Description	**Concrete Repairs for Two Clarifiers at Maphephethwa Waterworks**
Advert Date	17 September 2024
Closing Date and Time	27 September 2024 at 15:00
Compulsory or Non-Compulsory Briefing Session	N/A *(site inspection can be arranged upon request)*
SCM Enquiries	**Name:** Sphamandla Mthembu **Tel:** 033 341 1325 **Email:** spha.mthembu@umgeni.co.za
Technical Enquiries	**Name:** Mpume Njoko **Tel:** (031) 719-7391 **Email:** Mpume.Njoko@umgeni.co.za
Contents of RFQ	1. Invitation to quote 2. Bidders information 3. Terms and Conditions 4. Undertaking by Bidder 5. Terms of Reference/RFQ specifications 6. Price Schedule 7. Authority to Sign 8. Bidders disclosure [SBD 4] 9. Preference points claim form (SBD 6.1) 10. Briefing session certificate [not applicable] 11. Contract Form

Quotation Submission:	**Tip-Offs Anonymous Hotline:**
Quotations clearly marked, ***"Q24-441-SM(A) - Concrete Repairs for Two Clarifiers at Maphephethwa Waterworks"*** are to be deposited in the Tender Box located outside the main entrance: uMngeni-uThukela Water (Head Office) Supply Chain Management Unit 310 Burger Street Pietermaritzburg 3201	Report unethical conduct at uMngeni-uThukela Water on**:** Toll Free Number: 0800 864 463 Email: umgeniwater@whistleblowing.co.za Toll Free Fax: 0800 212 689 Postal: Freepost KZN665, Musgrave, 4062 SMS: 33490 Online: www.whistleblowing.co.za *Stop theft / fraud / dishonesty / bribery /blackmail / intimidation, and remain anonymous.*

BIDDERS INFORMATION

Name of Bidder	
Company Registration number	
VAT registration number	
Contact Person	
Telephone number	
Cell number	
E-mail address	
Postal address	
Physical address	
uMngeni-UThukela Vendor Number	
CSD Supplier number	

I certify that the information furnished on this form is true and correct. I further accept that, in addition to cancellation of a contract, action may be taken against me should this declaration prove to be false.

_____	_____	_____
Name of Representative (Duly Authorised)	Signature	Date

TERMS AND CONDITIONS OF REQUEST FOR QUOTATION (RFQ)

1. Any alteration made by the bidder must be initialled.
2. Use of correcting fluid is prohibited
3. Bidders must be registered on the National Treasury's Central Suppliers Database.
4. Tenderers are required to submit a valid Tax clearance verification PIN or CSD MAAA number
5. This quotation is subject to the Preferential Procurement Policy Framework Act and the Preferential Procurement Regulations, 2022; the General Conditions of Contract (GCC) and if applicable any other Special Conditions of Contract.
6. The applicable preference point system for this tender is the 80/20 preference point system, Failure on the part of a tenderer to submit proof or documentation required in terms of this RFQ to claim points for specific goals, will be interpreted to mean that preference points for specific goals are not claimed by the bidder. Kindly refer to SBD 6.1 form for additional information.
7. Suppliers must complete the attached SBD 4 – Bidders disclosure, failure to complete these documents may result in the quotation being invalidated.
8. Quotations must be in accordance and comply with the terms of reference/specifications provided, unless otherwise stipulated.
9. The official uMngeni-uThukela Water quotation form must be used to quote the offered price. Should the allocated price page be insufficient, the tenderer may supplement the price page with an additional pricing breakdown.
10. Price Declaration must be completed, and should the total RFQ prices differ, the one indicated on the price declaration shall be considered the correct price.
11. The successful supplier may be required to fill in and sign a written Contract Form. (If applicable)
12. This document may contain confidential information that is the property of uMngeni-uThukela Water.
13. No part of the contents may be used, copied, disclosed or conveyed in whole or in part to any party in any manner whatsoever other than for preparing a proposal in response to this RFQ, without prior written permission from uMngeni-uThukela Water and the Bidder.
14. All Copyright and Intellectual Property herein vests with uMngeni-uThukela Water and its Bidder.
15. Responses to this RFQ must be deposited in tender box situated as indicated on the quotation request form marked appropriated as directed.
16. It is the responsibility of the bidder to ensure that its response reaches uMngeni-uThukela Water on or before the closing date and time of the RFQ. Late and incomplete submissions will not be accepted.
17. No services must be rendered or goods delivered before an official uMngeni-uThukela Water Purchase Order form has been received.
18. **UMngeni-uThukela Water reserves the right to appoint more than one supplier/service provider and or to award the quote as whole or in part.**
19. A full copy of General Conditions of Contract (GCC) are available on the National Treasury website (https://www.treasury.gov.za/divisions/ocpo/sc/generalconditions/general%20conditions%20of%20contract.pdf)

UNDERTAKING BY BIDDER

1. I/We hereby quote to supply all or any of the supplies and/or to render all or any of the services described in the attached documents to uMngeni-uThukela Water on the terms and conditions. In accordance with the specifications stipulated in the quotation documents (and which shall be taken as part of and be incorporated into this quote) at the prices and on the terms regarding time for delivery and/or execution inserted therein.

2. I/we agree that:
   (a) the offer herein shall remain binding upon me and open for acceptance by uMngeni-uThukela Water during the validity period indicated and calculated from the closing time of the quote;

   (b) this quote and its acceptance shall be subject to the Public Finance Management Act, 1999, UMngeni-uThukela Water's Supply Chain Management Policy and Procedures, the General and Special Conditions of Contract as may be applicable, with which I/we am fully acquainted;

   (c) if I/we withdraw my quote within the period for which I/we have agreed that the quote shall remain open for acceptance, or fail to fulfil the contract when called upon to do so. UMngeni-uThukela Water may, without prejudice to its other rights, agree to the withdrawal of my quote or cancel the contract that may have been entered into between uMngeni-uThukela Water and I/us. I/we will then pay to uMngeni-uThukela Water any additional expenses incurred for having either to accept any less favourable quote or, if fresh quote have to be invited, the additional expenditure incurred by the invitation of fresh quotes and by the subsequent acceptance of any less favourable quotes. uMngeni-uThukela Water shall reserve the right to recover such additional expenditure by set-off against monies which may be due to me under this, or any other tender or contract or against any guarantee or deposit that may have been furnished by me or on my behalf for the due fulfilment of this or any other tender or contract. Pending the ascertainment of the amount of such additional expenditure to retain such monies, guarantee or deposit as security for any loss uMngeni-uThukela Water may sustain by reason of my default;

   (d) if my quote is accepted, the acceptance may be communicated to me by electronic mail, to the email address supplied in my quotation document;

   (e) the law of the Republic of South Africa shall govern the contract created by the acceptance of my quote and I choose *domicilium citandi et executandi* in the Republic at (full physical address) :

   _____

   _____

   _____

3. I/we furthermore confirm that I/we have satisfied myself as to the correctness and validity of my quote: that the price(s), rate(s) and preference quoted cover all of the work/item(s) and my obligations under a resulting contract, and I accept that any mistakes regarding the price(s) and calculations will be at my risk.

4. I/we hereby accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement, as the Principal(s) liable for the due fulfilment of this contract.

5. I/we agree that any action arising from this contract may in all respects be instituted against me and I/we hereby undertake to satisfy fully any sentence or judgement which may be pronounced against me as a result of such action.

6. I/we confirm that I/we have declared all and any interest that I or any persons related to my business has with regard to this quote or any related quotations by completion of the Declaration of Interest Section.

7. I/WE, THE UNDERSIGNED, WHO WARRANT THAT I AM DULY AUTHORISED TO DO SO ON BEHALF OF THE TENDERER, CERTIFY THAT THE INFORMATION SUPPLIED IN TERMS OF THIS DOCUMENT IS CORRECT AND TRUE, THAT THE SIGNATORY TO THIS DOCUMENT IS DULY AUTHORISED AND ACKNOWLEDGE THAT:

(1) The tenderer will furnish documentary proof regarding any tendering issue to the satisfaction of the uMngeni-uThukela Water, if requested to do so.

(2) If the information supplied is found to be incorrect and/or false then uMngeni-uThukela Water, in addition to any remedies it may have, may: -

a) Recover from the contractor all costs, losses or damages incurred or sustained by uMngeni-uThukela Water as a result of the award of the contract, and/or

b) Cancel the contract and claim any damages, which uMngeni-uThukela Water may suffer by having to make less favourable arrangements after such cancellation.

_____	_____	_____
Name of Representative (Duly Authorised)	Signature	Date

TERMS OF REFERENCE

1. Description of Works

The purpose of the project is to source the service of a competent structural rehabilitation Contractor especially in concrete structures to undertake the repair of the Clarifier 1 and Clarifier 2 concrete substrate where the clarifier bridge running track experienced abrasion damage due to clarifier bridge wheels.

2. Scope of Works

- Break out the cement capping and dispose.
- Scrabble the top of the concrete wall
- Install formwork to correct level
- Design, manufacture stainless steel track to be fitted in both clarifiers to correct the radius and allow the wheel to run smoothly on the track. Contactor to lay the concrete layer using Sikadur 43 ZA or similar before installing the stainless steel track. The thickness of the steel shall be between 50mm to 110mm. The as-built drawings will be provided together with the RFQ.
- Strip shutters
- Commissioning of the clarifier bridge to assess work completed.

3. Deliverables/Key Outcomes.

- The desired outcome is to have a smooth running track for the clarifier bridge wheels and durable concrete fixes.
- Once Clarifier number 1 is satisfactorily completed and commissioned, work on Clarifier number 2 will commence.

4. Contract term

- The contract period is one month.

