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Kunene Regional Council



Private Bag 502
 Opuwo

REQUEST FOR QUOTATIONS FOR WORKS (RFQ)

**DRILLING AND TEST PUMPING AT KUNENE RURAL
 DEVELOPMENT CENTRE – ALPHA, KUNENE REGION.**

Procurement Reference No: W/RFQ/KRC – 03/2024

BIDDER'S DETAILS

Bidder Name: _____	Bidder Representative: _____
Tel: _____	Mobile: _____
Fax: _____	E-mail: _____
Bid Amount: _____	Contract Period: _____ (Calendar Days)

Closing date: 18 December 2024

Kunene Regional Council

P/Bag 502

Opuwo

Tel: 065- 273950/065-275098

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E-mail: pmu@kunenerc.gov.na



KUNENE REGIONAL COUNCIL



Tel: +264-65-273950
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M. Muharukua Street
OPUWO, NAMIBIA

Private Bag 502
OPUWO, NAMIBIA

Letter of Invitation

[Name and Address of Bidder]

.....
.....

Procurement Reference No: **W/RFQ/KRC – 03/2024**

Dear Sir/Madam,


DRILLING AND TEST PUMPING AT KUNENE RURAL DEVELOPMENT CENTRE – ALPHA, KUNENE REGION

Kunene Regional Council invites you to submit your best quote for drilling and testing pumping at Kunene Regional Council as prescribed in detail hereunder.

Any resulting contract shall be subject to the terms and conditions referred to in the document. Queries, if any, should be addressed to Mr J Sachobo @ 0813334491 Opuwo, pmu.kunenerc@gmail.com

Please prepare and submit your quotation in accordance with the instructions given or inform the under signed if you will not be submitting a quotation.

Yours faithfully


Mr. G. Kamseb
CHIEF REGIONAL OFFICER

KUNENE REGIONAL COUNCIL
PRIVATE BAG 502, OPUWO
29 NOV 2024
TEL: 065-273950
FAX: 065-273077
REGIONAL OFFICER

SECTION II: QUOTATION LETTER

(to be completed by Bidders)

*[Complete this form with all the requested details and submit it as the first page of your quotation with the Priced Activity Schedule and documents requested above. A signature and authorisation on this form will confirm that the terms and conditions of the RFQ prevail over any attachments. **If your quotation is not authorised, it will be rejected***

Quotation addressed to: <i>[name of Public Entity]</i>	Kunene regional council
Procurement Reference Number:	W/RFQ/KRC - 03/2024
Subject matter of Procurement:	Drilling and test pumping of Kunene Rural Development Centre at Alpha, Kunene region.

We offer to execute the Works detailed in the Statement of Requirements, in accordance with the terms and conditions stated in your Request for Request of Quotations referenced above.

We confirm that we are eligible to participate in this Quotation exercise and meet the eligibility criteria specified in Section I: Instructions to Bidders

We undertake to abide by the Conduct of Bidders and Suppliers as provided under the Public Procurement Act during the procurement process and the execution of any resulting contract.

We have read and understood the content of the Bid Security/Bid Securing Declaration (BSD) attached hereto and subscribe fully to the terms and conditions contained therein. We further understand that this subscription could lead *[forfeiture of the security amount / disqualification on the grounds mentioned in the BDS]*

The validity period of our Quotation is _____ days *[insert number of days]* from the date of the bid submission deadline.

We confirm that the prices quoted in the Priced Activity Schedule are fixed and firm and will not be subject to revision or variation, if we are awarded the contract **prior to the expiry** date of the quotation validity.

Works will commence within _____ *[insert number]* days from date of issue of Purchase Order/ Letter of Acceptance.

Works will be completed within _____ *[insert number]* days from date of issue of Purchase Order/ Letter of acceptance.

Quotation Authorised by:

Name of Bidder			
Contact Person			
Name of Person Authorising the Quotation:	Position:	Signature:	

Date		Phone No./E-mail	
------	--	------------------	--

Eligibility criterias

To be eligible to participate in this Quotation exercise, you should:

- have a valid certified copy (NAMPOL) of company Registration Certificate;
- attach a valid copy(ies) (NAMPOL CERTIFIED) of the Company's owner's national identification document(s).
- have an original or valid certified copy (NAMPOL) of NAMRA good Standing Certificate;
- have an original or valid certified copy (NAMPOL) of BIPA good Standing Certificate
- have an original or valid certified copy (NAMPOL) of good Standing Social Security Certificate;
- have a valid certified copy (NAMPOL) of Affirmative Action Compliance Certificate, proof from Employment Equity Commissioner that bidder is not a relevant employer, or exemption issued in terms of Section 42 of the Affirmative Action Act, 1998;
- have a valid certified copy (NAMPOL) of certificate indicating SME Status (for Bids reserved for SMEs);
- submit signed bid securing declaration;
- an undertaking on the part of the Bidder that the salaries and wages payable to its personnel in respect of this proposal are compliant to the relevant laws, Remuneration Order and Award, where applicable and that it will abide to sub-clause 4.6 of the General Conditions of the Contract if it is awarded the contract or part thereof;
- attach proof of confirmation of account from a Namibian Banking institution (not older than six months);
- Attach certified copy of ID for the owner of the company.

BID SECURING DECLARATION
(Section 45 of Act)
(Regulation 37(1) (b) and 37(5))

Date: *[Day _____ | month _____ | year _____]*

Procurement Ref No.: W/RFQ/KRC – 03/2024

To:*[insert complete name of Public Entity and address]*

I/We* understand that in terms of section 45 of the Act a public entity must include in the bidding document the requirement for a declaration as an alternative form of bid security.

I/We* accept that under section 45 of the Act, I/we* may be suspended or disqualified in the event of

- (a) a modification or withdrawal of a bid after the deadline for submission of bids during the period of validity;**
- (b) refusal by a bidder to accept a correction of an error appearing on the face of a bid;**
- (c) failure to sign a procurement contract in accordance with the terms and conditions set forth in the bidding document, should I/We* be successful bidder; or**
- (d) failure to provide security for the performance of the procurement contract if required to do so by the bidding document.**

I/We* understand this bid securing declaration ceases to be valid if I am/We are* not the successful Bidder

Signed:
[insert signature of person whose name and capacity are shown]

Capacity of:
[indicate legal capacity of person(s) signing the Bid Securing Declaration]

Name:
[insert complete name of person signing the Bid Securing Declaration]

Duly authorized to sign the bid for and on behalf of: *[insert complete name of Bidder]*

Dated on _____ day of _____
[insert date of signing]

Corporate Seal (where appropriate)

[Note: In case of a joint venture, the bid securing declaration must be in the name of all partners to the joint venture that submits the bid.]*

**delete if not applicable / appropriate*



Republic Of Namibia

Ministry of Labour, Industrial Relations and Employment Creation

Written undertaking in terms of section 138 of the Labour Act, 2015 and section 50(2)(D) of the Public Procurement Act, 2015

1. EMPLOYERS DETAILS

Company Trade Name:.....

Registration Number :.....

Vat Number:

Industry/Sector:

Place of Business:.....

Physical Address:.....

Tell No.:.....

Fax No.:.....

Email Address:.....

Postal Address:.....

Full name of Owner/Accounting Officer:.....

.....

Email Address:.....

2. PROCUREMENT DETAILS

Procurement Reference No.:.....

Procurement Description:

.....

.....

Anticipated Contract Duration:

Location where work will be done, good/services will be delivered:

.....

3. UNDERTAKING

I[insert full name], owner/representative

of[insert full name of company]

hereby undertake in writing that my company will at all relevant times comply fully with the relevant provisions of the Labour Act and the Terms and Conditions of Collective Agreements as applicable.

I am fully aware that failure to abide to such shall lead to the action as stipulated in section 138 of the labour Act, 2007, which include but not limited to the cancellation of the contract/licence/grant/permit or concession.

Signature:

Date:

Seal:.....

Please take note:

- 1. A labour inspector may conduct unannounced inspections to assess the level of compliance*
- 2. This undertaking must be displayed at the workplace where it will be readily accessible and visible by the employees rendering service(s) in relations to the goods and services being procured under this contract.*

SECTION VI: GENERAL CONDITIONS OF CONTRACT AND CONTRACT AGREEMENT

Any resulting contract shall be placed by means of a Purchase Order/Letter of Acceptance and shall be subject to the General Conditions of Contract (GCC) for the Procurement of Work (Ref. **W/RFQ-GCC**) available on the website of the Public Entity (*insert website address*) except where modified by the Special Conditions below

SECTION VIII SPECIAL CONDITIONS OF CONTRACT

Procurement Reference Number: W/RFQ/KRC 03/2024

The clause numbers given in the first column correspond to the relevant clause number of the General Conditions of Contract. *[This section is to be customised by the Public Entity to suit the requirements of the specific procurement].*

GCC Clause Reference	Special Conditions										
Employer GCC 1.1(r)	Kunene Regional Council										
Intended Completion Date GCC	The intended completion date is:										
Project Manager GCC 1.1(y)	The Project Manager is: The Ministry of Agriculture, Water and Land Reform – Division Rural water supply and sanitation coordination										
Site GCC 1.1(aa)	The Sites is located at Alpha in Opuwo Urban constituency, Kunene region.										
Start Date GCC 1.1(dd)	The Start Date shall be:										
The Works GCC 1.1(hh)	<p>The Works consist of: Air Percussion Drilling and test pumping at Otjatjihete village.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Names</th> <th style="text-align: center;">Maximum drill depth(m)</th> <th style="text-align: center;">Recommended drill diameter (mm)</th> <th style="text-align: center;">Casing diameter (mm)</th> <th style="text-align: center;">Cost (N\$)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Kunene RDC</td> <td style="text-align: center;">150</td> <td style="text-align: center;">254- (0-6m) 204- (6-250m)</td> <td style="text-align: center;">219(-0.3- 6m) 165(6-150m)</td> <td></td> </tr> </tbody> </table>	Names	Maximum drill depth(m)	Recommended drill diameter (mm)	Casing diameter (mm)	Cost (N\$)	Kunene RDC	150	254- (0-6m) 204- (6-250m)	219(-0.3- 6m) 165(6-150m)	
Names	Maximum drill depth(m)	Recommended drill diameter (mm)	Casing diameter (mm)	Cost (N\$)							
Kunene RDC	150	254- (0-6m) 204- (6-250m)	219(-0.3- 6m) 165(6-150m)								
Interpretation GCC 2.2	The project will be completed in the following sections: _										
Interpretation GCC2.3	<p>The following additional documents shall form part of the contract:</p> <p>Bills of Quantities</p>										
Language and Law GCC 3.1	The language of the contract is English and the law that applies to the Contract is the law of Namibia.										

