existing Services

It is to be noted that construction work will be done adjacent to or traversing existing services. Prior to commencement of any constructional work in the aforesaid affected area, the Contractor shall satisfy the Engineer that all necessary precautions with respect to setting out procedures have been taken by the Contractor to evade the existing services.

The Contractor shall, before starting any excavations, carefully search and probe the terrain for any existing services or indications of the presence of such services. A payment item is included in the Schedule of Quantities for excavations by hand to locate known and unknown services. If other methods are to be used, the cost thereof is to be included in the Preliminary and General payment items.

In addition if the proposed new services crosses underneath overhead power lines belonging to Eskom as well as underground pipelines and communication cables belonging to Telkom, the Contractor shall have to comply with all the requirements laid down by the relevant authorities when working in the vicinity thereof. The Contractor shall be responsible for checking the locations of all such services with representative of the relevant authorities to ensure that no damage is caused by construction operations.

Work executed within the road reserve of provincial or local roads shall be carried out strictly in accordance with the requirements laid down by the relevant provincial or local authorities. These include the use of traffic signs, flagman and other requirements as applicable. As the

above work entails working in or close to an already developed enclosure, special care must be taken so as not to disturb the functioning of the existing facilities.

D4.4.2 Connection to Existing Services

Prior to connection of new services to existing services, the Contractor shall ensure that the constructed services are clean and free of foreign matter and shall subsequently request the Engineer, in writing, to inspect such Works. Only upon written approval of the Engineer, may connections to existing services be made.

D4.4.3 Contractor to Notify Relevant Authority and the Engineer of Damaged Service

In the event of any service being damaged or accidentally disconnected for any reason, the Contractor shall immediately contact the relevant authority for instructions and shall report the occurrence to the Engineer in writing. The report shall include the reasons for the occurrence of the incident. When instructed the damaged is to be repaired as soon as possible to the approval of the Engineer and Authority. The Contractor will be held responsible for paying all costs incurred by the Service owner or himself as result of each incident where the relevant service was clearly identified before hand.

D4.5 Site Establishment

D4.5.1 Services and Facilities provided by the Employer:

a) Water

Potable water for human consumption is available in the vicinity of the site. Although the supply is reasonably dependable, the supply cannot be guaranteed.

Potable water is to be used sparingly at all times.

b) Electricity / power supply

The Employer cannot guarantee that electricity will be available at all times. The Contractor shall make his own arrangements to connect to water, electric power and other services that he may require for construction purposes.

The costs of making such arrangements, for meeting the conditions imposed and for the metered consumption shall be paid by the Contractor, and his tender will be held to include for all such requirements throughout the duration of the Contract. All water including that used for testing will be charged for at the prevailing tariffs.

D4.5.2 Facilities Provided by the Contractor

The Contractor will be required to make his own arrangements for the provision of a suitable construction camp, offices and workshops. He shall be responsible for all negotiations with the relevant authorities and he shall comply with all requirements imposed by those authorities. Suitable sites available within the municipal area will be pointed out during the site inspection. Should the Contractor require additional storage sites outside of the municipal areas he will be responsible for making his own arrangements at his own cost for such offices.

The facility shall be properly fenced around the perimeter. Temporary buildings and fencing are to be neat and presentable and the surrounding areas must be at all times be kept in a neat, clean and orderly condition. The costs associated with the provision of these items shall be borne by the Contractor. The Contractor will be required to remove all facilities and restore the site to its original condition on completion of Works.

D4.5.3 Other Facilities and Services

a) Latrine and Ablution Facilities

It will be required of the Contractor to provide temporary toilets and ablution facilities for his staff for the currency of the contract, to the standards laid down by the Authorities.

b) Housing of Contractor's Staff

The Contractor shall make his own arrangements for the housing of his supervisory staff.

c) Security

The Contractor will be responsible for providing adequate security for the Works and for the site establishment. All costs associated with the provision of watchmen shall be borne by the Contractor.

D4.5.4 Name Board

The Contractor shall provide for the installation of two name boards. The size, design and contents shall be as indicated on the detail drawing.

The name board shall be removed upon completion of the Works.

D4.6 Site Usage

The Employer expects the contractor, his staff or agents to maintain good public relations with landowners, other contractors and members of the public at all time.

Access to the site will be arranged by the Employer with the contractor. The Contractor shall submit a list of all his staff to the Employer for the purpose of access control.

D4.7 Permits and Way Leaves

Way leaves are required on the project. The Contractor's staff will require access permits to enter the site.

D4.8 Alterations, Additions, Extensions and Modifications to Existing Works

The Contractor shall verify all levels, alignment and dimensions of existing structures or components thereof prior to the commencement of any work to determine the compatibility with the proposed works. The Contractor shall notify the Employer's Agent of any discrepancies.

D4.9 Water for Construction Purposes

No water for construction purposes is available on site. The Contractor shall make provision for procuring, transporting and storing of water for construction purposes at his own cost.

D4.10 Survey Control and Setting Out of the Works

D4.10.1 Survey Control

a) Geometric Control

The Bench Mark Control and topographical survey for the Works has been established. The Contractor is to check the Bench marks and existing levels prior to construction and bring any discrepancies to the attention of the Engineer.

b) Preservation and Replacement of Beacons and Pegs

The Contractor shall protect and preserve all survey marks. Any survey marks disturbed or removed without prior written consent of the Engineer, shall be replaced by a Registered Land Surveyor at the expense of the Contractor.

Any errors in construction levels or positions resulting from use of disturbed bench marks shall be made good by the Contractor at his expense.

D4.10.2 Setting out of the Works

a) Setting out

The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contract Data or notified by the Engineer. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works.

b) Construction Tolerance Control

The Contractor will be required to issue to the Engineer in writing certification of construction accuracy at each of the following construction phases, before continuing with the next phase of construction:

- i) Setting out of Works.
- ii) Positions and levels to top of concrete pads footings/bases of pumphouse floors.

The Contractor shall only continue with the next phase of construction when directed by the Engineer in writing.

Should any item or section of the Works be constructed outside the limits of tolerance specified, instruction for remedial or other measures will be issued by the Engineer. The Contractor will not be permitted to continue with the next phase of construction until remedial work has been completed to the satisfaction of the Engineer.

No claim for loss in material, production or time resulting from the Contractor's work being constructed outside the limits of tolerance specified, will be entertained.

D5. MANAGEMENT

D5.1 Management of the Works

D5.1.1 Planning and Programming

The Contractor shall supply within the period stated in the Contract Data a suitable and realistic construction programme, cash flow diagram, and critical path diagram for the consideration of the Engineer. This programme shall show the proposed scheduling and methods of execution of the Works and the resources to be allocated to each item or phase of the work. Quantities proposed for execution during each week and the anticipated cash-flow based upon these quantities should be shown, due allowance being made for price escalations and retention moneys.

The programme shall make provision for the accommodation of other contractor's requirements. It will be required from the contractor to liaise with other contractors to ensure continuous co-ordination and execution of the scheduled work.

D5.1.2 Recording of Weather

The Contractor shall provide and install a rain gauge on site and shall record rainfall data in the site diary. A site diary will be issued to the Contractor.

D5.2 Health and Safety

D5.2.1 Health and Safety Requirements

The Occupational Health and Safety Act, Act 85 of 1993 shall apply to this contract. The Contractor shall comply with the Particular Specification for Occupational Health and Safety.

D5.2.2 Protection of the Public

As the above entails working in an already developed area where services are provided to the general public special attention must be paid to the following aspects:

- a) No blasting or working with percussion tools will be allowed unless prior written approval from the Engineer and local authorities is obtained.
- b) Safety of the public must be of prime importance and the utmost care must be taken to ensure that the correct signs, barriers and warning devices are in place.
- c) Movement of construction equipment must be controlled on site at all times.

ANNEXURES TO THE SCOPE OF WORK

PSA	<u>GENERAL</u>
-----	----------------

PSA1 SPECIFICATION DRAWINGS (Clause 2.7)

PSA2	QUALITY (Clause 3.1)
------	----------------------

PSA3 **PREVENTION OF DUST AND NOISE NUISANCE** (Clause 5.6)

PSA4 TOLERANCES

PSA4.1 Methods of Specifying (Clause 6.1)

Tolerances for final earthwork reference positions (X & Y Plane as per the L.O. system) : 25 mm ±

PSA4.2 Degrees of Accuracy (Clause 6.2)

Elements or components above foundations where the degree of accuracy will be 1.

PSA5 TESTING (Clause 7)

PSA5.2 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

in terms of Clause 39 of the Conditions of Contract or for him to recommend termination to the Employer in terms of Clause 55 thereof.

PSA6 PAYMENT (Clause 8.2)

Monthly progress payment certificates shall be submitted to the Engineer's Representative on site on the last working day of the calendar month in which the work was done to allow for reconciliation of all quantities, rates, extensions and additions in the certificate. Upon approval by the Engineer's Representative, the certificate shall be submitted in typed form to the Engineer before or on the 7th day of each month following the month of measurement, together with the required number of copies, for certification. It will be assumed that the Contractor has made adequate provision in the prices tendered for manufacture/supply, delivery, assembly, installation and commissioning of all necessary aids required to execute the contract. The certificates shall be according to the standard format included in the annexures to these specifications. Special attention shall be given to the requirements set out in Special Condition of Contract 49(1).

Where day works have been instructed by the Engineer, the Contractor shall submit the returns to the Engineer for signature and approval within twenty-four (24) hours of the end of the working day on which the work was executed. Day work returns shall be submitted on forms included in the annexures to the Specifications.

PSA7 SUMS STATED PROVISIONALLY (Clause 8.5)

PSA7.1 A provisional amount has been included in Bill 1 for materials to be used during the execution of day works.

In addition to the abovementioned amount, provision is made for a mark-up on the materials to be used during the execution of day works. Payment made shall be regarded as full compensation for overheads, charges and profit on the materials to be used when executing day works.

PSA7.2 A Provisional Sum has been included in Bill 1 for contingencies. No percentage mark up will be applicable to any payments made in this regard other than those included in prices for variation determined in terms of Clause 36 of the Conditions of Contract.

PSA8 INSTRUCTIONS BY THE ENGINEER

Site instructions by the Engineer, addressed to the Contractor at his office on the site, will be numbered consecutively and will be deemed to have been received by the Contractor's Representative unless a break in the sequence of numbers is brought to the notice of the Engineer in writing immediately.

PSA9 SITE RECORD BOOK/DIARY

An approved quality A4-size, triplicate copy, Site Record Book/Diary shall be kept in the Contractor's site office and be accessible to the Engineer at all times.

A summary of each working day's events shall be recorded in this book, including inter alia, plant and machinery, movement of materials, construction work completed or undertaken (e.g. volume of concrete cast, mass of reinforcement fixed, length of cabling erected, etc).

Daily entries shall be initialled both by the Resident Engineer / Engineer / Engineer's Representative at the close of the day's activities, or immediately prior to the start of construction activity on the following working day.

Compliance with these requirements is deemed to be included in the Contractor's tendered rates.

PSA10 CONSTRUCTION

PSA10.1 Survey

PSA10.1.1 Setting out of the works

The Bench Mark Control and topographical survey for the works has been established. The Contractor is to check the Bench Marks and existing levels by staking prior to construction and bring any discrepancies to the attention of the Engineer.

PSA10.1.2 Preservation and Replacement of Beacons and Pegs

The Contractor shall protect and preserve all survey marks. Any survey marks disturbed or removed without prior written consent of the Engineer, shall be replaced by a Registered Land Surveyor at the expense of the Contractor.

PSA10.1.3 Setting-out and Construction Tolerance Control

The Contractor will be required to issue to the Engineer in writing certification of construction accuracy at each of the following construction phases, before continuing with the next phase of construction:

1. Setting out of Works
2. Trench excavation
3. Reservoir positions

The Contractor shall only continue with the next phase of construction when directed by the Engineer in writing.

Should any item or section of the Works be constructed outside the limits of tolerance specified, instruction for remedial or other measures will be issued by the Engineer. The Contractor will not be permitted to continue with the next phase of construction until remedial work has been completed to the satisfaction of the Engineer.

No claim for loss in material, production or time resulting from the Contractor's work being constructed outside the limits of tolerance specified, will be entertained.

PSA10.2 Quality Assurance

The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract. The Engineer shall be entitled to audit any aspect of the system.

Details of all procedures and compliance documents shall be submitted to the Engineer for information before each design (if specified) and execution stage is commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor himself shall be apparent on the document itself.

The Contractor shall:

1. supply a Quality Plan and Quality Programme at the time of tendering, both of which are subject to acceptance by the Engineer,
2. maintain Quality Control records in accordance with the Quality Plan during execution of the contract. Such records shall be available to the Engineer or his representative at each Quality Surveillance visit,
3. mark or securely label each component with a unique identification and
4. carry out such tests as are required to ensure compliance with the Specification

The cost of Quality Control shall be inclusive in the Contractor's tender price. Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

Any acceptance, approval, check, certificate, consent, examination, inspection, instruction, notice, observation, proposal, request, test or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances.

PSAB ENGINEER'S OFFICE

PSAB1 OFFICE BUILDINGS (Clause 3.2)

An amount is allowed in the priced schedules for payment by the Contractor.

PSAB2 TELEPHONE (Clause 5.4)

An amount is allowed in the priced schedules for this service.

PSAB3 NAME BOARD (Clause 3.1)

One name board will be required according to the Employer's standard detail.

PSAB4 MEASUREMENT AND PAYMENT

PSAB4.1 Office Building

A provisional sum shall be included for providing office accommodation.

Payment for expenditure under this item will be made in accordance with the money expended, subject to written proof by the Contractor of payment of the amounts.

PSC **SITE CLEARANCE**

PSC1 **SCOPE (Clause 1.1)**

The scope of the work shall also include:

- a) Clear and grub the area of the works. Include for material, rubble and debris, temporary stockpiling (if necessary) and dispose of neatly on site as directed by the Engineer.
- b) Remove and grub all trees and tree stumps regardless of girth. (No tree shall be removed without the express approval of the Engineer).
- c) A 3.0 m clearance has been allowed around the effective centre line outer limits of the pipeline. Should the Contractor require more space due allowance shall be made in his rate for this item.

PSC2 **DISPOSAL OF MATERIAL (Clause 3.1)**

All rubble, debris and waste material shall be disposed of neatly on site as directed by the Engineer.

PSC3 **PRESERVATION OF TREES (Clause 5.2.3)**

No trees shall be cut down without the express approval of the Engineer.

PSC4 **CONSERVATION OF TOPSOIL (Clause 5.6)**

Topsoil shall be preserved and restored over the backfill.

PSC5 **LANDSCAPE PRESERVATION AND CONSERVATION OF FLORA (Clause 5.7)**

All flora outside the designated 3.0 m clearance line defined under the preceding Clause PSC1 shall be preserved.

Any damage of whatever nature shall be made good to the Engineer's instructions and at the Contractor's own expense.

The cost of preservation shall be deemed included in the Tenderer's rates.

PSC6 **MEASUREMENT & PAYMENT**

PSC6.1 **Transport and Disposal of Materials and Debris on Site**

The rate shall cover all cost for temporary stockpiling on site (if necessary); and disposing of neatly on site to the Engineer's site instructions.

PSDA EARTHWORKS (SMALL WORKS)

PSDA1 FREEHAUL AND OVERHAUL (Clause 5.2.5)

The free haul distance for all material to be imported or spoiled shall be considered as 1 km for mechanically driven vehicles and a 200 m for wheelbarrows from the outer ring of houses which defines the village, or as agreed upon in the specified case of "wheelbarrow haul".

PSDA2 BORROW PITS (Clause 5.2.2.2)

Borrow materials shall be obtained from designated borrow pits approved by the Engineer.

PSDA3 DISPOSAL OF SURPLUS MATERIAL

All surplus or unsuitable materials arising from excavation shall be spoiled and spread where indicated by the Engineer. The Engineer shall determine the point of spoil roads that he may require for the construction of the works. No additional payment will be made in this regard.

PSDA4 HAUL AND SPOIL ROADS

The contractor shall be responsible for the provision of all haul and spoil roads that he may require for the construction of the works and that the engineer may approve. No additional payment will be made in this regard.

PSDB EARTHWORKS (PIPE TRENCHES)

PSDB1 MATERIALS (Clause 3)

PSDB1.1 Methods of Classifying (Clause 3.1)

Replace the contents of this sub-clause with the following:

- PSDB1.1.1 Save and except in respect of those portions of the Works which are specified in Portion 1 of the Project Specifications to be executed utilising Labour Intensive Construction Methods, the Contractor may use any method he chooses to excavate any class material, but his chosen method of excavation shall not determine the classification of the excavation. The Engineer will determine the classification of the materials.
- PSDB1.1.2 The classification will be based on the specified construction methods, inspection of the material to be excavated and on the criteria given in PSDB1.2 below, as applicable.
- PSDB1.1.3 Where the utilisation of Labour Intensive Construction Methods is specified in Portion 1 of the Project Specification for certain classes of excavation only, the material for those classes of material to be excavated using Labour Intensive Construction Methods will be classified in terms of PSDB1.2.2 and for those classes of excavation which are not required to be executed by Labour Intensive methods, classification will be based on the criteria given in PSDB1.2.1 (i.e. Where it is specified that the excavation of soft materials only shall be executed using Labour Intensive Construction Methods, the classification of the soft material to be so excavated will be based on the criteria given in PSDB1.2.2 (a) and the Contractor will be required to excavate all such soft material by Labour Intensive methods. However, when the material is classified in terms of PSDB1.2.2 (b) to be "intermediate" and is thus no longer required to be excavated by Labour Intensive methods, will be based on the criteria given in PSDB1.2.1 (thus a material classified as "intermediate" in terms of PSDB1.2.2 (b) may in terms of PSDB1.2.1 be deemed to be "soft" and will be measured and paid as such under such circumstances.).
- PSDB1.1.4 All tools and equipment referred to in PSDB1.2 shall be in good mechanical and operational condition.
- PSDB1.1.5 "Efficiently" as used in PSDB1.2.2(a) - (c) shall be taken to mean "in a manner that can be reasonably expected of a Contractor, having regard to the production achieved".
- PSDB1.1.6 The classification of material other than "soft excavatability" shall be agreed upon before excavation may commence.
- PSDB1.1.7 The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated changes to such an extent that a new classification is warranted for further excavation. Failure on the part of the Contractor to advise the Engineer in good time shall entitle the Engineer to reclassify, at his discretion, such excavated material.

PSDB1.2 Classes of Excavation (Sub-Clause 3.1)

Add the following new sub-clause:

- PSDB1.2.1 Classes of excavation where Labour Intensive Construction Methods are NOT specified
- The excavation of material will, in the case of work which is NOT required in terms of the Contract to be executed utilising Labour Intensive Construction Methods, be

-
- classified according to SABS 1200D for the purpose of measurement and payment.
Add the following new sub-clause:
- PSDB1.2.2 Classes of excavation where Labour Intensive Construction Methods are specified
The excavation of material will, in the case of work which is required in terms of the Contract to be executed utilising Labour Intensive Construction Methods, be classified as follows for purposes of measurement and payment:
- a) Soft excavation
 - i) **Class 1**

Soft excavation Class 1 shall be excavation, including the excavation of boulders not exceeding 0.04 m³, in material that can be excavated and removed from the excavation by an average able bodied labourer or group of such labourers, at a rate of not less than 2.5 m³ per 9.25 hour working day per labourer, using only a suitable shovel. The average volume/task can be accepted as 3.0 m³ per labourer per day.
 - ii) **Class 2**

Soft excavation Class 2 shall be excavation, including the excavation of boulders not exceeding 0.04 m³, (excluding soft excavation Class 1) in material that can be excavated and removed from the excavation by an average able bodied labourer or group of such labourers, at a rate of not less than 2.0 m³ and not more than 2.0 m³ per 9.25 hour working day per labourer, using only picks, "gwalas", shovels and similar hand tools. The average volume/task can be accepted as 2.5 m³ per labourer per day.
 - ii) **Class 3**

Soft excavation Class 3 shall be excavation, including the excavation of boulders not exceeding 0.04 m³ (excluding soft excavation Class 2) in material that can be excavated and removed from the excavation by an average able bodied labourer or group of such labourers, at a rate of not less than 1 m³ and not more than 2.5 m³ per 9.25 hour working day per labourer, using only picks, "gwalas", shovels and similar hand tools. The average volume/task can be accepted as 2.0 m³ per labourer per day.
 - b) Intermediate excavation

Intermediate excavation shall be excavation (excluding soft excavation) in material which requires ripping or loosening by mechanical means prior to removal of the loosened material utilising the methods as described in PSDB1.1.1(a).
 - c) Hard rock excavation

Hard rock excavation shall be excavation of boulders not yet decomposed exceeding 0.4 m³ and excavation in solid rock occurring in bulk or in banks or ledges, which requires loosening or breaking up by drilling, wedging, splitting or blasting or by other approved quarrying methods, prior to being excavated and removed from the excavation utilising only picks, "gwalas", shovels and similar hand tools.

(NOTE: Such excavation generally includes materials such as formations of unweathered rock that can be removed only after blasting.)
-

The Engineer will instruct for which portions of the Works, based on the evidence provided from trial holes excavated at approximately 200 m spacing by the Contractor for this purpose, will be executed utilising Labour Intensive Construction methods. The Trial hole shall be excavated to trench depth utilising a Cat 416 Backactor or similar.

PSDB2 PLANT

PSDB2.1 Excavation Equipment (Sub-Clause 4.1)

Replace the contents of this sub-clause with the following:

- a) “To the extent that the provisions of the Specifications permit the use of mechanical plant and equipment in the excavation of trenches, the Contractor may use trenching plant that will excavate to a width such that the side allowance does not exceed the appropriate value specified in 5.2 by more than 50%, except that where in terms of the Project Specifications or of the Drawings, the base width of a trench for a pipeline or a portion of a pipeline is not to exceed the maximum base width or a stated value, the Contractor may use trenching plant which will produce the required trench width or he shall accept the responsibility for all costs incurred in strengthening the relevant pipeline”.

PSDB3 ACCOMMODATION OF TRAFFIC (Sub-Clause 5.1.3)

Traffic must be accommodated along the lengths of the pipelines which fall within or adjacent to any road reserve.

The Contractor shall Bid a lump sum per village in Schedule 3 for accommodating traffic during the duration of the Contract, which sum shall cover all his obligations in this regard, including but not limited to temporary barricades; the erection and re-erection of existing and/or temporary traffic signs; lights and flagmen for the guarding and protection of the Works; and for making all necessary arrangements with the applicable traffic authorities. Payment shall be made monthly pro-rata to the overall progress of the Works.

If crossing of the road in half widths is allowed, the road shall remain continuously open to traffic. The Contractor shall make provision to ensure the safe passage of traffic using this public road whilst installing the pipe through the road, and to ensure that any disruption to public is kept to a minimum providing safe detour when so instructed by the Engineer. Each half width shall be completed in one day. No open trenches will be allowed overnight. If the half width is not completed by 16:00 the trench shall be backfilled, in which case the Contractor shall re-excavate the trench at a later stage to complete the work at his own expense. All detours and signs shall be erected and maintained in accordance with the latest issue of Road Signs Note 13 as issued by CSRA and CUTA.

PSDB4 EXISTING SERVICES (Sub-Clauses 5.1.4)

Where any existing service occurs within the specified trench excavation, and the presence of such service is known before being uncovered, then the protection of the service will be scheduled and measured as provided for in Clause 8.3.5 of 1200DB. Only known services (as defined in Clause 5.4 of 1200A) shall be measured for payment.

Where an unknown existing service is damaged during construction, and the Engineer orders that the Contractor should undertake the repair of such service, then such repair will either be measured and paid as dayworks or alternatively as a contractual variation in terms of Clause 40 of the General Conditions of Contract.

No construction activity which may affect the integrity of telephone or electrical poles or stays may be carried out without the prior written approval of the Engineer, which approval shall only be given subject to the acceptance of a *modus operandi* that will ensure the integrity of such structures during construction.

PSDB5 TRENCH WIDTHS (Sub-Clauses 4.1 and 5.2)

Trenches in general shall not exceed the widths laid down in Sub-Clause 8.2.3. If trenches exceed the specified width the Contractor shall be liable for the cost of measures which may be required as a result of the additional trench width.

PSDB6 MINIMUM BASE WIDTH (Sub-Clause 5.2)

Side allowance for pipes of diameter 125 mm or more (Sub-clauses 5.2 and 8.2.3):

The minimum base width of trench for pipes of external diameter less than 125 mm but larger than 70 mm laid at a depth of 1,5 m or less shall be 550 mm.

The minimum base width of trenches for pipes of external diameter less than 70 mm laid at a depth of 1,0 m or less shall be 400 mm.

The minimum base width of trenches where labour-based excavation is concerned shall be at least 150 mm on either side of the pipe's outer diameter to allow proper compaction of backfilling materials.

PSDB7 TRENCH BOTTOMS (Sub-Clause 5.5)

Replace the first paragraph of this sub-clause "Material thatcompacted as directed" with the following:-

Where a firm foundation cannot be obtained at the grade indicated due to soft or unsuitable material, the Engineer may instruct the Contractor to remove such unsuitable material and to backfill the excess depth with approved selected material or concrete, as directed by the Engineer in each particular case, at the cost of the Employer. Backfill other than concrete, shall be placed in layers of 100 mm uncompacted thickness, each layer thoroughly compacted to the entire satisfaction of the Engineer, to provide adequate support for the pipe bedding to be placed on top of it.

Should the Contractor remove more material than is required to secure the proper grade of the pipeline, the Contractor must, at his own cost, backfill the excess excavation with approved selected material or concrete as directed by the Engineer in each particular case.

PSDB8 DISPOSAL OF EXCAVATED MATERIAL (Sub-Clauses 5.6.3 and 5.6.4)

All surplus or unsuitable materials arising from excavation shall be spoiled and spread within or adjacent to the Site of the Works or when ordered by the Engineer be spoilt at a spoil site established by Contractor.

PSDB9 FREEHAUL AND OVERHAUL (Sub-Clause 5.6.8)

No overhaul will be payable on earthworks for pipe trenches.

PSDB10 AREAS SUBJECTED TO TRAFFIC LOADS (Clause 5.7.2)

The requirements of Clause 5.7.2 shall apply only to pipes and sleeves crossing streets or paved areas and pipes running parallel to the road as described below.

All service trenches running parallel to the road of which the roadside edge of the trench is located less than 1.4 m away from the edge of the travelled way, will be subject to the requirements for the above mentioned clause.

The measurement and payment will apply to the full trench width. Pipes and sleeves crossing streets or paved areas will be measured and paid for to a length equal to the width of road or length of pavement crossed plus 1,4 m either side of the travelled edges.

Compaction of other pipe trenches running parallel to the roadway shall be considered areas subject to traffic loads only where instructed by the Engineer in writing. The volume will be computed from the minimum base width determined in accordance with Sub-Clause 5.2 and the depth from the top of the back fill to the top of the bedding as specified in Sub-Clause 8.3.3.1.

PSDB11 REINSTATEMENT OF EXISTING BITUMEN SURFACED ROADS (Clause 3.6 and 5.9.4)

Pipe trenches through the existing bitumen surfaced roads shall be reinstated with a 150 mm upper selected subgrade layer compacted to 93% mod AASHTO density, followed by a 150 mm sub base layer compacted to 95% mod AASHTO density and a 150 mm graded crushed stone base compacted to 98% of mod AASHTO density. The road shall be provided with a 25 mm thick asphalt seal.

The upper selected subgrade layer shall have a CBR of at least 15, a grading modulus of at least 0,75 and a maximum PI of 12. The sub base shall conform to SABS 1200 ME and the base to SABS 1200 MF.

PSDB12 MEASUREMENT AND PAYMENT (Clause 8.3.2)

PSDB12.1 Basic Principles (Clause 8.1)

Insert the following heading for Clause 8.1.2:

"Trenches not required to be excavated by Labour Intensive Construction methods"

Add the following new sub-clause: (Clause 8.1.5)

"Works required to be executed utilising Labour Intensive Construction methods

Separate items will be provided for works covered by this Specification which are required to be executed by Labour Intensive Construction methods and for works for which the utilisation of such methods is not required.

The trench depth increments referred to in Clause 8.1.2(b) and the trench depth increment for 8.1.5 shall be:

- a) up to 1.5 m in depth

Trenches shall be measured volumetrically, irrespective of length.

Measurement and payment for works covered by this Specification and required to be executed utilising Labour Intensive Construction (LIC) methods shall, unless otherwise stated, be mutatis mutandis in accordance with the provisions of SABS 1200DB as amended in this Project Specification.

PSDB12.2 Excavation (Sub-Clause 8.3.2)

Excavate, in all materials for trenches 0 - 1,0 m wide, backfill, compact and dispose of surplus material utilising Labour Intensive Construction methods up to 1,5 m in depth
m³

Extra over the above for:

1)	Soft excavation Class 2	(refer PSDB1.2.2)	m ³
2)	Soft excavation Class 3	(refer PSDB1.2.2)	m ³
3)	Intermediate excavation	(refer PSDB1.2.2)	m ³
4)	Hard rock excavation	(refer PSDB1.2.2)	m ³

Excavate, in all materials for trenches 0 - 1,0 m wide, backfill, compact and dispose of surplus material utilising Conventional Construction methods

a)	Up to 1.5 m in depth	m ³
----	----------------------	----------------

Extra over the above for:

1)	Intermediate material	m ³
2)	Hard rock excavation	m ³
3)	Backfill and compact by means of Labour Intensive Construction Methods	m ³
4)	Disposal of surplus material by means of Labour Intensive Construction methods within 20 m from the source of spoil material using wheel barrows	m ³

Backfill should be in 200 mm thick layers compacted to 90% Mod AASHTO.

Payment for the excavation and backfilling of trenches shall be made at the Bided rates and at the following stages of the construction:

- i) Upon completion and approval of the trench bottom, prior to bedding: 40%
- ii) Upon completion and approval of top of selected backfill: 70% (cumulative)
- iii) Upon completion and approval of the mainfill: remaining 30%.

PSDB12.3 Excavation of Trial Holes

Excavation of trial holes as described in PSDB1.2.2 will be measured by number and shall include for backfilling after inspection.

PSDB12.4 Stone Bedding

Stone bedding will be measured per cubic metre under the appropriate item in SABS 1200LB. Type A bedding (crushed stone wrapped in a geotextile blanket) shall be measured per linear metre along the centreline of the trench. The provision, operation and removal of (a) de-watering pump where authorised by the Engineer will be measured as dayworks under the appropriate item in Schedule2.

PSG **CONCRETE (Structural)**

PSG1 **MATERIALS**

PSG1.1 **Cement (Clause 3.2.1)**

All Cement to be used shall conform to SANS EN 197-1. Only CEM I 42,5 cement shall be used in construction of the Works.

PSG1.2 **Storage of Cement (Clause 3.2.3)**

A first-in-first out circulation shall be followed to ensure that no cement shall be older than two (2) months from the date of manufacture.

PSG1.3 **Aggregates (Clause 3.4.1)**

The maximum size of the coarse aggregate shall be 20 mm unless otherwise indicated on the drawings.

PSG2 **PLANT**

PSG 2.1 **Formwork**

PSG2.1.1 **Finish (Clause 4.5.2)**

All concrete, save for water retaining structures against which earth will be backfilled, shall be finished rough.

All exposed concrete surfaces shall be finished smooth to Degree of Accuracy I. (Subclause 6.2.3), unless otherwise indicated on the drawings.

PSG2.1.2 **Ties (Clause 4.5.3)**

No system leaving holes through the walls will be permitted. Ferrules shall be of the permanent sacrificial type.

Sacrificial holes formed in reinforced concrete walls during the fixing of formwork shall be repaired with 1:3 cement-sand mortar. All grouting material shall be thoroughly punned in.

PSG2.1.3 **Chamfers (New Clause 4.5.4)**

All rectangular edges or corners shall be chamfered off to 20 mm x 20 mm unless otherwise indicated on the drawings.

The scheduled prices for formwork shall include for forming of chamfers.

PSG3 **CONSTRUCTION**

PSG3.1 **Reinforcement**

PSG3.1.1 **Fixing Tolerances (Clause 5.1.2)**

Reinforcement shall be positioned as shown on the drawings (read together with the bending schedules) and maintained in those positions within the tolerances given in Clause 6.2 to degree of accuracy I, unless otherwise indicated on the drawings.

PSG3.2 Formwork

PSG3.2.1 Classification of Special Finishes (Clause 5.2.1)

PSG3.2.1.1 Rubbed Surface Finish

Where a rubbed surface finish is specified or scheduled the surface shall first be treated as a smooth finish as specified in SANS 1200 G subclause 5.2.1(b).

After sufficient time has elapsed to allow the mortar to set, the surface shall be saturated by water. Rubbing shall then be carried out with a medium coarse carborundum stone and a small amount of mortar until all form marks, projections and irregularities are removed and a uniform surface obtained.

Leaving the paste produced by the rubbing in place, rubbing shall be continued with a fine carborundum stone and water. Rubbing shall be continued until the entire surface is of a smooth even texture and uniform colour. After the final rubbing the surface shall be washed down to remove surplus paste and powder.

PSG3.3 Holes, Chases and Fixing Blocks (Clause 5.3)

Substitute the contents of the clause with:

a) General

Holes, recesses and boxed-out openings shall be allowed in concrete structures, as specified, for the subsequent installation of mechanical equipment and/or pipework.

b) Preparation of openings for the installation of equipment

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

- i) Remove all shuttering and boxing remaining in the holes;
- ii) Make any alterations required to the position and shape of the holes;
- iii) Thoroughly clean the sides of the holes so as to obtain a satisfactory bond surface for the new concrete; and
- iv) Free all surfaces of the pipes/specials of all coatings, and thoroughly scrape and clean the pipes/specials.
- v) Apply a wet-to-dry concrete adhesive (two component, solvent free, polysulphide modified epoxy compound) immediately before grouting.

c) Grouting of voids

The concrete ingredients shall be mixed and placed as dry as possible to obtain a dense, waterproof concrete. Where a watertight seal is required, the concrete shall constitute a non-ferrous, non shrink grout. The grout shall be worked around the puddle flange, if any, and the pipe barrel or body of the special, and shall be vibrated in layers so as to obviate any falling away from pipe/special surface of the concrete already placed. The whole shall, when set, form a dense, homogeneous, and waterproof mass. A spare vibrator with an

independent power source shall be kept in readiness to ensure continuity of placing in the event of the breakdown of the duty vibrator.

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

PSG3.4 Pipes and Conduits Embedded in Concrete (Clause 5.4)

Except with the written approval of the Engineer, no pipes other than those shown on the drawings shall be embedded in concrete, and the approval of the Engineer for the position of all services to be embedded shall be obtained before concreting commences. The clear space between pipes of any kind embedded in reinforced concrete and the clear space between such pipes and reinforcement shall not at any point be less than:

- i) 40 mm; or
- ii) 5 mm plus the maximum size of coarse aggregate, whichever is the greater.

PSG3.5 Concrete

PSG3.5.1 Quality

PSG3.5.1.1 No-fines Concrete (New Clause 5.5.1.8)

a) Scope

This section covers the manufacture and placing of no-fines concrete used in the Works.

b) Materials

Cement, aggregate and water shall comply with the requirements of Clause 3 of SANS 1200G, read together with sub-clause PSG1.1 herein.

c) Classes of No-Fines Concrete

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

The volume of aggregate per 50 kg of cement for each class of concrete shall be as follows:

<u>Class</u>	<u>Aggregate per 50 kg cement</u>
NF 38	0,33m ³
NF 19	0,30m ³
NF 13	0,27m ³

d) Batching and Mixing

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

The quantity of water added shall be just sufficient to form a smooth grout which will adhere to and coat completely each and every particle of aggregate, and which is just wet enough to ensure that at periods of contact of aggregate the

grout will run together to form a small fillet to bond the aggregate together. The mix shall contain no more than 20 litres of water per 50 kg of cement. Mixing shall be carried out in an approved batch type mechanical mixer but small quantities may be hand mixed.

e) Placing

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

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

f) Curing

All no-fines concrete shall be protected from the elements and loss of moisture. Protection against loss of moisture shall be accomplished by one or more of the following:

- a) Retaining formwork in place.
- b) Covering exposed surfaces with sacking or other approved material kept continuously wet.
- c) Covering exposed surfaces with plastic sheeting.

No-fines concrete shall be cured for at least 7 days.

g) Covering of No-Fines Layer

In the event that no-fines concrete is to be covered by concrete, the undermentioned procedures shall be followed:

Before second stage concrete is cast on the no-fines, the surface shall be covered with building paper to prevent mortar from the wet concrete entering the no-fines layer. The building paper shall be properly protected against unnecessary damage before the concrete is cast.

h) Permeability of the No-fines Layer

After the no-fines concrete has been cured, the layer shall be tested for permeability by the continuous sprinkling of water over the entire area with approved sprinklers. The layer shall be considered acceptable if no water is ponding on the surface and if the water is running freely into the drainage system.

PSG3.5.2 Compaction (Clause 5.5.6.3)

Delete the words:

“or (if approved) by spading, rodding or forking”.

PSG3.5.3 Concrete Surface Finish (Clause 5.5.10.2)

Delete the words:

“Degree of Accuracy II” and substitute with: “Degree of Accuracy I unless otherwise indicated on the drawings”.

PSG3.5.4 Watertight Concrete (Clause 5.5.11)

Add to Clause 5.5.11 the following:

a) Definition (Clause 2.3)

For purposes of this Contract, all reservoirs, chambers and manholes will be regarded as water retaining structures.

b) Construction joints

i) General

Construction joints in the reinforced concrete walls shall consist only of horizontal joints. If under abnormal conditions a vertical construction joint is unavoidable it may only be constructed with the approval of the Engineer.

Construction joints shall only be placed at intervals shown on the drawings or as directed by the Engineer. The exact position of construction joints shall be marked on the formwork in order to obtain truly horizontal joints.

A sealant using an approved PVC water stop (waterbar) shall be placed, as specified, at all construction joints.

ii) Preparation of Surface

Prior to placing any further concrete the joint must be clean, damp and free of laitance. During the period when the concrete has set but is still green all loose material shall be removed, without disturbing the aggregates, by light brushing. Where this is not possible, or if the concrete has already set, the surface film shall be removed by mechanical means appropriate to the degree of hardness of concrete so as to expose the aggregate over the entire surface and leave a sound, irregular surface.

c) Ferrule Cup Holes

No system leaving holes passing through the walls will be permitted. Ferrules shall be of the permanent sacrificial type.

Holes formed in reinforced concrete walls during the fixing of formwork shall be repaired on the waterside face with an approved epoxy or non-shrink grout. On the dry face the holes left in the concrete shall be repaired with 1:3 cement-sand mortar. All grouting material shall be thoroughly punned in.

PSG4 TOLERANCES

PSG4.1 Permissible Deviations

PSG4.1.1 Specified PD's (Clause 6.2.3)

The following permissible deviations for location of holding down bolts shall apply:

- a) the centre line of a holding-down bolt from its designated location in plan:
 plus 1 mm, minus 1 mm
- b) the top of the bolt from its designated elevation:
 plus 5 mm, minus 3 mm

PSH STRUCTURAL STEELWORK

PSH 1 MATERIALS

PSH 1.1 Structural Steel (Clause 3.1)

Steel grade shall be 300 W

PSH 1.2 Tubular Steel

Tubular steel shall comply with the relevant requirements of BS 4848, Hot-rolled Structural Steel Sections, Part 2 : Hollow Sections and BS 6363, Welded Cold-formed Steel Structural Hollow Sections.

PSH 2 FABRICATION (Clause 5.2)

PSH 2.1 Cutting(Clause 5.3)

Manual flame cutting will not be permitted by the Engineer.

No oxy-acetylene or gas cutting will be permitted on site without the Engineer's approval.

Manual flame cutting and oxy-acetylene or gas cutting on site shall be cause for rejection of relevant steel elements.

Edges of machine flame-cut plates shall be dressed to remove notches and burrs.

PSH 2.2 Holes for Fasteners (Clause 5.2.4)

PSH 2.2.1 Sub-clause (5.2.4.3)

Holes for holding-down bolts shall not be flame-cut.

PSH3 ASSEMBLY (Clause 5.3)

PSH 3.1 Welding (Sub-clause 5.3.4)

Welding shall be done in accordance with the relevant recommendations of SABS 0162, BS5135 and AWS D1.1-81.

Welding shall be minimum grade B welding.

The qualification of welders shall be in accordance with the relevant clauses of the above standards, and specifically SABS 044 Part III and shall be Grade 1 welders. Grade 2 welders will be permitted only with the Engineers written approval.

The Contractor shall provide evidence, acceptable to the Engineer, that welding procedures and welders have been tested in accordance with the requirements of AWS D1.1-81.

No welding shall be permitted on site without the express approval of the Engineer, with the exception of those details shown on the drawings as Site Welded.

PSH 3.2 Marking (Sub-clause 5.3.8)

Erection marking of steelwork shall not, under any circumstances be done by welding. The system of marking shall be to the Engineers approval.

PSH 3.3 Protective Treatment (Sub-clause 5.3.9)

No painting on site shall be carried out in inclement weather, or when humidity or frost is liable to cause wet or damp conditions on the surfaces to be painted.

PSH 3.3.1 Wire Brushing

Steelwork after fabrication shall be wire-brushed to remove all rust, mill-scale and any other deleterious elements.

Within 4h after the completion of wire-brushing, one coat of red-oxide primer shall be applied to the relevant steelwork to provide a dry film of thickness between 25 and 30 µm. The primer shall be applied by means of an agitated pressure pot spray or, in the case of small areas only, by brush.

After the erection of steelwork, all areas where the primer coat has been damaged shall be touched up as specified above.

PSH 3.3.2 Sand Blasting

Steelwork after fabrication shall be subjected to abrasive blast cleaning to a finish equal to or better than Sa 2½ of SIS 05 59 00.

Steelwork Scheduled for Painting

Within 4 hours after the completion of blast cleaning, steelwork scheduled or shown on the drawings to be painted shall receive one coat of a one-pack ethyl silicate inorganic zinc-rich primer applied to the relevant steelwork to provide a dry film of thickness between 60 and 80 µm. The primer shall be applied by means of an agitated pressure pot spray or, in the case of small areas only, by brush.

Steelwork Scheduled for Galvanizing

Within 4 hours after the completion of blast cleaning, steelwork scheduled or shown on the drawings to be galvanized shall be galvanized in accordance with the requirements of SABS 763. The thickness of the coat shall conform to the thickness specified in SABS 763 to the type of article. The repair to galvanizing damaged by welding or other means shall be carried out on site in accordance with the recommendations given in Appendix C of SABS 763. Member and assembled units that are too large to be dipped in the galvanizing bath may be zinc-sprayed, provided that they are cleaned as recommended in Appendix C of SABS 763 and provided that the coating gives

protection to the steelwork at least equal to that afforded by the galvanizing specified above.

PSH 3.4 Setting-Out (Clause 5.4)

The setting out of all Holding-down bolts shall be accurately checked by the Contractor. Any discrepancies in excess of the permissible deviations of the positions of these bolts shall be reported immediately to the Engineer.

The Contractor shall not be permitted to make any relevant adjustments to the steelwork without the Engineers approval.

PSH 4 ERECTION (Clause 5.5)

PSH 4.1 Procedure (Clause 5.5.1)

Fourteen days before commencing erection of steelwork on site, the Contractor shall submit to the Engineer, for his general scrutiny and information, full details of the erection procedure and methods of erection.

PSH 4.2 Grouting of Supports (Clause 5.6)

Grouting shall be carried out by the Contractor in accordance with Sub-clause 5.5.13 and 8.7 of SABS 1200G.

Non-shrink grouting shall be used throughout.

PSH 4.3 Protective Treatment (Sub-clause 5.3.9)

After the erection of the steelwork, all areas where the primer coat has been damaged shall be touched up as specified in PSH 4.3.

Steelwork Scheduled for Wire Brushing

Provided that the primer is fully cured, as proved by a coin hardness test, an intermediate coat of an approved general purpose alkyd shall then be applied to provide a dry film of thickness between 25 and 30 µm. The paint shall be applied by means of an airless spray or a brush.

Provided that the undercoat is touch-dry within two hours, the finishing coat shall be applied after 4 hours. One coat of an approved alkyd enamel, the non-volatile vehicle of which contains at least 24% Pthalic Anhydride shall be applied to provide a dry film of thickness between 25 and 30 µm. The paint shall be applied by means of an airless spray or a brush.

The total dry film thickness of the paint, intermediate and primer coats shall be between 70 and 100 µm.

Steelwork Scheduled for Sand Blasting

Provided that the primer is fully cured, as proved by a coin hardness test, an intermediate coat of an approved high-build chemical-resistant primer shall then be applied to provide a dry film of thickness between 60 and 80 µm. The paint shall be applied by means of an airless spray or a brush.

Provided that the undercoat is touch-dry within one hour, the finishing coat may be applied after 4 hours. One coat of an approved chemical-resistant vinyl copolymer enamel shall be applied to provide a dry film of thickness between 20 and 40 µm. The paint shall be applied by means of an airless spray or a brush.

The total dry film thickness of the paint, intermediate and primer coats shall be between 150 and 200 µm.

PSH 5 TESTING (Clause 7)

PSH 5.1 Inspection (Clause 7.2)

The Engineer must be notified, at least 72h beforehand of the completion of the fabricated steelwork at the Contractors workshops, to enable him to make an inspection if he so desires.

The fabricated steelwork, thus to be inspected shall be in its prepared specified state immediately before the application of shop painting or galvanizing.

Any steelwork delivered to site without the Engineers prior approval and found to be defective and not fabricated in accordance with the Specification, will be returned to the Contractors works, at his own cost for remedial work.

PSHC CORROSION PROTECTION OF STEEL PIPES AND FITTINGS

PSHC1 SCOPE

This specification covers various corrosion protection systems for steel pipes for the conveyance of water at ambient temperatures.

PSHC2 EXTERNAL COATING SYSTEMS

PSHC2.1 Bitumen Coating

Bitumen coating specified shall be a 5 mm thick double layer fibre reinforced bitumen as specified in SABS 1200 L (Clause 3.9.2.2) and it shall comply with SABS 1130, 1137 and 1178 standard specifications (as amended).

The unprotected area at welded joints shall be protected with Denso HT Petrolatum Tape (Par PSHC 2.4) or Spect Bitumen Blanket (Par PSHC 2.6) or Densotherm 50 Blanket (Par PSHC 2.6) unless otherwise specified elsewhere.

Repair work with bitumen will only be allowed if approved by the Engineer. The following specification will apply:

- a) The metal surface must be cleaned with thinners or white spirit.
- b) Apply cold bitumen primer (Sovakote 7094) and leave for half an hour to dry.
- c) Bitumen temperature not to exceed 260°C.
- d) Fibre glass ("Vivian Rigina") is required in the middle of the bitumen layer.
- e) Minimum thickness of bitumen is 5 mm.
- f) Remove white wash on existing bitumen and chamfer the edge. New bitumen must overlap existing bitumen length of 500 mm.

- g) Pipe ends, with or without puddle flanges, to be cast into walls, only to receive a primer application for a minimum length of 500 mm.

Any pre-applied Epoxy paint coating at pipe ends (flanged, to suit straight and stepped couplings, or to suit flange adaptors, with or without restraining flanges) may not be covered by the Bitumen coating, except for a 50 mm overlap at Epoxy paint termination - never onto flanges.

PSHC2.2 Epoxy Paints

For surface preparation, abrasive blast cleaning to SA 2,5 of ISO 8501:1:1988.

Copon EP 2300, Copon KSIR 88, Sigmaguard EHB and Carboline 891 have to comply to SABS 1217 Type 1A, with a dry film thickness of 300 µm.

Copon Solvent Free Hotcote has to comply to SABS 1217 (1984) Type 1C with a minimum dry film thickness of 350 µm and maximum 500 µm.

Fusion Bonded Epoxy coating systems shall comply to SABS 1217 Type 2 with a dry film thickness of 300 µm.

The epoxy coatings shall not be immersed within the following periods after application:

- Copon EP 2300 28 days
- Copon KSIR 88, Copon Hotcote and
Copon Repair Kit (EPR1 & EPR3) 7 days
- Sigmaguard EHB 10 days (5), 5 days (15), 3 days (20)

Repair on epoxy linings which have to be put into operation within 7 days, have to be repaired with Hycote Code 151 JHC 21.