5. Other information

- Contractor to make provision for the supply of labour, transport and equipment required to carry out the supply and installation.
- Disposal of the removed concrete rubble
- All contractors to undergo a site induction before any work starts on site
- Before any site work starts, the Contractor to contact / see the site safety officer for safety file requirements which must be submitted before site induction. After the safety file is approved, a date for the induction will be communicated. Contractor to complete form for contractors working on our sites. Safety registers, workmen's compensation copy of forms of good standing with the commissioner.
- All contractor staff and vehicles brought onto our sites may and can be subject to a search when entering and when leaving our site.
- Before work starts on site contractor to contact project manager Mpume Njoko - Telephone 031 719 7300 E-mail: Mpume.Njoko@umgeni.co.za
- If any alterations, additions and or omissions are required written approval is to be sort from the Project Manager, before any work is carried out.

- The successful contractor must abide by uMngeni-uThukela Water's Rules for Contractors on Site and sign the relevant documents as acceptance.
- Working hours for the Contractor's personnel at uMngeni-uThukela Water's locations shall be between 07h30 and 16h00 on Monday to Thursday, Friday until 15h00. Before starting work on site, Contractor to report to the respective plant control room when arriving and leaving site contractor to report to the respective plant control room.
- Workers to be under supervision at all times and uMngeni-uThukela Water facilities such as phones, canteens and offices are out of bounds. Contractor is to ensure that their staff do not loiter around the site and stay in the area allocated to them.
- Site to be in a clean and tidy state at all times. Contractor to ensure adequate safety precautions that are required for this type of work are carried out. Site to be open to uMngeni-uThukela Water for inspection and operation requirements at all times. Contractor is to remove and dispose of all waste daily from site.
- UMngeni-uThukela Water will not be responsible for any items or equipment brought onto our site whatever the circumstances. uMngeni-uThukela Water will not provide storage facilities or be responsible for items left on site.
- Payment for the services rendered shall be within 30 days of the acceptance of the works completed to the satisfaction of uMngeni-uThukela Water.
- Before site work starts contractor to attend a site specific safety induction course for all staff before doing any work on any site.
- Before work commences the contractor must report to the control room on a daily basis.

6. Mandatory documentation/requirements

- CIDB Registration Certificate
- Registered with Central Supplier Database (CSD)
- Proof of good standing in terms of the COID Act
- Safety File (Post award)

7. Pricing

a) The bidder shall provide the price proposal as detailed in SBD 3.1
b) The bidders's price must be fully inclusive, and each item must be clearly specified.
c) All additional costs must be clearly specified and included in the total quotation price, (e.g. transport, labour, etc.).
d) All prices must be VAT inclusive.
e) The bidder is responsible for all the cost that they shall incur related to the preparation and submission of the quotation.

8. Evaluation Process

The RFQ will be evaluated using a three (03)-stage evaluation approach:

8.1 First stage: Mandatory/ Administrative Requirements

- Bidder completed all RFQ Forms
- SBD 4 – Bidders disclosure
- Bidder must have an active CIDB grade 2CE or above.

8.2 Second Stage: Functionality

- **A minimum functionality score of seventy (70) points is required for the tender to be considered further.**

- The criteria below lists the returnable that set out the scoring criteria and sub-criteria, and the percentage weighting for the score achieved against the relevant schedule:

Functionality Criteria	Weight
Tenderer's Experience	50
Experience of Key Personnel	50

Failure to score a single point in any of the criteria listed above will deem the bid non-responsive and the bidder will be disqualified.

DESCRIPTION	MAX POSSIBLE SCORE
Company Experience in projects comprising of successful completion of repairs or construction of >1ML water retaining structures in a water treatment plant. **Proof of a signed completion certificates or reference letter with the letterhead of the respective clients must be provided.** Proof of completion certificates certificate scores is as follows • 1 project – 50 points • 2 projects – 60 points • 3 projects – 70 points 5 additional points for every project more than 3 projects to a maximum of 100 points	**Max 100 Points**

Experience of Key Staff **Supervisor** ***(include CV and a list of similar projects and references)*** Experience of Site Supervisor on repair or construction of concrete water retaining structures: • 1 project – 50 points • 2 projects – 60 points • 3 projects – 70 points 5 additional points for every project more than 3 to a maximum of 100 points	**Max 100 Points**

Failure to score a single point in any of the criteria listed above will deem the bid non-responsive and the bidder will be disqualified.

Note:

Tenderer must submit all supporting documentation in a clear and concise manner as they would will be evaluated on the basis of experience in similar projects or similar areas and conditions in relation to the scope of work.

An example showing a guideline of how the Company Experience and Experience of Key Personnel will be evaluated;

Project name	Period/Year	Value of work inclusive of VAT (Rand)	Project/ task description	Company (where the project was done)	Company name and contact details
Construction of reservoir for uMngeni-uThukela Water	2018	R1,200,000	Construction of a 2ML reservoir at Wiggins WTP	Umgeni Water	Company X 033 341 1111 (Full Name)
Refurbishment of clarifier for uMngeni-uThukela Water	2022	R900 000	Construction of a 2ML reservoir at Wiggins WTP	Mhlathuze Water	Company XY 033 341 1111 (Full Name)

8.3 Third Stage: Price and Preference goals

1. Subsequent to the evaluation of mandatory/ administrative requirements and functionality, the third stage of evaluation of the bids will be in respect of price and preferential procurement only.
2. Tenderer is tax complaint

3. In compliance with the Preferential Procurement Regulations 2022, the 80/20 preference point system is applicable: points for this bid shall be awarded for:
    a) Price; and (80) and Preference as defined in SBD 6.1 (20)
4. The Preference Goals that have been identified for this bid is stipulated in SBD 6.1
5. Preferential goals and applicable points for this tender in terms of Preferential Procurement Regulations 2022, are indicated in the table below:

	Description	80/20	Evidence to be provided
HDI	The entity which is at least 51% black owned	10	BBBEE Certificate/ Sworn Affidavit
RDP	The promotion of enterprises located in KwaZulu-Natal	10	Lease Agreement/ Municipal Account/ Letter from the Traditional Authority.
Total points for preferential goals		**20**	

6. Failure on the part of a bidder to submit proof or documentation required in terms of this RFQ to claim points for specific goals will be interpreted to mean that preference points for specific goals are not claimed by the bidder.

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

8. UUW reserves the right to conduct negotiations with the qualifying bidder/s regarding any terms and conditions, including price(s), of a proposed contract where applicable UUW reserves the right not to accept the lowest financial offer or any offer.

PRICING SCHEDULE (BOQ) – FIRM PRICES

NOTE:

a) **Only firm prices will be accepted. Non-Firm prices (including prices subject to rates of exchange variations) will not be considered**

b) **In cases where different delivery points influence the pricing, a separate pricing schedule must be submitted for each delivery point**

Name of bidder _____ RFQ number_____

Closing Time _____ Closing date_____

OFFER TO BE VALID FOR **90** CALENDER DAYS FROM THE CLOSING DATE OF QUOTE.

Item No.	Description	Unit	Qty.	Rate	Amount	
					R	c
3.1	SHEQ Requirements - Health and Safety file, method statement, induction, the provision of PPE	Sum	1			
3.2	Site establishment	Sum	1			
3.3	Design, manufacture stainless steel track to be fitted in both clarifiers as per specification	Sum	1			
3.4	All construction works including labour, material, consumables, equipment, tools, supports etc. for Clarifier 1	Sum	1			
3.5	All construction works including labour, material, consumables, equipment, tools, supports etc. for Clarifier 2	Sum	1			
3.6	Commissioning and handover	Sum	1			
3.7	Disposal of concrete rubble	Sum	1			
				A. SUB-TOTAL		
				B. CONTINGENCY (add 10% of subtotal A)		
				C. SUB-TOTAL (A+B)		
				D. 15 % VAT OF C		
				E. TOTAL (C+D)		

Signature of duly authorized representative	_____	**DATE:** _____

AUTHORITY TO SIGN

RFQ NO: _____

Description: _____

Close Corporation / Company / Partnership / Trust /Sole proprietor or Sole trader

Company Name: _____

Registration Number: _____

Resolution Of The Directors Of The Company etc. resolved that _____, in his/her capacity as _____, is authorized to make applications on behalf of the Close Corporation / Company / Partnership / Trust /Sole proprietor or sole trader for:

Any documentation relating to the business (which is not necessarily a change of ownership). The nominated person will also have access to webpage for the business. Signature(s) for Close Corporation / Company / Partnership / Trust/ Sole proprietor or sole trader.
(Sole member still must sign this resolution)

Signature of members:

Name	Signature	Date
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____
6. _____	_____	_____

NB: FAILURE TO COMPLETE, SIGN AND DATE THE RESOLUTION AS OUTLINED ABOVE WILL RESULT IN THE TENDERER RENDERED INCOMPLETE AND WILL BE DISQUALIFIED/ ALTERNATIVELY THE TENDERER MAY ATTACH A SIGNED COMPANY RESOLUTION ON A COMPANY LETTERHEAD

SBD 4 - BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

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

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

2. Bidder's declaration

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

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

Full Name	Identity Number	Name of State institution

2.2 Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

_____

_____

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

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

2.3.1 If so, furnish particulars:

_____

_____

3 DECLARATION

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

3.1 I have read and I understand the contents of this disclosure;

3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;

3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium2 will not be construed as collusive bidding.

3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.

3.5 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

3.6 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

3.7 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted

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

from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

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

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

Signature	Date
Position	Name of bidder

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022 (SBD 6.1)

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 80/20 preference point system.

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

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

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	20
TOTAL POINTS FOR PRICE AND SPECIFIC GOALS	**100**

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:

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

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

Where

Ps = Points scored for price of tender under consideration
Pt = Price of tender under consideration
Pmin = Price of lowest acceptable tender

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

3.2.1. POINTS AWARDED FOR PRICE

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

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

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

Where

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

4. POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

(b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system, then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

Table 1: Specific goals for the tender and points claimed are indicated per the table below.
(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.

