

TENDER DOCUMENT

TENDER No: 27 OF 2025/26

EMERGENCY GROUNDWATER SUPPLY PROJECT – KNYSNA BOREHOLE REFURBISHMENT PROGRAMME

CONTRACTOR NAME	
ADDRESS OF CONTRACTOR	
TELEPHONE NO	
EMAIL ADDRESS	
CONTRACT AMOUNT	
COMPLETION PERIOD	3 weeks
GENERAL CONDITIONS OF	GCC 2015 3RD ED (SAICE)
CIDB Grading	N/A



Knysna

Municipality || Munisipaliteit || uMasipala

inclusive || innovative || inspired

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PART T1: TENDER DATA

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T1.1 Tender Notice

EMERGENCY GROUNDWATER SUPPLY PROJECT – KNYSNA BOREHOLE REFURBISHMENT PROGRAMME

Knysna Local Municipality hereby invites suitably qualified and experienced contractors to submit tenders for the Emergency Groundwater Supply Project – Knysna Borehole Refurbishment Programme.

PROJECT DESCRIPTION

The works comprise, but are not limited to, the refurbishment and rehabilitation of existing production boreholes, including cleaning, drilling, reaming, casing, borehole development, disinfection, capping, fishing, camera inspections, sustainable yield testing, and water quality testing of eight existing boreholes in the Knysna Municipal area.

CONTRACT DETAILS

Conditions of Contract: GCC 2015, Third Edition (SAICE)

Contract Type: Re-measurement

Contract Duration: 3 weeks from commencement date

Closing date: 16th January 2026 at 12:00pm

Defects Liability Period: 12 months

The Municipality reserves the right to appoint more than one contractor.

TENDER ELIGIBILITY

Tenderers must:

- Be tax compliant with SARS
- Have demonstrable experience in borehole drilling and groundwater works
- Be equipped with more than one drilling machine
- Must have ability to drill 300 meters
- Be equipped with more than one testing rig
- Competent Drilling supervisor / foreman must have a minimum of 5 years of experience
- This is an emergency project and time is of the essence
- Comply with the Occupational Health and Safety Act and Construction Regulations, 2014

Technical enquiries relating to the tender documents may be addressed via email to: Chamorne Bezuidenhout, e-mail cybezuidenhout@knysna.gov.za.

The closing time for submission of bids is **12h00 on Friday, 16 January 2026**. Bids must be sealed in an envelope clearly marked with the bid number and title given above and placed in the **bid box at the Supply Chain Management Unit, Finance Building, Queen Street, Knysna**, on or before the mentioned time and latest date. Telephonic, facsimile, e-mail, and late bids will not be accepted. Bids must remain valid for a period of **90** days after the closing date of the bid. Notwithstanding the period of validity of bids as set out in the bid documents, the Municipality reserve the right to request validity extension.

Bids will be opened on the same day at the Supply Chain Management Section at 12h05. Late or unmarked bids will not be considered.

Bids may only be submitted on the bid documentation that is issued.

Bids will be evaluated according to the 80/20 preference points system. The bids are subject to the Council Supply Chain Management Policy, Preferential Procurement Policy Framework Act, 2000, and Preferential Procurement Regulations 2022. The selection of service providers for specific work assignments will be on quotations based on the service required and in line with the prescribed rates.

FUNCTIONAILITY

The tenderers are required to score a minimum functionality scoring of 60 % to qualify for further evaluation on price and preference. Tenderers scoring less than 60 % will be regarded as non-responsive and will not be evaluated further. The Employer reserves the right to verify any information submitted in support of functionality claims. Failure to substantiate information may result in a reduction of the functionality score or disqualification.

- Key Personal – 30 points
- Previous experience – 30 points
- Drilling equipment and plant – 10 points

Criteria	Description	Scoring	Tenderers score
1. Key Personal			
Drilling Supervisor / Foreman	15 years relevant experience	20	
	10-14 years relevant experience	15	
	6-9 years relevant experience	10	
	Less than 5 years' experience	0	
Health and Safety Officer	10 years relevant experience	10	
	5-9 years relevant experience	5	
	3-4 years' experience	2	
	Less than 2 years	0	
2. Previous Experience			
Completion of projects of a similar nature in the past 10 years	10 projects	20	
	8 projects	15	
	5 projects	10	
	2 projects	0	
Drilling to a depth greater than 300 meters	5 projects	10	
	4 projects	8	
	3 projects	5	
	2 projects	2	
	1 project	0	
3. Drilling Equipment & Plant			
Drilling Rig's capability & depth	Greater than 300 meters	10	
	Less than 300 meters	0	

CONDITIONS

- **The Municipality reserves the right to appoint more than one contractor.**
- Points will be scored based on 80/20 (Price/preference)
- The estimate project duration is 3 weeks.

T1.2: TENDER DATA

T1.2.1 General

The Conditions of Tender are the Standard Conditions of Tender as contained in Annexure F of SANS 294 - Construction Procurement Processes, Methods and Procedures. The Standard Conditions of Tender for procurements make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender for procurement other than disposals. Each item of data given below is cross-referenced to the Standard Conditions of Tender to which it mainly applies.

Clause (SANS 294 Annex. F)	Applicable to this tender
F.1.1	The Employer is the Knysna Local Municipality
F.1.2	The Tender Document consists of the following: <u>TENDER</u> T1: Tendering Procedures T1.1: Tender Notice and Invitation to Tender T1.2: Tender Data T1.3: Preferential Procurement Policy T2: Returnable Documents T2.1: List of Returnable Documents T2.2: Returnable schedules <u>CONTRACT</u> C1.1: Form of Offer and Acceptance C1.2: Contract Data C1.3: Occupational health and Safety Mandatory Agreement Part 2: Pricing Data C2.1: Pricing Instructions C2.2: Bill of Quantities C2.3: Summary Part 3: Scope of Work C3.1: Description of the Works C3.2: Procurement C3.4: Construction C3.5: Site Information C3.6: Environmental Management plan C3.7: Annexures – Locality Plan

Clause (SANS 294 Annex. F)	Applicable to this tender
	- Borehole Refurbishment Works: Standard Drawing
F.1.4	The Employer's Agent's address for receipt of communications and notices is: Address (Physical): Knysna Municipality 5 Clyde Street Ground Floor Finance Building Supply Chain Section Knysna 6570
F.2.1	A tender offer may only be submitted if the tenderer satisfies the following: • The tenderers key personnel meet the minimum requirements • The tenderer scores a minimum of 60% for functionality.
F.2.7	Compulsory Briefing: None
F.2.13	Parts of each tender offer communicated on paper shall be submitted as originals only.
F.2.13/F.2.15	The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are: Location of tender box: The Knysna Local Municipality Physical Address: 5 Clyde Street, Knysna Identification Details: <u>TENDER</u> The Knysna Local Municipality Tender No. 27 OF 2025/26 EMERGENCY GROUNDWATER SUPPLY PROJECT – KNYSNA BOREHOLE REFURBISHMENT PROGRAMME TENDERER'S NAME:
F.2.13/F.2.15/F.3.5	A two-envelope procedure will not be followed.
F.2.15	Closing date and time for the submission of tender offer is: 16 January 2026 at 12:00pm

Clause (SANS 294 Annex. F)	Applicable to this tender
F.2.15	Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted
F.2.16	The tender offer validity period is 90 days from the tender closing date
F.2.18	Tenderers shall, when requested by the Employer, or the Employer's Representative to do so, submit the names of all management and supervisory staff that will be employed to supervise the labour-intensive portion of the Works, together with satisfactory evidence that such persons satisfy the eligibility requirements.
F.3.4	The time and location for the opening of the tender offers are: At the offices of Knysna Local Municipality directly after tender closing.
F3.7	Add the following clause: Accept that failure to submit certificates stated in the Tender Data and failure to complete in full the tender document, shall result in the tender regarded as non-responsive
F.3.11.5	The procedure for evaluation of responsive tender offers is Method 4: In the case of a financial, quality and preferences. The quality criteria and maximum score in respect of each of the criteria are as follows: - Key Personal – 30 points - Previous experience – 30 points - Drilling equipment and plant – 10 points
F.3.11.6.2	The value of the weighting factor W_1 is 80. Formula 2 shall apply.
F.3.17	Two paper copies of the Signed Contract are to be provided by the Employer.

T1.3: MUNICIPAL BID DOCUMENTS

MBD1

KNYSNA MUNICIPALITY TENDER NOTICE AND INVITATION TO BID DETAILS OF TENDERER									
NAME OF BIDDER:									
TRADING AS (if different from above):									
PHYSICAL ADDRESS:									
	City/Town					Code			
POSTAL ADDRESS:									
	City/Town					Code			
CONTACT PERSON:									
ENTERPRISE REGISTRATION NUMBER:					CIDB CRS NUMBER:				
TCS PIN					FACSIMILE NUMBER:				
E-MAIL ADDRESS:									
TELEPHONE NUMBER:					CELLPHONE NUMBER:				
HAS TAX COMPLIANCE STATUS PIN BEEN ATTACHED?						YES		NO	
HAS AN ORIGINAL OR CERTIFIED COPY OF A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE BEEN SUBMITTED? (MBD 6.1)						YES		NO	
HAS THE DECLARATION BEEN COMPLETED AND CURRENT, ORIGINAL OR CERTIFIED MUNICIPAL ACCOUNTS BEEN ATTACHED? (MBD 15)						YES		NO	
DECLARATION									
I am duly authorised to represent the tenderer for the purpose of this tender and hereby tender to supply all or any of the goods and/or render all or any of the services described in the attached document to the Knysna Municipality on the terms and conditions stipulated in this tender document and in accordance with the specification stipulated in the tender document.									
NAME (PRINT)					SIGNATURE				
CAPACITY					DATE				

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

KNYSNA MUNICIPALITY	
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 connected with or related to persons in the service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.
3.	In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.
3.1.	Full Name of bidder or his / her representative:
3.2.	Identity number:
3.3.	Position occupied in the Company (director, trustee, shareholder ²)
3.4.	Company Registration Number:
3.5.	Tax Reference Number:
3.6.	VAT Registration Number:
3.7.	The names of all directors / trustees / shareholders / members, their individual identity numbers and state employee numbers (where applicable) must be indicated in paragraph 4 below.
3.8.	Are you presently in the service of the state* YES / NO
3.8.1.	If yes, furnish particulars.

3.9.	Have you been in the service of the state for the past twelve months?	YES / NO	
3.9.1.	If so, furnish particulars.		
3.10.	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 bid?	YES / NO	
3.10.1.	If so, state particulars.		
3.11.	Are you aware of any relationship (family, friend, other) between the bidder and any person in the service of the state who may be involved with the evaluation and or adjudication of this bid?	YES / NO	
3.11.1.	If so, state particulars.		
3.12.	Are any of the company's directors, managers, principal shareholders or stakeholders in service of the state?	YES / NO	
3.12.1.	If so, state particulars.		
3.13.	Is any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?	YES / NO	
3.13.1.	If so, furnish particulars.		
3.14.	Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract?	YES / NO	
3.14.1.	If so, furnish particulars.		
4.	Full details of directors / trustees / members / shareholders:		
COMPLETION OF THE FOLLOWING INFORMATION IS <u>COMPULSORY</u>:			
Full Name	Identity Number	Individual Tax Number for each Director	State Employee Number
CERTIFICATION			
I 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.			
NAME OF ENTERPRISE			

CAPACITY		DATE	
NAME (PRINT)		SIGNATURE	

¹MSCM 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 of any municipal entity;
c)	an official or 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 entity; or
f)	an employee of Parliament or a provincial legislature.

²"Shareholder" means a person who owns shares in the company and is actively involved in the management of the company or business and exercise control over the company.

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

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

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

1. GENERAL CONDITIONS

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

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

1.2 **To be completed by the organ of state**

(delete whichever is not applicable for this tender).

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

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	
SPECIFIC GOALS	
TOTAL POINTS FOR PRICE AND SPECIFIC GOALS	100

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

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

2. DEFINITIONS

- (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:

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

Where

P_s = Points scored for price of tender under consideration

P_t = Price of tender under consideration

P_{min} = Price of lowest acceptable tender

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

3.2.1. POINTS AWARDED FOR PRICE

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

80/20

or

90/10

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

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.)

NB: BBBEE Contribution Status Level will be applied in order to allocate preference points. The 80/20 preference points system is applicable in this tender.

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system)	Number of points allocated (80/20 system)	Number of points claimed (90/10 system)	Number of points claimed (80/20 system) (To be completed by the tenderer)
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	(To be completed by the organ of state)	(To be completed by the organ of state)	(To be completed by the tenderer)	

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:	

KNYSNA MUNICIPALITY			
DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES			
1.	This Municipal Bidding Document 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.		
2.	The bid of any bidder may be rejected if that bidder, or any of its directors have:		
2.1.	abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;		
2.2.	been convicted for fraud or corruption during the past five years;		
2.3.	wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or		
2.4.	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).		
3.	In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.		
3.1.	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? (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).	Yes / No	
3.2.	If so, furnish particulars:		
3.3.	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)? 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.	Yes / No	
3.4.	If so, furnish particulars:		
3.5.	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes / No	
3.6.	If so, furnish particulars:		
3.7.	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 / No	
3.8.	If so, furnish particulars:		
3.9.	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes / No	
3.10.	If so, furnish particulars:		

4.	CERTIFICATION		
I, CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM 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.			
NAME OF ENTERPRISE			
CAPACITY		DATE	
NAME (PRINT)		SIGNATURE	
WITNESS 1		WITNESS 2	

KNYSNA MUNICIPALITY	
CERTIFICATE OF INDEPENDENT BID DETERMINATION	
1.	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 bidding (or bid rigging). ² Collusive bidding is a <i>per se</i> prohibition meaning that it cannot be justified under any grounds.
2.	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 bid of any bidder if that bidder 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 bidding process or the execution of the contract.
3.	This Municipal Bidding Document serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.
4.	In order to give effect to the above, the following Certificate of Bid Determination must be completed and submitted with the bid:
CERTIFICATE OF INDEPENDENT BID DETERMINATION	
I, the undersigned, in submitting the accompanying bid:	
Bid Number	T 27 of 2025/26
Description:	EMERGENCY GROUNDWATER SUPPLY PROJECT – KNYSNA BOREHOLE REFURBISHMENT PROGRAMME
in response to the invitation for the bid ISSUED by the Knysna Municipality , do hereby make the following statements that I certify to be true and complete in every respect:	
certify, on behalf of (Name of Bidder):	
That: 1. I have read and I understand the contents of this Certificate; 2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect; 3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder; 4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder; 5. For the purposes of this Certificate and the accompanying bid, I understand that the word “competitor” shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who: (a) has been requested to submit a bid in response to this bid invitation; (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder 6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium³ will not be construed as collusive bidding. 7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding: a) prices;	

b) geographical area where product or service will be rendered (market allocation) c) methods, factors or formulas used to calculate prices; d) the intention or decision to submit or not to submit, a bid; e) the submission of a bid which does not meet the specifications and conditions of the bid; or f) bidding with the intention not to win the bid.			
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.			
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.			
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of Section 59 of the Competition Act No 89 of 1998 and or 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.			
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM 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.			
NAME (PRINT)		SIGNATURE	
CAPACITY		DATE	
¹ Includes price quotations, advertised competitive bids, limited bids and proposals.			
² Bid rigging (or collusive bidding) 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 bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.			
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.			

KNYSNA MUNICIPALITY

CERTIFICATE FOR PAYMENT OF MUNICIPAL SERVICES

(To be signed in the presence of a Commissioner of Oaths)

I, the undersigned, in submitting the accompanying bid, declare that I am duly authorised to act on behalf of:

(name of the enterprise)

I hereby acknowledge that according to SCM Regulation 38(1)(d)(i), the Municipality may reject the tender of the tenderer if any municipal rates and taxes or municipal service charges owed by the Tenderer or any of its directors/members/partners to the Knysna Municipality, or to any other municipality or municipal entity, are in arrears for more than 3 (three) months.

To the best of my personal knowledge, neither the firm nor any director/member/partner of said firm is in arrears on any of its municipal accounts with any municipality in the Republic of South Africa, for a period longer than 3 (three) months.

If the value of the transaction is expected to exceed R10 million (VAT included) I certify that the bidder has no undisputed commitments for municipal services towards any **Municipality** in respect of which payment is overdue for more than 30 days;

PHYSICAL BUSINESS ADDRESS(ES) OF THE TENDERER

MUNICIPAL ACCOUNT NUMBER

FURTHER DETAILS OF THE BIDDER'S Director / Shareholder / Partners, etc.:

Director / Shareholder / partner	Physical address of the Business	Municipal Account number(s)	Physical residential address of the Director / shareholder / partner	Municipal Account number(s)

NB: Please attach certified copy(ies) of ID document(s)

NB: Please attach copy(ies) of Municipal Accounts

Number of sheets appended by the tenderer to this schedule (If nil, enter NIL)

Therefore hereby agrees and authorises the Knysna Municipality to deduct the full amount outstanding by the Tenderer or any of its directors/members/partners from any payment due to the tenderer; and

I further hereby certify that the information set out in this schedule and/or attachment(s) hereto is true and correct. The Tenderer acknowledges that failure to properly and truthfully complete this schedule may result in the tender being disqualified, and/or in the event that the tenderer is successful, the cancellation of the contract.

NAME OF ENTERPRISE			
NAME (PRINT)			
CAPACITY			
SIGNATURE		DATE:	

COMMISSIONER OF OATHS Signed and sworn to before me at _____, on this _____ day of ____ 20_____ by the Deponent, who has acknowledged that he/she knows and understands the contents of this Affidavit, it is true and correct to the best of his/her knowledge and that he/she has no objection to taking the prescribed oath, and that the prescribed oath will be binding on his/her conscience. COMMISSIONER OF OATHS: - Position: _____ Address: _____ Tel: _____	Apply official stamp of authority on this page:
--	--

Version 3.0

PART T2: RETURNABLE DOCUMENTS

- T2.1 List of Returnable Documents**
- T2.2 Returnable Schedules**

T2.1: LIST OF RETURNABLE SCHEDULES

The following documents are to be completed and returned to form part of the Contract. Failure to submit any of the returnable schedules required – then you will be deemed nonresponsive.

No	Part of the Contract	Returnable Name	Tick if completed and submitted
1. RETURNABLE SCHEDULES TO FORM PART OF THE CONTRACT			
1M	YES	Schedule of Construction Equipment	
1N	YES	"Tax Compliant Status" & SARS certificate	
1O	YES	VAT Registration Certificate (If Applicable)	
1P	Optional	Proof of Registration with the Construction Industry Development Board (in the applicable category or higher)	
1Q	YES	Letter of good standing	
1R	YES	Proof of banking details	
2A	YES	Estimated Monthly Cash flow	
2B	YES	Schedule of Key Personnel / Competent persons assigned to the Contract	
2C	YES	Schedule of Proposed Subcontractors	
2D	YES	Preliminary Program of the Works	
2E	YES	Contract Organogram	
2F	YES	Schedule of experience	
2G	YES	Methodology	
2. OTHER DOCUMENTS AND AFFIDAVITS THAT WILL BE INCORPORATED INTO THE CONTRACT			
C 1.1:	YES	Form of Offer and Acceptance	
C 1.2:	YES	Contract Data	
C 1.4:	YES	Occupational Health and Safety Mandatory Agreement	
C 2.1:	YES	Pricing Instructions	
C 2.2:	YES	Bill of Quantities	
C 2.3:	YES	Summary of Prices	

T2.2: RETURNABLE SCHEDULES

1M: SCHEDULE OF PLANT AND EQUIPMENT

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

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

DESCRIPTION (type, size, capacity etc)	QUANTITY	YEAR OF MANUFACTURE

Attach additional pages if more space is required.

Please note it is a tender requirement for the contractor to have multiple rigs available that are able to drill to a depth of 300 meters.

Proof of ownership of plant or lease agreement to be provided for functionality points to be claimed.

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

DESCRIPTION (type, size, capacity etc)	QUANTITY	HOW ACQUIRED	
		HIRE/BUY	SOURCE

Attach additional pages if more space is required.

The Tenderer undertakes to bring onto site without additional cost to the Employer any additional plant not listed but which may be necessary to complete the contract within the specified contract period.

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Signed:

Date:

Name:

Position:

Tenderer:

IN: SARS TAX CLEARANCE

Tenderers must ensure that they are up to date with their payments of taxes.

The tenderer must submit a “tax compliant” status in respect of his/her company, close corporation, or partnership as well as a SARS tax clearance certificate or pin certificate. In the case of a joint venture between two or more firms, the tenderer shall attach the SARS documents for each of the joint venture partners.

10: VAT REGISTRATION CERTIFICATE (IF APPLICABLE)

NOTE: REQUIRED INFORMATION TO BE SUBMITTED IN THE ATTACHMENT DOCUMENT UNDER SECTION 10

1Q: WORKMENS COMPENSATION: LETTER OF GOOD STANDING

(Tenderer's Details):

.....

.....

.....

.....

(Date).....

**LETTER OF GOOD STANDING
COMPENSATION FOR OCCUPATIONAL INJURIES & DISEASES ACT,1993**

ATTENTION:.....

Dear Sirs

In terms of Section.....of the Act, we confirm that, for the period ending

.....

(Tenderer's
Details).....

carrying on the business of

are insured with the Company under Policy Number.....

and their standing with the Compensation Fund is.....

The Compensation Commissioner's Reference Number being.....

Yours Faithfully

.....

A letter of current Good Standing received from Workmen's Compensation may be submitted with the tender.

1R: Proof of Banking Details

NOTE: Tenderer to provide proof of banking details on banking letter head and stamped by the bank.

1S: DECLARATION CONCERNING FULFILMENT OF THE CONSTRUCTION REGULATIONS, 2014

In terms of the Construction Regulations, 2014 (hereinafter referred to as the Regulations), promulgated on 07 February 2014 in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) the Employer shall not appoint a contractor to perform construction work unless the Contractor can satisfy the Employer that his/her firm has the necessary competencies and resources to carry out the work safely and has allowed adequately in his/her tender for the due fulfilment of all the applicable requirements of the Act and the Regulations.

Tenderers shall answer the questions below:

1. I confirm that I am fully conversant with the Regulations and that my company has (or will acquire/procure) the necessary competencies and resources to timeously, safely and successfully comply with all of the requirements of the Regulations.

(Tick)

YES	
NO	

2. Indicate which approach shall be employed to achieve compliance with the Regulations. (Tick)

Own resources, competent in terms of the Regulations (refer to 3 below)	
Own resources, still to be hired and/or trained (until competency is achieved)	
Specialist subcontract resources (competent) – Specify:	

3. Provide details of proposed key persons, competent in terms of the Regulations, who will form part of the Contract team as specified in the Regulations (CVs to be attached):

.....

.....

.....

.....

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

.....

.....

.....

5. List potential key risks identified and measures for addressing risks:

.....

.....

.....

.....

I have fully included in my tendered rates and prices (in the appropriate payment items provided in the Schedule of Quantities) for all resources, actions, training and any other costs required for the due fulfilment of the Regulations for the duration of the construction and defects repair period
(Tick)

YES	
NO	

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

1. ID NO:
.....

(Name in Print):

2. ID NO:
.....

(Name in Print):

2B: KEY PERSONNEL / COMPETANT PERSONS ASSIGNED TO THE CONTRACT

Curriculum vitae (CV) must be submitted for each of the key personnel proposed in the table below. **The CV must specifically include the proof of qualifications, years of experience (only relevant to the Job Description)**, courses completed and experience in construction contracts of a similar value and higher and nature. Contactable referees must also be provided.

NOTE: REQUIRED INFORMATION TO BE SUBMITTED IN THE ATTACHMENT DOCUMENT UNDER SECTION 2B

Job Description	Full Name	Qualification	Years of Experience
Contracts Manager / Director – NQF Level 6			
Foreman/Drilling Supervisor – NQF Level 4			
Health and Safety Officer – NQF Level 5			

*To be filled in by Tenderer

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Signed:

Date:

Name:

Position:

Tenderer:

2C: SCHEDULE OF PROPOSED SUBCONTRACTORS

We notify you that it is our intention to employ the following subcontractors to work on the contract.

Sub-contracting of the core activity (refurbishment and drilling) is not allowed.