Edges with epoxy paint shall have a radius of 3 mm or 50% of the pipe wall thickness (smaller of two).

Epoxy paint lining shall continue around pipe edge for each of the following:

- a) Flanged end onto both flange faces, extending for 50 mm (min) onto pipe outer wall beyond flange.
- b) Ends suitable for straight or stepped couplings or flange adaptors onto pipe outer wall for 250 mm (min) from pipe end.
- c) Ends suitable for flange adaptors, incorporating a restraining flange onto pipe outer wall from pipe end, up to and including both faces of the restraining flange as well as 50 mm (min) beyond the restraining flange.

The Contractor has to supply to the Engineer the necessary equipment for accurate measurement of paint thickness and pin holes.

Apply Plascothane recoatable enamel code CPC 3 000 series as a top coat on Copon exposed to the sun.

PSHC2.3 Hot-dip Galvanize

Unless otherwise specified steel pipes smaller than 150 mm dia shall be hot-dipped galvanized. Hot-dip galvanizing to be in accordance with SABS ISO1461 and 14713

except that minimum thickness shall be 105 micron. Cut ends and small damaged areas shall be repaired by the application of a zinc-rich epoxy (single pack) to the same standard (ZINC GALV 1 - Dulux or POLY GALV - Plascon).

Only heavy duty galvanizing will be approved and all items to be provided with a SABS approval certificate.

PSHC2.4 Denso HT Petrolatum Tape

Chip off weld scale and remove grease, then wire brush to remove all loose rust, burnt bitumen/coal tar enamel and dirt to a Standard St 2 of SIS 055900 (Swedish Standard).

Chamfer any raised edges or steps in the existing coating.

Apply Denso Priming Solution

Apply Denso HT Tape of appropriate width uniformly in a spiral fashion to provide a 55% overlap on the pipe and for not less than 200 mm along the length of the intact factory coating.

Apply uniform tension to ensure the tape is smooth and free from wrinkles. Do not apply excessive tension that will stretch the tape nor insufficient or uneven tension that will give rise to air bubbles and wrinkles.

For flexible coupling and flanges

Apply Denso Mastic so as to create a smooth profile suitable for over-wrapping. Wrap a suitable width of Denso HT Tape over the coupling. Ensure that there are no air voids under the tape. Apply a double layer of Denso Layflat polyethylene sheeting over the whole length of the repair and for 100 mm beyond each end of the repair. Tape the ends of the Layflat with two complete turns of 100 mm wide adhesive Denso PVC tape to seal the ends.

Denso fabric baked mastic blanket can be used as an alternative for Denso HT Tape. After priming, pack potential air void areas such as under the bolts with Denso Mastic. Place the Mastic Blanket in position and press it for all air voids. Start under the pipe and work upward. Over wrap the Mastic Blanket with two layers of Denso Layflat sheeting and secure the ends with 100 mm wide adhesive Denso PVC tape.

If the pipe runs through very wet soils it is recommended that Denso S105 Paste be used in preference to Denso Priming Solution, and the coupling be wrapped with Denso PVC Self Adhesive Tape using a 55% overlap in place of Layflat Sheeting.

For welded joints and straight pipe lengths

After completion of Denso HT Tape wrapping and approval by the Engineer, apply 0,3 mm adhesive PVC outer wrap with 55% overlap over the whole length of the wrapping and for 100 mm beyond each end.

All flanges, couplings and flange adaptors in contact with soil shall be protected with Denso HT Tape.

PSHC2.5 Denso Corroklad 1250/3

Chip off weld scale and remove grease, then wire brush to remove all loose rust, burnt bitumen/coal tar enamel and dirt to a Standard St 2 of SIS 055900 (Swedish Standard).

Chamfer any raised edges or steps in the existing coating.

Apply Denso Primer D.

Wrap 100 mm wide Denso Corroklad 1250/.3 Tape spirally onto the pipe with a minimum 55% overlap and for not less than 100 mm along the length of the intact factory coating. Ensure that the tape is smooth and free from wrinkles.

PSHC2.6 **Bitumen Blanket** (Spect Bitumen Blanket 2PE 8 mm thick or Densotherm 50 Blanket)

Clean the welded joint by removing contaminants such as dust, whitewash and weld splatter. Remove the whitewash protective coating over the bitumen by brushing with a soft wire hand brush.

Prime the full width of the joint including the chamfered bitumen coating on each side of the butt welded joint. Ensure that the prime coat covers the pipe coating beyond the application width, using a bitumen primer that complies to SABS 1136.

Allow the primer to cure until touch-dry.

Apply the Blanket.

Seal the side laps with a metal iron or trowel.

Begin the next Blanket approximately 100 mm onto the preceding Blanket to ensure a complete fusion.

Stop application at the apex of the joint and continue at the base of the other pipe segment. This will ensure that fusion is always in the upward direction.

Overlap the final Blanket 100 mm over the previous Blanket at the apex of the pipe.

Holiday test the sealed joint at 15 kV.

Conduct destructive peel tests, as required, all in accordance with the approved method for Bitumen glass fibre coated pipes. Frequency will depend on site conditions.

Swish the joint with an iron rod to determine for voids. Mark the points with chalk and cut a star into the coating only when the repair is to be done.

Cut out the defective area and clean down to the metal surface. The patch area must be cut into a square and then measured for cutting out the infill. Fuse the infill into the cleaned area and mould the bitumen around the perimeter. Using an additional patch of 50 mm greater in all directions, fuse onto the repaired area and iron the edges so that they are moulded. Use Blanket for repair kits. Holiday test.

Spect Bitumen Blanket

Torch the first sheet starting at the lowest point on the pipe and fuse in an upward direction.

At all times the molten bitumen reservoir must run across the full width of the Blanket.

The Bitumen Blanket Wrap contains no insert filters or anti blocking agents.

Densotherm 50 Blanket

Torch the sheet until a shiny surface is obtained then place blanket onto the pipe. Torch the ends of the Blankets to seal and to acquire a smooth finish.

PSHC2.7 Coating of Welded Joints of FBLDPE Coated Pipes

PSHC2.7.1 Polyethylene Shrink Sleeve System

Only shrink sleeves approved by the manufacturer of the FBLDPE coating shall be used.

The cutback of the FBLDPE coating shall be 100 mm from the pipe ends.

Chip off weld scale and remove grease, then wire brush to remove all loose rust, burnt coating material and dirt to a Standard St 2 of ISO 8501.

Chamfer any raised edges or steps in the existing coating and slightly roughen the coating for 100 mm.

Preheat joint area unit hot to the hand, approximately 60°C minimum. Remove the protective release plastic from the coated sleeve. Place shrink sleeve over the joint with an overlap of 50 mm onto adjacent pipe coating and an overlap of 50 mm at the sleeve ends. Press closure seal in position, centring over the exposed sheet end. Using the heating torch, adjust flame length to approximately 50 cm to produce a yellow flame. Using the yellow portion of the flame, heat the closure evenly until the pattern of the fabric reinforcement is visible. With gloved hand, pat down the closure and smooth any wrinkles by gently working them outward from the centre of the closure. Using the heating torch, begin at the centre of the sleeve and heat circumferentially around the pipe, using a constant motion. Continue heating toward one end of the sleeve, followed by the other. During shrink down, occasionally check adhesive flow with finger. Wrinkles should disappear automatically.

Sleeve is fully shrunk when all of the following have occurred:

- a) There are no cold spots or dimples on the sleeve surface.
- b) Weld bead profile can be seen through the sleeve.
- c) After sleeve is cool, mastic flow is evident on both edges.
- d) The sleeve has fully conformed to the pipe and adjacent coating.

PSHC2.7.2 Tape Wrap System

Chip off weld scale and remove grease, then wire brush to remove all loose rust, burnt coating material and dirt to a Standard St 2 of ISO 8501.

Chamfer any raised edges or steps in the existing coating and slightly roughen the coating for 100 mm.

Apply Denso Primer D on steel surface and 50 mm on coating. Allow 20 minutes to touch dry.

Wrap 100 mm wide Denso Rockwrap 3000 Tape spirally onto the pipe with a minimum of 55% overlap for not less than 100 mm along the length of the intact factory coating. A new roll must overlap backward by 300 mm. Apply 100 mm wide Denso MP/HD tape with a minimum of 10% overlap, starting and ending at least 50 mm past the ends of the Rockwrap 3000 Tape. Ensure that the tape is smooth and free from wrinkles.

Sufficient tension must be applied to the tapes to ensure a wrinkle free and tightly adherent wrap. Test the tape wrap system with a high voltage spark tester at a setting of 15 kV.

PSHC2.8 External Protection of Pipes, Valves and Fittings in Valve Chambers

PSHC2.8.1 Protection in the Workshop

Abrasive blast cleaning to Grade Sa 2½ of ISO 8510 : 1 : 1988. The anchor pattern profile achieved shall be angular and of magnitude 30 µm minimum and mean 50 µm unless otherwise specified for a particular primer. Apply one coat of Plascon recoatable Epoxy MIO Primer EPH11 at 125 m DFT.

PSHC2.8.2 Patch Repairs of Primer after Installation

Wash all primed surfaces with a suitable detergent (Plascon Aquasolv) or equivalent, and water to remove all traces of mud, grease, dirt any other deleterious matter. Rinse with clean water to ensure no traces of detergent remain on the surfaces.

Areas of damage exposing the underlying metal must be thoroughly cleaned by mechanical wire brushing to remove all traces of corrosion products.

Areas without a factory primer must be cleaned with Derostan 24 that can be diluted with water as per manufacturer's instructions.

Patch repair with Plascon EPH11 (125 m).

PSHC2.8.3 Top Coats after Installation

Unless top coats are applied immediately after the patch priming, wash all surfaces with detergent (Plascon Aquasolv) and water, rinse and dry.

Apply two separate coats of solvent borne, mineral and fibre filled bituminous solution (ABE Super Laykold) to a dry film thickness of 300 µm per coat. Application shall be by stiff brush or airless spray.

The application shall overlap at least 50 mm onto the coating or wrapping of the incoming pipe, where applicable.

PSHC2.8.4 General Notes

The applications of all coatings shall be in strict accordance with the respective paint manufacturer's recommendations. Particular note shall be taken of over coating and curing procedures and times.

PSHC2.8.5 Additional external protection for pipes cast into chamber walls

After the concrete has cured for 7 days, wire brush or scabble the exterior and interior surfaces of the wall to remove laitance. Dry brush to remove all loose powder.

Mix ABE Super Laykold and water (1:1 ratio) and apply as a primer to the concrete and the pipe surfaces. After ± 1 hour apply a thick coat of ABE Super Laykold to the concrete and the pipe and immediately embed 250 mm wide ABE non-woven Polyester membrane 'SBP' into the Super Laykold. After ± 3 hours apply another coat of Super Laykold.

This additional protection is required on the inside and outside of the walls.

PSHC2.9 External Protection of Pipes and Fittings above Ground

PSHC2.9.1 Protection in the Workshop

Abrasive blast cleaning to Grade Sa 2½ of ISO 8501 : 1 : 1988. The anchor pattern profile achieved shall be angular and of magnitude 30 µm minimum and mean 50 µm

unless otherwise specified for a particular primer. Apply one coat of Plascon recoatable Epoxy MIO Primer, EPH11 at 125 µm DFT.

PSHC2.9.2 **Patch Repairs of Primer on Site**

Wash all primed surfaces with a suitable detergent (Plascon Aquasolv) or equivalent, and water to remove all traces of mud, grease, dirt and any other deleterious matter. Rinse with clean water to ensure no traces of detergent remain on the surfaces.

Areas of damage exposing the under laying metal must be thoroughly cleaned by mechanical wire brushing to remove all traces of corrosion products.

Patch repair all primer damage with Plascon EPH11 (125 µm).

PSHC2.9.3 **Protection on Site**

Unless topcoats are applied immediately after patch priming, wash all surfaces with detergent (Plascon Aquasolv) or equivalent and water, rinse and dry.

Apply one coat ABE Super Laykold to a dry film thickness of 300 µm and one coat bitumen aluminium paint (ABE Silvakote) to dry film thickness of 20 µm.

All damaged protection after installation shall be restored to Engineer's approval.

PSHC2.10 **Pipes and Fittings Partially above Ground**

Apply Denso SS Primer.

Apply Denso Fabric Backed SS Tape, using a minimum of 300 mm overlap. Apply only sufficient tension to ensure a smooth wrap, without stretching the tape.

Saturate the fabric backing on tape with Denso Base coat a cementitious latex, at a spread of 2 kg/m². The aid of a fluted aluminium roller is recommended to assist with the full saturation of the fabric.

Allow 24 hours to cure if over coating with a water-based product, or 48 hours if over coating with a solvent based top coat.

Apply one coat ABE Super Laykold to a dry film thickness of 300 µm and one coat bitumen aluminium paint (ABE Silvakote) to dry film thickness of 20 µm.

PSHC2.11 **External Protection of Pipes and Fittings in Buildings**

PSHC2.11.1 **Protection in the Workshop**

Abrasive blast cleaning to Grade Sa 2½ of ISO 8501 : 1 : 1988.

The anchor pattern profile achieved shall be angular and of magnitude 30 µm minimum and mean 50 µm unless otherwise specified for a particular primer. Apply one coat of Plascon recoatable Epoxy MIO Primer, EPH11 at 125 µm DFT.

PSHC2.11.2 **Patch Repairs of Factory Applied Primer and Apply Universal Coat on Site**

Wash all primed surfaces with a suitable detergent and water to remove all traces of mud, grease, dirt and any other deleterious matter. Rinse with clean water to ensure no traces of detergent remain on the surfaces.

Areas of damage exposing the underlying metal must be thoroughly cleaned by mechanical wire brushing to remove all traces of corrosion products. These areas must be patch primed as specified in PSHC2.9.2.

PSHC2.11.3 Alkyd Enamel Based Finishing Coats

Apply two alkyd-based enamel finishing coats to SABS 630 Grade 1 (dry film thickness 25 mm each). Final colour will be as specified by the Engineer.

PSHC3 INTERNAL LINING SYSTEMS

PSHC3.1 Cement-Mortar Lining

Section PJ of the Particular Specification covers the Cement-Mortar lining of pipes.

PSHC3.2 Epoxy Paints

Refer clause PSHC2.2.

For surface preparation, abrasive blast cleaning to SA 3 of ISO 8501:1:1988.

PSHC4 GENERAL

The Contractor shall submit the name of the company which will do the corrosion protection to the Engineer for his approval.

The area at welded joints to be repaired on site is:

Coating	:	200mm wide
Lining	:	butt weld joint - 100 mm wide spigot & socket joint - refer Project Specification.

PSHC5 BOLTS, NUTS AND WASHERS

PSHC5.1 Bolts, Nuts and Washers for Exposed Flanges and Couplings

All bolts, nuts and washers which will be exposed after installation (e.g. in valve chambers, pump stations, etc) shall be hot-dip galvanized in accordance with the requirements of SABS ISO 1461 and SABS 14713 (as amended), for heavy duty applications unless otherwise specified.

PSHC5.2 Bolts, Nuts and Washers for Buried Flanges and Couplings

Unless otherwise specified, all bolts, nuts and washers for flanges and couplings which will be buried after installation shall be hot-dip galvanised in accordance with the requirements of SABS ISO 1461 and SABS 14713 (as amended) for heavy duty applications. These flanges and couplings shall be protected with Denso HT Petrolatum Tape as specified in paragraph PSHC2.4.

PSL MEDIUM PRESSURE PIPELINES

PSL1 MATERIALS

PSL1.1 GRADE OF STEEL (Clause 3.4)

All steel piping and fittings shall be electric welded low carbon steel pipes in accordance with the requirements of SANS 719-1971 and BS 534-1966. Where non standard specials have been detailed on the drawings, such dimensions shall be adhered to. All flanged pipes and fittings shall have flanges as specified, and shall be supplied complete with all packings, nuts, bolts and washers. Steel piping shall be made from Grade B steel. Viking Johnson couplings complete with all seals, bolts, nuts, etc. shall be used where detailed. Where new installations couple up with existing the Contractor shall ascertain what the flange drillings are of all existing fittings prior to any placement or order, and shall confirm this information with the Engineer.

PSL1.2 PVC Pipes (Clause 3.7.1)

uPVC pipes and fittings shall be fitted with spigot and socket rubber ring joints and shall comply with the relevant requirements of SANS 966 Part 1 for all pipe sizes.

PSL1.3 HDPE Pipes (Clause 3.7.2)

Polyethylene pipes and fittings to comply with SANS ISO 4427 and the HDPE material used for the pipe manufacture to be PE80. Only pipes manufactured by a member of the South African Plastic Pipe Manufacturer's Association may be supplied.

PSL1.4 DUCTILE IRON PIPES (New Sub-Clause)

a) Materials standard

All ductile iron pipes shall be manufactured from iron in compliance with ISO 2531 standard, with spigot/socket push-fit joint.

The coefficient designating the thickness class shall be K8.

The mean iron wall thickness for the specified 350 DN Ductile Iron Pipe shall be 6.8 mm, with no upper tolerance limit and a lower tolerance limit of minus 1.65 mm.

The outside diameter of the pipes shall be identical, whatever the wall thickness class specified.

b) Quality Assurance

The model for quality assurance in production shall be ISO 9002.

c) Design Pressure

The design pressure is 20 Bar.

d) Allowable Test Pressure

The test pressure for field testing shall be 1,5 times the design pressure.

e) Pipe Cement Mortar Lining

The internal protection for the pipes shall be a blast furnace cement mortar lining, applied by a centrifugal process in the factory, to specification ISO 4179. The mortar lining thickness shall be 5 mm nominal, with a lower limit tolerance of minus 2 mm.

f) Pipe External Coating

The external coating of ductile iron pipes shall be metallic zinc and bituminous paint, in conformity with ISO 8179-1. It shall consist of a minimum layer thickness of 200 g/m² sprayed metallic zinc, covered with a bituminous paint finish (acting as pore-sealer) applied to a minimum thickness of 100 microns.

PSL2 **PIPE COUPLINGS (Additional to clause 3.7)**

PSL2.1 **PVC pipes** shall be supplied with factory fitted "rubber ring type" couplings. PVC pipe fittings shall be PVC or Spheroidal Graphite (SG) Iron, aluminium fittings are not allowed.

PSL2.2 **Fittings for HDPE pipe**

Fittings shall be of the compression type where tightening of the unit causes the thrust ring to push against the gasket, causing it to deform evenly towards the centreline of the fitting to, exerting pressure against the inserted pipe.

All fittings with a threaded female off take will be fitted with a reinforcing ring.

All fittings shall be pressure-rating PN16.

Saddles will be supplied with galvanized bolts and nuts.

The materials used in the manufacture of the fitting will comply with the following:

Body, nut and thrust ring	-	Virgin polypropylene, UV stabilized
Clamp ring	-	Acetylic resin (POM)
Gaskets	-	Food safe rubber with Shore hardness 70
Reinforcing rings	-	Stainless steel

The fittings shall hold Acceptance Certificates from recognised quality control bodies in South Africa (JASWIC 594) and at least from two other countries in the European Union.

PSL3 **VALVES (Clause 3.10)**

PSL3.1 **Gate Valves**

All gate valves to comply with SANS 664, waterworks application, be clockwise closing have a non-rising spindle and be plain thrust collared. Valves and flanges (if any) to be to the class specified.

Valves to be operated by handwheel, cap top and tee-key or extended spindle and handwheel/tee-key. Operator to be specified. Valves to be flanged or spigot ended as specified.

PSL3.2 Threaded Fullway Gate Valves

The valves shall be of the dezincified brass type with brass gate and body, non-rising spindle and BSP threaded socket ends. The valve shall conform to SANS 776/1965 Class 125. The valves shall be able to withstand a working pressure of 1 600 kPa.

PSL3.3 Air Valves

The air vent valve shall be of the compact single chamber design with solid cylindrical HDPE control floats housed in a tubular stainless steel body with epoxy powder coated mild steel ends or stainless steel ends secured by means of stainless steel tie rods.

The valve shall have an integral anti-shock orifice mechanism which shall operate automatically to limit transient pressure rise or shock induced by closure to 1.5 times valve rated working pressure. The intake orifice area shall be equal to the nominal size of the valve i.e., a 150 mm (6") valve shall have a 150 mm (6") intake orifice.

Large orifice sealing shall be effected by the flat face of the control float seating against a nitrile rubber 'O' ring housed in a dovetail groove circumferentially surrounding the orifice.

Discharge of pressurised air shall be controlled by the seating and unseating of a small orifice nozzle on a natural rubber seal affixed into the control float. The nozzle shall have a flat seating land surrounding the orifice so that damage to the rubber seal is prevented.

The valve construction shall be proportioned with regard to material strength characteristics, so that deformation, leaking or damage of any kind does not occur by submission to twice the designed working pressure.

The valve design shall incorporate an over pressure safety feature that will fail without an explosive effect, such as is normally the case when highly compressed air is released suddenly. The feature shall consist of easily replaceable components such as gaskets, seals or the like.

Connection to the valve inlet shall be facilitated by a screwed BSP (ISO R7) or NPT male end (DN 25 & DN 50 only) or a flanged end conforming to PN10, 16, 25 or 40 ratings of BS4504 or SANS 1123 Standards or ANSI B16.1 Class 125 and Class 250 and ANSI B16.5 Class 300 Standards.

Flanged ends for DN 80 and DN 100 valves shall be supplied with the requisite number of stainless steel screwed studs inserted for alignment to the specified standard. Nuts and washers to be included.

A 1/4" BSP/NPT Test/Bleed Cock to be provided if specified.

PSL3.4 Valve Spindles

All extended valve spindles shall be supplied at both ends with cast iron tops for valve key operation. The spindle shall be fitted into the valve box with a bearing for easy operation.

The lengths of extended spindles are to suit the dimensions of their installation positions, all spindles supported at 4m max intervals.

PSL4 STEEL FLANGES (Clause 3.8.3)

PSL4.1 All flanges to be drilled as specified.

PSL5 CORROSION PROTECTION (Clause 3.9)

PSL5.1 General

No separate payment will be made for work described in this sub-section.

Before painting or the application of anti-rust compounds all metal elements shall be cleaned of all rust, scale, grease and any substance deleterious to subsequent operations.

All steel surfaces shall then be treated in accordance with one of the following methods as specified.

PSL5.2 Galvanising

Where galvanising is specified it shall be carried out by the hot dip process to provide a minimum mass of zink coating of 650 g/sq.m of surface area galvanised.

PSL5.3 Epoxy Tar

The epoxy tar to be used shall comply with the specifications of SANS 801 Type 2. It shall be applied in three coats, with either one or two coats being applied in the workshop. After installation any scratch or chip marks shall be touched up and the whole item covered with a further coat (or two coats) of epoxy tar to give a total final thickness of not less than 0,5mm.

PSL5.4 Epoxy Enamel

Epoxy enamel shall be 'Crown Cebestos; Copon EP 2300'. It shall be applied in the workshop by spraying to a final enamel thickness of not less than 0,30mm. After installation any chips or scratch marks shall be made good on site with brush applied epoxy enamel.

PSL5.5 Painting

All ungalvanised components of structural steelwork, fencing or any other components of steel or iron to be used in this contract for which no galvanising or other treatment has been specified, shall be painted in accordance with the following specifications.

- a) Apply one prime coat of Red Lead paint to SANS 312 Type II Grade II and one coat of Zinc chromate primer to SANS 679 Type I.
- b) Subsequently apply: Undercoat to SANS 681 Type I.
- c) Subsequently apply: Final gloss enamel coat SANS 630 Grade I. (Colour as specified).

PSL5.6 Schedule of Corrosion Protection

Steel pipework

- . 300 mm DN and smaller : Internal
- : External
- . Extra over on external surfaces of pipework above ground or pipe work inside building
- . Pipe straps

Galva-nising	Epoxy Tar	Epoxy Enamel	Painting
(x)		x	
(x)		x	
			x
			x

Galva- nising	Epoxy Tar	Epoxy Enamel	Painting
	x		

Valves

Notes:

(x) : Applicable to standard galvanized steel pipework and fittings (50 mm dia and smaller)

PSL6 HANDLING AND RIGGING (Clause 4.1)

PSL6.1 Transportation

Pipes and valves shall be protected during transportation and handling against damages caused by impact, dropping, etc. Special care shall be taken during transportation to protect pipes. Rubber lined vertical posts shall be spaced on the sides of transporting vehicles to provide adequate support to the loaded pipes. All pipes shall be inspected for defects immediately before laying and faulty pipes or pipes which have suffered damage which would affect their serviceability shall not be used in the Works.

PSL6.2 Off-loading and storage

Pipes which cannot be off-loaded by hand shall only be lifted by means of suitably approved broad band slings. The use of wire, chains, hooks, crowbars and similar items shall not be permitted and the pipes, fittings and specials shall not be handled in such a manner as could cause damage to occur.

Pipes, fittings and specials shall at no time be laid, stacked or rolled directly into the ground but shall be supported on suitable padded cradles or other approved material near each end of the pipe, fittings or special. Particular care shall be taken where pipes with fitted couplings are handled or stacked to prevent any pressure on the couplings. Where loose AC-couplings are provided the couplings shall be stored flat on their sides and under no condition be rolled or stored in an upright position.

All PVC-pipework as well as the rubber sealing rings in pipe couplings shall be protected from the elements to prevent deterioration of the pipework.

No concessions will be made in the above regard and failure on the Contractor's part to comply shall be considered just cause for the Engineer to order such part of the works to be closed down.

When the pipes are to be stored on site it is essential that the storage be as level as possible and clearing of any objects which may cause damage to the pipes. When a load of pipes arrives, insure that a representative of the manufacturer is present to supervise the off-loading.

PSL6.3 Inspection on delivery

The Engineer's Representative will thoroughly inspect all pipes, fittings and specials delivered to the site but his acceptance of same as being in good condition shall not relieve the Contractor of any of his obligations or responsibilities under this Contract.

Materials rejected by the Engineer shall be removed from the site and shall be replaced by other approved materials by the Contractor at his own expense.

PSL7 SETTING OUT (Clause 4.2)

Alignment of the pipes may be done either by means of infra-red sighting equipment or by sight rails. The following method should be followed if alignment is to be done by sight rails:

Prior to the preparation of the pipe bedding, the Contractor is to erect sight rails of 38mm x 150mm timber at intervals of a maximum of 60m or at points of change of pipe gradient, whichever may be the lesser. These shall be supported by wooden posts on each side firmly fixed on solid ground and the rails shall be accurately placed in position as regards alignment and invert level of the proposed trench. The centre line of the trench (i.e. pipeline) shall be denoted on each sight rail, both back and front by a single vertical line drawn thereon, and the rail on either side of the centre line painted in two contrasting colours. The Contractor shall also provide boning rods of an appropriate length marked in even decimetres for use in the fixing of the trench bottom to the correct line and level.

PSL8 LAYING AND JOINTING

PSL8.1 Approval of trenches and bedding

No pipe laying shall commence on any particular section until the Engineer has approved of the trenches and bedding. No pipes shall be laid in trenches with free standing water.

PSL8.2 Positioning pipes and fittings

The pipes shall be laid true to the lines, levels and grades shown on the drawings, or ordered by the Engineer, to within the specified tolerances.

PSL8.3 Jointing

All valves and fittings are to be checked beforehand to ensure their operational order prior to connection in the line.

The ends of laid pipes shall be suitably closed by means of approved caps, or as shown on the drawings, to prevent the ingress of soil or other matter. After the pipes have been laid, they shall be inspected and checked by the Engineer for grade, direction and line, to the specified tolerances.

PSL9 LEGEND AND NODAL DESCRIPTIONS

Descriptions of each pipeline node, giving details of the required fittings and the sequence of assembly, as well as legend explaining the codes used in the nodal descriptions will be supplied to the successful Tenderer.

PSL10 TEST PRESSURE (Clause 7.3.1.2)

The maximum working pressure head for the purposes of clause 7.3.1.2 shall be taken as the working pressure of the specified pipe or such working pressure indicated by the Engineer for the particular designed pipe reach.

PSL11 MEASUREMENT AND PAYMENT

PSL11.1 Principles

- a) Measurement of the specials and valves shall be as per the appropriate items in SANS 1200L i.e. Items 8.2.2 and 8.2.3.
- b) Measurement of the pipes shall be as per item 8.2.1 in SANS 1200 L.

PSLB **BEDDING (Pipes)**

PSLB1 **MATERIALS (Subclause 3)**

PSLB1.1 Selected Granular Material (Subclause 3.1)

Selected granular material shall be regarded as a clean river sand or any other granular, non-cohesive material of an acceptable nature and a P.I. less than 6. Stones shall not be in excess of 20 mm. Selected granular material might occur in-situ, be imported or selected from trench excavation.

PSLB1.2 Selected Fill Material (Subclause 3.2)

Selected fill material shall be material that has a P.I. less than 10 and does not contain vegetation or stones exceeding 30 mm. Selected fill material might occur in-situ, be imported or selected from trench excavations.

PSLB1.3 Ordinary Backfilling

Ordinary backfilling will consist of material excavated and, if so approved by the Engineer, of material imported from other parts of the trench or borrowed from adjacent to the trench on the downhill side. All material above the selected fill blanket (drawing SANS LB-1) will be measured as ordinary backfill.

PSLB2 **BEDDING (Subclause 3.3)**

PSLB2.1 Rigid Pipes

All steel and AC pipes for water supply will be regarded as being rigid and shall be bedded in a class C bed detailed on attached drawing 8100.91.1C, unless otherwise specified.

PSLB2.2 Flexible Pipes

uPVC and polythene pipes will be regarded as being flexible and shall be bedded as detailed on attached drawing 8100.2006.1 OR 2.

PSLB3 **TOLERANCES**

PSLB3.1 Moisture Content and Density (Subclause 6.1)

Degree of accuracy II shall prevail.

PARTICULAR SPECIFICATIONS

PA TRIMMING OF SITE

PA1 SCOPE

This work shall consist of the finishing of the entire site affected by the Contractor's operations before the issue of the Completion Certificate.

PA2 REQUIREMENTS

After completion of the work covered by this Contract, the entire area affected by the Contractor's operations shall be finished off and cleared up and all loose rock shall be removed, if required, and disposed of as directed by the Engineer.

Under no circumstances shall the Contractor use machines for trimming.

All loose stones, roots or other waste matter exposed on fill or excavation slopes, which are liable to become loosened shall be removed and all debris and muck from clearing operations shall be disposed of and the area affected by the Contractor's operations and all camp sites left in a neat and presentable manner.

All falsework, temporary supports and structures, casting yards or platforms and equipment shall be removed from the site and from all ground occupied by the Contractor in connection with the work. All parts of the work and adjacent ground shall be left in a neat and presentable condition, all to the satisfaction of the Engineer.

PA3 MEASUREMENT AND PAYMENT

Measurement and payment for complying with the above requirements will not be made separately, and would be regarded as being provided for in full by relevant payment items under 1200 A - General.

PB BUILDING WORK

PB1 SCOPE

This section of the Specifications deals specifically with all the building work associated with the Works.

Concrete work, steelwork, cladding, pipelaying, mechanical and electrical equipment, etc. forming part of or to be housed in a building erected in terms of this specification shall conform to the requirements of the relevant standardized or particular specifications referred to in the Project Specification.

PB2 INTERPRETATIONS

The relevant SABS 1200 Standardized Specifications such as Site Clearance, Earthworks, Earthworks (pipe trenches), Concrete (structural), Low pressure pipelines, Bedding (pipes), Sewers and Stormwater drainage shall also apply to the work under this section.

PB3 MATERIALS

All materials used for the Building Work shall, where such mark has been awarded for a specific type of material, bear the SABS mark.

PB3.1 Brick and Plasterwork

Cement, sand and water shall conform to the requirements of SABS 1200 G - Concrete.

Unless otherwise described, cement mortar shall be composed of six parts by volume of sand to one part by volume of cement. The materials are to be mixed dry until the mixture is of a uniform colour and then clean water is to be added gradually through a fine rose and the mixture turned over until the ingredients are thoroughly incorporated.

Cement mortar must be mixed in small quantities and must be used within one hour of mixing, as the use of cement mortar that has commenced to set will not be permitted.

Plaster on concrete ceilings, beams, columns etc. shall be mixed one part cement to three parts sand.

Bricks shall be of the best quality sound hard burnt pressed bricks even in size and shape and equal to a sample submitted to and approved by the Engineer prior to commencement of work.

Clay bricks shall conform with the requirements of SABS 227.

Damp proof courses, unless otherwise described, shall be an asphaltic damp proof course with a base of fibre felt, and complying with the requirements of SABS 248 Horizontal Damp Proof Courses, and with a mass of 3,25 kg/m² or a plastic damp proof course of 15 micron thickness as Type B, complying with the requirements of SABS 952.

PB3.2 Fascias, Barge Boards and Window sills

Asbestos cement fascias and barge boards, where specified, shall be 10mm thick pressed sheets, 200mm wide free from cracks, twists, blemishes or other defects and complying with the requirements of SABS 685.

Internal asbestos cement sills shall be in single lengths cut between reveals, fitted with fixing lugs and solidly bedded in 3:1 cement mortar with a slight projection beyond the finished wall face below. Sills shall be pressed asbestos cement of approved manufacture 152x15mm thick, set level.

PB3.3 Paintwork

PB3.3.1 Primers

Plastered surfaces must be cleaned down and have one coat alkali resisting primer of an approved brand applied in strict accordance with the manufacturer's instructions, before any undercoats are applied.

Galvanised metal surfaces must be treated with one coat Metal Etch Primer complying with the requirements of SABS 723.

Steel surfaces must be treated with one coat Type Zinc Chromate Primer complying with the requirements of SABS 679.

Steel windows and doors and steel door frames, before being built in, must have all loose primer together with all rust spots, dirt, etc. removed and be treated with one coat red oxide or zinc chromate primer complying with the requirements of SABS 909.

Wood surfaces to receive paint finish must be cleaned down, all knots treated with knotting and be primed with Type I Wood Primer externally and Type III Wood Primer internally, both complying with the requirements of SABS 678.

PB3.3.2 Emulsion paint for interior use must be Grade I Emulsion Paint complying with the requirements of SABS 663. Emulsion paint for exterior use must be of the Synthetic Polymer Base Type complying with the requirements of SABS 634.

PB3.3.3 High Gloss Enamel Paint Shall be used on all surfaces other than specified above. High Gloss enamel paint must be Grade I paint complying with the requirements of SABS 630 for decorative High Gloss Enamel Paints with a Non-Aqueous Solvent Base, for Interior and Exterior use.

Undercoats for paints, except Emulsion paints, must be Type I undercoat Paint complying with the requirements of SABS 681.

PB3.4 Doors, Windows and Glazing

PB3.4.1 Doors

Unless indicated otherwise on drawings, all doors and door frames shall be of solid hardwood. Frames shall be fitted with suitable tie bars and braces at bottom, and lugs for building in, three to each jamb of frames without fanlights and four to each jamb of frames with fanlights. All doors shall be provided with locks to the requirements of SABS 4 and each lock shall be provided with a duplicate key.

PB3.4.2 Windows

Steel windows must be of approved manufacture and design, constructed of rolled mild steel sections, properly mitred and welded at angles with welding cleaned off smooth on all faces and complying with the requirements of SABS 727. Window types and sizes shall be as specified on the drawings.

PB3.4.3 Glazing

Sheeting glass for glazing, unless otherwise specified, must be flat drawn clear glass of the thicknesses indicated below:

For panes not exceeding 0,65 m ²	: 3 mm
For panes exceeding 0,65 m ² and not exceeding 1,5 m ²	: 4 mm

PB3.5 Tiling

PB3.5.1 Adhesives and Grouts

a) Wall adhesive

A grey, cement-based thin bed, wall tile powder adhesive for fixing tiles to walls.

b) Floor adhesive

A grey, cement-based thick bed, floor tile powder adhesive for fixing heavy tiles to floors or walls.

c) Wall grout

A cement-based, plasticized grouting compound for wall tile installation.

d) Bonding agent

Latex modified for use with adhesives and grouts to improve water resistance.

e) Silicone sealant

A silicone-based sealant of nearest approximate colour to tile, used to seal expansion joints (made at consistent interval positions) on large tiled surfaces.

PB3.5.2 Tiles

Tiles shall be of first grade quality glazed ceramic tiles, white in colour, a maximum size of 160mm square, of a maximum thickness of 5mm, unless otherwise specified.

PB4 PLANT

Plant, equipment, tools, scaffolding, etc. utilised in building work shall be of suitable capacity, condition and design to ensure the satisfactory and timeous completion of the Works within the specified period and in terms of these specifications and good building practices.

Only registered artisans (e.g. plumbers, electricians, etc.) shall be employed on any work where this is compulsory building practice.

PB5 CONSTRUCTION

PB5.1 Brick- and Plasterwork

PB5.1.1 Normal Brick Walls

Brickwork must be built in stretcher bond. No false headers are to be used and none but whole bricks except where legitimately required to form bond. All perpends and angles are to be kept plumb. The brickwork is to have the joints flushed up at every course solid throughout the whole width of the course, and each course is to be laid on a solid bed of mortar.

The joints of all walls to be plastered are to be raked out 15mm as the work proceeds to form a key for plaster or screed. All walls are to be built up in regular and horizontal courses and carried out so that no part built is more than 1,2m higher than any adjoining walls. Mortar beds generally are not to exceed 12mm thickness.

PB5.1.2 Face brick walls

In all faced brickwork the bond must be set out on the first level course of brickwork, at floor level internally and two courses below ground level externally. The bond, if necessary, is to be broken in the centre of panels under windows or to piers between windows. All perpends must be kept true and all courses must be built to gauge rods. Facings must be carefully protected from damage, mortar droppings, paint splashes, etc. during the whole period of the Contract and, on completion, they must be thoroughly cleaned down and left perfect. The practice of oiling facings on completion will not be allowed.

PB5.1.3 Reinforced Brick Lintels

Brick lintels are to be built of normal, sound, well burnt, good quality building bricks, similar to the facings where exposed, properly bonded longitudinally and bedded and pointed in cement mortar as described. Special care must be taken to ensure solid bedding, particularly where the reinforcement occurs.

The lintels are to be reinforced with straight continuous mild steel rods of the size and number scheduled. The rods must each extend 300mm on each side of the opening and are to be evenly spaced across its thickness in the first horizontal joint above the soffit.

Brick lintels in cavity walls must have all rods placed below the solid sections of the walls, excepting for those rods specifically scheduled to occur below the cavity.

Where two or more openings are less than 665mm apart, the lintel shall be continuous over all such openings and the dividing piers, plus 300mm bearing at each extreme end as before, shall have such height and reinforcement as scheduled for widest opening spanned.

Span in mm	Min height of lintels above soffit course, in brick courses	Reinforcement per half brick thickness of wall above for solid walls	
		No of Rods	Dia (mm)
600	2	1	6
900	3	2	6
1 200	3	2	6
1 500	4	3	6
1 800	4	3	6
2 400	6	3	6

In addition to any reinforcing specified in the table above one layer of brick reinforcing shall be placed at every alternate brick course above the lintel. The brick reinforcing thus placed shall extend at least 300mm on each side of the opening.

All brick lintels are to be supported by two 114 x 38 timber bearers (on edge) for duration of 7 days. Extreme care shall be taken beforehand to ensure a level and straight support.

PB5.1.4 Damp proof courses

The sheeting is to be cut into strips of the required width and laid on all foundation walls to the full thickness of the walls and without any longitudinal joints. At ends, angles and intersections the sheeting must be lapped 150mm and sealed.

Under all window sills exposed to the weather, the sheeting must be laid on the brickwork in the first joint immediately below the sill and turned up with an easy bend and tucked into window frame.

Over reinforced brick lintels exposed to the weather, the sheeting must be laid to form damp proof course as detailed above for solid walls and cavity walls.

PB5.1.5 Reinforcing in Brick walls

Reinforcing (brickforce) of an approved manufacture shall be placed on every fifth course in all brick walls. In halfbrick and cavity walls 80mm wide reinforcing mesh shall be used and 150mm wide mesh in the case of the one-brick walls.

PB5.1.6 Plasterwork

All chases must be cut and electrical conduiting and boxes fixed before any plastering is done. On no account will chasing be allowed in finished plaster work, and if such chasing is necessary, the entire wall surface must be hacked off and replastered.

Except where otherwise described, all external plaster is to be finished with a wooden float and all internal plaster is to be finished with steel trowel, all to perfectly true and even surfaces, free from tool marks and other defects on completion.

All finished surfaces are to be protected from injury. All joints in brickwork are to be well raked out, all surfaces, brickwork and concrete, to be plastered must be brushed down to remove all dirt and dust and be thoroughly wetted directly before plastering. Concrete surfaces must be roughened or hacked as necessary to give a proper key for plaster. The surfaces must then be slashed with coarse cement grout before plastering is commenced. The surfaces of all internal plaster must be steel troweled to a smooth even and true finish. External plaster must be finished to a true and even surface with wood float. Plaster must be returned into reveals and soffit of openings and all angles and edges must be true and straight. All plaster surfaces must be free from blemish and any cracks, blisters, or other defects must be cut out and made good and the whole left perfect at completion. Plaster on walls must be not less than 12mm or more than 20mm in thickness, and plaster on concrete work must be not less than 10mm or more than 15mm in thickness, except where specifically otherwise described.

PB5.1.7 Slip joints

Slip joints shall be provided between brickwork and concrete slabs and beams by levelling up and steel trowelling smooth the bearing surfaces of brickwork with 3:1 mortar.

The ends and sides of beams and edges of concrete slabs shall be separated from the brickwork with 12mm polystyrene placed vertically against the brickwork before the concrete is cast.

PB5.1.8 Beam filling

Unless otherwise specified, beam filling shall be half brick thick, built in cement mortar, cut in between roof timbers and carried hard up to underside of roof covering and flushed up in mortar with a groove formed between covering and mortar. Care shall be taken to protect cladded surfaces from mortar, prior to beam filling.

PB5.1.9 Securing of Roofs

Roof plates shall be fixed to walls with bands of 1,6mm thick galvanised hoop iron, 32mm wide, built six (6) courses deep into brickwork or embedded 300mm deep into concrete, at not exceeding 1,5 metre centres, and well lapped and spiked to plates and to roof trusses where adjacent, otherwise taken up to and lapped round the nearest purlin and well spiked thereto. A layer of brickforce shall be provided at each alternate course above the building in of the hoop iron to fix the roofs.

PB5.2 Rainwater Goods

All gutters, down pipes and flashings shall be 0,6mm thick galvanised sheet iron. Rates for sheet iron eaves gutter and rainwater pipes shall include for short lengths and for lapped, riveted and soldered joints. Eaves gutters are to be screwed or welded to fascia boards or roof timbers/beams with 38 x 3mm galvanised mild steel gutter brackets at approximately 900mm centres, or as otherwise described. Rainwater pipes are to be fixed with sheet iron ears to and including 25 x 76 x 150mm wrot and chamfered hardwood blocks, plugged to brickwork or concrete and oiled, or with 38 x 14 gauge galvanised hoop iron straps built into walls not more than 2 meter apart, bent around pipe and bolted at back.

Flashings shall be properly cut, lapped and shaped to render a waterproof finish. Flashings turned up against walls must be finished with cover flashings bent to shape, dressed over the under flashing and with top edge wedged into joint of brickwork and pointed or secured by other approved means.

Asbestos-cement fascias and barge boards shall be secured with screws or bolts. Where joints occur in the length they are to be covered with two channels 40mm girth with web to suit thickness of plates formed from 0,5mm thick galvanised sheet iron cut to shape, bent as required and with the webs riveted together back to back. Tongues 15mm wide by 15mm long must be left projecting at both ends of flanges and clamped down over edges of fascias or barge board when in position.

PB5.3 Paintwork

All surfaces not being painted, such as face brickwork, sills, floors and stained woodwork, must be covered up and protected against paint and distemper sports before any painting is commenced. All floors must be swept clean and walls dusted down before any paintwork is commenced and no sweeping or dusting must be done while painting is in progress.

All plastered wall, ceiling and similar surfaces must be perfectly dry and in a fit state to receive the finishings, before the work is put in hand.

All coats of paints, etc. must be thoroughly dry before subsequent coats are applied, and rubbed down where necessary.

All work must be finished to colours approved by the Engineer.

The tints of undercoats must approximate those of the finishing colour and in order to indicate the number of coats applied and to avoid misses when applying a succeeding coat a slight difference shall be made in the tint of each coat.

The Contractor must provide all necessary dust sheets, covers, etc., and shall exercise all necessary care to prevent marking the surfaces of joinery, walls, floors, glass, electrical fittings, etc., and must keep all parts of the works perfectly clean and free at all times from spotting, accumulation of rubbish, debris or dirt arising from the painting operations. Any surface disfigured or otherwise damaged must be completely renovated or replaced as necessary, by the Contractor at his own expense. The premises must be left clean and fit for occupation at the completion of the work.

PB5.4 Floor Finishes

Where a floated concrete floor finish is specified on the drawings, the requirements of SABS 1200G or GA, whichever is relevant, shall apply.

Granolithic finish to floors, treads and risers of steps, thresholds, landings etc., must be composed of two parts hard stone chippings; half part sand and one part cement, steel troweled to a true and even surface. The granolithic must be laid before the concrete

surface bed has matured, otherwise the surface of the concrete must be thoroughly cleaned with a wire brush and a coat of neat cement grout applied immediately before the granolithic is laid. The granolithic must be laid in panels not exceeding 6 m² in areas, and jointed to lines of panels and lined into smaller squares as directed with sunk V-joint. The joints between the panels should coincide with joints in the concrete surface bed, where these occur. No dusting on of colouring pigment will be allowed.

Terrazzo floor tiles shall be even in size and shape, free from cracks, chips, twists, blemished or other defects uniform in colour and equal to samples to be submitted to and approved by the Engineer. Special care must be taken to preserve arises and faces during transit and handling.

Pointing etc. Terrazzo floor tiles are to be bedded and jointed solidly in cement mortar and unless otherwise described, flush pointed on all exposed faces with semi-dry cement mortar pressed in. On no account must liquid grout be poured in. Terrazzo floor tile work must be well protected to prevent all possibility of damage or discolouration and thoroughly cleaned on completion.

Vinyl floor tiles shall be fixed on to a screed of thickness at least 25mm. The screed shall have a wood floated finish and shall be smooth with no obstruction greater than 3mm protruding and with the screeded surface level in such a way that no gap greater than 5mm would show underneath a 3m straight-edge or part thereof.

Vinyl tile adhesives shall carry the same product name as the vinyl tiles and the adhesives shall be applied as stipulated by the supplier.

The acceptable tolerance of the final tiled floor shall be similar to that specified for the screeded surface underlying the tiles.

PB6

TOLERANCES

Where tolerances are not specified in the clauses above those generally accepted as re-presenting good workmanship in the building trades shall apply.

PB7

TESTING

The Engineer reserves the right to order any tests, whether at place of manufacture or on site, necessary to evaluate the quality of the work and to ensure the finished building conforms to all the specified requirements.

PB8

MEASUREMENT AND PAYMENT

PB8.1

Schedule Items

PB8.1.1

Brickwork

Brickwork, if measured as a separate item, shall be measured in square metre of the nett brick-walled area (with the wall width and type of brick-finish, indicated). No deductions will be made for small openings such as air bricks, etc. The tendered price per square metre of brickwork shall include also for the following:

- a) Brick forcing (every fifth layer)
- b) Reinforcing of lintels

- c) Miscellaneous items built into brickwork shown on the drawings such as air bricks.

PB8.1.2 Wall, ceiling, roof and floor finishes

Cement plaster on walls and ceilings, roof screeds, floor screeds, paint and any other finish described or specified, shall if measured as separate item be measured in square metre of the nett surface area. No deductions shall be made for small openings nor shall additions be made for small protrusions and reveals. No separate payment shall be made for the processes involved and material supplied for the complete painting of all fixtures and fittings, as specified herein and the costs thereof shall be included in the bided price for the supply, manufacturing and erection of all such items to be erected.