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

The specific goals allocated points in terms of this tender	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (80/20 system) (To be completed by the tenderer)
The entity which is at least 51% black owned	10	
The promotion of enterprises located in KwaZulu-Natal	10	

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm _____

4.4. Company registration number: ……...

TYPE OF COMPANY/ FIRM [TICK APPLICABLE BOX]

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

4.5. 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: _____

_____

_____

_____

OFFICIAL BRIEFING SESSION/SITE INSPECTION CERTIFICATE – NOT APPLICABLE

THIS IS TO CERTIFY THAT (NAME)

_____

ON BEHALF OF

_____

ATTENDED THE COMPULSORY BRIEFING SESSION AT **UMNGENI-UTHUKELA WATER** AS FOLLOWS:

TIME:

DATE:

VENUE:

AND IS THEREFORE FAMILIAR WITH THE CIRCUMSTANCES AND THE SCOPE OF THE SERVICE TO BE RENDERED.

_____

TENDERER'S SIGNATURE /REPRESENTATIVE

DATE:_____

_____ _____

UMNGENI-UTHUKELA WATER SCM REPRESENTATIVE **SIGNATURE**

(PRINT NAME)

UMNGENI-UTHUKELA WATER'S STAMP

SBD 7.1 CONTRACT FORM - PURCHASE OF GOODS/WORKS

This form must be filled in duplicate by both the successful bidder (part 1) and the purchaser (part 2). Both forms must be signed in the original so that the successful bidder and the purchaser would be in possession of originally signed contracts for their respective records.

PART 1 (TO BE FILLED IN BY THE BIDDER)

1. I hereby undertake to supply all or any of the goods and/or works described in the attached bidding documents to uMngeni-UThukela Water in accordance with the requirements and specifications stipulated in the above mentioned RFQ 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 time of 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);
   - Technical Specification(s);
   - Preference claim form for Preferential Procurement in terms of the Preferential Procurement Regulations;
   - Bidder's Disclosure form;
   - 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 goods and/or works 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 TENDERER _____

DATE _____

WITNESSES

1 _____

2. _____

DATE: _____

SBD 7.1 CONTRACT FORM - PURCHASE OF GOODS/WORKS

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I_____ in my capacity as _____ accept your quotation under reference number _____dated _____ for the supply of goods/works indicated hereunder and/or further specified in the annexure(s).

2. An official order indicating delivery instructions is forthcoming.

3. I undertake to make payment for the goods/works delivered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice accompanied by the delivery note.

ITEM NO.	
PRICE (ALL APPLICABLE TAXES INCLUDED)	
BRAND	
DELIVERY PERIOD	
TOTAL PREFERENCE POINTS CLAIMED	
POINTS CLAIMED FOR SPECIFIC GOAL 1	The entity which is at least 51% black owned
POINTS CLAIMED FOR SPECIFIC GOAL 2	The promotion of enterprises located in KwaZulu-Natal

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

SIGNED AT _____ ON:_____

NAME (PRINT):_____ SIGNATURE:_____

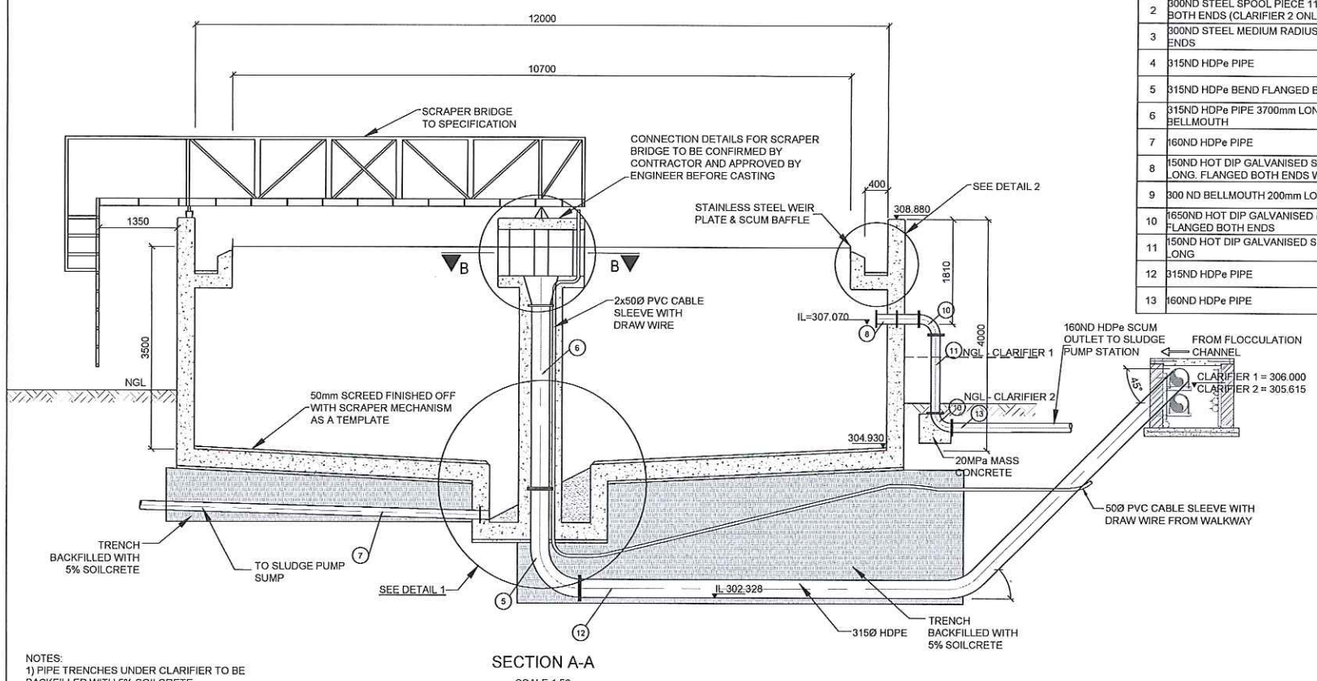
OFFICIAL STAMP

WITNESSES

1. _____

2. _____

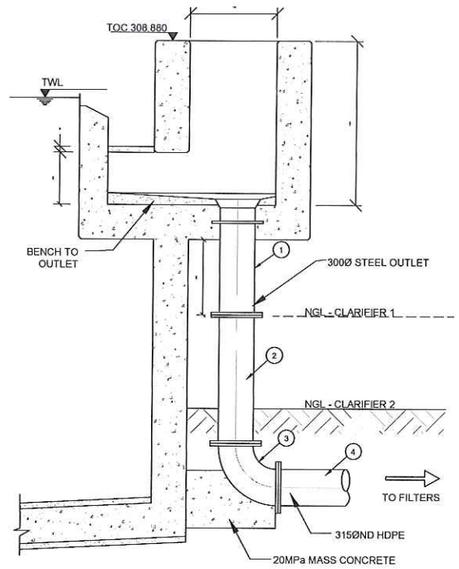
DATE: _____



SECTION A-A

SCALE 1:50

ITEM	DESCRIPTION	QTY/ CLARIFIER
1	300ND STEEL SPOOL PIECE 1000mm LONG FLANGED ONE END WITH BELL MOUTH AND PUDDLE FLANGE	1
2	300ND STEEL SPOOL PIECE 1110mm LONG FLANGED BOTH ENDS (CLARIFIER 2 ONLY)	1
3	300ND STEEL MEDIUM RADIUS BEND FLANGED BOTH ENDS	1
4	315ND HDPe PIPE	1
5	315ND HDPe BEND FLANGED BOTH ENDS	1
6	315ND HDPe PIPE 3700mm LONG WITH LONG BELLMOUTH	1
7	160ND HDPe PIPE	1
8	150ND HOT DIP GALVANISED SPOOL PIECE 1000mm LONG. FLANGED BOTH ENDS WITH PUDDLE FLANGE	1
9	300 ND BELLMOUTH 200mm LONG	1
10	1650ND HOT DIP GALVANISED MEDIUM RADIUS BEND FLANGED BOTH ENDS	2
11	150ND HOT DIP GALVANISED SPOOL PIECE 1400mm LONG	1
12	315ND HDPe PIPE	1
13	160ND HDPe PIPE	1



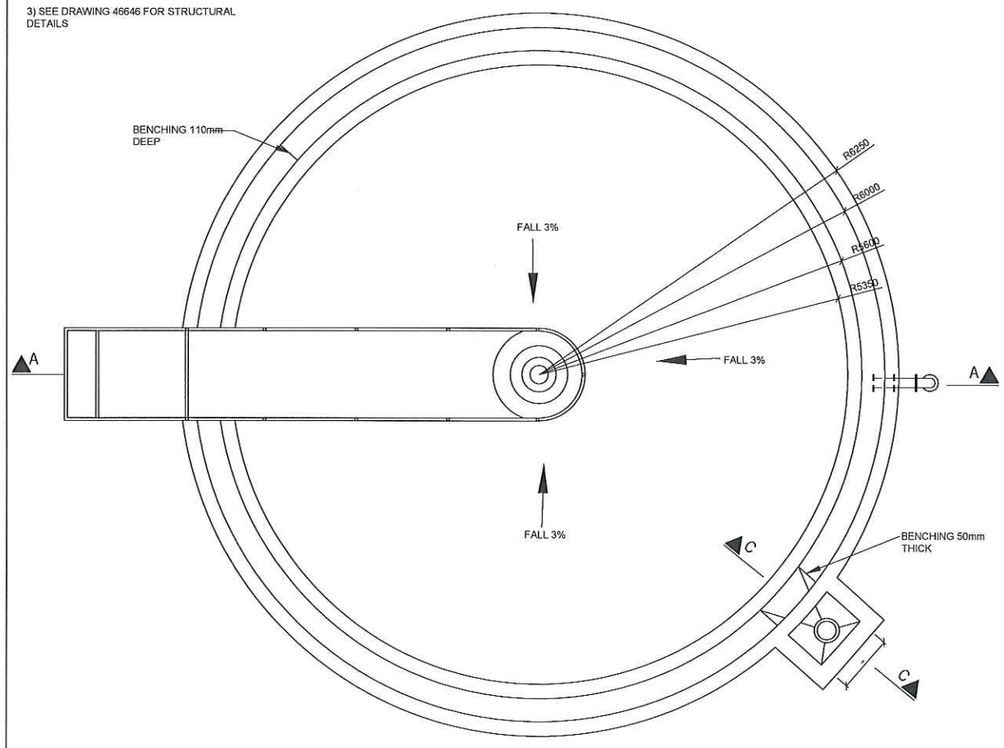
SECTION C-C THROUGH OUTLET STRUCTURE

SCALE 1:25

NOTES:
1) PIPE TRENCHES UNDER CLARIFIER TO BE BACKFILLED WITH 5% SOILCRETE

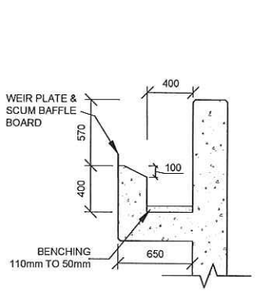
2) SEE DRAWING 46609 FOR CLARIFIER SITE LAYOUT AND PIPE POSITIONS.