If we are awarded the contract, we agree that this notification does not change the requirement for us to submit the names of proposed subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

NOTE: ADDITIONAL INFORMATION TO BE SUBMITTED IN THE ATTACHMENT DOCUMENT UNDER SECTION 2C

No.	Name and address of proposed subcontractor	Nature and extent of work	Previous experience with subcontractor
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

Signed:

Date:

Name:

Position:

Tenderer:

2E: CONTRACT ORGANOGRAM

The tenderer must submit a basic organogram for the contract of the personnel he intends using. The organogram should show administrative and other support staff plus team structure.

Failure to submit the organogram will result in the tenderer scoring zero for key personnel.

NB: Attach organogram of the key personnel who will be appointed for this contract ONLY.

NOTE: REQUIRED INFORMATION TO BE SUBMITTED IN THE ATTACHMENT DOCUMENT UNDER SECTION 2E

2F: SCHEDULE OF EXPERIENCE

Contractor to submit a schedule of experience detailing experience of works of a similar nature (demonstrate refurbishment, drilling deep (300m) boreholes, fishing, and sustainable yield testing up to 12 l/s in the last 10 years). The schedule is to include contactable references, value of previous contract, and appointment letters and letter of completion are to be provided.

No.	Date	Project	Description of services	Contract value	Contact

Please note is a eligibility criteria for the contractor to have multiple rigs available, and experience in drilling to depths of 300 meters.

NOTE: REQUIRED INFORMATION TO BE SUBMITTED IN THE ATTACHMENT DOCUMENT UNDER SECTION 2F

CONTRACT PART C1: AGREEMENT AND CONTRACT DATA
--

CONTENTS

C1.1	Form of Offer and Acceptance
C1.2	Contract Data (Part 1 and 2)
C1.3	Occupational Health and Safety Mandatory Agreement

C1.1: FORM OF OFFER AND ACCEPTANCE

1 OFFER

The employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of: **TENDER NO. T 27 OF 2025/26 EMERGENCY GROUNDWATER SUPPLY PROJECT – KNYSNA BOREHOLE REFURBISHMENT PROGRAMME.**

The tenderer, identified in the offer signature block, has examined the documents listed in the tender data and addenda thereto as listed in the tender schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the tenderer, deemed to be duly authorized, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the Contractor under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract identified in the Contract Data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE-ADDED TAX IS:

.....

.....

..... Rand (in words); R..... (in figures)

This offer may be accepted by the employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the tenderer before the end of the period of validity stated in the tender data, whereupon the tenderer becomes the party named as the contractor in terms of the conditions of contract identified in the contract data.

Signature(s) of authorized agents:

Name(s) (in block letters) :

Capacity of authorized agents:

for and on behalf of the Tenderer

(Name and address of organization)

Witness: (Full name – in block letters – and signature)

(Name)

..... (Signature)

Date:

ACCEPTANCE

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

The terms of the contract are contained in:

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

Part C2: Pricing data

Part C3: Scope of work

Part C4: Site Information

and drawings and documents or parts thereof, which may be incorporated by reference into the above listed Parts.

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

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

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the tenderer (now contractor), within five (5) working days of the date of such receipt, notifies the employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the parties.

For and on behalf of the Employer:

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

Name(s)

Capacity

for the **Employer:** (Name and address of organization)

Witness:.....(Full name) (signature)

Date:

2 SCHEDULE OF DEVIATIONS

Notes:

1. The extent of deviations from the tender documents issued by the employer before the tender closing date is limited to those permitted in terms of the conditions of tender.
2. A tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid, be the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here.
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents, and which it is agreed by the parties becomes an obligation of the contract, shall also be recorded here.
4. Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the contract.

1. Subject
Details
2. Subject
Details
3. Subject
Details
4. Subject
Details
5. Subject
Details
6. Subject
Details
7. Subject
Details
8. Subject
Details

By the duly authorized representatives signing this schedule of deviations, the employer and the tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the tender data and addenda thereto as listed in the returnable schedules, as well as any confirmation, clarification, or changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt

by the tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this agreement.

For and on behalf of the Tenderer.....
(Name and address of organization)

Witness: (Full name – in block letters – and signature)
(Name)

.....
(Signature)

Date:

For and on behalf of the Employer:

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

Name(s):

Capacity:

for the **Employer:**
(Name and address of organization)

Witness: (Full name – in block letters – and signature)
(Name)

.....
(Signature)

Date:

C1.2: CONTRACT DATA

The General Conditions of Contract for Construction Works, Third Edition, (2015) published by the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House, 1685, is obtainable from www.saice.org.za. Copies of these conditions of contract may be obtained on the tenderer's own cost from the SAICE Tel: 011-805 5947

PART 1: CONTRACT SPECIFIC DATA PROVIDED BY THE EMPLOYER

The following contract specific data, referring to the General Conditions of Contract for Construction Works, Third Edition, 2015, are applicable to this Contract:

Clause	Description
1.1.1.13	The Defects Liability Period is 12 months , measured from the date of the Certificate of Completion.
1.1.1.15	Name of Employer is: Knysna Local Municipality
1.1.1.16	The Employer's Agent is Mrs. Charmorne Bezuidenhout Email – cybezuidenhout@knysna.gov.za
1.1.1.26	The pricing strategy is: Re-measurement Contract
1.2.1.2	The Employer's Agent's address for receipt of communications and notices is: 5 Clyde Street Finance Building Supply Chain Management Section 6570
1.3.2	The governing law is the law of the Republic of South Africa.
3.2.3	The Employer's Agent shall obtain specific approval from the Employer before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract: 1. <u>New Clause 3.2.3.2</u> For expenditure on the Contract to exceed the Contract Sum. 2. <u>Existing Clauses:</u> 3.3.1 - Nomination of person as Employer's Agent's Representative. 5.6 – Approval of the programme 5.7.2 - Work at night as well as by day 5.8 – Non-working times (i.e. Sunday Work) 5.12 - Granting of extension of time excluding Clause 5.12.2.2 (Abnormal climatic conditions) 5.13 - Reduction of penalty for delay. 5.14.2 - The issue of a Certificate of Practical Completion.

Clause	Description
	5.14.4 - The issue of a Certificate of Completion. 5.16.1 - The issue of a Final Approval Certificate. 6.3 – All Variations 8.2.2.2 - Order to repair and make good damage arising from any "excepted" risk.
3.2.4	The Employer's Agent has not been appointed as Agent in terms of Occupational Health and Safety on this contract. The Client will perform the duties of the Client, in terms of the Construction Regulations, 2014 as promulgated in terms of Section 43 of the Occupational Health and Safety Act, 1993.
4.3.1	Add the following to the clause: For construction works the Basic Conditions of Employment Act of 1997 (Act No 75 of 1997) shall apply and the minimum employment conditions which will apply shall be guided by the latest Sectorial Determination: Civil Engineering Sector published from time to time. Compliance with the National Environmental Management Act (NEMA), Act 107 of 1998. The Contractor shall comply with the Occupational Health and Safety Specification prepared by the Employer in terms of the Construction Regulations, 2014 promulgated in terms of Section 43 of the Occupational Health and Safety Act (Act No. 85 of 1993). Without limiting the Contractor's obligations in terms of the Contract, the Contractor shall before commencement of the Works or any part thereof, be in the possession of an approved Health and Safety Plan, method statement and risk assessment.
4.3.2	Add the following to the clause: Failure to provide such proof shall entitle the Employer to withhold any payment due to the Contractor until such proof is provided.
4.4.2	The Contractor shall submit the names of all subcontractors to the Employer's Agent for approval.
4.10.2	The dates for the information to be provided will be communicated to the Contractor during the Site Handover Meeting.
5.2.1	The commencement date shall be two days after the Confirmation of Receipt referred to in the form of Offer and Acceptance has been signed for by the Contractor.
5.3.1	The documentation required before Commencement of the Works are: Health and Safety Plan (Refer to Clause 4.3) Occupational Health and Safety Agreement (Refer to Clause 4.3) Initial Programme (Refer to Clause 5.6) Security (Refer to Clause 6.2) Insurance (Refer to Clause 8.6) Letter of Good Standing (Refer to Clause 4.3)

Clause	Description
5.3.2	The Contractor is required, within 2 days of the Commencement Date, to submit the documents listed above in Clause 5.3.1 to the Employer's Agent for his approval.

Clause	Description
	Health and Safety Plan The Contractor shall deliver his health and safety plan, in terms of Clause 5(1) of the Construction Regulations (2014). Initial Programme The Contractor shall deliver his Initial Programme of work in terms of Clause 5.6 Insurance Submit copies of receipts of registration, or payment for the premiums for the following insurances, as required by the new Clause 8.6 in this Contact Data.
5.4.2	Access to and possession of the site shall not be exclusive to the Contractor insofar as the provisions of Clause 4.8 apply and where ongoing use by the general public is required. The Contractor shall bear all costs and charges for special and temporary rights of way required by him in connection with access to the site and protection of the public.
5.5	Due Completion Date is 3 weeks after the Commencement Date.
5.8.1	This is an emergency programme, and working hours shall not be restricted and a 7 (seven) day week applies.
5.8.1.1	Add the following to the clause: The cost of supervision by the Employer's Agent or his representatives outside of normal (Monday to Saturday) working hours in accordance with this Clause, shall be to the Contractor's account.
5.12.2.2	Add the following to the clause:

	The time period specified as the time for completion excludes allowances for those days on which it is expected that work, on the critical path items of the works, would be prevented due to weather conditions such as wind, rain falling or the subsequent waterlogged condition. • Allowance should be made for 4 days per month from Nov - Apr. • Allowance should be made for 1 day per month for May - Oct. If the Contractor has been prevented by these weather conditions from working on the critical path items of the works, then he must notify the Employer's Agent in writing. The submission shall be made within five calendar days of the resumption of work. The Employer's Agent shall upon considering all the relevant factors determine the extension of time to be granted. The tendered sums of the appropriate time-related items shall be increased to take account of the extensions of time granted.
5.12.5	Add the following to the clause: A delay in so far as extension of time is concerned, will be regarded as a delay only if, on a claim by the Contractor in accordance with the General Conditions of Contract, the Employer's Agent rules that all progress on an item or items of work on the critical path of the approved programme for the execution of the Works by the Contractor, has been brought to a halt. Delays on normal working days only, based on a working week, of six normal working days, will be taken in account for the extension of time.
5.13.1	The penalty for failing to complete the Works is R 1 500.00 per calendar day
5.16.3	The latent defect period is 10 years.
6.2.2	Delete Clause 6.2.2 in its entirety.
6.2.3	The expiry date shall be the date, 30 calendar days after the programmed
6.5.1.2.3	The maximum percentage allowed to cover overhead charges is: Labour – 10% Materials – 10%
6.8.4	Notwithstanding the above, in the event that a public holiday is proclaimed within 28 days before the closing date for tenderers, no cost other than those that can be claimed under Clause 5.12.3 shall be added to the contract price.
6.10.1.5	The percentage advance on materials on site not yet built into the Permanent Works is 80%, and will only be paid once invoices, delivery slips and proof of payments have been submitted with the IPC to the Employer's Agent as per this clause and Clause 6.10.2.
6.10.3	Retention monies held will be 10% (excl VAT) of payments due up to the limit of retention money which will be 5% of the Contract Sum (excl VAT).
6.10.4	Contractor's statement to include ALL relevant information and details as required by the Employer's Agent for evaluation. The "7 day period" will commence once ALL information and details have been received. Replace the wording "within 28 days" in Clause 6.10.4 with the wording "within 30 days".

6.10.8	Replace the wording "within 28 days" in Clause 6.10.4 with the wording "within 30 days".
6.10.9	Replace the wording "within 28 days" in Clause 6.10.4 with the wording "within 30 days".
8.6.6	The Contractor and/or Sub-Contractor shall provide, as a minimum, the following: (a) Proof of registration with the Department of Labour as an employer, in terms of the Compensation for Occupational Injuries and Diseases Act 1993, as amended (b) Common Law Liability Insurance for the duration of the Contract Period and with a minimum Limit of Indemnity of not less than R1 000 000 for any one accident; (c) Insurance on an All Risks basis for construction plant, equipment and other things (except those intended to incorporation into the works) brought onto the site to the full value of such construction plant, equipment and other things; (d) Motor Vehicle Liability Insurance, comprising a minimum of Balance of Third Party motor risks, including Passenger Liability, subject to a minimum limit of R2,5 million; (e) Where the Contract involves manufacturing and/or fabrication of the works or part thereof at premises other than the site, the Contractor shall satisfy the employer that all materials and equipment for incorporation in the works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such works during manufacture or fabrication, then such interest shall be noted by endorsement to the Contractor's Policies of Insurance. (f) Imported equipment or component parts or materials to be supplied in terms of this Contract which require any process of assembly or finishing in South Africa prior to delivery to the site are to be insured by the Contractor up to the commencement of transit to site of the assembled or finished equipment, component parts or materials, unless special arrangements are made with the Employer. These insurances shall be maintained in force for the duration of the Contract, including any Defects Liability Period and in respect of Sub-Contractors, the Contractor shall be deemed to have complied with the provisions of the requirements relating to insurance by ensuring that the Sub-Contractors
8.6.7	The Contractor may effect, at his own cost, any insurance additional to that effected by the Employer which he deems necessary in his own interests. The Employer reserves the right to call for full information regarding such insurances.
8.6.8	The insurances to be provided by the Contractor and Sub-Contractor shall be effected with Insurers and on terms approved by the Employer (which approval shall not be unreasonably withheld) and the Contractor shall, if required by the employer, produce to the employer the Policy or Policies of insurance and the receipts for payment of the current premiums.
8.6.9	If the Contractor fails to effect and keep in force the insurances referred to, then the employer may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and, from time to time, deduct the amount paid by the Employer from any monies due or which may become due to the Contractor or recover same as a debt from the Contractor.

8.6.10	Where the Contractor is responsible for the appointment of Sub-Contractors, then the Contractor shall (a) ensure that potential and appointed Sub-Contractors are aware of the whole content of this Special Conditions of Contract Clause; and (b) ensure the compliance of Sub-Contractors with this Special Conditions of Contract clause, where applicable.
8.6.11	The Contractor warrants that he shall give all notices and shall observe all the Terms and Conditions and requirements of all insurances applicable to this Contract.
9.1.4	Replace Clause 9.1.4 with the following: Up to the time of termination of the contract by either party in terms of this Clause, or until the Contractor gives notice in terms of this Clause to terminate the contract and the Contractor is precluded from exercising his right to terminate the contract because the Employer agrees to bear any resultant additional costs provided for in Clause 9.1.2.2 hereof, the Contractor: a) will be entitled to an extension of calendar time for working days lost as may be approved by the Employer's Agent, and b) will be reimbursed the cost of delays per working day, where the number of working days will be determined pro rata the effect the delays have on the progress of the work as agreed with the Employer's Agent. Payment in full and final settlement will be made at the rates tendered for the payment items specially provided in the Bill of Quantities Where the circumstances described in Clauses 9.1.1 and 9.1.2 are applicable only to a certain portion of the contract, the Employer's Agent will decide after consulting the Contractor, to what extent the contract as a whole is affected and whether or not a claim in terms of this Clause can be submitted. No payment will be made in terms of this Clause after the expiry of the due completion date.
10.3.2	Amicable settlement in terms of Clause 10.4 shall be contemplated for all disputes prior to referring any dispute to adjudication or arbitration.
10.5.1	Dispute resolution shall be by ad-hoc adjudication
10.5.3	The number of Adjudication Board Members to be appointed is one.
10.7.1	The determination of disputes which are unresolved in terms of Clause 10.5.3 shall be by arbitration.

PART 2: DATA PROVIDED BY THE CONTRACTOR

Clause	Description
1.1.1.9	The Contractor is:
1.2.1.2	The Contractor's address for receipt of communications and notices is: Telephone: Facsimile:..... Address (Postal): Address (Physical):
5.12.1	The Works shall be completed in calendar days (if different).

C1.3: OCCUPATIONAL HEALTH AND SAFETY MANDATORY AGREEMENT

(To be filled out by the successful Tenderer)

ARTICLE OF AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL SAFETY ACT, 1993 BETWEEN

EMPLOYER

(Hereinafter referred to as the "EMPLOYER")

AND

.....

Herein represented byin his/her capacity as duly
authorised by virtue of a resolution dated....., Attached hereto
Annexure A, of the said

..... (herein after referred to as the "CONTRACTOR")

.....

WHEREAS the CONTRACTOR is the mandatory of the EMPLOYER as
contemplated in an agreement in respect of

.....

.....

..... Contract number

AND WHEREAS section 37 of the Occupational Health and Safety act, 1993 (Act 85
of 1993, hereinafter referred to as the "ACT"), imposes certain powers and duties
upon the EMPLOYER.

AND WHEREAS the parties have agreed to enter into an agreement in terms of
section 37(2) of the ACT. **NOW THEREFORE** the parties agree as follows:

- (a) The CONTRACTOR undertakes to acquaint the appropriate officials and
employees of the CONTRACTOR with all relevant provisions of the ACT and the
regulations promulgated in terms thereof.
- (b) The CONTRACTOR undertakes that all relevant duties, obligations, and
prohibitions imposed in terms of the ACT and Regulations will be fully
complied with, provided that should the EMPLOYER prescribe certain
arrangements and procedures, that same shall be observed and adhered to by
the CONTRACTOR, his officials, and employees. The CONTRACTOR shall bear
the onus of acquainting himself/herself/itself with such arrangements and
procedures.
- (c) The CONTRACTOR hereby accepts sole liability for such due compliance with
the relevant duties, obligations, prohibitions, arrangements, and procedure, if

any, imposed by the ACT and Regulations and the EMPLOYER expressly absolves the EMPLOYER from itself being obliged to comply with any of the aforesaid duties, obligations, prohibitions, arrangements, and procedure as the case may be.

- (c) The CONTRACTOR agrees that any duly authorised officials of the EMPLOYER shall be entitled, although not obliged, to take such steps as may be necessary to ensure that the CONTRACTOR has complied with the undertakings as more fully set out in paragraphs 1 and 2 above, which steps may include, but shall not be limited to, the right to inspect any appropriate site or premises occupied by the CONTRACTOR, or to inspect any appropriate records held by the CONTRACTOR or to take such steps it may deem necessary to remedy the default of the CONTRACTOR at the cost of the CONTRACTOR.
- (d) The CONTRACTOR shall be obliged to report forthwith to the EMPLOYER any investigations, complaint or criminal charge which may arise as a consequence of the provisions of the ACT and Regulations, pursuant to work performed in terms of this agreement, and shall, on written demand, provide full details in writing of such an investigation, complaint or criminal charge as the case may be.

Signature(s) of authorized agents:.....

Name(s) (in block letters)

Capacity of authorized agents:.....

For and on behalf of the Tenderer

.....

(Name and address of organization)

Witness: (Full name – in block letters – and signature)
(Name)

.....
(Signature)

.....
Date:

For and on behalf of the Employer:

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

Name(s)

Capacity

for the **Employer:**

.....

(Name and address of organization)

Witness: (Full name – in block letters – and signature)

(Name)

.....

Date:

(Signature)

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CONTRACT PART C2: PRICING DATA
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CONTENTS

- C2.1 Pricing Instructions**
- C2.2 Bills of Quantities**
- C2.3 Day-work Schedule**

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C2.1: PRICING INSTRUCTIONS

C2.1 PREAMBLE TO THE BILL OF QUANTITIES

C2.1.1 The General Conditions of Contract, the Contract Data, the Scope of Work, the Standardized Specifications and the Drawings are to be read in conjunction with the Bill of Quantities.

C2.1.2 For the purposes of this Bill of Quantities, the following words shall have the meanings hereby assigned to them:

Unit: The unit of measurement for each item of work as defined in the standard Specifications of the Scope of Work.

Quantity: The number of units of work for each item.

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

Amount: The product of the quantity and the rate tendered for an item.

Lump sum: An amount tendered for an item, the extent of which is described in the Bill of Quantities, the Scope of Work or elsewhere but of which the quantity of work is not measured in units.

C2.1.3 The method of measurement published by the South African Bureau of Standards in Clause 8 of the Standardised Specifications for Civil Engineering Construction is applicable, subject to the variations and amendments contained in the section “Applicable SABS 1200 standardised specifications”.

Work executed will be measured for payment in accordance with the methods described in the Contract documents under the various payment items, notwithstanding any custom of the contrary. Attention is directed to the provisions of the Standard Specifications regarding the mass of the finished work in place that will be taken for payment, excluding any volume or mass of work in excess of that ordered.

C2.1.4 Descriptions in the Schedule/Bill of Quantities are abbreviated and comply generally with those in Clause 8 of each Standardised Specifications. Reference shall inter alia be made to the drawings, standard specifications, Scope of Work, General Conditions of Contract and Contract Data for more detailed information regarding the extent of the work entailed under each item.

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 Schedule/Bill, the requirements of the Standardised or Scope of Work, as applicable, shall prevail.

C2.1.5 A payment reference column is provided in the BOQ to assist the Tenderer when pricing this tender. Certain items may not have a payment reference and the onus is on the tenderer to refer to the relevant specifications as stated above to ensure that the item is priced correctly. If in doubt the

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tenderer shall preferably seek clarification or else qualify any assumptions made.

C2.1.6 The clauses in a specification in which further information regarding the schedule/bill item can be obtained appear under “Reference clause” in the Schedule. The reference clauses indicated are not necessarily the only sources of information in respect of schedule items. Further information and set specifications may be found elsewhere in the contract documents. Standardised Specifications are identified by the letter or letters which follow SABS in the SABS 1200 series of specifications, e.g., G for SABS 1200 G.

C2.1.7 Unless otherwise stated, items are measured nett in accordance with the drawings, and no allowance is made for waste. The Schedule has to be completed in black non-erasable ink and the tenderer is referred to the Tender Specifications in regard to the correction of errors.

C2.1.8 The quantities set out in the Schedule/Bill of Quantities are the estimated quantities of the Contract Works, but the Contractor will be required to undertake whatever quantities may be directed by the Employer’s Agent from time to time. The Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.

The validity of the Contract shall in no way be affected by differences between the quantities in the Bill of Quantities and the quantities certified for payment. Work will be valued at the rates or lump sums tendered, subject only to provisions of the Conditions of Contract, of the Standard Specifications and of the Scope of Work.

C2.1.9 The prices and rates to be inserted in the Schedule/Bill of Quantities are to be the full inclusive prices for the work described under the several items. Such prices and rates shall cover all costs and expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based, as well as overhead charges and profit. Reasonable prices shall be inserted as these will be used as a basis for assessment of payment for additional work that may have to be carried out.

C2.1.10 Tenderers are required to allow in their tendered prices for the supply and use of tools, the provision, operation and maintenance of all the Contractor’s Equipment, the provision of secure storage facilities for materials supplied by others, the supply of key personnel, the supervision of all labour and workmanship and everything and every service necessary for the construction, completion and maintenance of the Works in the manner required by the Contract and to the entire satisfaction of the Engineer

C2.1.11 A price or rate is to be entered against each item in the Schedule/Bill of Quantities, whether the quantities are stated or not. An item against which no price is entered or where a word or phrase such as “included” or “provided elsewhere” will be accepted as a rate of nil (R0,00) having been entered against such items and covered by the other prices or rates in the Schedule.

If the Tenderer should group a number of items together and tender one lump sum for such group of items, this single tendered lump sum shall apply to that group of items and not to each individual item. Or, should he indicate

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against any item that full compensation for such item has been included in another item, the rate for the item included in another item shall be deemed nil.

Any work executed to which such a pay item applies, shall be measured under the appropriate items in the Bill of Quantities and valued at a rate of nil (R0,00). The rate of nil shall be valid irrespective of any change in the quantities during the execution of the Contract.

The tendered lump sums and rates shall be valid irrespective of any change in the quantities during execution of the Contract.