GCC Clause Reference	Special Conditions
Project Manager's Decisions 4.1	The Project Manager shall obtain specific approval from the Employer before carrying out any of his duties under the Contract which in the Project Manager's opinion will cause the amount finally due under the Contract to exceed the Contract Price or will give entitlement to extension of time. This requirement shall be waived in an emergency affecting safety of personnel or the Works or adjacent property.
Delegation GCC 5.1	The Project Manager <i>may not</i> delegate his/her duties.
Notices GCC 6	<p>Any notice shall be sent to the following addresses:</p> <p>For the Employer, the address shall be as given on the page 2 of this Bidding Document and the contact name shall be Ms. Sendra Nakale – Head of PMU</p> <p>For the Contractor, the address shall be as given on the first page of the Purchase Order/Letter of Acceptance and the contact name shall be:</p> <p>_____</p>
Insurance GCC 13.1	<p>Except for the cover mentioned in (d)(i) hereunder, the other insurance covers shall be in the joint names of the Contractor and the Employer and the minimum insurance amounts shall be:</p> <ul style="list-style-type: none"> (a) for the Works, Plant and Materials: (<i>for the full amount of the works including removal of debris, professional fee etc...</i>) (b) for loss or damage to Equipment: (<i>for the replacement value of the equipment that the contractor intends to use on site until the taking over by the Employer.</i>) (c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract <i>for an amount representing the value of the properties that are exposed to the action of the contractor in the execution of the works. It will extend to the property of the Procuring Entity as well).</i> (d) for personal injury or death: <ul style="list-style-type: none"> (i) of the Contractor's employees: [<i>The Contractor shall take an adequate insurance cover for its employees for any claim arising in the execution of the works</i>]. (ii) of other people: [<i>This cover shall be for an adequate amount for Third Party extended to the Employer and its representatives</i>]. (e) for loss or damage to materials on-site and for which payment have been included in the Interim Payment Certificate, where applicable. <p>The Contractor shall choose to take the insurance covers indicated above as separate covers or a combination of the Contractor's All Risks coupled with the Employer's liability and First Loss Burglary, after approval of the Employer. All insurance covers shall be of nil or the minimum possible deductibles at sole expense of the contractor.</p>

GCC Clause Reference	Special Conditions
Site Date GCC 14.1	Not applicable
Possession of the Site GCC 20.1	The Site Possession Date shall be: 2024
Procedure for Disputes GCC 24	No Adjudicator shall be appointed under the contract and arbitration shall not apply. If any dispute arises between the Employer and the Contractor in connection with or arising out of the Contract, the parties shall seek to resolve any such dispute by amicable agreement. If the parties fail to resolve such dispute by amicable agreement, within 14 days after one party has notified the other in writing of the dispute, then the dispute shall be referred to court by either party.
Program GCC 25.1	The Contractor shall submit for approval a Program for the Works within two (2) week days days from the date of the Letter of Acceptance or issue of Purchase Order Agreement.
GCC 25.3	Program updates <i>insert shall</i> be required.
Defects Liability Period GCC 33.1	The Defects Liability Period is: 12 months .
Payment Certificates GCC 39.7	The Kunene Regional Council shall choose: “ A single statement of work as executed shall be submitted on completion of the Works. The Project Manager shall check the statement and certify the amount to be paid to the Contractor”.
Payments GCC 40	The amount certified by the Project Manager shall be paid in full within 30 days of receipt by the Employer of an invoice, supported by: <ul style="list-style-type: none"> (a) the payment certificate; and (b) a certificate of Completion of the Works.
Adverse weather Conditions GCC 41.1 (l)	<i>n/a</i>
Price Adjustment GCC 44.	The Contract <i>is not</i> subject to price adjustment.
Retention GCC 45.	10% of the amount shall be retained from any payment. Half of the retention money will be released after formal taking over of the Works and the remaining shall be released after the Defect Liability Period subject to the Contractor making good all defects.

GCC Clause Reference	Special Conditions
Liquidated Damages GCC 46.1	<p>The liquidated damages for the whole of the Works are 0.5% per day.</p> <p>The maximum amount of liquidated damages for the whole of the Works is <i>[amount based on a maximum number of days]</i>.</p> <p><i>[Usually liquidated damages are set between 0.05 per cent and 0.10 per cent per day, and the total amount is not to exceed between 5 per cent and 10 per cent of the Contract Price. Alternatively, the daily rate could reflect the actual prejudice that the procuring entity may claim to suffer as direct cost, where applicable or a nominal value taking into consideration the size of the building, nature of construction and the incidence due to non-availability of the building as from the intended completion date. If Sectional Completion and Damages per Section have been agreed, the latter should be specified here.]</i></p>
Bonus GCC 47.1	The rate for the Bonus per calendar day is: N/A
Advance Payment GCC 48.1	No advance or partial payment shall be made.
Performance Security GCC 49.1	No Performance Security is required
GCC 56.1	“As built” drawings or operating and maintenance manuals are not required.
GCC 59.1	The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, is: <i>[insert percentage]</i>

Table 1: Drilling specifications and price summary

Air Percussion Drilling Price Summary				
Names	Maximum drill depth(m)	Recommended drill diameter (mm)	Casing diameter (mm)	Cost (NS)
Alpha RDC	150	254- (0-6m) 204- (6-160m)	219(-0.3- 6m) 165(6-160m)	
<u>Grand Total</u>				
VAT should be included in the price				

Kunene Rural Development Centre - Alpha

AIR PURCUSSION DRILLING		Boreholes: 1		Depth: 150		(Nominal)	
ITEM	DESCRIPTION	UNIT	QTY	RATE per unit	AMOUNT		
1	Mobilisation and demobilisation of all equipment, material and personnel						
1.1	Mobilisation to the first borehole	Ls	-				
1.2	Demobilisation from the last borehole	Ls	1				
1.3	Erection & dismantle of rig per site	No.	1				
1.4	Movement of all material, equipment and personnel to and between sites	Km	-				
2	Air Percussion Drilling						
2.5	254mm/10" (Air Percussion Drilling) 0 - 100m	m					
2.6	204mm/ 8" (Air Percussion Drilling) 0 - 100 m	m	100				
2.7	204mm/ 8" (Air Percussion Drilling) 100 - 200 m	m	50				
3	Steel casing supply & install of 4.5 mm wall thickness						
3.4	Supply 219 mm plain	m	6.3				
3.5	Supply 219 mm screen	m	0		Rate only		
3.6	Install 219 mm	m	6.3				
4	UPVC casing supply, delivery & install of 9.5 mm wall thickness						
4.1	Supply 165 mm plain	m	100				
4.2	Supply 165 mm screen - slot size 1 mm	m	50				
4.3	Install 165 mm	m	150				
5	Gravel Pack supply and emplace						
5.1	Supply 2 - 3 mm grain size in 40 kg bags (26 lt)	bag	50				
5.2	Emplace gravel pack	bag	50				
6	Emplace backfill						
		m	107				
7	Grouting / Cementation						
7.1	By tremi-pipe	m ³	1		Rate only		
7.2	Pressure grouting through casing string	m ³	1		Rate only		
8	Fit end plugs and caps on casing						
		No.	1				
9	Development by airlift						
9.1	Development with air blown through drill string	hr	6				
10	Pumping Tests						
10.1	Erect and dismantle test pump equipment, installation and removal of a submersible pump including rising pipes, layflat and water meter. Pump capacity: 10 m ³ /h with a pumping head of 200 m	No.	1				
10.2	Short step-drawdown pumping test	hr	4				
10.3	Ground water level recovery measurements	hr	4				
10.4	Constant Discharge test	hr	8				
10.5	Ground water level recovery measurements	hr	8				

11	Water Quality Analysis	No.	1		
12	Inscription of borehole number by suitable means on casing.	No.	1		
13	Completion of Documentation per Borehole	No.	1		
14	Account Works (according to TOR chap. 8 and FIDIC Part 1 chap. 52.4)				
14.1	Car (4 x 4) travelling in the field	km	1		Rate only
14.2	Car (4 x 4) travelling on tar/gravel road	km	1		Rate only
14.3	Truck (4 x 4) travelling in the field	km	1		Rate only
14.4	Truck (4 x 4) travelling on tar/gravel road	km	1		Rate only
14.5	Truck (6 x 6) travelling in the field	km	1		Rate only
14.6	Truck (6 x 6) travelling on tar/gravel road	km	1		Rate only
14.7	Drilling rig and crew travelling in the field	km	1		Rate only
14.8	Drilling rig and crew travelling on tar/gravel road	km	1		Rate only
14.9	Travelling of the Water Tanker	km	10		
14.10	Bush clearing	m ²	1		Rate only
14.11	Road building 3 m wide	km	1		Rate only
14.12	Standing time of drilling crew/rig per day	day	1		Rate only