PB8.1.3 Miscellaneous

- a) Doors and windows shall be measured per unit of door or window complete with door frame, lock keys, glazing, painting, etc., for each type and size of door or window or as a lump sum payment for all doors and windows included in the door and window schedule of the Works.
- b) Other items of building work, fixtures and fittings, shall be measured and paid for in the units of measurement listed in the Schedule of Quantities.

PBC **CENTRIFUGAL PUMPSETS**

PBC1 **SCOPE**

This specification covers the requirements for fabrication, installation, erection, testing and commissioning of centrifugal pumpsets.

PBC2 **GENERAL**

A total of 3 centrifugal pumpsets is required, each pump coupled to its respective motor, mounted on a common bedplate.

PBC3 **MATCHING OF PUMP AND MOTOR**

All pumps are to be matched for coupling to their respective motors. Couplings shall impose no restriction on normal end play or expansion and shall be provided with a removable guard, painted red. The direction of rotation shall be indicated with a clear arrow painted on the exterior of the coupling guard. The latter shall be designed thus to render reversed mounting impossible.

All relevant information shall be indelibly stamped on pumps and motors respectively, furthermore the motor control centre numeric designation of the pumpset shall be clearly marked on the pumpset.

PBC4 **PUMPSET BEDPLATES**

Bedplates must fulfil the more stringent requirements, set by either the pump - or motor supplier regarding strength, mass and robustness. Each baseplate shall be rigid, adequately braced, square and true in cross section. All welding to be full strength, full penetration. A complete set of holding down bolts is to be supplied with each bedplate, for grouting into the concrete plinth.

Bedplates will only be grouted after the alignment of pumpsets has been approved. The Contractor must provide details of pump bases and grouting pockets to the Civil Contractor within 4 weeks from commencement of the contract.

PBC5 **PUMPSET ALIGNMENT**

PBC5.1 **General**

It is accepted that all new pumpsets have been aligned on the baseplates in the factory. A certain amount of baseplate deformation is possible during transit and installation. Therefore, the alignment shall be rechecked on site following a hot run as specified hereafter.

Two main checks are to be carried out, viz.

- a) angular alignment and
- b) radial alignment of the pump shaft

The checks are to be done on all pumpsets.

PBC5.2 **Preparation**

Before any check, the following preparations shall be performed:

- Final grouting to the baseplates shall be completed.
- Driving unit shall be isolated from the power supply. The Contractor shall ensure that no damage can be caused by turning either unit (driving or driven unit).

Couplings should be fixed to their respective shafts and the segments must be free to move relative to each other. Where the method of coupling is too tight to allow free movement between the two half-couplings the rims should be marked so that readings can be taken when the two marks are in line.

PBC5.3 **Alignment Checks**

Angular Alignment

- i) Clamp two clock gauges diametrically opposite coupling pin holes of the driving or driven half-coupling, the plunger ends resting on the back of the opposite half-coupling.
- ii) With one gauge at the top and one at the bottom, set both gauges to zero.
- iii) Turn both couplings through 180°. If the alignment is correct, the readings on the gauges should be numerically the same, although not necessarily zero.
- iv) Adjustment should (generally) be made on the outboard end of the pump.
- v) Turn both couplings through 90° and set the clock gauges to zero. Repeat step iii).

Note: This method does not require axial location of either half coupling.

Intersection of Axis (Radial Alignment)

- i) Clamp one clock gauge into one of the coupling holes in the driving or driven half-coupling, the plunger end of the clock gauge seating on the rim of the other coupling.
- ii) Rotate the couplings together and note the readings at each quarter turn.
- iii) Adjust the position and heights of the units until uniform clock readings are obtained.

Note: Where the operating temperature of a unit has the effect of lifting the centre line of one machine in relation to the other, allowance in the height of the appropriate machine must be made. Height adjustment must be in accordance with the manufacturer's specifications.

PBC5.4 Tolerances

- i) Angular Alignment: The angle between two half-couplings shall not be more than 0,01o (174,4 x 10⁻⁶ radians) for speeds up to 1500 rpm and 0,003o for higher speeds measured in both the horizontal and vertical planes. This corresponds to a variation of 0,05 mm and 0,02 mm between readings on a 300 mm dia coupling.
- ii) Radial Alignment: If readings vary by more than 0,10 mm (i.e. 0,05 mm eccentricity) for 1500 rpm and 0,05 mm (i.e. 0,025 mm eccentricity) for higher speeds, adjustments shall be made.

PBC5.5 Grouting of Baseplates

- i) A gap of approximately 25 mm is provided between the baseplate and top of the foundation.
- ii) Following approval of initial pumpset and pipework alignment, the Civil Contractor will erect suitable formwork along the baseplate perimeter and will grout the entire aforesaid gap, foundation bolt pockets and baseplate volume up to the top surface of the baseplate. Appropriate grout holes shall be provided on the baseplate surface for this purpose. The Contractor shall timeously, prior to erection, submit to the Engineer full details of the grout type required. It is required of the Mechanical Contractor to attend to the entire grouting operation.
- iii) Prior to execution of final shaft alignment checks, the grouting operation shall have been completed, the grout adequately cured and all foundation bolts tightened.
- iv) Final alignment control checks to be performed in the presence of the Engineer (or his appointed representative), immediately following a hot run.
- v) Alignment Control Sheets will be completed for every unit checked, and will be signed by both the Engineer and the Contractor. The original copy will be kept by the Engineer and a duplicate by the Contractor.
- vi) For alignment control sheet, see annexures to specifications.

PBC5.6 Required equipment for alignment control

The Contractor shall supply a complete set of equipment and instrumentation necessary for due performance of the specified tests. On successful completion of the specified alignment tests, and in any event at the commissioning date, the complete set of Alignment Control equipment and instrumentation shall be handed over to and become the property of the Employer.

PBC5.7 Installation of Dowel Pins

Following approved alignment of pumpsets, suitable dowel pins shall be fitted to facilitate correct re-location of pumpsets.

PBC5.8 Manufacturer's Certificate of Approval

Following wet commissioning of pumpsets, the pump manufacturer or his approved supplier shall check the installation and when satisfied shall issue to the Engineer a certificate approving installation in compliance with the manufacturer's specifications.

PBC6 **CENTRIFUGAL PUMPS**

PBC6.1 **General**

The maximum permissible rotational speed shall be 1 500 r.p.m. Each shaft shall be designed that the operating speed is well below the first critical speed. Rotors shall be accurately balanced.

Pumps shall be of the horizontal split casing type.

PBC6.2 **Pump materials**

i) **Casing**

Pump casings shall be of high grade cast iron, material in compliance with BS1452 Grade 260. The casing support shall be designed for foot mounting. Hydraulic tests shall be performed on casings after manufacture and machining to 2x the specified working pressure.

ii) **Shafts**

Shafts shall be manufactured of high tensile steel. Shafts shall be fitted with renewable sleeves of high quality wear resistant alloy at appropriate bearing and stuffing box positions.

iii) **Impellers**

Impellers shall be high quality bronze to BS1400 LG4.

iv) **Bearings**

Bearings shall be of the ball or roller type. Lubrication shall be forced grease.

v) **Wearing Rings**

Wearing rings shall be of high quality and shall be easily replaceable.

vi) **Packing**

Graphite asbestos packings shall be provided.

vii) **Motor/Pump couplings**

Couplings shall be of the flexible type, using a flexible component in compression as Fenner H.R.C. or equivalent. Couplings shall be designed to transmit 185 kW for continuous duty.

PBC6.3 **Pumpset duties**

PBC6.3.1 **General**

Pumpsets shall be suitable to operate continuously in the normal operating range without overloading.

PBC6.3.2 **Operating site conditions**

- a) Medium: Filtered Water, pH 7,3, Specific Gravity 1, Temperature 16°C to 20°C
- b) Altitude : 720 m AMSL (average)

PBD **DRILLING, TESTING AND CLEANING OF BOREHOLES**

PBD1 **SCOPE**

The specifications are for the drilling, testing, installation of casing, construction and development and sealing of boreholes for rural water supply. It also includes any work necessary on existing boreholes, such as cleaning. No guarantee as to the final number of boreholes to be requested to be drilled, tested, cleaned, etc., under this contract is made.

The Contractor shall provide all labour, transport, plant, tools, materials and appurtenances, and shall perform all work necessary to satisfactorily construct and complete the required work on boreholes in accordance with this Specification and to any further details as may be ordered by the Engineer. The borehole depths will be dependent on results and the strata intersected.

Sealing of boreholes shall comply with the details in fig. 9.

PBD2 **MATERIAL**

PBD2.1 **General**

The materials shall be new and undamaged and shall be supplied and delivered on site.

PBD2.2 **Steel casing**

- a) New standard borehole casing will be inserted to prevent collapse of the boreholes, to a minimum depth of 5,7m below natural ground level. The casing must be firmly driven from natural ground level (NGL) down to levels indicated or directed by the Engineer. All casing shall have a minimum wall thickness of 4mm and shall be bevel-edged with lugs or threaded to accomplish positive mechanical interlock. After completion of the work, the casing shall protrude a minimum of 100mm above natural ground level.
- b) The casing shall be of the diameter specified, high tensile steel shall be self-aligning and suitable for ramming and from approved suppliers. It must be possible to uplift, disconnect and re-use the casing.

PBD2.3 **Slotted Casing**

Where collapsing conditions are present at the water bearing horizon, slotted casing shall be installed over the affected zone to depths determined by the Engineer. There shall be six 300mm long slots around the diameter of the casing with each alternative set longitudinally staggered. There shall be an 80mm space between the ends of each set. Width of slots shall be 3mm minimum and 4mm maximum. The slots shall be of uniform width, with no resultant protrusions and shall be clear of debris. The minimum wall thickness of slotted steel casing shall be 4mm.

PBD2.4 Other Materials

Casing clamps and all other such items as are required in the construction of the boreholes shall be assembled in an approved manner and in accordance with normal groundwater engineering practice.

PBD3 DRILLING AND TESTING EQUIPMENT

- a) The Contractor shall specify in the Schedule of Plant and Equipment the type of plant to be used and the method of operation. Its capacity shall be sufficient to cope with the work as specified for each particular drilling programme. It shall be kept at all times in full working order and good repair. The Engineer will reserve the right to inspect the equipment to be used for the completion of the Works prior to the commencement of the Works.
- b) If the Engineer considers that the plant in use on the site of the Works is in any way inefficient or inadequate in capacity, he shall have the right to call upon the Contractor to put such equipment in order within seven (7) days, or alternatively, to remove such plant and replace it with additional plant or equipment which he considers necessary to meet the requirements of the Contract. In the event that this requirement is not satisfied, the Engineer reserves the right to terminate the Contract immediately.
No extra payment shall be made for the Contractor's plant, labour or equipment to complete the work specified, nor for any incidentals thereto, the cost being deemed to be included in the Contractor's prices.
Equipment brought onto the site may not be removed therefrom without the Engineer's specific permission in writing.
- c) It will be the responsibility of the Contractor to arrive on site with all equipment and chemicals required to complete the work without interruption, an arc welding machine and oxyacetylene torch must be available on site at all times.

PBD4 BOREHOLE CONSTRUCTION

PBD4.1 Design and Depth

Various borehole design options will be employed. The decision as to which design to use will be made by the Engineer while drilling is in progress.

It is anticipated that borehole depth will vary between 40m and 120m. The final borehole depth will be determined by the Engineer and shallower boreholes than requested will not be acceptable and will not be paid for.

The final choice of borehole design can only be made when drilling has penetrated below the water table in the overburden or into the hard bedrock, whichever occurs first.

PBD4.2 Diameter

Drilling diameter shall normally be 152mm.

PBD4.3 Drilling Techniques

The standard drilling technique shall be the air percussion rotary drilling technique unless otherwise ordered by the Engineer. The standard drilling technique shall further include the necessary facilities with adequate capacity to consistently introduce lubrication water and/or foam as required by the Engineer.

The Engineer may alternatively order the use of Odex air percussion drilling techniques. Mud rotary drilling techniques could also be employed.

In exceptional cases, the Engineer may permit the use of cable tool (jumper) rigs.

PBD4.4 Drilling Media

The Contractor may not use drilling media which may cause hole erosion or involve the use of clay, oil salt or any lost circulation agent, sawdust, cement, or any form of plugging that could affect the production capacity of the water bearing strata intersected.

In the event of circulation losses commercially available foam can be introduced during drilling operations.

PBD4.5 Sanitary Seal

Each borehole shall be completed with a suitable sanitary seal. in the top annular section between the casing and borehole sides just below natural ground level. The seal shall be mixed in the ratio of 30 litres of water to 50kg Portland Cement.

PBD4.6 Formation Stabilizer

Where collapsing conditions are found, formation stabilizer is to be inserted in the annular space at a depth specified by the Engineer. Formation stabilizer material shall be rounded, uniform and clean gravel with a grain size varying between 6 and 14mm. Sieved and washed river gravel can also be accepted. Samples of formation stabilizer must be submitted to the Engineer for approval before emplacement.

PBD4.7 Drilling and Construction of Boreholes

The drilling shall be carried out with the least possible delay in order to run the casing as required.

All boreholes shall be presented for testing free of all bridging and obstruction to bottom. Any time spent in conditioning holes or removing obstructions shall be at the Contractor's expense.

PBD4.8 Straightness and Verticality

a) **Straightness**

Boreholes shall be sufficiently straight to permit a steel tube of outer diameter no more than 15mm smaller than the inner diameter of the cased borehole, to be lowered without hindrance to the full depth of the particular borehole. Any deviation which prevents the lowering of such plumb to the bottom of the borehole will not be accepted, and the hole declared unacceptable. The Contractor shall, in such case, redrill the hole at his own cost to specification.

The Contractor shall ensure that the above piping, complete with the necessary attachments and equipment required for testing straightness, is available at the drilling machine and such piping shall form part of his standard equipment.

b) **Verticality**

The centre of the borehole at any depth shall not deviate from the vertical through the centre of the borehole at the top by more than one-third (1/3) of the borehole diameter per 30m of depth.

The determination of the deviation of a borehole from the vertical shall be carried out in accordance with latest issue of SABS 045. The apparatus referred to in SABS 045 shall be supplied by the Contractor and shall form part of his standard equipment under this Contract.

In the event that these requirements for verticality are not met, the borehole will be declared unacceptable. The Contractor shall thereupon redrill the hole at his own cost, to specification.

PBD4.9 Development

On completion of construction the water borehole shall be developed to a maximum yield of water, free of suspended materials. Development will be carried out using either air surging, air jetting, water jetting or such other standard techniques as may be directed by the Engineer. Development will be continued for the period directed by the Engineer.

PBD4.10 Sampling

Representative samples of the strata intersected shall be collected every one metre. The Contractor shall take every possible precaution to guard against sample contamination due to hole erosion or collapse. Cuttings samples shall be bagged, labelled with the borehole number and depth increment, and stored in a position where they will not be contaminated by site conditions or drilling operations.

PBD4.11 Disinfection

On completion of development the borehole shall be disinfected with a solution of 0,5 kg of HTH in 250 litres of water.

PBD4.12 Protection and marking of boreholes

During the contract period when work is not in progress, the boreholes shall be kept capped in such a manner as to prevent the entrance of foreign material. The Contractor shall remove any foreign matter at his own expense. On completion of each borehole, the Contractor shall cap the borehole with a 4mm thick metal plate, adequately welded or bolted to the protruding borehole casing as detailed on fig. 9. Upon completion of the above, the borehole number allocated by the Engineer will be welded to the steel plate.

PBD4.13 Concrete Collar (Cap)

Each borehole shall be completed with a concrete collar of dimensions not less than indicated and sunk into the ground. The block will be made of approved aggregate, river sand and cement.

PBD5 CESSATION OF DRILLING ACTIVITIES

The termination, at any stage, of drilling operations on a particular borehole shall rest with the Engineer.

PBD6 ABANDONMENT

The Engineer shall have the right at any time during the progress of the work to order the abandonment of the borehole. The Contractor thereupon shall remove the plant, withdraw the casing and salvage or attempt to salvage all such materials as the Engineer shall direct and/or up until the Engineer revokes such direction, and shall fill

up or leave the borehole to the satisfaction of the Engineer. No payment will be approved for any casing left in the borehole which has been abandoned or has an inadequate water supply unless the Engineer has satisfied himself that the casing cannot be salvaged and has certified it in writing.

PBD7 **LOST BOREHOLE**

Should accident to the plant, behaviour of the ground, jamming of the tools or casing, or any other cause, prevent the satisfactory completion of the works, the borehole shall be deemed to be lost and no payment shall be made for the drilling costs nor for any materials not recovered in good order therefrom, nor for any time. The cost of materials which have been recovered but are in a damaged state shall be borne by the Contractor. Should the materials recovered be in good order, then the Contractor shall have no claim for such materials and will have the option to re-use such materials within the scope of the project.

In the event of a lost borehole, the Contractor shall construct a new borehole adjacent to the lost borehole, on a site indicated by the Engineer. The option of declaring any borehole lost shall rest with the Contractor, subject to directions from the Engineer.

No payment whatsoever will be made for the lost borehole. Measurement and payment for the construction of a borehole adjacent to the lost borehole, shall be in accordance with the specifications of any other borehole included in this document, provided that the specifications therefore are met.

PBD8 **WATER SAMPLES**

One litre water samples shall be collected as directed by the Engineer on completion of development of each borehole. Such samples shall be submitted to an approved laboratory for chemical analysis.

The analysis to be undertaken on each sample shall include the following:

- a) Na, K, Ca, Mg, CL, CO₃, HCO₃, NO₃, SO₄, F, Fe, in mg/l
- b) Conductivity in mS/m
- c) pH
- d) Total dissolved solids (ppm)
- e) Total hardness
- f) Sum of Cations
- g) Sum of Anions
- h) Langelier Index

PBD9 **REPORTS**

The contractor shall provide the following reports to the Engineer.

Name	Description	Supplied
Strata Log	An accurate account of strata passed through and the depths at which the strata were intercepted.	Daily
Penetration Log	An accurate record of the penetration rates achieved, in minutes for each metre drilled, together with type, size and grade of bit.	Daily

Name	Description	Supplied
Construction Log	An accurate record of all casing and screens run into borehole, and quantities of all other materials used, such as cement.	On Completion of Construction
Time Log	An accurate of time spent on all phases of drilling	Daily and summary on completion sub-mitted to Engineer for signature

PBD10 TESTING OF BOREHOLES

PBD10.1 Scope

The service to be provided at each new or existing borehole indicated by the Engineer is the execution of a multiple discharge rate test.

PBD10.2 Equipment required

The Contractor shall provide all labour, plant, tools and materials and shall perform all work necessary to carry out the pumping tests referred to above, as called for in PBD1

The test pump shall be a vertical line drive pump capable of producing variable yields between 0,5 l/s and 10 l/s, with a pump suction that will not be set at a depth greater than 100m below surface.

In order to provide control of the yield discharge will be periodically checked by timing the flow into a tank of not less than 250 litres capacity. For low yielding boreholes an accurately marked tank of 30_50 litres should be provided.

The discharge pipeline shall release water at least 10m from the borehole in a downhill direction.

The Contractor shall provide four water level measuring devices capable of measurements to $\pm 0,5$ cm accuracy. These water level measuring devices shall be electrically operated. Air line water level measuring devices will not be permitted.

PBD10.3 General Procedures

a) Water level measurements in pumped boreholes

The Contractor shall fix an open ended pipe or hose of minimum 20mm diameter to the pump column through which an electrical water level measuring device will be used to measure the drawdown in the pumping boreholes.

b) Starting and Stopping of Tests

No pumping test shall be started/stopped unless the Engineer's Representative is present at the borehole to be/being pumped, and without the express approval of the Engineer's Representative.

c) Abandonment of Test

A pumping test will be considered abandoned if pumping of the borehole at the desired rate ceases for any reason whatsoever during the test. Abandoned tests will be repeated after sufficient time has elapsed to allow adequate recovery. This period will be determined by the Engineer's Representative.

PBD10.4 Multiple Discharge Rate Test

This test will be carried out on each borehole. The test shall comprise a minimum of four discharge rates, with each rate being greater than the previous rate. Each discharge shall be pumped for 60 minutes, or as directed by the Engineer's Representative, whereupon the rate shall be immediately increased to the next discharge rate.

The discharge rates will be determined by the Engineer's Representative. Should the pump installed by the contractor not be capable of delivering the yields of each of the 4 discharge rates prior to the commencement of the following step the pump shall be stopped, the water level allowed to recover, the pump removed and a larger capacity pump installed and the test shall be continued.

Water level measurements shall be taken at the following intervals during the tests, unless otherwise directed, on the pumping bore.

Discharge 1

0 _ 3 minutes every half minute
3 _ 10 minutes every minute
10 _ 30 minutes every 5 minutes
30 _ 60 minutes every 10 minutes

Discharge 2

60 _ 63 minutes every half minute
63 _ 70 minutes every minute
70 _ 90 minutes every 5 minutes
90 _ 120 minutes every 10 minutes

Discharge 3

120 _ 123 minutes every half minute
123 _ 130 minutes every minute
130 _ 150 minutes every 5 minutes
150 _ 180 minutes every 10 minutes

Discharge 4

180 _ 183 minutes every half minute
183 _ 190 minutes every minute
190 _ 210 minutes every 5 minutes
210 _ 240 minutes every 10 minutes

Thereafter as directed by the Engineer's Representative.

PBD11 CLEANING OF BOREHOLES

PBD11.1 Scope

Where indicated by the engineer, existing boreholes shall be subjected to cleaning comprising the following operations:

- a) Removal of existing equipment from the boreholes, the storing or safekeeping thereof while the cleaning operation is in process (refer to PBE3), and the re-erection or re-equipping of such borehole with new or the original equipment.
- b) The cleaning of the borehole using standard drilling equipment specified in PBD3 and possibly if so instructed by the engineer, the performance of additional drilling to deepen such a borehole.
- c) The testing of a cleaned borehole if so instructed.
- d) Possible sealing of a newly cleaned borehole if re-equipping is not immediately affected.

PBD12 SAFETY STANDARDS

The contractor shall adhere to the relevant Mines and Works Act Safety Regulations and the Laws related to safety.

PBD13 MEASUREMENT AND PAYMENT

PBD13.1 General

The Contractor under this Contract is considered to be an expert water well driller and is expected to organise and carry out the work specified hereunder in an expert manner. Drilling problems encountered will be overcome entirely within the framework of this Specification and Schedule of Rates, and no claims for extra payments will be entertained for problems foreshadowed in the Specification or due to limitations placed by this Specification.

PBD13.2 Drilling

The rates for drilling are based on diameter and shall cover all the costs involved in drilling, including foam mixing, injection mixers, bit sharpening, conditioning of the drilling foam for logging, tripping in and out of the hole and all other works as are associated with the drilling, and are not covered under other payment. **Unit : m**

PBD13.3 Supply, Delivery and Installation of borehole casing

The rates for casing (differentiating between standard and slotted) of varying sizes shall cover the cost of supply, transport, delivery, safe storage on site, and installation of casing in boreholes. Payment will be made only for materials used and shall be calculated for each completed hole. No claim for extra payment will be entertained by reason of remoteness, wharfage, insurance etc. or by reason of omission in calculating the tender rate **Unit : m**

PBD13.4 Pulling of Casing

This rate shall cover the pulling of casing from abandoned boreholes. No payment will be made for pulling of casing in boreholes declared lost or in which the casing cannot be set in position due to misalignment or other operational problems.

Unit : m

PBD13.5 Development of boreholes

The borehole development time rate is to cover all the time effectively spent on borehole development, as instructed by the Engineer. Contractors shall note that time rates do not allow for building standard development tools on site **Unit : hours**

PBD13.6 Supply and insertion of formation stabiliser

Where instructed by the Engineer formation stabiliser shall be inserted and will be measured for the various types and shall include the supply and insertion of the material to be used

Unit : m³

PBD13.7 Sanitary seal

The sanitary seal shall include the supply, mixing and placing of the sanitary seal

Unit : no

PBD13.8 Disinfection

The rate for disinfection shall include for the supplying, mixing and placing of the disinfection solution, irrespective of depth

Unit : no

PBD13.9 Protection

The rate for protection of boreholes for the various sizes of holes shall include the provision of the steel plate, the welding or bolting of the steel plate to the casing and the marking of the borehole number by welding the number on the steel plate

Unit : no

PBD13.10 Chemical analysis of water

The rate shall cover the provision of the container, the timeous transport to an approved laboratory and the cost of the tests including all markings and profit

Unit : no

PBD13.11 Concrete Collar (Cap)

The rate shall cover the supplying, mixing and placing of the borehole cap as detailed in fig. 6.1

Unit : no

PBD13.12 Reports

The rates shall cover all costs and incidentals in preparing and submitting the various reports and logs to the Engineer as set out in paragraph PBD9

Unit : no

PBD13.13 Testing of boreholes

The rate shall cover all work and incidentals required for the completion of a borehole test for the specified four discharge rates. If a further similar complete test on the same borehole is ordered by the engineer, separate payment shall be made.

Unit : no

PBD13.14 Cleaning

The rate shall cover all work required for the completion of cleaning operations. Separate payments shall be made for removal and installation of existing or new borehole equipment as described in PBE10 as well as for additional drilling, disinfection, etc. for which pay items are included in clauses PBD 13.2 to PBD 13.12.

Unit : no

PBE EQUIPPING OF BOREHOLES

PBE1 SCOPE

This specification includes all work related to the installation of a submersible borehole pump.

The service to be rendered is the supply, delivery, fabrication, installation, erection and commissioning of all the borehole equipment, electrical switchgear and appurtenant works.

PBE2 GENERAL

Depending on borehole test results, the borehole will be equipped upon the Engineer's site instruction. The pump set shall comprise one complete borehole pump, including all pipework to couple to main pipeline, electrical connection and protection. The complete installation is to be housed in a brick manhole as specified.

All equipment shall be installed according to the relevant manufacturer's specifications.

PBE3 REMOVAL OF EXISTING EQUIPMENT FROM BOREHOLES

In cases where the boreholes listed are presently equipped (hand pump, power head, engine and shelter or windmill), all such equipment shall be carefully dismantled by the contractor and stored securely at the Contractor's camp, all to be handed over to the Employer.

Where boreholes are sealed, the Contractor shall remove these entirely and demolish the seals. All such debris shall be dumped at spoil sites indicated by the Engineer.

The Contractor will only be permitted to expose the boreholes immediately prior to equipping such boreholes as instructed by the Engineer and shall at all times exercise great care to prevent the ingress of debris or any foreign material into the borehole.

PBE4 MEASUREMENTS AND RECORDS

Prior to equipping of each boreholes, the Contractor shall measure and record the diameter of the borehole at natural ground level, the static water level (in metres below ground level), the depth of the casing and the total depth (in metres below ground level).

PBE5 POSITIVE BOREHOLE PUMPS

Pumps shall be of the direct coupled submersible motor pump type and shall be suitable for pumping potable water from a borehole to a concrete reservoir.

- i) The inlet of the pump unit shall be fitted with a suitable stainless steel strainer.
- ii) The pump casing, drive shaft and all nuts, washers and screws shall be stainless steel.
- iii) A stainless steel cable guard shall be fitted on the outside of the pump unit.
- iv) The shaft bearings and pump to motor adaptor shall ensure perfect alignment. The pumpset offered shall be maintenance free as far as possible.

PBE6 POSITIVE ELECTRIC MOTORS

PBE6.1 Standards

Electric motors shall comply with JIS and IEC requirements and shall be of the submersible type. Insulation of motors shall be Class 'F' (B-rise).

Motor casings and seals shall comply with IP68 and cooling shall be by means of contact with water on the outer casings, taking note of the lowest tolerable water level.

PBE6.2 Types

The motors for all pumps shall be suitable for 380 Volt, 3-phase, 50 Hz, continuous operation.

The transformers supplying power to the motors will be standard 400/231 V secondary voltage (SABS 780) type. The supply voltage at the terminals of the motors during start-up will not be lower than ± 385 Volt whilst the voltage will be ± 395 Volt as full-load current.

PBE6.3 Construction

Casing

The outer casing, end shields, etc., shall be manufactured from non-corrosive material. Frames shall be machined to close tolerances.

Shafts, seals and bearings

Shafts shall be manufactured of stainless steel and fitted with carbon sleeve bearings. Suitable seals shall be provided to protect the motor against water penetration.

Cable

The cable shall be moulded into the motor casing and the cable entry shall be completely waterproof and placed in such a position that pipe connections or other work on the pump does not damage the cable.

The cable shall be of the compound PVC-rubber sheathed type and shall be sufficiently rated for the motor size.

Markings

All motors shall be supplied complete with fixed labels on which the following information is stamped:

Manufacturer
Date manufactured
Serial No.
Voltage
Full load current
Output kW rating on shaft

PBE7 ELECTRICAL SWITCHGEAR

PBE7.1 General

Installation of all items of electrical equipment shall be carried out by qualified Electrical Contractor. Installation of electrical equipment shall always comply with the requirements, stipulations and regulations contained in the following Acts:

- i) Machinery and Occupational Safety Act with special reference to regulations C61 to C70.
- ii) Code of Practice for the Wiring of Premises - SABS 0142.
- iii) The Electricity Act No. 40 of 1958.

Unless otherwise specified all materials must comply with SABS specifications. Where no applicable SABS specification exist, all materials must comply with the equivalent IEC or British Standard Specification or be of the quality as specified.

A 380 Volt, 3-phase, 50 Hz power supply is available on site.

PBE7.2 Switchboards

All switchboards shall be of ample size to accommodate the switchgear specified below and shall comply with SABS 1180, Part II.

The switchboards shall be moisture proof and vermin proof and shall be suitable for mounting on a steel stand. The board shall be manufactured from 2mm 3CR12 steel with a face panel, housing the specified switchgear, and a door. The distance between the inside of the closed door and the face panel shall not be less than 20mm. The face panel shall be provided with 'Camlock' square key catches and the door shall be equipped with handles and catches. The face panels shall have heavy duty long pedestal hinges and folded edges and shall fit flush into the body of the board and shall be sealed all round with neoprene seals.

The board shall have a powder coated finish. The paints shall be baked on and shall harden within 10 minutes at a temperature of 190° C. The minimum paint thickness after baking shall be 0,05mm and the colour finish shall be Electrical Orange.

The board shall be provided with fully descriptive labels on the front of panels and inside the boards and shall be in English.

PBE7.3 Control Wiring

All control wiring and power wiring ends, regardless on which equipment it terminates, shall either be lugged or soldered. Lugs shall be used throughout on control wiring and on bolt-on power wiring. Soldering shall be used on ends of power wires where clamps terminals are used.

Control wiring shall be numbered for identification purposes.

PBE8 MEASUREMENT AND PAYMENT

The tendered price and payment made shall cover full compensation for the design, manufacture, supply and assembly of pumpsets, electrical switchgear, installation testing and commissioning and for all connections and appurtenance specified.

PE CONTINGENCIES

PE1 CONTINGENCIES

An amount to be spent in part or in whole at the complete discretion of the Engineer. This amount shall not form part of the 15% as is defined in Clause 53 of the General Conditions of Contract.

PG ELECTRICAL INSTALLATION FOR BOREHOLE PUMPS

PG1 SCOPE

This specification covers the requirements for the fabrication, supply, delivery, erection, testing, commissioning and maintenance of the electrical equipment and controls for borehole pumpsets.

PG2 ELECTRICAL POWER SUPPLY

PG2.1 General

The Supply Authority is ESKOM.

PG2.2 Details of Supply

A 380 Volt, 3-phase, 50Hz power supply to be applied to ESKOM.

PG3 ELECTRICAL INSTALLATION

Installation of all items of electrical equipment shall be carried out by qualified Electrical Contractors. Installation of electrical equipment shall always comply with the requirements, stipulations and regulations contained in the following Acts :

- i) Machinery and Occupational Safety Act with special reference to regulations C61 to C70.
- ii) Code of Practice for the Wiring of Premises - SABS 0142.
- iii) The Electricity Act, No 40 of 1958.

Unless otherwise specified all materials must comply with SABS specifications. Where no applicable SABS specification exist all materials must comply with the equivalent IEC or British Standard Specification or be of the quality as specified.

PG4 EXISTING INSTALLATIONS

The Electrical Contractor shall allow changing over to the new installation with a minimum of interruptions to the existing works. As soon as the new equipment is installed and tested, he shall allow disconnecting, removing and making safe the whole existing electrical installation which becomes redundant.

PG5 SWITCHBOARDS

All switchboards shall be of ample size to accommodate the switchgear specified below and shall comply fully with SABS 1180, Part II.

The switchboards shall be moisture proof and verminproof and shall be suitable for mounting against a brick wall or a steel and corrugated iron structure. The board shall be manufactured from 2 mm steel with a face panel, housing the specified switchgear, and a door. The distance between the inside of the closed door and the face panel shall not be less than 20 mm. The

face panel shall be provided with "Camlock" square key catches and the door shall be equipped with handles and catches. The face panels shall have heavy duty long pedestal hinges and folded edges and shall be fit flush into the body of the board and shall be sealed all round with neoprene seals.

The board shall have a powder coated finish. The paint shall be baked on and shall harden within 10 minutes at a temperature of 190° C. The minimum paint thickness after baking shall be 0,05 mm and the colour finish shall be Electrical Orange. The board shall be provided with fully descriptive labels on the front of panels and inside the boards and shall be in English.

PG6 CONTROL WIRING

All control wiring and power wiring ends, regardless on which equipment it terminates, shall either be lugged or soldered. Lugs shall be used throughout on control wiring and on bolt-on power wiring. Soldering shall be used on ends of power wires where clamps terminals are used.

PG7 SWITCHGEAR

Each switchboard shall contain the following equipment:

- Main switch - suitably rated triple-pole motor application circuit breaker.
- One set of 3 MOV surge arrestors, mounted on the incoming isolater terminals.
- Suitably rated ammeter with current transformer.
- HRC withdrawable front panel fuses.
- Suitably rated Star-Delta starter, overloads and contactors.
- Indicator lights : "Run" - Green LED
 "Off" - Red LED
- 1 x Start button
- 1 x Stop/Reset button.
- 1 x Sauter pressure switch to be mounted on a 25 mm BSP socket in pipework.
- 24 Hour. 7 days Theben timer to stop borehole automatically after 8 hours and to be restarted by hand.
- 3 Phase Monitor relay for phase failure, phase rotation and over- and under voltage conditions.
- Liquid level control such as Syrelec DNR2.

The pressure switch shall be timed with a timer. The device for this duty shall be of the Sauter type with a maximum permissible pressure of 1600 kPa. The tenderer shall, however, check with the supplier to ensure that the selected units can perform correctly and have small tolerances in the pressure ranges specified below.

Examples of the design pressures on the main pipeline are as follows:

Borehole 01

Dynamic pressure	-	690 kPa
Static pressure	-	500 kPa
Pump to stop at	-	750 kPa

Borehole 02

Dynamic pressure	-	1230 kPa
Static pressure	-	785 kPa
Pump to stop at	-	1280 kPa

PG8 MEASUREMENT AND PAYMENT

The tendered price and payment made shall cover full compensation for the supply, fabrication, delivery, installation, testing and commissioning of the complete switchboard and switchgear as per the requirements of this particular specification.

Unit : Lump Sum

POHAS OCCUPATIONAL HEALTH AND SAFETY

POHAS1 SCOPE

This specification details the health and safety requirements associated with the Works.

This specification is drawn up in accordance with the Construction Regulations. This specification must be read in conjunction with the following sections of this document:

- | | | | |
|------|------------------------------|---|--|
| i) | Portion 2, Part 1, Section 2 | : | Contract Data |
| ii) | Portion 2, Part 3 | : | Scope of Work |
| iii) | Portion 2, Part 4 | : | Site Information, prior to attempting to identify and detail the hazards relative to the specific Works. |

POHAS2 INTERPRETATIONS

POHAS2.1 Legislation and Regulations

The following legislation is applicable:

- | | |
|----|--|
| a) | Occupational Health and Safety Act, Act 85 of 1993 (hereinafter referred to as "the Act"), |
| b) | Construction Regulations promulgated on 18 July 2003 and incorporated into the said Act by Government Notice R. 1010, published in Government Gazette 25207, (hereinafter referred to as "the Regulations"). |

POHAS2.2 Definitions

- | | |
|----|---|
| a) | Construction work is defined as:
"Any work in connection with: - |
| • | the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; |
| • | the installation, erection, dismantling or maintenance of a fixed plant where such work includes the risk of a person falling; |

- the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
 - the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work”.
- b) The “Contractor” is defined as an employer who performs construction work and includes the principal contractor and his sub-contractors.
- c) The “Employer” means any person, institution or company for whom construction work is performed.
- d) The “Agent” means any person who acts as a representative of the Employer.

POHAS3 GENERAL

- POHAS3.1 The Contractor shall ensure that all work is executed in accordance with work procedures, which comply to accepted safety practices with the Act and the Regulations.
- POHAS3.2 The Employer will appoint the Contractor in writing for execution of the Works. The Contractor shall accept its appointment under the terms and Conditions of Contract. The Contractor shall sign and agree to those terms and conditions and shall, before commencing work, notify the Department of Labour in writing of the intended construction work in terms of Regulation 3 of the Regulations.
- POHAS3.3 The Contractor shall not engage in any construction work until confirmation has been received in writing on behalf of the Employer that the Contractor’s health and safety plan is deemed suitable.
- POHAS3.4 The Contractor shall inform the Engineer in writing of the name and address of the Contractor’s construction safety officer (CSO) and of any subsequent changes in the name and address of the officer, together with the scope and limitations of the CSO’s authority to act for the Contractor. The Contractor’s CSO shall make available to the Employer an all-hours telephone number at which the CSO can be contacted at any time in the event of an emergency involving any of the Contractor’s employees, or other persons at the Works.
- POHAS3.5 The location of the Works specific to this Contract is clearly described in the Scope of Work, forming Portion 2, Part 3 of this document.
- The Contractor shall, in preparation of his Health and Safety Plan, familiarise himself with emergency services in the location of the Works and with the local infrastructure, e)g. clinics, hospitals, police services, ambulance services, fire protection services and disaster management centres, to such extent that he is conversant with these, should the need therefor arise.
- Telephone numbers of all emergency services to be permanently displayed at the site camp, in a convenient and prominent position, wherever possible, close to a telephone.
- POHAS3.6 Should the Contractor at any stage in execution of the Works -
- a) fail to implement or maintain his health and safety plan;
 - b) execute construction work which is not in accordance with his health and safety plan; or
 - c) act in any way which may pose a threat to the health and safety of persons,

the Employer, his Agent or the Engineer will, by written order, suspend the progress of the Works. The Contractor shall, during such suspension, properly protect the Works so far as is necessary.

- POHAS3.7 The Contractor shall provide proof of his registration and good standing with the Compensation Fund, or with a licensed compensation insurer, prior to commencement with the Works.
- POHAS3.8 The Contractor shall, in submitting his tender, demonstrate that he has made provision for the cost of compliance with the specified health and safety requirements, the Act and the Construction Regulations, all in terms of sub-clause 4(1)h of the Construction Regulations. The costs of compliance shall clearly be demonstrated separately under the appropriate items of measurement, both under "fixed charge items" and "time related items".
- POHAS3.9 The Contractor shall consistently demonstrate his competence and adequacy of resources to perform the duties imposed on the Contractor in terms of this Specification, the Act and the Construction Regulations.
- POHAS3.10 The Contractor shall, throughout execution of the Contract, ensure that all conditions imposed on his sub-contractors in terms of the Act and the Construction Regulations are complied with, as if they were the Contractor.

POHAS4 GENERAL REQUIREMENTS

POHAS4.1 Health and Safety Plan

The Contractor shall provide and demonstrate to the Employer a suitable and sufficiently documented health and safety plan, in compliance with the Act and the Regulations, which shall be applied from the date of commencement of and for the duration of execution of the Works.

- a) The Contractor's health and safety plan shall include the following principles:
- (i) A Health and Safety Policy authorised by the Contractor's executive corps that clearly states overall health and safety objectives and commitment to improving health and safety performance.
 - (ii) A proper risk assessment of the construction work.
 - (iii) Pro-active identification of potential hazards and unsafe working conditions.
 - (iv) Informing and/or training of employees working in hazardous and risk areas.
 - (v) Provision of a safe working environment and safety equipment.
 - (vi) Ensure the safety of sub-contractors through their safety plans.
 - (vii) Monitoring health and safety on the construction works on a regular basis.
 - (viii) Use of competent construction safety officers.
- b) The Contractor's health and safety plan should cover the following detail:
- i) Health and Safety Policy.
 - ii) Indication of competent supervision on site.
 - iii) Competencies of persons (scaffold supervisors, first aiders, etc.)
 - iv) Duties and responsibilities of all appointed persons on the project.
 - v) Indication of condition and availability of high-risk equipment, tools & equipment.
 - vi) Monitoring mechanisms.
 - vii) Risk assessments of hazards identified.
 - viii) Arrangements for continuous risk assessments on the project.
 - ix) Medical and first aid arrangements.

- x) Emergency preparedness arrangements.
- xi) Accident/ incident reporting and investigation arrangements.
- xii) Personal protective equipment arrangements.
- xiii) Site health and safety meeting arrangements.
- xiv) Audit arrangements.
- xv) Selection, procurement & management of other contractors.
- xvi) Maintenance arrangements of machinery and equipment.
- xvii) Designer/Engineer interaction arrangements.
- xviii) Workers welfare facilities.
- xix) Induction arrangements.
- xx) Training arrangements.
- xxi) Performance review and improvements on the project.
- xxii) Past health and safety performance statistics of the Contractor.

POHAS4.2 Health and Safety File

- a) The Contractor shall ensure that a health and safety file, which shall include all documentation required in terms of the provisions of this specification, the Act and the Regulations, is opened and kept on site and made available to the Employer or inspector upon request.
- b) The Contractor's health and safety file should inter alia cover the following detail:
 - i) A copy of the health and safety plan.
 - ii) All inspection reports as indicated in POHAS4.4.
 - iii) Accident and incident reports.
 - iv) Minutes of monthly health and safety meetings.
 - v) Contact details of the CSO.
 - vi) Inventory of safety and first aid equipment.
 - vii) Method statements and procedures not included in the health and safety plan.
 - viii) Continuous risk assessments on the project.
 - ix) Toxic and hazardous material data sheets.
- c) Upon completion of the Works, the Contractor shall hand over a consolidated health and safety file to the Employer.

POHAS4.3 Appointments

POHAS4.3.1 Construction Supervisor (CS)

The Contractor shall in writing appoint a full time competent employee as the construction supervisor, with the duty of supervising construction of the Works.

POHAS4.3.2 Construction Safety Officer (CSO)

Before commencing with the Works, the Contractor shall designate in writing a competent construction safety officer who shall be acceptable to the Agent, to represent and act for the Contractor in health and safety related matters.

POHAS4.3.3 Other Appointments

The Contractor shall in writing appoint competent supervisors, suitable and accomplished, as identified in the health and safety plan.

POHAS4.4 Monitoring Mechanisms

Inspections as required by the Act must be conducted and the records thereof kept in the health and safety file.

-
- POHAS4.4.1 Weekly inspections of first aid boxes.
- POHAS4.4.2 Weekly inspections of ladders.
- POHAS4.4.3 Weekly inspections of fire-fighting equipment.
- POHAS4.4.4 Names and addresses of its employees who are registered as trained fire fighting personnel as well as a duty roster.
- POHAS4.4.5 Monthly inspections of welding machines.
- POHAS4.4.6 Monthly inspections of oxy-acetylene equipment.
- POHAS4.4.7 Monthly inspections of builders' hoists.
- POHAS4.4.8 Monthly inspections of mobile and tower cranes.
- POHAS4.4.9 Monthly inspections of lifting gear.
- POHAS4.4.10 Monthly inspections of electrical equipment.
- POHAS4.4.11 Monthly tests of earth leakage units.
- POHAS4.4.12 Inspections of formwork and support work on a routine basis as specified in POHAS5.1 d).

POHAS4.5 First Aid

POHAS4.5.1 Safety Notice Board

The Contractor shall provide a safety notice board where safety notices, site regulations concerning safe working practices and information on the location of the nearest first aid station, can be conspicuously displayed to its entire staff. The size of the notice board shall be at least 600 mm x 800 mm.

POHAS4.5.2 First Aid Equipment

The Contractor shall provide a stretcher for emergencies and a first aid box with the minimum contents as prescribed by the General Safety Regulations as published by means of Government Notices.

The first aid box(es) shall be checked weekly by a responsible person, who shall be appointed by the Contractor and a record shall be kept of the contents. Any deficient medical supplies shall be promptly replenished by the Contractor.

POHAS4.5.3 Hazard Notices

The Contractor shall display hazard notices in all areas where hazardous conditions prevail or may occur. Areas so demarcated shall be deemed to be "designated areas".

POHAS4.5.4 Reporting of incidents and/or injuries

All incidents in respect of damage to Works, property or machinery or injury to persons shall be reported by the CSO or Site Representative to the Employer as soon as possible.

A mandatory incident report form, containing full details of the incident, shall be completed and submitted to the Employer within twenty four(24) hours of the occurrence of the incident.

The Employer shall have the right to make all or any enquiries as to the cause and result of any such incident. The Contractor shall provide the Employer with full facilities for carrying out such enquiries.

POHAS4.6 Good Housekeeping

The Contractor shall at all time carry out the Works in a manner to avoid the risk of bodily harm to persons or risk of damage to any property. The Contractor shall take all precautions, which are necessary and adequate to eliminate any conditions, which contribute to the risk of injury to persons or damage to property. The Contractor shall continuously inspect all work, materials and equipment to discover and determine any such conditions and shall be solely responsible for the discovery, determination and elimination of such conditions.

The Contractor shall keep the construction site neat and tidy and shall dispose of all waste material in an orderly manner.

All materials and equipment on the construction site shall be stored neatly and safely.

POHAS4.7 Personal Protective Clothing

The Contractor shall provide the necessary personal protective clothing for his employees in hazardous areas, appropriate to the nature of the hazard.

POHAS4.7.1 Hard Hats

All employees of the Contractor shall wear hard hats in designated areas. The Contractor shall keep enough hard hats available, of a contrasting colour to that of his employees, for the use of visitors to the Works. Hard hats shall not be painted or otherwise defaced.

POHAS4.7.2 Eye & Ear Protection

Suitable eye and/or ear protection shall be worn in designated areas or when grinding, chipping, breaking, drilling, arc-welding, cutting with oxy-acetylene equipment or similar activities are taking place.

POHAS4.7.3 Footwear

All employees of the Contractor shall wear serviceable, laced-up safety footwear suitable for the intended purpose in designated areas.

POHAS4.7.4 Gloves

All employees of the Contractor shall wear suitable protective gloves in designated areas or when handling hot or hazardous materials or chemicals.

POHAS4.7.5 Clothing

All employees of the Contractor shall wear suitable protective clothing when working in proximity of machinery, power tools, hazardous materials or chemicals. Reflective vests shall be worn when working in or close to areas where traffic or movement of vehicles, earth moving equipment and poor visibility occur. Persons working over an

accumulation of water e.g. reservoirs, rivers, dams or harbours, where a danger exists of falling into the water, shall wear life belts.

POHAS4.8 Road Traffic and Transportation

POHAS4.8.1 The Contractor shall ensure that vehicles are maintained in a roadworthy condition.

POHAS4.8.2 The Contractor shall ensure that drivers of vehicles are in possession of an appropriate and valid drivers licence.

POHAS4.8.3 The Contractor shall not permit any driver to be in control of a vehicle on the Works while under the influence of intoxicating liquor or narcotic drugs.

POHAS4.8.4 All vehicles of the Contractor shall display a name board bearing the Contractor's name. Hired vehicles shall bear an identifying sticker.

POHAS4.9 Overhead Power Lines

Regulations of the electricity supply authority in connection with prohibition of operations in the vicinity of overhead power lines shall be complied with by the Contractor at all times.

POHAS4.10 Machinery, Tools and Equipment

The Contractor shall ensure that all machinery, tools and equipment are safe to use and maintained in a good condition. All tools and machinery driven by electrical, mechanical or other means shall be adequately guarded. All machinery, tools and equipment are to be regularly inspected and such registers are to be kept on site.

POHAS4.11 Welfare Facilities

POHAS4.11.1 The Contractor shall provide and maintain at or within reasonable access of the Works, the following clean facilities:

- a) At least one (1) shower for every fifteen (15) workers of each gender.
- b) At least one (1) sanitary facility for every thirty(30) workers of each gender.
- c) Changing facilities for each gender, and
- d) Sheltered eating areas.