- C2.1.12** For provisional sums and prime cost sums refer to clause 6.6 of the Conditions of Contract.
- C2.1.13** Except where rates only are required, the Tenderer shall insert all amounts to be included in his total tendered price in the “Amount” column and show the corresponding total tendered price.
- C2.1.14** All prices or rates inserted in the Bill of Quantities shall be EXCLUDING VAT. Provision has been made on the Summary Page, of the Bill of Quantities, for the addition of VAT.
- C2.1.15** Arithmetical errors of responsive tenders will be corrected as stated in the Tender Data.
- C2.1.16** Should a tenderer be unwilling to make the corrections ordered by the Employer’s Agent, the tender may be disqualified.
- C2.1.17** The quantities set out in the Bill of Quantities are the estimated quantities of the Works, but the Contractor will be required to undertake whatever quantities as may be directed by the Employer’s Agent from time to time. The Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.
- C2.1.18** The quantities of materials or the amount of work listed in the Schedule of Quantities shall not be regarded as authorisation for the Contractor to order materials or to execute work. The Contractor shall obtain the Engineer’s detailed instructions for all work before ordering any materials or executing work or making arrangements in this regard.
- C2.1.19** The Bills of Quantities must be completed by the insertion of rates / prices in accordance with the instructions described in the items above. As this contract is a re-measurable contract and not a lump sum contract, a blank Bill of Quantities with only a lump sum amount will not be accepted.
- C2.1.20** Any entry made by the Tenderer in the Price Schedule, forms, etc., which the tenderer desires to change, shall not be erased or painted out. A line shall be drawn through the incorrect entry and the correct entry shall be written above in black ink and the full signature of the Tenderer shall be placed next to the correction.
- C2.1.21** The Tenderer shall ascertain the nature of the access to the Site, the quality and nature of the soil conditions as well as existing materials on site and all other matters such as relevant local ordinances etc. which might influence the completion of the Works.
- C2.1.22** The Tenderer shall allow for all obvious items which have not necessarily been

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specified but which can reasonably be inferred as necessary in order to carry out the Works as specified.

- C2.1.23** Tenderers are to refer to the Scope of Works and in particular the Specification Data when pricing the Bills of Quantities. Certain clauses in the Standard Specifications and the Particular Specifications have been omitted, amended, or added to and these changes must be taken into account when pricing the tender.
- C2.1.24** Should the Tenderer wish to offer alternative equipment to that which is specified, please include the full specifications / pump curves / manufacturer details of the alternative equipment being offered.
- C2.1.25** As it is not always practical or possible to cross reference every change to the Specifications, the onus rests on the tenderer to ensure that he is aware of the changes and to structure his rates accordingly.
- C2.2.26** It is deemed that all costs incurred by the Contractor to ensure conformity with the Environmental Management Specifications, is made in the priced items of the measured Bill following the Preliminary and General Bill and that any increases and decreases in the measured quantities will correspondingly adjust for these charges.
- C2.1.27** It is deemed that all costs incurred by the Contractor to ensure conformity with the OHS Act, Health and Safety Specifications, is made in the priced items of the measured Bill following the Preliminary and General Bill and that any increases and decreases in the measured quantities will correspondingly adjust for these charges.
- C2.1.28** An amount for contingencies has been entered in the Schedule of Quantities which will be used in whole or in part for additional work that may be deemed necessary and only as shall be directed in writing by the Engineer. This amount shall be deducted in part or in whole from the final Contract Value if not required
- C2.1.29** The units of measurement described in the Schedule/Bill of Quantities are metric units.

Abbreviations used in the Schedule/Bill of Quantities are as follows:

mm	millimetre	H	hour
m	metre	kg	kilogram
km	kilometre	t	ton (1 000 kg)
m ²	square metre	No.	number
m ² .pass	square metre-pass	sum	lump sum
ha	hectare	MN	MegaNewton
m ³	cubic metre	MN.m	MegaNewton-metre
m ³ .km	cubic metre-kilometre	P C sum	Prime Cost sum
ℓ	litre	Prov sum	Provisional sum
kℓ	kilolitre	%	per cent
MPa	MegaPascal	kW	kilowatt

- C2.1.30** Rates for materials are to include for delivery and offloading at the Contractor's main site store, or if material can be delivered directly to the point of operations, for the delivery and unloading at that point.

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C2.2: BILL OF QUANTITIES

Borehole drilling and rehabilitation

Payment	Sub Item	Description	Unit	QTY	Rate	Total (Rands)
1		Establishment	No.	2		
2		Health and Safety Plan, and all health and safety requirements for Contract				
3		Contractual requirements				
4		Occupational Health and Safety Agent (on behalf of the client) as instructed by the Employers Agent	Prov. Sum	1	R 50 000.00	R 50 000.00
5		Management, overheads, charges and profit on the above item	%	R 50 000.00		
6		Set-up (Percussion)	No.	8		
7		Inter borehole moves	km	300		
8		Water Haulage	m³/km	40		
9		Air Percussion Drilling				
		Drilling Depth Range: 0 - 150m	m			
	(a)	305mm (12")	m	20		
	(b)	254mm (10")	m	20		
	(c)	216 / 203mm (8 / 8.5")	m	240		
	(d)	165mm (6.5")	m	960		
		Drilling depths 150m - 300m				
	(g)	216 / 203mm (8 / 8.5")	m			
	(h)	165mm (6.5")	m	600		
10		Reaming				
		Drilling Depth Range : 0 - 150m				
	(a)	305mm (12")	m	40		
	(b)	254mm (10")	m	40		
	(c)	216 / 203mm (8 / 8.5")	m	200		

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11		ODEX / SYMETRIX Drilling				
	(a)	Drilling Depth Range : 0 - 100m	m	200		
	(b)	Casing Shoe	No.	3		
	(c)	ODEX/Symetrix casing	m	200		
12		Borehole Rehabilitation (work time rate)	hr	200		
13		Casing				
	(a)	Mild Steel 4mm wall thickness				
		(i) 6.5" Plain	m	300		
		(ii) 6.5" Factory Slotted	m	40		
		(iii) 8/8.5" Plain		40		
		(iv) 8/8.5" Factory slotted		10		
		(v) On-site perforation of mild steel casing	m	40		
	(b)	PVC (Class 9 - 16)				
		(i) Plain factory threaded 140mm min Class 9	m	120		
		(ii) Factory Slotted, factory threaded 140mm min Class 9	m	30		
	(c)	140mm uPVC casing Centralizers	No.			
14		Borehole Development	hr	24		
15		Jetting	hr	4		
16		Backfill	m ³	20		
17		Gravel / Filter Pack (Graded Silica)	40 kg bag	50		
18		Grout Backfill / Bentonite Seal	m	8		
19		Capping of borehole	No.	8		
20		Borehole Disinfection (granular HTH)	No.	8		
21		Additional Items	Prov. Sum			R 100 000.00
		Materials not included in the schedule of rates, and as specified by the Employers Representative	No.	1		
Sub Total						

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Sustainable Yield Testing

Payment	Sub Item	Description	Unit	QTY	Rate (R)	Rate (Rands)
1		Establishment	No.	2		
2		Set-up (Positive Displacement or Variable yield control)	No.	8		
3		Inter borehole moves	km	6		
4		Test pump installation (up to 50m)				
	(a)	< 8l/s	No.	4		
	(b)	>8l/s	No.	4		
		Pump installation >50m)				
	(a)	< 8l/s	m	120		
	(b)	>8l/s	m	120		
5		Laying of Discharge Hose	50m	16		
6		Yield Testing				
	(a)	Step testing	hr	48		
	(b)	Constant Discharge Testing	hr	384		
	(c)	Recovery	hr	432		
7		Water Level monitoring of adjacent boreholes during CDT	Bh.	8		
8		Water Quality				
		Sampling and delivery to certified laboratory	No.	8		
		Analysis (SANS 241 - short / groundwater)	No.	8		
9		Capping of borehole	No.	8		
10		Borehole Disinfection (granular HTH)	kg	8		
11		Data recording, and digital report	Bh.	8		
Sub Total						

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DayWorks

Payment	Sub Item	Description	Unit	QTY	Rate	Total (Rands)
		Day Works				
1		Unskilled labour	hour	8		
2		Semi-skilled labour	hour	20		
3		Skilled labour	hour	20		
4		Pipe Layer	hour	8		
5		Plumber	hour	8		
6		Steel Fixer	hour	8		
7		Concrete Hand	hour	8		
8		Section Leader	hour	8		
9		Foreman	hour	8		
10		Contracts Manager (Site Agent)	hour	8		
11		TLB	hour	9		
12		Generator	hour	10		
13		175l Concrete Mixer	hour	11		
14		1 ton bakkie	hour	12		
15		3 ton flat-bed truck	hour	13		
Sub Total: Dayworks						

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Summary

Item	Description	Total (Rands)
1	Borehole drilling and refurbishment	
2	Sustainable yield testing	
3	Dayworks	
4	Bonus provision of R 100 000.00 for every week the project is completed earlier. Contractor will only be compensated in the event the project is completed earlier to the required standards	R 200 000.00
	Sub Total	
	Contingency (15%)	
	Sub Total	
	VAT (15%)	
	TOTAL	

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C2.3 DAYWORKS SCHEDULE

C2.3.1 GENERAL

Tenderers must complete this list, which shall be used for the assessment of value of the work, which the Engineer instructed in writing that must be done on a day work bases, all in agreement with Clause 6.5 of the General Conditions of Contract for Construction Works 2015. All the rates are fixed and shall be binding until and with the issuing of the final certificate, except for statutory increases, announced from time to time.

C2.3.2 LABOUR COSTS

Tenderers are required to state the rates to be used in evaluating work done on a daywork basis. The rates quoted are to cover site supervision, superintendence, insurances, holidays with pay, travelling allowances, lodging, any other allowances and emoluments, all overhead charges and profit.

Rates for labour are to include for the use and maintenance of hand tools and appliances, non-mechanical Contractor Equipment such as ladders, trestles, stages, bankers, hand pumps, scaffolding and all similar items unless they are used exclusively for day work etc., as per the allowances as specified in the General Conditions of Contract for Construction Works 2015.

Overtime costs attached to this contract shall be paid in the same relation as to that which the employees are actually paid.

Only the net working hours will be measured under Day-work and it will be held that the Contractor has made provision in his rates for possible interruptions and standing time.

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C2.3.3 EQUIPMENT COSTS

Full comprehensive hourly rates, which also include the cost of the operators and other equipment, must be listed below. Rates must also include all the costs of consumable items, fuel, maintenance, depreciation, tools and all other coincidences that shall be necessary to operate the equipment for the purpose it is designed for. The rates must also include all the overhead costs, profits, site supervision, insurance, holidays with payment, travelling costs (or travelling allowances) and residence allowances of operators and any other allowances that is applicable. No further percentage allowances shall be applicable on equipment. The Tenderer must list under each heading the fabrication and specification of the equipment available.

Rates will be held to be applicable not only to such Contractor's Equipment as may be available on site, but also to such mechanically operated Contractor's Equipment as may be brought onto site on the written instruction of the Engineer.

The Contractor will be paid the actual net cost of plant hired by him for Day-work and in addition will be paid a percentage allowance on the net cost of such hire which allowance will cover the Contractors overhead costs and profit.

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PART C3: SCOPE OF WORK

- C3.1 Description of the Works**
- C3.2 Engineering**
- C3.3 Procurement**
- C3.4 Construction**
- C3.5 Site Information**
- C3.6 Environmental Management Plan**
- C3.7 Annexures**

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C3.1: DESCRIPTION OF THE WORKS

C3.1.1 EMPLOYER'S OBJECTIVES

This specification and Bill of Quantities have been prepared in response to the Knysna Municipality wanting to re-activate various groundwater resources into its water supply network. Some of these boreholes are in a poor state of repair, and will require cleaning out of boreholes, borehole rehabilitation, and borehole re-drilling. Camera inspections, sustainable yield testing, and water quality analysis will form part of this scope of works.

The Employer requires that the work be of a high standard and be completed in the shortest practical time whilst making use of local labour where possible and ensuing that the provision of water is sustainable and does not create negative impacts on the receiving environment.

C3.1.2 OVERVIEW OF THE WORKS

There are some 25 municipal production boreholes in various states of operation of which eight (8 No.) boreholes have been prioritized for emergency repair (see table 1), however, based on the outcome of refurbishment attempts, additional and alternate boreholes may be considered. This specification will thus be split into the following parts:

- Refurbishment, re-drilling, and yield testing of existing boreholes

Table 1: A brief synopsis of the existing boreholes is indicated in the table below.

BH No.	BH Depth (mbgl)	Latitude (Dec.Degs)	Longitude (Dec.Degs)	Indicative Yield (l/s)	Priority
BHE3 Arch Dam	294	S34.01032	E23.09833	7	1
BHE10 Arch Dam	210	S34.01522	E23.09938	5	1
BHE1 Gouna PS	250	S33.99074	E23.04010	2.7	2
BHE2 Arch Dam	300	S34.00935	E23.09459	1.1	2
BHE8b Glebe Dam	300	S34.00624	E23.11783	4.5	1
BHE14 Old Cape Road	213	S33.46232	E21.26475	5	1
Mosque Borehole	210	S34.036580	E23.043718	TBA	1
Brenton on Sea BH1	42	S34.06967	E23.02046	0.5	2
Brenton on Sea BH2	131	S34.06938	E23.02743	1.2	2
BRNE2		S33.45994	E21.25904	4	1
WWF HOA		S34.069142	E23.018773		2
BH1 (HoA)	96			4	2
Belvidere BH2		S34.046195	E22.998049		2
Belvidere BH3		S34.044885	E22.997996		2
Belvidere BH4		S34.046120	E22.996360		2
Sedgefield BH1		S34.01697	E22.81540	4	2
Sedgefield BH2		S34.01632	E22.81373	4	2
Sedgefield BH3		S34.01554	E22.81277	3	2
Sedgefield BH4		S34.01516	E22.81118	3	2
Sedgefield BH5		S34.01472	E22.80981	4	2
BH6 (Blombosnek)		S34.025085	E22.810661		1
BH7 (Blombosnek)		S34.023517	E22.811428		1

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C3.1.3 EXTENT OF THE WORKS

The Knysna boreholes are located within various wellfields to the west, north and East. Some boreholes have 3-Phase 400V electricity, and were at one point operational, however, the bulk of the emergency intervention boreholes are exploratory boreholes that were drilled previously, not equipped, that are open to the elements, and require refurbishment, sustainable yield testing, and water quality analysis prior to equipping.

C3.1.3.1 PART 1: Refurbishment of Non-Operational Boreholes

The following boreholes are non-operational, and have been prioritized for emergency refurbishment:

- BHE3 Arch Dam
- BHE 10 Arch Dam
- BHE14 Old Cape Road
- BHE8b Glebe Dam
- BRNE2 Lake Brenton
- BH6 (Blombosnek) – Sedgefield
- BH7 (Blombosnek) – Sedgefield
- Mosque

Any boreholes that are unable to be refurbished (cleaned and opened to depth), will need to be drilled on instruction from the Employers Representative.

C3.1.3.2 PART 2: Fishing, Camera Inspections, and Sustainable Yield Testing of boreholes.

Some boreholes are confirmed to have existing equipment and blockages in the borehole and will require fishing to try to remove these obstructions to re-equip the boreholes. Accordingly fishing equipment is required. Also, camera inspections to check the integrity of the hole and to try and determine the nature of any blockages is required.

All refurbished (and redrilled boreholes) will be subjected to sustainable yield tests consisting of step tests, 48-hour constant discharge test, and associated recovery, under the guidance of the Employers Representative.

C3.1.3.3 PART 3: Day Works.

Labour and transport costs for unforeseen items to be addressed with written approval from the Employers Representative.

C3.1.4 CONSTRUCTION PROGRAM AND METHODS

Construction methods must be such that no property or life is endangered. The Employer accepts no responsibility for work that is done outside the site boundaries without the Employer's Representative approval.

The Contractor must program his work in such a way that no construction is to be done during the Christmas holiday and Easter weekend as set out in the Contract Data nor on non-working days (Sundays). The compilation of the construction program and any amendments thereto during the course of construction shall be at the cost of the Contractor and shall not be measured elsewhere in this contract.

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The following is to be noted:

- The Employer's target for the overall practical completion of the works is **3 weeks**, however, the Tenderer must work out the duration required for the contract completion.
- A final realistic, comprehensive and detailed construction programme and cash flow must be submitted together with the tender. Bidders must note that the programme and cash flow will be binding on award.

C3.1.5 LABOUR INTENSIVE CONSTRUCTION

An objective of this Contract is the optimum utilization of local resources where possible. One of the methods to be adopted to achieve this objective is through the implementation of labour-intensive construction methods. The contractor will be required to source the bulk of his labour from the local communities through the Municipality's data base.

C3.1.6 LOCATION OF WORKS

The specific wellfields are located the Knysna Local Municipality. Boreholes are located within various wellfields (See Annexure A for approximate site locations) and the table below:

Knysna Borehole Coordinates		
BH No.	X : Longitude (Dec.Deg)	Y : Latitude (Dec.deg)
BHE3 Arch Dam	23.09833	-34.01032
BHE 10 Arch Dam	23.09938	-34.01522
BHE14 Old Cape Road	21.26475	-33.46232
BHE8b Glebe Dam	21.27140	-33.46117
BRNE2 Lake Brenton	21.25904	-33.45994
BH6 (Blombosnek) – Sedgfield	21.26321	-33.46160
BH7 (Blombosnek) - Sedgfield	21.27389	-33.45976
Mosque	23.043718	-34.03658

C3.17 TEMPORARY WORKS

Temporary Works will be required as necessary to facilitate permanent works.

C3.1.8 MANAGEMENT MEETINGS

In order to facilitate the smooth functioning of the Works and to ensure the closest co-operation between all the parties concerned, the Employers Agent will call for regular meetings to be held on the site or virtually, at which a senior member of the Contracting firm and the General Foreman of the Works will always be required to be present.

In addition to the above, other persons will be required to attend these meetings as and when their presence is necessary, e.g., Consultants in all disciplines, representatives of the various Sub-Contractors, etc. Proper minutes of these meetings will be kept by the Employers Agent and copies will be circulated to all persons attending the meetings and to others who need to be kept informed.

C3.1.9 FORMS OF CONTRACT ADMINISTRATION

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The Employers Agent shall provide necessary forms where available.

C3.1.10 ELECTRONIC PAYMENTS

The Contractor shall provide all required information to the Employer to facilitate electronic payments upon request.

C3.1.11 DAILY RECORDS

The Contractor shall keep daily records of people and equipment employed as well as a site diary in respect of work performed on the site. The site diary shall be presented DAILY to the Employers Agent's Representative for his confirmation and signature.

C3.1.13 PAYMENT CERTIFICATES

Requirements will be in accordance with the Employer's prescriptions.

C3.1.14 NATURE OF THE CONTRACT

The Contractor under this Contract is considered to be an expert in ground-water borehole construction and is expected to organize and carry out the work specified hereunder in a competent 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.

- a) The Specifications are for the refurbishment, redrilling, and sustainable yield testing of boreholes.

For this the Contractor shall provide all labour, transport, plant, tools, equipment and materials and appurtenances, and shall perform all Works necessary to satisfactorily pump test, sample, deliver, and analyze water quality (chemical and biological) in accordance with the SANS 241 specification and to any further details as may be ordered by the Client.

- b) The Contractor shall employ only competent workmen for the execution of the Works, and all such Works shall be performed under direct supervision of an expert borehole driller/site supervisor.

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C3.3: PROCUREMENT

C3.3.1 NOT APPLICABLE

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C3.4: CONSTRUCTION (General and Particular Specifications)

PART A: GENERAL

A1 APPLICABLE STANDARDIZED SPECIFICATIONS RELATING TO THE WORKS

<u>Section</u>	<u>Description</u>
SANS 1200 A :	General
SANS 1200 GA :	Concrete (Small works)

**PART B: AMENDMENTS TO THE STANDARD SPECIFICATION AND OTHER
ADDITIONAL SPECIFICATIONS**

In certain clauses in the Standard Specifications, allowance is made for a choice to be specified in the Project Specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this contract are contained in this part of the Project Specifications. It also contains the necessary additional specifications required for this contract.

The clauses and payment items dealt with in this part of the Project Specifications are prefixed “PS” and numbered sequentially. The number corresponding to the relevant clause or item number in the Standard Specifications is given in parenthesis.

PS - Variations to Standard Specifications

PSA	-	General
PSGA	-	Concrete (Small works)

New clauses and payment items not covered by clauses or items in the Standard Specifications have also been included here.

Additional specifications where applicable are prefixed “P” and numbered alphabetically.

P - Particular Specifications

PA	-	Occupational Health & Safety
PB	-	Borehole Drilling and refurbishment
PC	-	Fishing, camera inspections and sustainable yield testing
PD	-	Measurement and payment

PART B1 VARIATIONS AND ADDITIONS TO THE STANDARDIZED SPECIFICATIONS

This section covers the variations and additions to the SANS 1200 Standard Specifications applicable to this Contract, as per SANS 1200.

SUB-CLAUSE REFERENCE

The sub clause in brackets refers to the sub clause in the standardized specifications of SANS 1200.

PSA : GENERAL (SANS 1200A)

PSA 1 Scope (1)

Replace sub-clause 1.1 with the following:

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

PSA 2 INTERPRETATIONS (2)

PSA 2.3 Definitions (2.3)

(a) General (a)

Add the following definitions:

"Task: A quantified activity or operation.

Task work: Work paid for by the completed task or job.

Daily rate: The remuneration of a day's work, regardless of output.

Daily wage: See daily rate.

Task rate: The remuneration for a completed task.

Labour intensive construction:

The employment of as great a portion of labour as is technically feasible to produce as high a standard of construction as demanded by the specifications and allowed by the funding available, thus the effective substitution of labour for mechanised or motorised construction equipment.

(c) Measurement and payment (c)

Replace the definitions for fixed charge, time-related charge and value-related charge with the following:

"Fixed charge: A charge that is not subject to adjustment on account of variation in the value of the Contract amount or the Contract time of completion.

Time-related charge: A charge, the amount of which is varied in accordance with the time for completion of the work as adjusted in accordance with the provisions of the Contract."

Value-related charge: A charge, the amount of which is varied pro rata the final value of the measured work executed and valued in accordance with the provisions of the Contract."

PSA 2.4 Abbreviations (2.4)

(a) Abbreviations relating to standard documents (a)

Add the following abbreviation:

"CKS: SABS Co-ordinating Specification."

PSA 2.9 Site Instruction Book (New Sub-Clause)

Due to the dispersed nature of the project a formal hard copy site instruction book will not be utilised.

Mobile communication in the form of a "What's App" group. The group will be utilised for general discussion and logistics but will also be utilised to give and receive site instructions.

A formal What's App will be entitled SI-01, SI-02 etc. Confirmed receipt of the site instruction will be adopted in the form of delivery and read notifications.

PSA 2.10 Request for Information (New Sub-Clause)

Requests for Information will be communicated in the same form as the Site Instruction in PSA5.

PSA 3 MATERIALS (3)

PSA 3.1 Quality (3.1)

Add the following:

"All manufactured materials supplied shall be new materials unless the contrary is specified. All materials shall bear the standardization mark, whether so specified or not.

The Contractor shall submit to the Engineer samples of all materials intended to be incorporated in the works, at least two weeks prior to the materials being required for construction.

Where proprietary materials are specified, it is to indicate the quality or type of materials or articles required and where the terms "or other approved" or "or similar approved" are used in connection with proprietary materials or articles, it is to be understood that the approval shall be at the sole discretion of the Employers Agent".

PSA 3.3 Ordering of Materials (New Sub-Clause)

The quantities set out in the Schedule of Quantities have been determined from calculations based on data available at the time and should therefore be considered to be only approximate quantities. The liability shall rest entirely and solely with the Contractor to determine before ordering, the required types and quantities of the various materials required for the completion of the Works in accordance with the Specifications and the Drawings issued to the Contractor for construction purposes.

Any reliance placed by the Contractor on the estimated quantities stated in the Schedule of Quantities issued for tendering purposes, or measurements made by the Contractor from the drawings issued for tendering purposes, shall be entirely at the Contractor's risk, and the Employer accepts no liability whatsoever in respect of materials ordered by the Contractor on the basis of Tender Documents.

PSA 4 SAFE-GUARDING MACHINERY

PSA 4.1 Management of construction machinery

Alter the reference to the “Machinery and Occupational Safety Act, 1983 (Act 6 of 1983)” to “Occupational Health and Safety Act, 1993 (Act 85 of 1993)” and General Machinery Regulations (GNR 1521 of 05 August 1988).