3) SEE DRAWING 46646 FOR STRUCTURAL DETAILS



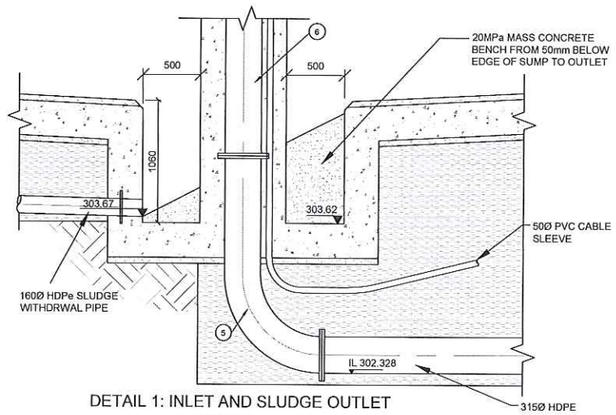
PLAN

SCALE 1:50



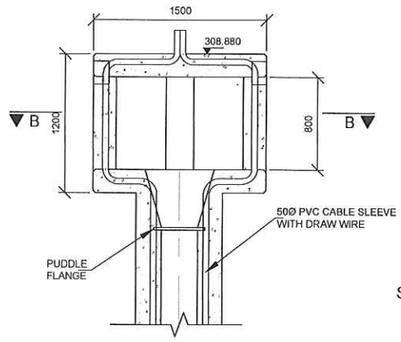
DETAIL 2 SIDE CHANNEL

SCALE 1:25



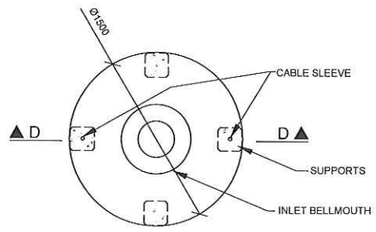
DETAIL 1: INLET AND SLUDGE OUTLET

SCALE 1:25



SECTION D-D TROUGH THE INLET WELL

SCALE 1:25



SECTION B-B TROUGH THE INLET STRUCTURE

SCALE 1:25

AS-BUILT

REFERENCE DRAWINGS

DRAWING No.	TITLE/DESCRIPTION	SOURCE

UMGENI WATER • AMANZI — WATER FOR GROWTH AND SUSTAINABLE DEVELOPMENT

RECORD DRG

APPROVED	
DATE	

DRAWING STATUS CODES :

D = DEVELOPMENT T = TENDER C = CONSTRUCTION
P = PLANNING A = AS BUILT

	BY	DRAWN	CHECKED
SURVEYED	N/A	N/A	N/A
DESIGNED	B. FREDLUND	P. NAIDOO	H. van STADEN

CONSULTING ENGINEER APPROVAL

CONSULTING ENGINEER DRAWING No. J01003-01-18-46608-A-00

NAME:	SIGNATURE:	DATE:
H. van STADEN Pr. ENG No. 990529		2015-02-06

DISCIPLINE WATER SUPPLY AND SANITATION

THE MASTER HELD AT THE BKS DURBAN OFFICE BEARS THE ORIGINAL SIGNATURE OF APPROVAL.

BKS
DURBAN OFFICE
2 MARYVALE ROAD
WESTVILLE
3630
TEL : +27 (0)31 204 3800
FAX : +27 (0)31 204 3818
Reg. No. 1966/006628/07

UMGENI WATER APPROVAL

ENGINEERING SERVICES

	NAME	SIGNATURE	DATE
DESIGN ENGINEER			
ENGINEERING MANAGER			

OPERATIONS

	NAME	SIGNATURE	DATE
MAINTENANCE MANAGER			
AREA MANAGER			
ASSET MANAGER			
GENERAL MANAGER			

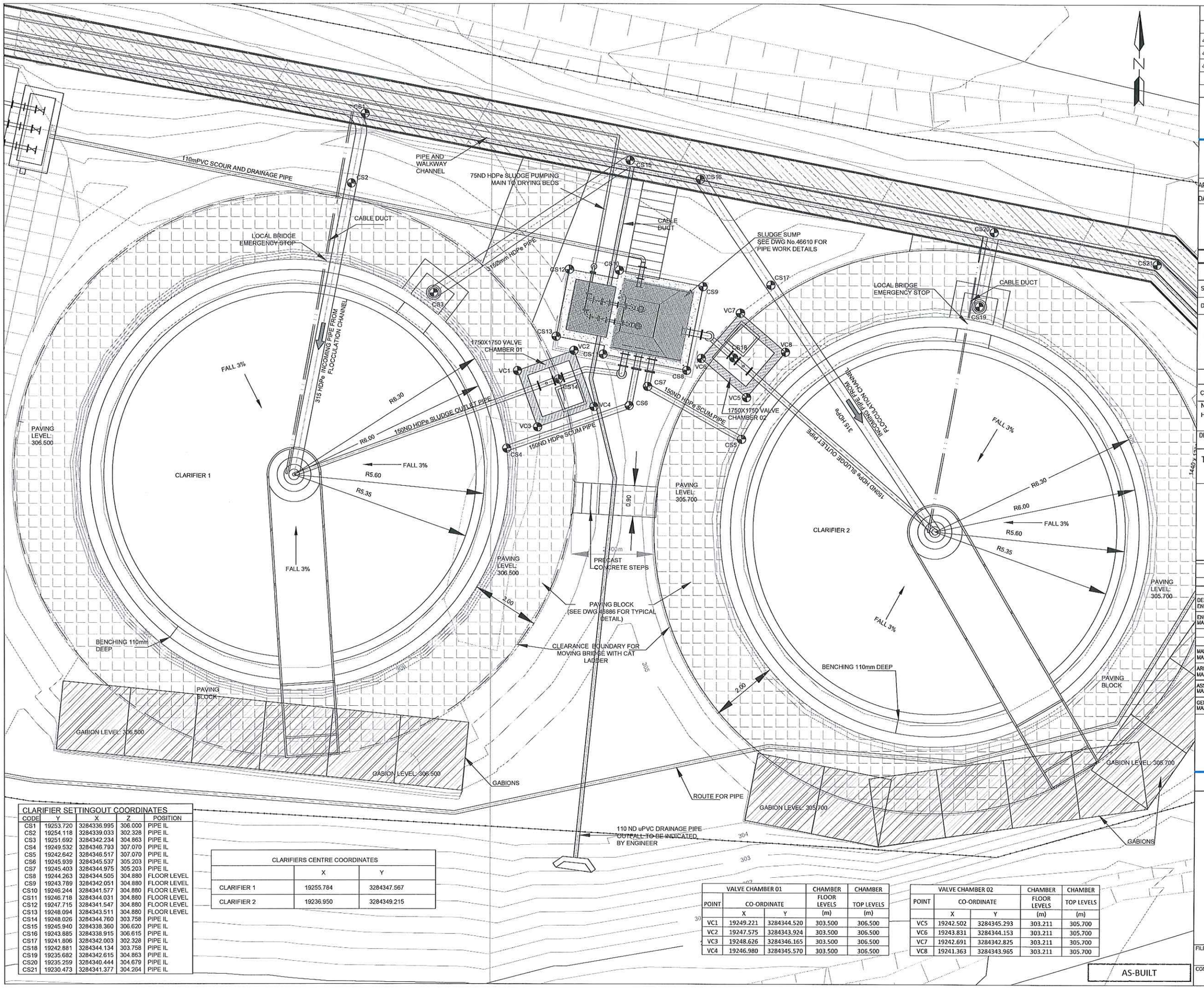
310 BURGER STREET
PIETERMARITZBURG
3201
TEL. (033) 341 1111

UMGENI WATER • AMANZI — WATER FOR GROWTH AND SUSTAINABLE DEVELOPMENT

MAPHEPHETHWA WTW UPGRADE

CLARIFIER GENERAL ARRANGEMENT

FILE No.	SCALE	SHEET
	AS SHOWN	1 OF 1
CONTRACT No. 2010/043	DRAWING No. 46608	REVISION A00



CLARIFIER SETTINGOUT COORDINATES				
CODE	Y	X	Z	POSITION
CS1	19253.720	3284336.995	306.000	PIPE IL
CS2	19254.118	3284339.033	302.328	PIPE IL
CS3	19251.692	3284342.234	304.863	PIPE IL
CS4	19249.532	3284346.793	307.070	PIPE IL
CS5	19242.642	3284346.517	307.070	PIPE IL
CS6	19245.939	3284345.537	305.203	PIPE IL
CS7	19245.403	3284344.975	305.203	PIPE IL
CS8	19244.263	3284344.505	304.880	FLOOR LEVEL
CS9	19243.789	3284342.051	304.880	FLOOR LEVEL
CS10	19246.244	3284341.577	304.880	FLOOR LEVEL
CS11	19246.718	3284344.031	304.880	FLOOR LEVEL
CS12	19247.715	3284341.547	304.880	FLOOR LEVEL
CS13	19248.094	3284343.511	304.880	FLOOR LEVEL
CS14	19248.026	3284344.760	303.758	PIPE IL
CS15	19245.940	3284338.360	306.620	PIPE IL
CS16	19243.885	3284338.915	306.615	PIPE IL
CS17	19241.806	3284342.003	302.328	PIPE IL
CS18	19242.681	3284344.134	303.758	PIPE IL
CS19	19235.682	3284342.615	304.863	PIPE IL
CS20	19235.259	3284340.444	304.679	PIPE IL
CS21	19230.473	3284341.377	304.264	PIPE IL