POHAS5 SPECIAL REQUIREMENTS

POHAS5.1 Formwork and Support Work

The Contractor shall ensure that -

- a) all formwork and support work operations are carried out under the supervision of a competent person who has been appointed by the Contractor in writing for that purpose;
- b) 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;

- c) the foundation conditions are and remain suitable to withstand the load caused by the formwork and support work structure and any imposed loads such that the formwork and support work structure are stable;
- d) all formwork and support work structures are inspected by a competent person, who has been appointed by the Contractor in writing for that purpose, 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, kept in the health and safety file;
- e) 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 load, but also any imposed loads and not removed until authorisation has been given by the competent person contemplated in sub-paragraph a).

POHAS5.2 Prevention of Uncontrolled Collapse

The Contractor shall ensure that:

- a) all reasonable practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work; and
- b) no structure or part of a structure is loaded in a manner that would render it unsafe.

POHAS5.3 Scaffolding

- a) When using access scaffolding the Contractor shall ensure that such scaffolding, when used, complies with the safety standards incorporated for this purpose into the Regulations under section 44 of the Act.
- b) The Contractor shall ensure that all scaffolding operations are carried out under the supervision of a competent person who has been appointed in writing and that all scaffold erectors, team leaders and inspectors are competent to carry out their work.
- c) All scaffolding shall comply to SANS 085 "The design, erection, use and inspection of access scaffolding" of which a copy shall be kept in the health and safety file.

POHAS5.4 Safe Working Loads

The Contractor shall ensure that:

- a) the safe working loads of hoists, load-bearing beams and cranes are prominently displayed at all times;
- b) the safe working loads are not exceeded under any circumstances; and
- c) all lifting gear is marked with a unique identity number and recorded in a register kept in the health and safety file.

POHAS5.5 Commissioning Safety Precautions

The Contractor shall ensure that wherever repairs, adjustments or any other work are undertaken on any plant or machinery, the power supply is switched off, disconnected or the plant/machinery disengaged until the work or repairs have been completed.

POHAS5.6 Use and Storage of Toxic, Hazardous Chemical and Flammable Materials

- a) The Contractor shall take adequate safety precautions with the handling and storage of any toxic, hazardous chemicals and flammable materials.
- b) The Contractor shall provide suitable and adequate protective equipment when working in areas where toxic, hazardous chemicals and flammable materials are being used.
- c) The Contractor shall ensure that its employees have familiarised themselves with the toxic and hazardous material data sheets applicable as well as the location of fire fighting equipment, safety showers/baths and other washing facilities, prior to commencement of work.

POHAS5.7 Work on Elevated Positions

- a) Whenever persons are required to work in an elevated position, every possible and practicable means shall be adopted to provide such persons with effective safeguards;
- b) The Contractor shall stop all persons working on the erection of steelwork during periods of inclement weather or if the possibility of lightning strikes is present;
- c) Safety belts shall be worn when working at an elevation of 2 metres or more;
- d) Working on elevated positions shall only be carried out under the supervision of a competent person, appointed in writing by the Contractor;
- e) Under no circumstances may safety belts be used as fall arrest equipment but only as a fall prevention device. Full body harnesses with appropriate arrest mechanisms are to be used for fall arrest purposes;
- f) Lifelines are to be used with safety harnesses or safety belts when doing steel erection and other similar activities such that persons are not exposed to danger by continuously attaching and detaching the lanyards from the structure.

POHAS5.8 Excavations

- a) Digging or excavation operations may not commence without the written authorisation from the competent supervisor appointed by the Contractor in writing.
- b) Adequate precautions shall be taken by the Contractor to prevent slumping of excavations, as well as to prevent rocks and loose material falling onto workers.
- c) All excavations by the Contractor are to be clearly demarcated to prevent accidental access.
Solid barricading shall be used at areas where there is a fall hazard present (save for pipe trenches). Danger tape may only be used to make the solid barricading more visible.

POHAS5.9 Indemnity of Employer and His Agents

- a) The annexure to this Contract Document contains a declaration pertaining to the Health and Safety Plan which shall be duly completed and signed by the Tenderer.
A copy of the signed declaration shall be included in the Contractor's Health and Safety Plan.
- b) Any acceptance, approval, check, certificate, consent, examination, inspection, instruction, notice, observation, proposal, request, test or similar act by either the Employer or any of his Agents (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, the Act and the Construction Regulations, including responsibility for errors, omissions, discrepancies and non-compliances.

POHAS6

MEASUREMENT AND PAYMENT

The Contractor shall clearly demonstrate that he has indeed made provision for the cost of health and safety measures during the construction process, as required in terms of Subclause 4(1)(h) of the Construction Regulations (2003) proclaimed under section 43 of the Occupational Health and Safety Act. (Act No. 85 of 1993).

The tendered price shall include for compliance to the following legislation:

- Compensation for Occupational Injuries and Diseases Act, 130 of 1993;
- Occupation Health and Safety Act, 85 of 1993 and Regulations promulgated there under;
and
- Construction Regulations, 2003.

Differentiation shall be made in the Schedule of Quantities between the following two payment items:

- Establishment by the Contractor of facilities on site,
and
- Operations and maintenance by the Contractor of facilities on site to ensure that all work is executed in accordance with above mentioned legislation and this Specification.

PART D SITE INFORMATION

CONTENTS

<u>Item</u>	<u>Topic</u>	<u>Page</u>
D1.	GENERAL	D2.2
	D1.1 Documentation	D2.2
	D1.2 Information	D2.2
D2.	SITE INFORMATION	D2.2
	D2.1 Records and Test Results	D2.2
	D2.1.1 Subsoil records	D2.2
	D2.2 Reports on Physical Conditions	D2.2
	D2.2.1 Mapping	D2.2
	D2.2.2 Hydrographic data	D2.2
	D2.2.3 Hydrological information	D2.2
	D2.3 Publicly available Information	D2.2
	D2.3.1 Published papers and interpretation of geotechnical information	D2.2
	D2.4 Information about services below the surface of the site	D2.2
	D2.4.1 Water	D2.2
	D2.4.2 Sewage	D2.2
	D2.4.3 Electricity	D2.2
	D2.4.4 Gas	D2.2
	D2.4.5 Communications	D2.2
	D 2.5 Information about adjacent main infrastructure	D2.3
	D2.5.1 Buildings	D2.3
	D2.5.2 Structures	D2.3
	D2.5.3 Internal Roads	D2.3
	D2.5.4 Restrictions for Heavy Loads	D2.3
	D2.6 Atmospheric criteria	D2.3
	D2.7 Environmental criteria	D2.3
D3	DRAWINGS (at the back of the document)	D2.3

D2 SITE INFORMATION

D1. GENERAL

D1.1 Documentation

The documentation included in this section describes the site as at the time of tender to enable the Tenderer to price his tender, furthermore to decide upon his method of working and programming and to evaluate his risks.

D1.2 Information

Only actual information about physical conditions of the site and its surroundings (if any available) is included in this Site Information and interpretation thereof is a matter for the Tenderer.

D2. SITE INFORMATION

D2.1 Records and Test Results

D2.1.1 Subsoil records

N/A

D2.2 Reports on Physical Conditions

D2.2.1 Mapping

N/A

D2.2.2 Hydrographic data

N/A

D2.2.3 Hydrological information

N/A

D 2.3 Publicly available Information

D2.3.1 Published papers and interpretation of geotechnical information

N/A

D2.4 Information about services below the surface of the site

D2.4.1 Water

Not available on site.

D2.4.2 Sewage

Not available on site.

D2.4.3 Electricity

Not available on site.

D2.4.4 Gas

Not available on site.

D2.4.5 Communications

Not available on site.

D 2.5 Information about adjacent main infrastructure

D2.5.1 Buildings

Unavailable

D2.5.2 Structures

Unavailable

D2.5.3 Internal Roads

Unavailable

D2.5.4 Restrictions for Heavy Loads

Unavailable

D2.6 Atmospheric criteria

Unavailable

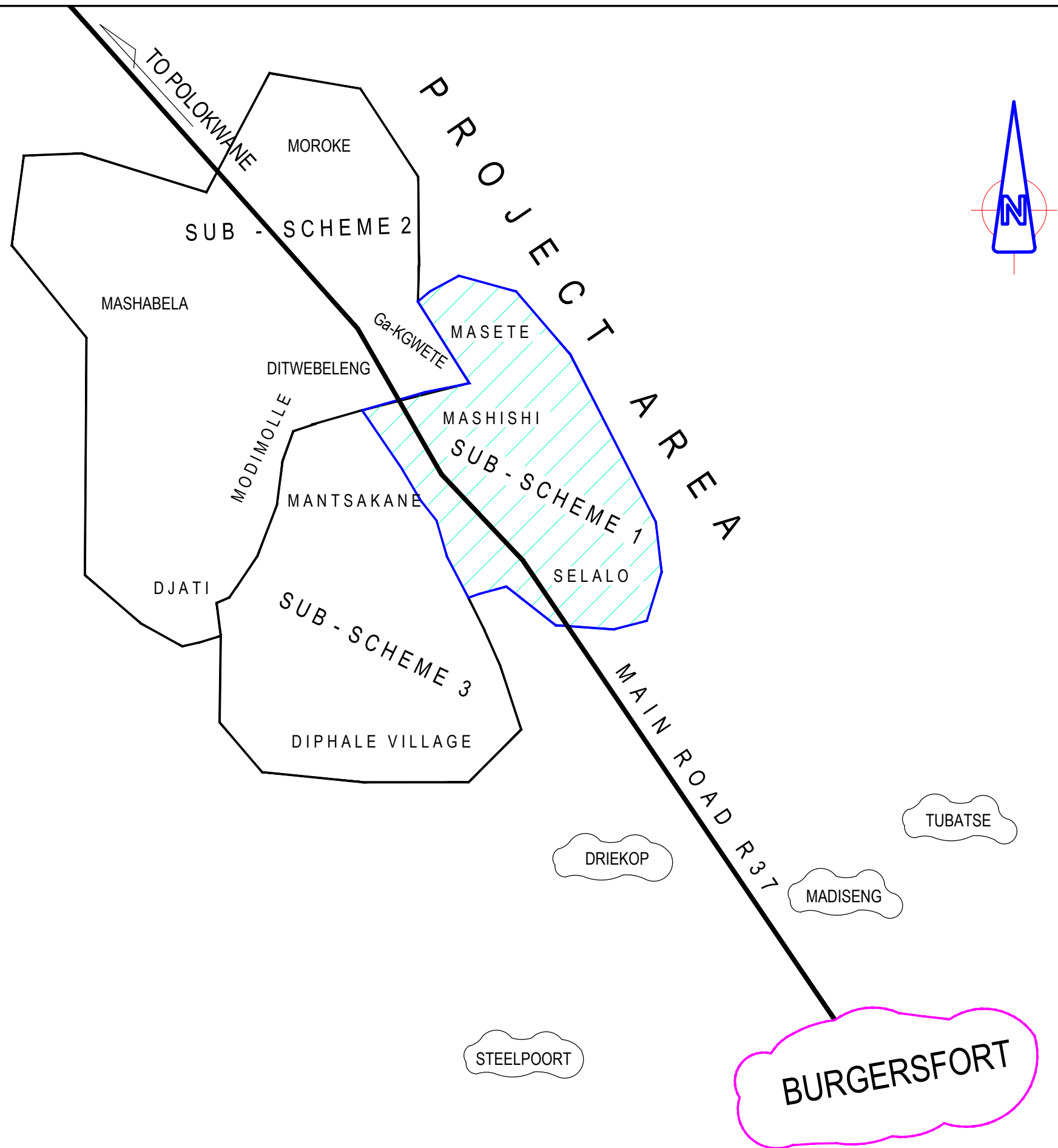
D2.7 Environmental criteria

Unavailable

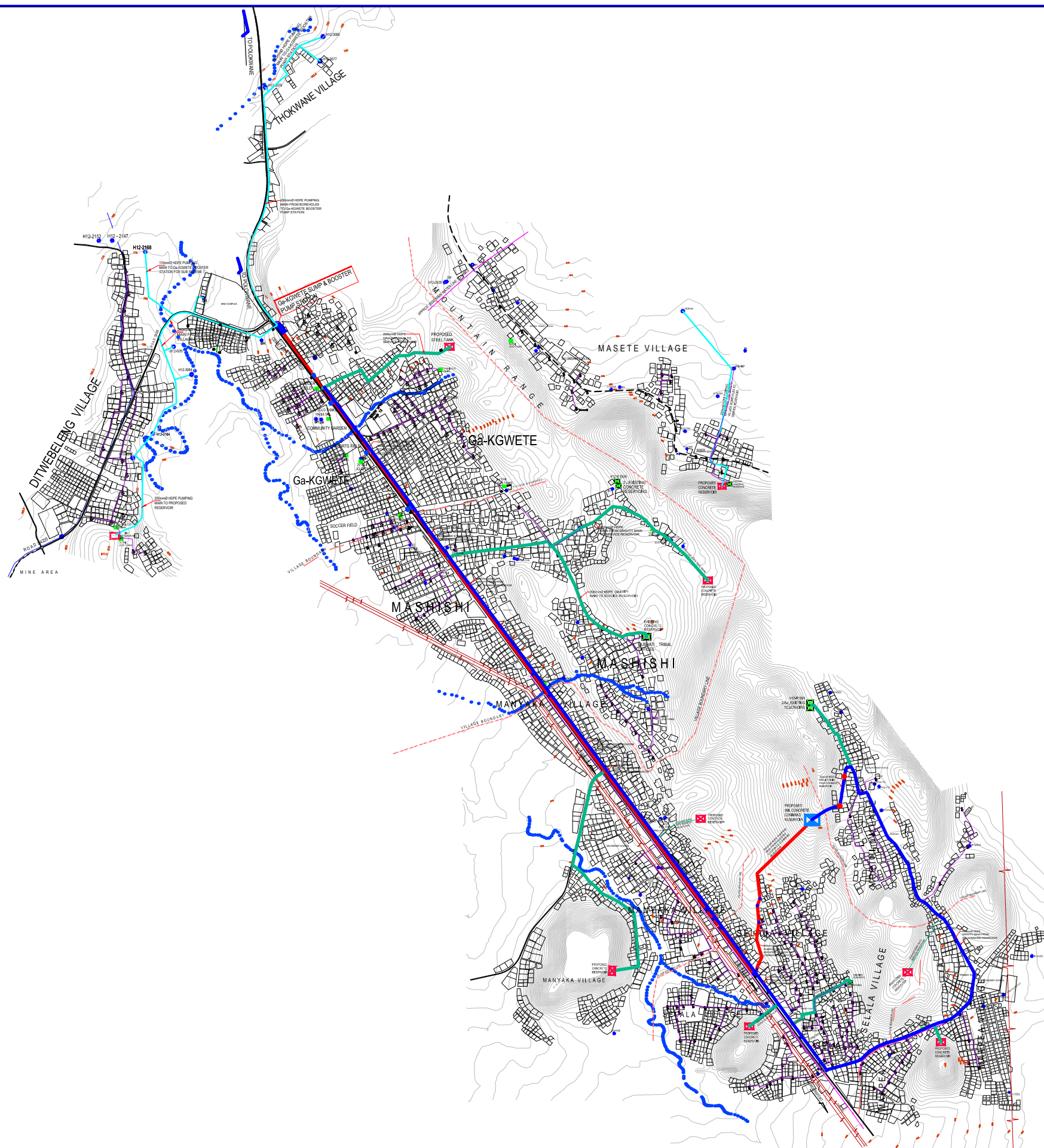
D3. DRAWINGS

DRAWING NO	DESCRIPTION	REFERENCE NO.:
001	LOCALITY MAP SUB. SCHEME 1A	LBCRWS/SUB.1/LM/01
002	OVERALL WATER SCHEME LAYOUT	LBCRWS/SUB.1/WT/01
003	PUMPING MAIN LAYOUT	LBCRWS/SUB.1/P/WT/01-03
004	PUMPHOUSE LAYOUT WITH PLATFORM DOOR AND L-DOOR	LBCRWS/STD-04
005	PUMPHOUSE ROOF PLAN & ELEVATIONS	LBCRWS/STD-05
006	PUMPHOUSE PLAN AND SECTIONS LAYOUT	LBCRWS/STD-06
007	PUMPHOUSE DETAILS	LBCRWS/STD-07
008	PUMPHOUSE SLEEVES AND STEEL VENTILATOR	LBCRWS/STD-08
009	PUMPSTATION MANIFOLD LAYOUT & DETAILS – 100NB	LBCRWS/STD-01
010	PUMPSTATION MANIFOLD LAYOUT & DETAILS – 80NB	LBCRWS/STD-02
011	PUMPSTATION MANIFOLD LAYOUT & DETAILS – 65NB	LBCRWS/STD-03
012	TYPICAL BOREHOLE INSTALLATION DETAIL	LBCRWS/STD-13
013	AIR VALVE CHAMBER DETAILS PIPELINEV SIZES	LBCRWS/STD-14

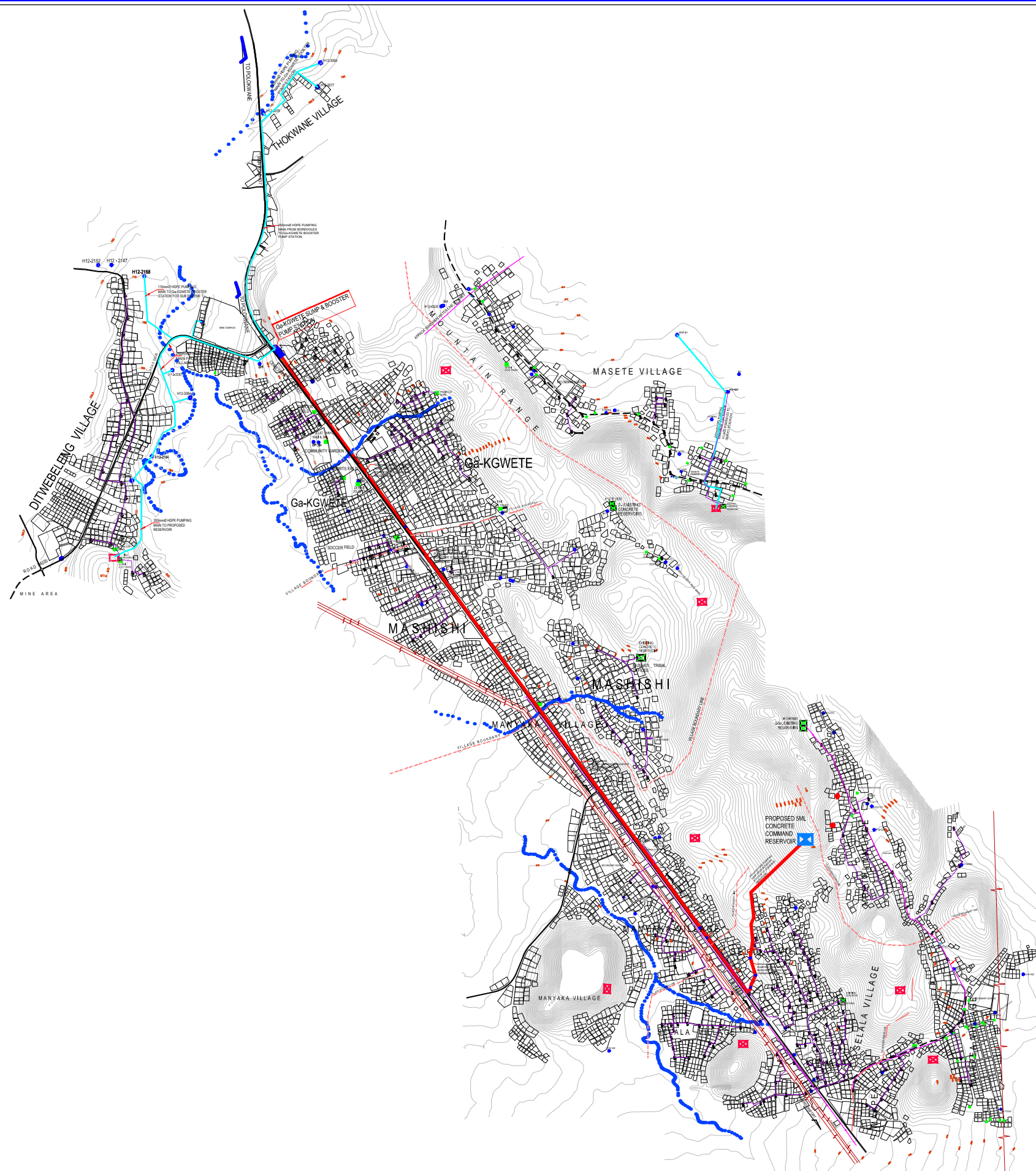
	200mm-450mm DIA. DETAIL 1	
014	AIR VALVE CHAMBER DETAILS PIPELINEV SIZES 200mm-450mm DIA. DETAIL 2	LBCRWS/STD-14
015	YARD CONNECTION – STANDPIPE DETAIL	LBCRWS/STD-53
016	TRUST BLOCK DETAILS 350-450mm Dia Pipes	LCRWS/STD-36
017	TRUST BLOCK DETAILS 75-300mm Dia Pipes	LCRWS/STD-37
018	INLINE ISOLATION VALVE CHAMBER DETAILS FOR PIPES 350mm to 450mm Dia	LCRWS/STD-18
019	AIR VALVE CHAMBER FOR SMALL PIPES SMALLER THAN 200mm	LCRWS/STD-15
020	AIR VALVE CHAMBER DETAILS 3300X2550 & 2800X2550 REINFORCING DETAILS	LCRWS/STD-16
021	CONCRETE PALISADE FENCE DETAILS	LCRWS/STD-54



	NOTES: 1. Do not scale off this drawing	DESIGNED BY	CPM	CLIENT:  GREATER SEKHUKHUNE D. MUNICIPALITY <small>No. 3 New Street, P.O. Box 19611, JOHANNESBURG, 0150 Tel: 015 262 7300</small>	CONSULTANT:  Dynamic Integrated Geohydro Environmental Services cc. <small>88 Marshall Street, P.O. Box 1743, Johannesburg, 0150 Tel: 015 291 4151 Fax: 015 291 4167</small>	DRAWING TITLE:	LOCALITY MAP SUB. SCHEME 1	DRAWING NUMBER:	LBCRWS/SUB. 1/LM/01	SHEET No.: SHEET 1/1
		CHECKED BY	GKM			PROJECT TITLE:	LEBALALO CENTRAL REGIONAL WATER SCHEME SEKHUKHUNE DISTRICT MUNICIPALITY	PROJECT NUMBER:	SK8/1A-11/2018/2019	
		DRAWN BY	MPM					CONTRACT No.:		
		APPROVED BY	RC-Pr.Eng							

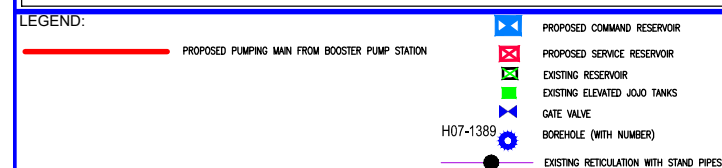


DRAWING NUMBER: LBCRWS/SUB. 1/WT/01	SHEET No.: SHEET 1
PROJECT NUMBER: SK8/1A-11/2018/2019	
CONTRACT No.:	



FOR TENDER

LEGEND:



NOTES:

1. Do not scale off this drawing

DESIGNED BY	CPM
CHECKED BY	GKM
DRAWN BY	MPM
APPROVED BY	RC -Pr.Eng

CLIENT:



GREATER SEKHUKHUNE D. MUNICIPALITY
No.3 Wen Street,
P.BAG X8611, GROBLERSDAL, 0470
Tel: 013 262 7300

CONSULTANT:



Dynamic Integrated Geohydro
Environmental Services cc.
98 Marshall Street,
P.O.Box 5743, Polokwane, 0700
Tel: 015 291 4151 Fax: 015 291 4167

DRAWING TITLE:

OVERALL WATER PUMPING MAIN LAYOUT
SUB. SCHEME 1

PROJECT TITLE:

LEBALALO CENTRAL REGIONAL WATER SCHEME
SEKHUKHUNE DISTRICT MUNICIPALITY

DRAWING NUMBER:

I RCPWS/SUB 1/PMT/01

EDCRWS/SOL

PROJECT NUMBER:

SK8/1A-11/

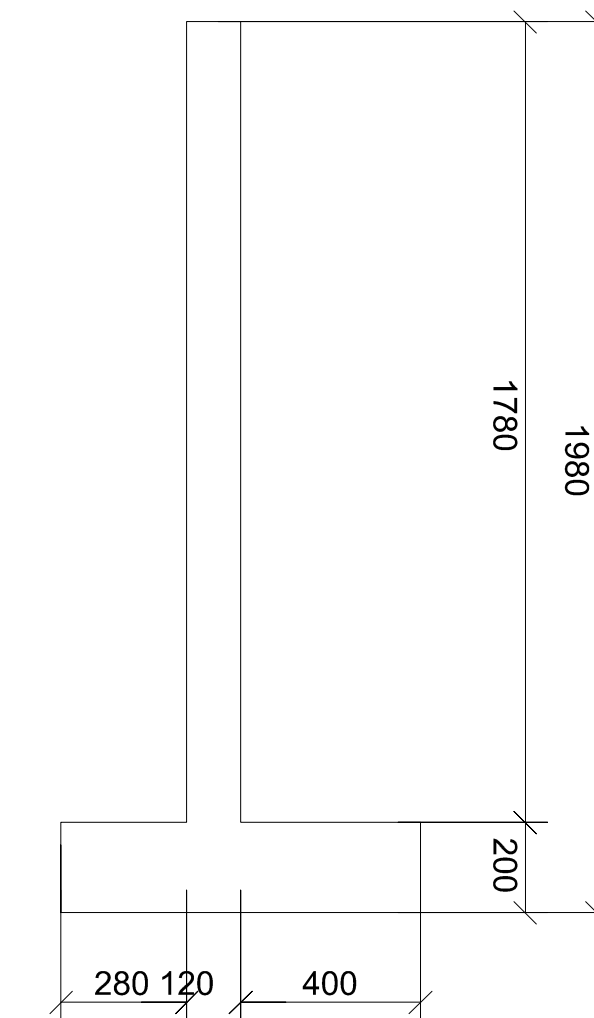
SHEET No.

1000

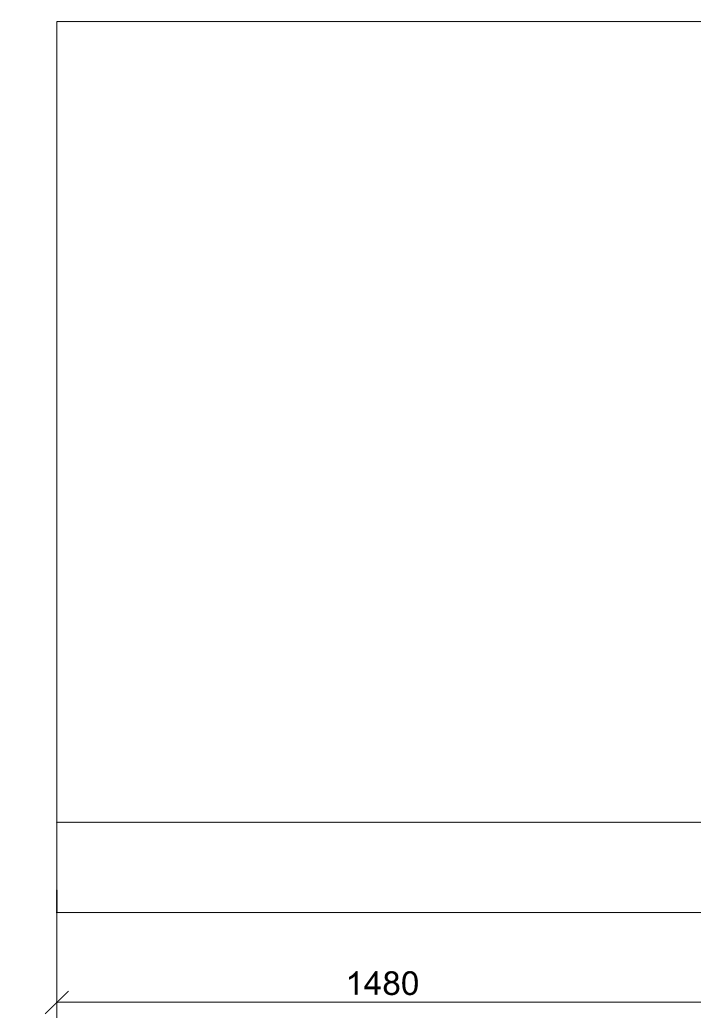
SHEE

100

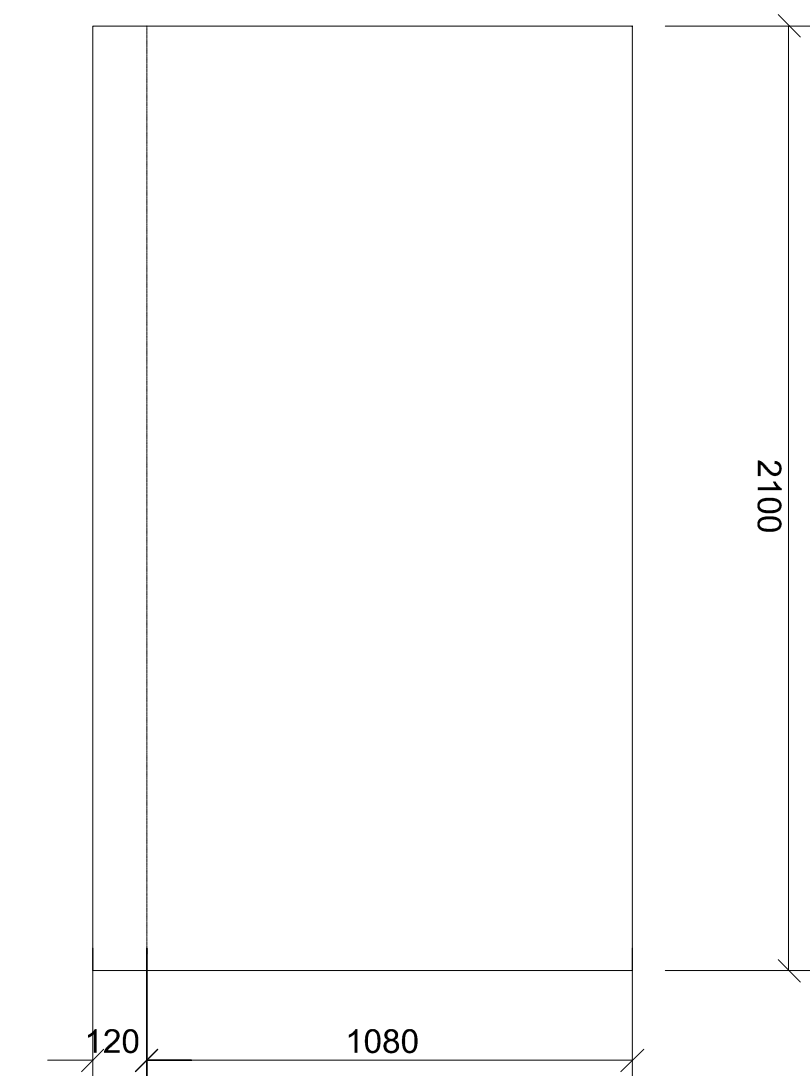
SCALE:



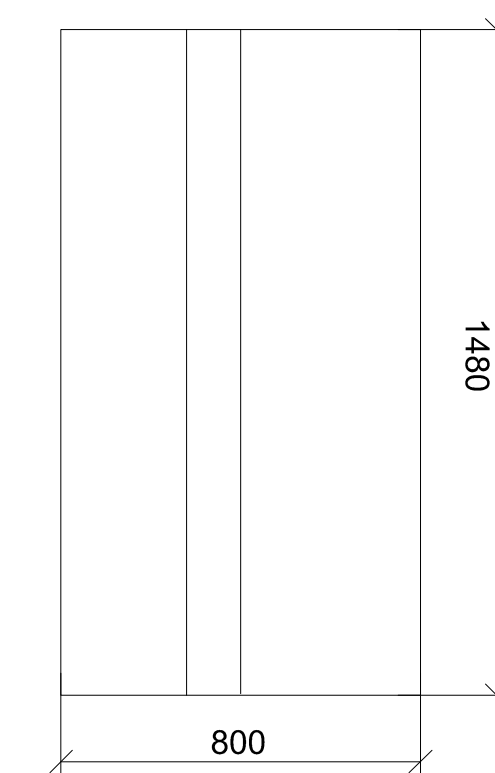
PLATFORM DOOR
SIDE VIEW
SCALE 1 : 25



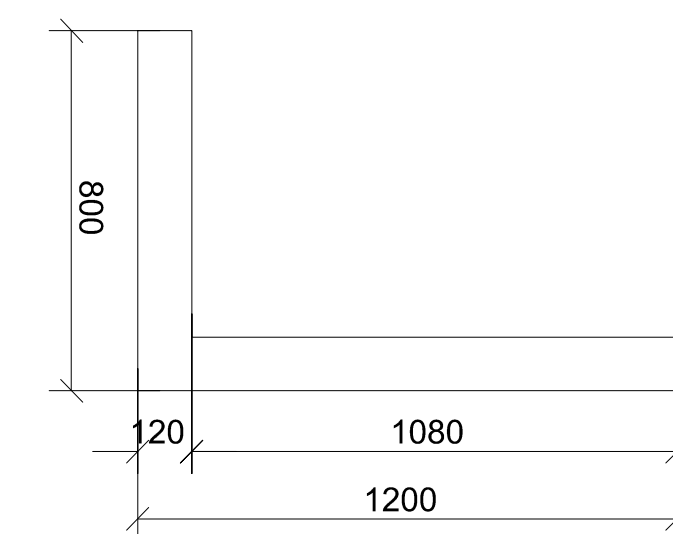
PLATFORM DOOR
FRONT VIEW
SCALE 1 : 25



L - DOOR
FRONT VIEW
SCALE 1 : 25





PLATFORM DOOR
PLAN
SCALE 1 : 25





L - DOOR
PLAN
SCALE 1 : 25

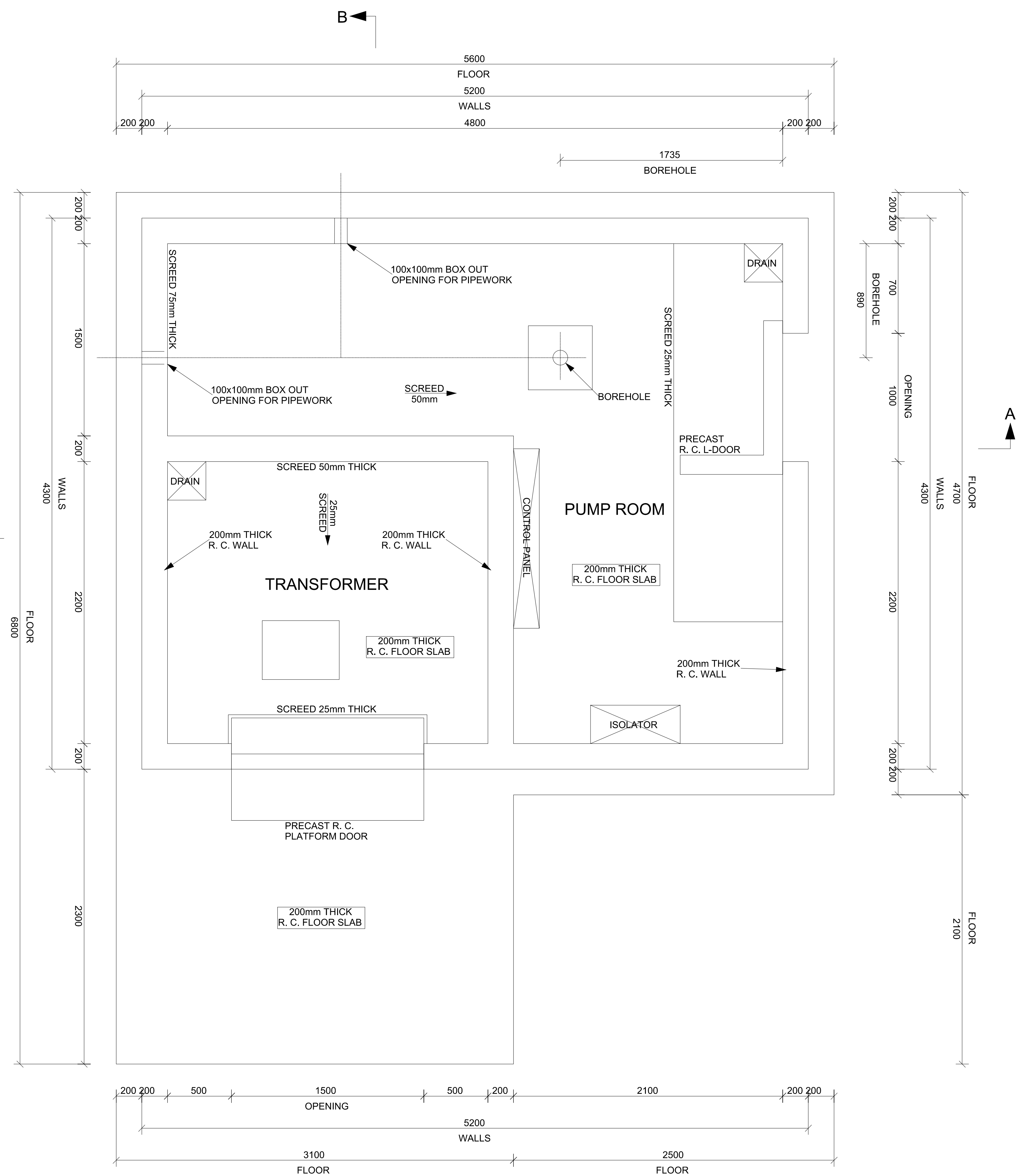
1. OPENING IN CONCRETE WALL TO BE 1500mm WIDE x 2000 mm HIGH. TO ACCOMMODATE PLATFORM DOOR
2. THE STEEL RAILS FOR THE CONCRETE DOORS WILL BE INSTALLED BY THE DOOR MANUFACTURER.

1. OPENING IN CONCRETE WALL TO BE 1000mm WIDE x 2000 mm HIGH. TO ACCOMMODATE L - DOOR
2. THE STEEL RAILS FOR THE CONCRETE DOORS WILL BE INSTALLED BY THE DOOR MANUFACTURER.

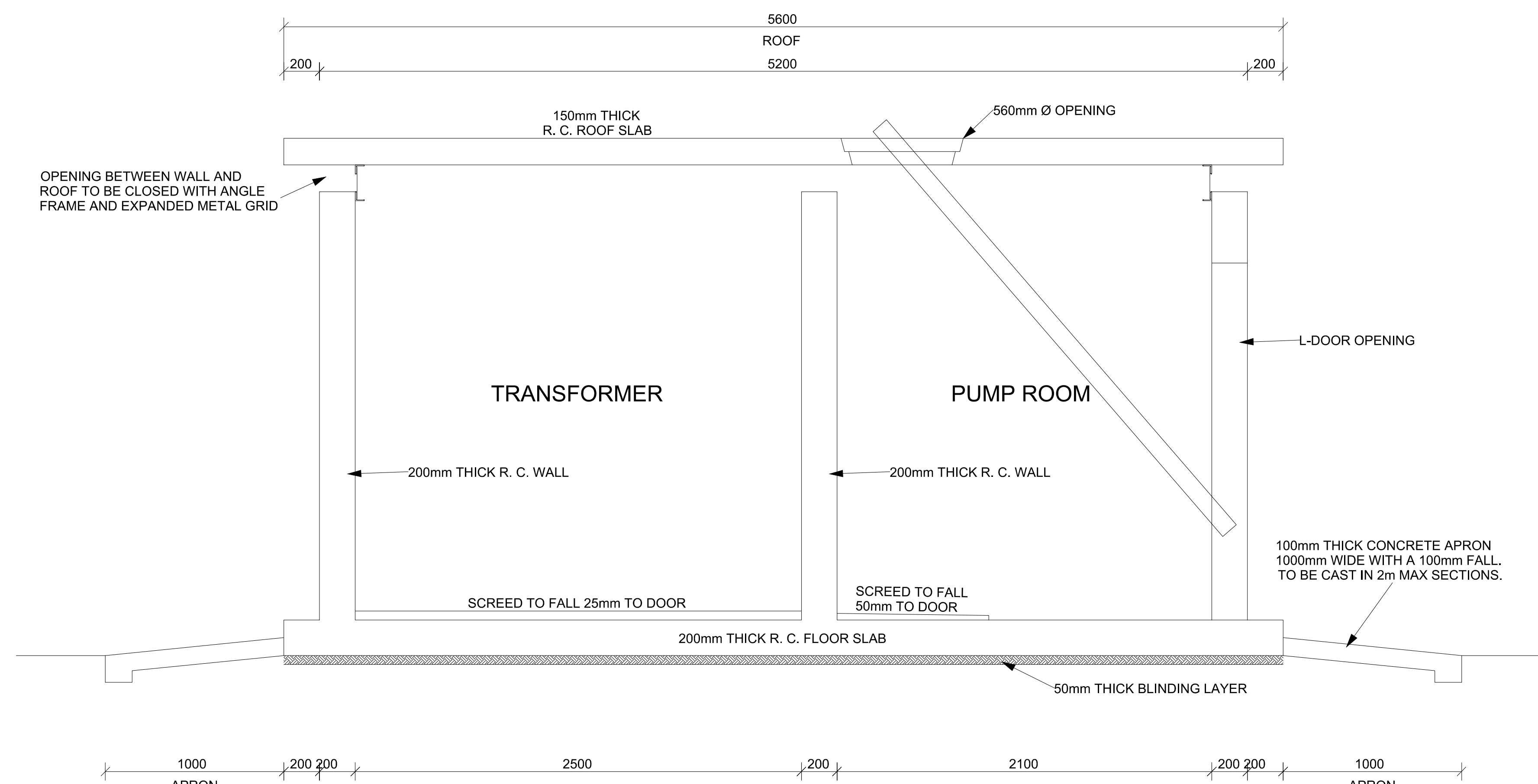
NOTES:	LEGEND:	DESIGNED BY	DIGES GROUP	<div>CLINT:</div> <div></div> <div>GREATER SEKHUKHUNE D. MUNICIPALITY</div> <div>No.3 Mop Street, P.O.Box 5743, Polokwane, 0700 Tel: 015 262 7300</div>	<div>CONSULTANT:</div> <div></div> <div>DYNAMIC INTEGRATED GEOHYDRO ENVIRONMENTAL SERVICES CC</div> <div>98 Marshall Street, P.O.Box 5743, Polokwane, 0700 Tel: 015 261 4151 Fax: 015 261 4167</div>	DRAWING TITLE:	PUMPHOUSE LAYOUT WITH PLATFORM DOOR AND L-DOOR	DRAWING NUMBER:	LCRWS/STD-04	DRAWING No.:	SHEET No.:	
1. Do not scale off this drawing		CHECKED BY	CPM			PROJECT NUMBER:		PROJECT TITLE:	LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1 SEKHUKHUNE DISTRICT MUNICIPALITY			SHEET 1
		DRAWN BY	NJC									SCALE:
REVISION		APPROVED BY	RC -Pr.Eng							CONTRACT No.:		AS SHOWN



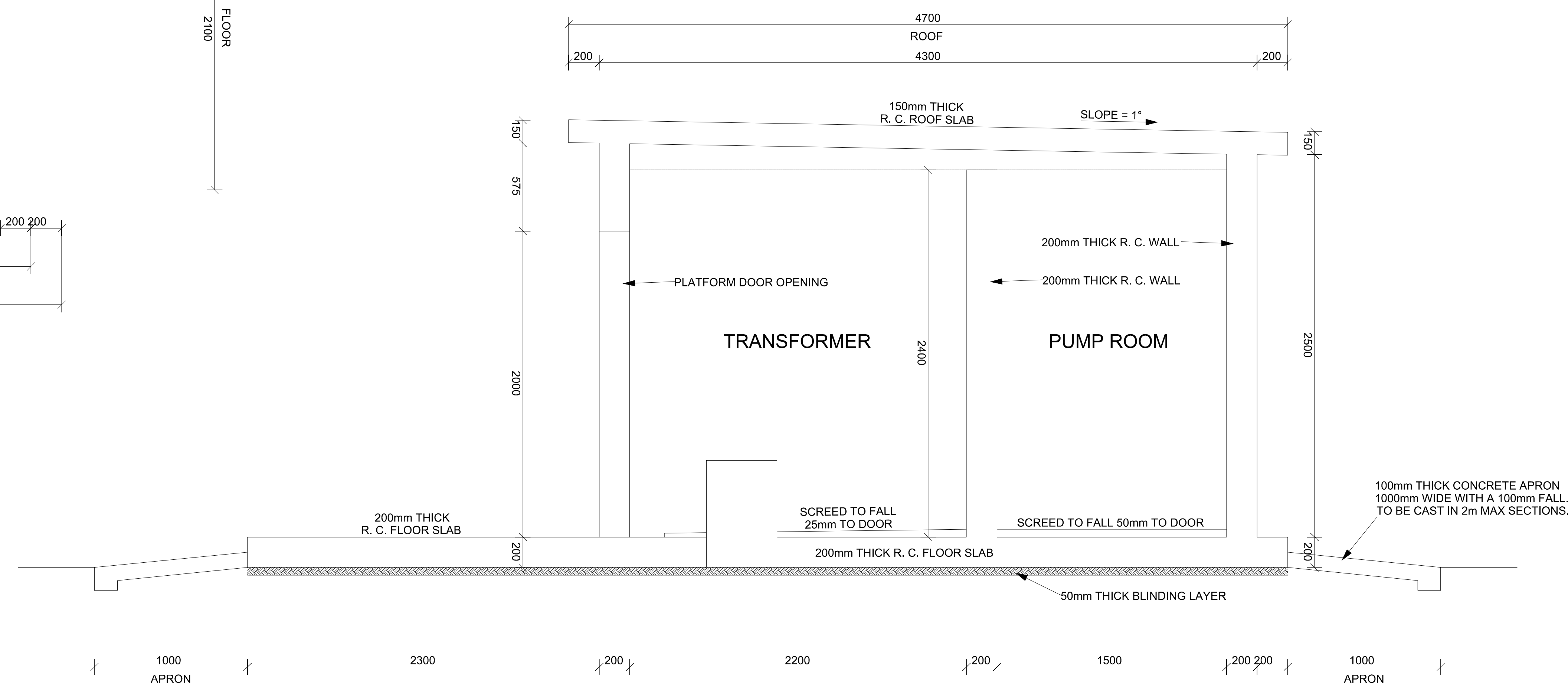
<p>NOTES:</p> <p>1. Do not scale off this drawing</p> <p>REVISION</p>	<p>LEGEND:</p>	DESIGNED BY	DIGES GROUP	<p>CLIENT:</p>  <p>GREATER SEKHUKHUNE D. MUNICIPALITY</p> <p>No.3 Wes Street, P.O.Box 10861, PROVERGSDAL, 0470 Tel: 013 262 7300</p>	<p>CONSULTANT:</p>  <p>Dynamic Integrated Geohydro Environmental Services cc.</p> <p>98 Marshall Street, P.O.Box 5743, Polokwane, 0700 Tel: 018 252 1000</p>	<p>DRAWING TITLE:</p> <p>PUMPHOUSE ROOF PLAN & ELEVATIONS</p>	DRAWING NUMBER:	LCRWS/STD-05	<p>SHEET No:</p> <p>SHEET 1</p>
		CHECKED BY	CPM				PROJECT NUMBER:		
		DRAWN BY	NJC				SCALE:		
		APPROVED BY	RC -Pr.Eng				CONTRACT No:		
								AS SHOWN	