PSA 4.2 Contractor's Office, Stores and Services (4.2)

Alter the clause heading to “CONTRACTOR’S OFFICE, STORES, SERVICES AND HOUSING”

Add the following:

“The Contractor shall be responsible for the security of his construction camp (should he choose to provide one) on site and the construction site at his own cost.”

“Neither housing nor shelters are available for the Contractor's employees, and the Contractor shall make his own arrangements to house his employees and transport them to and around the Site.

PSA 4.3 Restriction on the Use of Construction Equipment (New Sub-clause)

The Contractor shall use only hand tools and equipment in the construction of the portions of the Works identified as being a Labour-Intensive activity, except for the following items of mechanical Construction Equipment as approved by the Employers Agent:

- vehicles to be used for transporting purchased items from the Contractor's campsite or the storage site, to the places on site where they will be incorporated into the Works
- water bowser for transporting water
- Excavation equipment (only where digging by hand is impractical due to the nature of the ground as determined by the Employers Agent).

PSA 4.4 Plant for Construction Purposes (New Sub-clause)

The Contractor's plant for construction purposes shall be of modern design, adaptable for the purpose for which it is required, in sound condition, and ample in capacity for carrying out the Works expeditiously.

Should the Engineer be of the opinion that the plant 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, they shall have the right to call on the Contractor at any time during the progress of the works to provide additional or improved plant and tools as may be necessary to meet these requirements.

PSA 5 CONSTRUCTION (5)

PSA 5.1 Survey (5.1)

PSA 5.1.1 Setting Out of the Works (5.1.1)

Add:

“Where Labour Intensive work is specified, the Contractor shall be responsible for the setting out of the daily tasks for the labourers in his employ and for checking the daily tasks as set out.”

PSA 5.3 Protection of Structures (5.3)

Alter the reference to the “Machinery and Occupational Safety Act, 1983 (Act 6 of 1983)” to “Occupational Health and Safety Act, 1993 (Act 85 of 1993)” and General Machinery Regulations (GNR 1521 of 05 August 1988).

PSA 5.4 Protection of Underground Services (5.4)

Delete title and substitute the following:

Protection of Exposed and Underground Services.

Add to the Sub-Clause

"Providing of services shall be paid for under the item/s included in the Schedule as approved by the Employers Agent ".

PSA 5.7 Safety (5.7)

Re-title this Sub-Clause “HEALTH AND SAFETY” and replace the contents of this Sub-clause with:

“All work under this Contract shall be carried out in terms of the Occupational, Health and Safety Act, (Act 85 of 1993) and shall be subject to its Construction Regulations, 2014. The Employer’s Project Health and Safety Specifications pertaining to this project are included under Particular Specifications.”

PSA 5.9 Environmental Management (New Sub-Clause)

Add the new sub-clause:

“The Contractor shall take note of the mitigation requirements in the Environmental Management Plan (EMP), which has been included in Section C3.6 of the Contract Document and take the necessary steps for compliance with the EMP to ensure minimal environmental impact throughout the project duration.”

PSA 7 TESTING (7)

PSA 7.1 Principles

PSA 7.1.1 Checking

Replace this sub-clause with the following:

“The Contractor shall carry out sufficient checks to satisfy himself and the Employers Agent that the materials used and the workmanship (i.e. the quality of construction, adherence to tolerances and, when applicable, the strength attained) comply consistently with the specified requirements, and the results of those checks shall be submitted to the Employers Agent.

The contractor may use his own laboratory, if approved, or an approved independent laboratory for the execution of the abovementioned tests. All quality control tests to ensure that work is done according to specifications, will be for the contractor's account. It is assumed that these costs are included in the rates of items that are subjected to quality control tests.

All test results shall as soon as available immediately be given to the Engineer for approval.

The Employers Agent may carry out such checks as deemed necessary at any point or

at any depth or at any layer, as applicable.”

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.1 Measurement

PSA 8.1.2 Preliminary and general items or section

PSA 8.1.2.2 Tendered Sums

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

The Contractor’s tendered sums under items PSA 8.3 and PSA 8.4 shall collectively cover all charges for:

- Risks, costs and obligations in terms of the General Conditions of Contract and of this Standardized Specification, except to the extent that provision is made in these Project Specifications to cover compensation for any of these items of work.
- Head-office and site overheads and supervision.
- Profit and financing costs.
- Expenses of a general nature not specifically related to any item or items of permanent or temporary work.
- Providing facilities on Site for the Contractor’s personnel, including offices, storage facilities, workshops, laboratories, living accommodation, tools and equipment, ablutions, for providing services such as water, electricity, communications, sewerage, sewage and rubbish disposal, for access roads to access the various parts of the works and all other facilities required, as well as for the maintenance and removal on completion of the Works of these facilities and the cleaning-up of the camp site on completion of the works.
- Dealing with water.

PSA 8.2 Payment

PSA 8.2.1 Fixed-charge and value-related items

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

“Payment of fixed charges in respect of item PSA 8.3 will be made as follows:

Eighty per cent (80%) of the sum tendered will be paid once the facilities have been provided and approved. The remaining twenty per cent (20%) will be paid once the Works have been completed, the facilities removed, and the camp site cleared and cleaned.

PSGA Concrete (Small Works)

PSGA 3 MATERIALS (3)

PSGA 3.2 Cement (3.2)

PSGA 3.2.1 Applicable Specifications (3.2.1)

Unless agreed to otherwise by the Employers Agent, the cement used on the Works shall be CEM 1, grade 42.5 complying with the requirements of SANS ENV 197-1.

PSGA 3.2.2 Storage of Cement (3.2.2)

Add to the sub-clause:

“Cement shall not be kept in storage for longer than three weeks without the Employers Agent's permission. The cement store shall be run on a first in, first out basis.”

PSGA 3.4 Aggregates (3.4)

PSGA 3.4.1 Applicable Specification (3.4.1)

Add to the Sub-Clause:

“Sand from a source selected by the contractor and approved by the Employers Agent after testing will be used under this Contract.

The Contractor shall demonstrate by means of a report from an approved laboratory that the aggregates do not exhibit excessive shrinking properties, in accordance with clause C.14 of appendix C of SANS 1083.

The fineness modulus of the sand aggregate shall not vary by more than 0.2 from the fineness modulus of the sand used in the trial mix. Where the variation in fineness modulus exceeds this limit, the mix shall be adjusted to suit. If the fineness modulus of the fine aggregate varies by more than 0.5 from the sand used in the trial mix, the Employers Agent may call for a new trial mix to be made for re-approval.

PSGA 3.4.2 Use of Plums (3.4.2)

The use of plums will only be permitted, if agreed to by the Employers Agent, in mass-fill concrete.

PSGA 3.8 Admixtures (New Sub-Clause)

Unless approved by the Employers Agent, neither admixtures nor air-entraining agents shall be used in any concrete.

PSGA 5 CONSTRUCTION (5)

PSGA 5.1 Reinforcement (5.1)

PSGA 5.1.1 Bending (5.1.1)

Add to the Sub-Clause:

“Reinforcement shall be cut with cropping or shearing equipment only. Cutting torches shall not be used.”

PSGA 5.1.2 Fixing (5.1.2)

Add to the Sub-Clause:

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“No welding of reinforcement will be permitted.”

PSGA 5.3 Holes, Chases and Fixing Blocks (5.3)

Add:

“Fixing blocks for the attachment of fixtures may be embedded in concrete if the strength or any other desirable feature (such as appearance) is not, in the opinion of the Employers Agent, impaired thereby.”

PSGA 5.3.1 Chamfers (New Sub-Clause)

Unless otherwise noted on the drawings, all exposed sharp edges shall be chamfered 20 x 20 mm.

PSGA 5.4 CONCRETE (5.4)

PSGA 5.4.1 Quality (5.4.1)

PSGA 5.4.1.2 Consistency (5.4.1.2)

Delete the paragraph (b) and substitute the following:

(b) by the Employers Agent in respect of prescribed mix and strength concrete, or

PSGA 5.4.1.4 Prescribed Mix Concrete (5.4.1.4)

Replace the contents of the sub-clause with:

“The grades of prescribed mix concrete are designated 20, 15 and 10 and are composed of cement, sand and stone, as specified herein before, proportioned as listed in the accompanying table.

Grade	Size of stone (mm)	Cement (kg)	Sand (m ³)	Stone (m ³)
20	19	50	0.11	0.140
15	19	50	0.13	0.160
10	37.5	50	0.16	0.22

While the proportion of cement to the combined quantity of sand and stone must remain constant for each grade of concrete, as set out in the table, the relative proportions of sand and stone are to be adjusted if required by the Employers Agent, so as to attain the most suitable consistency of concrete, due allowance being made for the bulking of sand due to moisture.

The addition of water shall be regulated by the use of properly calibrated containers, only sufficient water being added as will in the opinion of the Employers Agent, afford a workable mix.

The fine and coarse aggregate approved for use in strength concrete Grade 25 is to be used for prescribed concrete mixed Grades 20 and 15.

PSGA 5.4.1.5 Strength Concrete (5.4.1.5)

Replace the contents of the sub-clause with:

“The grades of strength concrete designated Grade 25 is composed of cement, sand and stone, as specified herein before, proportioned as listed in the accompanying table.

Grade	Size of stone (mm)	Cement (kg)	Sand (m ³)	Stone (m ³)
30	19	50	0.080	0.110
25	19	50	0.095	0.125

At least three weeks before placing any strength concrete on the Works, the Contractor shall supply and deliver to a laboratory at his own cost, samples of the aggregates he proposes to use in the strength grade

concrete. While the proportion of cement to the combined quantity of sand and stone must remain constant for each grade of concrete, as set out in the table, the relative proportions of sand and stone may be adjusted to achieve the requirements of this Specification. The proportions given above are to guide the Tenderer in pricing the grades of strength concrete.

PSG 5.4.1.6 Ready Mixed Concrete (5.4.1.6)

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 Employers Agent. When such approval has been given, the Employers Agent shall then decide whether or not to accept the test results obtained by the facility concerned.”

PSG 5.4.1.7 No-fines Concrete (New Sub-Clause)

No-fines concrete shall be composed of cement and coarse aggregate only, the fine aggregate being, omitted from the mix. The proportions of the cement and stone shall be one part by volume of cement to eight parts by volume of stone. The stone shall comply with the grading requirements of 19 mm 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 particular of aggregate.

Proportions may be varied on site with the approval (or to the direction) of the Employers Agent to obtain a more satisfactory result if so directed by the Employers Agent on site. 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 the voids in order to prevent the ingress into the interstices of foreign matter.

Mixing shall be carried out in a mechanical batching plant and the hopper shall first be charged with the aggregate to which a small quantity of water has been added to moisten the aggregate particles. The cement shall then be added and shall be followed by the remainder of the water.

The 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 following upon the placing of the no-fines concrete and then only over planks or boards placed for this purpose.

PSGA 5.4.1.8 Blinding Layer (New Sub-Clause)

Add new sub-clause:

Beneath all structural grades of concrete or elsewhere, if so ordered by the Employers Agent, or shown on drawings, the bottom of the excavation is to be covered by a blinding layer (screed) in Grade 15/20 concrete to a specified depth to prevent disturbance of the ground and to serve as an even and accurate positioned working floor for setting steel and placing foundation concrete. This blinding layer shall be laid immediately after excavations have been taken out and trimmed to the required depths and have been inspected and approved by the Employers Agent.

PSGA 5.4.8 Concrete Surfaces (5.4.8)

PSGA 5.4.8.1 Unformed Concrete Surfaces (5.4.8.1)

Add to the Sub-clause:

"All unformed concrete surfaces shall be finished to one or more of the following classes of finishes:

Class 1: Screeded Finish

Immediately after being poured the concrete shall be screeded with a straight edge working between templates set accurately to line and level. No mortar shall be added to overcome surface irregularities. These shall be made good by rescreeding or by the addition of concrete.

Class 2: Wood Floated Finish

After screeding to line and level and when the water sheen has disappeared, the concrete surface shall be trowelled by hand with a wood float to a uniform consolidated surface free from any trowel marks and uniform in texture and appearance.

Class 3: Steel Trowelled Finish

Commence as for Class 2 and finish with a steel trowel. The final finish shall be done at the correct time, for example, while the concrete is still sufficiently plastic to take polish but when it has hardened sufficiently to prevent drawing water and fine materials to the surface. Any adherence of mortar to the steel trowel indicates that the correct stage has not yet been reached.

PSGA 5.5 Positions of Surface Finishes (New Sub-clause)

- a) Top of foundations: Class 1 - Screeded finish.
- b) Top of slabs: Class 2 – Wood floated finish.

PSGA 6 TOLERANCES

PSGA 6.1 Basis of Measurement

PSGA 6.1.2 Tolerances (6.1.2)

Replace the contents of the sub-clause with:

- a) Surface Class 1 shall not vary by more than 6 mm measured from a 3 m straight edge placed anywhere on the surface.
- b) Surface Class 2 and 3 shall not vary by more than 3 mm measured from a 3 m straight edge placed anywhere on the surface
- c) Special surfaces such as bearing seats shall be finished to a higher degree of accuracy, as shown on the drawings."

PSGA 5.4.11 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."

PSGA 8 MEASUREMENT AND PAYMENT

PSGA 8.1 Measurement and Rates (8.1)

PSGA 8.1.3 Concrete (8.1.3)

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Delete (sub-clause 8.1.3.1(b)) and substitute:

“(b) No allowance will be made for concrete required to make up over break in soft, intermediate or hard rock excavation. No payment will therefore be made for additional concrete or formwork, ordered in writing by the Employers Agent to replace over break.”

Add to the sub-clause 8.1.3.3 a):

“Any additional precautions required for adverse weather conditions shall be covered in the unit rate.”

Delete from the first line of Sub-clause 8.1.3.3 (a) the words "the cost of the design of the mix in the case of strength concrete,".

Add the following new Sub-clause after Sub-clause 8.1.3.3. (d):

“(e) Separate items have been included in the Schedule of Quantities for concrete complete with formwork for each particular grade of concrete or for structural units of similar size and shape, or for both. The unit rates shall cover the cost of the provision of concrete (made with ordinary Portland Cement unless otherwise so scheduled); mixing, testing, placing, compacting, the forming of stop-ends and unforeseen construction joints, striking where necessary, together with the cost of all parts of formwork in contact with the concrete and the necessary bearers, struts, and other supports, plus the layout and plant necessary to erect and strike such formwork.”

PSGA 8.3 Scheduled Reinforcement Items (8.3)

Delete Unit: t and replace with Unit: kg

PART B2: PARTICULAR SPECIFICATIONS

PA OHSA 1993 HEALTH AND SAFETY SPECIFICATION

PA.1 SCOPE

The following information regarding the locality and scope of works are standard for all projects and applies to any person or organization.

The following information may be used for referencing as applicable to the works to be done:

- Occupational Health and Safety Act No. 85 of 1993 and Regulations (as amended);
- Compensation for Injury and Occupational Diseases Act No. 100 of 1993 (as amended);
- South African Bureau of Standards (SABS) 1200. Standardized specification for civil engineering construction;
- South African National Standard 1921-1 General Engineering and construction works;
- South African National Standard 1921-3 Steelworks;
- South African Council for the Project and Construction Management Professions (SACPCMP) 2013, and Scope of services for the CHS Agent, Manager and Officer

PA.2 DEFINITIONS

For the purpose of this contract the following shall apply:

Employer” where used in the contract documents and in this specification, means the Employer as defined in the General Conditions of Contract and it shall have the exact same meaning as “Client” as defined in the Construction Regulations 2014. **“Employer”** and **“client”** is therefore interchangeable and shall be read in the context of the relevant document.

- (a) **“Contractor”** wherever used in the contract documents and in this specification, shall have the same meaning as **“Contractor”** as defined in the General Conditions of Contract.

In this specification the terms **“principal contractor”** and **“contractor”** are replaced with **“Contractor”** and **“subcontractor”** respectively.

For the purpose of this contract the **Contractor** will, in terms of OHSA 1993, be the mandatory, without derogating from his status as an employer in his own right.

- (b) **“Engineer”** where used in this specification, means the Engineer as defined in the General Conditions of Contract. In terms of the Construction Regulations the Engineer may act as agent on behalf of the Employer (the client as defined in the Construction Regulations).

PA.3 TENDERS

The Contractor shall submit the following with his tender:

- (a) A documented Health and Safety Plan as stipulated in Regulation 5 of the Construction Regulations. The Safety Plan must be based on the Construction Regulations 20014 and will be subject to approval by the Employer;
- (b) A declaration to the effect that he has the competence and necessary resources to carry out the work safely in compliance with the Construction Regulations 2014;
- (c) A declaration to the effect that he made provision in this tender for the cost of the health and safety measures envisaged in the Construction Regulations; and

- (d) Failure to submit the foregoing with his tender, will lead to the conclusion that the Contractor will not be able to carry out the work under the contract safely in accordance with the Construction Regulations.

PA.4 NOTIFICATION OF COMMENCEMENT OF CONSTRUCTION WORK

After award of the contract, but before commencement of construction work, the Contractor shall, in terms of Regulation 4, notify the Provincial Director of the Department of Labour in writing if the following work is involved:

- (a) The demolition of structures and dismantling of fixed plant of height of 3,0m or more;
- (b) The use of explosives;
- (c) Construction work that will exceed 30 days or 300 person-days;
- (d) Excavation work deeper than 1,0m; or
- (e) Working at a height greater than 3,0m above ground or landings

The notification must be done in the form of the pro forma included under Section C1.1) (Contract Data) of the tender document.

A copy of the notification form must be kept on site, available for inspection by inspectors, Employer, Engineer, employees and persons on site.

PA.5 RISK ASSESSMENT

Before commencement of any construction work during the construction period, the Contractor shall have a risk assessment performed and recorded in writing by a competent person. (Refer Regulation 9 of the Construction Regulations 2014).

The risk assessment shall identify and evaluate the risks and hazards that may be expected during the execution of the work under the contract, and it shall include a documented plan of safe work procedures to mitigate, reduce or control the risks and hazards identified.

The risk assessment shall be available on site for inspection by inspectors, Employer, Engineer, subcontractors, employees, trade unions and health and safety committee members, and must be monitored and reviewed periodically by the Contractor.

PA.6 APPOINTMENT OF EMPLOYEES AND SUBCONTRACTORS

PA6.1 Health and safety plan

The Contractor shall appoint his employees and any subcontractors to be employed on the contract, in writing, and he shall provide them with a copy of his documented Health and Safety Plan, or relevant sections thereof. The Contractor shall ensure that all subcontractors and employees are committed to the implementation of his Safety Plan.

PA6.2 Health and safety induction training

The Contractor shall ensure that all employees under his control, including subcontractors and their employees, undergo a health and safety induction training course by a competent person before commencement of construction work. No visitor or other person shall be allowed or permitted to enter the site of the works unless such person has undergone health and safety training pertaining to hazards prevalent on site.

The Contractor shall ensure that every employee on site shall at all times be in possession of proof of the health and safety induction training issued by a competent person prior to commencement of construction work.

PA.7 APPOINTMENT OF SAFETY PERSONNEL

PA7.1 Construction supervisor

The Contractor shall appoint a full-time Construction Supervisor with the duty of supervising the performance of the construction work.

He may also have to appoint one or more competent employees to assist the construction supervisor where justified by the scope and complexity of the works.

PA7.2 Construction safety officer

Taking into consideration the size of the project and the hazards or dangers that can be expected, the Contractor shall appoint in writing a full-time or part-time **Construction Safety Officer** if so decided by the Inspector of the Department of Labour.

PA7.3 Health and safety representatives

In terms of **Section 17 and 18 of the Act (OHSA 1993)** the Contractor, being the employer in terms of the Act for the execution of the contract, shall appoint a **health and safety representative** whenever he has more than 20 employees in his employment on the site of the works. The health and safety representative must be selected from employees who are employed in a full-time capacity at a specific workplace.

The number of health and safety representatives for a workplace shall be at least one for every 100 employees.

The function of health and safety representative(s) will be to review the effectiveness of health and safety measures, to identify potential hazards and major incidents, to examine causes of incidents (in collaboration with his employer, the Contractor), to investigate complaints by employees relating to health and safety at work, to make representations to the employer (Contractor) or inspector on general matters affecting the health and safety of employees, to inspect the workplace, plant, machinery etc. on a regular base, to participate in consultations with inspectors and to attend meetings of the health and safety committee.

PA7.4 Health and safety committee

In terms of Sections 17 and 18 of the Act (OHSA 1993) the Contractor (as employer), shall establish one or more health and safety committee(s) where there are two or more health and safety representatives at a workplace. The persons selected by the Contractor to serve on the committee shall be designated in writing.

In function of the health and safety committee shall be to hold meetings at regular intervals, but at least once every three months, to review the health and safety measures on the contract, to discuss incidents related to health and safety with the Contractor and to keep record of recommendations and reports made by the committee.

PA7.5 Competent persons

In accordance with the Construction Regulations the Contractor has to appoint in writing competent persons responsible for supervising construction work on each of the following work situations that may be expected on the site of the works.

- (a) Risk assessment and induction training as described in Regulation 9 of the Construction Regulations;
- (b) Fall protection as described in Regulation 10;
- (c) Excavation work as described in Regulation 11;
- (d) Demolition work as described in Regulation 14;

- (e) Scaffolding work as described in Regulation 16;
- (f) Suspended platform operations as described in Regulation 17;
- (g) Material hoists as described in Regulation 19
- (h) Bulk mixing plant as described in Regulation 20
- (i) Explosive powered tools as described in Regulation 21
- (j) Cranes as described in Regulation 22
- (k) Construction vehicle and mobile plant as described in Regulation 23
- (l) Control of all temporary electrical installation on the construction site as described in Regulation 23
- (m) Stacking and storage on construction sites as described in Regulation 28; and
- (n) Inspections of fire equipment as described in Regulation 29

A competent person may be appointed for more than one part of the construction work with the understanding that the person must be suitably qualified and able to supervise at the same time the construction work on all the work situations for which he has been appointed.

The appointment of competent person to supervise parts of the construction work does not relieve the Contractor from any of his responsibilities to comply with all requirements of the Construction Regulations.

PA.8 RECORDS AND REGISTERS

In accordance with the Construction Regulations the Contractor is bound to keep records and registers related to health and safety on site for periodic inspection by inspectors, the Engineer, the Employer, trade union officials and subcontractors and employees. The following records and registers must be kept on site and shall be available for inspection at all times.

- (a) A copy of the OHSA 1993 Construction Regulations 2014;
- (b) A copy of this Health and Safety Specification;
- (c) A copy of the Contractor's Health and Safety Plan
- (d) A copy of the notification of construction work
- (e) A health and safety file in terms of CR with inputs by the Construction Safety Officer
- (f) A copy of the risk assessment described in Regulation 9;
- (g) A full protection plan and the corresponding records of evaluation and training of employees working from elevated positions as described in Regulation 8;
- (h) Drawings pertaining to the design of structures and formwork and support work structures must be kept on site;
- (i) Pronouncement of the safety of excavations must be recorded in a register to be kept on site.
- (j) A copy of the certificate of the system design for suspended platform.
- (aa) A notice must be affixed around the base towers of material hoists to indicate the maximum mass load, which may be carried at any one time by material hoists.
- (bb) Maintenance records of material hoists and inspection results must be kept in a record book to be kept on site.
- (cc) A record of any repairs to or maintenance of a batch plant must be kept on site
- (dd) A warning notice must be displayed in a conspicuous manner when and wherever an explosive powered tool is used
- (ee) A register for recording of findings by the competent person appointed to inspect construction vehicles and mobile plant.

PA.9 CONTRACTORS RESPONSIBILITIES

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For this contract the Contractor will be the mandatory of the Employer (Client), as defined in the Act (OHSA 1993), which means that the Contractor has the status of employer in his own right in respect of the contract. The Contractor is therefore responsible for all the duties and obligations of an employer as set out in the Act (OHSA 1993) and the Construction Regulations 2014.

Before commencement of work under the contract, the Contractor shall enter into an agreement with the Employer (Client) to confirm his status as mandatory (employer) for the contract under consideration.

The Contractor's duties and responsibilities are clearly set out in the Construction Regulations 2014 and are not repeated in detail, but some important aspects are highlighted hereafter, without relieving the Contractor of any of his duties and responsibilities in terms of the Construction Regulations.