DESCRIPTION	AMOUNT N\$
Subtotal of Item 1: Mobilisation	
Subtotal of Item 2: Air percussion drilling	
Subtotal of Item 3 :Steel casing supply, delivery & install	
Subtotal of Item 4: UPVC casing supply, delivery & install	
Subtotal of Item 5: Gravel Pack	
Subtotal of Item 6:Backfill emplace	
Subtotal of Item 7: Grountig/Cementing	Rate only
Subtotal of Item 8: Fit end plugs and caps on casing	
Subtotal of Item 9: Development of the borehole	
Subtotal of Item 10: Pumping Tests	
Subtotal of Item 11: Water Quality Analysis	
Subtotal of Item 12: Inscription of borehole number	
Subtotal of Item 13: Completion of documentation	
Subtotal of Item 14: Accounting Works	

Subtotal Item 1 – 14:
VAT (15 %):
Total:

.....
Contractor Signature

.....
Date/Place



Tel: +264-65-273950
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Kunene Regional Council



Private Bag 502
Opuwo

**DRILLING AND TESTING PUMPING OF RURAL DEVELOPMENT CENTRE -
ALPHA BOREHOLE IN OPUWO URBAN CONSTITUNCY, KUNENE REGION**

CONDITIONS AND SPECIFICATIONS FOR DRILLING

November 2024

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1 INTRODUCTION

The information provided in this section, is provided for general information and background to the drilling programme. The Bidder in his/her professional and experienced judgement is required to confirm the adequacy and accuracy of the information provided and to compile his bid and, if successful, execute the works.

2 BIDDING DOCUMENTS

It is the obligation of the Bidder to familiarise himself/herself and fully understand the contents of this bidding document.

If any page in this Bidding Document should be left out or if anything concerning the document not be clear, the Bidder shall immediately notify the Kunene Regional Council in order that any discrepancy can be rectified, since the Kunene Regional Council will not take responsibility for any such discrepancies not rectified during the tendering period.

Any enquiries regarding the bidding documents or any related matter, prior to submission of bid documents, should be directed to the Kunene Regional Council. Verbal replies given at any site inspection or elsewhere shall not be regarded as binding unless confirmed in writing upon request by means of a notice, which notice shall be sent to all Bidders.

3 Eligibility criteria

To be eligible to participate in this Quotation exercise, you should:

- have a valid certified copy (NAMPOL) of company Registration Certificate;
- attach a valid copy(ies) (NAMPOL CERTIFIED) of the Company's owner's national identification document(s).
- have an original or valid certified copy (NAMPOL) of NAMRA good Standing Certificate;
- have an original or valid certified copy (NAMPOL) of BIPA good Standing Certificate
- have an original or valid certified copy (NAMPOL) of good Standing Social Security Certificate;
- have a valid certified copy (NAMPOL) of Affirmative Action Compliance Certificate, proof from Employment Equity Commissioner that bidder is not a relevant employer, or exemption issued in terms of Section 42 of the Affirmative Action Act, 1998;
- have a valid certified copy (NAMPOL) of certificate indicating SME Status (for Bids reserved for SMEs);
- submit signed bid securing declaration;
- an undertaking on the part of the Bidder that the salaries and wages payable to its personnel in respect of this proposal are compliant to the relevant laws, Remuneration Order and Award, where applicable and that it will abide to sub-clause 4.6 of the General Conditions of the Contract if it is awarded the contract or part thereof;

- attach proof of confirmation of account from a Namibian Banking institution (not older than six months);
- Attach certified copy of ID for the owner of the company.

4 SCOPE OF WORK

3.1 Validity of Bidder

- (a) The Bidder will have a validity period of one hundred and eighty (180) days from the closing date.
- (b) The Bids is open to any prospective bidders to participate.
- (c) Bidder's documents should be addressed to:

Kunene Regional Council
P/Bag 502
Opuwo
Tel: 065- 273950/065-275098
Fax: 065-273077

3.2 Time frame

For this bid "a purchase order or Letter of Award" issued to the successful bidder, a mobilisation period of fourteen (14) days will be granted.

3.3 Drilling site

The drilling work will be carried out in a single phase and as the bid will only be awarded to a single contractor.

Table 1: Drilling site

Locations	Constituency	Latitude	Longitude	Max. drill depth (m)	Drill technique
Kunene RDC – Alpha	Opuwo Urban			150	Air percussion

Detailed scope of work - Drilling

- 3.4.1. **Drilling technique:** Air Percussion (254 mm / 10" for standpipe; 204 mm / 8" to final drill depth).
- 3.4.2. **Collection of drill chips:** Drill chips must be collected every 1 m in the prescribed container and submitted to the Representative of the Employer.
- 3.4.3. Electrical conductivity and pH must be observed every 2m during drilling.

3.4.4. **Total drill depth:** The maximum drill depth provided in table 1 under 3.3 serves as a guideline and should not be taken as the final drill depth. Employer/Employer's representative reserves the right to stop the drilling at any depth depending on their discretion on site. The Employer is not responsible for payment of any meters which were not drilled or for any material which may have been left over at any site.

3.4.5. **Installation of casing:**

- 219mm Steel casing for standpipe
- 165mm UPVC plain casing constituting 2/3 (two-thirds) of total borehole depth.
- 165mm UPVC screens (slot size of 1mm) constituting 1/3 (one-third) of total borehole depth. Hence, the successful bidder is required to have at least 27m casing onsite.
- 165mm UPVC end plug to be installed at bottom of each borehole.

3.4.6. **Installation of gravel pack:** Gravel pack must be installed at least 1/3 (one third of total depth of borehole while the remaining space must be filled with natural backfill.

3.4.7. **Development:** Borehole must be developed for 6 hours, or until instructed by the Employer or Representative of the Employer to stop. The borehole must be allowed to recover to the rest water level prior to the start of the pumping tests.

3.4.8. For the purpose of this bid, the successful bidder must be equipped with testing equipment capable to test at abstraction rates up to 10 m³/h, and a discharge distance of at least 100m from the borehole.

3.4.9. **Step test:** A total of four steps must be completed as per specifications

3.4.10. **Main discharge test:** An eight-hour main discharge test must be completed after the recovery period of the step test.

3.4.11. **Water sampling:** A water sample must be taken at the end of the constant discharge recovery test

3.4.12. **Inscription of borehole number:** Borehole number must be welded on the top plate of the steel casing.

3.4.13. **Submission of water sample to lab:** The water sample collected under section 3.4.10 must be submitted to a certified Namibian laboratory and the results must be submitted to the Representative of the Employer within 2 weeks after completion of the drilling programme.

3.5 Eligibility of drillers

All drilling companies wanting to be eligible to attach the following to the bid:

- Complete curriculum vitae of:
 - the drill foreman/head driller and site supervisor under company profile,
 - **indicating the number of years in business,**
 - drilling projects successfully completed,
 - the methods of drilling employed
 - and any other relevant information.

- All bidder will be required to complete the list of:
 - equipment,
 - tools,
 - workshops,
 - plant,
 - vehicles and personnel
 - and provide, where applicable, photographic evidence of such equipment, tools, workshops, plant and vehicles to allow the Kunene Regional Council to ascertain whether the Bidder is qualified to perform the work.

- Bidders without suitable tooling, equipment and other resources will not qualify for the award of this bid. Such a bidder will therefore be rejected.

- Bidders are required to submit proof of ownership of all vehicles (copies of NATIS registration documentation) and equipment for evaluation process.

3.6 Drilling machines and equipment

- Bidders who want to be considered for this bid, it would be preferable to have their own drilling rig/s and equipment.
- The drilling rig/s and equipment must be suitable for air percussion drilling.
- Suitable drilling equipment must include catch tackle, "fishing" equipment, borehole development equipment, electrical welding equipment and oxy-acetylene cutting equipment.
- All equipment afore-mentioned should be in good working condition.

3.7 Joint Ventures/Partnerships

- If a bidder does not have his/her own drilling rig/s or drilling equipment, he/she will be allowed to form a joint venture/partnership with an existing, experienced drilling contractor.
- On submission of the bid document, proof of such a joint venture/partnership must be attached to the bid document and shall be in the form of a legal contract or undertaking, signed by both parties.
- Failure to produce such a contract/undertaking will result in the bidder being disqualified.

- Complete curriculum vitae of the experienced partner, drill foreman/head driller and site supervisor must be attached to the contract/undertaking, indicating the number of years in business, drilling projects successfully completed, the methods of drilling employed and any other relevant information, which

strengthens the joint venture/partnership's chances of being accepted as bidder.

3.8 Bid evaluation criteria

- 3.8.1 All bids submitted will be subject to a full Legal, Financial and Technical evaluation criterion as reguid in this bid, and may not be based on the lowest financial bid submitted.

4. SPECIAL CONDITIONS OF CONTRACT

The Special Conditions of Contract supplement the General Conditions of Contract and General Specifications. In case of any discrepancy or in case of conflict with any part of the General Conditions of Contract, then the Special Conditions of Contract shall prevail and take preference.

4.1 Definitions

In the Contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them, except where the context otherwise requires in the Contract.

- 4.1.1 **"Employer"** means the Government of the Republic of Namibia hereinafter represented by the Chief Regional Officer for the Kunene Regional Council, Private Bag 502, Opuwo.
- 4.1.2 **"Chief Regional Officer"** means the Chief Regional Officer of the Kunene Regional Council or a person duly appointed on his behalf.
- 4.1.3 **"Contractor"** means the person, firm or company whose bid has been accepted by the Employer.
- 4.1.4 **"Subcontractor"** means any person, firm or company named in the Contract for part of the Works that has been subcontracted with the consent of the Employer and Consultant.
- 4.1.5 **"Contract"** means the General Conditions of Contract and Special Conditions of Contract, Contract Specifications for Drilling, Schedule of Quantities, all Schedules, the Form of Bid, Appendix to the Bid and such further documents as may be incorporated in the Contract Agreement.
- 4.1.7 **"Site"** means the area or other place where over which and under which the Work must be done or any area or place which the Employer might provide for Contract purposes.
- 4.1.8 **"Letter of Award"** means the written confirmation that the Contractor's bid has been accepted.
- 4.1.9 **"Work"** and/or **"Drilling Work"** means the work or drilling activities which must be carried out in terms of the Contract.
- 4.1.10 **"Contract Price"** means the amount stated in the Contract and any additions or subtractions there from as stated in the Contract.