PUMPHOUSE
PLAN
SCALE 1 : 25



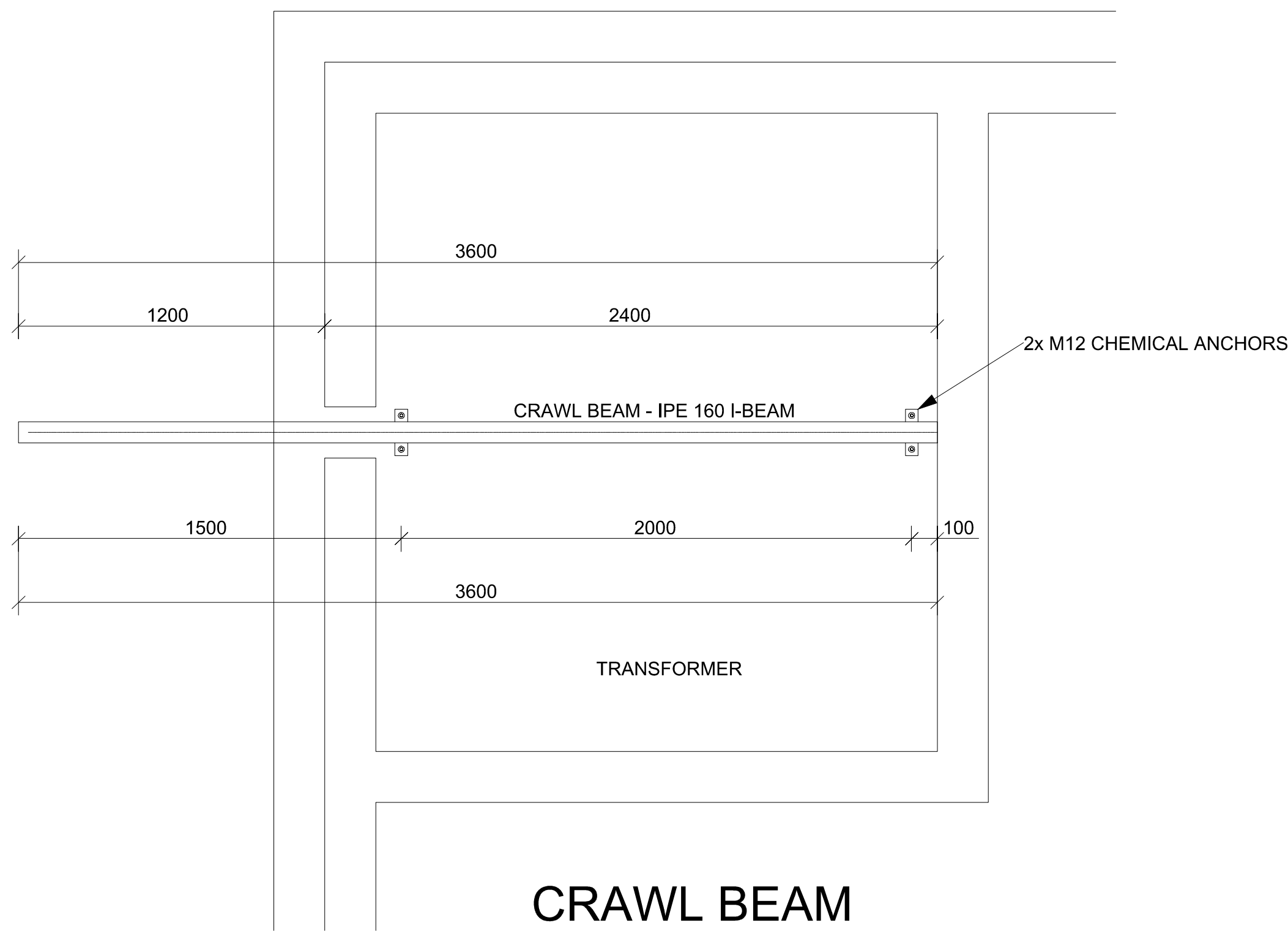
PUMPHOUSE
SECTION A-A
SCALE 1 : 25



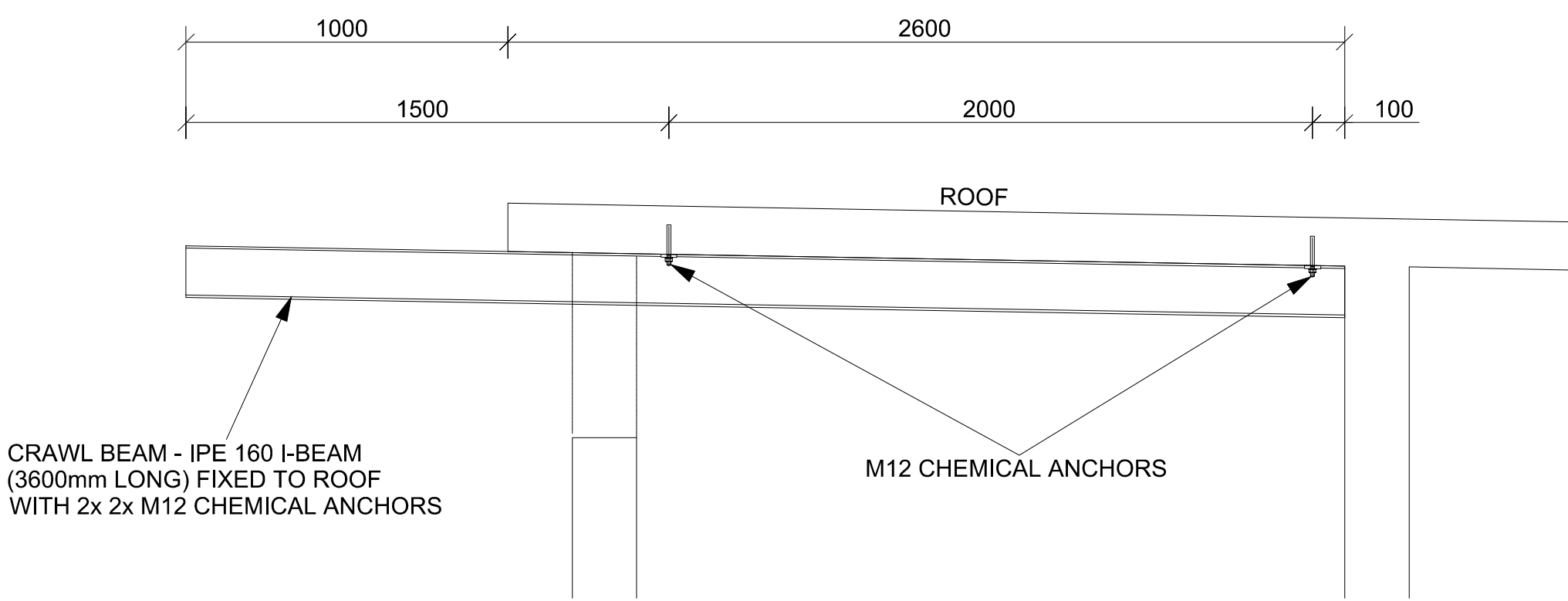
PUMPHOUSE
SECTION B-B
SCALE 1 : 25

NOTES: 1. Do not scale off this drawing	LEGEND:	DESIGNED BY	DIGES GROUP	CLIENT:  GREATER SEKHUKHUNE D. MUNICIPALITY No.3 Mies Street, P.O.Box 5743, Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	CONSULTANT:  Dynamic Integrated Geohydro Environmental Services cc. 88 Marshall Street, P.O.Box 5743, Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	DRAWING TITLE: PUMPHOUSE PLAN AND SECTIONS LAYOUT PROJECT TITLE: LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1 SEKHUKHUNE DISTRICT MUNICIPALITY	DRAWING NUMBER: LCRWS/STD-06	SHEET No.: SHEET 1
		CHECKED BY	CPM				PROJECT NUMBER:	SCALE: AS SHOWN
		DRAWN BY	NJC				CONTRACT No.:	
		APPROVED BY	RC -Pr.Eng					

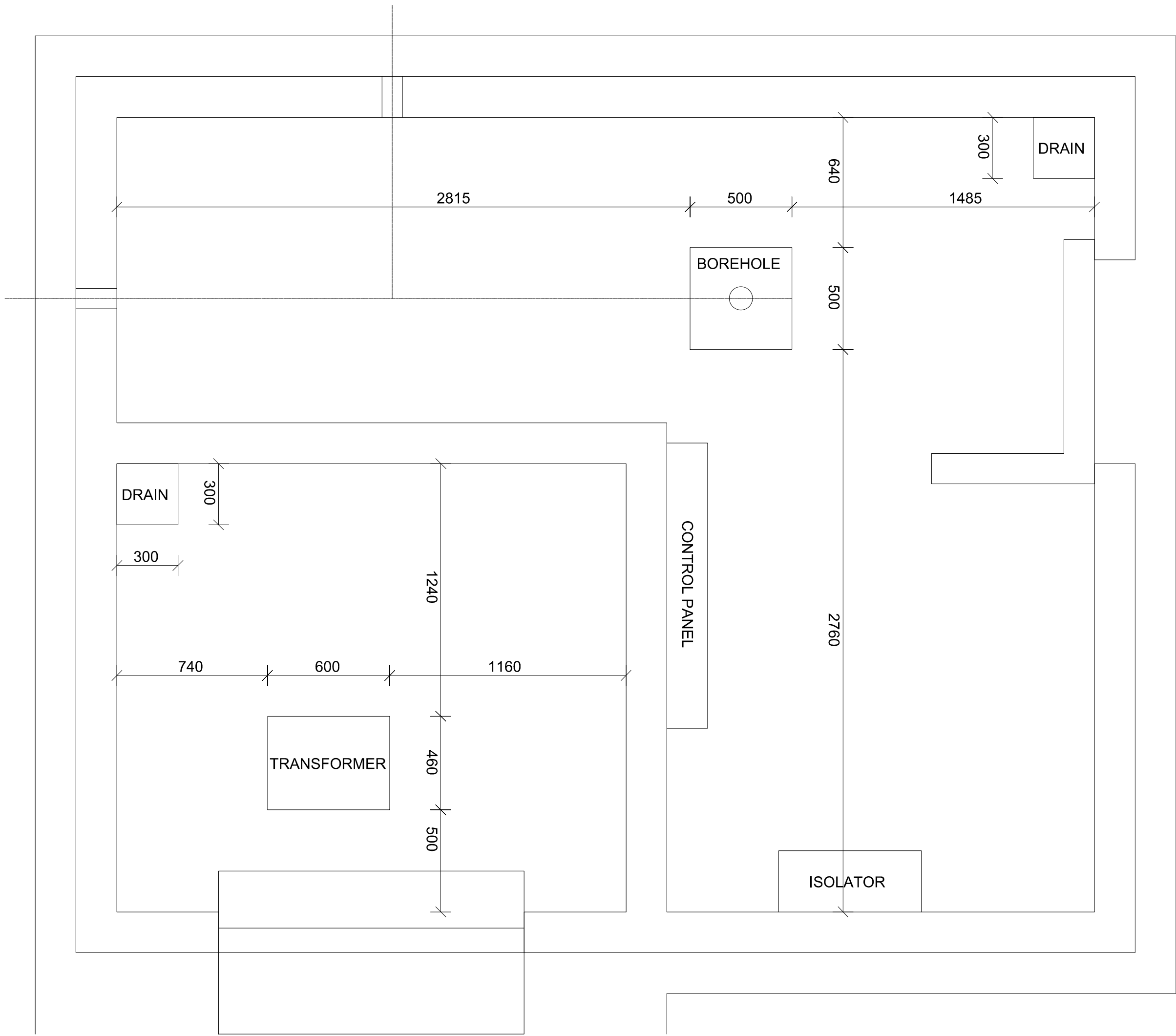
REVISION



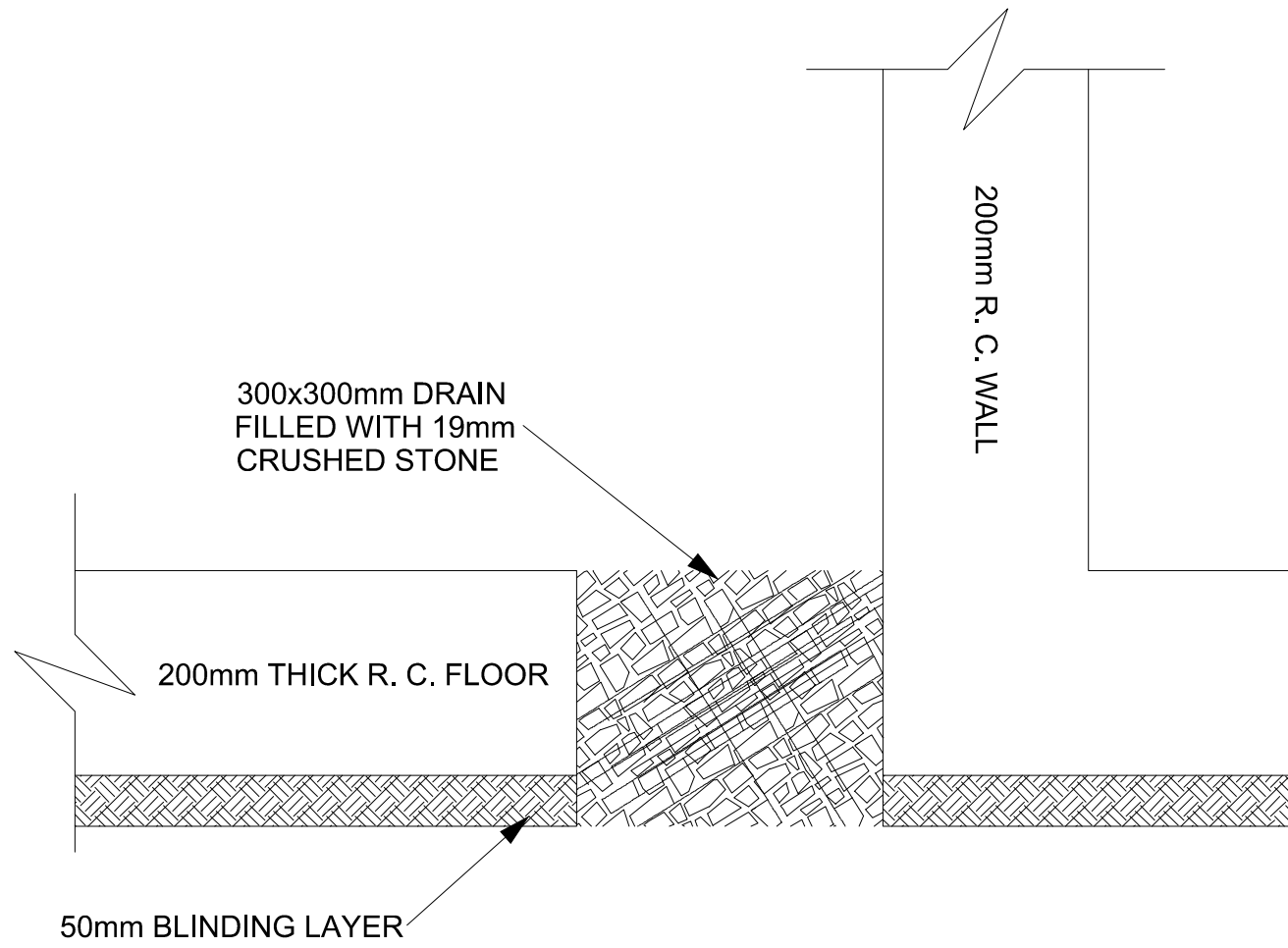
CRAWL BEAM
PLAN
SCALE 1 : 25



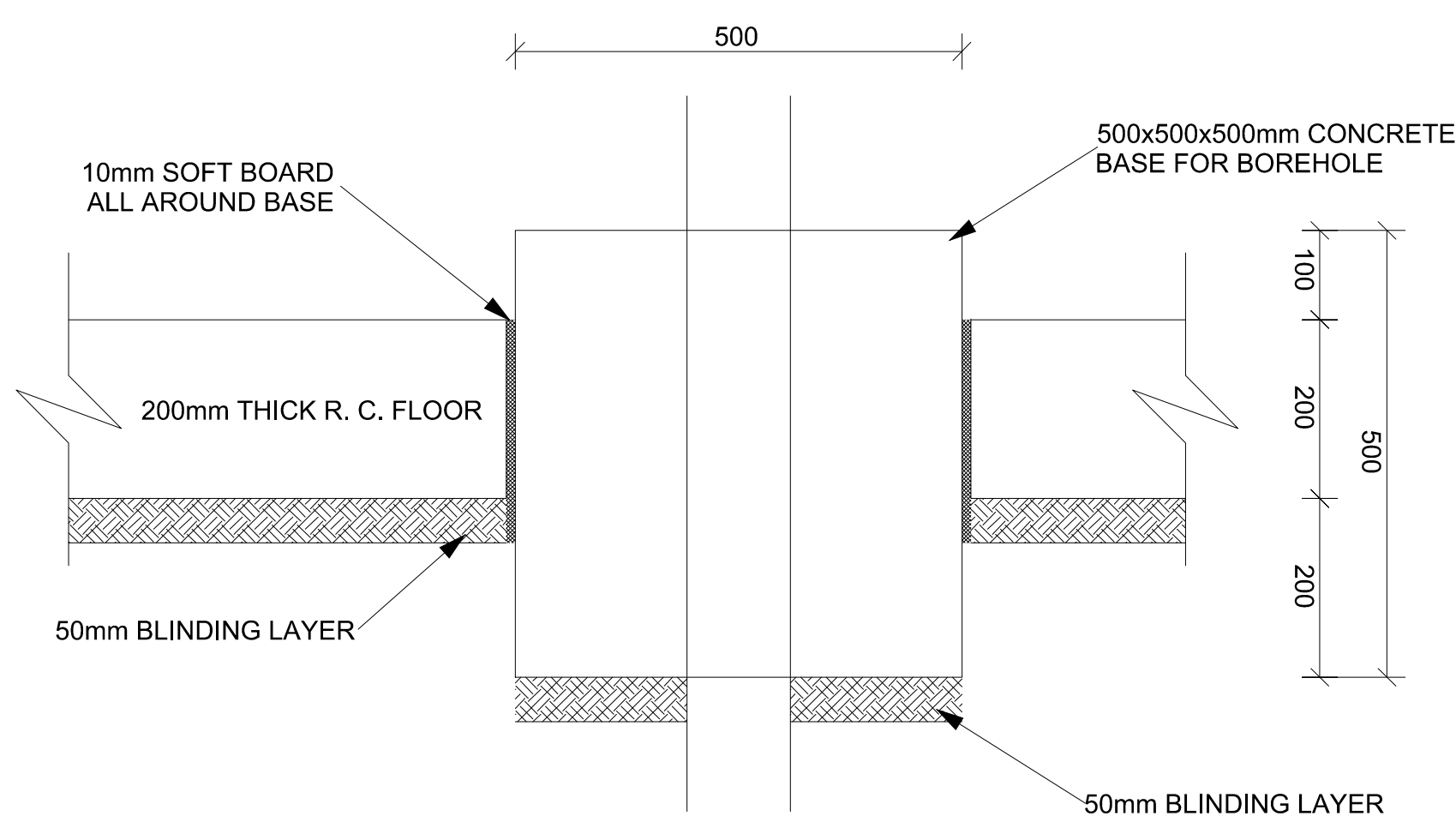
CRAWL BEAM
ELEVATION
SCALE 1 : 25



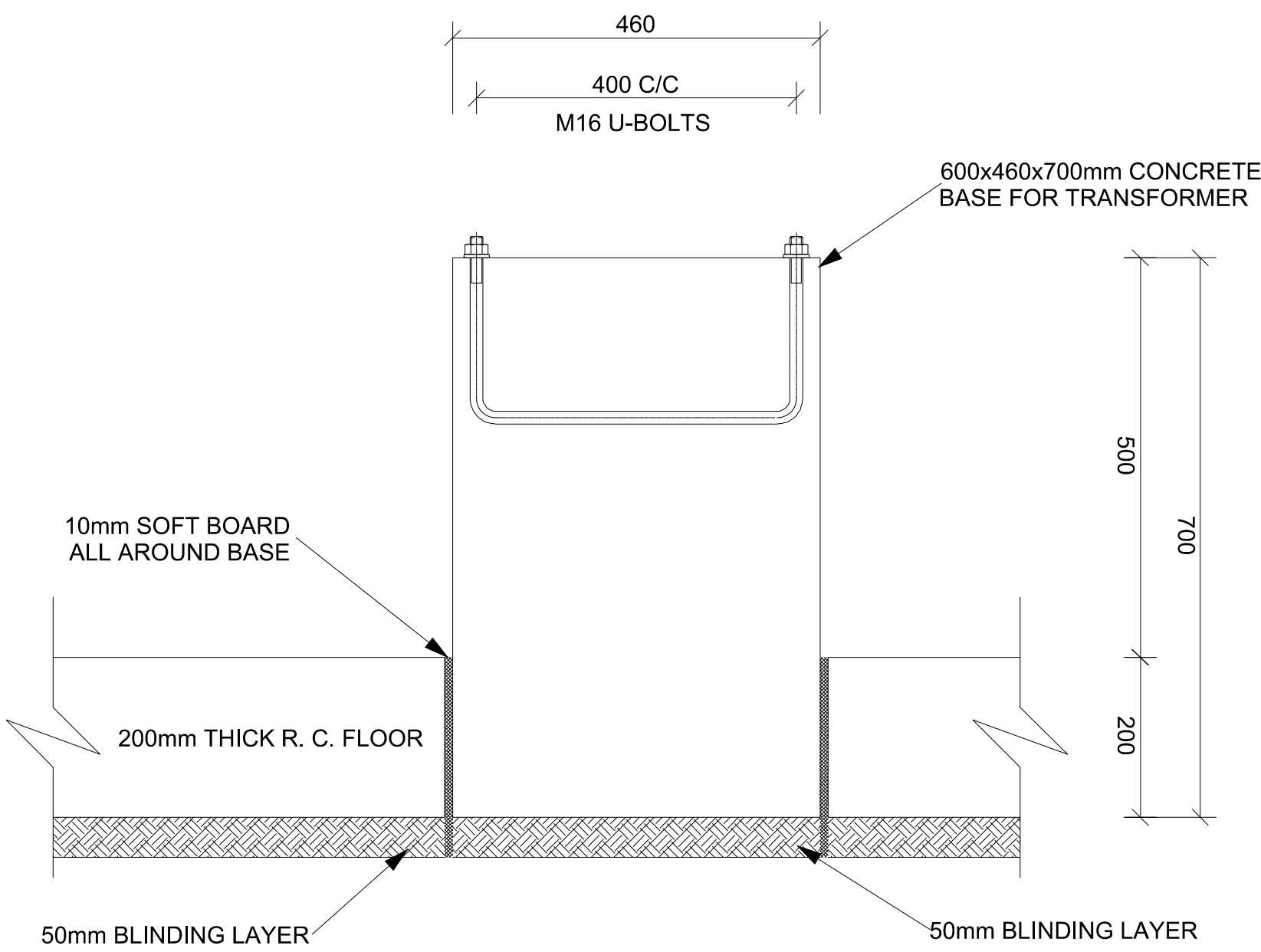
CONCRETE BASES
LAYOUT PLAN
SCALE 1 : 25



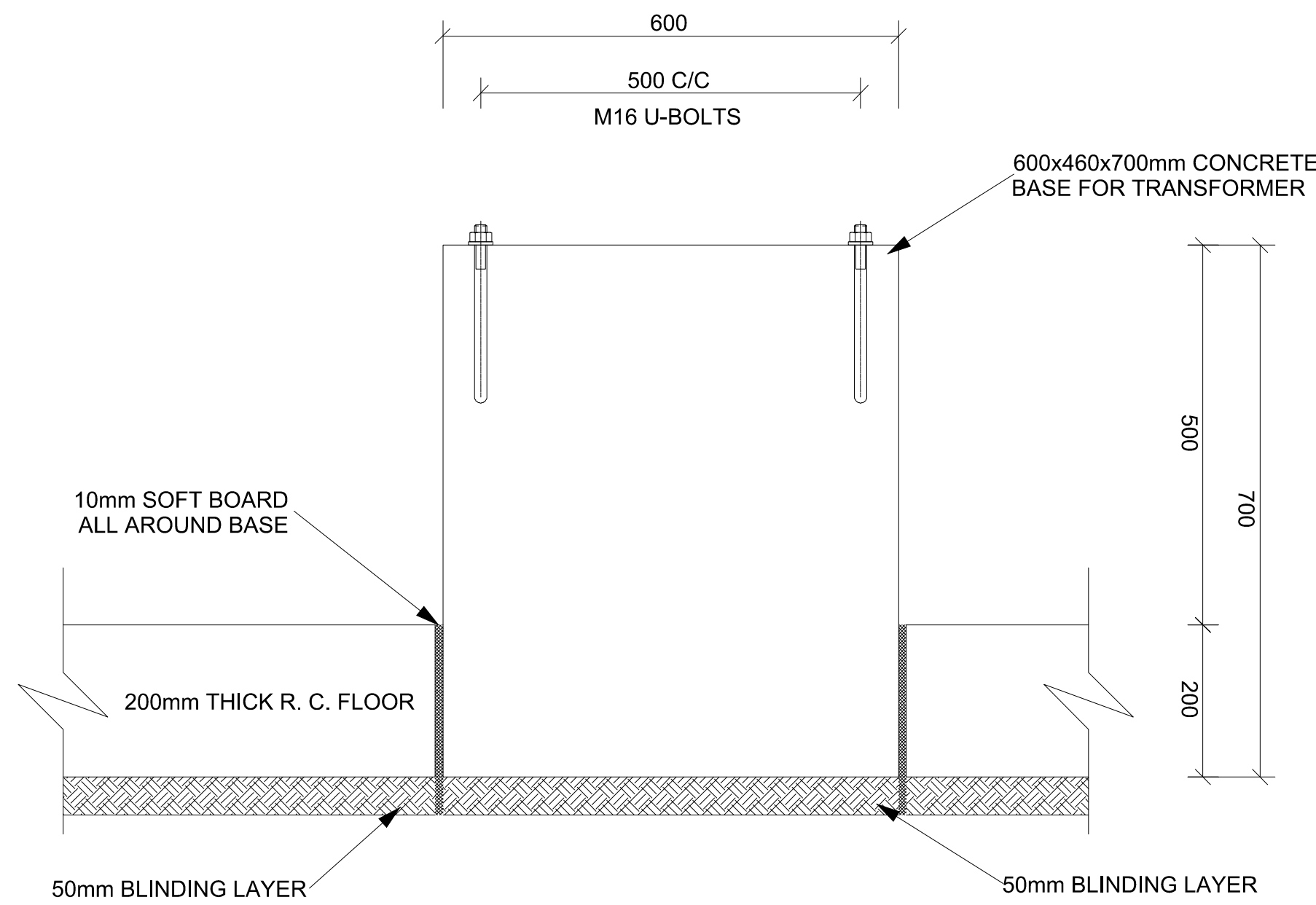
DRAIN
SECTION
SCALE 1 : 10



BOREHOLE
SECTION
SCALE 1 : 10

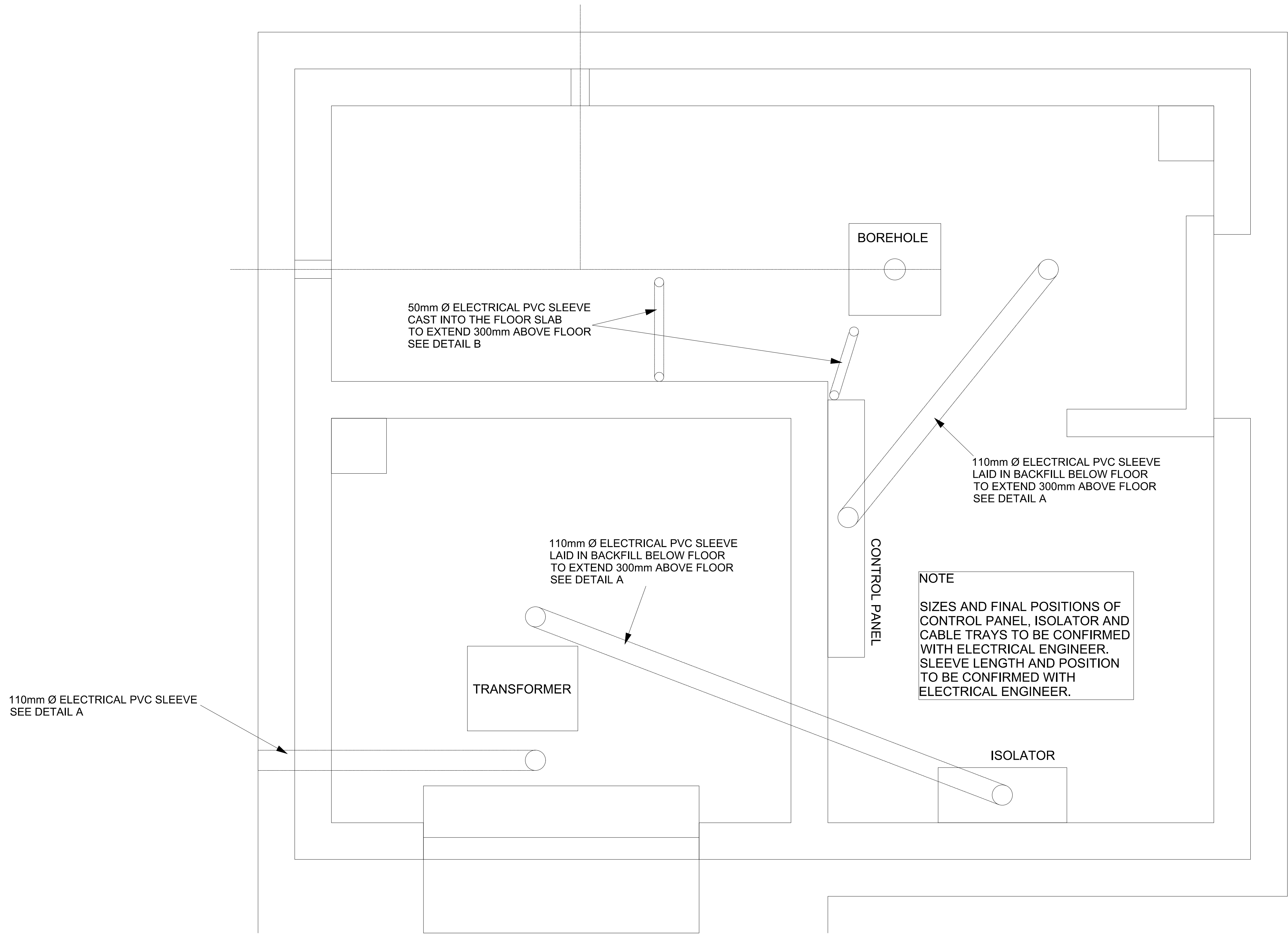


TRANSFORMER
SECTION
SCALE 1 : 10

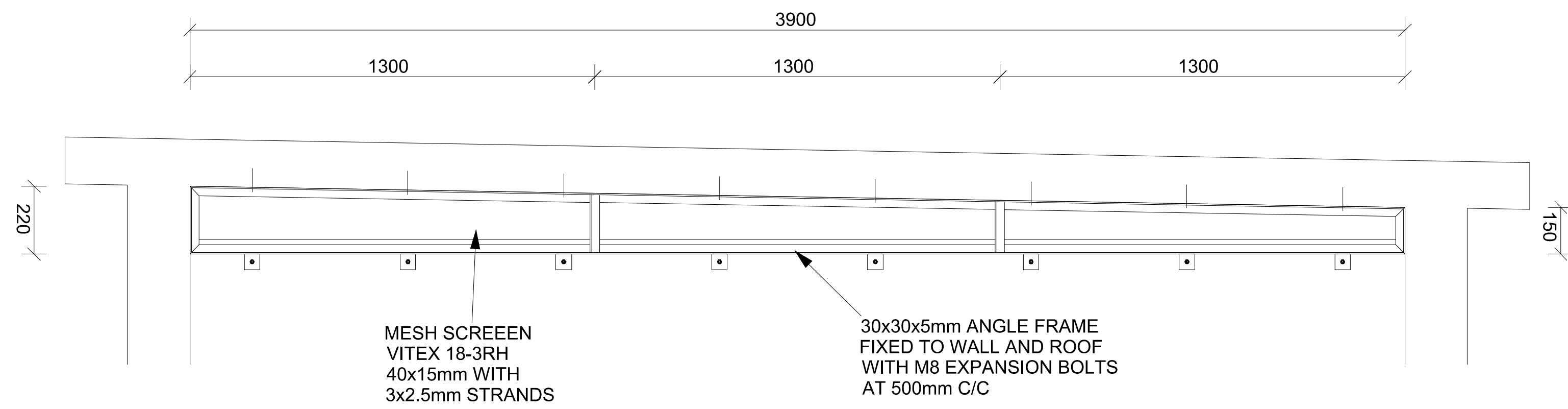


TRANSFORMER
SECTION
SCALE 1 : 10

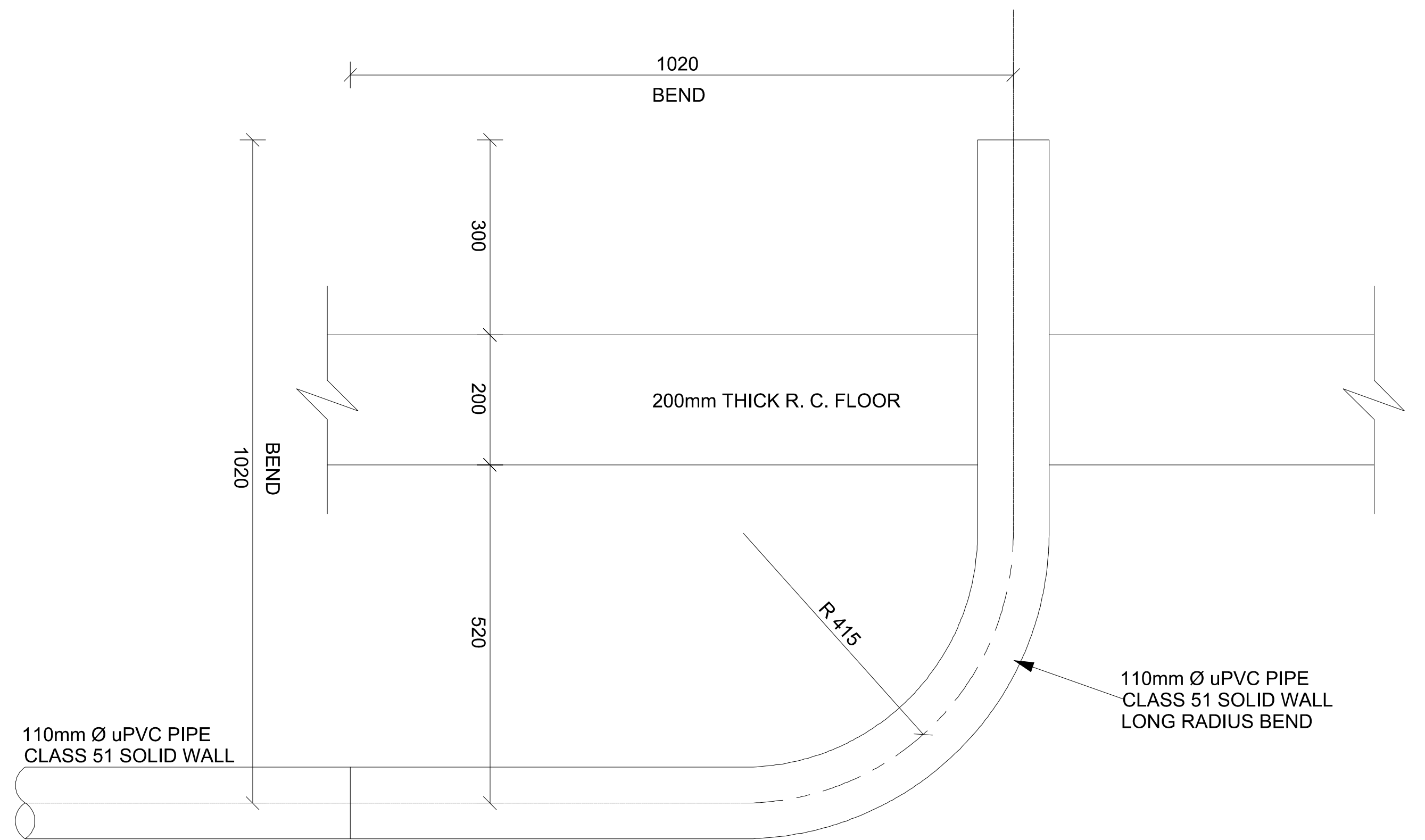
NOTES: 1. Do not scale off this drawing <



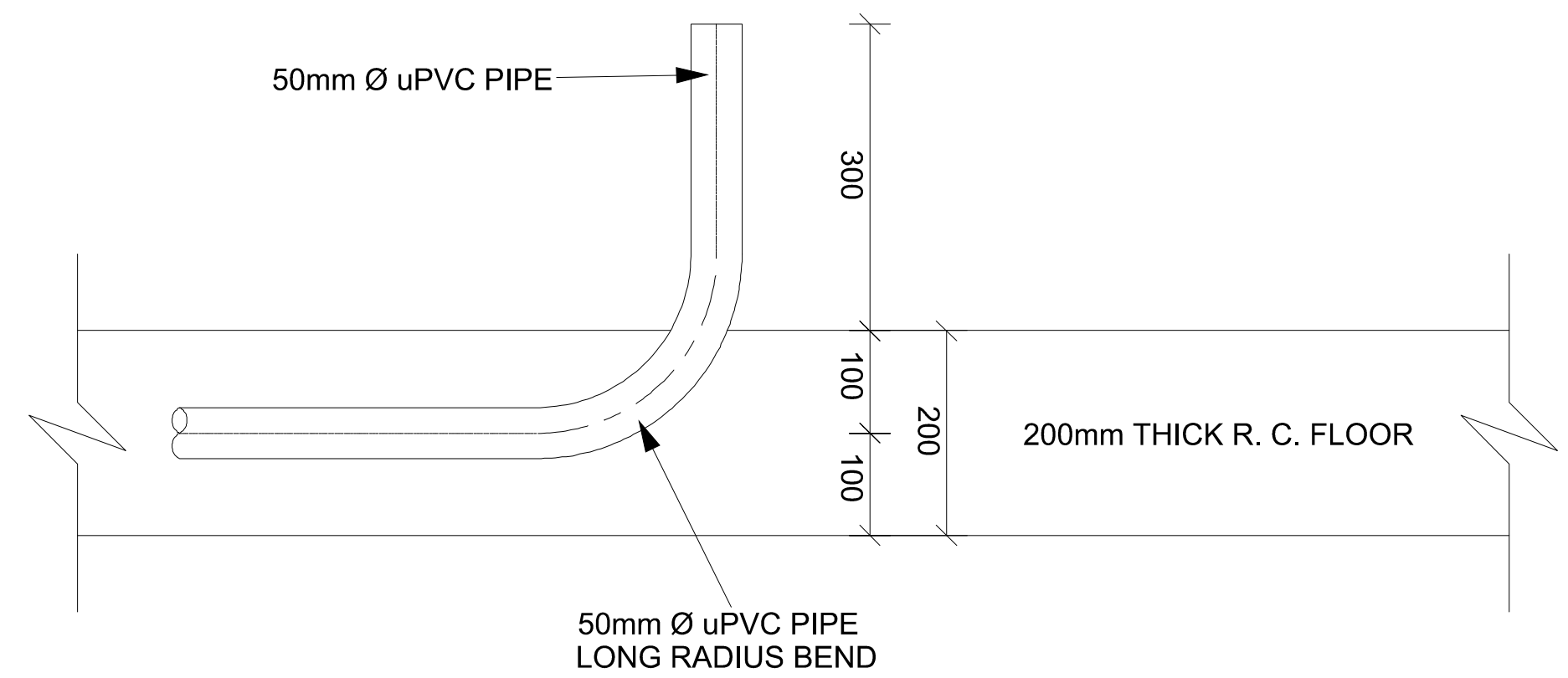
SLEEVES
LAYOUT PLAN
SCALE 1 : 20



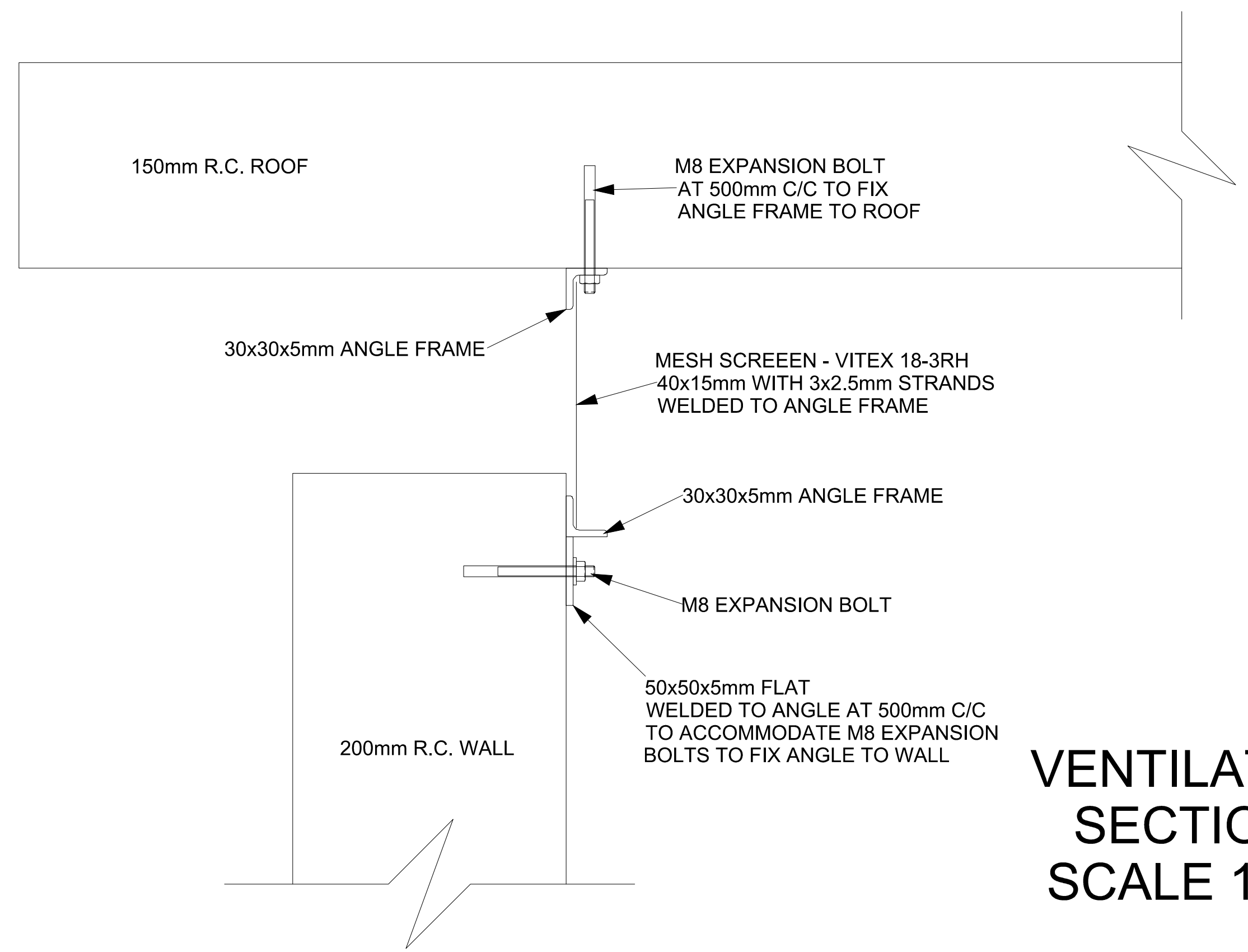
VENTILATOR
ELEVATION
SCALE 1 : 20



DETAIL A
SCALE 1 : 10



DETAIL B
SCALE 1 : 10



VENTILATOR
SECTION
SCALE 1 : 5

NOTES:
1. Do not scale off this drawing

LEGEND:

DESIGNED BY	DIGES GROUP
CHECKED BY	CPM
DRAWN BY	NJC
APPROVED BY	RC -Pr.Eng


CLIENT:



GREATER SEKHUKHUNE D. MUNICIPALITY

No 3 Wess Street,
P.O.BAG 19811, GROBLERSDAL, 0470
Tel: 015 291 7300

CONSULTANT:



Dynamic Integrated Geohydro
Environmental Services cc.