(a) Contractor's position in relation to the Employer (client)

In accordance with Section 4 of the Regulations, the Contractor shall liaise closely with the Employer or the Engineer on behalf of the Employer, to ensure that all requirements of the Act and the Regulations are met and complied with.

(b) The principal contractor and contractor

The Contractor is in terms of the definition in Regulation 2(b) the equivalent of Principle Contractor as defined in the construction Regulations, and he shall comply with all the provisions.

Any subcontractors employed by the Contractor must be appointed in writing, setting out the terms of the appointment in respect of health and safety. An independent subcontractor shall, however, provide and demonstrate to the Contractor a suitable, acceptable and sufficiently documented health and safety plan before commencement of the subcontract. In the absence of such a health and safety plan the subcontractor shall undertake in writing that he will comply with the Contractor's Safety plan, the health and safety specifications of the Employer and the Construction Regulations 2014.

(c) Supervision of construction work

The Contractor shall appoint the safety and other personnel and employees as required in terms of Regulation 6 and as set out in paragraph 7 above. Appointment of these personnel and employees does not relieve the Contractor from any of the obligations under Regulation 6.

(d) Risk assessment Regulation 7

The Contractor shall have the risk assessment made as set out in paragraph 7 above before commencement of the work and it must be available on site for inspection at all times. The Contractor shall consult with the Health and Safety committee or health and safety representative(s) etc. on a regular basis to ensure that all employees, including subcontractors under his control, are informed and trained by a competent person regarding health hazards and related work procedures.

No subcontractor, employee or visitor shall be allowed to enter the site of works without prior health and safety induction training, all as specified in Regulation 7.

(e) Fall protection (Regulation 8)

Fall protection, if applicable to this contract shall comply in all respects with Regulation 8 of the Construction Regulations.

(f) Structures (Regulation 9)

The Contractor will be liable for all claims arising from collapse or failure of structures if he failed to comply with all the specifications, project specifications and drawings related to the structures, unless it can be proved.

That such collapse or failure can be attributed to faulty design or insufficient design standards on which the specifications and the drawings based.

In addition, the Contractor shall comply with all aspects of Regulation 9 of the Construction Regulations.

(g) Formwork and support work (Regulation 10)

The Contractor will be responsible for the adequate design of all formwork and support structures by a competent person.

All drawings pertaining to formwork shall be kept on site and all equipment and materials used in formwork, shall be carefully examined and checked for suitability by a competent person.

The provisions of Regulation 10 of the Construction Regulations shall be followed in every detail.

(h) Excavation work (Regulation 11)

It is essential that the Contractor shall follow the instructions and precautions in the Standard Specifications and Project Specifications as well as the provisions of the Construction Regulations to the letter as unsafe excavations can be a major hazard on any construction site. The Contractor shall therefore ensure that excavation work is carried out under the supervision of a competent person, that inspections are carried out by a Professional Engineer or Technologist, and that all work is done in such a manner that no hazards are created by unsafe excavations and working conditions.

Supervision by a competent person will not relieve the Contractor from any of his duties and responsibilities under Regulation 11 of the Construction Regulations.

(i) Demolition work (Regulation 12)

Whenever demolition work is included in a contract, the Contractor shall comply with all the requirements of Regulation 12 of the Construction Regulations. The fact that a competent person has to be appointed by the Contractor does not relieve the Contractor from any of his responsibilities in respect of safety of demolition work.

(j) Tunneling (Regulation 13)

The Contractor shall comply with Regulation 13 wherever tunneling of any kind is involved.

(k) Scaffolding (Regulation 14)

The Contractor shall ensure that all provisions of Regulation 14 of the Construction Regulations are complied with. (Note: Reference in the Regulations to “Section 44 of the Act” should read “Section 43 of the Act”).

(l) Suspended platforms (Regulations 15)

Wherever suspended platforms will be necessary on any contract, the Contractor shall ensure that copies of the system design issued by a Professional Engineer are submitted to the Engineer for inspection and approval. The Contractor shall appoint competent persons as supervisors and competent scaffold erectors, operators and inspectors and ensure that all work related to suspended platforms are done in accordance with Regulation 15 of the Construction Regulations.

(m) Boatswain's chain (Regulation 16)

Where boatswain's chains are required on the construction site, the Contractor shall comply with Regulation 16.

(n) **Material hoists (Regulation 17)**

Wherever applicable, the Contractor shall comply with the provisions of Regulations 17 to the letter.

(o) **Batch plants,**

Wherever applicable, the Contractor shall ensure that all lifting machines, lifting tackle, conveyors, etc. used in the operation of a batch plant shall comply with, and that all operators, supervisors and employees are strictly held to the provisions of Regulation 18. The Contractor shall ensure that the General Safety Regulations (Government Notice R 1031 of 30 May 1986), the Driven Machinery Regulations (Government Notice R 2271 of 11/10/1995) are adhered to by all involved.

In terms of the Regulations, records of repairs and maintenance shall be kept on site.

(p) **Explosive powered tools**

The Contractor shall ensure that, wherever explosive-powered tools are required to be used, all safety provisions of Regulation 19 are complied with.

It is especially important that warning notices are displayed and that the issue and return of cartridges and spent cartridges be recorded in a register to be kept on site.

(q) **Cranes**

Wherever the use of tower cranes becomes necessary, the provisions of Regulation 20 shall be complied with.

(r) **Construction vehicles and mobile plant**

The Contractor shall ensure that all construction vehicles and plant are in good working condition and safe for use, and that they are used in accordance with their design and intended use. The vehicles and plant shall only be operated by workers or operators who have received appropriate training, all in accordance with all the requirements of Regulation 21.

All vehicles and plant must be inspected on a daily basis, prior to use, by a competent person and the findings must be recorded in a register to be kept on site.

(s) **Electrical installation and machinery on construction sites**

The Contractor shall comply with the Electrical Installation Regulations (Government Notice R2920 of 23 October 1992) and the Electrical Machinery regulations (Government Notice R1953 of 12 August 1993). Before commencement of construction, the Contractor shall take adequate steps to ascertain the presence of, and guard against dangers and hazards due to electrical cables and apparatus under, over or on the site.

All temporary electrical installations on the site shall be under the control of a competent person, without relieving the Contractor of his responsibility for health and safety of all workers and persons on site.

(t) **Use of temporary storage of flammable liquids on construction (Regulation 23)**

The Contractor shall comply with the provisions of the General Safety Regulations (Government Notice R1031 of 30 May 1986) and all the provisions of Regulation 23 of the Construction Regulations to ensure a safe and hazard-free environment to all workers and other persons on site.

(u) **Water environments**

Where construction work is done over or in close proximity to water, the provisions of Regulation 24 shall apply.

(v) **Housekeeping on Construction sites**

Housekeeping on all construction sites shall be in accordance with the provisions of the environment Regulations for workplaces (Government Notice R2281 of 16 October 1987) and all the provisions of the Construction Regulations.

(w) **Stacking and storage on construction sites.**

The provisions for the stacking of articles contained in the General Safety Regulations (Government Notice R1031 of 30 May 1986) as well as all the provisions of the Construction Regulations shall apply.

(x) **Fire precautions on construction sites.**

The provisions of the Environmental Regulations for Workplaces (Government Notice R2281 of 16 October 1987) shall apply.

In addition, the necessary precautions shall be taken to prevent the incidence of fires, to provide adequate and sufficient for protection equipment, sirens, escape routes etc. all in accordance with the Construction Regulations.

(y) **Construction welfare facilities**

The Contractor shall comply with the construction site provisions as in the Facilities Regulations (Government Notice R1593 of 12 August 1988) and the provisions of Regulation of the Construction Regulations.

(z) **Non-compliance with the Construction Regulations 2014**

The foregoing is a summary of parts of the Construction Regulations applicable to all construction projects.

The contractor, as employer for the execution of the contract, shall ensure that all provisions of the Construction Regulations applicable to the contract under consideration are complied with to the letter.

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PB BOREHOLE DRILLING AND REFURBISHMENT

PB1 GENERAL

The specifications are for the drilling (or rehabilitation), development, testing, equipping and maintenance (repair) of groundwater boreholes for water supply. No guarantee as to the final number of boreholes to be requested of each Contractor under this contract is made. Boreholes to be rehabilitated may have existing equipment that will need to be removed prior to rehabilitation.

The Contractor shall provide all labour, transport, plant, tools, and appurtenances (unless otherwise specified by the Employer in the work order). The Contractor shall perform all work necessary to satisfactorily construct and complete the boreholes in accordance with this Specification and to any further details as may be ordered by the Employer's Representative. The borehole depths will be dependent on drilling results and the strata intersected.

PB2 EQUIPMENT

The equipment to be used must be of such standard that the requirements as set out in the Project Specifications can be accomplished without any disruption of the works.

The Contractor shall specify in the Form 1M: List of Available Plant and Equipment in Section 1: Forms to be Completed by Tenderer the type of plant he intends to use as well as the method of operation. Its capacity shall be sufficient to cope with the work as specified for each particular Work Order. It shall be kept at all times in full working order and in good repair. The Employer's Representative will reserve the right to inspect the equipment to be used for the completion of the Works prior to the commencement of the Works.

If the Employer's Representative considers that the plant in use on the site of the Works is in any way inefficient or inadequate in capacity, the Employer's Representative shall have the right to call upon the Contractor to put such equipment in order, alternatively, the Contractor will remove such plant and replace it with additional plant or equipment the Employer's Representative considers necessary to meet the requirements of the Contract.

Equipment brought onto the site may not be removed there from without the Employer's Representative's specific permission in writing.

It will be the responsibility of the Contractor to arrive on site with all equipment required to complete the work specified in the work order without interruption.

Where existing equipped boreholes are to be rehabilitated, the Contractor must provide suitable plant to enable the installed pumping equipment to be removed and possibly re-installed. This includes the removal and re-installation of hand-pumps, windmills and motorised pumps.

PB3 MATERIALS

All materials to be used shall be new and undamaged and shall be supplied and delivered as such on site.

All materials as are required in the drilling and development of ground-boreholes shall be assembled in an approved manner and in accordance with normal ground-water engineering practice.

PB4 DRILLING

(i) Drilling Techniques

a) Rotary Air Percussion Drilling

Where the geological formation comprises consolidated rock with limited overburden the standard drilling technique shall be rotary air percussion drilling unless otherwise ordered by the Employer's Representative. Under this technique provision must be made for drilling through boulders and the provision of Odex / Symetrix Air Percussion drilling for advancement through collapsible layers.

(ii) Design and Depth

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Various borehole design options will be employed. Typical Borehole Design Options include:

Geological Formation	Typical Construction Detail Drawing No. (See Annexure B)
a) Boreholes in Consolidated Rock Formations - Stable rock formation (with outer casing only) - Un-stable rock formation and Production Type Borehole (with inner casings, perforated casings and/or screens)	B1 B2
b) Boreholes in Un-consolidated Soil Formations - All types of borehole	B3

The decision as to which design to use will be made by the Employer's Representative. The Employer's Representative will base his decision(s) on geological conditions encountered as well as the final diameter to which the borehole must be completed.

It is anticipated that borehole depths will vary typically between 50 and 300m. It should be noted that provision has been made in the Schedule of Rates for drilling to depths of 300m. Final depth of the borehole will be determined by the Employer's Representative. Boreholes not reaching the requested depth will not be acceptable and will not be paid for, unless it can be satisfactorily proved that the borehole cannot be drilled to the required depth.

A minimum 10m sump will be drilled below the level at which the major water strike is intersected or to a level as specified by the Employer's Representative.

(iii) Drilling Diameter

Drilling diameters will be 165 mm (6 ½ "), 203 mm (8"), 216 mm (8 ½ "), 254 mm (10") and 305 mm (12"). Diameter/s for each borehole to be drilled will be specified by the Employer's Representative.

(iv) Drilling Media

The Contractor may not use drilling media which may cause hole erosion or involve the use of native 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, unless specified in writing by the Employer's Representative.

(v) Drilling Foam

In the event of circulation losses, commercially available foam can be introduced during drilling operations at the Contractors own discretion and cost.

(vi) Straightness and Verticality

a) Straightness

Boreholes shall be sufficiently straight to permit a steel tube 6 m in length and with outer diameter no more than 15 mm smaller than the inner diameter of the cased borehole, to be lowered without hindrance to the full depth of the particular borehole. Deviation preventing the lowering of such plumb to the bottom of the borehole will not be accepted, and the hole declared a lost borehole. The Contractor shall, in such case, re-drill 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

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diameter per 30 m of depth. The diameter of the deviation of a borehole from the vertical shall be carried out in accordance with the 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 a lost borehole. The Contractor shall thereupon re-drill the hole at his own cost, to specification.

(vii) Sampling

Representative drilled cutting samples of the materials intersected shall be collected every meter and the Borehole Information recorded on a Borehole Drilling Report.

Where specifically instructed by the Employer's Representative, the Contractor shall bag and label the samples with the depth increment and store in a position where they will not be contaminated by site conditions or drilling operations for detailed logging by the Employer's Representative.

(viii) Reaming

Where a borehole has previously been drilled to a smaller diameter than required, the original borehole shall be reamed to the required diameter as specified by the Employer's Representative. Reaming shall comprise the widening of the existing borehole using rotary air percussion methods for varying borehole diameters advanced through all types of consolidated rock formations encountered. Reaming shall be to one of the following diameters:

203 mm (8"), 216mm (8 ½ ") 254 mm (10") or 305 mm (12").

(ix) Borehole Rehabilitation

Where an existing borehole is not serviceable the Contractor shall at the instruction of the Employer's Representative rehabilitate the borehole. Rehabilitation shall comprise one or more of the following activities:

- removal of existing pump equipment
- drilling and cleaning of existing borehole
- insertion of casing (where deemed necessary)
- development of borehole
- re-installation of existing serviceable pumping equipment

This Clause does not cover the return of the Contractor to a borehole previously drilled by the Contractor, which has failed due to in-proper construction.

PB5 CASING, PERFORATED CASING AND SCREENS

(i) General

Casings, perforated casings and screens shall be supplied by the Contractor as specified in the Schedule of Rates or as specified by the Employer's Representative. Mild steel casing will be used predominantly for consolidated type rock formation boreholes and PVC casing will be used predominantly for un-consolidated type formations but not limited thereto.

All materials to be used shall be new and undamaged and shall be supplied and delivered as such on site.

(ii) Plain Casing

Plain casing shall be used as an outer and / or inner lining to a borehole and shall be made of either mild or stainless steel, or PVC depending on the nature of the formation and as determined by the Employer's Representative.

The outer casing shall be inserted through the overburden and any zones of non-potable / undesirable seepage water and driven into the consolidated rock formation below. The

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inner casing shall be installed in conjunction with perforated casing and / or screens according to the specification issued by the Employer's Representative.

All steel casing shall have a minimum 4mm wall thickness (or as specified by the Employer's Representative), shall be bevel edged and weld jointed. All PVC casing shall be a minimum CLASS 9 (or as specified by the Employers Representative) and shall be factory threaded both ends with which they shall be joined unless otherwise specified by the Employer's Representative.

Casing shall be installed to depths as specified by the Employer's Representative. After completion of the work, the casing shall protrude a minimum of 500mm above natural ground level.

The casing shall be of the diameter specified, self-aligning and from approved suppliers. Refer to drawing No's B1 to B3 for typical construction details of casing installations in consolidated rock and un-consolidated soil formations.

(iii) Perforated Casing

Perforated casing shall be used as an inner lining to a borehole where collapsing conditions occur at water bearing horizons and for production boreholes. The perforated casing shall be made of either mild or stainless steel, or PVC as determined by the Employer's Representative and shall comply with the requirements of Clause PB5 (ii) for Plain Casing. The perforated casing shall be installed under supervision to levels as given by the Employer's Representative. There may be a requirement under special circumstances to perforate steel casing on-site otherwise all casing must be factory perforated. The diameter, slot size and percentage open area of the slotted casing shall be determined by the Employer's Representative.

(iv) Temporary Casing

Where difficult drilling conditions occur, the insertion of temporary casing during drilling and borehole construction will be necessary. This casing must also comply with the requirements of Clause PB5 (ii).

(v) Casing Centralizers

Casing shall be guided and supported by casing centralisers where requested by the Employer's Representative.

PB6 DEVELOPMENT AND CAPPING

(i) Development of Borehole

On completion of construction the borehole shall be developed to attain the maximum possible yield of groundwater, free of suspended materials. Development by means of flushing and blowing large volumes of water shall be carried out using air surging, jetting, or such other standard techniques as may be directed by the Employer's Representative.

Where there is insufficient natural water in the borehole to develop adequately, then sanitised water shall be imported to site by the Contractor to augment the low yielding borehole.

(ii) Blow Yield Measurement

Blow yield measurement shall be undertaken and recorded during drilling operations in order to establish the blow yields for different water strikes occurring in each borehole. Additionally, a blow yield test shall be carried out by the Contractor after completion of drilling of the borehole as specified by the Employer's Representative. The blow yield test comprises the constant displacement of groundwater at optimum yield using air flush methods with the yield measured by draw-off pipe and bucket method or a v-notch flow meter.

(iii) Jetting of Borehole

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High pressure water jetting to effectively develop a sand filter and / or aquifer shall be carried out on a screened borehole at the instruction and supervision of the Employer's Representative.

(iv) Back-filling

Where there is a need to provide a base for a sanitary seal or support for the sidewalls of the borehole and the solid casing, back-fill comprising drill cuttings removed from the borehole while drilling, may be used. Annular backfilling is not suitable where the casing extends to substantial depths and comprises open casing (perforated, slotted or screens) or where the water-bearing zone is shallow and open to the borehole via open casing. Back-fill is to be inserted in the annular space of the borehole and solid casing at depths specified by the Employer's Representative.

(v) Filter Pack/Gravel Pack

A filter pack installed between the annular space of the borehole and perforated casing and / or screens may be specified by the Employer's Representative where specific geological conditions are encountered. The filter material shall comprise clean, graded silica gravel (as specified) and shall be placed by means of a "tremie pipe" to the levels as specified by the Employer's Representative. Sanitised water shall be used for this process. Refer to Drawing No's B2 and B3 for typical construction details.

(vi) Grout Back-fill / Bentonite Seal

Where specific levels in a borehole require to be sealed off, a grout back-fill or bentonite seal shall be specified by the Employer's Representative. The grout shall comprise a mixture of bentonite, sand and cement as specified by the Employer's Representative. Refer to Drawing No's B1 to B3 for typical construction details.

(vii) Capping of Borehole

During the Time for Completion when work is not in progress, the boreholes shall be kept capped in such a manner as to prevent the ingress of foreign material. The Contractor shall remove any foreign matter at his own expense. Unsuccessful boreholes shall also be capped in the same manner unless otherwise instructed by the Employer's Representative to stone plug the unsuccessful borehole as given in Clause PB6 (viii).

On completion of the borehole and / or prior to installation of a pump the Contractor shall cap the borehole by completely welding a 4mm thick steel cover onto the protruding steel casing or by permanently affixing a PVC cap onto the protruding PVC casing. It is the responsibility of the contractor to ensure that the capping is not broken off and the borehole not damaged.

A borehole number identification is to be inscribed onto the capping.

(viii) Plugging of Unsuccessful Borehole

Where an unsuccessful borehole is drilled or a borehole abandoned or lost the outer casing may be removed at the direction of the Employer's Representative and the borehole stone plugged as detailed in Drawing No. B4

A borehole identification number is to be inscribed onto the concrete cover.

(ix) Disinfection

On completion of developing of borehole the borehole shall be disinfected with a solution of 0,5kg of HTH mixed in 50 litres of water.

PB7 LOST BOREHOLE

Should accident to the plant, behaviour of the ground, jamming of the tools or casing, non-compliance of the straightness or verticality test (as specified in Clauses PB4 (vi)) 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 or borehole construction costs nor for any materials, nor for any time.

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The costs of materials which have been recovered but are in a damaged state are 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. A lost borehole shall be stone plugged as given in Clause PB6 (viii) and as detailed in Drawing No. B4, or as per the Employers Representative's instruction.

Should the lost borehole be considered a potential pollution point source, the Employer's Representative may issue further instructions to effectively seal the borehole.

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 Employer's Representative. The option of declaring any borehole lost shall rest with the Contractor, subject to directions from the Employer's Representative.

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.

PB8 REPORTS

The Contractor shall accurately record the following reports:

	Name	Description	Supplied
1	Construction Report	An accurate record of all Contractors activities including time, personnel, plant, equipment, quantities of materials used, borehole depths, etc.	Daily record kept by Contractor and available for inspection by the Drilling Inspector and / or the Engineer
2	Borehole Drilling Report	An accurate record for each borehole of borehole No., locality, drilling techniques used and stratigraphic data including depths, strata type, water strike levels, blow yields, casing diameter, lengths, etc.	On completion of each borehole drilled
3	Borehole Rehabilitation Report	An accurate record for each borehole of borehole No., locality, drilling techniques used and stratigraphic data including depths, strata type, water strike levels, blow yields, casing diameter, lengths, etc.	On completion of each borehole drilled

The Contractor shall not be paid for any work invoiced unless the above-mentioned reports pertaining to the work invoiced have been satisfactorily submitted.

The Contractor shall submit each report to the Employer's Representative within 3 days of completion of the work as detailed in the Report. Failure to do so shall be regarded as non-performance in terms of the contract and will be subject to the conditions of contract.

PB9 SUPERVISION

The Contractor is to provide a suitably experienced foreman who is required to supervise and direct the work at all times, and who will be responsible for:

- a) Confirmation of borehole positions (with allocated Borehole Numbers) as set out by the Employer's Representative;
- b) Introduction and acquaintance with the Employer's Area Representative, the community leader and / or water committee representative if so directed by the Employer's Representative;
- c) Supervision of operations;
- d) Preparation of all field reports.

PC FISHING, CAMERA INSPECTIONS, AND SUSTAINABLE YIELD TESTING

PC1 GENERAL

Wherever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly stated in the Contract.

This contract comprises the test pumping, and water quality analysis of eleven existing boreholes in the Knysna Municipality, as will be indicated by the Geohydrologist.

PC2 MOBILIZATION, DEMOBILIZATION AND RESTITUTION

The Contractor shall mobilize to the site in accordance with the agreed Work Programme. The sum for mobilization/demobilization shall include transportation of machinery, erection, dismantling and preparation of temporary camps as the Contractor deems necessary, water for camping, personnel sanitary facilities.

The contractor shall minimize disturbance, particularly ensuring that pumped test water is discharged in a manner that does not create a nuisance either to the public or private property.

Site re-instatement under the conditions of contract shall include the removal of all waste, including hydrocarbons spilled, leaked or otherwise released. Site re-instatement is deemed an integral part of mobilization.

It is envisaged that there are two types of teams to establish as follows:

- a) Drilling and borehole refurbishment
- b) Test pumping, fishing, and camera work

PC3 CONTRACTOR'S EQUIPMENT

No extra payment shall be made for the Contractor's change of labour or other equipment required to complete the Works specified, nor for any incidentals thereto, the cost being deemed to be included in the schedule of rates.

PC4 FISHING

The Contractor shall attempt to hook and retrieve amongst others, existing equipment and infrastructure in the borehole. Equipment retrieval shall be performed as specified and supervised by the Employers' Representative. The contract or is to ensure that he has the necessary equipment and appurtenances to successfully locate and hook said existing equipment and remove it from the borehole.

PC5 DOWN HOLE CAMERA INSPECTIONS

The Contractor will lower a down-the-hole borehole camera into the hole to inspect the borehole integrity, and / or to identify any items requiring removal from the borehole.

PC6 AQUIFER TESTING

Borehole testing will be conducted according to SANS 10299 – 4:2003 (Development, maintenance and management of groundwater resources Part 4: Test-pumping of water boreholes). The following elements are required.

- Step-drawdown test;
- Recovery test;
- Constant discharge test;
- Recovery test.

PC7 STEP DRAWDOWN TEST

The step drawdown test will typically comprise four (4) steps tests of sixty (60) minutes each, with no recovery phase between successive steps. The step constant drawdown test shall not start until water level has returned to the true static water level, unless otherwise directed by the Geohydrologist.