4.1.11 "**Contract Period**" and/or "**Time for Completion**" means the period in which the Contractor must complete the Work as set out in the Letter of Award or as altered in variation orders in terms of the Conditions of Contract.

5 RETENTION GUARANTEE

With the submission of each invoice a retention guarantee of 10 % of the total invoice amount will be deducted for retention. This retention guarantee will have a validity period of six (6) months from the date of the final invoice.

6. SPECIAL CONDITIONS OF CONTRACT

The "Special Conditions of Contract" means any Contract Conditions added to the General Conditions of Contract or any alterations to these Conditions that may be added to any Contract.

The Contractor must satisfy himself/herself that he/she fully understands the meaning of all the Special Conditions of Contract which appear in the Contract Document.

6.1 DATE OF COMMENCEMENT

The Contractor must commence the work not later than **fourteen (14) days after** the issue of the "Letter of Award".

6.2 MOBILISATION

The mobilisation of a contractor with his/her equipment, to a project, will be regarded as from his/her normal base of operations to the first site of a drilling project. From there on, the costs for movement between drill sites will be covered by the inter-hole movement.

6.3 PERIOD FOR COMPLETION

Subject to any regulations in the Specifications, all work as set out in the Contract, must be completed within the period mentioned in each work order, unless the Employer later shortens or lengthens the period in which case the variation order will be confirmed in writing. The Employer reserves the right to alter the completion period of certain portions of the work.

6.4 SUSPENSION OF CONTRACT ON ACCOUNT OF UNSATISFACTORY PROGRESS

The Employer will be justified to end the Contract after seven days notice to the Contractor of his intention to end the Contract Should the Contractor fail:

- To commence work
- To sign the Contract
- To hand in the Contract Guarantee within the period stated in the Contract and the Letter of Award
- The date of completion and any further lengthening of time granted by the Employer expire and in the judgment of the Employer that it is impossible for the Contractor because of his failure to start his work in time or because of his slow progress to complete the work within a reasonable period after the expire date.

- The Contractor notifies the Employer that he is unable to complete the Contract.

6.5 PENALTIES FOR DELAY

6.5.1 DELAY BY CONTRACTOR

Should the Contractor fail to complete the work within the time of completion or any extension of time, the Employer will have the right to apply a penalty fee of N\$2,500, which will be subtracted from the money which is owed to the Contractor for every work day - Saturdays, Sundays, official holidays and holiday periods excluded - in which he completes the work after the date of completion or extended date of completion. The payment or subtraction of such penalty will not exempt the Contractor from any obligation or responsibility in accordance with the Contract. **The Contractor will also be blacklisted when it comes to future related tenders.**

6.5.2 DELAY BY CONSULTANT

Should the Consultant fail to complete the work within the time of completion or any extension of time, the Employer will have the right to apply a penalty fee of N\$2,500, which will be subtracted from the money which is owed to the Consultant for every work day - Saturdays, Sundays, official holidays and holiday periods excluded - in which he completes the work after the date of completion or extended date of completion. The payment or subtraction of such penalty will not exempt the Consultant from any obligation or responsibility in accordance with the Contract. The Consultant will also be blacklisted when it comes to future related tenders.

6.6 STANDING TIME - CONSULTANT

Should a consultant be kept waiting on site for longer than 48 hours, by the Contractor, as a result of negligence, breakdowns or personnel problems, the Contractor will be held liable for the reimbursement of the Consultant in accordance with the Bid approved tariff of fees, which would normally be paid by the Client. Should the delay result in the Consultant having to demobilize and re-mobilize later, these additional costs will also be at the expense of the Contractor.

6.7 STANDING TIME – CONTRACTOR

Should a contractor be kept waiting on site for longer than 48 hours, by the consultant, as a result of negligence, breakdowns or personnel problems, the consultant will be held liable for the reimbursement of the Consultant in accordance with the Bid approved tariff of fees, which would normally be paid by the Client. Should the delay result in the contractor having to demobilize and re-mobilize later, these additional costs will also be at the expense of the Consultant.

6.8 INSPECTION

At all times, the Employer and the Consultant will have free entry to the Site and the Contractor will render assistance for the inspection of the borehole and/or any other operations.

On final inspection of the completed borehole, one field trip will be undertaken. A borehole camera inspection will be undertaken.

A consultant or someone appointed by the Employer, will be on site permanently, to supervise drilling activities.

6.9 INSTRUCTIONS

All instructions given by the Employer and/or the Consultant will be given in writing unless agreed differently by the parties concerned. It is mandatory that the Contractor shall obtain a pen-carbon instruction book which must be kept at Site for the recording of all instructions given by the Employer or the Consultant to the Contractor.

Written instructions given to the driller on the site, by the Employer and/or the Consultant, when the Agent or Contractor is not by the drilling machine, will be regarded as given to the Contractor.

6.10 CONTRACTOR'S RISKS AND RESPONSIBILITIES

All damages caused by the Contractor and/or workers or his machines, to private or public property on the Site, or on the way to the Site, will be the Contractor's responsibility and will be paid by him.

The contractor is responsible to adhere to all industrial safety laws of the Republic of Namibia.

6.11 ACCESS TO SITE

The Employer and/or the Consultant will be responsible for obtaining permission from community where the work for this Contract must be done, on behalf of the Contractor.

Before the Contractor begins with the Work, he must contact the community representative and notify them of the date of commencement of the Work at the Site. The Contractor must negotiate with the community or responsible persons at the Site for the supply of water and/or the use of firewood.

Access to site is the sole responsibility and for the account of the Contractor. Nevertheless, the Bidder shall make himself familiar with existing infrastructure and road conditions in the project area and take into consideration the necessity for road clearing and establishment of suitable access road to the drill sites on his behalf.

6.12 CONTRACTOR'S CAMP AND WORK SITE

At all times the Contractor must keep the Site tidy and clean, he must supply good housing and toilet facilities for himself and his workers with the least inconvenience to the community with regard to toilet facilities. The Contractor must clear the Site around the borehole of grass and bushes, excluding trees, unless they are obstructing the Works, after consultation with the community.

The Contractor must take all the necessary precautions to prevent field fires. All refuse, empty containers and all materials no longer of use after completion of each borehole, must be removed or buried at the Contractor's cost to the satisfaction of the community

The Contractor must make sure he complies with any further conditions in connection with the site and his camp as laid out in the Specifications.

6.13 STANDING TIME WITHOUT PAYMENT

After completion of the Work at a borehole or part completion, where inspection, tests or supervision is required, the Contractor must notify the Employer in writing or per telephone or by other suitable means of the required presence on Site of a representative of the Employer. A minimum period of 24 hours notice must be given by the Contractor to the Employer of his required presence, **and the Contractor must be prepared to stand for at least 24 hours, without payment**, for a representative of the Employer to do the necessary inspection, tests or supervision.

If the Contractor notifies the Employer by telephone, such telephone conversation must be confirmed in writing and the Employer will also record the message in writing.

If chemical analysis of a water strike is thought to be necessary by the Employer before borehole development or drilling deeper, the Contractor must also be prepared to stand for 24 hours, or a mutually agreed period of time, without payment, before continuing with the completion of the borehole.

The Contractor must notify the Employer in writing of the number of hours he had to stand for the Representative, or the result of any tests, within 24 hours after such period of standing.

In the event that the Employer approves payment for the standing time, payment will be in accordance with the tariffs stated in the Schedule of Quantities/Bills of Quantities.

Only 9 hours standing time per day will be paid if due after the first 24 hours.

No standing time will be paid when waiting for cement to dry.

6.14 EXTENSION OF TIME FOR COMPLETION

If the amount of extra or additional work or other special conditions which occur whatever the nature may be, is such that the Contractor can, in all fairness, claim an extension of time, then the Employer shall determine the period and grant it in writing. The Employer is, however, under no obligation to consider such an extension of time for extra or additional work or any other special conditions unless the Contractor, within 14 days after commencement of such work or after such conditions had been identified or occurred or as soon as practically possible thereafter, provide the Employer with complete and competent information of any claim for extension of time for which he qualifies and which he can justify, so that it can be processed and investigated immediately.

6.15 SUBMISSION OF ACCOUNTS

- **The Contractor must submit his signed accounts on a payment form consisting of a summary invoice and actual bill of quantity.**

- **Accounts may only be submitted once the borehole is fully completed as no payment will be made for partly completed boreholes.**

6.16 PAYMENT

All payments to the Contractor will be made in accordance with the monetary system of the Republic of Namibia.

Payment for any work will only be made if and when the Employer is satisfied that the Work for which payment is claimed, was done in accordance with the Work which is described in the Contract and which has been completed by the Contractor to the satisfaction of the Employer and/or the Consultant.

Payment for completed Work will be made within **thirty (30) days** after approval of the Contractor's accounts. The Contractor must submit his accounts in four fold on the prescribed forms and in accordance with the rates in the accepted Schedule of Quantities for the true quantity of completed work.

The Employer, however, reserves the right to subtract the value of any shortage in the quantity of screens and/or casings, or other materials, which the Employer has delivered to the Contractor, from the Contractor's account.

The Contractor will receive no payment for any item which is not specifically covered or mentioned in the Contract or for which the Employer or the Consultant did not issue written instructions.