CLARIFIERS CENTRE COORDINATES		
	X	Y
CLARIFIER 1	19255.784	3284347.567
CLARIFIER 2	19236.950	3284349.215

VALVE CHAMBER 01			CHAMBER	CHAMBER
POINT	CO-ORDINATE		FLOOR LEVELS	TOP LEVELS
	X	Y	(m)	(m)
VC1	19249.221	3284344.520	303.500	306.500
VC2	19247.575	3284343.924	303.500	306.500
VC3	19248.626	3284346.165	303.500	306.500
VC4	19246.980	3284345.570	303.500	306.500

VALVE CHAMBER 02			CHAMBER	CHAMBER
POINT	CO-ORDINATE		FLOOR LEVELS	TOP LEVELS
	X	Y	(m)	(m)
VC5	19242.502	3284345.293	303.211	305.700
VC6	19243.831	3284344.153	303.211	305.700
VC7	19242.691	3284342.825	303.211	305.700
VC8	19241.363	3284343.965	303.211	305.700

AS-BUILT

REFERENCE DRAWINGS

DRAWING No.	TITLE/DESCRIPTION	SOURCE
46610	SLUDGE P-STATION PLAN & DET	BKS
46608	CLARIFIER GENERAL ARRANGEM	BKS
46886	TYPICAL DETAILS	BKS

UMGENI WATER · AMANZI
WATER FOR GROWTH AND SUSTAINABLE DEVELOPMENT

RECORD DRG

APPROVED	
DATE	

	BY	DRAWN	CHECKED
SURVEYED	ALIGN SURVEY	ALIGN SURVEY	ALIGN SURVEY
DESIGNED	B. FREDLUND	P. NAIDOO	H. van STADEN

DRAWING STATUS CODES :
D = DEVELOPMENT T = TENDER C = CONSTRUCTION
P = PLANNING A = AS BUILT

CONSULTING ENGINEER APPROVAL

CONSULTING ENGINEER DRAWING No. J01003-01-18-46609-A-00

NAME:	SIGNATURE:	DATE:
H. van STADEN PR. ENG No. 900523		2015-02-06

DISCIPLINE WATER SUPPLY AND SANITATION

THE MASTER HELD AT THE BKS DURBAN OFFICE BEARS THE ORIGINAL SIGNATURE OF APPROVAL.

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2 MARYVALE ROAD
WESTVILLE
3630
TEL : +27 (0)31 204 3800
FAX : +27 (0)31 204 3818
Reg. No. 1966/006628/07

UMGENI WATER APPROVAL

ENGINEERING SERVICES

	NAME	SIGNATURE	DATE
DESIGN ENGINEER			
ENGINEERING MANAGER			

OPERATIONS

	NAME	SIGNATURE	DATE
MAINTENANCE MANAGER			
AREA MANAGER			
ASSET MANAGER			
GENERAL MANAGER			

310 BURGER STREET
PIETERMARITZBURG
3201
TEL. (033) 341 1111

UMGENI WATER · AMANZI
WATER FOR GROWTH AND SUSTAINABLE DEVELOPMENT

MAPHEPHETHWA WTW UPGRADE

WATER TREATMENT WORKS CLARIFIERS SITE LAYOUT

FILE No.	SCALE	SHEET
	1:50	1 OF 1
CONTRACT No.	DRAWING No.	REVISION
2010/043	46609	A00

UMGENI WATER

PROJECT SPECIFICATION FOR CONCRETE

Version 001

Dated: 2010-10-20

UW PROJECT SPECIFICATION FOR CONCRETE

PSG CONCRETE (STRUCTURAL)

PSG 2 DEFINITIONS

PSG 2.3 a) General

Adverse weather

Delete the figure **"**25°C" and replace with **"32**°C"

PSG 2.3 d) <u>Concrete finishes:-</u>

Add new Sub-Clause

Generally the concrete is to be finished to the tolerances stated in Clause 6.2.3 for the relevant degree of accuracy.

For **"WATER RETAINING STRUCTURES"** the finishes are to as listed below:-

(I) FORMED SURFACES : CLASSES OF FINISH

a) Class F1 Surface Finish

After repair work has been done to surface defects, no further treatment of the as-stripped finish will be required. This finish is required on concealed formed surfaces

b) Class F2 Surface Finish

This finish shall be equivalent to that obtained from the use of square-edged timber panels and boards wrought to the correct thickness, or shutter boards or steel forms arranged in a regular pattern. This finish is intended to be left as struck. Although minor surface blemishes and slight discolourations will be permitted, large blemishes and severe stains and discolouration shall be repaired where so directed by the Engineer.

c) Class F3 Surface Finish

This finish shall be that obtained by first producing a Class F2 surface finish with joint marks which form an approved regular pattern to fit in with the appearance of the structure. All projections shall then be removed, irregularities repaired and the surface rubbed or treated to form a smooth finish of uniform texture, appearance and colour.

(II) UNFORMED SURFACES : CLASSES OF FINISH

a) Class U1 Surface Finish (rough)

The top surface shall be screeded off with a template to the required cross-section and tamped with a tamping board to compact the surface thoroughly and to bring mortar to the surface, so as to leave the surface slightly rough but generally at the

required elevation.

b) Class U2 Surface Finish (floated)

The surface shall first be given a Class U1 surface finish and after the concrete has hardened sufficiently, it shall be wood-floated to a uniform surface free from trowel marks. For non-skid surfaces such as on those exposed to pedestrian traffic, the surface shall then be given a broom finish. The corrugations so produced shall be approximately 1mm deep, uniform of appearance and width and shall be perpendicular to the centre line of the pavement.

c) Class U3 Surface Finish (smoothly finished)

The surface shall first be given a Class U1 surface finish, and after the concrete has hardened sufficiently, it shall be floated with a steel float to a smooth surface to within 5mm of the position shown on the drawings, and to within 2mm of the required level.

PSG 3 MATERIALS

PSG 3.2 CEMENT

PSG 3.2.1 Applicable specifications

Delete the sub-clause and replace with the following :

SANS 50197-1 and -2: Common cements, and SANS 50413-1 and -2: Masonry cement.

These specifications will be applicable to this contract and the descriptions and types of cements, where specified, will be based on the designations as defined in these specifications.

No Ordinary Portland Cement having an equivalent sodium monoxide content (calculated as $Na_20 + 0.658\ K_20$) exceeding 0.60 percent by mass of the cement may be used in any reinforced concrete other than in combination with an approved coarse aggregate, which has been shown by testing to be non-reactive in respect of potential alkali-aggregate reaction.

All cement and cement extenders used on the project shall comply with SANS EN 197-1 and SANS 1491 respectively.

Unless agreed to otherwise by the Engineer, the cement used on the works shall be either Type Cem I, Type Cem II/A-S or Cem II/B-S (all of minimum strength Class 32,5) – refer table 1 of SANS 50197-1.

All cement of a particular type shall be supplied from the same source for the duration of the Contract.

PSG 3.2.2 Alternative Types of Cement

Add to the Sub-Clause:

Pulverised Fly Ash (PFA) used on the works shall be from an approved source and shall comply with the requirements of SANS 1491 part II

PSG 3.2.3 Storage of Cement

Add to the Sub-Clause:

Cement shall not be kept in storage for longer than 8 weeks without the Engineer's permission. Cement, if not delivered in bulk for storage in an approved silo, must be stored in a separate room with a raised floor constructed of heavy planks supported on bricks, or similar. This room must be completely damp-proof and well ventilated. Cement must be used in the order that it is delivered. Any bags of cement that show any degree of hydration or setting shall be removed from the site and replaced at the Contractor's expense.

PSG 3.3 WATER

Add to the Sub-Clause:

If potable water is not used in the concrete, samples of the water that it is proposed to use for the concrete shall be submitted to the Engineer for his approval in terms of Clause 3.1.

PSG 3.4 AGGREGATES

PSG 3.4.2 Use of Plumbs

PSG 3.4.2 g) *.Add New Sub-Clause:*

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

PSG 3.4.4 Aggregate quality

Add New Sub-Clause:

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

Records of grading analysis tests on all the aggregate shall be kept.

Fine aggregate must be clean, naturally occurring, siliceous sand or approved crushed rock. The broken shell content determined in accordance with SANS Method 5840 must not exceed 30 percent by mass. In addition, for water retaining structures the following shall apply: fine aggregate grading is to comply with the table below. It may be necessary to blend two sands in order to meet the grading envelope. The maximum variance of the fineness modulus (FM) of the fine aggregate shall not exceed 0.2. Revision to the submitted mix design must be carried out where this becomes unavoidable.

SIEVE SIZE (MM)	% PASSING
4,75	100 – 90
2,36	100 – 75
1,18	96 – 60
0,60	60 – 40
0,30	40 – 20
0,15	20 – 10

0,075	6 – 3 (6 – 15)*

***** If crusher sand

The coarse aggregate shall all be retained on a screen with 4,75mm nominal aperture size with the exception of dust content, which shall not exceed 0,5 percent by mass. Flakiness indices determined in accordance with SANS Method 5847 must not exceed 30 percent in the case of 26,5mm aggregate size and 25 percent in the cast of 19,0mm aggregate size respectively.