- Typically, individual step discharges would comprise 50%, 75%, 100%, and 130% of the anticipated production discharge rate.
- Discharge increments shall be effected as nearly instantaneously as possible and once set shall not be changed except by instruction of the Geohydrologist.
- Discharge variations and measurement shall be effected by means of the globe valve and manometer gauge as follows;

PC8 CONSTANT DISCHARGE TEST (CDT)

The CDT shall typically last not less than twelve (12) hours, and for suitable production boreholes continue for 48 hours, or as otherwise determined by the Geohydrologist. A water Sample will be procured towards the end of the test for subsequent analysis by an accredited laboratory.

PC9 RECOVERY TEST

Recovery tests shall typically continue for the time duration of the CDT or until 95% recovery has been achieved, whichever occurs first, or as otherwise directed by the Geohydrologist. Only after the completion of recovery data collection may pumping and ancillary plant be removed from the borehole.

PC10 METHODOLOGY

- a) Test pumping plant and dipper conduit shall be installed in the borehole to be tested. The Contractor shall investigate and agree with the Geohydrologist as to the anticipated discharge and pump intake depth.
- b) The Contractor shall have on site the necessary equipment for measurement of flows, a suitable electrical contact meter (dip meter), calibrated in centimeters, with backup.
- c) Readings of flow and water level shall be taken at the intervals defined on the test pumping form.

PC11 PUMPING PLANT

- i) Pumps used for test pumping may be electrical submersible or positive displacement pumps (it is the contractors' responsibility to ensure constant flow rates).
- ii) Any pump used in tests must have a fully functioning non-return valve either in the pump itself or in the rising main immediately above the top of the pump.
- iii) The Contractor must have pumps covering the anticipated discharge range.
- iv) The water pumped from the borehole shall be discharged to waste at a distance and in such a manner that it does not pond or flow back towards the borehole.
- v) The Contractor must provide a generator or other prime mover for powering the pump, as power is not available at the sites.

PC12 DISCHARGE MEASUREMENT AND CONTROL

Discharge measurements shall be by an approved accurate method, such as an Orifice Plate, calibrated flow meter or a V-notch weir. If volumetric methods are proposed, the Contractor will

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ensure the container to be used has been calibrated. When time to fill measurements is made, each discharge measurement shall be calculated from the average of three measurements. Discharge shall vary by no more than 3% across each step of step drawdown test, and the constant discharge test.

PC13 WATER LEVEL MEASUREMENT

Water level measurements shall be by electric sounding and/or lighting dipper and shall be made in a dipper tube installed alongside the test pump rising main and tied securely to it. Measurements must preferably be to mm scale and not less cm scale. The Geohydrologist will check the dipper for stretch and any other inaccuracies prior to accepting its use.

PC14 ADMISSIBLE RATES

Rates of pumping and recovery are deemed to include the cost of plant installation and removal. The rates are deemed inclusive of installation, removal, plant use, testing and data collection.

PC15 TIME MEASUREMENT

All times shall be measured by means of a stopwatch. The Contractor shall ensure that spare batteries etc. for all equipment are available prior to commencing tests.

PC16 WATER QUALITY TESTING

- a) The contractor shall take a water quality sample at every borehole.
- b) The water quality sample should be delivered to an accredited laboratory, as authorized by the client, and as directed by the geohydrologist.
- c) Water samples for chemical analysis should be collected at the end of the test pumping process and analyzed at an accredited laboratory. Samples are to be cooled and delivered within the timeframes stipulated by said laboratory or the earliest possible time of delivery.
- d) Samples are to be collected in sample bottles as approved and supplied by the laboratory.

PC17 BOREHOLE DISINFECTION

Each successful borehole must be chlorinated following completion of drilling operations. The Contractor will dose at a concentration of chlorine as specified by the geohydrologist.

PC18 PROTECTION

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 materials. Should the borehole be compromised due to poor protection during the contract period, then the Contractor shall remove any foreign matter at his own expense.

After successful completion of drilling, casing and testing headworks will be constructed in line with the guidelines which form part of the documentation of this contract.

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PD MEASUREMENT AND PAYMENT

1 GENERAL

1.1 HEALTH AND SAFETY PLAN

The contractor shall submit a health and safety plan in accordance with relevant legislation for the works to be conducted.

Unit: Lump Sum

2 BOREHOLE REFURBISHMENT AND REDRILLING

2.1 ESTABLISHMENT

The rate is inclusive of provision of all equipment, plant, personnel and facilities that is necessary to perform the work as required per rig with establishment thereof at the first borehole site and de-establishment on completion of the work order. Payment shall be made as a lump sum to locate the rig to the first borehole site Unit: lump sum

2.2 SET-UP (Percussion)

The rate is inclusive of the set-up of the percussion drilling rig and all plant and equipment. Payment shall be made at a unit rate per borehole.Unit: No.

2.3 INTER BOREHOLE MOVES

The rate is inclusive of all transport and personnel required for relocation of the drilling rig. Payment shall be made at a unit rate per kilometre and include travel costs.Unit: km

2.4 WATER HAULAGE

Where additional water is required to be hauled to site to satisfactorily carry out Jetting of Borehole (Payment Item 8 and 11). The rate is inclusive of all water supply equipment and personnel required to draw, contain and to haul the water from water source to site. Payment shall be made per cubic meter (m³) of water hauled per kilometer travelled Unit: m³/km

2.5 AIR PERCUSSION DRILLING

The rates for Air Percussion Drilling are based on diameter and cover all costs for labour, plant, materials and fuel required for advancement of borehole to specified depths, and which are not covered under other payment items. Payment shall be per linear meter advanced.Unit: m

The drilling depth rates for depths 150 – 300m. Payment shall be per linear meter.Unit: m

2.6 REAMING

The rate provides for all additional labour, plant, material and fuel required for reaming a smaller diameter borehole to a larger diameter as specified by the Employer's Representative. The Contractor shall be paid at a rate per linear metre advanced.Unit: m

2.7 ODEX / SYMETRIX

a) Odex / Symetrix (194mm) Air Percussion Drilling

The rates for Odex / Symetrix Air Percussion Drilling are based on diameter and cover all costs for labour, plant, material and fuel required for the successful advancement of the borehole through collapsible layers of any thickness occurring within the consolidated rock formation where standard air percussion drilling methods are proved to be ineffective, and which are not covered under other payment items. Payment shall be per linear meter advanced Unit: m

b) Odex / Symetrix Casing Shoe

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Where Odex / Symetrix Air Percussion drilling is required an Odex / Symetrix casing shoe shall be supplied and used. Payment for the cost of supply, transport, delivery and safe keeping on site of the casing shoe as specified by the Employer's Representative. Payment shall be per casing shoe used
Unit: No.

c) Odex / Symetrix Casing

Where Odex / Symetrix Air Percussion drilling is required an Odex / Symetrix casing shall be supplied and used. Payment for the cost of supply, transport, delivery and safe keeping on site of the casing shoe as specified by the Employer's Representative. Payment shall be per casing shoe used
Unit: No.

2.8 BOREHOLE REHABILITATION

The rate provides for the appropriate air percussion drilling operations required to clean the existing borehole to the satisfaction of the Employer's Representative. The rate includes all risks insurance cover attached to rehabilitation of boreholes and is a fixed rate of 60% of the air percussion drilling rate per meter. Payment shall be per linear meter advanced. Unit: hr

Note: Where existing pump-housing requires removing and subsequently re-erecting, the Contractor may be requested by the Employer's Representative to obtain three competitive quotes to undertake such work and will be measured under Payment Item 17.

2.9 CASING

a) Plain and Factory Perforated Mild Steel Casing

Payment for the cost of supply, transport, delivery and safekeeping on site of Plain and Factory Perforated Mild Steel Casing of 4mm wall thickness. Payment shall be made only for materials used per linear meter installed and shall be calculated for each completed borehole. No claims for extra payment will be entertained by reason of remoteness, wharfage, insurance, etc. Payment shall be measured at a rate per linear metre of casing Unit: m

b) Plain and Factory Perforated PVC Casing

Payment for the cost of supply, transport, delivery and safekeeping on site of threaded Plain and Factory Perforated PVC Casing of varying diameter (minimum class 9). Payment shall be made only for materials used per linear meter installed and shall be calculated for each completed borehole. No claims for extra payment will be entertained by reason of remoteness, wharfage, insurance, etc. Payment shall be measured at a rate per linear metre of casing. Unit: m

Only factory-performed, factory-threaded PVC casing will be acceptable (i.e. not to be perforated on site, and riveting and glue not acceptable). There shall be no payment for material declared lost or made unusable due to damage thereof.

a) Centralizers

Payment for the cost of supply, transport, delivery and safekeeping on site of casing centralisers for PVC (140mm) casing. Payment shall be made per casing centralizer used and shall be calculated for each completed borehole. No claims for extra payment will be entertained by reason of remoteness, wharfage, insurance, etc. Payment shall be per casing centraliser. Unit: No.

There shall be no payment for material declared lost or made unusable due to damage thereof.

b) PVC End Caps

Payment for the cost of supply, transport, delivery and safekeeping on site of PVC Casing End Caps (140mm). Payment shall be made only for materials used per end cap installed / used and shall be calculated for each completed borehole. No claims for extra payment will be entertained

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by reason of remoteness, wharfage, insurance, etc. Payment shall be measured per end cap used
.....Unit: No.

2.10 DEVELOPMENT AND BLOW YIELD TESTING

The borehole development and blow yield testing time rate is to cover all the time effectively spent on borehole development and the blowing time required for carrying out blow yield testing as instructed by the Employer's Representative and where drilling operations are not being performed concurrently. The Contractor is deemed to have all the necessary equipment on site for development and blow yield testing. Payment shall be at an hourly rate for any further development for blow yield testing and / or developing thereafter and as instructed by the Employer's Representative.Unit: hr

If additional water is required for development the water haulage cost thereof shall be covered under Payment Item 3.

2.11 JETTING OF BOREHOLE

The rate is to cover all the special equipment used and time effectively spent on jetting the borehole as instructed by the Employer's Representative. The Contractor is deemed to have all the necessary equipment on site for jetting. Payment shall be made per hour the borehole is jetted Unit: hr

If additional water is required for jetting the water haulage cost thereof shall be covered under Payment Item 3.

2.12 BACK-FILL

Where instructed by the Employer's Representative back-fill shall be inserted and will be measured at a rate per cubic meter (m³) of material inserted. Payment shall be per cubic meter inserted Unit: m³

2.13 GRAVEL / FILTER PACK

Payment for the cost of supply, transport, delivery and safekeeping on site and inserting of filter pack / gravel pack as specified by the Employer's Representative. Payment shall be made only for materials used and shall be calculated for each completed borehole. No claims for extra payment will be entertained by reason of remoteness, wharfage, insurance, etc. Payment shall be per 40kg bag of gravel / filter pack supplied and inserted.Unit: bag

There shall be no payment for material declared lost or made unusable due to damage thereof.

2.14 GROUT BACK-FILL / BENTONITE SEAL

Payment for the cost of supply, transport, delivery and safekeeping on site of cement and bentonite used for the grout back-fill / bentonite seal as specified by the Employer's Representative. No claims for extra payment will be entertained by reason of remoteness, wharfage, insurance, etc. Payment shall be per linear meter of grout back-fill / bentonite seal supplied and inserted Unit: m

There shall be no payment for material declared lost or made unusable due to damage thereof.

2.15 CAPPING OF BOREHOLE

The rate for capping of a borehole of varying diameter includes the provision and affixing of the 4mm steel plate or PVC cover to the steel or PVC casing respectively and the inscription of the borehole number identification thereof. Payment shall be per borehole capped.
.....Unit: No.

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2.16 DISINFECTION OF BOREHOLE

The rate for the disinfection of a borehole includes payment for the cost of supply, transport, delivery and safekeeping on site of disinfectant (specifically granular HTH) as specified by the Employer's Representative. No claims for extra payment will be entertained by reason of remoteness, wharfage, insurance, etc. Payment shall be per kilogram of material supplied and inserted.Unit: kg.

There shall be no payment for material declared lost or made unusable due to damage thereof.

2.17 ADDITIONAL ITEMS

Where Additional Items are specified by the Employer's Representative and rates are not included in the Schedule of Rates, the costs thereof shall be recovered on the basis of proven cost with a percentage mark-up of 10% on the Nett price (excluding VAT).

Payment shall be made only for materials used and shall be calculated for each completed borehole. No claims for extra payment will be entertained by reason of remoteness, wharfage, insurance, etc. The Contractor shall purchase specified materials on the basis of three competitive quotes with written approval by the Employer's Representative.

3 FISHING, CAMERA INSPECTIONS, AND SUSTAINABLE YIELD TESTING

3.2 Test Pumping Rig Establishment

The anticipated borehole yield will range from 1 to 15l/s. The test pumping should consider this yield range prior to establishment and installation to be versatile enough to cover the whole yield range.

The rate is inclusive of provision of all equipment, plant, personnel and facilities that is necessary to perform the work as required per test pumping rig with establishment thereof at the first borehole site and de-establishment on completion of the work order. Payment shall be made as a lump sum per rig to locate the rig to the first borehole site.

Unit: Lump Sum

3.3 Inter Borehole moves

Once established, rigs will move from one borehole testing location to the next under the guidance of the hydrogeologist.

The rate is inclusive of moving all equipment, plant, personnel and facilities that is necessary to perform the work as required per test pumping rig with establishment thereof at every borehole after the first borehole site. Payment shall be made per kilometre measured between each borehole moved to.

Unit: km

3.4 Test Pumping Rig Set-up

The rate is inclusive of all transport and personnel required for location of the test pumping rig and all plant and equipment at the borehole site and the set-up thereof. The provision of pumps is to cover the anticipated yield range is required. Payment shall be made at a unit rate per borehole.

Unit: No.

3.5 Removal and Re-installation of existing equipment

Some existing boreholes may have equipment installed. The pump/equipment will need to be removed and re-installed to the same standard or better. Anticipated installation depths will vary but are estimated to be 80mbgl. The rate is inclusive of the removal and re-installation of the existing pumping equipment.

Payment shall be measured for the first 50m, and then at a rate per linear metre thereafter.

a) For pumps up to and including the first 50m

Unit: No.

b) For every linear meter thereafter

Unit: m

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3.6 Test Pump Installation / Removal

The test pump will need to be installed at the interpreted main strike within the borehole, where perforated casing should be present to allow for linear flow. Anticipated installation depths will vary but are estimated to be 80mbgl. Installation includes both the test pump, and the necessary conduiting for the electrical contact meter to take water level measurements during the test. The rate is inclusive of the removal of the test pumping equipment on completion of the test.

Payment shall be measured for the first 50m, and then at a rate per linear metre thereafter.

- a) For pumps up to and including the first 50m

Unit: No.

- b) For every linear meter thereafter

Unit: m

3.7 Laying of Discharge Hose

The laying of discharge hose is particularly important to minimize recharge of the aquifer from the discharge component of the test. The discharge hose should be capable of coping with flows of the pump installed. Hydrogeological conditions will require a minimum distance of 100m away from the borehole in a direction that encourages run-off away from the borehole.

Payment shall be measured at a rate per 100m of discharge hose installed.

Unit: 100m

3.8 Step (Variable) Discharge Rate Testing

A variable discharge and/or constant discharge test (using either an approved line-shaft or submersible pump) shall be carried out to determine the optimum yield of the Constant Discharge Test (CDT). The pump must be typically capable of pumping at variable rates in line with the anticipated yields of the boreholes. Positive displacement type pumps are recommended for high yielding boreholes, unless variable speed drive technology is available on a submersible pump. Pumping heads should be capable of lifting up to 120m head.

A sustainable yield test should comprise 4 x 60minute step tests, and associated recovery, followed by the interpreted Constant Discharge Rate that will attain 60 to 75% drawdown at the end of the CDT. The CDT duration is 24 to 48 hours.

The step discharge rate includes for the pumping time required to carry out test-pumping for the time period, pumped flow rate/s, and time intervals as specified by the Employer's Representative and the monitoring of water levels thereof. Payment shall be made per hour (or part thereof) that discharge testing actually takes place.

Unit: hr

3.9 Constant Discharge Rate Testing (CDT)

The CDT is the constant rate pumping of the optimum yield as determined in the step discharge rate test. of the Constant Discharge Test (CDT). The CDT should attain 60 to 75% drawdown at the end of the stipulated pumping period. The CDT duration is variable, and will be specified between 12 and 48 hours by the geohydrologist on site.

The rate includes for the pumping time required to carry out test-pumping for the time period, pumped flow rate/s, and time intervals as specified by the Employer's Representative and the monitoring of water levels thereof. Payment shall be made per hour (or part thereof) that discharge testing actually takes place.

Unit: hr

3.10 Recovery Testing

The rate of recovery comprising the monitoring of recovery of water level at specific time intervals shall be measured for a minimum period to recover to 95% of original static water level or equal to pumping time (whichever occurs first).

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Monitoring of water recovery levels shall be measured at an hourly rate for the time frame and time interval as described above. Payment shall be made per hour (or part thereof) that recovery is monitored.

Unit: hr

3.11 Borehole Disinfection

On completion of testing of the borehole and the removal of the testing equipment, the borehole is to be shock treated with two cups of granular chlorine to remove any potential bacteriological contamination the test equipment may have introduced into the borehole.

The rate for the disinfection of a borehole includes payment for the cost of supply, transport, delivery and safekeeping on site of disinfectant granular chlorine (e.g., HTH). Payment shall be made only for materials used and shall be calculated for each completed borehole. No claims for extra payment will be entertained by reason of remoteness, wharfage, insurance, etc. Payment shall be per kilogram of material supplied and inserted.

Unit: kg

3.12 Water Quality Testing

All new groundwater sources should be sampled and sent to a recognized and certified laboratory for human consumption potability assessment (SANS 241 short).

The rate is inclusive of all time and disbursement costs to sample, deliver and analyse the water quality to the minimum relevant standard. Payment shall be water sample taken and submitted for analysis.

Unit: No.

3.14 Reporting

The Contractor shall accurately record all aspects performed for the project. An accurate record of yield test information is to include borehole No., locality (co-ordinates), borehole depth, datum point, water levels, time intervals, flow rates, recovery and any special observations. The report is to include start and end times, and site instructions issued by the Employer's representative. The report shall be made available both in hard copy, and in excel format.

All test results must be quantified, i.e., accurate measurements for drawdown, flow rate, time, recovery and test borehole details to be recorded on the applicable Test Pumping Report. Payment shall be made per test result, inclusive of all observation boreholes.

Unit: No.

3.14 Down-the-hole Camera Inspections

The Contractor shall lower a suitable waterproof camera down the borehole to inspect the integrity of the borehole wall, and well as to identify any items requiring removal from the borehole.

All test results must be recorded, and the video file recorded and submitted digitally. Payment shall be made per down the hole camera inspection.

Unit: No.

3.15 Fishing

The Contractor shall "hook" and remove" items (existing equipment, pipework, and obstacles) requiring removal from the borehole.

Unit: No.

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C3.5: SITE INFORMATION

C3.5.1 SITE AND ACCESS

The specific wellfields are located the Knysna Local Municipality. Boreholes are located within various wellfields (See Annexure A).

Should access to a site prove to be difficult, the onerous remains on the contractor to make a genuine attempt to reach the site in the presence of the Employer's representative.

C3.5.2 NATURE OF SITE, GROUND AND SUB-SOIL CONDITIONS

The existing geological information is available and may be purchased from the Council for GeoScience. Existing geohydrological information may be accessed through the Directorate of Geohydrology at the Department of Water & Sanitation (DWS) - "Geohydrological Maps Series of South Africa – 1998".

C3.5.3 SITE FACILITIES AVAILABLE

3.5.3.1 Water

There is no water available on site and the Contractor shall make his own arrangements to obtain water.

3.5.3.2 Power

The Contractor shall make his own arrangements for electricity supply to the site camp and elsewhere as required for the duration of the Contract.

3.5.3.3 Contractor's Site Camp and Accommodation

The Employer has not identified an area for the site camp and has not negotiated use of the land with the relevant landowner and / or relevant authority. The Contractor will be responsible for this, should he wish to establish a site camp.

The Employer will not make housing, shelters, or transport available for the Contractor's employees and the Contractor shall make his own arrangements to house his employees and transport them to the site.

The "temporary buildings" and fencing are to be neat and presentable and the surrounding area must, at all times, be kept in a neat, clean and orderly condition. The Contractor shall not cut down or damage any trees nor make any excavation without the written permission of the Employers Agent and shall leave the site in a clean condition.

All buildings and fencing provided at the contractor's site camps shall remain the property of the Employer at the end of the contract.

3.5.3.4 Refuse Removal

The Contractor shall be responsible for daily disposal of refuse and waste generated under this Contract. The site camp and the site shall be kept clean, neat and tidy to the Employers Agent's satisfaction. The cost of refuse disposal shall be deemed to be included in the tendered rates for Site Facilities.

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C3.5.4 SITE FACILITIES REQUIRED

3.5.4.1 Temporary offices

No temporary offices are required for the Employers Agent.

3.5.4.2 Temporary Latrines

The Contractor shall provide adequate chemical toilet facilities for the use of the various workmen in accordance with the Regulations of the Department of Public Health and/or other authority and pay all charges in connection therewith; maintain same in a thoroughly clean and orderly condition; allow for moving the chemical toilets to new locations as necessary during the course of the Contract and finally remove such chemical toilets at completion and make good.

3.5.4.3 Personnel

One assistant must be made available to the Employers Agent, his Representative or the Clerk of Works, if so required.

3.5.4.4 Survey Instruments

The required survey instruments, including a GPS, and 100m steel tape must be available to the Clerk of Works at all times.

3.5.4.5 Telephone / Telefax

The Contractor shall provide his own telephone and/or fax facilities.

C3.5.5 FEATURES REQUIRING SPECIAL ATTENTION

3.5.5.1 Existing Services

The Contractor shall carry out all his operations so as not to unnecessarily encroach on, or interfere with, trespass on, or damage adjoining lands, buildings, properties, road structures, pipelines, places and things, in the vicinity of the Works and so as not to interfere in any way at any time with the smooth and continuous operation of existing facilities except for periods when interference is planned.

The Contractor must take all precautions against damaging existing structures or services or affecting the operation of the existing works. The municipality and other service owners must be approached to indicate these existing underground services before any works in any area shall commence. The contractor should request 7 days in advance for the indication of existing services.

The Contractor will be held responsible for any damage to these services during the execution of the Works. Damaged services must immediately be reported to the proper authority and repaired to the satisfaction of the Engineer.

3.5.5.2 Providing Access

Adequate trench crossings shall be provided by the Contractor at his own cost at all times. Such temporary trench crossings shall be in the form of portable bridges, temporary backfill or other approved means and shall be capable of permitting the safe passage of vehicles of mass not exceeding 2 tons. The Contractor shall also be responsible for maintaining such crossings and for removing them when they are no longer required.

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Where affected, roads shall be made safe and re-opened to traffic overnight. Barricades, traffic signs and drums erected according to the requirements of the SA Road Traffic Signs Manual shall be provided by the Contractor to suit specific conditions.

The Contractor shall organize the work in such a manner as to cause the least possible inconvenience to the public and to the property owners adjacent to or affected by the work included in this Contract. If, as a result of restricted road reserve widths and the nature of the works, the construction of bypasses is not feasible, construction shall be carried out under traffic conditions in order to provide access to the properties.

The Contractor may, with the approval of the Employers Agent, make arrangements with the occupiers of the affected properties to close off a portion of a street, road, footpath or entrance temporarily, provided the Contractor duly notifies the occupiers of the intended closure and its probable duration and shall, as punctually as possible, re-open the route at the prescribed time. Where possible, the road shall be made safe and re-opened to traffic overnight. Any such closure shall be made by arrangement between the Contractor and the occupiers and shall not absolve the Contractor from his obligations under the Contract to provide access at all times. Barricades, traffic signs and drums shall be provided by the Contractor to suit the specific conditions.

3.5.5.3 Surveying

The Contractor must ensure that the specified tolerances are adhered to in setting out the works.

Payment for the setting out will be deemed inclusive in the rates and no additional payment will be made in that regard.

No beacons, reference pegs, corner pegs, etc. may be disturbed or removed without the prior consent of the Engineer.

3.5.5.4 Source of Materials

The Contractor will be responsible for locating of all materials complying with the relevant minimum requirements to be used in this contract. No separate payments shall be made for this as all costs related thereto shall be deemed to be covered by the bid rates.