The Contract price is based on estimated quantities and the Contractor will only be paid for the actual quantities as measured in accordance with the Specification and for which prices and rates have been included in the Schedule of Quantities.

10% of each invoice value will be held back as retention guarantee. This retention money will be paid back after six (12) months from the last invoice date.

6.17 ALTERATIONS, ADDITIONS AND OMISSIONS

- 6.17.1 The Employer has the right to make any alterations he deems fit in the format, quality or quantity of the Work which he thinks may be necessary or which may be feasible for that or any other purpose, and he may instruct the Contractor to do any of the following:
- 6.17.2 Increase or decrease the quantity of any work covered by the contract;
- 6.17.3 Omit any such work;
- 6.17.4 Change the nature, quality or type of any such work;
- 6.17.5 Alter the heights, lines, positions and dimensions of any part of the work and
- 6.17.6 Execute any additional work of whatever nature, which is necessary for the completion of the Works, and any such alteration will in no way invalidate the Contract, but the value (if any) of

all such variations must be taken into consideration when determining the final Contract price.

- 6.17.7 No alterations can be made by the Contractor without the written instructions of the Employer. No written instructions will, however, be necessary for an increase or a decrease in the quantities as shown in the Schedule of Quantities unless such an increase or decrease results from an instruction under this clause. Should the Employer or the Consultant for some reason consider that it is feasible to issue an instruction verbally, the Contractor must execute the instruction whereby any written confirmation of such verbal instructions by the Employer or the Consultant, being before or after the execution of the instructions, will be accepted as a written instruction covered by this clause. Should the Contractor confirm such verbal instructions by the Employer or Consultant in writing to the Employer or Consultant and such confirmation is not denied by the Employer or Consultant in writing, this confirmation will then be considered as a written instruction by the Employer or Consultant.
- 6.17.8 The Employer must determine the amount (if any) which must be added or subtracted from the Bid amount for any extra or additional work executed or work omitted on these instructions. All such work must be valued in accordance with the rates in the Contract unless the Employer states that these rates are not applicable. If no rates for extra or additional work are mentioned or included in the contract, reasonable rates must be agreed between the Employer and the Contractor, and such rates must, as far as possible, relate to the rates covered by the Contract.
- 6.17.9 Should the nature and the quantity of any omission or addition in relation to the nature or the quantity of the total Works or any part thereof be such that, in the opinion of the Employer, the rate or price in the Contract for any item of the work be such that the relevant omissions or additions makes it unreasonable or inapplicable, then under these circumstances the Employer, in agreement with the Contractor, may determine any other rate or price that he considers reasonable and applicable.

6.18 EVIDENCE OF INSURANCE

All Insurance as demanded by Contract deeds must be finalized before work for this Contract begins and in any case within two weeks after the successful Bidder has been notified that his Bid has been accepted. Copies of policies must be provided to the Employer for his records.

Third Party insurance must be obtained indemnifying the employer against any Third Party Claim.

In anticipation of the issuing of the formal policy documents, the successful Bidder must produce proof that his application of Insurance has been accepted. This proof will in the meantime be accepted by the Employer in place of the policies.

6.19 VARIATIONS IN PRICE

No price variations or variations in tariffs in the Schedule of Quantities, with regard to decreases or increases in prices, will be considered, except where such changes in price are due to statutory measures or as a result of any law or proclamation, with the understanding that any demand for price or tariff adjustments must reach the Employer within 30 days after completion of Contract and must be accompanied by documents to prove the demand.

6.20 LEGAL RIGHTS AND POWERS

Should the estate of the Contractor be sequestered, either provisionally or finally, or should the Contractor publish a notice of surrendering of his estate or submit a petition for the acceptance of the surrendering of his estate as insolvent or a compromise with his Creditors or surrender in favour of his Creditors or agrees to complete the contract under supervision of a Committee which represents his Creditors or (being a Company) goes into liquidation (other than voluntary liquidation for the purpose of amalgamation or restructuring) or should the Contractor transfer a contract without first getting written permission from the Employer or should execution be made of his goods or should the Employer be of opinion that the Contractor

- 6.20.1 gives up the contract;
- 6.20.2 without reasonable excuse failed, according to clause 7.1, to begin with or stopped work for 14 days after having received written notice from the Employer to proceed;
- 6.20.3 failed to remove material from the site, or to demolish and rebuild work, 14 days after receipt of written notice from the Employer that the said material or work was rejected;
- 6.20.4 does not do work according to the Contract or openly continues to fail in his responsibilities according to the Contract;
- 6.20.5 in detriment to good quality work or in spite of the Employer's opposite instructions lets part of the Contract;
- 6.20.6 failed to proceed with the Work with the necessary zeal;
- 6.20.11 Should the Contractor fail to carry out satisfactorily any command or instruction by the Employer after it has been given by virtue of the Contract or otherwise fail to carry out any duties which have been laid on him by virtue of the Contract, the Employer may, without impairment of any other rights or legalities, rectify such failure or have it done by his employees or agents and all costs which may be thus entailed, must be paid by the Contractor and will be due by him or will be subtracted from any amount due to the Contractor.

7. STANDARD SPECIFICATIONS FOR DRILLING

7.1. SCOPE

This Specification covers the requirements relating to drilling, reaming, supply and delivery of casing and screens, installation and extraction of casing and screens, transport of screens and/or casing supplied by the Employer, perforation of casing, supplying and placing of gravel pack, testing of boreholes, development of boreholes and other additional work as for example cementing of casing, sealing or partial sealing of boreholes, cleaning and repair of existing boreholes.

This Specification must be read with the Additional Specifications for this Contract. Should there be contradictions between this Specification and the General Conditions of Contract for Drilling and Rehabilitation of Boreholes or the Additional Specifications, the latter two shall be considered as correct.

7.2 STANDARD SPECIFICATIONS

The following Standard Specifications form part of this Specification when reference is made thereto. The Contractor must therefore, keep himself fully up to date on the latest addition of these Standard Specifications.

SABS 044	covering welding.
SABS 62	covering steel casing with outside diameter smaller than 165 mm with smooth ends.
SABS 455	covering welding electrodes.
SABS 626	covering cement.
SABS 719	covering steel casing with an outside diameter of 165 mm or more with smooth ends.
BSS 879	covering water well casing screwed flush butt joint
BSS 879	covering water well casing screwed and socked joints
SABS 966	covering Unplasticized Polyvinyl Chloride (UPVC) casing
BS 2782	covering plastic borehole casing.
BS 879	covering thread design for UPVC casing.
DIN 4925	covering UPVC well screens and plain casing, with lateral slotting and threaded joints.
BS 6316	covering test pumping of water wells.

7.3 MATERIALS

7.3.1 Steel Casing:

7.3.1.1 Manufacture and supply of steel casings

All steel casing supplied by the Contractor and which is installed in permanent boreholes, must comply with the Standard Specification SABS 719 (latest edition) for Electric Welded Low Carbon Steel Pipes for Aqueous fluids (ordinary duties - metric units).

- (a) Steel casing shall be fabricated from 3m or 6m lengths and be strip formed, rolled, or pressed to a cylindrical form with no joint or longitudinal seams. Steel casing must be plain (square) ended and bevelled for welding.
- (b) Welding of steel casing shall comply with the relevant SABS specifications for welding, and any inner weld reinforcement shall not exceed 1mm in height.

7.3.1.2 Material

- (a) All steel casings shall be manufactured from grade A carbon steel pipes.
- (b) The steel plate or strip used for the manufacture of the pipes shall have been produced by the electric-furnace, basic open hearth, or basic oxygen process and shall be free from seams, cracks, laminations and other injurious defects.
- (c) Test certificates are required

7.3.1.3 Wall thickness and diameter

Wall thickness of steel casing shall be at least 4.5mm subject to a tolerance of 8 % and the outer diameter as specified in the Bill of Quantities subject to a tolerance of 2%.

7.3.1.4 Pre-slotted steel casings

All casing shall be longitudinal welded and factory vertically slotted with different slot openings and slot lengths as indicated in the Bill of Quantities. The open area per one meter of slotted casing must be at least 5 %.

7.3.2 UPVC Casing:

7.3.2.1 Unless otherwise specified in the Additional Specifications, all UPVC casing supplied by the Contractor and which is installed in permanent boreholes, must comply with the DIN 4925 parts 1, 2 & 3 (latest edition) which prescribe Unplasticized Polyvinyl Chloride UPVC.

- (a) All plastic casings, screens and end caps shall be supplied with square-cut ends, and internal/external threads flush and in accordance with DIN 4925 for trapezoidal threads (DIN 103 part 1).
- (b) Fabrication shall be by one-shot moulding process. No jointing or welding will be acceptable within individual pipe lengths.
- (c) Casing shall be manufactured with impact-modified materials.
- (d) Thread specification must be according to DIN 103 part 1.
- (e) Screens must be slotted by machine slot.
- (f) **Casing shall have a minimum wall thickness of 9.5mm.**

7.3.2.2 Manufacture and supply of UPVC casings

Plastic water-well casing with plain surface and slotted screen shall comply with the DIN 4925, (latest edition),

7.3.2.3 Installation of UPVC Casing:

Unless otherwise specified in the Additional Specifications, all UPVC casing must be installed into the completed borehole with UPVC casing clamps. UPVC casing which is not threaded should be attached together with a commercially available "fast setting" solvent cement or glue and also secured in a manner approved by the Consultant.

7.3.2.4 Screens:

All screens to be installed into permanent boreholes will be of internal and external diameter and wall thickness as specified by the Employer in the Additional Specifications. The type, size of the screen opening and the percentage of open area on the screen will also be specified by the Employer in the Additional Specifications. Under no circumstances will screens be supplied and installed into boreholes without the installation instruction from either the Employer and/or the Employer's representative.