PSG 3.5 ADMIXTURES

PSG 3.5.1 Approval of Admixtures Required

Add to the Sub-Clause:

Admixtures may be used in concrete mixes provided their use has been approved by the Engineer. To facilitate approval, the Contractor shall provide the following information:-

- The trade name of the admixture, its source and the manufacturer's recommended method of use
- Typical dosage rates and possible detrimental affects of under-dosage and over-dosage.
- Whether compounds (such as those containing chloride in any form as an active ingredient) likely to cause corrosion of the reinforcement or deterioration of the concrete are present and, if so, the chloride content (expressed as chloride ions or as equivalent anhydrous calcium chloride) by mass of admixture.
- The method and accuracy of dispensing the admixture.
- Generally, admixtures that improve workability and water retention shall comply with AASHTO M194 "Chemical Admixtures for concrete"

PSG 4 PLANT

PSG 4.2 BATCHING PLANT

Add to the Sub-Clause:

Reports on the calibration of weight batching plant, clearly stating the date of the test, shall be submitted to the engineer.

In addition, when concrete is being mixed for **water retaining structures** the following shall apply:

The batching of concrete shall be done by weigh batching only, volume batching will not be permitted.

The Contractor shall ensure, by regular examination, calibration and tests, that the batching system functions efficiently and accurately and that hoppers and cement containers are kept dry and clean. Proof of examination and calibration, clearing stating date of test shall be submitted to the Engineer.

No mixed concrete shall be deposited directly onto the ground prior to placing. A board or other suitable platform is to be provided onto which the mixed concrete can be deposited whilst it awaits placing.

Excess concrete from mixing shall be deposited in a designated area awaiting removal to an approved landfill site, or for use in the reservoir embankment.

The Contractor will contain wash water from cement mixing operations, by directing the water into a sump for collection. The material contained in the sump will be removed to an appropriate landfill site, or included in the reservoir embankment.

PSG 4.5 FORMWORK

PSG 4.5.1 Design

Add to the Sub-Clause:

The Contractor shall submit detailed proposals for the formwork and support work to the Engineer at the beginning of thr contract. The formwork shall be designed to limit deflection to a value not exceeding 1/360th of the span between supports.

PSG 4.5.3 Ties

Add to the Sub-Clause:

The spacing and method of fixing shutters and filling of voids shall be subject to the approval of the Engineer.

For water-retaining structures:-

(a) If sacrificial metal ties are used, they are to be drilled out so as not to extend beyond 60mm of concrete surface on the wet side of the wall and 50mm on the outside.

(b) If plastic sheaths are used to permit removal of the metal ties, the sheaths are to be removed and the holes are to be completely removed by using an oversized drill bit to ream out the holes.

(c) the surface of the hole is to be primed by wetting with a cement/SBR latex slurry and the hole filled by caulking with a cementitous mortar consisting of 1 part cement to 2 parts concrete sand by volume, well mixed with sufficient clean water to obtain the required consistency. The grout is to be well rodded into the hole to completely fill same and provide a dense void free plug. The surface is to be towelled to finish flush with the surrounding area.

PSG 5 CONSTRUCTION

PSG 5.1 REINFORCEMENT

PSG 5.1.2 Fixing

Delete from the eighth and ninth lines the following:

"or, if permitted by the Engineer, by welding".

PSG 5.1.3 Cover

Add to the Sub-Clause:

Binding wire used for fixing reinforcement must be tightly bound around the nodes at bar intersection with cut ends bent inwards. A nominal reduction of the minimum specified cover by 3mm will be allowed for binding wire. The reinforcing tie wire used for the cover blocks is to be hot dipped galvanized. Great care is to be taken over the manufacturing of these blocks and the Contractor must ensure that when the blocks are made that the tie wires are not pushed too deep into the blocks. A minimum of 30mm cover must be maintained between the reinforcing tie wire and the end of the block.

The Contractor shall use only high quality cement mortar cover blocks to maintain the specified cover to reinforcement. The concrete cover blocks shall be made with mortar having the same characteristic 28 day strength as that which is specified for the structural concrete elements. The blocks shall not be less than 80mm x 80mm and the same thickness as the required cover.

Cover blocks shall not be less than 7 days old at time of installation and shall have been cured by full immersion in water for a period of not less than 3 days.

For water-retaining structures the minimum cover shall be 60mm on the wet surface; and 50mm on the outside surface.

For chambers minmim cover is to be 40mm

PSG 5.2 FORMWORK

PSG 5.2.1 Classification of Finishes

Add to the Sub-Clause:

Generally all surfaces of minor structures (such as valve chambers) are to be smooth, and only those surfaces which will be covered under permanent backfill may be cast using rough shutters.

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

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

PSG 5.2.1 c.) Special

Add to the Sub-Clause:

For **water-works** and other **water-retaining structures** the following classes of finish shall apply :-

CLASS	COMMENT	USE IN WORKS
F1	Formwork to be constructed to prevent liquid leakage. Minimum standard of finish for water retaining structures. (degree of accuracy III)	Surfaces below ground not exposed to view and other surfaces indicated on the drawings.
F2	This is a good quality finish of uniform texture and colour. 'Groutex' or other similar approved sealer to be fitted between formwork panels. (degree of accuracy II)	All visible surfaces not directly in contact with water
F3	This is a high quality, smooth finish of uniform texture and colour. Unless specified to the contrary, steel forms may be used to form surfaces with a Class F3 surface finish. (degree of accuracy I)	All surfaces in contact with water; all surfaces exposed to view and other surfaces indicated on the drawings or as directed by the Project Manager.

PSG 5.2.2 Preparation of Formwork

Add to the Sub-Clause:

The Contractor is required to provide a method statement together with hand sketches for the proposed formwork and concrete pours for the reservoir.

All formwork must be treated with a release agent which is compatible with the concrete surface finish specified. Details of the proposed release agent shall be submitted to the Engineer for his approval, prior to its use on site. Great care is to be

taken not to get any shutter release oil or any other contamination on any of the reinforcing.

All exposed external corners shall have 20mm x 20mm chamfers.

PSG 5.2.5 Removal of Formwork

PSG 5.2.5.2 Permissible Time for Removal of Formwork

Delete the first two lines and substitute the following:

For this purpose and except as allowed in SANS 1200G 5.2.5.3, the formwork shall remain in place, after all the concrete has been placed in the relevant lift, for the appropriate minimum period of time given in Table 2

Ammend Table 2 as following:-

In columns 2,3 and 4 after the word “Portland cement and portland cement 15” add “and Type Cem I, Type Cem II/A-S and Type Cem II/B-S”

PSG 5.3 HOLES, CHASES AND FIXING BLOCKS

Add to the Sub-Clause:

Fixing blocks for the attachment of fixtures may be embedded in concrete provided that the strength or any other desirable feature (such as appearance) is not in the opinion of the Engineer, thereby impaired.

PSG 5.5 CONCRETE

PSG 5.5.1 Quality

PSG 5.5.1.1 General

Add to the Sub-Clause the following:-

Unless specifically stated in the Project Specification Prescribed Mix Concrete will not be used

PSG 5.5.1.2 Consistency

Add to the Sub-Clause the following:-

Slump limits specified in Table 3 shall apply except for slabs where the maximum slump must not exceed 60mm

PSG 5.5.1.5 Durability

Add to the Sub-Clause:

The exposure conditions at the site of the Works are to be considered as being severe.

PSG 5.5.1.6 Prescribed Mix Concrete

Delete the Sub-Clause and substitute the following:

Unless the Design mix is detailed on the drawings or in the Specification, all concrete shall be Strength concrete.

PSG 5.5.1.7 Strength Concrete

Add to the sub-clause:

Unless otherwise agreed to by the Engineer, the concrete mix is to be designed by an approved laboratory. At least four weeks before placing any concrete on the Works, the Contractor shall supply and deliver to the approved laboratory, at his own cost, samples of the aggregates he proposes to use in the concrete mix. While the proportion of cement to the combined quantity of sand and stone will remain constant for each grade of concrete, as set out above, the relative proportions of sand and stone may be adjusted to achieve the required strength. The laboratory will be bound by the requirements of this Specification which are to guide the Contractor in pricing the grade of strength concrete. The Contractor is to allow in his rate for strength concrete an amount to cover the fees and charges levied by the approved laboratory in designing the strength concrete mix.

Grade 35/19 Concrete for Water Retaining Structures

Grade 35/19 concrete shall be used in water retaining structures (refer to clause PSG 5.5.11)

PSG 5.5.1.8 No-Fines Concrete

Add new Sub-Clause:

No-Fines concrete shall be composed of cement and course aggregate only, the fine aggregate being omitted from the mix.

The stone shall comply with the grading requirements of 19mm single-sized crushed stone to table 7 of SANS 1083.

Only sufficient water shall be added to the mix to produce a smooth grout to completely cover each and every particle of aggregate.

Portions may be varied on site with the approval of the Engineer to obtain a more satisfactory result. The upper surface of the no-fines is to be finished off with a wood float to provide a smooth working surface while adding just sufficient dry mix mortar (1 to 8) to close the upper surface of voids in order to prevent the ingress of foreign matter into the interstices.

No-Fines concrete shall be placed within 20 minutes of having been mixed and shall be rodded and hand tamped into position. The use of vibrators will not be permitted.

No traffic shall be permitted to traverse the surface of the no-fines concrete during the three days after placing and then only over planks or boards placed for that purpose.

PSG 5.5.3 Mixing

PSG 5.5.3.1 Mixing at Construction Site

Add to the Sub-Clause:

i) Site batching shall be by mass using an approved type of weigh-batching plant.

PSG 5.5.3.2 Ready-Mixed Concrete

Delete the first sentence and substitute the following:

Concrete produced at a central concrete production facility other than at the site of the Works shall only be accepted for use in the Works with the prior and express approval of the Engineer. When such approval has been given the Engineer shall then decide whether or not to accept the test results obtained by the facility concerned.