3.5.5.5 Environmental Management

A requirement for the approval of the project by the Department of Environmental Affairs is that the contractor must maintain the Environmental Management Plan as detailed under section 3.6 during the construction period to ensure that the environmental impact of the activity is minimized and that all mitigating requirements are met.

No claims to maintain the Environmental Management Plan will be considered. Work required maintaining the Environmental Management Plan is considered to be included in the bid rates bid by the contractor.

Protection of the Environment

All surplus material and rubbish arising from construction during and on completion of the contract must be removed from site. Any dumping or disposal of waste must be at a recognised licensed landfill site.

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The location of stockpile areas for storing excavated material and of proposed spoil areas for surplus excavated material will be indicated by the Employers Agent. No deviation from these designated areas will be permitted without the written permission of the Employers Agent.

The Environmental Management Programme (EMPr) is to be adhered to at all times.

3.5.5.6 Occupational Health and Safety Act

Separate allowance to be made in the Tender document for the Principal Contractor to comply with the Occupational Health and Safety Act (Construction Regulations).

The project Health and Safety Specifications is attached as Section PA.

Provision therefore is to be made as specified. These items are to be included in the Tender to be submitted.

3.5.5.7 Courtesy

In all dealings with the public, the contractor is requested to deal with discussions and disputes with deliberate courtesy and understanding, in close liaison with the Employer and the Employer's representative. On arrival in an area and that specific project locations, the contractor as directed by the Employer's representative, shall introduce himself to the Employer's area representative, community leader and / or a member of the representative water and / or sanitation committee.

3.5.5.8 Facilities for Other Contractors

There are other contracts planned on the site but these contracts will not interfere with the Contractor's work.

3.5.5.9 Protection of Existing Works

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

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

3.5.5.10 Objectives (mission)

The contractor and all of his operational staff are required to understand and be fully conversant with the objectives (mission) of the Employer. This is to ensure clear ambiguous communication with the beneficiary communities and to avoid waved expectations that the Employer cannot meet. Where available, a statement of the Employer's objectives shall be issued to the contractor, and the contractor shall be fully briefed / trained on the contents therein.

3.5.5.11 Labour Intensive Construction

An additional objective of this Contract is the optimum utilization of local resources. One of the methods to be adopted to achieve this objective is through the implementation of labour-intensive construction methods. The Contractor is

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to maximise his construction team's local labour content in this regard. Labour intensive construction is to be in accordance with the EPWP guidelines.

3.5.5.12 Training

Training local members of the beneficiary communities in the use and maintenance of water supply and sanitation installations may be required by the Employer / Employer's representative from time to time. The contractor shall be asked to allow such training sessions to be held by the Employer or Employer's representative at the time of construction and or installation.

3.5.5.13 Drawings

The depths, pipe sizes and lengths of pipes as shown on drawings are subject to confirmation on site, and the Contractor shall submit all such information to the Engineer for confirmation before he commences any construction work.

3.5.5.14 "As-builts" Drawings

The Contractor shall provide the Engineer with "as-built" drawings at the end of the contract indicating all levels, positions, coordinates, sizes, etc.

For this purpose an additional set of drawings will be kept in the site office, for the exclusive use of keeping as-built information.

The completion certificate shall only be issued after the Engineer has received a properly completed set of "As-Built" drawings from the Contractor. No separate payment shall be made for this service, as all costs related thereto shall be deemed to be included in the related items.

3.5.5.15 Housing for contractor's employees

No housing is available for the Contractor's employees, and the Contractor shall make his own arrangement for housing his employees and transporting them to and from the site. The Contractor is in all respects responsible for the housing and transporting of his employees and for the arrangement thereof, and no claim for extension of time due to any delays resulting from this, will be considered.

3.5.5.16 Finishing, Tidying and Site Maintenance

During the progress of the work and upon its completion, the site of the works shall be kept and left in a clean and orderly condition. The Contractor shall at all times store materials and equipment for which he is responsible in an orderly manner and shall keep the site free from debris and obstruction.

All plastic pipes are to be protected from direct sunlight with 80% shade cloth cover. All steel reinforcement shall be stored off the ground on timber pallets.

Progressive and systematic finishing and tidying will form an essential part of this Contract. On no account must spoil, rubble, materials, equipment or unfinished operations be allowed to accumulate in such a manner as to unnecessarily impede the activities of others, and in the event of this occurring, the Employer shall have the right to withhold payment for as long as may be necessary, in respect of the relevant Works in the areas(s) concerned, without thereby prejudicing the rights of others to institute claims against the Contractor on the grounds of unnecessary obstruction.

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Finishing and tidying shall not be deferred to the end of the Contract. Works will not be certified as complete, until all finishing and tidying for the portion of the Works to be certified as complete, has been fully completed to the satisfaction of the Employers Agent. In this regard, payment for pipelines shall be made to a maximum of 80% pending clearing and tidying to the satisfaction of the Employers Agent, where after the balance will be certified for payment.

All finishing and tidying shall be carried out to the best advantage of the project as a whole and in the closest cooperation with other Contractors.

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C3.6: ENVIROMENTAL MANAGEMENT PLAN

C3.6.1 Environmental Monitoring

1.1 Preamble:

This document aims, in part, to meet the environmental management and environmental policy requirements of the South African Government, where the following examples of statutory requirements apply:

- *The Environmental Conservation Act (Act 73 of 1989);*
- *National Environmental Management Act (Act 107 of 1998) Environmental Impact Assessment Regulations (2014);*
- *The Conservation of Agricultural Resources Act (Act 43 of 1983);*
- *The National Water Act (Act 36 of 1998); and*
- *The National Environmental Management Act (Act 107 of 1998).*

It has been established that, while numerous boreholes will be drilled and installed as part of the Groundwater Supply Project, by virtue of the geographic isolation of the boreholes, this project constitutes a bulk water supply scheme wherein general authorization limits are likely exceeded. Water Use Licensing will need to be addressed.

The environmental impacts that may arise will most likely be localised and insignificant in nature. Nevertheless, it was determined that some form of environmental control needs to be included. Thus, the Environmental Management Plan (EMP), documented hereunder, has been compiled and included as part of the conditions of the Groundwater Supply Project to ensure proper environmental management at each borehole site.

All the requirements stipulated hereafter apply to the Borehole Drilling Contractor, Borehole Test Pumping Contractor, and Equipping contractor unless otherwise specified in the EMP. The requirements also apply to the Hydrogeological Consultant(s) who, in their investigative and supervisory capacity, are to ensure that the EMP requirements are met.

1.2 Definitions:

Borehole Drilling Contractor: Contractor appointed to carry out the drilling of boreholes.

Test Pumping Contractor: Contractor appointed to carry out the test pumping of boreholes.

Equipping Contractor: Contractor appointed to carry out the equipping of boreholes.

Employers' Representative: Consultant team appointed to undertake the investigative assessment and the supervision of the drilling, test pumping and installation of boreholes.

Community Representative: A responsible person appointed to be the liaison between the school and the implementation team (typically the headmaster)

Borehole Sites: The site at which the existing borehole is drilled and installed.

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Borehole Installation: *The equipment and ancillary connections to the borehole.*

Disturbed Areas: *Any site at which the soil and/or vegetation has been disturbed including the site camp, borehole monitoring sites and infrastructure routes.*

C3.6.2 Environmental Awareness and Responsibilities

Section 28 of the National Environmental Management Act or NEMA (No. 107 of 1998) states that any cost incurred to remedy environmental damage shall be borne by the person responsible for that damage (polluter pays principle). It is therefore imperative that the Hydrogeological Consultant, the Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor read and understands the requirements of this EMP before commencing activities.

Section 28 of NEMA also states that everyone is required to take reasonable measures to ensure that they do not pollute the environment. Reasonable measures include informing and educating employees about the environmental risks of their work and instructing them to operate in an environmentally acceptable manner. In terms of this:

- * the Employers' Representative, the Borehole Drilling Contractor, the Borehole Test Pumping Contractor, and the Equipping Contractor will meet with the respective teams to explain the requirements of this EMP;
- * the Employers' Representative will ensure that environmental awareness is prioritized and where applicable posters will be provided and displayed at the site camp to visually depict the environmental do's and don'ts.

3.5 Animals

No member of the Employers' Representative, Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor team will be permitted to:

- (i) hunt, kill, set devices to trap, tamper with or harass wild animals and livestock or any form of animal shelter;
- (ii) feed native animals;
- (iii) bring his/her own pets to the site.

Avoid attracting animal pests by keeping the site camp and drilling sites free of litter and by providing adequate waste receptacles that can be covered to prevent access by animal pests.

Where appropriate, dangerous areas will be cordoned off using stakes / timber poles to prevent access by animals and thereby prevent the injury or death of wild animals and livestock.

3.6 Surface Water

The following will NOT be permitted:

- * Disposal of any liquid or solid waste in any watercourse or water body;
- * Stockpiling of soil or any other materials within or near a watercourse or water body.
- * Use of watercourses or water bodies for domestic purposes including bathing, washing;
- * Use of watercourses or water bodies for the cleaning of equipment or containers;
- * Impeding the flow of any watercourse or water body;

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- * Permanent diversion of the existing natural alignment of watercourses.

Wastewater will not be allowed to enter watercourses or water bodies. Refer to Section 3.9 for procedures for handling wastewater. Abstraction of water from watercourses and water bodies for drilling purposes will be kept within the Department of Water Affairs limits. Temporary crossings will be constructed to traverse watercourses. The crossings will be discussed with and be to the satisfaction of the Hydrogeological Consultant and will ensure that minimal disruption of the stream bed and surrounding vegetation is caused.

3.7 Dust

The excavation, handling and transport of erodible materials under windy conditions, or when a visible dust plume is evident, will be avoided as high wind speeds will exacerbate erosion. Exposed surfaces will be re-vegetated with indigenous vegetation as soon as activities at each site are complete.

Vehicle speeds will be restricted to a maximum of 40 km/h along gravel (unpaved) roads and 20 km/h when traversing unconsolidated and un-vegetated areas.

Only the minimum amount of vegetation necessary to allow activities to take place will be stripped/disturbed (vegetated surfaces are less prone to erosion). Appropriate dust suppression measures will be used when dust generation is unavoidable e.g., dampening with water. Caution not to allow muddy conditions to develop due to excessive watering.

3.8 Noise

Operational hours will be limited to between 06h00 to 18h00 to avoid sleep/rest disruption and general disturbance of adjacent land users/residents.

Neighboring landowners/land users/residents will be:

- * Alerted at least 24 hours before commencing activities to eliminate the surprise element;
- * Consulted before conducting activities on weekends and Public Holidays.

All equipment will be regularly and systematically checked, maintained and repaired (especially exhaust systems) as poorly maintained equipment can generate disturbing and unnecessary noise.

The members of the Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor team will be made aware of not creating unnecessary noise such as hooting and shouting.

3.9 Visual Aspects

Where possible and applicable, a vegetation buffer will be maintained around the site camp and borehole sites. In addition to providing a visual screen, the vegetation buffer will aid in dissipating the noise audible at the surrounding receiver points and will act as a barrier to the movement of wind and therefore reduce the erosion of the exposed surfaces.

All areas will always be kept neat and tidy. Disturbed sites will be re-vegetated with indigenous material as soon as activities at a site are complete.

External lighting for the general illumination of the site camp and borehole sites will be kept to the minimum necessary. Lighting will be directed downwards, and use will be

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made of lighting equipment that minimises the spread of light near to or above the horizontal.

3.10 Community Liaison and Involvement

Any nuisance impacts, such as noise, dust or bright lights, which may cause disturbance to the surrounding landowners / land users / residents, will be kept to a minimum. The Hydrogeological Consultant, the Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor and their team members will maintain good relations with the surrounding communities by respecting their lifestyles and customs.

A Community Representative will be informed as each borehole is drilled, test pumped and installed. Any disputes will be directed to and handled by the Hydrogeological Consultant (in consultation with the Community Representative and the Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor for resolution.

The Hydrogeological Consultant(s) must be familiar with and comply with local customs and procedures. Any complaints from the community will be recorded in a complaints register/daily diary and attended to immediately by the Hydrogeological Consultant.

The Hydrogeological Consultant will be responsible for educating and capacity building the community with regards to the operation, maintenance and repair of the monitoring borehole and related accessories.

3.11 Labour and Safety

Where possible and practical, the Hydrogeological Consultant, Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor will endeavor to employ local labour, both male and female.

All workers on site will be required to wear and be supplied with the necessary safety equipment e.g., hard-hats, glasses, dust masks and ear plugs, where applicable (this will depend on the task being undertaken).

The Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor will ensure that the members of his/her team have access to some form of medical treatment for minor injuries (e.g., a first aid kit) and taken to a clinic/hospital if injuries are of a more serious nature. The Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor will obtain the details of the closest medical facility prior to commencing activities.

Workers and visitors will be warned of any dangerous working areas and activities and will be required to wear and provided with the necessary safety equipment. Where members of the local community are employed, the following must be discussed and agreed beforehand between the Community Representative, the Hydrogeological Consultant, Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor:

- * Rate of remuneration;
- * Number of persons required;
- * Tasks for which additional labour will be required.

C3.6.3 Site Specific Responsibilities

1.1 General

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Fires will only be allowed in facilities or equipment specially constructed for this purpose. The borehole sites will be maintained in a clean and tidy state always.

1.2 Access Routes

1.2.1 Establishment of Access Routes

Access roads to the borehole sites will be established in consultation with the landowner/land user/resident and/or Community Representative. Existing tracks and roads will be used to access borehole sites, where practical and possible.

Should new access routes (or a portion thereof) need to be constructed, the following will be adhered to:

- * The routes will be planned beforehand to avoid haphazard traversing of the target area;
- * Routes will be planned to follow the contours of the land where possible;
- * The routes will be so selected that a minimum number of trees are felled for this purpose and fence lines be followed as far as possible; indigenous tree will be avoided where possible. Should it be required that indigenous trees be removed, permits will be obtained from the Department of Agriculture, Forestry and Fisheries (DAFF).
- * Grassed areas (as opposed to scrub and thicket) will be followed as grasslands recover more rapidly and easily from vehicle tracks;
- * watercourses and steep gradients will be avoided as far as is practical;
- * the herbaceous vegetation will not be cleared beforehand (over time the vegetation will become trampled by the passage of vehicles and tracks will develop, however, the presence of the vegetation will reduce the risk and severity of erosion problems and will accelerate the rehabilitation of these routes).

The Community Representative/Relevant Authority is to be consulted should it be deemed necessary to install long-term or permanent access routes.

All disturbed areas requiring such, will be rehabilitated to the previous condition or better on completion of the works.

1.2.2 Use and Maintenance of Access Routes

Reasonable speeds (less than 20 km/h on tracks; less than 40 km/h on gravel roads) will be observed to avoid accidents, excessive noise, dust and injury to livestock. In cases where a road needs to traverse a watercourse, a crossing will be built that is to the satisfaction of the Hydrogeological Consultant.

The erection of gates in fence lines and the open/closed status of gates in new and existing positions will be clarified with the landowners/land users/residents and maintained throughout the work period. For the temporary access routes to the borehole sites, it is neither practical nor feasible to install extensive runoff and storm-water control measures. However, the roads will be monitored for erosion and wear, and repaired accordingly.

All new and existing access routes will be continually checked for actual or potential erosion sites (especially after rain). Erosion problems will be repaired immediately. Repair may involve backfilling and contouring, seeding and the appropriate placement of sack/rock gabions to control further erosion. Any public roads used during the project are kept in good working order by maintaining reasonable speeds to reduce wear of the

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roads, repairing any damage to or erosion of the roads directly linked to project activities, and cleaning any spillages of materials or mud along public roads caused by project vehicles.

1.3 Site Clearing

1.3.1 Vegetation

Vegetation will not be unnecessarily disturbed, and trees or shrubs will, as far as is practical, not be damaged or felled.

Herbaceous vegetation (e.g., grass cover) will only be removed where soil is to be stripped.

Invasive plants/clumps of invasive plants within the active work areas will be removed. For aesthetic and ecological reasons and for shade provision, large trees within the borehole site will be left intact and the layout of these sites will be planned to accommodate the large trees (where applicable).

To minimise the disturbance and fragmentation of important plant communities (e.g., continuous bands of thicket/forest) the location of borehole sites and access routes will be planned to avoid traversing directly through these communities and rather circumvent such areas where possible.

No trees or shrubs will be felled or damaged for obtaining firewood.

1.3.2 Soil Stripping

All soil material will be stripped from areas underlying structures (temporary, permanent or semi-permanent), areas susceptible to contamination, and areas to be disturbed. This is to guarantee a source of soil material is available for site rehabilitation.

The topsoil layer (top 100 mm to 200 mm) will be stripped first and stockpiled separately (the biological and chemical characteristics of the topsoil differ from the subsoil and are more suitable for the growth and development of vegetation, so it is important that it be stripped and stored separately).

To avoid wastage, soil material that can be used for site backfilling, contouring and rehabilitation, will also be excavated and stockpiled (e.g., during the excavation of sumps).

The following soil handling guidelines will apply:

- * avoid handling soils when they are wet (causes compaction);
- * avoid repeated handling of soils (results in the loss of soil structure and compaction);
- * avoid handling soils during windy conditions (exacerbates soil loss through wind erosion).

A suitable site for the stockpiling of soil will be selected, and will meet the following criteria:

- * away from the working area - so that the stockpiles will not be disrupted by site activities;
- * away from drainage lines - so that there is no risk of wash away;
- * away from the base of a bank - so that runoff from the bank does not cause ponding of water alongside the stockpile.

1.4 Erosion

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To minimize the risk of erosion:

- * Where applicable loose sack gabions¹ (or similar) will be placed upslope of borehole sites to divert runoff away and thereby prevent potential erosion of the disturbed area; and,
- * disturbed areas will be rehabilitated as soon as possible after completion of activities

Monitoring for actual or potential erosion sites will be undertaken. Should any actual or potential erosion sites develop, repair of such sites will be undertaken immediately by backfilling erosion cavities and seeding with an appropriate seed mix, or, placing loose sack gabions will also be placed within and upslope of such sites, or utilising both methods (in severe cases).

Any activity involving the release of large volumes of water or water under pressure (e.g., borehole pump tests) shall be controlled to ensure the minimum amount of disturbance to the surrounding environment. Flow velocity shall be dissipated using sandbags if required to reduce the possibility of erosion.

1.5 Borehole Sites

For the purposes of this Contract, it is assumed that no formal site camp will be established. Activities will be confined to each borehole site at which a minicamp will be established. Such mini camps will be utilised for no longer than 3 consecutive days.

1.5.1 Borehole Siting, Layout and Access

The location of the borehole sites will be planned beforehand. The minimum area necessary to enable tasks to be carried out will be selected. The borehole site area will be defined using gum poles / stakes and hazard tape and activities will be confined to the demarcated area.

Where possible, borehole sites will be chosen where a buffer distance of 50 m from streams, dams, pans or springs can be maintained. The layout of the borehole sites will be planned beforehand to ensure that the camp is neat and orderly. Where possible, use will be made of existing roads or tracks to avoid creating new access routes.

1.5.2 Accommodation

Accommodation structures will be temporary and mobile (e.g., tents or caravans) and will be neatly planned with easy access to amenities to prevent haphazard scattering throughout the area.

1.5.3 Services/Facilities

An adequate number of waste receptacles will be supplied at each borehole site to gather all domestic and other refuse and to minimise the occurrence of littering. Potable water will be supplied and stored at each borehole site for the duration of the contract.

Adequate cooking facilities will be provided. Gas will be used for cooking purposes so that it is not necessary for the surrounding vegetation to be felled for use as a fuel source. No open fires are allowed.

Where possible and practical, existing school or community ablution facilities will be used.

¹ Biodegradable sacks (e.g. hessian) filled with soil material and *Cynodon dactylon* (Kweek) seed. The gabions will be used to divert runoff away from susceptible areas and reduce flow velocity. In time the seeds will germinate and establish a cover of vegetation that will protect the surface.

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The use of existing facilities will be done in consultation with the surrounding landowners/land users/residents and the Community Representative.

Should access to existing ablution facilities not be available, an adequate number of portable chemical toilets will be provided at each borehole site. The toilets are to be used and sited in such a way that they do not cause water or soil pollution. The toilets will be regularly cleaned and properly maintained to prevent odors and health risks. Waybills for the chemical waste haulage must be maintained.

1.6 Liquid Effluent Management

A distinction is made between domestic type wastewater and wastewater that will contain non-biodegradable pollutants such as oil, grease, etc.

- * Domestic-type wastewater will preferably be disposed of by linking up with existing facilities at the schools. If the use of existing facilities is not feasible, domestic wastewater will either be:
 - * Accumulated in a suitable container (e.g., large drum) and periodically carted to an existing facility for disposal; or,
 - * Released in a controlled manner into the surrounding veld (erosion control practices to be followed; refer to Section 12);
- * Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle (e.g. a sunken PVC tank or sump). The contents of the wastewater receptacle will be regularly cleared and removed from the site for appropriate disposal at a permitted disposal facility.
- * When excavating these pits to accommodate the wastewater receptacle, the topsoil and the subsoil will be stripped and stockpiled separately (refer to Section 11).
- * The pits will be surrounded by an earth wall of at least 30 - 50cm in height and be constructed to withstand the impact of heavy rainfall.
- * Upon completion of the works the contents of the pits will be disposed of at a waste facility permitted to cater for the waste. The sump/tank will be removed and the disturbed area rehabilitated to previous condition or better.

1.7 Hazardous Materials

All potentially hazardous materials stored or used on site will be handled in such a manner as to prevent soil and water contamination.

This will include:

- * Storage of such materials in a lockable, mobile structure that has an impermeable surface²;
- * Maintenance of vehicles and equipment on an impermeable surface (e.g. plastic lining);
- * Parking of vehicles that are prone to oil leaks on an impermeable surface (e.g. plastic lining) or using drip pans;
- * Use of suitably sized drip pans under equipment that may leak oil, grease or fuel (e.g. drill rigs, generators);
- * Storage of fuel within a secure, bunded area which has a capacity 2 times the volume of fuel being stored.

² Impermeable surface – layer of concrete, plastic lining or similar.

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Any accidental or negligent spills of potentially hazardous materials will be cleaned up immediately. The area of contaminated soil will be removed, stored in a plastic bag or container until it can be disposed of at a permitted disposal site. The affected area will be treated with a suitable absorbent such as Drizit or Peat Sorb or similar, a suitable volume of which is to be kept on site.

Used oil will be recovered and recycled.

1.8 Waste Management

The borehole sites will be cleared of litter and other waste on completion of the day's work. At least two waste receptacles (e.g. empty drums) will be provided at each borehole site for the collection waste – one for non-biodegradable refuse (glass bottles, plastic bags, metal scrap); the other for biodegradable waste (food, paper).

The waste receptacles will be cleared regularly and preferably be covered to prevent access by pest animals. Precautions will be taken to prevent any refuse from spreading from the borehole site. Domestic waste will be disposed of by making use of existing facilities and services at the nearest school(s).

If no suitable domestic waste disposal facilities exist at the local schools, then one of following procedure can be followed:

- * Biodegradable refuse will be buried in a pit excavated for that purpose. The pit will be covered with a final layer of soil (200 mm to 300 mm thick).
- * Non-biodegradable waste will be accumulated in a suitable container(s) and will be transferred to the nearest permitted waste disposal site.

Flammable, toxic or poisonous materials (including the contents of drip trays and sumps/pits) and the containers thereof (including linings) will not be disposed of with the domestic waste. Instead, such waste will be transferred to an appropriate, permitted industrial disposal facility. These materials and containers will be appropriately stored to contain contamination until they can be taken to the disposal site.

Drilling waste (including drill muds, concrete, rock and core material) where applicable can be used to contour the site to limit erosion, otherwise they will be cleared from the sites and disposed of appropriately.

1.9 Rehabilitation

All areas disturbed during the drilling, test pumping and installation of the boreholes (including boreholes sites, infrastructure sites and routes, access tracks and roads) will be rehabilitated, to the satisfaction of Hydrogeological Consultant, on completion of activities.

1.10 Structures

All temporary storage, living, ablution structures will be disassembled and removed from the site. All concrete structures (e.g., concrete bunding slabs) will be broken up and the concrete fragments transferred to a permitted disposal site. Any concrete waste will be disposed of in the same manner. All wastewater sumps/pits at the borehole sites will be drained and the liquid and solid waste transferred to a permitted disposal facility. Linings will be removed and disposed of in the same manner.