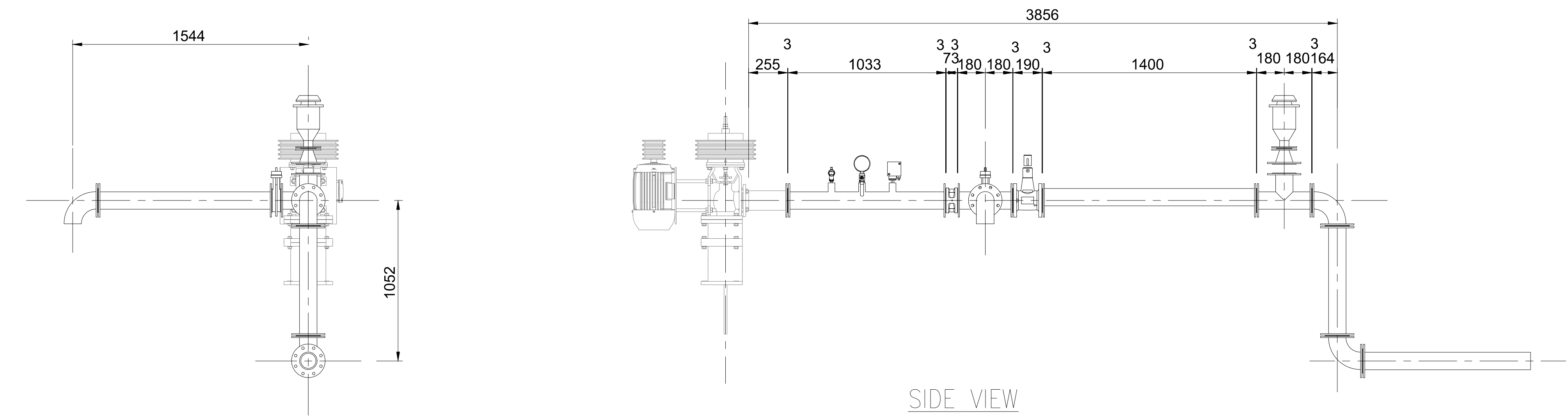
88 Marshall Street,
P.O.Box 5743, Polokwane, 0700
Tel: 015 291 4151 Fax: 015 291 4167

DRAWING TITLE:
PUMPHOUSE SLEEVES AND STEEL VENTILATOR

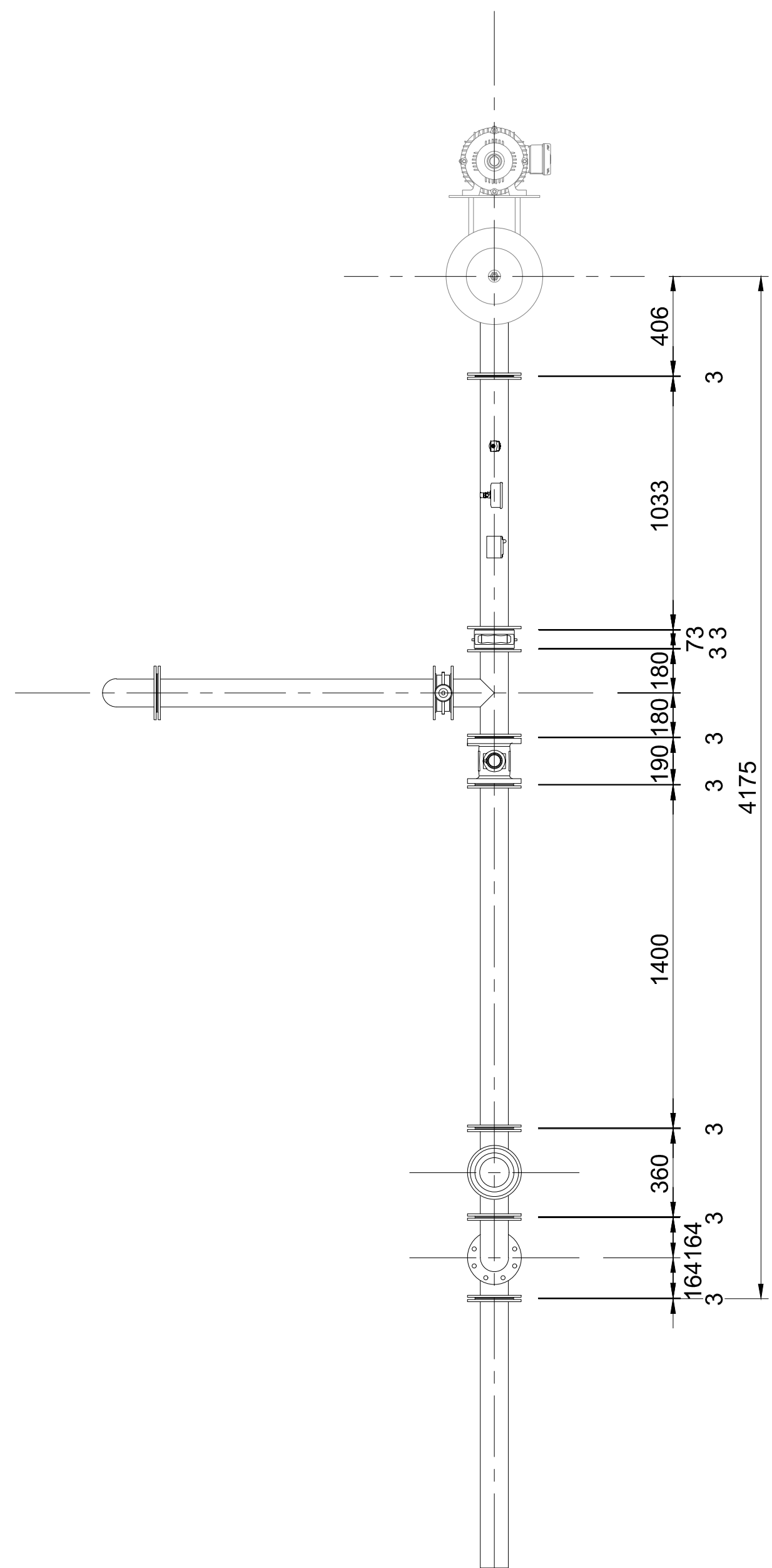
PROJECT TITLE:
**LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1
SEKHUKHUNE DISTRICT MUNICIPALITY**

DRAWING NUMBER: LCRWS/STD-08	SHEET No.: SHEET 1
PROJECT NUMBER:	SCALE: AS SHOWN
CONTRACT No.:	

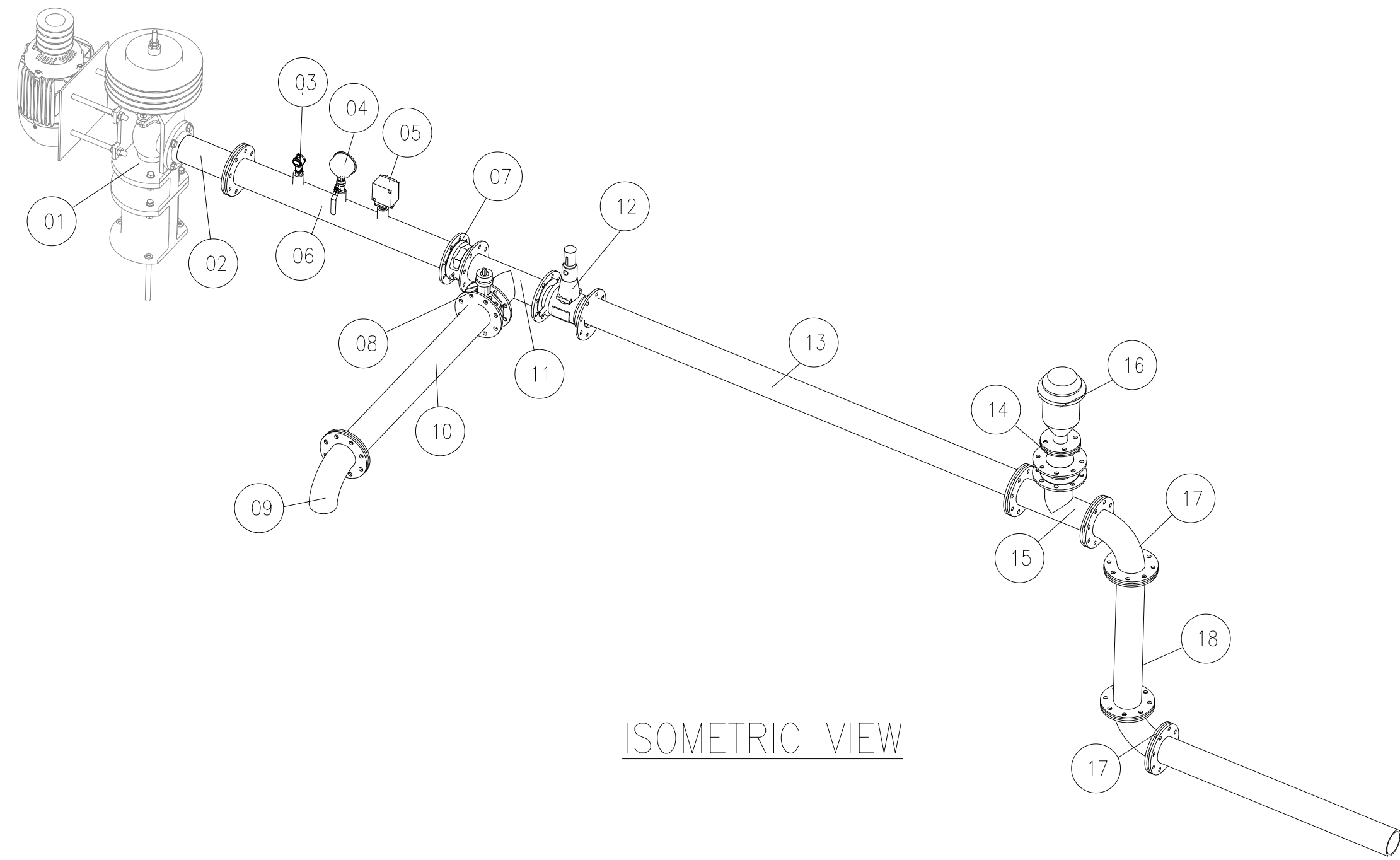
REVISION



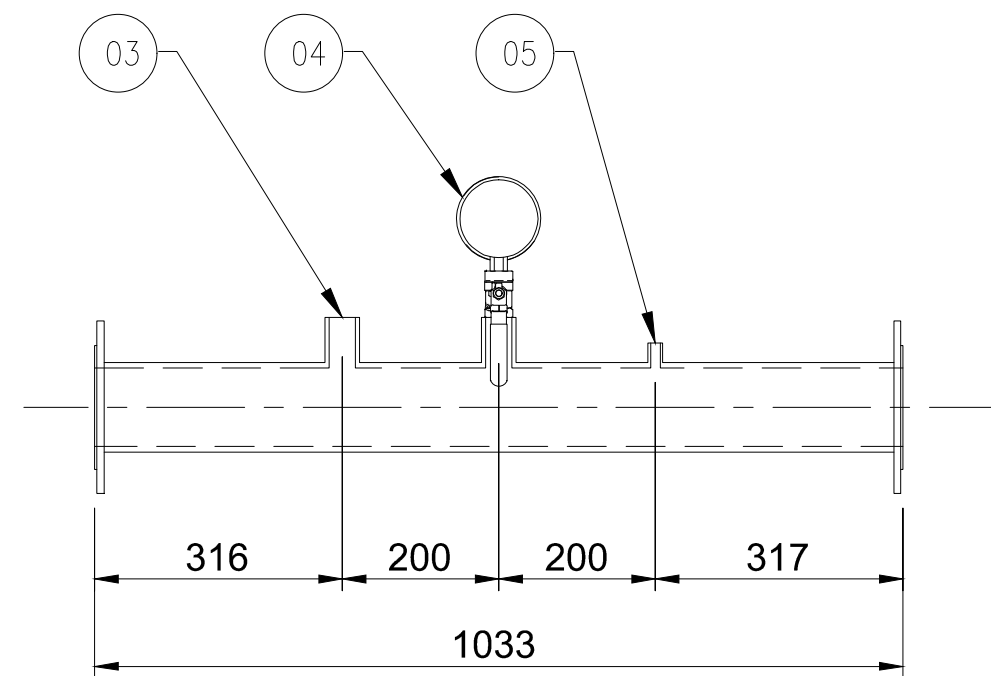
FRONT VIEW



PLAN VIEW



ISOMETRIC VIEW



DETAIL VIEW ITEM 06

MATERIAL LIST ABOVE PUMP MANIFOLD				
ITEM No	No. OFF	DESCRIPTION	I.D.(in mm)	COMMENT
1	1	TYP MONO PUMP		OR SIMILAR APPROVED
2	1	SPECIAL CONNECTION	100	
3	1	BSP SOCKET	25	
4	1	BSP SOCKET WITH BALL VALVE	25	GLYCERINE PRESSURE GAUGE 0–1600 KPA 304.55 BALL VALVE
5	1	NPT SOCKET	12.5	
6	1	SPECIAL ITEM DETAIL	100	
7	1	NON RETURN VALVE	100	WAFER TYPE SPRING LOADED
8	2	BUTTERFLY VALVE	100	
9	1	90° SHORT RADIUS BEND FLANGED ONE SIDE	100	
10	1	PIPE	100	
11	2	T–PIECE FLANGED	100	
12	1	GATE VALVE FLANGED	100	RSV TYPE
13	1	PIPE	100	
14	1	CONCENTRIC REDUCER	100–80	
15	1	PIPE	100	
16	1	AIR RELIEF VALVE	80	ARI D46 MIN PN16
17	2	90° SHORT RADIUS BEND FLANGE	100	

NOTE FOR ALL VALVES
SIZE AND TYPE FROM WATER SURGE REQUIREMENT TAKES PREFERENCE



- NOTES:
- MAKE OF ALL VALVES TO BE APPROVED BY ENGINEER IN WRITING.
 - ALL BOLT HOLES TO STRADDLE CENTRE LINES.
 - ALL WELDING TO BE FULL STRENGTH AND FULL PENETRATION.
 - WHERE PLAIN ENDS FOR PIPING ARE CALLED FOR, PLAIN ENDS AND FLEXIBLE COUPLINGS MUST MATCH.
 - CORROSION PROTECTION SHALL BE IN ACCORDANCE WITH DWS 9000 C1 – CORROSION PROTECTION FOR STEEL PIPES AND SPECIALS FOR PIPELINES.
LEGEND OF CORROSION PROTECTION IS AS FOLLOWS:
 - G. GALVANISING
 - EC. EPOXY COATING
 - D. DENSO TAPE WRAPPING
 - P. PAINTING – TOUCH UPS

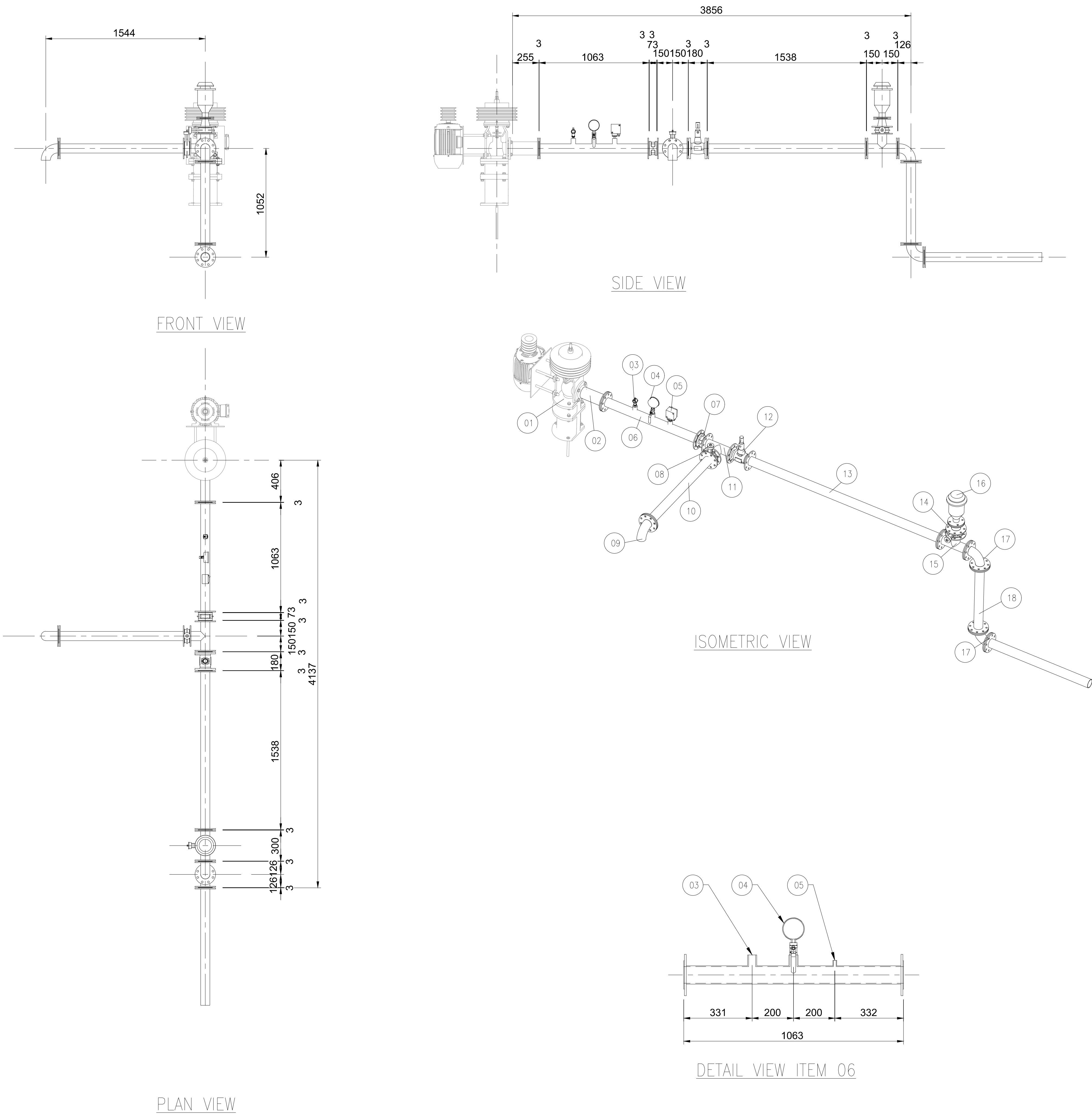
a) ALL PIPES SPECIALS SHALL BE GALVANISED BY THE HOT DIP GALVANISING (HDG) PROCESS TO PROVIDE A MINIMUM THICKNESS OF ZINC COATING OF 105 MICRON IN ACCORDANCE WITH SANS 121 (ISO 1481) FOR HEAVY DUTY APPLICATIONS. HDG PIPE IS NOT TO BE PASSIVATED, THE SURFACE SHOULD BE DEGREASED, SWEEP BLAST, AND THEN APPLY A SUITABLE PRIMER TO BOND TO THE HDG

b) HDG PIPE AND FITTINGS TO BE DEGREASED, PREPARED BY LIGHT ABRASION AND OVER COATED WITH A >90% ZINC PAINT FOR 120 MICRON DFT
 - ALL LEVELS TO BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK, AND THE ENGINEER TO BE NOTIFIED IN CASE OF ANY DISCREPANCIES.
 - ALL GASKETS, BOLTS, NUTS AND WASHERS TO BE SUPPLIED WITH FITTINGS TO ENSURE A COMPLETE INSTALLATION.
 - ALL UNDERGROUND STEEL PIPE AND FITTINGS TO HAVE A CORROSION PROTECTION SYSTEM COMPRISING OF A VOID FILLING PUTTY WITH CORROSION PROTECTION TAPE AND PVC OUTERWRAP DENSO (PROFILING MASTIC, PETROLATUM TAPE AND CLINGWRAP); STOPAQ (4100 PUTTY, WRAPPINGBAND C2H AND OUTERWRAP PVC) OR SIMILAR APPROVED
 - MACFLOW METER AND FLANGES ON EITHER SIDE OF MACFLOW METER MUST BE DRILLED AND TAPPED M6X20 DEEP ON THE SIDE OF THE FLANGE IN THE 9 O' CLOCK POSITION LOOKING IN THE DIRECTION OF FLOW. M6X15 LG EARTHING BOLTS AND WASHERS TO BE SUPPLIED.
 - FOR REFERENCE DRAWINGS SEE REFERENCE COLUMN ON DRG.
 - WHERE FOUNDING ON CLAY, A FLANGE ADAPTOR AND 500MM OF HDMS TO BE ADDED AT EACH END OF THE INSTALLATION. ENGINEER TO CONFIRM.
 - 1.2m LONG EARTHING ROD SHALL BE HAMMERED INTO THE SOIL BELOW THE CHAMBER. THE ROD FORMS THE EARTHING POINT AND MUST PROTRUDE 250mm ABOVE THE TOP OF THE CONCRETE BASE SLAB DIRECTLY BELOW THE FLOW METER.

- PIPING SPECIFICATIONS:
- PIPING SPEC. FOR 400 NB. AND BELOW TO BE ANSI B36.19 SHED. 40
PIPING SPEC. FOR 450 NB. AND ABOVE TO BE ANSI B36.19 SHED. 20
 - ALL FLANGES TO BE SLIP ON BS 4504 MIN TABLE 16.
ALL PUDDLE FLANGES TO BE SLIP ON UNDRILLED.
 - ALL FITTINGS 400 NB. AND BELOW TO BE ANSI (ASA) B16.9 SHED. 40
ALL FITTINGS 450 NB. AND ABOVE TO BE ANSI (ASA) B16.9 SHED. 20
 - ALL GASKETS TO BE FLAT RING TYPE, 3mm THK. KLINGER TYPE
TG200, DRILLING TO ANSI (ASA) B16.9, MATL. COMPRESSED EXPANDED GRAPHITE.
 - ALL BOLTS TO BE SABS 1700 S–1 (SABS) Gr. 8.8 GALVANISED.
ALL NUTS TO BE SABS 1700 S–2 (SABS) Gr. 8 GALVANISED.
ALL WASHERS TO BE FLAT TYPE GALVANISED.
 - GATE VALVE TO BE PREMIER TYPE RESILIENT SEAL NON–RISING SPINDLE MIN PN16
 - CHECK VALVE TO BE PREMIER TYPE SWING CHECK TYPE MIN PN16.
 - SOCKET TO BE WROUGHT STEEL SCREWED TO ISO–R7 DIM'S TO BS1740.
SOCKET WELDED TO PIPE TO BE HOT DIP GALVANIZED.
 - PLUG TO BE WROUGHT STEEL SCREWED TO ISO–R7.
 - SPOOL PIECE INCLUDING GASKET TO SUIT FLOW METER / GASKET PROVIDED.
 - ALL WELDING AND TAPPING TO BE COMPLETE PRIOR TO GALVANIZING.

- GENERAL NOTES
- ALL AMBIGUITIES ON DRAWING MUST BE REPORTED TO THE DESIGN ENGINEER BEFORE COMMENCEMENT OF CONSTRUCTION.
 - PRIOR TO ANY WORK BEING DONE, A SURVEY OF THE EXISTING GROUND WORK, TO BE PROVIDED TO THE ENGINEER BY THE CONTRACTOR.
 - ALL WORK MUST BE DONE IN ACCORDANCE WITH THE STANDARD SANS 1200 SPECIFICATION AND THIS PROJECT'S APPLICABLE CONTRACT DOCUMENTATION.

NOTES: 1. Do not scale off this drawing	LEGEND:	DESIGNED BY	DIGES GROUP	CLIENT:  GREATER SEKHUKHUNE D. MUNICIPALITY No.3 Wen Street, P.O.Box 5743, Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	CONSULTANT:  Dynamic Integrated Geohydro Environmental Services cc. 98 Marshall Street, P.O.Box 5743, Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	DRAWING TITLE: PUMPSTATION MANIFOLD LAYOUT & DETAILS - 100NB	DRAWING NUMBER: LCRWS/STD-01	SHEET No: SHEET 1
		CHECKED BY	CPM				PROJECT NUMBER:	
		DRAWN BY	NJC			PROJECT TITLE: LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1 SEKHUKHUNE DISTRICT MUNICIPALITY	CONTRACT No:	SCALE: AS SHOWN
		APPROVED BY	RC -Pr.Eng					



MATERIAL LIST ABOVE PUMP MANIFOLD				
ITEM No.	No. OFF	DESCRIPTION	I.D.(in mm)	COMMENT
1	1	TYP MONO PUMP		OR SIMILAR APPROVED
2	1	SPECIAL CONNECTION	80	
3	1	BSP SOCKET	25	
4	1	BSP SOCKET WITH BALL VALVE	25	GLYCERINE PRESSURE GAUGE 0-1600 KPA 304.55 BALL VALVE
5	1	NPT SOCKET	25	
6	1	SPECIAL ITEM DETAIL	80	
7	1	NON RETURN VALVE	80	WAFER TYPE SPRING LOADED
8	2	BUTTERFLY VALVE	80	
9	1	90° SHORT RADIUS BEND FLANGED ONE SIDE	80	
10	1	PIPE	80	
11	2	T-PIECE FLANGED	80	
12	1	GATE VALVE FLANGED	80	RSV TYPE
13	1	PIPE	80	
14	1	CONCENTRIC REDUCER	80-50	
15	1	PIPE	80	
16	1	AIR RELIEF VALVE	80	ARI D46 MIN PN16
17	2	90° SHORT RADIUS BEND FLANGE	80	

NOTE FOR ALL VALVES
SIZE AND TYPE FROM WATER SURGE REQUIREMENT TAKES PREFERENCE

- NOTES:
- MAKE OF ALL VALVES TO BE APPROVED BY ENGINEER IN WRITING.
 - ALL BOLT HOLES TO STRADDLE CENTRE LINES.
 - ALL WELDING TO BE FULL STRENGTH AND FULL PENETRATION.
 - WHERE PLAIN ENDS FOR PIPING ARE CALLED FOR, PLAIN ENDS AND FLEXIBLE COUPLINGS MUST MATCH.
 - CORROSION PROTECTION SHALL BE IN ACCORDANCE WITH DWS 9000 C1 - CORROSION PROTECTION FOR STEEL PIPES AND SPECIALS FOR PIPELINES.

LEGEND OF CORROSION PROTECTION IS AS FOLLOWS:



G. GALVANISING
EC. EPOXY COATING
D. DENSO TAPE WRAPPING
P. PAINTING - TOUCH UPS

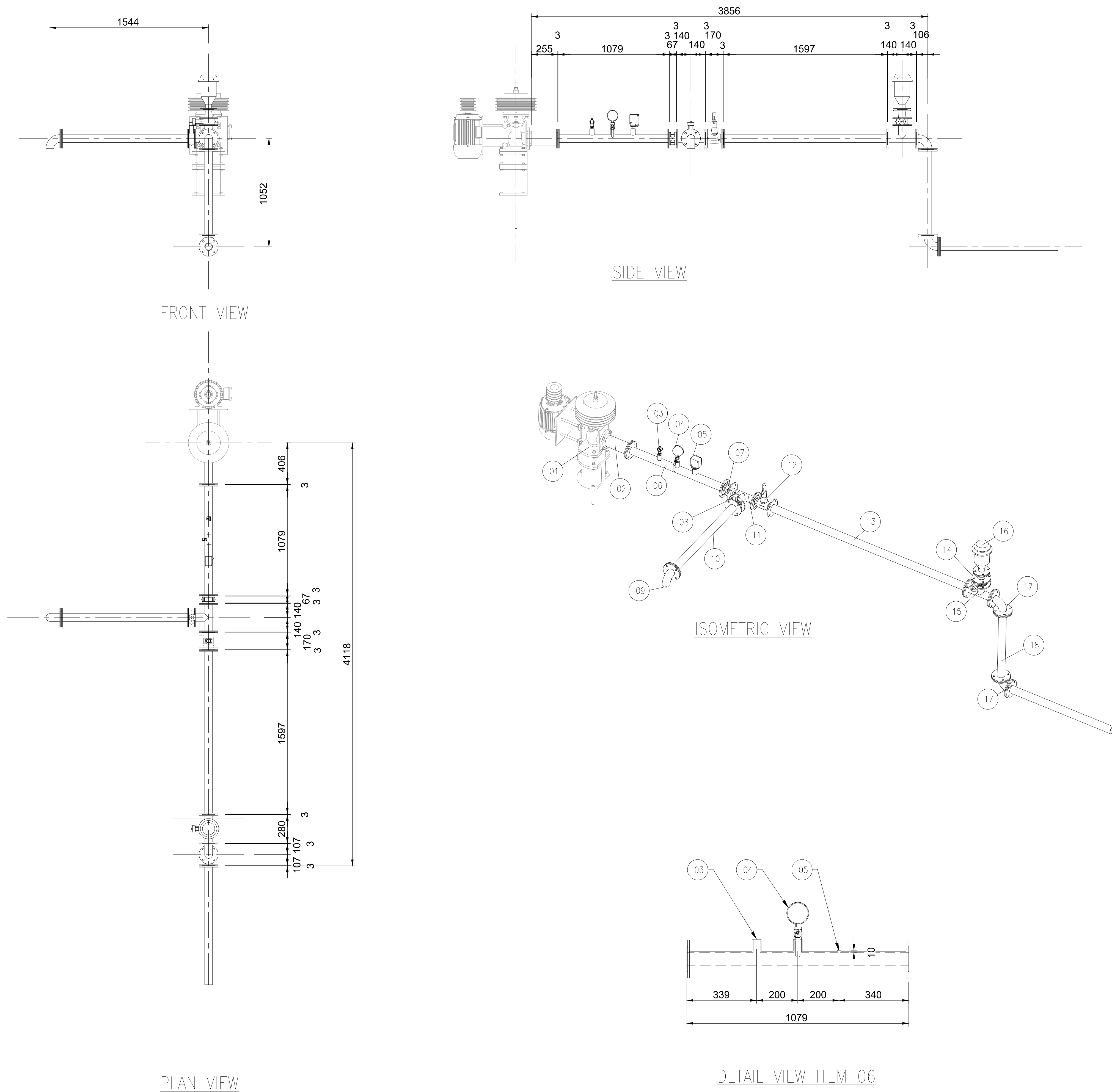
a) ALL PIPES SPECIALS SHALL BE GALVANISED BY THE HOT DIP GALVANISING (HDG) PROCESS TO PROVIDE A MINIMUM THICKNESS OF ZINC COATING OF 105 MICRON IN ACCORDANCE WITH SANS 121 (ISO 1481) FOR HEAVY DUTY APPLICATIONS. HDG PIPE IS NOT TO BE PASSIVATED, THE SURFACE SHOULD BE DEGREASED, SWEEP BLAST, AND THEN APPLY A SUITABLE PRIMER TO BOND TO THE HDG

b) HDG PIPE AND FITTINGS TO BE DEGREASED, PREPARED BY LIGHT ABRASION AND OVER COATED WITH A >90% ZINC PAINT FOR 120 MICRON DFT
 - ALL LEVELS TO BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK, AND THE ENGINEER TO BE NOTIFIED IN CASE OF ANY DISCREPANCIES.
 - ALL GASKETS, BOLTS, NUTS AND WASHERS TO BE SUPPLIED WITH FITTINGS TO ENSURE A COMPLETE INSTALLATION.
 - ALL UNDERGROUND STEEL PIPE AND FITTINGS TO HAVE A CORROSION PROTECTION SYSTEM COMPRISING OF A VOID FILLING PUTTY WITH CORROSION PROTECTION TAPE AND PVC OUTERWRAP DENSO (PROFILING MASTIC, PETROLATUM TAPE AND CLINGWRAP); STOPAQ (4100 PUTTY, WRAPPING BAND C2H AND OUTERWRAP PVC) OR SIMILAR APPROVED.
 - MACFLOW METER AND FLANGES ON EITHER SIDE OF MACFLOW METER MUST BE DRILLED AND TAPPED M6X20 DEEP ON THE SIDE OF THE FLANGE IN THE 9 O' CLOCK POSITION LOOKING IN THE DIRECTION OF FLOW. M6X15 LG EARTHING BOLTS AND WASHERS TO BE SUPPLIED.
 - FOR REFERENCE DRAWINGS SEE REFERENCE COLUMN ON DRG.
 - WHERE FOUNDING ON CLAY, A FLANGE ADAPTOR AND 500MM OF HDMS TO BE ADDED AT EACH END OF THE INSTALLATION. ENGINEER TO CONFIRM.
 - 1.2m LONG EARTHING ROD SHALL BE HAMMERED INTO THE SOIL BELOW THE CHAMBER. THE ROD FORMS THE EARTHING POINT AND MUST PROTRUDE 250mm ABOVE THE TOP OF THE CONCRETE BASE SLAB DIRECTLY BELOW THE FLOW METER.

- PIPING SPECIFICATIONS:
- PIPING SPEC. FOR 400 NB. AND BELOW TO BE ANSI B36.19 SHED. 40
PIPING SPEC. FOR 450 NB. AND ABOVE TO BE ANSI B36.19 SHED. 20
 - ALL FLANGES TO BE SLIP ON BS 4504 MIN TABLE 16.
ALL PUDDLE FLANGES TO BE SLIP ON UNDRILLED.
 - ALL FITTINGS 400 NB. AND BELOW TO BE ANSI (ASA) B16.9 SHED. 40
ALL FITTINGS 450 NB. AND ABOVE TO BE ANSI (ASA) B16.9 SHED. 20
 - ALL GASKETS TO BE FLAT RING TYPE, 3mm THK, KLINGER TYPE TG200, DRILLING TO ANSI (ASA) B16.9, MATL. COMPRESSED EXPANDED GRAPHITE.
 - ALL BOLTS TO BE SABS 1700 S-1 (SABS) Gr. 8.8 GALVANISED.
ALL NUTS TO BE SABS 1700 S-2 (SABS) Gr. 8 GALVANISED.
ALL WASHERS TO BE FLAT TYPE GALVANISED.
 - GATE VALVE TO BE PREMIER TYPE RESILIENT SEAL NON-RISING SPINDLE MIN PN16
 - CHECK VALVE TO BE PREMIER TYPE SWING CHECK TYPE MIN PN16.
 - SOCKET TO BE WROUGHT STEEL SCREWED TO ISO-R7 DIM'S TO BS1740.
SOCKET WELDED TO PIPE TO BE HOT DIP GALVANIZED.
 - PLUG TO BE WROUGHT STEEL SCREWED TO ISO-R7.
 - SPOOL PIECE INCLUDING GASKET TO SUIT FLOW METER / GASKET PROVIDED.
 - ALL WELDING AND TAPPING TO BE COMPLETE PRIOR TO GALVANIZING.

- GENERAL NOTES
- ALL AMBIGUITIES ON DRAWING MUST BE REPORTED TO THE DESIGN ENGINEER BEFORE COMMENCEMENT OF CONSTRUCTION.
 - PRIOR TO ANY WORK BEING DONE, A SURVEY OF THE EXISTING GROUND WORK, TO BE PROVIDED TO THE ENGINEER BY THE CONTRACTOR.
 - ALL WORK MUST BE DONE IN ACCORDANCE WITH THE STANDARD SANS 1200 SPECIFICATION AND THIS PROJECT'S APPLICABLE CONTRACT DOCUMENTATION.

NOTES: 1. Do not scale off this drawing	LEGEND:	DESIGNED BY	DIGES GROUP	CLIENT:  GREATER SEKHUKHUNE D. MUNICIPALITY No.3 Wep Street, P.O.Box X8611, ROBBERPSDAL, 0470 Tel: 013 262 7300	CONSULTANT:  Dynamic Integrated Geohydro Environmental Services cc. 98 Marshall Street, P.O.Box 5743, Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	DRAWING TITLE: PUMPSTATION MANIFOLD LAYOUT & DETAILS - 80NB PROJECT TITLE: LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1 SEKHUKHUNE DISTRICT MUNICIPALITY	DRAWING NUMBER: LCRWS/STD-02	SHEET No: SHEET 1
		CHECKED BY	CPM				PROJECT NUMBER:	SCALE: AS SHOWN
		DRAWN BY	NJC				CONTRACT No:	
		APPROVED BY	RC -Pr.Eng					



MATERIAL LIST ABOVE PUMP MANIFOLD				
ITEM No	No. OFF	DESCRIPTION	I.D.(in mm)	COMMENT
1	1	TYP MONO PUMP		OR SIMILAR APPROVED
2	1	SPECIAL CONNECTION	65	
3	1	BSP SOCKET	25	
4	1	BSP SOCKET WITH BALL VALVE	25	CGYCCERINE PRESSURE RANGE 0-1600 KPA 304.55 BALL VALVE
5	1	NPT SOCKET	12.5	
6	1	SPECIAL ITEM DETAIL	65	
7	1	NON RETURN VALVE	65	WAFFER TYPE SPRING LOADED
8	2	BUTTERFLY VALVE	65	
9	1	90° SHORT RADIUS BEND FLANGED ONE SIDE	65	
10	1	PIPE	65	
11	2	T-PIECE FLANGED	65	
12	1	GATE VALVE FLANGED	65	RSV TYPE
13	1	PIPE	65	
14	1	CONCENTRIC REDUCER	65-50	
15	1	PIPE	65	
16	1	AIR RELIEF VALVE	50	ARI D46 MIN PN16
17	2	90° SHORT RADIUS BEND FLANGE	65	



NOTE FOR ALL VALVES
SIZE AND TYPE FROM WATER SURGE REQUIREMENT TAKES PREFERENCE

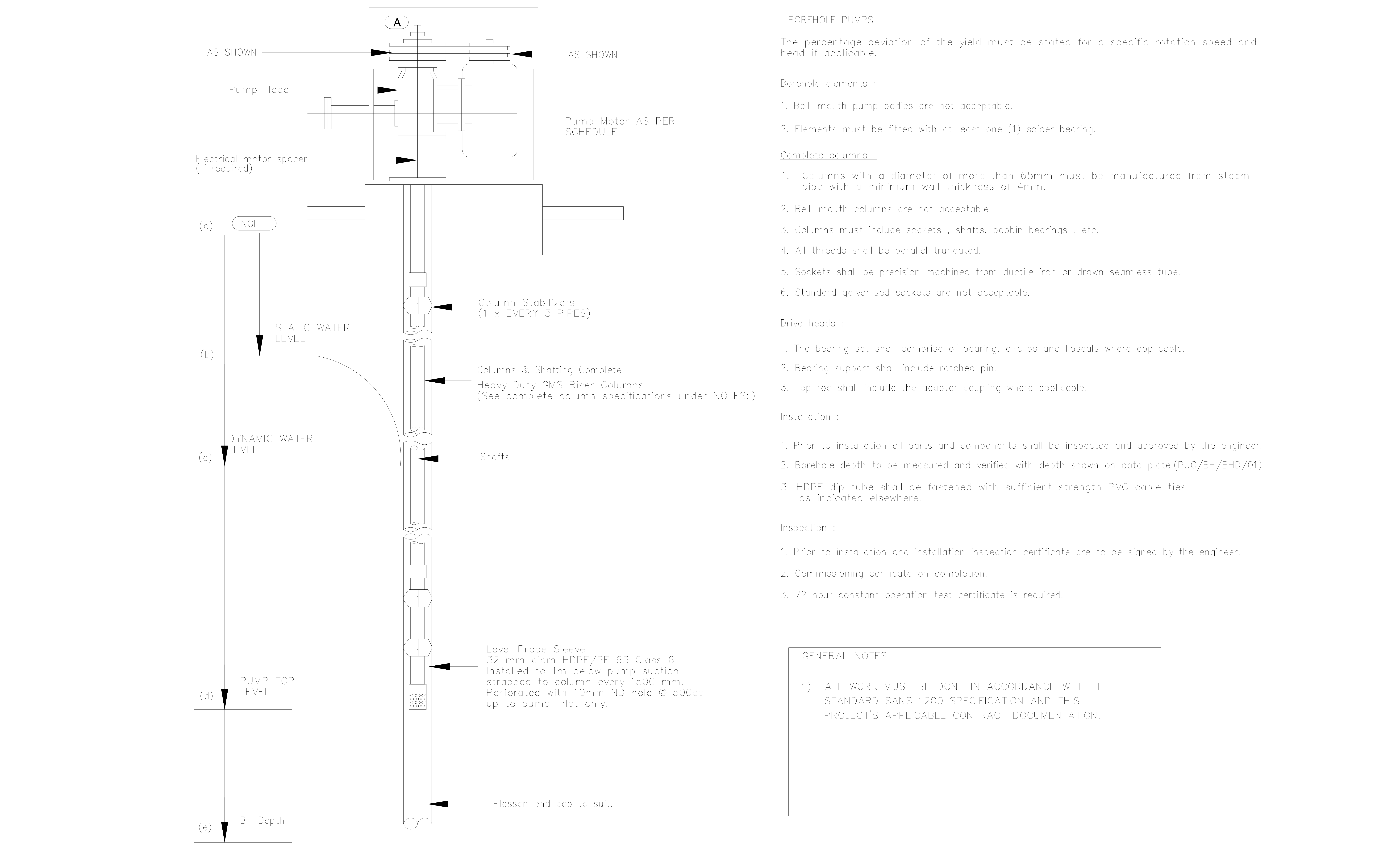
- NOTES:
- MAKE OF ALL VALVES TO BE APPROVED BY ENGINEER IN WRITING.
 - ALL BOLT HOLES TO STRADDLE CENTRE LINES.
 - ALL WELDING TO BE FULL STRENGTH AND FULL PENETRATION.
 - WHERE PLAIN ENDS FOR PIPING ARE CALLED FOR, PLAIN ENDS AND FLEXIBLE COUPLINGS MUST MATCH.
 - CORROSION PROTECTION SHALL BE IN ACCORDANCE WITH DWS 9000 C1 – CORROSION PROTECTION FOR STEEL PIPES AND SPECIALS FOR PIPELINES.

LEGEND OF CORROSION PROTECTION IS AS FOLLOWS:

 - G. GALVANISING
 - EC. EPOXY COATING
 - D. DENSO TAPE WRAPPING
 - P. PAINTING – TOUCH UPS
 - a) ALL PIPES SPECIALS SHALL BE GALVANISED BY THE HOT DIP GALVANISING (HDG) PROCESS TO PROVIDE A MINIMUM THICKNESS OF ZINC COATING OF 105 MICRON IN ACCORDANCE WITH SANS 121 (ISO 1481) FOR HEAVY DUTY APPLICATIONS. HDG PIPE IS NOT TO BE PASSIVATED, THE SURFACE SHOULD BE DEGREASED, SWEEP BLAST, AND THEN APPLY A SUITABLE PRIMER TO BOND TO THE HDG
 - b) HDG PIPE AND FITTINGS TO BE DEGREASED,PREPARED BY LIGHT ABRASION AND OVER COATED WITH A >90% ZINC PAINT FOR 120 MICRON DFT
 - ALL LEVELS TO BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK, AND THE ENGINEER TO BE NOTIFIED IN CASE OF ANY DISCREPANCIES.
 - ALL GASKETS, BOLTS, NUTS AND WASHERS TO BE SUPPLIED WITH FITTINGS TO ENSURE A COMPLETE INSTALLATION.
 - ALL UNDERGROUND STEEL PIPE AND FITTINGS TO HAVE A CORROSION PROTECTION SYSTEM COMPRISING OF A VOID FILLING PUTTY WITH CORROSION PROTECTION TAPE AND PVC OUTERWRAP DENSO(PROFILING MASTIC,PETROLATUM TAPE AND CLINGWRAPE); STOPAQ (4100 PUTTY,WRAPPINGBAND C2H AND OUTERWRAP PVC) OR SIMILAR APPROVED)
 - MAGFLOW METER AND FLANGES ON EITHER SIDE OF MAGFLOW METER MUST BE DRILLED AND TAPPED M6X20 DEEP ON THE SIDE OF THE FLANGE IN THE 9 O' CLOCK POSITION LOOKING IN THE DIRECTION OF FLOW. M6X15 LG EARTHING BOLTS AND WASHERS TO BE SUPPLIED.
 - FOR REFERENCE DRAWINGS SEE REFERENCE COLUMN ON DRG.
 - WHERE FOUNDING ON CLAY, A FLANGE ADAPTOR AND 500MM OF HDMS TO BE ADDED AT EACH END OF THE INSTALLATION. ENGINEER TO CONFIRM.
 - 1.2m LONG EARTHING ROD SHALL BE HAMMERED INTO THE SOIL BELOW THE CHAMBER. THE ROD FORMS THE EARTHING POINT AND MUST PROTRUDE 250mm ABOVE THE TOP OF THE CONCRETE BASE SLAB DIRECTLY BELOW THE FLOW METER.
- PIPING SPECIFICATIONS:
- PIPING SPEC. FOR 400 NB. AND BELOW TO BE ANSI B36.19 SHED. 40 PIPING SPEC. FOR 450 NB. AND ABOVE TO BE ANSI B36.19 SHED. 20
 - ALL FLANGES TO BE SLIP ON BS 4504 MIN TABLE 16. ALL PUDDLE FLANGES TO BE SLIP ON UNDRILLED.
 - ALL FITTINGS 400 NB. AND BELOW TO BE ANSI (ASA) B16.9 SHED. 40 ALL FITTINGS 450 NB. AND ABOVE TO BE ANSI (ASA) B16.9 SHED. 20
 - ALL GASKETS TO BE FLAT RING TYPE, 3mm THK. KLINGER TYPE TG200, DRILLING TO ANSI (ASA) B16.9, MATL. COMPRESSED EXPANDED GRAPHITE.
 - ALL BOLTS TO BE SABS 1700 S-1 (SABS) Gr. 8.8 GALVANISED. ALL NUTS TO BE SABS 1700 S-2 (SABS) Gr. 8 GALVANISED. ALL WASHERS TO BE FLAT TYPE GALVANISED.
 - GATE VALVE TO BE PREMIER TYPE RESILIENT SEAL NON-RISING SPINDLE MIN PN16
 - CHECK VALVE TO BE PREMIER TYPE SWING CHECK TYPE MIN PN16.
 - SOCKET TO BE WROUGHT STEEL SCREWED TO ISO-R7 DIM'S TO BS1740. SOCKET WELDED TO PIPE TO BE HOT DIP GALVANIZED.
 - PLUG TO BE WROUGHT STEEL SCREWED TO ISO-R7.
 - SPOOL PIECE INCLUDING GASKET TO SUIT FLOW METER / GASKET PROVIDED.
 - ALL WELDING AND TAPPING TO BE COMPLETE PRIOR TO GALVANIZING.

- GENERAL NOTES
- ALL AMBIGUITIES ON DRAWING MUST BE REPORTED TO THE DESIGN ENGINEER BEFORE COMMENCEMENT OF CONSTRUCTION.
 - PRIOR TO ANY WORK BEING DONE, A SURVEY OF THE EXISTING GROUND WORK, TO BE PROVIDED TO THE ENGINEER BY THE CONTRACTOR.
 - ALL WORK MUST BE DONE IN ACCORDANCE WITH THE STANDARD SANS 1200 SPECIFICATION AND THIS PROJECT'S APPLICABLE CONTRACT DOCUMENTATION.

NOTES: 1. Do not scale off this drawing	LEGEND:	DESIGNED BY	DIGES GROUP	CLIENT:  GREATER SEKHUKHUNE D. MUNICIPALITY No.3 Mee Street, P.O.Box 5743,Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	CONSULTANT:  Dynamic Integrated Geohydro Environmental Services cc. 98 Marshall Street, P.O.Box 5743,Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	DRAWING TITLE: PUMPSTATION MANIFOLD LAYOUT & DETAILS - 65NB PROJECT TITLE: LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1 SEKHUKHUNE DISTRICT MUNICIPALITY	DRAWING NUMBER LCRWS/STD-03	SHEET No.: SHEET 1
		CHECKED BY	CPM				PROJECT NUMBER:	
		DRAWN BY	NJC				CONTRACT No.:	
		APPROVED BY	RC -Pr.Eng					SCALE: AS SHOWN



BOREHOLE PUMPS

The percentage deviation of the yield must be stated for a specific rotation speed and head if applicable.

Borehole elements :

1. Bell-mouth pump bodies are not acceptable.
2. Elements must be fitted with at least one (1) spider bearing.

Complete columns :

1. Columns with a diameter of more than 65mm must be manufactured from steam pipe with a minimum wall thickness of 4mm.
2. Bell-mouth columns are not acceptable.
3. Columns must include sockets , shafts, bobbin bearings . etc.
4. All threads shall be parallel truncated.
5. Sockets shall be precision machined from ductile iron or drawn seamless tube.
6. Standard galvanised sockets are not acceptable.

Drive heads :

1. The bearing set shall comprise of bearing, circlips and lipseals where applicable.
2. Bearing support shall include ratched pin.
3. Top rod shall include the adapter coupling where applicable.

Installation :


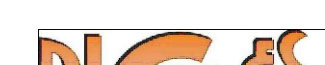
1. Prior to installation all parts and components shall be inspected and approved by the engineer.
2. Borehole depth to be measured and verified with depth shown on data plate.(PUC/BH/BHD/01)
3. HDPE dip tube shall be fastened with sufficient strength PVC cable ties as indicated elsewhere.

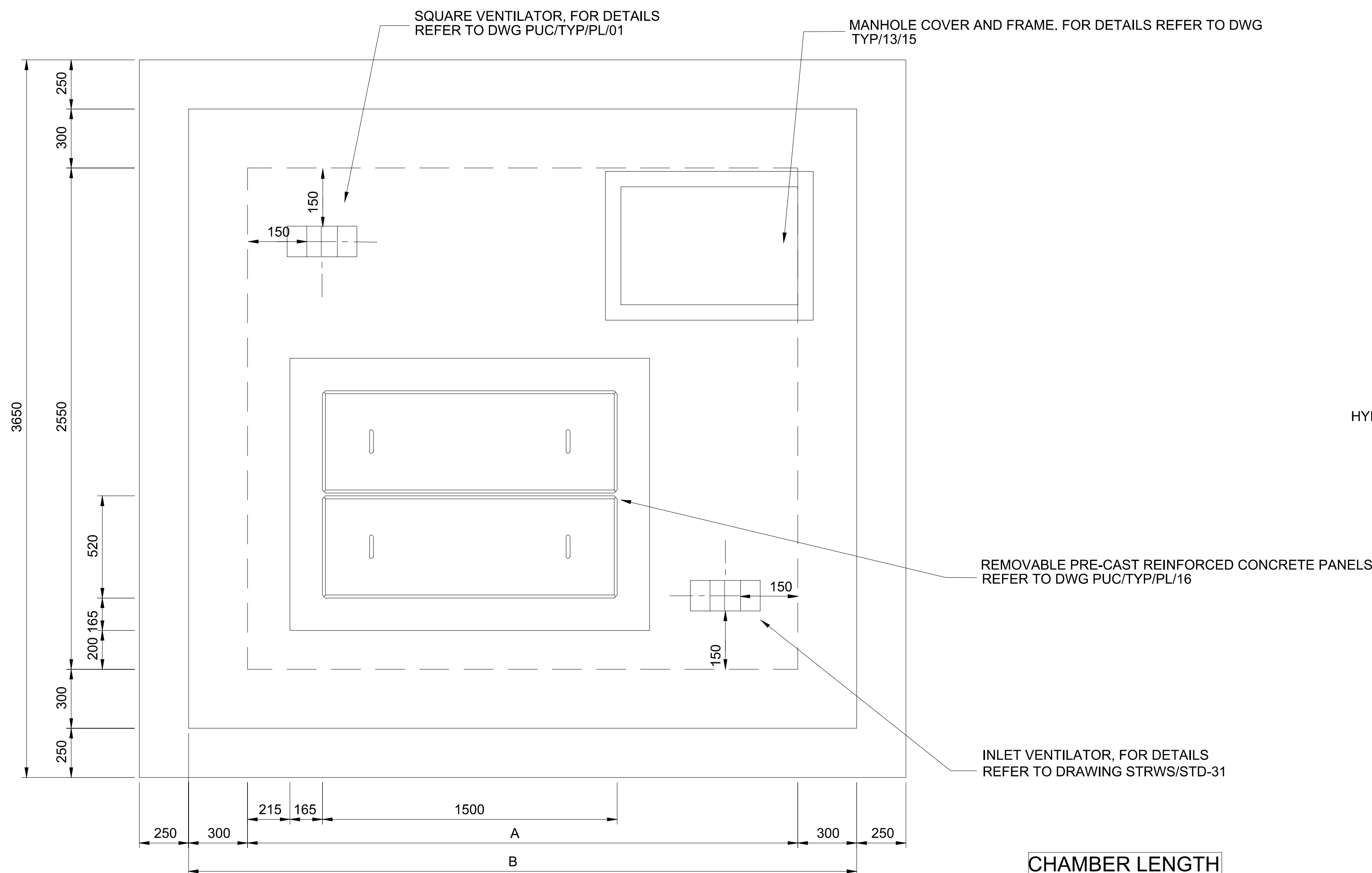
Inspection :

1. Prior to installation and installation inspection certificate are to be signed by the engineer.
2. Commissioning cerificate on completion.
3. 72 hour constant operation test certificate is required.