7.3.2.5 End caps

End caps must be threaded with socket threads for sealing the bottom of the casing string. The end cap must be plugged off with a 50 cm cement plug.

7.3.3 Cement

All cement which is used must comply with the Standard Specification SABS 626 and must be not older than three months. Unless otherwise specified in the Additional Specifications, a hardening agent such as calcium chloride should be used to accelerate the cement setting process. The normal aggregate size for use with the cement may not exceed 20 mm unless otherwise stated.

7.3.4 Concrete Block:

After the completion of the borehole to the specifications of the Consultant or the Consultant's Representative, the Contractor must excavate around the steel casing to a minimum depth of 0.80 m, and construct a concrete block with a diameter 0.6 m larger than the outside diameter of the conductor casing [standpipe] to avoid the steel casing from sinking and/or to avoid surface water from entering next to the casing. In all cases where no firm formation is available close to the surface on which the cement block can rest, the space around the casing up to 3 m below the ground surface must be filled with cement before the cement block itself is constructed.

The concrete block shall have a mix of one cement, three sand and six aggregate. If no concrete stone is available in the vicinity of the drill site, a mix of one cement and four sand will be acceptable. No mixes of ordinary soil and cement will be accepted.

7.3.5 Filter gravel

- (a) The filter gravel for water filtration shall comply with the standards as describe in DIN 19 632.

- (b) Filter sands and filter gravels according to these specifications are natural sands and gravel that prevent clogging of boreholes in sandy formations.
- (c) The particle size should be 2-3mm, well-sorted (half round to round particles) and acceptable gravel (not crushed or broken rock fragments, such as chipping etc.).
- (d) The mass content of silicon (IV) oxide must be not less than 90% SiO₂ content of impurities.
- (e) The appearance must particulate, approximately as closely as possible to spherical form.

8. STORAGE OF MATERIALS

8.1 Steel Casing

All steel casing, which will be permanently placed in boreholes, must be stored in such a manner that it is not in contact with damp or wet earth.

8.2 UPVC Casing

All UPVC casing which will be permanently placed in boreholes, must be stored in such a manner that it is not in contact with damp or wet earth. In addition the casing shall not be exposed to direct sunlight and should preferably be stored in containers or in a shaded place to the satisfaction of the Employer or Consultant.

8.3 Screens

All screens must be stored in a manner so that they are not in contact with damp or wet earth, and they must not be exposed to direct sunlight and must be handled carefully to prevent damage.

8.4 Cement

All cement must, during transport to the Site and whilst on Site, be protected against rain and dampness.

8.5 PROVISION OF CASINGS AND SCREENS

The Contractor shall be responsible to supply all casing and screens necessary to construct the boreholes as required.

8.6 TRANSPORT OF CASING AND/OR SCREENS

Transport of casing to and from the site will be the responsibility of the Contractor.

8.7 DRILLING FLUID

Unless otherwise specified in the additional specifications all drilling fluid should be of a biodegradable type of non-toxic drilling medium, has to be used as additive to the drilling fluid. Bentonite will in no case be accepted as additive. The Contractor must ensure that, if mud rotary drilling is specified by the Consultant or the Consultant's

Representative, he has the necessary equipment including mud pumps, viscosity measuring apparatus, water tanks etc., to enable him to successfully complete the Works.

9. DRILLING

9.1 General

For the purpose of this Contract, drilling work will be defined as the drilling of a borehole with a nominal diameter of between 150 mm and 400 mm.

9.2 Reaming

Reaming means the enlargement of any borehole to a nominal diameter larger than the drilled borehole diameter.

9.3 Boreholes where Gravel Pack must be supplied

This type of borehole must first be drilled to the depth and diameter as specified in the Contract. All sand, or other loose collapsible formation, must be cased off correctly, for the installation of the perforated casing and/or screens and the emplacement of the gravel pack.

9.4 Boreholes where Collapsible Formation is cased off

The following procedure must be followed with the emplacement of the gravel pack when the collapsible formation is cased off.

- 9.4.1 After the installation of the perforated casing and/or screens, the gravel pack is poured into the annulus between the perforated casing and the formation by means of a tremi-pipe. It is very important that gravel is poured at a slow rate to avoid any blockages. Tests have proven that a rate of about 20 litres of gravel per minute is safe.
- 9.4.2 The gravel pack must be placed to at least 8 m above the perforated casing and/or screens before development of the borehole can begin.
- 9.4.3 The Contractor must ensure that the portion of the borehole above the gravel pack up to the surface must remain open to enable the addition of more gravel pack if necessary.
- 9.4.4 After completion of the borehole development, the Contractor must ensure that the gravel pack is stabilized up to the prescribed height of 8 m above the perforated casing and/or screens.
- 9.4.5 The outer temporary casing, if any, must then be removed and the borehole must then be further filled to the surface with sand, soil, or any other acceptable material.

9.5 Boreholes where the collapsible Formation is kept stable with Drilling Mud

The following procedure must be followed when drilling mud is used for drilling:

- 9.5.1 The perforated casing and/or screens must be installed to the drilled depth of the borehole while the borehole is filled with drilling mud and is stable.
- 9.5.2 The gravel must then be placed up to the prescribed height above the perforations, again at a slow rate to avoid blockages. As there are in this case no outside casing pipes to cut off the collapsible formation, it is only necessary to measure the gravel height at regular intervals to insure that no blockages have occurred. It is recommended that a lead plum line is used to measure the height of the gravel pack. As an alternative to the above method a Tremie pipe can be used to place the gravel around the screen. Contractors are recommended to read the publication by Johnson "Ground Water and Wells" on the different methods of placing gravel pack material.
- 9.5.3 After the emplacement of the gravel pack, the borehole must stand for at least 48 hours before development of the borehole can begin.
- 9.5.4 The outer temporary casing, if any, must then be removed and the borehole must then be further filled to the surface with sand, soil, or any other acceptable material.
- 9.5.5 If the Consultant is of the opinion that all the drilling mud has not been removed with the development of the borehole, he may instruct the Contractor to use a suitable solvent to insure that the gravel pack and surrounding aquifer formation is clean.
- 9.5.6 After completion of the development process, the Contractor must ensure that the gravel pack has stabilized to the prescribed height of 8 m above the perforated casing and/or screens and the borehole can then be backfilled as previously described.
- 9.5.7 The above instruction can be changed by the initiative of the Employer.

9.6 Collection of Drill Samples

If not stated otherwise, unwashed drill samples must be taken at every meter of drilling as well as at a change of formation in between such an interval. After completion of the borehole the dried samples must be placed into sample trays, which have to be obtained by the contractors themselves prior to the commencement of the work. The sample trays are to be size 10 x 40 or similar. The borehole number and the depth of the samples will be marked with a black waterproof marker on the trays. The sample trays containing samples have to be handed over to the Consultant or the Consultants Representative with the final invoice or prior.

The cost for the trays, pen, sampling and transportation are included in the unit prices for drilling. The head driller is obliged to control the sampling depth in consultation with Consultant or the Consultants Representative at all times.

9.7 Completion of Borehole with UPVC Casing

Unless otherwise specified in the Additional Specifications, upon the successful installation of the UPVC casing to the required depth and the satisfactory emplacement of gravel pack and/or suitable backfill material and development to the satisfaction of the Employer or the Consultant, the borehole must be completed by installing steel casing of a length of 3 meters or more and a nominal diameter larger than the UPVC casing. The

steel casing must surround the UPVC casing and must protrude 0,5 meters above ground level. This steel casing should then be cemented in the usual way specified in clause 8.3.4.

9.8 Capping of the Borehole and Inscription of Numbers on Concrete Block

The casing must protrude 0,5 m above the ground surface unless otherwise specified by the Employer or Consultant, and a circular steel cap of at least 4 mm in thickness must be welded on each completed borehole.

The borehole number must be welded onto the lid and onto the casing pipe and must be clearly marked on the concrete block.

Successful boreholes must be marked with the letter "X" and unsuccessful boreholes must be marked with the letter "Z".

9.9 Provision of Plug for Water Measurements

Unless otherwise specified by the Employer or the Consultant every borehole should be fitted with a small pipe socket hole of approximately 75mm diameter which should be fitted with a plug, to enable water level measuring apparatus to be lowered into the borehole.

9.10 Borehole Installation

Grain sizes of the gravel and metric properties of the casing to be installed are given in the Bill of Quantities. The Contractor is obliged to present to the Consultant or the Consultant's Representative sieve analysis of the gravel to be installed during execution of each work order. The quality and properties of the casing material to be installed must be documented by an official certificate of the manufacturer of the casing to be used during execution of each work order. The Ministry of Agriculture, Water and Forestry reserve the right to perform analysis of the gravel and the casing material any time during the execution of a specific work order.

9.11 Backfill

Suitable material must be used to backfill the hole above the gravel pack. The gravel pack must be placed at least 10 m above the top of the upper-most screens.

9.12 Development

Each borehole shall be developed directly after drilling.

In soft collapsible formations

A mechanical double-packer system in combination with air-lifting or a submersible pump shall be used, mounted in a way to enable flushing the borehole in sections of 1 m maximum distance between the packers. The entire saturated section must be developed in this manner. RWL and PWL's should be recorded. A minimum of 6 hours development is to be undertaken in collapsible formation.

In hard formations

Development by blow testing is acceptable. If the contractor has to wait a certain period during blow testing sessions, especially with low yielding boreholes, for the borehole to recover, he will not be able to claim standing time for the aforementioned periods.

At the end of development the borehole should be cleaned from the bottom of the hole and all debris must be removed.

9.13 Pumping Tests

Unless otherwise instructed by the Ministry or its Consultant all Test Pumping must be undertaken according to SABS 0299 (1998), part 4, Clause 4, Paragraph 4.2.1.2:

- Step 1: one-third of the expected yield
- Step 2: two-thirds of the expected yield
- Step 3: equal to the expected yield
- Step 4: one-and-a-half times the expected yield

Unless otherwise specified, no test pumping can be undertaken without the prior consent of the Ministry or its Consultant.