After all foreign matter has been removed from the sumps/pits, the excavations will be backfilled with subsoil, compacted and leveled, and capped using the stockpiled topsoil. No foreign matter such as cement or other rubble will be introduced into such backfilling.

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All waste from the borehole sites will be disposed of as documented in Section 15. All unused materials, equipment and implements will be packed up and removed from the site.

If not to be used on a permanent basis, any power, water, sanitation infrastructure on site will be disconnected, disassembled and the components removed from the site.

All portable chemical toilets will be drained by the chemical waste contractor and removed from site and any voids associated with the ablution facilities will be backfilled, contoured and revegetated. Any gate or fence made or erected by the applicant/holder, which is not required by the landowner, will be removed. Fences/gates will be disassembled, and the components removed from the site.

Any private fences/gates that have been disturbed during the project will be repaired.

1.11 Revegetation of Disturbed Areas

1.11.1 Backfilling and Contouring

All remaining voids will be backfilled using the stockpiled subsoil material removed during site clearing. Wherever backfilling is to take place, rocks will be placed at the bottom of the voids and soil replaced in sequence (subsoil underlying topsoil).

Site levelling will ensure that no troughs (low points) are created where water could accumulate/pond. The site will be contoured and levelled so that it is continuous with the surrounding topography.

1.11.2 Topsoiling

In all affected areas where topsoil was previously stripped, the topsoil layer will be replaced. Topsoil will be sourced from the stockpiles set aside on-site establishment. An even spread of topsoil over all affected areas will be created.

The topsoil layer must be replaced on top of the subsoil to maximise the benefit of the seed-bank present in the topsoil (the seedbank will accelerate the re-vegetation process).

1.11.3 Physical Substrate Preparation

The substrate will be physically prepared for re-vegetation. This will involve scarifying compacted areas and tilling affected areas to a depth of 10 cm to loosen clods and prepare a planting/seeding surface. Scarifying and tilling can be done manually by teams of local labour using picks and spades.

Compacted areas will include all areas underlain by heavy equipment (equipment stores, vehicle parking area) and machinery (drill rig), areas traversed by vehicles (access routes), areas underlying structures (toilets, ablutions).

1.11.4 Chemical Substrate Preparation

The substrate will be chemically prepared for re-vegetation. This will involve applying a granular chemical fertiliser (30g/m² 2:3:2 NPK slow-release granular fertiliser) and working this into the topsoil manually.

1.11.5 Re-vegetating

The prepared substrate will be re-vegetated to establish a cover of plant material to control erosion, improve the visual quality of the site and control runoff velocity.

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The affected areas will be seeded with an appropriate mix of indigenous plant species. The following mix is recommended:

* Eragrostis tef (tufted annual/nurse crop)	Teff	@ 8 kg/ha
* Cynodon dactylon (stoloniferous perennial)	Kweek	@ 5 kg/ha
* Chloris gayana (stoloniferous perennial)	Rhodes grass	@ 6 kg/ha
* Digitaria eriantha (tufted perennial)	Smuts finger	@ 5 kg/ha

The seed mix will be hand broadcast over the prepared substrate.

All re-vegetated areas will be thoroughly watered after seeding.

1.11.6 Protection Structures

Erosion protection measures will be installed at sites which may be susceptible to erosion in the long-term. Where applicable, a brush mattress (dry branches, preferably thorny) will be placed along the perimeter of rehabilitated sites to prevent access by cattle and goats. This will ensure that the rehabilitated areas are not trampled and overgrazed by livestock and the vegetation cover has an opportunity to become established before being exposed to grazing pressures.

1.11.7 Rehabilitation of Access Routes

Any access road or portion thereof, constructed or upgraded for the purposes of this project and which will no longer be required by the landowner/land user/resident will be rehabilitated per the procedures documented under Section 3.14. Attention will need to be given to the physical amelioration of substrates. The roads will be ripped or ploughed to break up compaction and clodding and prepare the substrate for seeding.

Imported road construction materials which may hamper regrowth of vegetation will be removed prior to rehabilitation and disposed of in an approved manner.

1.12 Environmental Design Criteria

The Hydrogeological Consultant is to ensure that the following requirements are included in the design of the borehole. The requirements are to be implemented by the Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor during construction of the boreholes.

Any borehole water outlet point or storage point (including taps, tanks, pumps) must be designed to (i) cater for and control the flow of water so that runoff is adequately dispersed and/or captured and does not cause erosion; (ii) ensure that water does not accumulate or pond at any point where it may stagnate, become contaminated by humans or animals, develop algal blooms or attract animal pests such as mosquitoes. Thus, the design is to include the following features:

- * Grading of the areas surrounding water outlet or storage points to encourage gentle runoff away from the area;
- * Where required, constructing formal channels to carry water away from the outlet/storage point either in the form of a concrete chute or a grassed channel;
- * Re-vegetation of the surrounding areas through rehabilitation (refer to Section 16);
- * Where applicable, planting rows of Vetiver grass in areas that will be susceptible to erosion;
- * Installation of concrete base around the water outlet or storage point to minimize splash erosion;

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1.13 Water Quality

Water samples are to be collected by the Hydrogeological Consultant from each successful borehole. The samples are to be analyzed at a reputable laboratory per acceptable industry standards and procedures for the determinants listed in the table below.

The Employers' Representative must assess the physio-chemical and microbiological properties of the water samples to ensure that it complies with the drinking water standards as set by SANS 241 "short" (as itemized in the table below).

Laboratory Sample Reference		Acute health	Chronic health	Aesthetic	Operational	Class 1 (suitable)	Class II (max allowable)
Determinand	Unit						
Micro biological determinands							
E. coli or faecal coliforms	Count per 100 mL	Detected				0	1
Total coliforms	Count per 100 mL				10	1	10
Physical and aesthetic determinands							
Appearance						-	-
Colour	mg/L Pt-Co			15		20	50
Conductivity at 25 °C	mS/m			170		150	370
Odour or taste	-			Inoffensive		-	-
Turbidity	NTU			5	1	1	5
pH at 25 C	pH units				≤ 5 or ≥ 9.7	5.0 - 9.5	4.0 - 10.0
Alkalinity						-	-
Total hardness						-	-
Chemical determinands — macro-determinands							
Nitrate as N	mg/L	11				10	20
Nitrite as N	mg/L	0.9				10	20
Combined Nitrate/Nitrite as N	mg/L	1				10	20
Sulphate as SO ₄ ²⁻	mg/L	500		250		400	600
Fluoride as F ⁻	mg/L		1.5			1	1.5
Chloride as Cl ⁻	mg/L			300		200	600
Calcium as Ca	mg/L			150/300*		150	300
Magnesium as Mg	mg/L		70/100*			70	100
Potassium as K	mg/L		50/100*		50/100*	50	100
Sodium as Na	mg/L			200		200	400
Chemical determinands — micro-determinands							
Iron as Fe	mg/L		2	0.3		0.2	2
Manganese as Mn	mg/L		0.4	0.1		0.1	1

1.14 Monitoring and Reporting

The Hydrogeological Consultant, in conjunction with the Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor, are to compile a Weekly Report on the activities that have been undertaken during that period. The reports are to be submitted to the Funding Agent. The reports are to cover the following matters:

- * the sites at which boreholes have been drilled and/or test pumped and/or installed (including the name, co-ordinates, etc.);
- * details of the borehole design including diagrams/sketches where applicable;

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- * details of environmental controls implemented;
- * water quality results and interpretation;
- * test pumping results and interpretation;
- * water levels, date and time.
- * details of discussion with the local community where applicable;
- * problems encountered and resolved;
- * details required by the EMP (e.g. waste disposal methods and sites, effluent management strategies, ablution facilities);
- * names and details of the Borehole Drilling Contractor, Borehole Test Pumping Contractor and the Equipping Contractor;
- * names and details of persons employed on a casual basis;
- * any other items specified and agreed with the Hydrogeological Consultant.

The Weekly Reports are to be synthesized monthly by the Hydrogeological Contractor to form a Monthly Report for submission to the Funding Agent. On completion of the contract, the Hydrogeological Contractor is to compile a Final Report for submission to the Funding Agent. At any time during the contract, the Funding Agent and the Relevant Authority may carry out an inspection of the site activities to ensure that they are complying with the requirements stipulated in this EMP.

Following the completion of the boreholes, the Funding Agent may undertake an inspection of the borehole/infrastructure sites to verify that rehabilitation of disturbed areas has been carried out to the satisfaction of the requirements stipulated in this document. Where applicable, the Hydrogeological Consultant will advise on follow-up and aftercare requirements that need to be carried out. Following the completion of the boreholes, the Hydrogeological Consultant will undertake an inspection of the borehole/infrastructure sites to verify that the requirements stipulated above have been incorporated into the design.

The long-term maintenance (including re-seeding, erosion control) of the rehabilitated areas will form part of the maintenance plan to be developed and implemented by the Department of Water Affairs in conjunction with the relevant implementing government department.

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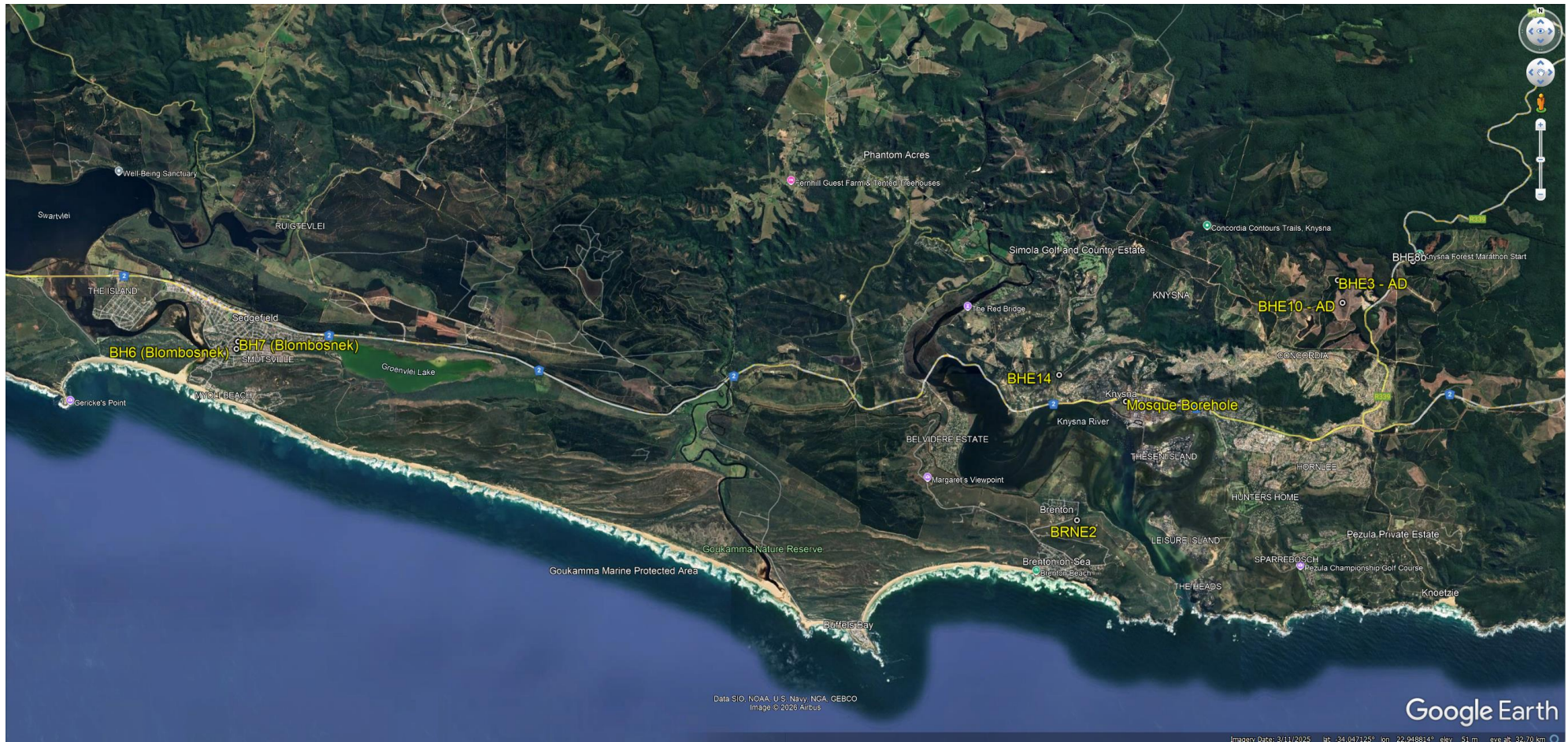
C3.7: ANNEXURES

Annexure A : Locality Plan

Annexure B : Standard Drawings

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ANNEXURE A: LOCALITY PLAN

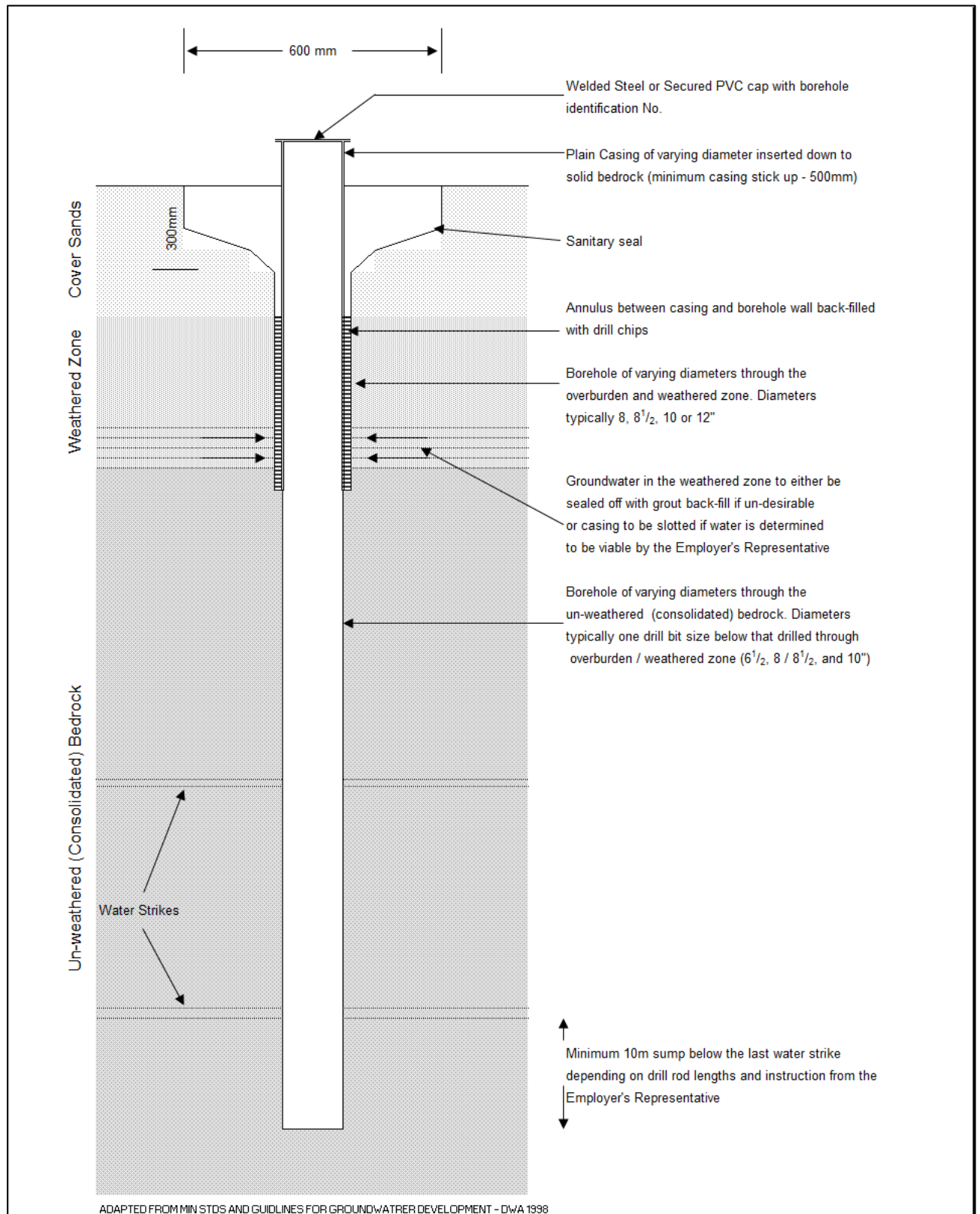


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**ANNEXURE B: REFURBISHMENT WORKS :
STANDARD DRAWINGS**

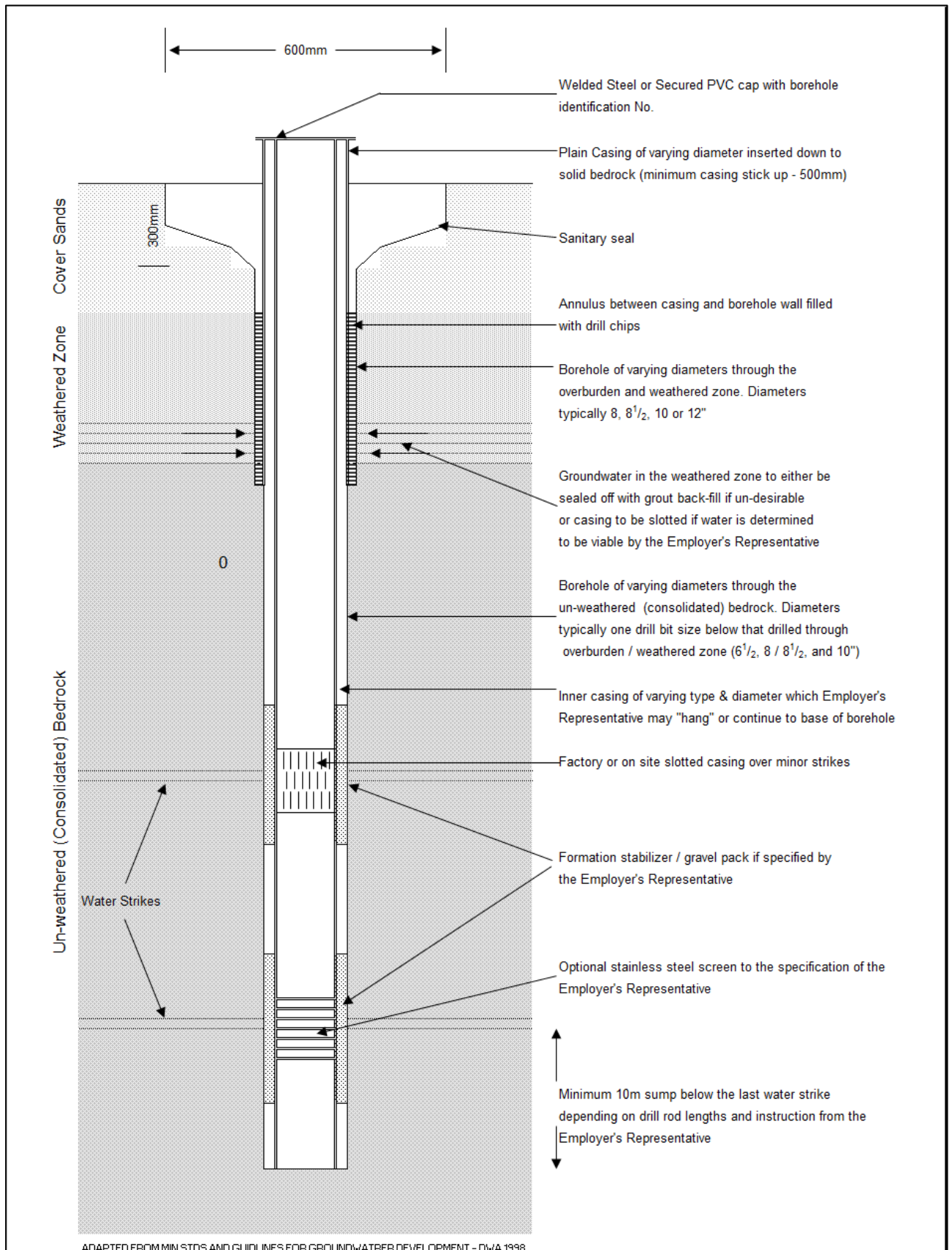
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B1: Typical borehole construction detail for competent consolidated rock formation



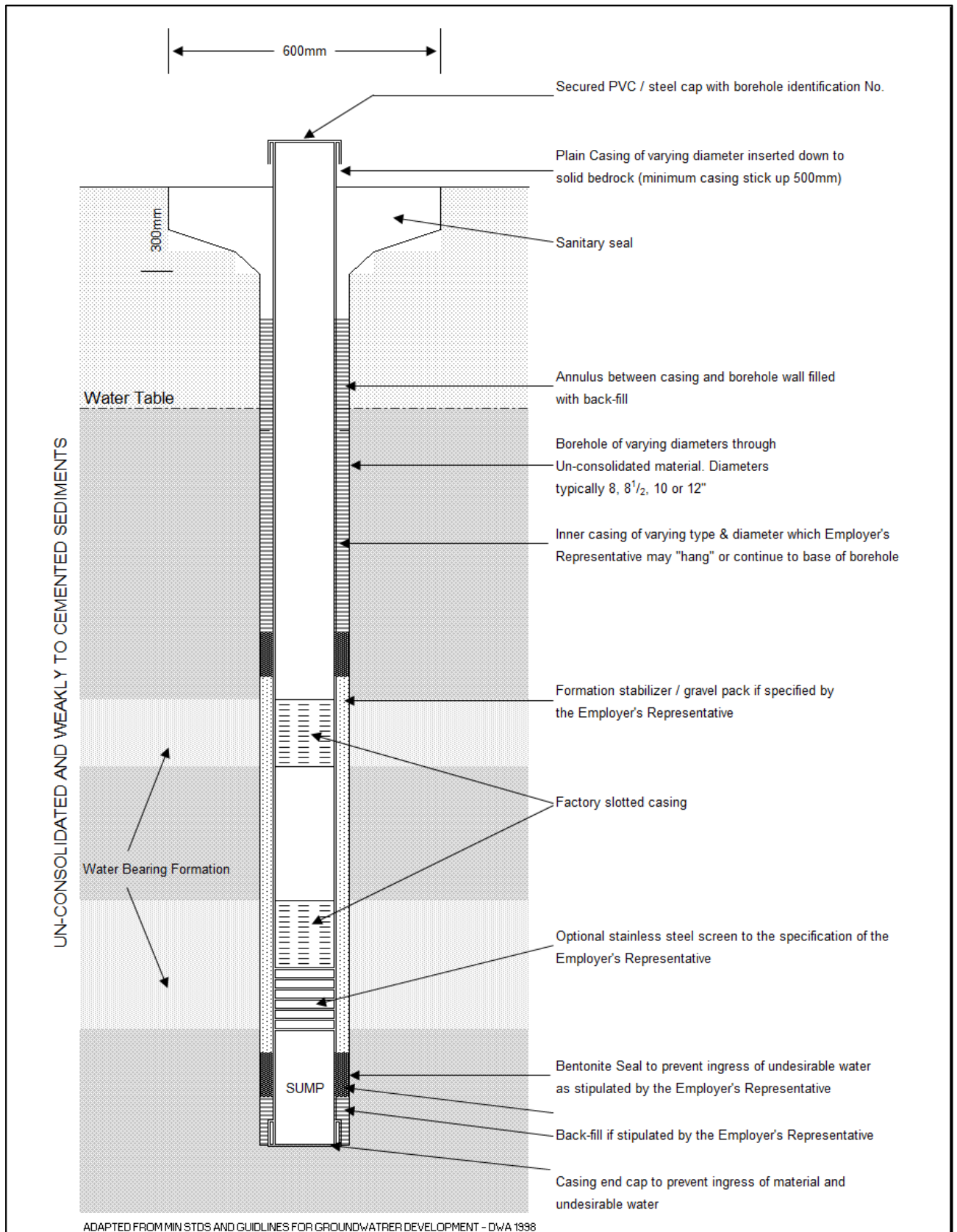
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B2: Typical borehole construction detail for unstable rock formation



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B3: Typical borehole construction detail for unconsolidated alluvium



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B4: Stone plugging detail