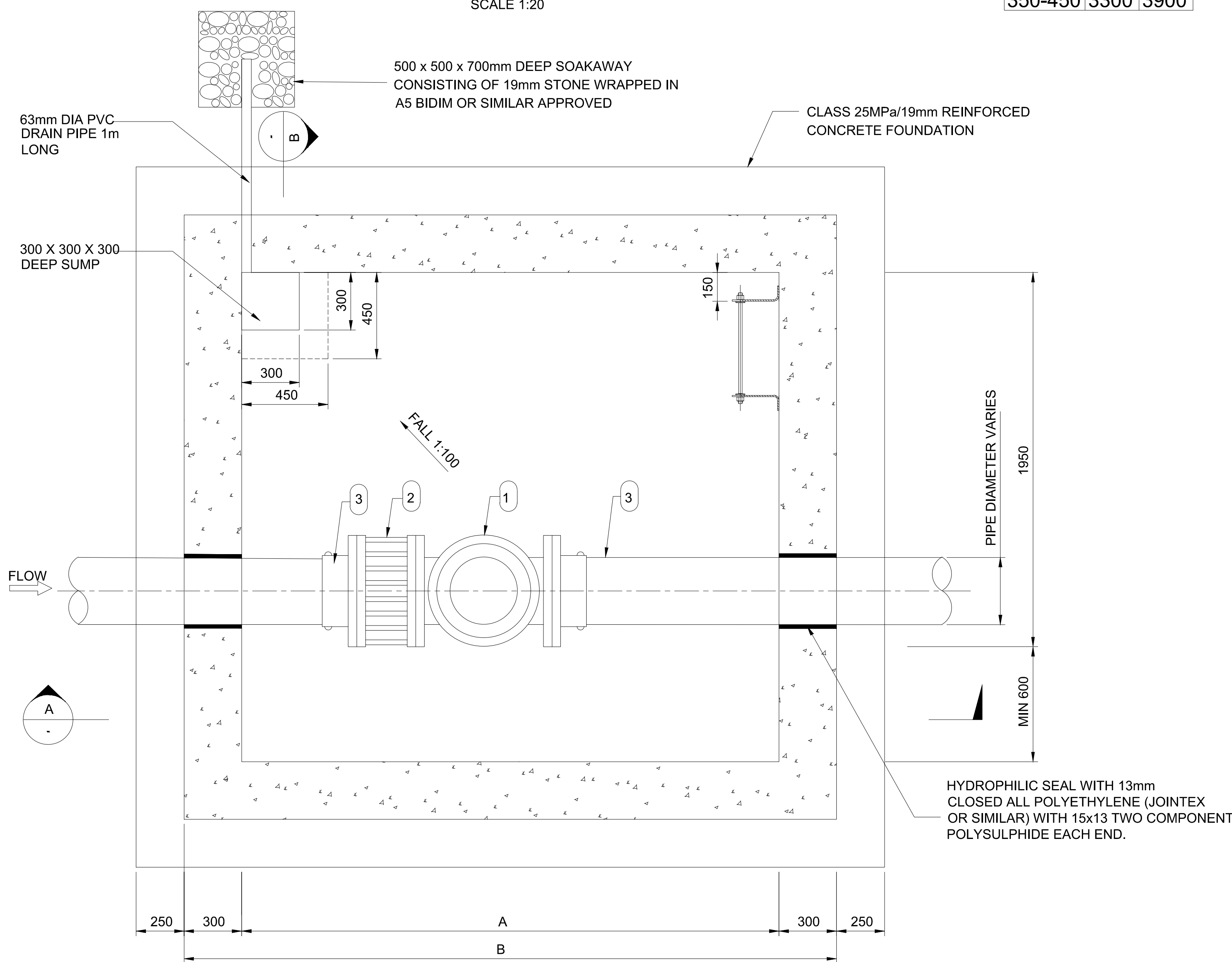
GENERAL NOTES

- 1) ALL WORK MUST BE DONE IN ACCORDANCE WITH THE STANDARD SANS 1200 SPECIFICATION AND THIS PROJECT'S APPLICABLE CONTRACT DOCUMENTATION.

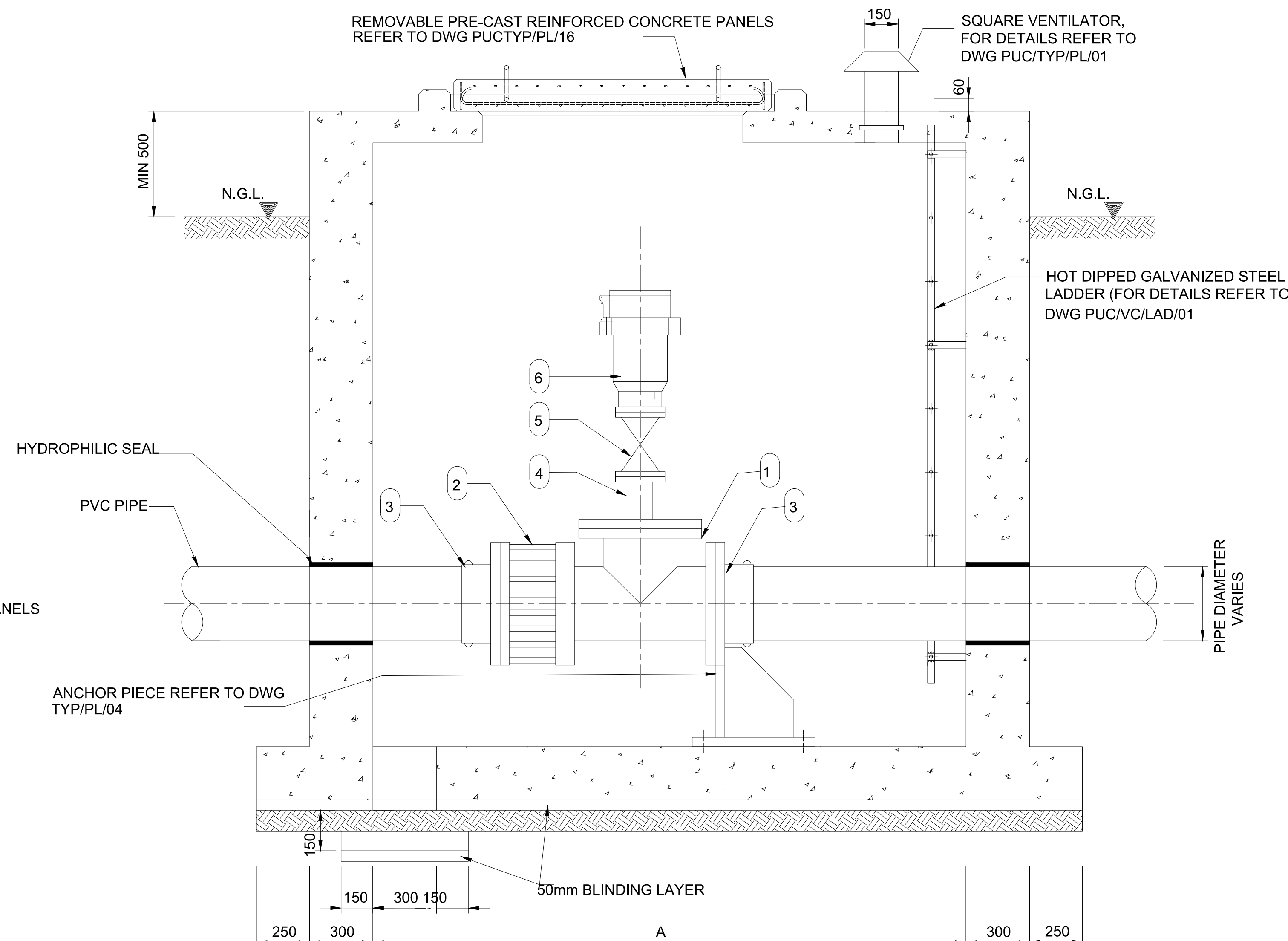
NOTES: 1. Do not scale off this drawing	LEGEND:	DESIGNED BY	DIGES GROUP	CLIENT:  GREATER SEKHUKHUNE D. MUNICIPALITY No.3 Wep Street, P.O.Box 5745, Polokwane, 0700 Tel: 015 262 7300	CONSULTANT:  Dynamic Integrated Geohydro Environmental Services cc. 88 Marshall Street, P.O.Box 5745, Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	DRAWING TITLE: TYPICAL BOREHOLE INSTALATION DETAIL	DRAWING NUMBER: LCRWS/STD-13	SHEET No.: SHEET 1	
		CHECKED BY	CPM				PROJECT NUMBER:	SCALE: AS SHOWN	
		DRAWN BY	NJC				CONTRACT No.:		
		APPROVED BY	RC -Pr.Eng						
		REVISION					PROJECT TITLE: LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1 SEKHUKHUNE DISTRICT MUNICIPALITY		



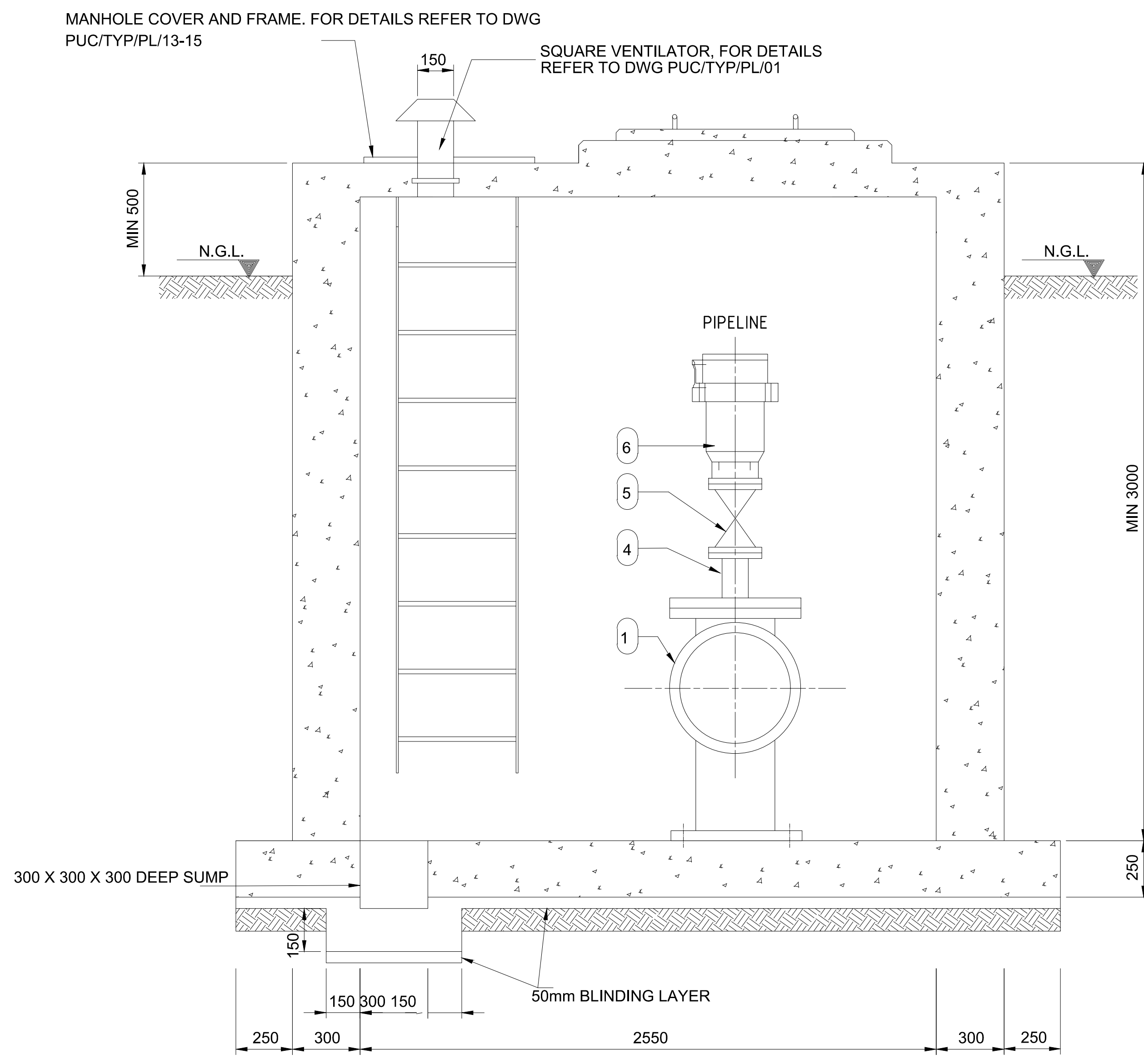
TOP VIEW OF CHAMBER
SCALE 1:20



PLAN LAYOUT
SCALE 1:20



SECTION A
1:20



SECTION B
1:20

NOTES

THE FOLLOWING SPECIFICATIONS SHALL BE READ IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS FOR :

1. PLAIN AND REINFORCED CONCRETE
2. CONCRETE SCREED
3. CONCRETE SURFACE BEDS
4. SOILCRETE

GENERAL

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS PERTAINING TO THIS PROJECT. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY.

CONCRETE

1. CONCRETE GRADES (UNLESS SHOWN OTHERWISE ON RELEVANT CONCRETE DRAWINGS):

MASS CONCRETE AND BLINDING CLASS 15MPa/38mm
FLOOR SLAB AND SUMP CLASS 25MPa/19mm
WALLS CLASS 25MPa/19mm
ROOF SLABS CLASS 25MPa/19mm
PLINTHS CLASS 25MPa/19mm

2. A 50mm THICK CONCRETE BLINDING LAYER SHALL BE CAST UNDER ALL FOOTINGS, UNLESS SOILCRETE FILLING IS SPECIFIED

3. ALL FOUNDATIONS HAVING MESH REINFORCING CAST-IN SHALL HAVE CONCRETE OR OTHER APPROVED SPACER BLOCKS OR STOOLS TO EFFECT A 50mm TOP COVER

4. THE CONTRACTOR SHALL ENSURE THAT ALL EMBEDDED PIPE FITTINGS HAVE BEEN PLACED AND PROVIDED FOR ACCORDING TO THE LATEST DRAWINGS PRIOR TO CASTING OF CONCRETE

5. POURING HEIGHT OF CONCRETE MAY NOT EXCEED 3.5m UNLESS AUTHORIZED BY ENGINEER

6. CONCRETE CUBES SHALL BE TAKEN ON SITE OF ALL CLASSES OF CONCRETE POURED ON ANY ONE DAY IN ACCORDANCE WITH AURECON'S REQUIREMENTS

7. ALL EXPOSED CONCRETE SURFACES SHALL COMPLY WITH THE SPECIFICATION FOR SMOOTH SURFACE FINISHES AND HAVE A 5mm CHAMFER

8. CURING AND PROTECTION OF CONCRETE SHALL BE CARRIED OUT STRICTLY IN ACCORDANCE WITH THE SPECIFICATION (REFER TO CLAUSE 5.5.8 OR SANS 1200 G)

9. TO PREVENT BUOYANCE UPLIFT OF THE STRUCTURE DURING THE CONSTRUCTION OF VALVE CHAMBERS IN WET AREAS:
9.1 CAST 150mm DIA uPVC SLEEVE PIPES (PLACED VERTICAL) IN THE FLOOR SLAB OF THE CHAMBER
9.2 SLEEVE PIPES ONLY TO BE REMOVED AFTER THE COMPLETION OF THE ENTIRE STRUCTURE (THIS INCLUDES THE ROOF SLAB CONSTRUCTION AND BACKFILLING AROUND THE STRUCTURE)
9.3 APPLY AN APPROVED WET TO DRY EPOXY TO THE EXPOSED CONCRETE SURFACE AND IMMEDIATELY THEREAFTER POUR CONCRETE INFILL AND WORK OFF TO MATCH EXISTING
10. REINFORCING SEE DWG 1702107/PUC/VC/RB/01

GENERAL NOTES

- 1) ALL WORK MUST BE DONE IN ACCORDANCE WITH THE STANDARD SANS 1200 SPECIFICATION AND THIS PROJECT'S APPLICABLE CONTRACT DOCUMENTATION.

NOTES:
1. Do not scale off this drawing

LEGEND:

DESIGNED BY DIGES GROUP
CHECKED BY CPM
DRAWN BY NJC
APPROVED BY RC -Pr.Eng

CLIENT:



GREATER SEKHUKHUNE D. MUNICIPALITY
No.3 Mies Street,
P.O.Box 59611, PROBLEPSDAL, 0470
Tel: 015 292 7300

CONSULTANT:

DIGES
Dynamic Integrated Geospatial
Environmental Services cc.
88 Marshall Street,
P.O.Box 5743, Rossouw, 0700
Tel: 015 291 4151 Fax: 015 291 4167

DRAWING TITLE:

AIR VALVE CHAMBER DETIALS
PIPELINE SIZES 200mm -450mm DIA DETAIL 1/2
PROJECT TITLE:
LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1
SEKHUKHUNE DISTRICT MUNICIPALITY

DRAWING NUMBER:

LCRWS/STD-14

PROJECT NUMBER:

CONTRACT No.:

SHEET No.:

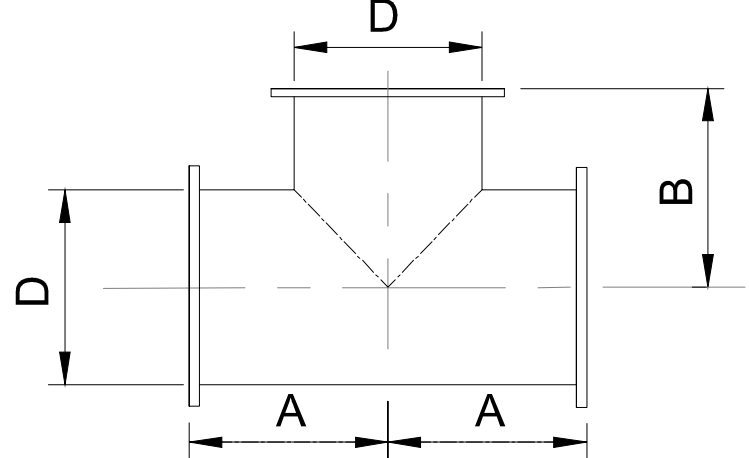
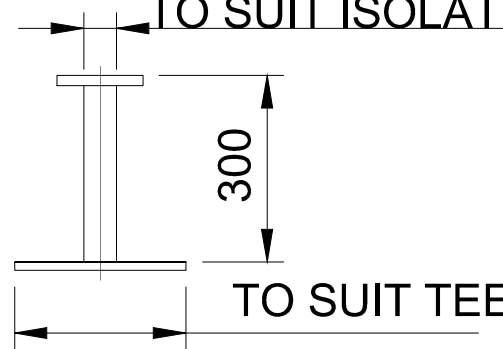
SHEET 1

SCALE:

AS SHOWN

REVISION

PIPE SCHEDULE FOR AIR VALVE CHAMBER ON A uPVC PIPELINE

ITEM NO.	QTY	DESCRIPTION	PROTECTION		MATERIAL	DIMENSION*	WORKING PRESSURE (BAR)
			LINING	COATING			
1	1	PIPE SPECIAL: FULLY FLANGED EQUAL TEE	HDG	HDG	GRADE C MILD STEEL T= 4.5 mm		16/25
2	1	VAG (OR SIMILAR) RIGID, DOUBLE FLANGED DISMANTLING JOINT: TO SUIT STEEL PIPE	-	-	-	D	16/25
3	1	FLANGE ADAPTOR: FOR D 200 AND 250 DN: SG IRON FLANGE ADAPTOR BITUMEN COATED PN16 OR 25 FOR D 300 TO 450 DN: FLANGE ADAPTOR ENERSEAL FROM THOMAS PIPE PRODUCTS OR SIMILAR APPROVED	-	-	-	D	16/25
4	1	DISTANCE PIECE: MEDIUM CLASS MILD STEEL BLANK FLANGE WITH HOLE DRILLED IN CENTRE OF BLANK FLANGE, MILD STEEL DISTANCE PIECE WELDED TO BLANK FLANGE, TOP FLANGED END TO SUIT ISOLATING VALVE SIZE	HDG	HDG	MILD STEEL GRADE C		16/25
5	1	ISOLATING VALVE: FULLY FLANGED, CLOCKWISE CLOSING, NON RISING SPINDLE, RESILIENT SEAL GATE VALVE (RSV) TO SANS 664	-	-	-	TO SUIT AIR VALVE SIZE	16/25
6	1	AIR VALVE: FLANGED DOUBLE ORIFICE AIR VALVE WITH ANTI-SHOCK ORIFICE MECHANISM (A.R.I MODEL D-46 OR SIMILAR APPROVED)	-	-	-	REFER TO LONGSECTION FOR AIR VALVE SIZE	16/25

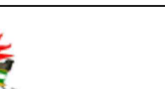
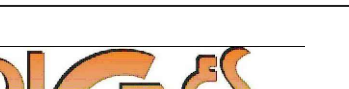
DIMENSIONS FOR PIPE SPECIALS		
PIPE DIA. (D) (mm)	A (mm)	B (mm)
200	230	230
250	280	280
315	330	330
350	380	380
400	430	430
450	480	480

NOTES - PIPEWORK:

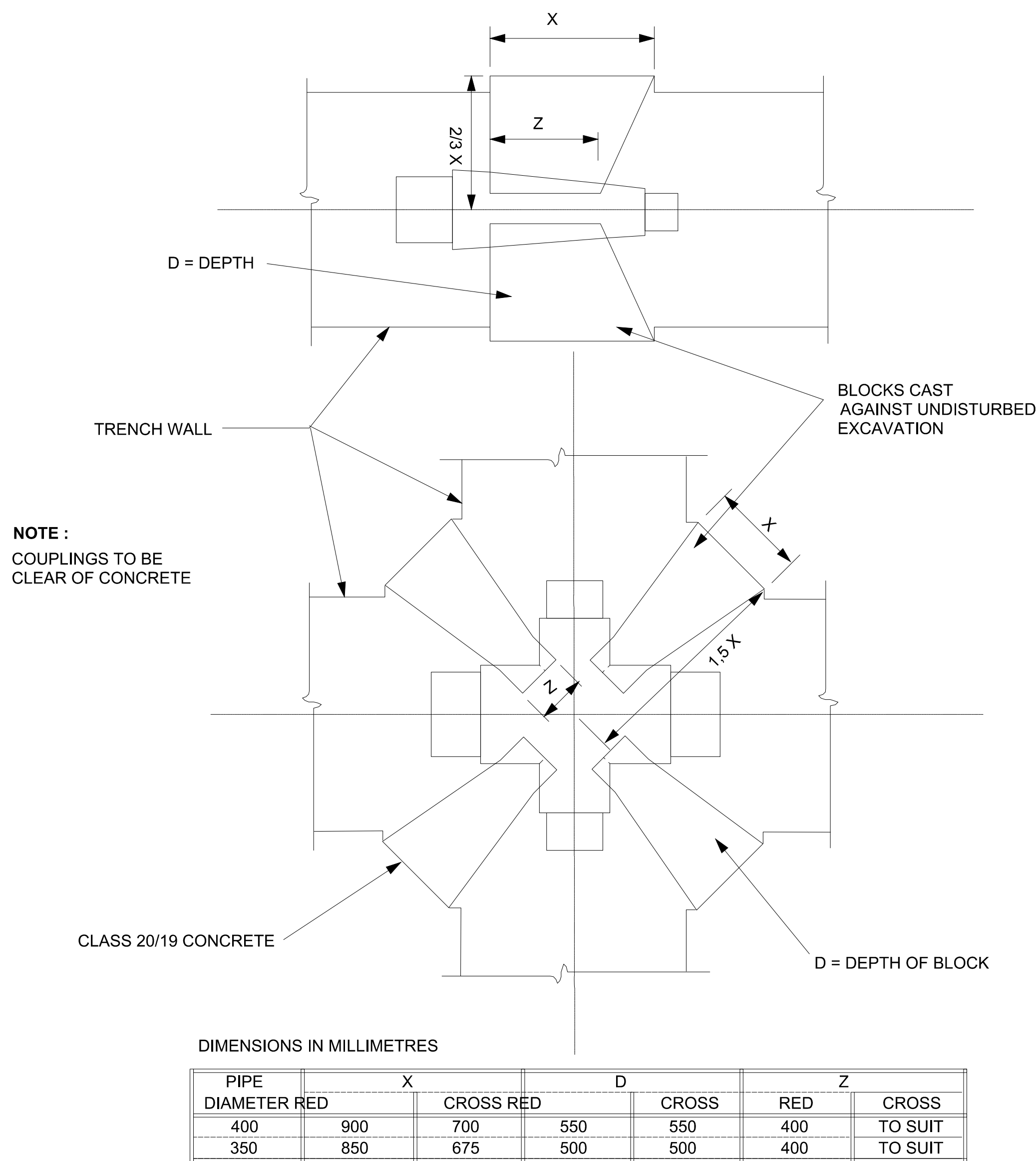
1. ALL DIMENSIONS SHOWN ARE NOMINAL MILD STEEL DIAMETERS AND MILLIMETER (UNLESS OTHERWISE SPECIFIED) AND SHALL BE CHECKED BY THE CONTRACTOR BEFORE ORDERING ANY MATERIAL. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER. DIMENSIONS MAY VARY DEPENDING ON THE TYPE AND MAKE OF ITEMS SUCH AS VALVES AND PUMPS. DIMENSIONS DO NOT REFLECT THE WIDTH OF PACKING BETWEEN FLANGES.
2. CORROSION PROTECTION OF PIPES, SPECIALS, COUPLINGS AND VALVES
 - 2.1 ALL MILD STEEL PIPES, FLANGES AND COUPLINGS WITH BOLTS AND NUTS BURIED IN THE GROUND SHALL EXTERNALLY BE PROTECTED BY PUTTY FILLER, CORROSION PROTECTION TAPE AND PVC OUTERWRAP (DENSO OR STPAQ OR SIMILAR APPROVED) (AS PER SUPPLIER'S SPECIFICATIONS) OVER AND ABOVE THE SPECIFIED COATING. THE ABOVE DO NOT APPLY TO PIPE WORK WHICH ARE CONCRETE ENCASED.
 - 2.2 HGD STEEL FITTINGS IN CHAMBER TO BE DEGREASED, LIGHTLY ABRADED AND OVERCOATED WITH >90% ZINC RICH PAINT TO MIN DFT 150 MICRON
3. ALL FLANGE DRILLING SHALL COMPLY WITH SANS 1123 TABLE 1600/3 OR 2500/3 FOR A WORKING PRESSURE OF 16 OR 25 BAR RESPECTIVELY, UNLESS OTHERWISE NOTED. REFER TO LONGITUDINAL SECTIONS FOR WORKING PRESSURES.
4. ALL STEEL FITTINGS SHALL COMPLY WITH B5354.
5. ALL STEEL PIPES WITH A NOMINAL BORE OVER 150mm SHALL BE MILD STEEL TO SANS 719 GRADE C WITH A WALL THICKNESS AS SPECIFIED.
6. ALL STEEL PIPES WITH A NOMINAL BORE UP TO 150mm SHALL BE HEAVY DUTY MILD STEEL TO SANS 62-1.

GENERAL NOTES

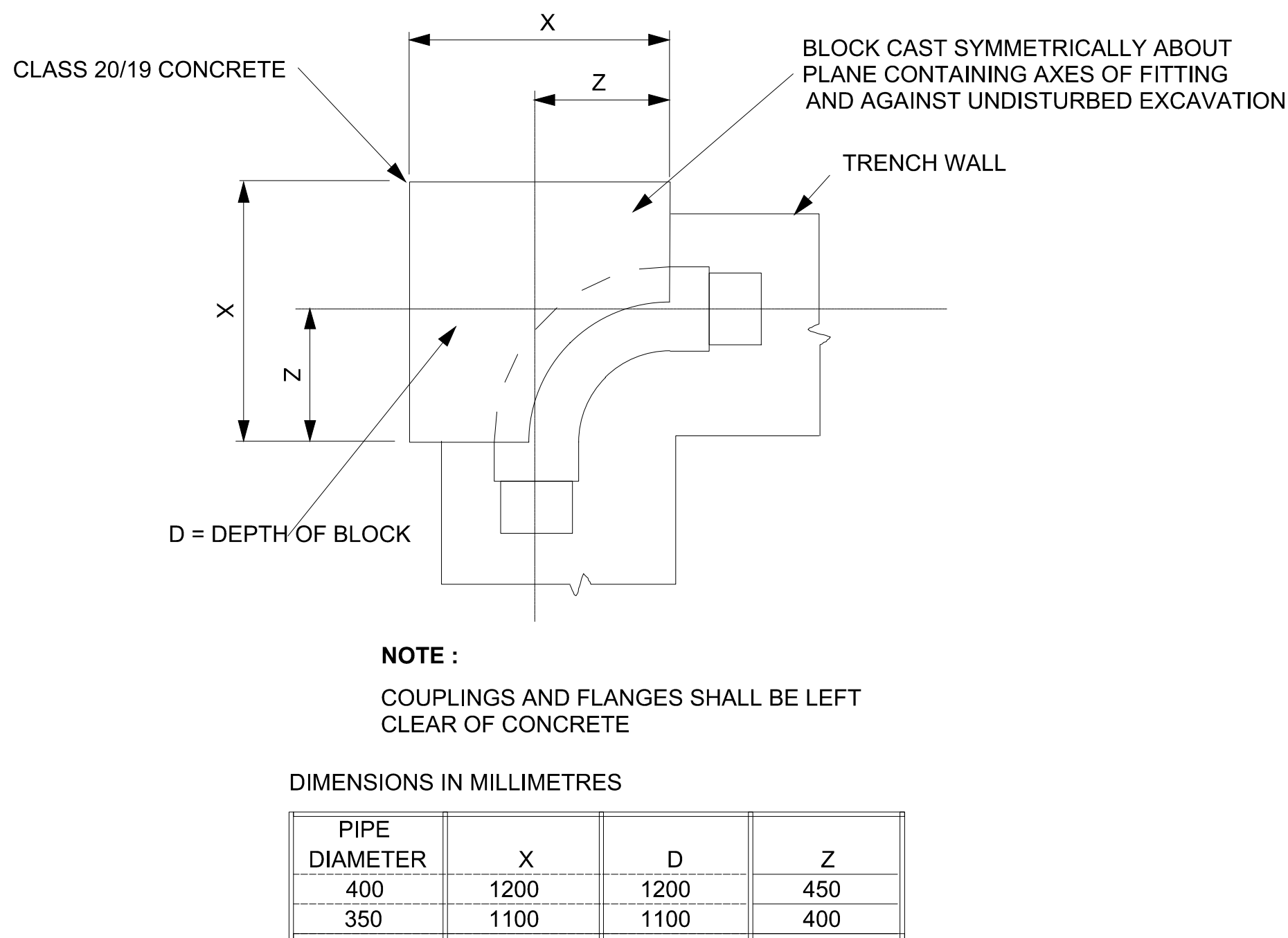
- 1) ALL WORK MUST BE DONE IN ACCORDANCE WITH THE STANDARD SANS 1200 SPECIFICATION AND THIS PROJECT'S APPLICABLE CONTRACT DOCUMENTATION.

NOTES:	LEGEND:	DESIGNED BY	DIGES GROUP	CLIENT: <div></div> <div>GREATER SEKHUKHUNE D. MUNICIPALITY</div> <div>No.3 West Street, P.O.Box 110908 JEPPIHALL, 0100 Tel: 013 262 1200</div>	CONSULTANT: <div></div> <div>Dynamic Integrated Geohydro Environmental Services cc.</div> <div>18 Marshall Street, P.O.Box 3743 Polokwane, 0100 Tel: 015 291 4151 Fax: 015 291 4167</div>	DRAWING TITLE:	AIR VALVE CHAMBER DETIALS PIPELINE SIZES 200mm -450mm DIA DETAIL 2/2	DRAWING NUMBER:	LCRWS/STD-14	SHEET No.:	
1. Do not scale off this drawing		CHECKED BY	CPM			PROJECT NUMBER:		SHEET 1			
		DRAWN BY	NJC					SCALE:			
		APPROVED BY	RC -Pr.Eng			CONTRACT No.:		AS SHOWN			

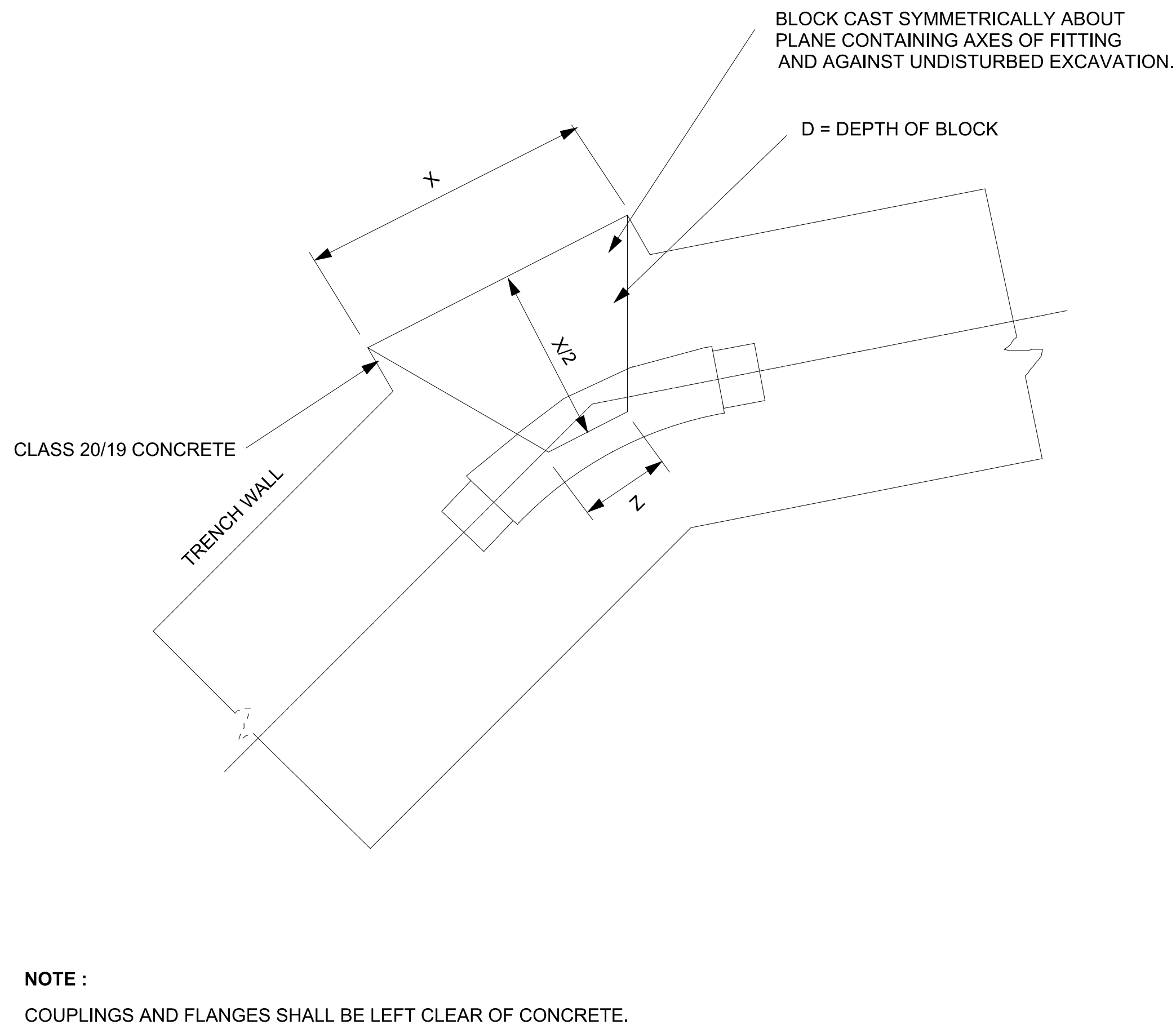
REVISION



THRUST BLOCKS IN PRESSURE PIPELINES FOR REDUCERS AND CROSSES

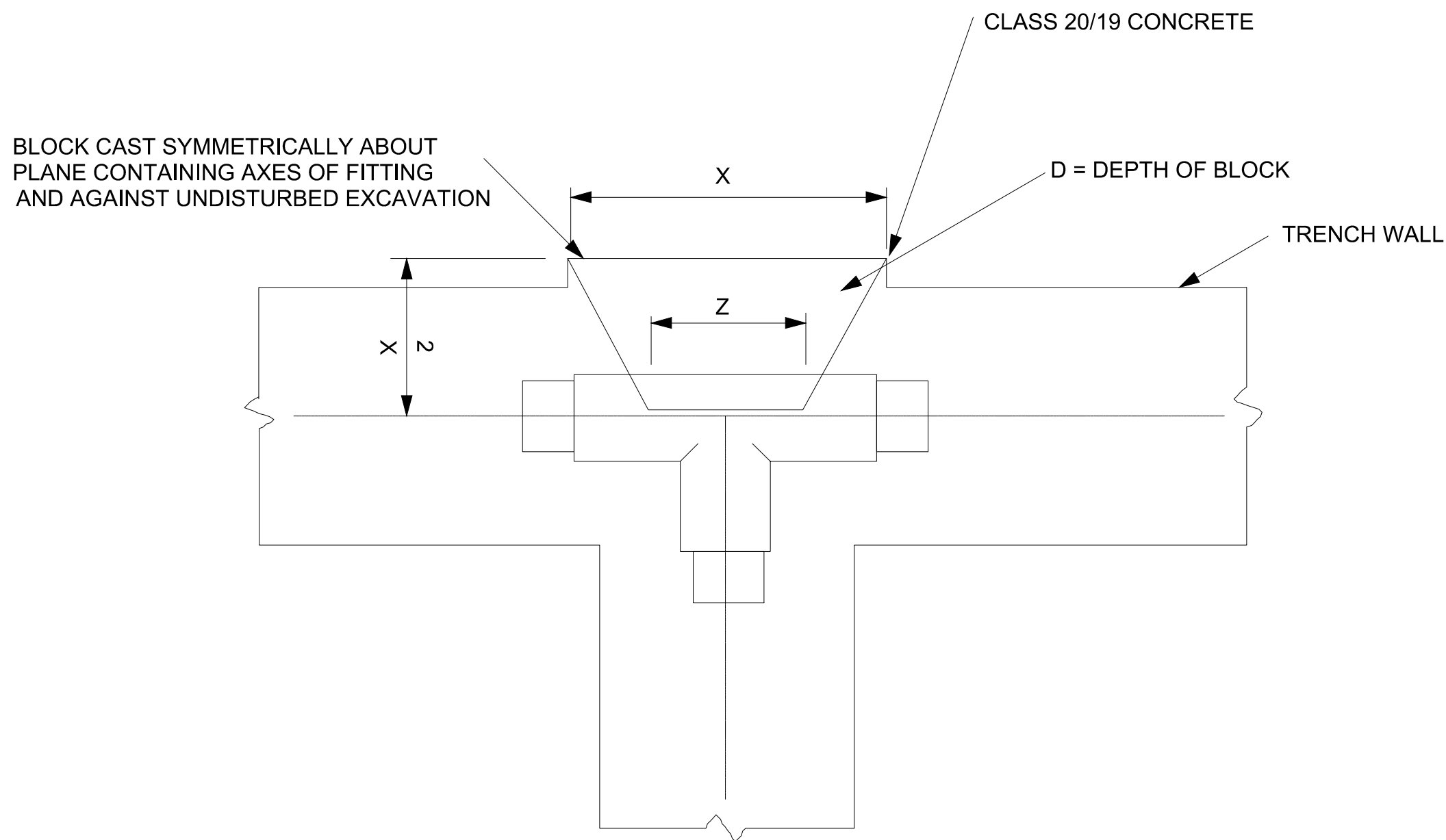


THRUST BLOCK IN PRESSURE PIPELINE



PIPE DIAMETER	X			D			Z		
	45°	22.5°	11.25°	45°	22.5°	11.25°	45°	22.5°	11.25°
400	1200	1200	1200	800	600	600	450	200	150
350	1150	1150	1150	700	500	500	400	200	125

THRUST BLOCKS IN PRESSURE PIPELINES FOR



THRUST BLOCK IN PRESSURE PIPELINE FOR TEE

DIMENSIONS IN MILLIMETRES			
PIPE DIAMETER	X	D	Z
400	1200	1000	600
350	1150	900	550

NOTES:
1. Do not scale off this drawing

LEGEND:

DESIGNED BY DIGES GROUP
CHECKED BY CPM
DRAWN BY NJC
APPROVED BY RC -Pr.Eng

CLIENT:

GREATER SEKHUKHUNE D. MUNICIPALITY
No.3 Wep Street,
P.O.Box 93611, 2008, JOHANNESBURG, 0470
Tel: 011 362 1200

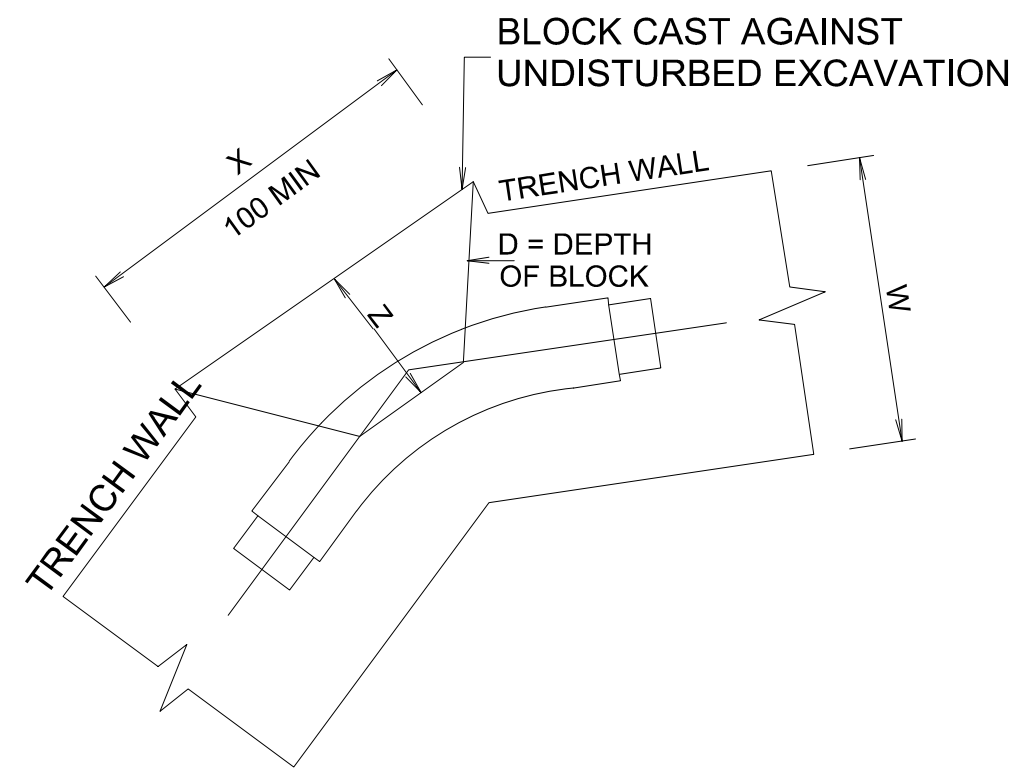
CONSULTANT:

Dynamic Integrated Geohydro
Environmental Services cc.
88 Marshall Street,
P.O.Box 5743, Pretoria, 0700
Tel: 015 291 4151 Fax: 015 291 4167

DRAWING TITLE:
THRUST BLOCK DETAILS 350mm - 450mm DIA. PIPES
PROJECT TITLE:
LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1
SEKHUKHUNE DISTRICT MUNICIPALITY

DRAWING NUMBER:
LCRWS/STD-36
PROJECT NUMBER:
CONTRACT No:
SHEET No:
SHEET 1
SCALE:
AS SHOWN

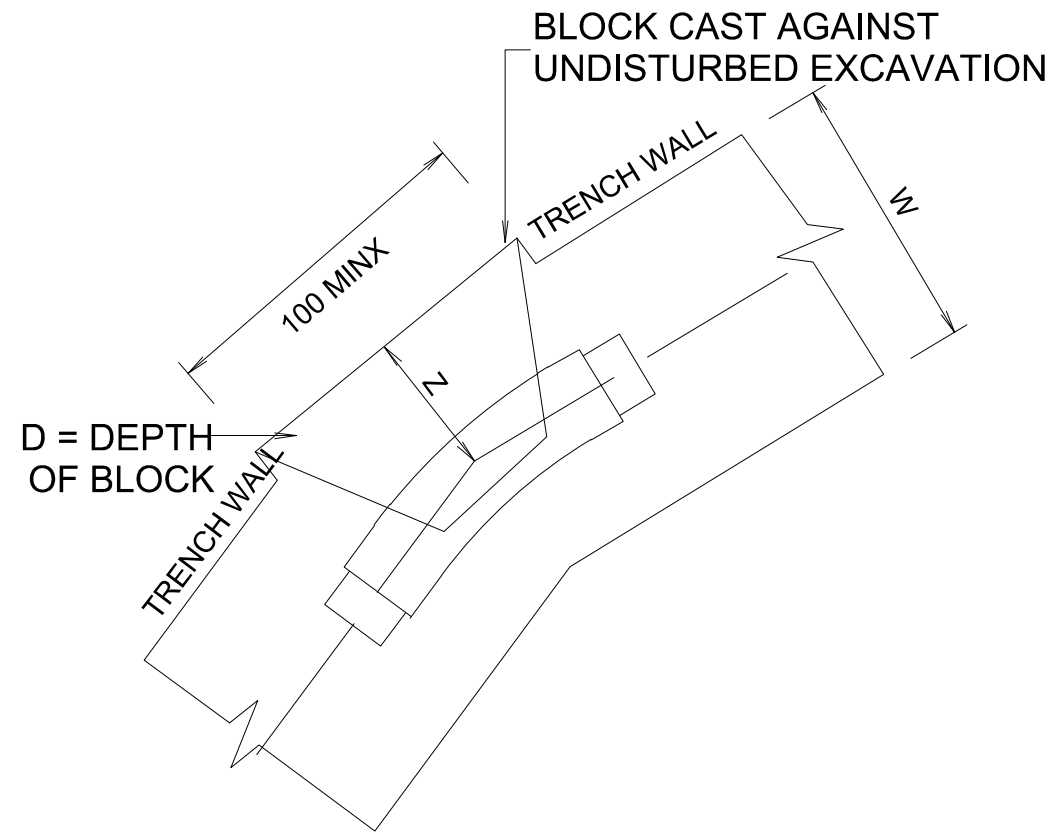
REVISION



THRUST BLOCK FOR 45° BEND

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE							
		900 kPa		1350 kPa		1800 kPa		X (mm)	A (mm)
		X (mm)	A (mm)	X (mm)	A (mm)	X (mm)	A (mm)		
300	1200	450	0,49	650	0,74	850	0,98		
250	1000	350	0,34	550	0,51	700	0,68		
200	800	300	0,22	450	0,33	550	0,44		
150	600	250	0,13	350	0,91	450	0,25		
100	400	150	0,06	250	0,09	300	0,11		
75	300	100	0,03	150	0,05	200	0,06		
50	200	100	0,02	100	0,02	150	0,03		