9.13.1 Step multi-rate test

The pumping test shall comprise a step multi-rate test at 4 different rates of 2 hours each, unless otherwise specified by the Employer or the Employer's representative, continuously executed with no recovery between. A recovery test is then undertaken immediately at the end of the 4th step of the Step multi-rate test. During the recovery period, the pump and the riser pipes of the pumping test unit must remain in the borehole. The observed recovery period is normally as long as the duration of the discharge, provided that 95 % of the drawn down water level has recovered, i.e. recovery water level has reached (RWL/PWL x 100). The point of discharge of the pumped water must be at least 200 m away from the borehole site. Discharge measurements shall be carried out using a suitable container together with a stopwatch. A suitable container is one, which will be filled up in approximately 20 seconds.

Water level measurements will be taken with an electrical contact gauge accurate to 5mm. A minimum diameter 25mm pipe (piezometer) should be built into the borehole for monitoring (taking reading) of the water level. Draw down, Electric Conductivity (EC) and the discharge rate must be measured and recorded according to the time intervals given in the appropriate forms (Appendix 3.4).

9.13.2 Constant Discharge Test

Constant Discharge tests will be necessary for every successful borehole and will be executed according to BS 6316. The duration of the Constant Discharge Test is 8 hours or as prescribed in the Additional Specifications for this Contract. However the test duration may differ and this will be specified by the Employer or the Employer's representative. A recovery test is then undertaken immediately at the end of the constant discharge test.

9.13.3 Groundwater Sampling during the Test Pumping

Before the pump is switched off, a groundwater sample has to be taken. The sample has to be filled in a clean and unused 1-ltr-PVC bottle. The Contractor has to obtain his own bottles from the suppliers, to the work. Odd bottles such as Coke-bottles or other is not acceptable. The bottles have to be marked with the borehole number and the date and time of the sampling. The form "Groundwater Sampling" (Annexure 12) must be completed for each sample. The bottles have to be kept cool and must be protected against sunlight. A transport to the Ministry of Agriculture, Water and Forestry must be organised at least every two weeks during the contract period by the Contractor. Remaining bottles must be handed back to the Ministry of Agriculture, Water and Forestry latest with the final invoice.

10 UNSUCCESSFUL BOREHOLES

In case a borehole drilled unsuccessful the stand pipe should be left in the ground with the borehole number welded on it. The stand pipe must be sealed off with a suitable plate. A 50 mm square ended plug must be fitted on top of the plate.

11 ABANDONMENT

The Kunene Regional Council shall have the right at any time during the progress of the Work, to order the abandonment of the borehole.

The Contractor there upon shall withdraw the casing from the borehole, if applicable, and salvage or attempt to salvage all such materials as the Employer or his Consultant shall direct and/or up until the Employer or his Consultant revokes such direction, and shall fill in or leave the borehole to the satisfaction of the Employer or the Consultant.

Payment shall be made for such abandoned boreholes at the rates and tariffs shown in the Schedule of Quantities.

12 LOST BOREHOLES

Should any accident to the Plant, jamming of the tools or casing prevent the satisfactory completion of the Works, the borehole shall be deemed to be lost and no payment shall be made for this borehole or for any materials not recovered there from, nor for any time spent during drilling operations or while attempting to overcome problems.

Any casing which is not recovered from the lost boreholes in good condition, shall be replaced immediately by the Contractor at his own expense.

In the event of a lost borehole, the Contractor shall drill a borehole adjacent to the lost borehole or at a site indicated by the Employer or the Consultant. The option of declaring any lost borehole shall rest with the Contractor, subject to direction from the Employer or the Consultant.

13 TOLERANCES

13.1 General

Drilling work must be done strictly according to the tolerances listed hereunder and the measurements made by the Employer or his Consultant will be accepted as correct according to the stipulation of the Tolerances. Should drilling work deviate from the tolerances, the Employer reserves the right to do replacement or remedial work at the Contractors cost.

13.2 Erection of Drilling Machine at Borehole Site

The drilling machine must be erected at the borehole site in such a way that the hole will be drilled within 500 millimetres of the geological peg or other mark which is shown to the Contractor by the Employer or the Consultant.

13.3 Diameter of Boreholes

The drilled or reamed diameter of boreholes may normally vary between 150 mm and 450 mm, unless stipulated differently in the Additional Specifications. The required nominal diameter, as specified in the Contract is a minimum diameter, and must be maintained for the full depth of the borehole, unless otherwise desired or approved by the Employer or the Consultant.

13.4 Depth of Borehole

The final completed depth of the borehole, must, when measured by the Employer or the Consultant, be not less than one meter, or deeper than 3 meters, than the specified depth of the borehole.

13.5 Verticality

All completed boreholes with a final diameter as specified must be vertical, unless it has been specifically stated under the Additional Specifications. When the Employer or the Consultant is of the opinion that the permissible deviation has been exceeded, the real deviation will be measured and the Contractor must help with the measuring should it be required of him.

13.6 Straightness

A borehole of any nominal diameter must satisfy a test where a pipe ("dummy") at least 6 meters long and of 50 mm (2 inch) in diameter narrower than the hole, can freely be passed down to the bottom of the borehole without force.

Failing this test the borehole will have to be reamed / re-drilled at the expense of the Contractor.

13.7 **Placing of Casing**

All casing placed in the borehole, whether it be for temporary purposes or for a permanent installation, must be linearly welded. **Slotted casing or screens placed in boreholes must be provided with centralisers, before the emplacement of gravel pack. Centralisers for steel casing must be constructed from 6 mm round steel and welded lengthwise. One set of 2 spacers minimum must be provided for every 6 meters of casing or screen.**

Centralisers made for UPVC casing must fit over the outside diameter of the casing. The casing and screens must fit into the borehole with the minimum of play and hold the casing in the middle of the borehole.

13.8 **Welding of Steel Casing and/or Screens**

All welding joints for steel casing and/or screens must satisfy the Standard for welding as described in SABS 044 and must form a tight joint with a smooth lining on the inside of the casing. Welding rods (electrodes) used must satisfy the requirements as in the Material clause 3.8 and if so desired by the Employer, the welding joints inside and outside of the casing or screens must be painted with epoxy tar.

14 **PRESSURE GROUTING**

Pressure grouting works shall be in accordance with JOHNSONS "Groundwater and Wells", second edition by DRISCOLL [pages 317-333 and 888].

15 **LOCALISATION OF BOREHOLES**

The lateral topographic coordinates of each borehole have to be measured by handheld GPS in Decimal Degrees and documented. The reference system for the GPS is the Bessel 1841 Spheroid with the WGS 84 Datum.

16 **INSTRUCTIONS REGARDING THE DRILL SITES**

16.1 **Preparation of Drill Sites**

The Contractor will have to make his own interpretation of the necessary works for preparation of drilling site and has to state the works in the Bidding Documents. It is required from the Contractor to use only the space necessary for the setting up of his drill site.

16.2 **Power Supply**

The Contractor shall provide its own power supply wherever needed.

16.4 **Water Supply**

The Contractor shall make his own water supply arrangements with respect to the drilling and associated works.

16.5 Fuel Supply

The Contractor shall make his own fuel supply arrangements. Fuel shall be stored on site in suitable containers, with appropriate fire extinguishers available. The filling process must be executed in a contained designated area, and in such a way, that no spillage takes place.

16.6 Accommodation

The Contractor shall make his own arrangements.

16.7 Environmental Issues

Oil, lubricants and fuel shall be stored on site in suitable, clearly marked containers. The filling/application process must be executed in such a way, that no overflow and contamination of the environment takes place. Any routine maintenance work on any of the Contractors equipment on site is prohibited. Necessary repair works must be carried out with due diligence in order not to contaminate the environment. In case of a contamination of the environment, any further steps –provided it is not an emergency case- must be discussed and agreed on with the Consultant or the Consultant's Representative prior to any steps taken. All minor oil- or fuel-spills have to be dug out and burned in an open fire.

17 PERSONNEL

Contractors are instructed to employ only Namibian citizens when requiring the need for unskilled labour. The unskilled labour should also preferably be hired in the village where the drilling activities take place.

18 DEFECTIVE WORKS

The Kunene Regional Council or its Representative has the right to refuse the acceptance of the borehole completely or in parts in case of defective works and declared as abandoned. Reasons for the refusal may be for instance (but not limited to):

- No or uncompleted samples of cuttings have been gained.
 - Losses of drilling fluid/mud have not been recorded.
 - The required documentation is insufficient.
 - The drilling diameters do not correspond to the Contract and the change of it has not been agreed in writing.
 - The type of casings and screen do not correspond to the Contract prescriptions.
 - The final depth has not been attained.
 - The required pumping tests are not performed or not performed properly.
- In case that the borehole is refused, no payment would be made.

20 DOCUMENTATION AND PROJECT MANAGEMENT

20.1 General

- (a) The Contractor is obliged to document all the work done and all events occurring during the period of the contract. Any foreseeable delay and any expected increase in costs must be communicated in writing in advance. No payment will be made if the contractual sum is exceeded, without obtaining giving prior approval by the Kunene Regional Council.
- (b) All forms must be completed where applicable and submitted as signed hardcopies. It is the responsibility of the Contractor to provide a sufficient number of copies of the forms as well as carbon copy paper to enable the completion of the forms in the field.