In addition for water retaining structures:

Ready-mixed concrete must comply fully with the specifications detailed in SANS 878 (latest amendment). The concrete batching plant is to be inspected by the Engineer for compliance with SANS tolerances and his approval is to be obtained in writing before commencement of the concrete works.

The slump of the concrete is to be measured from every truck delivered and is to comply with the relevant parts of the SANS 878 specifications and this specification.

A computer printout of the concrete mix from the batching plant is to be made available when requested. The printout is to give details of the truck registration, the actual mix proportions and the time that the water was added to the mix. The arrival time of each truck and the time that the concrete discharge is completed must also be recorded.

The use of the ready-mixed concrete will be approved subject to concrete being placed in its final position within a maximum time of 2 hours from the time of discharge from the central batching plant into the mixing truck. In addition all other requirements relating to concrete materials, plant and construction contained in the Standardised and project Specifications shall apply. The ready-mixed concrete will be subject to the same testing requirements as site-batched concrete.

The Contractor shall submit a written request to the Engineer to concrete any section of work at least 24 hours beforehand. No concreting may take place until such time that the request has been counter-signed by the Engineer.

PSG 5.5.5 <u>Placing</u>

PSG 5.5.5.5 <u>Dropping of Concrete (new heading)</u>

Add to the Sub-Clause:

Dropping concrete freely will only be permitted if the Engineer is satisfied that this is the only practical method of placing.

PSG 5.5.5.9 Pumping Concrete

Add new Sub-clause:

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

PSG 5.5.5.10 <u>Continuous Pours</u> (New Sub-Clause)

Add new Sub-clause:

In the case of continuous walls in **water-retaining structures**, these are to be cast in lifts of such height that each lift can be poured uninterrupted in one continuous operation over the entire perimeter of the wall. No vertical or inclined construction joints of any kind will be permitted in continuous walls unless they have been specifically ordered or authorized by the Engineer. When placing a complete perimeter wall in a single pour, the placing of concrete shall commence at convenient points on the perimeter of the wall and shall proceed both ways simultaneously so that fresh concrete meets fresh concrete. Any rest pauses, such as for meals, shall be avoided as far as possible, and the Contractor may be required by the Engineer to make the operation continuous by working in shifts. A workable arrangement must be made before each concreting operation commences.

PSG 5.5.5.11 Blinding Layer (New Sub-Clause)

Add new Sub-clause:

Beneath all structural grades of concrete, or where shown on drawings or elsewhere if so ordered by the Engineer, the bottom of the excavation is to be covered by a blinding layer (screed) in Grade 15/19 mPa concrete to a minimum depth of 75mm to prevent disturbance of the ground and to serve as an even, clean and accurately positioned working floor for setting steel and placing foundation concrete. This blinding layer shall be laid within a day after excavations have been taken out, trimmed to the required depths and have been inspected and approved by the Engineer.

PSG 5.5.7 Construction Joints

PSG 5.5.7.3 <u>Preparation of Construction Joints (new heading)</u>

Delete Sub-Clauses and substitute with the following:

All horizontal and vertical construction joints shall be cleaned of all dirt and loose particles and shall be prepared to the satisfaction of the Engineer. Formed keys shall be provided if shown on the drawings or if instructed by the Engineer. All intersections of construction joints with concrete surfaces which will be exposed to view shall be made straight and level or plumb and shall be constructed to the details shown on the drawings.

The Contractor is to provide a compressor with suitable oil traps in the air delivery hoses on site for the whole period during which concreting is in progress, and this must be available for cleaning concrete faces prior to placing fresh concrete or pouring joints.

The method adopted for forming joints not covered by 5.5.7.1 and unforeseen joints (see 2.4.3) shall be one of the following as agreed with the Engineer:-

(a) “Blowing off” may generally be carried out on horizontal surfaces but under special circumstances approved by the Engineer it may also be carried out on vertical surfaces. The surface concrete to be prepared shall be between 4 and 8 hours old after completion of placing and shall be blown off using a mixture of air and water under a pressure of at least 500 kPa or by using a high pressure water jet until all dirt, laitance, etc. is removed and particles of clean coarse aggregate are exposed sufficiently to produce a rough surface. Any loose particles of coarse aggregate shall also be removed. The success of this method of preparation depends on selecting the correct time (dependent on the type of cement, atmospheric conditions etc.) so that the concrete has set to just the necessary degree of hardness. The operation may therefore have to be undertaken outside normal working hours and at night. When the surfaces are at least 12 hours old any remaining loose fine aggregate particles shall be washed off. All surfaces prepared by “blowing-off” shall be kept continuously wet until the next lift of fresh concrete is to be placed against them; the maximum time being 12 hours.

(b) “Scabbling”, which refers to removal of all surface laitance plus roughening the concrete surface with (pneumatic) picks in order to expose the coarse aggregate in a uniform pattern, may be carried out on both horizontal and vertical surfaces. The surfaces to be prepared in this manner shall be at least 12 hours old after mixing the concrete. At least 35% of the roughened surface area shall consist of exposed coarse aggregate. All surfaces prepared by “scabbling” shall be kept continuously wet until the next lift of fresh concrete is to be placed against them; the maximum time

being 12 hours.

(c) The use of approved wet-to-dry epoxy resin concrete adhesive, strictly in accordance with the manufacturer's instructions, will be permitted in the formation of concrete joints at surfaces where the concrete is older than 7 days.

PSG 5.5.7.4 Placing Fresh Concrete at Construction Joints (new sub-clause)

Add new Sub-clause:

Horizontal and vertical construction joint surfaces shall have been "scabbled" or "blown-off", cleaned and continuously wet as specified in 5.5.7.3 above before fresh concrete is placed over them. Immediately before placing the fresh concrete, the damp surface of the set concrete shall be evenly coated (by brushing or brooming) with a layer of cement mortar between 10mm and 15mm thick. The water/cement ratio and the cement/sand ratio of this mortar shall be the same as that of the fresh concrete to be placed. This mortar shall be produced by leaving the coarse aggregate fraction out of a batch of the fresh concrete. Coating with mortar is to be done in stages immediately before areas of set concrete are covered with fresh concrete, so that no mortar is exposed for longer than one hour after mixing, or less if the mortar has become dry or has started to set before being covered with fresh concrete. Any dried out mortar shall be removed and after cleaning the surface, shall be replaced with fresh mortar.

PSG 5.5.8 Curing and Protection

Add to Sub-clause:

f) For concrete in water retaining structures,

particular attention must be paid to curing concrete properly and for this reason a separate scheduled rate has been included for curing.

The Contractor must ensure that all materials required for the curing process are on hand before stripping any formwork. He must also ensure that the concrete elements from which the forms are being removed are prevented from drying out at any stage during the stripping process.

Elements must be cured by applying an approved non-toxic reflective type curing compound, which complies with the requirements of ASTM C309-74 "Liquid membrane forming compounds for curing concrete" Type 2, using suitable spray equipment to provide full even coverage.

Horizontal and sloping floor elements must have the curing compound applied within two hours after finishing and then all exposed surfaces must be completely covered by 250 micron white polythene sheeting and lapping by not less than 150mm at joints.

Vertical and near vertical elements must have the abovementioned treatment within 2 hours of striking formwork. All polythene sheeting must be in good condition with no tears or punctures and must be secured in position to prevent the wind from lifting it free of the concrete surface.

Polythene sheeting is to be retained in position for a minimum period of 7 days for strength Grade 42.5 and 10 days for Grade 32.5.

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

Measurement for curing shall be per square metre. The rate shall be fully inclusive of all plant, labour and materials to cure the concrete as specified.

PSG 5.5.10 Concrete Surfaces

PSG 5.5.10.2 *Delete and replace with the following*:-

Where a wood-floated or steel-floated or power-floated finish or a screed topping or granolithic finish is required in terms of the project specification, the concrete shall, unless otherwise stated in the project specification, be finished to the tolerances specified below in the following degrees of Accuracy :-

(a) For interior surfaces of walls and floors of water-retaining surfaces – degree of accuracy I shall apply;

(b) For floors within buildings – degree of accuracy I shall apply;.

(c) For all unexposed surfaces – degree of accuracy III shall apply;.

(d) For all other surfaces – degree of accuracy II shall apply;.

(e) For water works and other water retaining structures; the following class of finish shall apply:-

CLASS	COMMENTS	USE IN WORKS
U1	.	Surfaces below ground not exposed to view and other surfaces indicated on the drawings.
U2	As from steel formwork with all joints between formwork panels horizontal or vertical or parallel to supporting members to produce a high quality, smooth finish of uniform texture and colour. Joints shall be tight to prevent loss of grout. Groutex or similar is to be fitted between formwork panels.	Surfaces exposed to pedestrian traffic within waterworks>
U3	Rubbing with carborundum stone after the concrete has hardened shall be allowed but under no circumstances will plastering of the surface be permitted.	All surfaces in contact with water; all surfaces exposed to view and other surfaces indicated on the drawings or as directed by the Project Manager.

PSG 5.5.11 Watertight Concrete

Add to Sub-clause:

Grade W 35/19 concrete shall be used in water retaining structures. In reservoirs the floor, roof, walls, columns and sump shall be constructed with Grade 35/19 concrete. Approval from the Engineer if on site batching and mixing is to be undertaken. Although strength concrete in terms of clause PSG 5.5.1.7, this concrete shall comply with the following requirements:-

a) it shall consist of cement PFA blended together so that the combined cementitious material comprises between 70– 75% cement and 25 – 30% PFA respectively by weight
b) GGBS will not be allowed as an alternative to PFA
c) The cement content shall be between 380 – 450 kg/m³
d) The minimum cement water: ratio shall be 2
e) The characteristic cube strength at 28 days shall be 35MPa

PSG 5.5.12 Concrete in Wet Ground

Delete the Sub-Clause and substitute:

Where concrete has to be laid in wet ground (eg. River crossings) steps must be taken to lower the water level to at least 150mm below the bottom level of the concrete, and such level must be maintained for a period of at least two days after the concrete has been poured.