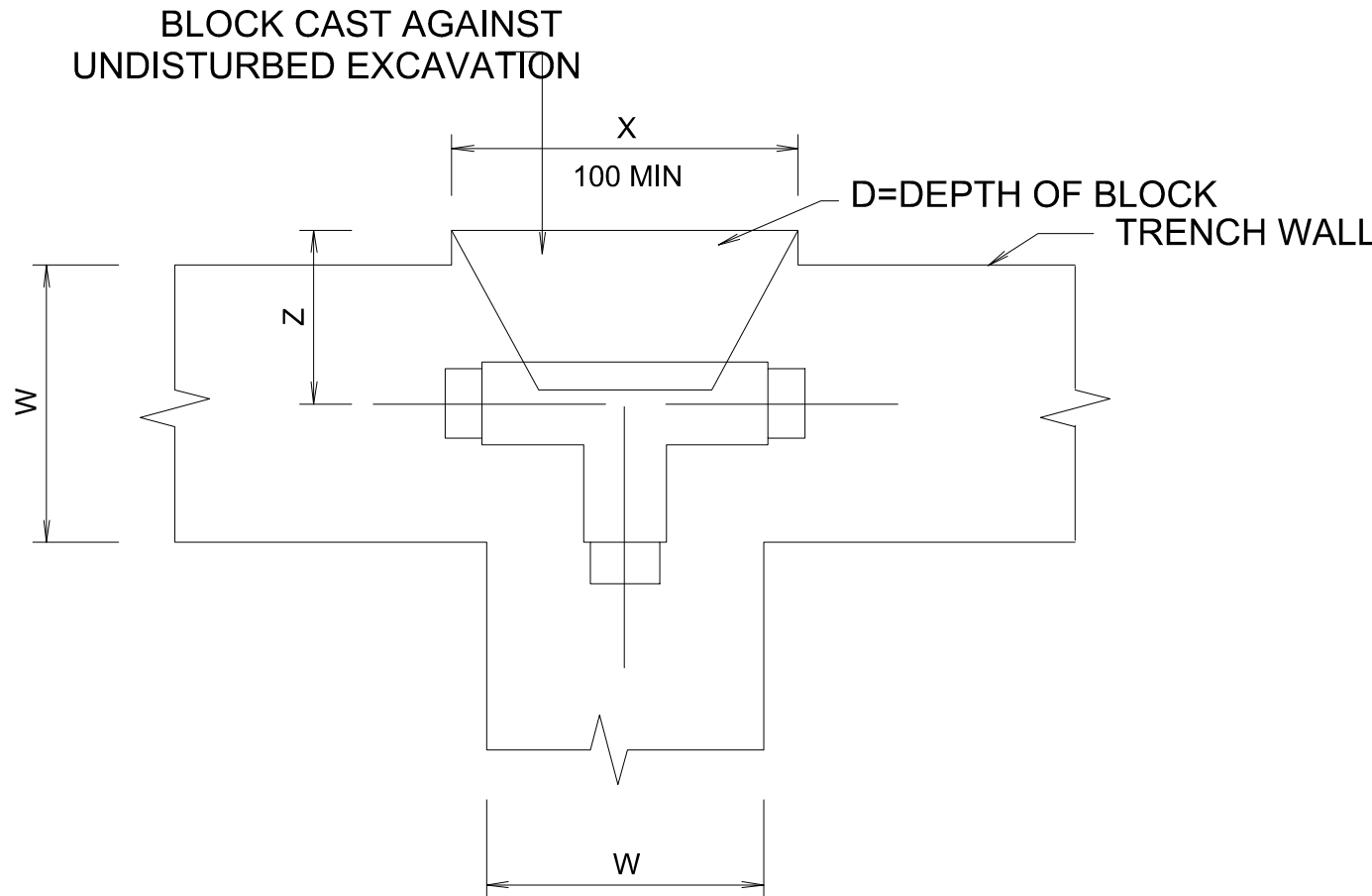
1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. Z SHALL BE THE MINIMUM OF X/2 OR W/2
4. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE



THRUST BLOCK FOR 22.5° AND 11.25° BEND
(X AND A TO BE HALVED FOR 11.25° BENDS)

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE							
		900 kPa		1350 kPa		1800 kPa		X (mm)	A (mm)
		X (mm)	A (mm)	X (mm)	A (mm)	X (mm)	A (mm)		
300	1200	250	0,25	350	0,38	450	0,50		
250	1000	200	0,18	300	0,26	350	0,35		
200	800	150	0,11	250	0,17	300	0,22		
150	600	100	0,06	200	1,00	250	0,13		
100	400	100	0,04	100	0,04	150	0,06		
75	300	100	0,03	100	0,03	100	0,03		
50	200	100	0,02	100	0,02	100	0,02		

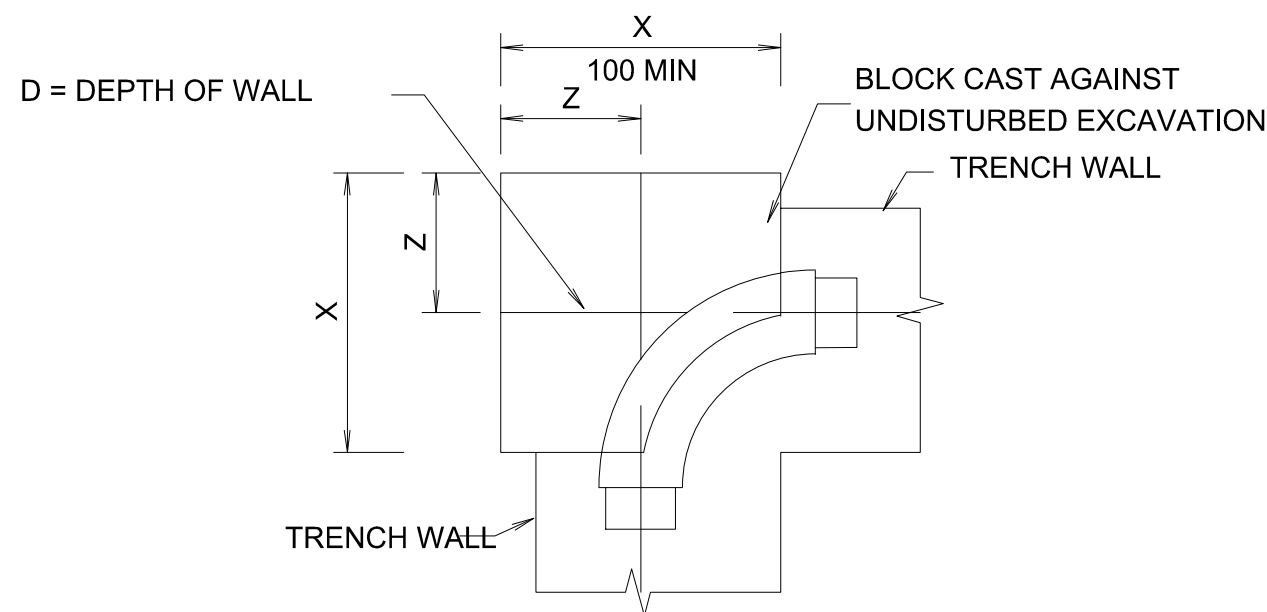
1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. Z SHALL BE THE MINIMUM OF X/2 OR W/2
4. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE



THRUST BLOCK FOR TEE
AND END CAP

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE							
		900 kPa		1350 kPa		1800 kPa		X (mm)	A (mm)
		X (mm)	A (mm)	X (mm)	A (mm)	X (mm)	A (mm)		
300	1200	550	0,64	800	0,96	1100	1,27		
250	1000	450	0,44	700	0,67	900	0,89		
200	800	350	0,29	550	0,43	700	0,57		
150	600	300	0,16	400	0,24	550	0,32		
100	400	200	0,07	300	0,11	350	0,14		
75	300	150	0,04	200	0,06	300	0,08		
50	200	100	0,02	150	0,03	200	0,04		

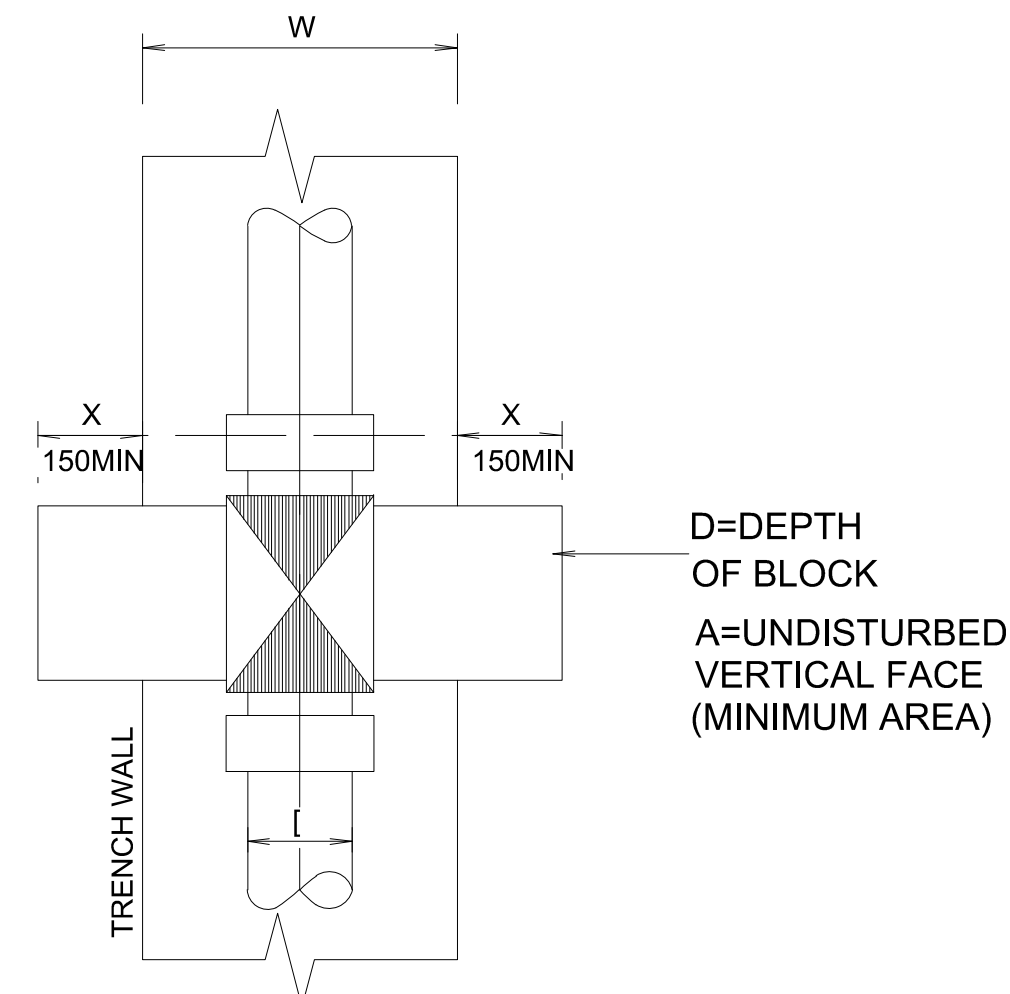
1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. Z SHALL BE THE MINIMUM OF X/2 OR W/2
4. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE



THRUST BLOCK FOR 90° BEND

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE							
		900 kPa		1350 kPa		1800 kPa		X (mm)	A (mm)
		X (mm)	A (mm)	X (mm)	A (mm)	X (mm)	A (mm)		
300	1200	750	0,90	1150	1,35	1550	1,81		
250	1000	650	0,63	950	0,94	1250	1,26		
200	800	500	0,40	750	0,60	1000	0,81		
150	600	400	0,23	600	0,34	750	0,46		
100	400	250	0,10	400	0,15	500	0,20		
75	300	200	0,06	300	0,09	400	0,12		
50	200	150	0,03	200	0,04	250	0,05		

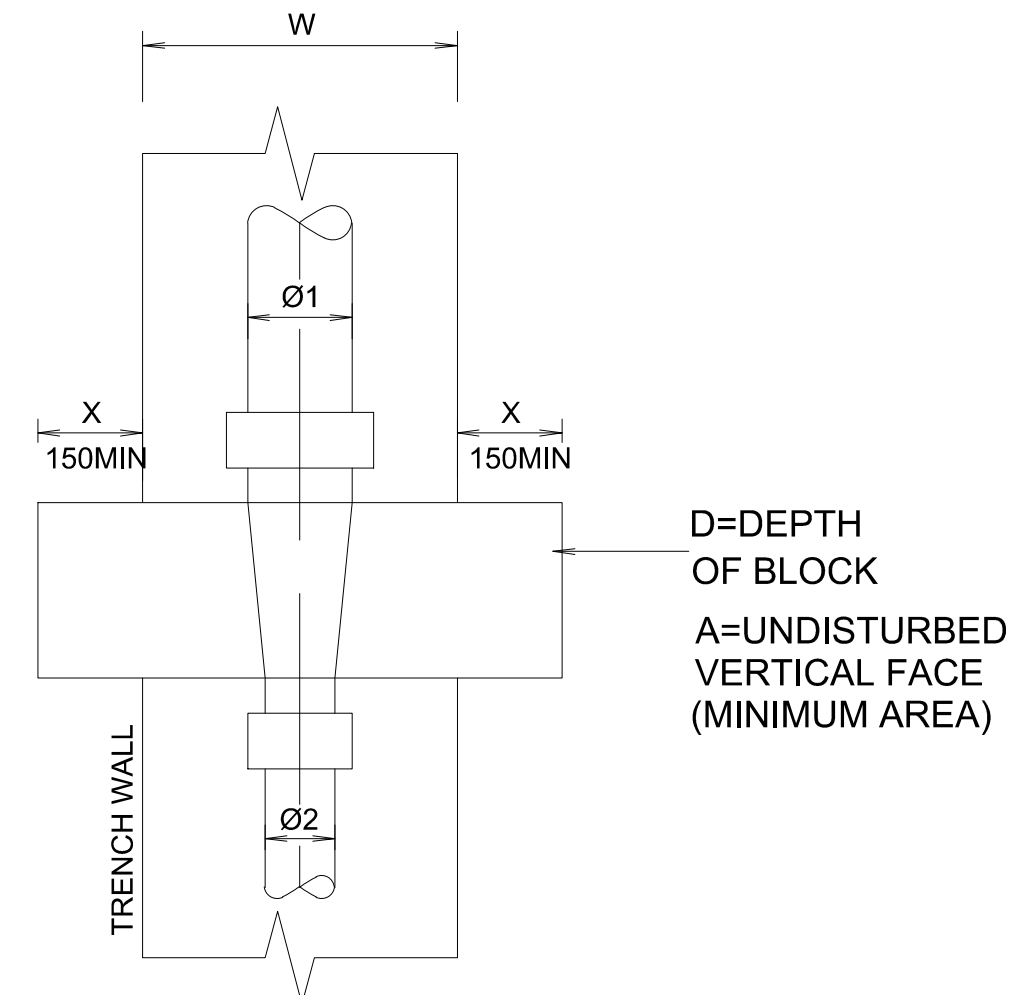
1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. Z SHALL BE THE MINIMUM OF X/2 OR W/2
4. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE



THRUST BLOCK FOR GATE VALVE

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE							
		900 kPa		1350 kPa		1800 kPa		X (mm)	A (mm)
		X (mm)	A (mm)	X (mm)	A (mm)	X (mm)	A (mm)		
300	500	500	0,64	850	0,96	1150	1,27		
250	450	350	0,45	600	0,67	850	0,89		
200	400	250	0,29	400	0,43	600	0,57		
150	350	150	0,16	200	0,24	350	0,32		
100	300	150	0,07	150	0,11	150	0,14		
75	250	150	0,04	150	0,06	150	0,08		
50	200	150	0,02	150	0,03	150	0,04		

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. X - DIMENSION SHALL BE 150mm MINIMUM
4. THE BLOCK DEPTH SHALL BE MEASURED FROM THE PIPE AXIS DOWNWARDS
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR OF CONCRETE




THRUST BLOCK FOR REDUCER

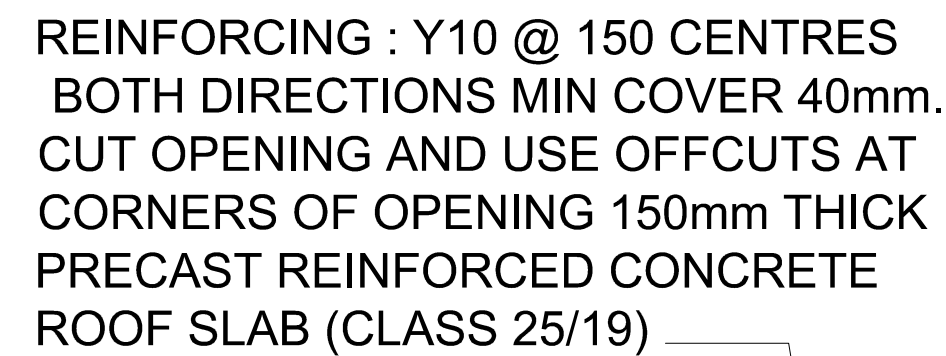
NOMINAL DIAMETER Ø1 (mm)	NOMINAL DIAMETER Ø2 (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE							
			900 kPa		1350 kPa		1800 kPa		X (mm)	A (mm)
			X (mm)	A (mm)	X (mm)	A (mm)	X (mm)	A (mm)		
300	250/200	700	250	0,35	400	0,53	550	0,71		
250	200/150	650	250	0,29	350	0,43	450	0,57		
200	150/100	600	200	0,22	300	0,32	400	0,43		
150	100/75	500	150	0,12	200	0,18	250	0,24		
100	75/50	400	150	0,06	150	0,08	150	0,11		
75	50	300	100	0,03	150	0,04	150	0,05		

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. X- DIMENSION SHALL BE 150mm MINIMUM
4. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR OF CONCRETE

GENERAL NOTES

- 1) ALL WORK MUST BE DONE IN ACCORDANCE WITH THE STANDARD SANS 1200 SPECIFICATION AND THIS PROJECT'S APPLICABLE CONTRACT DOCUMENTATION.

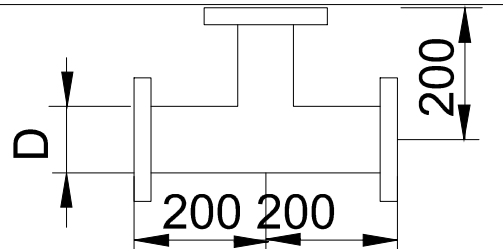
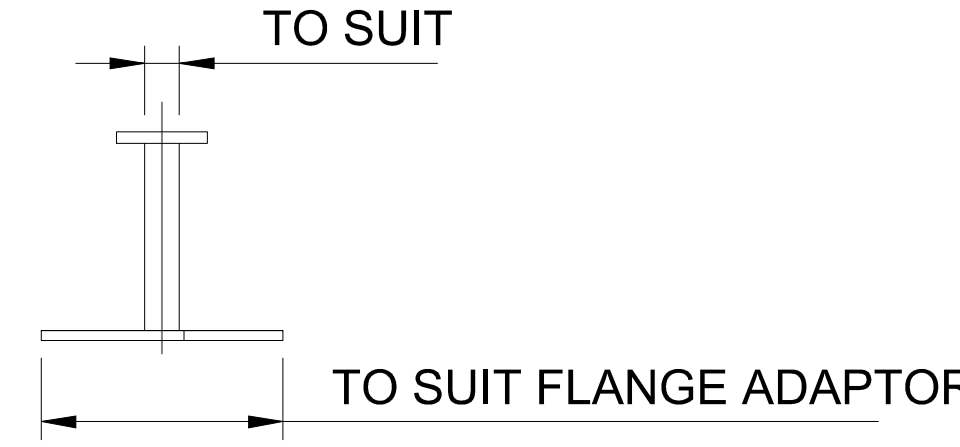
NOTES: 1. Do not scale off this drawing	LEGEND:	DESIGNED BY	DIGES GROUP	CLIENT:  GREATER SEKHUKHUNE D. MUNICIPALITY No.3 Mee Street, P.O.Box 5743, Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	CONSULTANT:  Dynamic Integrated Geohydro Environmental Services cc. 36 Marshall Street, P.O.Box 5743, Polokwane, 0700 Tel: 015 291 4151 Fax: 015 291 4167	DRAWING TITLE: THRUST BLOCK DETAILS 75mm - 300mm DIA. PIPES	DRAWING NUMBER: LCRWS/STD-37	SHEET No: SHEET 1
		CHECKED BY	CPM			PROJECT TITLE: LEBALALO CENTRAL REGIONAL WATER SCHEME: SUB SCHEME A1 SEKHUKHUNE DISTRICT MUNICIPALITY	PROJECT NUMBER:	
		DRAWN BY	NJC				CONTRACT No:	
		APPROVED BY	RC -Pr.Eng					



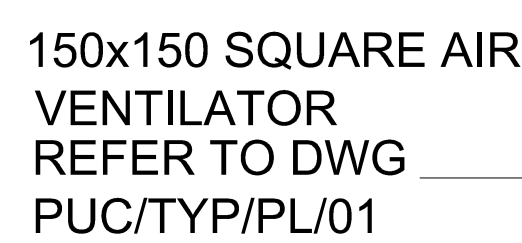
SCALE 1:20



PLAN
SCALE 1:20



ITEM NO.	QUANTITY	DESCRIPTION	PROTECTION		MATERIAL	DIMENSION*	WORKING PRESURE (BAR)
			LINING	COATING			
①	1	FLANGED EQUAL TEE	HDG	HDG	MILD STEEL		16/25
②	1	FLANGED, NON-RISING SPINDLE CLOCKWISE CLOSING WITH HANDWHEEL RESILIENT SEAL GATE VALVE TO SANS 664	-	-	-	TO SUIT AIR VALVE SIZE	16/25
③	1	BLANK FLANGE WITH HOLE DRILLED IN CENTRE OF BLANK FLANGE, DISTANCE PIECE WELDED TO BLANK FLANGE, TOP FLANGE END TO SUIT ISOLATING VALVE	HDG	HDG	MEDIUM CLASS MILD STEEL		16/25
④	1	FLANGED COMBINATION WITH NON-SLAM MECHANISM AIR RELEASE VALVE ARI D-46 OR SIMILAR APPROVED	-	-	-	REFER TO LONGSECTION FOR AIR VALVE SIZE	16/25
⑤	1	S.G IRON FLANGE ADAPTOR	BITUMEN	BITUMEN	S.G IRON	TO SUIT PIPE SIZE	16/25

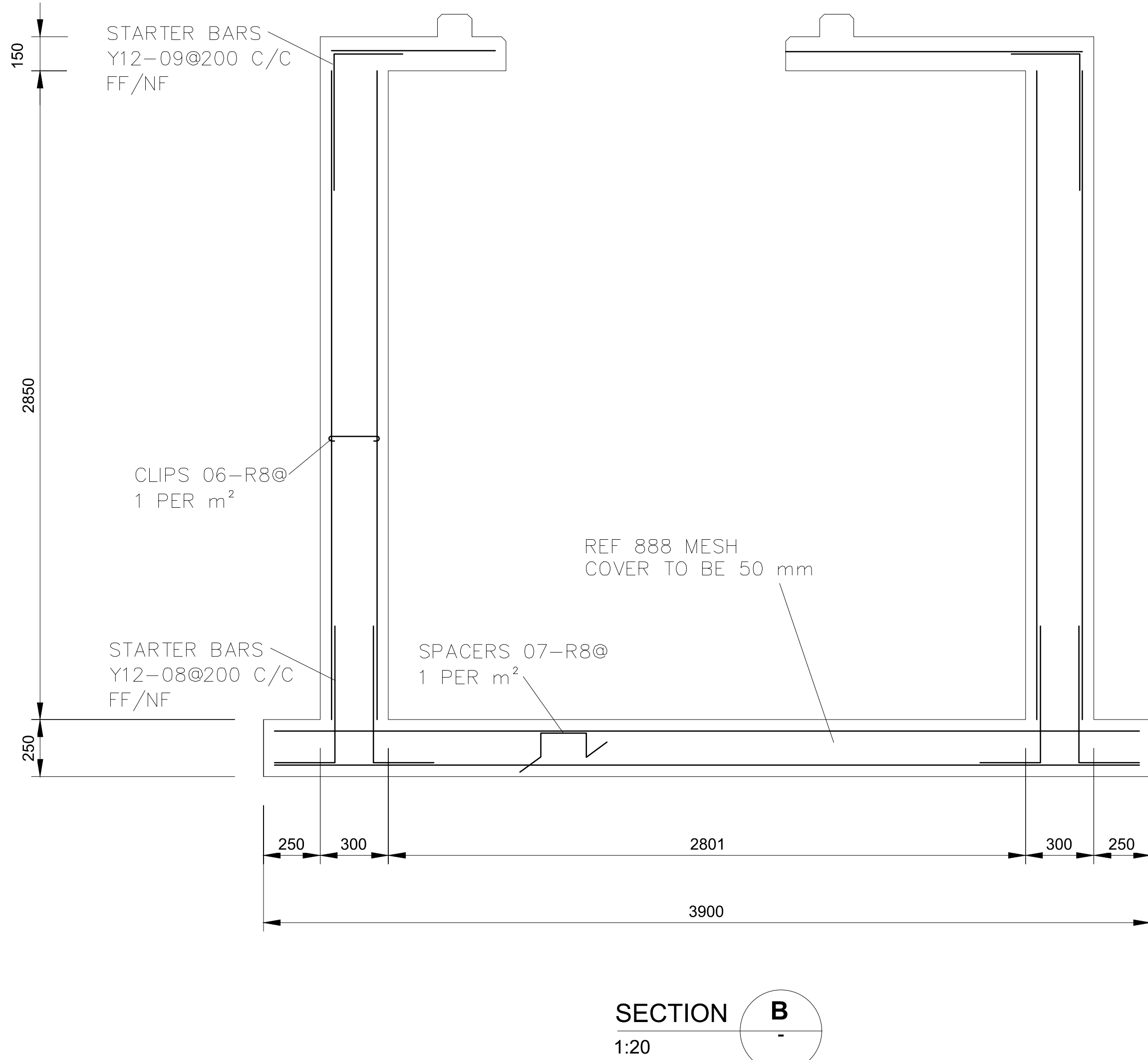
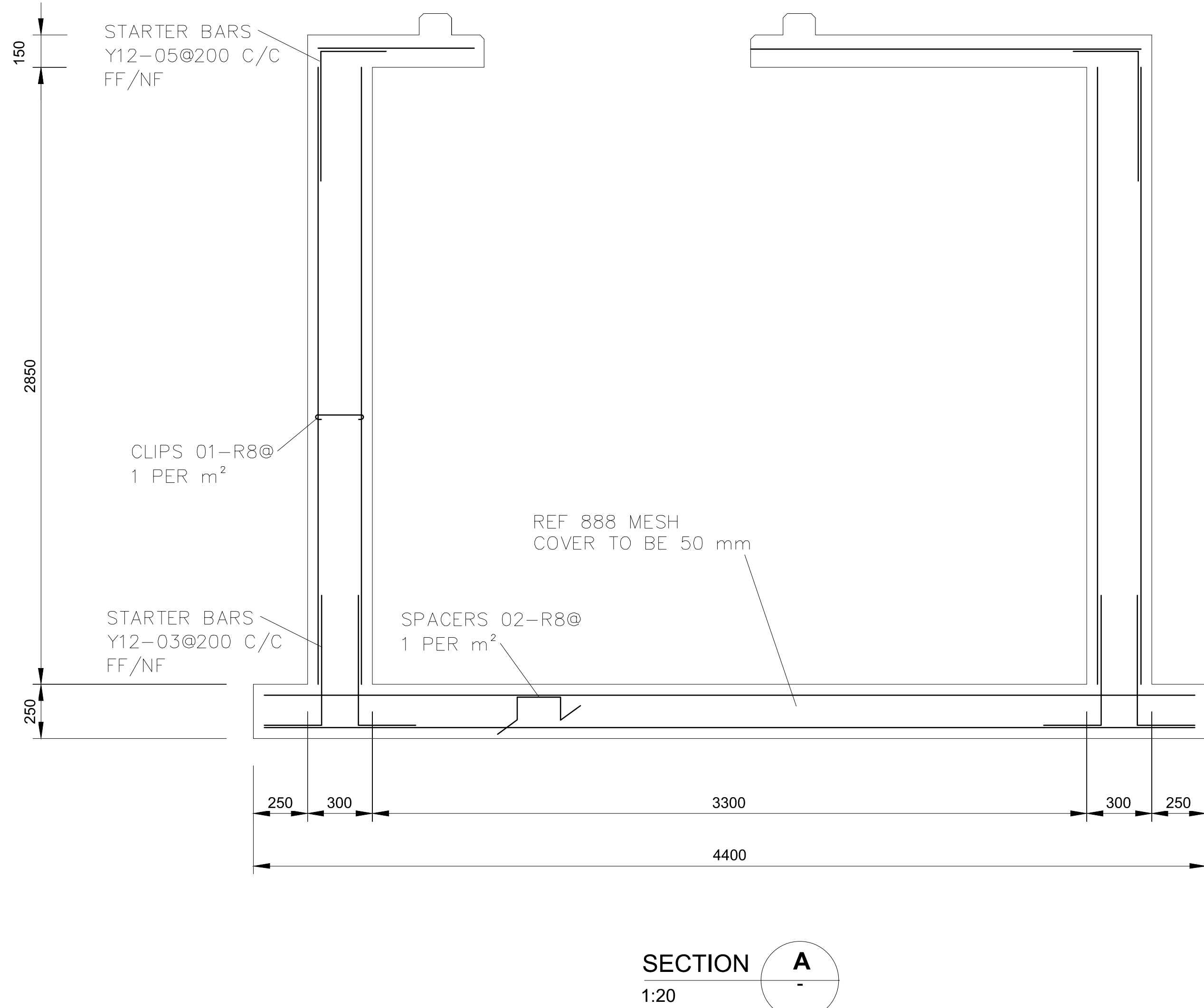
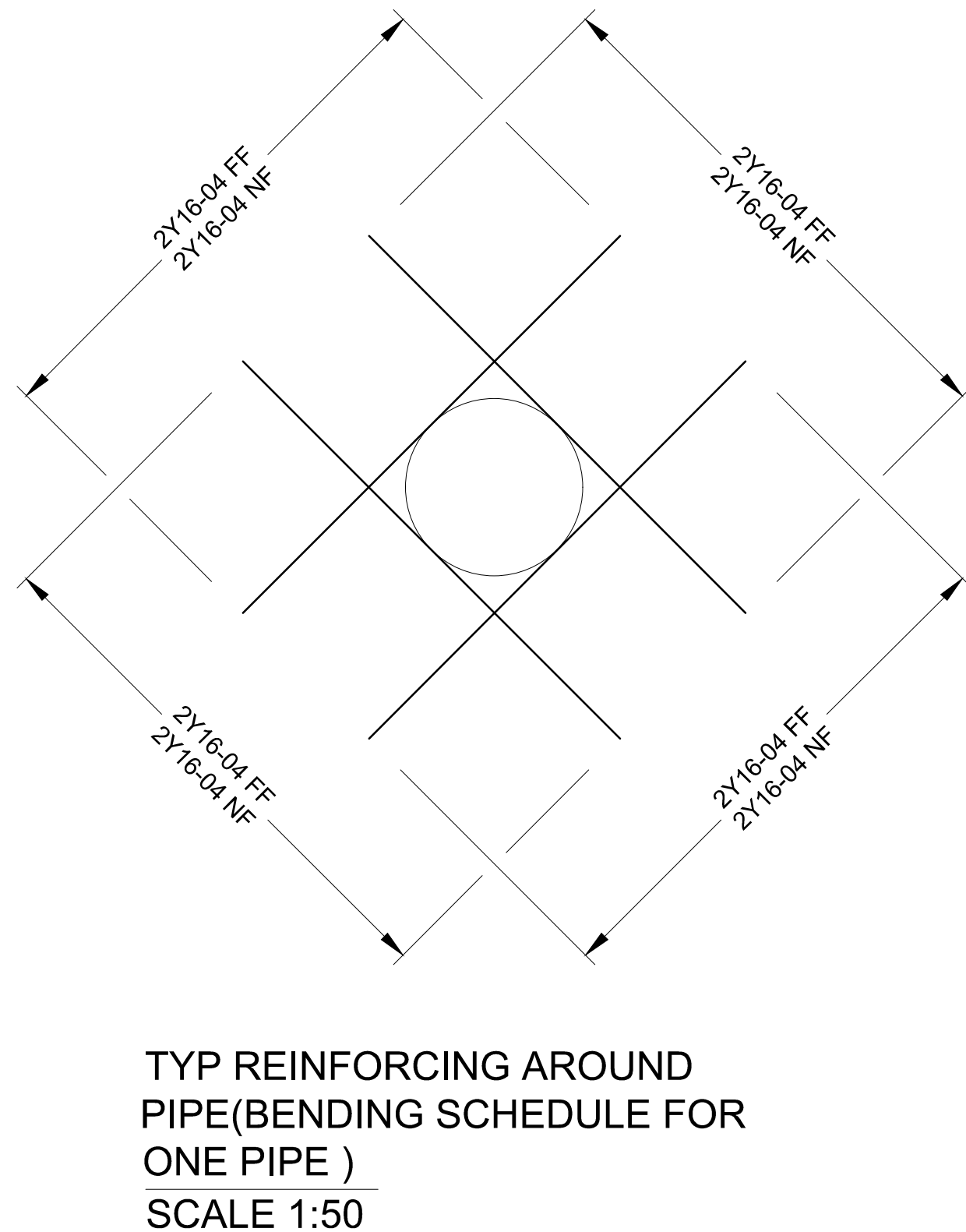
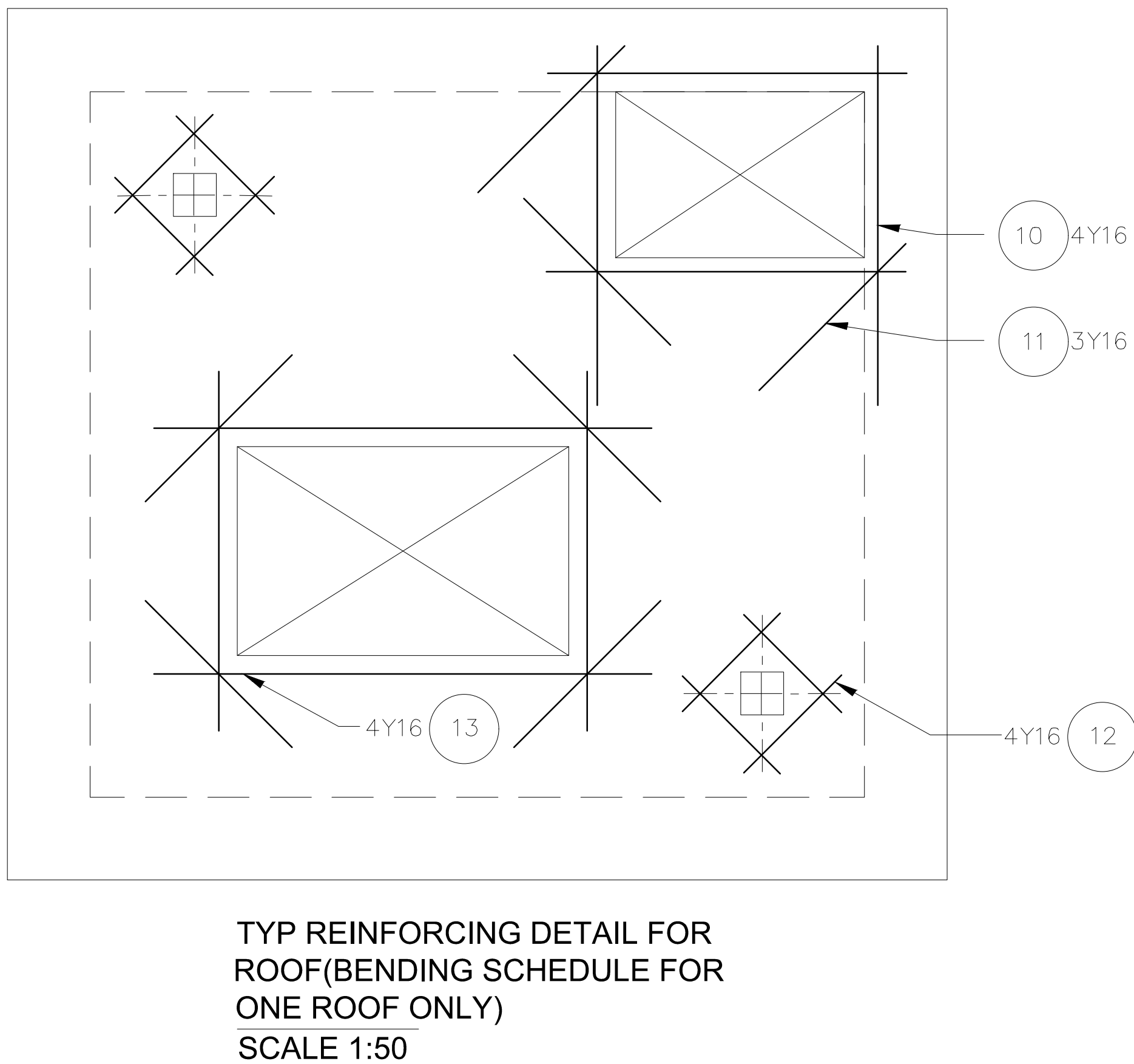
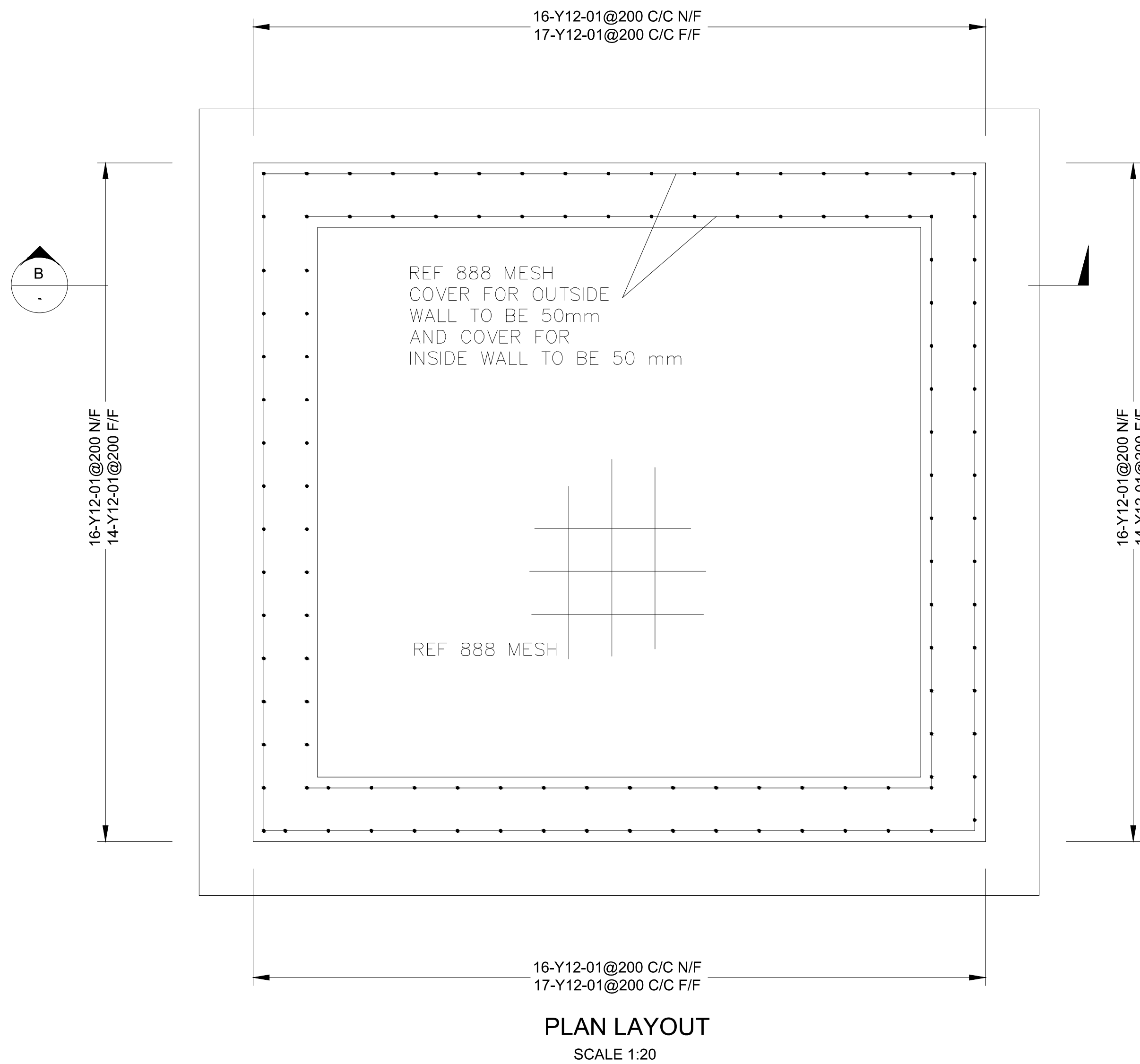
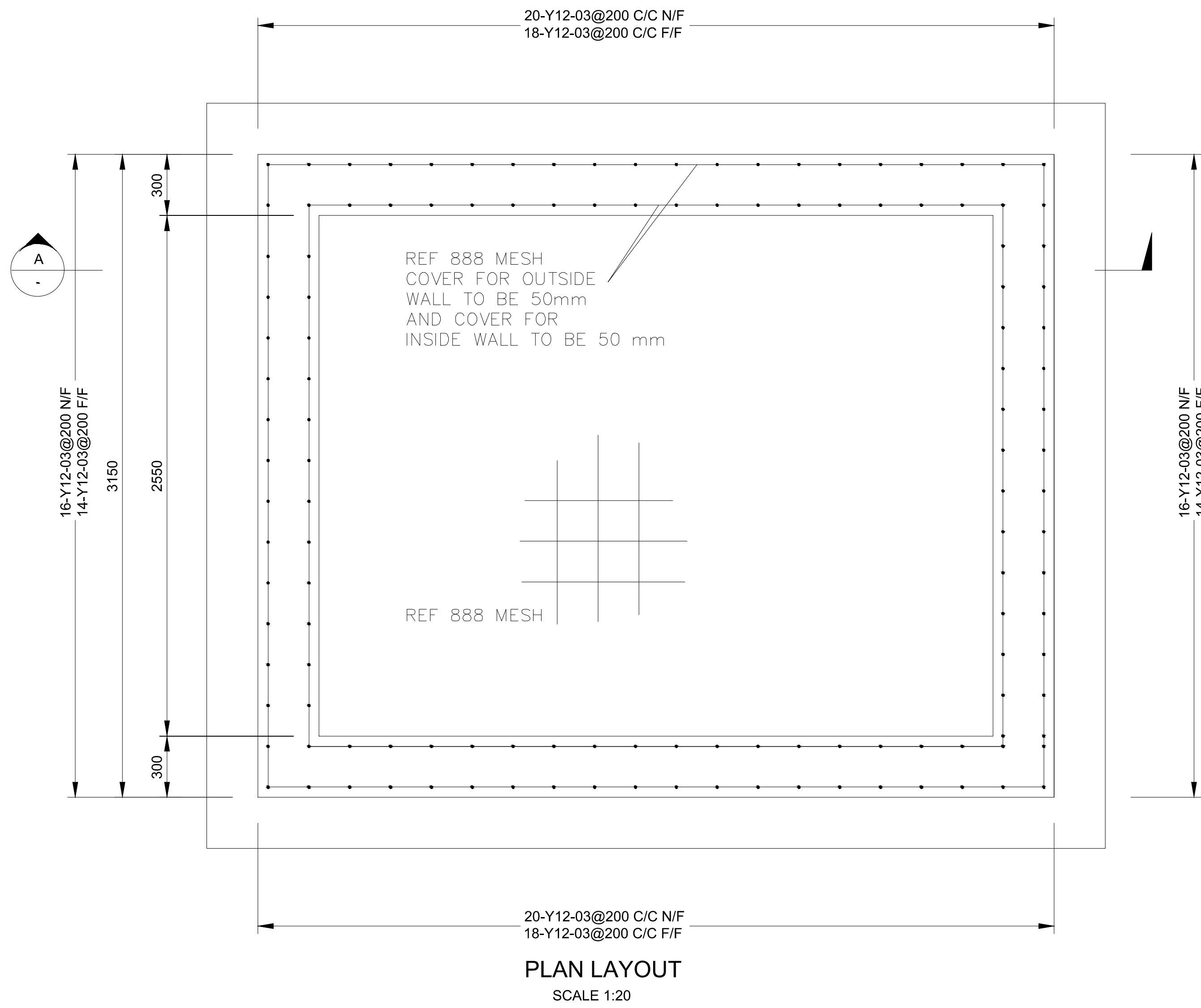
1. ALL DIMENSIONS SHOWN ON THE DRAWING MUST BE CHECKED BY THE CONTRACTOR AND ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER.
2. CORROSION PROTECTION OF STEEL PIPES, FITTINGS & COUPLINGS :
 - 2.1 ALL UNDERGROUND STEEL PIPES MUST BE PROTECTED EXTERNALLY WITH A PUTTY FILLER, CORROSION PROTECTION TAPE AND PVC OUTERWRAP, "DENSO TAPE" OR SIMILAR APPROVED.
 - 2.2 HDG STEEL FITTINGS IN CHAMBER TO BE DEGREASED, LIGHTLY ABRADED AND OVERCOATED WITH >90% ZINC RICH PAINT TO MIN DFT 150 MICRON
3. ALL FLANGE DRILLING IS TO BE IN ACCORDANCE WITH SABS 1123 TABLE 2500/3.
4. STEEL PIPES ARE TO BE TO SABS 62.
5. FINAL POSITION AND DEPTH OF THE CHAMBER IS TO BE DETERMINED ON SITE BY THE ENGINEER.
6. WHERE WATER TABLE IS HIGH, LONG CHAMBER TO BE PLASTERED AND WATER-PROOFED.
7. ALL STEP IRONS TO BE 255mm LONG GALVANIZED SAINT GOBAIN OR APPROVED EQUIVALENT.



SCALE 1:20

AIR VALVE CHAMBER FOR SMALL PIPES
SMALLER THAN 200MM

NOTES: 1. Do not scale off this drawing	LEGEND:	DESIGNED BY	DIGES GROUP	<div>CLIENT:</div> <div></div> <div>GREATER SEKHUKHUNE D. MUNICIPALITY</div> <div>No.3 West Street, P.O.Box: 49611,JOHANNESBURG, 2010 Tel: 011-262-7300</div>	<div>CONSULTANT:</div> <div></div> <div>Dynamic Integrated Geohydro Environmental Services cc.</div> <div>98 Marshall Street, P.O.Box: 5743,ROSKILDE, 0700 Tel: 015 291 4151 Fax: 015 291 4167</div>	DRAWING TITLE: <div>AIR VALVE CHAMBER FOR SMALL PIPES SMALLER THAN 200mm DETAIL 1/2</div>	DRAWING NUMBER: LCRWS/STD-15	SHEET No.: SHEET 1
		PROJECT NUMBER:	SCALE: AS SHOWN					
		DRAWN BY				NJC		
		APPROVED BY				RC -Pr.Eng		
		REVISION						



BENDING SCHEDULE													
LOCATION/ MEMBER	NO. IN EACH	TYPE & SIZE	BAR MARK	TOTAL NO.	CUTTING LENGTH	SHAPE CODE	BENDING DIMENSIONS TO SABS 82						
							A	B	C	D	E/R		
	10	R8	01	40	360	33	250					34	
	16	R8	02	16	950	83	300	125	200	200		33	
	38/30	Y12	03	136	900	34	600						
	8	Y16	04	8	1500	20	1500					83	
	38/30	Y12	05	68	900	34	600						
	10	R8	06	40	360	33	250						
	16	R8	07	16	950	83	300	125	200	200			
	33/30	Y12	08	126	900	34	600						
	33/30	Y12	09	63	900	34	600						
	4	Y16	10	4	1300	20	1300						
	4	Y16	11	4	750	20	750						
	4	Y16	12	8	500	20	500						
	4	Y16	13	4	1800	20	1800						