The cost of any necessary drains, sumps and pumping etc. neessary to achieve this shall be included in the tendered rates for the construction work and no separate payment shall be made for such dewatering throughout the construction period.

The Contractor shall be fully responsible for keeping the excavations free from water whilst the construction work is being carried out. The methods by which he proposes to achieve this shall be approved by the Engineer before being implemented.

PSG 5.5.13 Grouting

Add to the Sub-Clause:

Grouting shall be done to the approval of the Engineer using materials of suitable consistency as follows. Unless otherwise directed, the grouting admixture shall be added to 1 part cement and 2 parts concrete sand by volume, well mixed and with sufficient water added to obtain the required consistency. Where recesses to be filled are of appreciable dimensions, the Engineer may direct the Contractor to replace a proportion of sand with fine stone to reduce shrinkage. The Engineer may also require the Contractor to use non-shrink or other additives in grouting mixtures.

PSG 5.5.13.1 Grouting of Pipes/Specials through Wall (New Sub-Clause)

Add new Sub-Clause:

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

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

- Remove all shuttering and boxing remaining in the holes
- Make any alterations required to the position and shape of the holes and reinforcing steel (lacing bars, etc) in the holes
- Thoroughly clean and scabble the sides of the holes so as to obtain satisfactory bond surface for the new concrete

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

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

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

pipe/special surfaces of the concrete already placed.

The hole shall when set, form a dense, homogeneous and waterproof mass.

A spare vibrator with an independent power source shall be kept as a standby measure to ensure continuity of placing in the event of the breakdown of the duty vibrator.

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

PSG 5.5.13.2 Dry-Packed Grout (New Sub-Clause)

Add new Sub-Clause:

When dry-packed grout is specified under baseplates etc., only sufficient water shall be added to make the mixture ball when squeezed in the hand. Before any grouting is done with dry caulking, the surfaces between which the caulking is to be placed shall first be thoroughly cleaned and flushed with water. All surplus visible water shall be wiped or blown away and the dry caulking shall be forcefully rammed or hammered into place using suitable tools. Exposed surfaces shall be finished off neatly with a trowel and extensive exposed areas shall be covered with wet sacking and kept damp for at least 24 hours.
Where additives are required for grouting operations, these shall be brought on to site in the manufacturer's unopened containers and used strictly in accordance with the manufacturer's instructions. The Contractor shall undertake preliminary tests to check the behaviour of proprietary additives under the conditions pertaining to the site.

PSG 5.5.13.3 Epoxy Grout (Epoxy mortar type only) (New Sub-Clause)

Add new Sub-Clause:

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

PSG 5.5.14 Defects

PSG 5.5.14.3 Add New Sub-Clause:

Localised minor imperfections (e.g. blow holes, small recesses etc.) shall be made good by rubbing in a stiff 1:2 cement mortar immediately after stripping of formwork. Curing compound shall not be applied to these areas. Once the repair work has set, curing compound and curing membrane shall be applied to the area within 24 hours of stripping formwork.

All other remedial work shall be carried out in dry conditions after the concrete is fully cured. Defective material shall be cut out and contact surfaces to which new concrete shall be bonded shall be cleaned by sandblasting. Repairs shall be made with an epoxy mortar with an appropriate 2 part epoxy primer on concrete or a wet to dry epoxy adhesive, depending on the extent of the defect.

All epoxy resin compounds used in repair work must be approved by the Engineer and applied strictly in accordance with the manufacturer's specification. The Contractor shall match the colour of repair work with existing concrete where repair work is permanently exposed.

PSG 5.5.16 Manhole Covers and Frames (New Sub-Clause)

Add new Sub-Clause:

Manhole frames are to be set into the concrete with the upper edge 10mm above the concrete level to prevent the entry of rainwater.

All areas of damaged galvanised surfaces are to be repaired using a cold galvanising systems ('Zinga' or similar approved) as per manufacturer's instruction.

PSG 6 TOLERANCES

PSG 6.1.2 Methods of Measurement of Deviations

PSG 6.1.2 (a) *Add to theSub-Clause:*

If the deviation can't be measured over a three metre length , the longest practical length shall be used.

PSG 7 TESTS

PSG 7.1.2.3 Frequency of Sampling

Add to the Sub-Clause:

Samples of concrete as actually placed in the structure shall be taken at the point of discharge from the mixer at random on eight separate occasions during each of the first five days of using that mix on site.

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

Each sample for subsequent testing shall comprise 4 test cubes, one of which must be tested at 7 days and the other 3 at 28 days. Samples for subsequent testing shall be taken at a rate by volume of not less than one sample per 20m³ of concrete cast or in the event of small volumes, at least one sample on each day that concrete of a particular grade is made.

Notwithstanding this schedule the Contractor shall arrange the exact details of numbers of samples to be taken with the Engineer at commencement of construction.

PSG 7.1.2.4 *delete this sub-clause*

PSG 7.2 TESTING

PSG 7.2.3 Laboratory Testing

Add to the Sub-Clause:

All test cubes shall be made, cured and tested in accordance with the requirements of SANS Standard Method 863 and 864.

Test cubes shall be cured in an approved curing tank.

Delivery of cubes for testing shall take place not less than 24 hours in advance of the

specified time for testing.

The Contractor shall keep accurate records of the exact position in the structure of the concrete batch represented by the cube test. All costs connected with sampling and testing of concrete, as described in this section of the project specification, shall be included in the relevant strength concrete rates.

PSG 8 MEASUREMENT AND PAYMENT

PSG 8.1 MEASUREMENT AND RATES

Formwork

PSG 8.1.1.3C *Add to the Sub-Clause:*

Propping heights for beams, slabs and columns shall be measured in accordance with the following:

- Separate items shall be given for formwork propped to heights not exceeding 3,5m and thereafter in stages of 1,5m except in cases of sloping or stepped work exceeding 3,5m high extreme where the height extremities shall be stated.
- Formwork to columns shall be separated into groups for columns not exceeding 3,5m in height above bearing level and thereafter for total heights above bearing level in successive stages of 1,5m.

PSG 8.1.2 Reinforcement

PSG 8.1.2.2 *Delete and replace with the following:*

a) Mild steel and high tensile steel will be measured by mass for the diameters or range of diameters as scheduled.

b) Welded mesh will be scheduled separately for each type and mass per square metre of mesh."

PSG 8.1.2.3 *Delete and replace with the following:*

a) The unit rate for steel bars shall cover the cost of supply, cutting, bending, placing in position, and fixing of the reinforcing and supporting steel scheduled. The rate shall also include the provision of all spacer devices and binding wire, as well as the cost of tests in terms of SANS 920.

b) The unit rate for welded mesh shall cover the supply, cutting and placing of mesh, as well as the cost of all waste due to laps".

PSG GENERAL

The Contractor shall provide a slump cone with base plate and taping rod on site. Standard slump cone tests will be carried out on a regular basis as part of the testing programme to control the quality of concrete on the site.

Compressive strengths will be determined by crushing 150 mm square cubes.

PSG 7.4 ACCEPTANCE CRITERIA FOR WATER RETAINING STRUCTURES

Water retaining structures shall be tested for water tightness generally in accordance with BS 8007, Section 9 and shall be subject to the following tests and disinfection as required by the project specification. The structures shall not be considered commissioned until these criteria have been successfully met.

PSG 7.4.1 HYDRAULIC TESTING OF STRUCTURE

The completed structure shall be watertight, and the quality and finish of the work shall be such that no after-treatment of the work such as plastering or cement wash is necessary to ensure compliance with this requirement.

The Works will not be certified complete until the reservoir has been proved by testing to be watertight.

The reservoirs, on completion shall be cleaned of sand, dust, debris etc and tested for water tightness. The reservoirs shall be filled with water at a uniform rate of not greater than 2m in 24hrs until the water reaches the designed maximum level.

Thereafter, the water level should be maintained by the addition of further water for a stabilising period while absorption and autogenous healing take place.

The stabilising period will be 21 days. After the stabilising period, the level of the water must be recorded at 24hr intervals for a test period of 7 days.

During this 7 day test period the total permissible drop in level, after allowing for evapouration, should not exceed 1/500th of the average water depth of the reservoir or 10mm.

Notwithstanding the satisfactory completion of the test, any evidence of water to the outside faces of the structure should be assessed.

Any necessary remedial treatment of the concrete, cracks, or joints must be carried out from the water face.

PSG 7.4.2 TESTING OF ROOFS

The roof of a water retaining structure must be watertight. The roof shall be tested on completion, by flooding the roof with water to a minimum depth of 25mm for 24hrs. The roof shall be considered satisfactory if no leaks or damp patches show on the soffit.

PSG 7.4.3 DISINFECTION OF POTABLE WATER RETAINING STRUCTURES

The entire disinfection will be supervised by Umgeni Water Personnel. The disinfection criteria are stringent and the Contractor is encouraged to make every effort to ensure that the reservoir is kept clean through the duration of the contract.

While the reservoir is being filled with water, a sodium hypochlorite solution shall be dosed to achieve a theoretical total chlorine concentration of 25ppm.

Once the reservoir has been filled with water, it shall be left for a 24 hour period. Thereafter total chlorine concentration shall be measured. A concentration of 20ppm total chlorine will be considered acceptable. Should such concentration not be achieved, the Contractor shall carry out, at his own cost, all steps deemed necessary by the Engineer to achieve satisfactory disinfection.

Once satisfactory disinfection is achieved, the reservoir shall be drained and sufficient sodium thiosulphate (typically 1 part/part of total chlorine) shall be dosed into the system to fully neutralise the

chlorine before discharging to watercourse.

The reservoir shall then be filled and after 24 hours samples will be taken by Umgeni Water for analysis (no charge will be made for the analysis). Should the following limits not be achieved, the Contractor shall carry out, at his own cost, all steps deemed necessary by the Engineer to confirm satisfactory disinfection.