20.2 List of Equipment and Personnel

- A completed List of Equipment (Annexure 1) and List of Personnel (Annexure .2) available for the execution of the works must be submitted with the bidding document.
- The Bidder shall provide curriculums vitae (CV's) of all key staff members to be used on the project, including education, background, experience on similar projects and with the devices intended to be used.
- Only relevant projects carried out in the last three years together with contact details of the Employer/Client/Sponsor of the specific projects, accomplishments and other pertinent information shall be submitted.
- For key personnel from foreign countries, also relevant projects carried out in their home countries in the last three years together with the details mentioned above must be submitted.
- A specific List of Equipment (Annexure 1) and List of Personnel (Annexure 2) has to be submitted for each work order signed.
- Any changes to any of these documents require the written approval of the Kunene Regional Council

20.3 Project Communication List

- A completed Project Communication List (Annexure 3) containing the people involved in the project with applicable contact details must be submitted for each work order signed. * Any changes hereto have to be submitted in writing to the Kunene Regional Council.
- It is the obligation of the contractor to ensure, that the contact details of his personnel remains valid during the project period.

20.4 Project Plan

- The project plan for the drilling activities (see Annexure 4 of this document and FIDIC Part II, Sub-Clause 14.1) has to be submitted with each work order signed. Any changes hereto require the written approval.
- The plan must at least indicate the time requirements for the following tasks per borehole:
 - Mobilisation, inter-hole movement ;
 - Drilling;
 - Test pumping;

20.5 Daily Drilling Record

- The Daily Drilling Record (Annexure 5) has to be completed for every day of any construction period, when drilling activity is taking place.
- A signed copy of it must be provided whenever a site visit takes place or on special request.

20.6 Borehole Completion Report

The Borehole Completion Report (Annexure 7) has to be completed and must accompany the invoice.

20.8 Drilling Record

The form 'Drilling Record' (Annexure 8) has to be completed concurrently during the drilling process and should accompany the invoice.

20.9 Development Record

The form 'Development Record' (Annexure 9) has to be completed concurrently during the development process must be accompanied the invoice.

20.10 Hydraulic Testing

- (a) The form for the Step-Drawdown-Test (Annexure 10) must be completed where applicable for each hydraulic test must accompany the invoice.
- (b) Main Discharge Test will be necessary for the borehole and will be executed according to BS 6316. The form for the Main Discharge Test must be completed where applicable (Annexure 11). The duration of the Constant Discharge Test is 8 hours or as prescribed in the Additional Specifications for this Contract. However the test duration may differ and this will be specified by the Employer or the Employer's representative. The Constant Discharge Test (Main Discharge Test) comprises two phases. The first being the pumping phase, the second being the pump off phase (recovery). The water level in the bore is measured prior to the pumping being started, during pumping, and after the pump is turned off, until the water level reaches what it was before the pump was turned on or 95 % the static water level has been reached.

20.11 Groundwater Sampling

The form for Groundwater Sampling (Annexure 12) must be completed for the groundwater sample taken and must accompany the invoice.

20.12 Instruction to Contractor/Consultant

Each Instruction to Contractor/Consultant must be done in writing using the form supplied in Annexure 13. Instructions are only valid, if both parties have signed the specific form sheet. Objections of the Contractor against an instruction must be specified on the specific form indicating also possible consequences. However, only in cases of endangering the Contractors equipment or personnel, the Contractor has the right to ignore an instruction.

20.13 Change Requests

For any change of the contractually agreed procedure the form 'Change Request' (Annexure 14) must be used and the Kunene Regional council or the representative shall approve a Change Request before it can be applied.

20.14 Site Register

The contractor must be in possession of a Site Register, that is to be used at all times and must be open for scrutiny by the consultant and Employer or Employer's Representative. Any official site visit by the Ministry of Agriculture, Water and Land Reform, the Consultant or Consultant's Representative or any representative of local governmental authorities or affected third parties must be documented using the form 'Site Visits' as provided in Annexure 15.

20.15 Meetings

- (a) The Employer , or the Representative shall chair all project meetings. For all non-regular or non-scheduled project meetings a minimum of five working days notice shall be given by either party depending on which party has initiated the meeting. An agenda shall be provided latest 24 hours prior to all regular or scheduled meetings to all affected parties. For all non-regular or non-scheduled project meetings the party who has initiated the meeting shall provide the agenda latest 24 hours prior to the meeting.
- (b) At all meetings minutes must be minuted and kept by the Employer or the Representative. In case a meeting is held without the presence of the Employer Representative, the Contractor must keep the minutes. A draft version of the minutes must be circulated amongst the parties for their input at 9:00 a.m. on the next day after the meeting. Latest three days after submission of the draft minutes, the input of all parties should be available and the final version should be submitted on the next day thereafter for signature.

20.18 Penalties

- Without prejudice to any other clause in this contract, each failure to comply with the specifications given regarding the management of the project and each unprofessional, incomplete, improper completion or not timely submission of any of the above mentioned forms will result in a deduction of **N\$1,500** per form.

- If the Contractor fails to complete the Works within the Time for Completion, as stated in the Letter of award, the Contractor will be penalised with N\$2,500 per day for each day that he/she has failed to complete the work on time.

21 DELAYS AND INTERRUPTION OF WORKS

- It is the obligation of the Bidder to commence the work not later than fourteen (14) days after the issue of each “Letter of Award”. After commencement of works, it must be executed without any delays or interruptions, unless approved by the Employer or the Employer’s Representative.
- Any technical breakdown exceeding 24 hours will be judged to be an interruption. The impact of frequent breakdowns will be valued and judged on and in due consultation with the Bidder and the Employer on a case-by-case basis. Delays and interruptions will be handled and compensated for according to the specifications as listed under headings 6.6 and 6.7.

22 RIGHT OF AUDIT

The Kunene Regional Council will have the right to audit all records of the Contractor related to the Services anytime to verify the expenditures.

23 RIGHT OF SUPERVISION

Employer reserves the right at any time during the drilling period to employ another person acting as a supervisor on his behalf. This person will have the same rights and permissions as the Kunene Regional Council and has to be accepted like that by the Contractor.

24 SUBCONTRACTING OF WORK

In the event of a successful Contractor not being able to start, carry out or complete work that they were officially appointed for, they are allowed to subcontract the work to another suitable contractor. The subcontracting of work to another contractor **must be approved in writing by the Employer. The original contractor, to whom the Letter of Award or Official Work Order has been issued to, will remain liable for the successful completion of the work and all payments for work successfully completed, will be made to them, and not to a subcontractor. The original contractor will also be held responsible for the submission of the required forms.**

List of Personnel

Project:

Contractor:

Key Personnel			
Name	Position	Responsibility	Authorisation
			Accepting Instructions without financial Implications
		<input type="checkbox"/> Intermittently	Accepting Instructions with financial Implications
		<input type="checkbox"/> Continuously	Making Decisions without financial Implications
			Making Decisions with financial Implications
		<input type="checkbox"/> Intermittently	Accepting Instructions without financial Implications
		<input type="checkbox"/> Continuously	Accepting Instructions with financial Implications
			Making Decisions without financial Implications
		<input type="checkbox"/> Intermittently	Accepting Instructions with financial Implications
		<input type="checkbox"/> Continuously	Accepting Instructions without financial Implications
			Making Decisions with financial Implications
		<input type="checkbox"/> Intermittently	Accepting Instructions with financial Implications
		<input type="checkbox"/> Continuously	Accepting Instructions without financial Implications
			Making Decisions with financial Implications
		<input type="checkbox"/> Intermittently	Accepting Instructions with financial Implications
		<input type="checkbox"/> Continuously	Accepting Instructions without financial Implications
			Making Decisions with financial Implications
		<input type="checkbox"/> Intermittently	Accepting Instructions with financial Implications
		<input type="checkbox"/> Continuously	Accepting Instructions without financial Implications
			Making Decisions with financial Implications
Other Personnel			
Function	Number		
Drivers for Rig and Trucks			
Drivers for cars			
Drilling Assistants			
Handy Men			

Signature:

PROJECT PLAN

Project: _____

Contractor: _____

Summary					
WW Number	Task Name	Resources used	Duration [day]	Date of Start	Date of Finish
(first borehole)	Mobilisation				
	Drilling				
	Developing				
	Test Pumping				
(last borehole)	Interhole Movement				
	Drilling				
	Developing				
	Test Pumping				
	De-Mobilisation				

Signature: _____

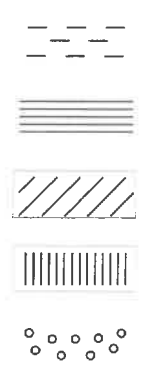
Date: _____

DAILY DRILLING RECORD						
Borehole No: WW					Agency:	
Date:					Page 1 of 2 pages	
DRILLING						
DIAMETER mm	FROM m	TO m	TOTAL M	MEDIUM	REMARKS	
REAMING						
DIAMETER		DEPTH				
FROM m	TO m	FROM m	TO M	TOTAL m		
CASING INSTALLED						
TYPE	OD mm	WT mm	PLAIN m	PERF. M	DEPTH	
					FROM m	TO m
CASING RETRIEVED						
TYPE	OD mm	WT mm	PLAIN m	PERF. M	TOTAL m	
OTHER ACTIVITIES						
ITEM			UNIT	QUANTITY		
MOBILIZATION			LS			
DEMOBILIZATION			LS			
ERECTION AT SITE			LS			
DISMANTLING AT SITE			LS			
INTERHOLE MOVE			Km			
CASING TRANSPORT			Km			
WATER TRANSPORT (min 10 m ³)			Km			
GRAVEL SUPPLY			m ³			
GRAVEL TRANSPORT			Km			
GRAVEL EMPLACEMENT			m ³			
CEMENT			50 kg			
BOREHOLE CAP			LS			
ENDPLUG			LS			
INSCRIPTION BOREHOLE No			LS			
CONSTRUCTION HEADWORKS			LS			
CENTRALICERS (Sup. & Inst)			Ea			

Weekly Report	
Project:	Contractor:
For the period from to	Date:
Accomplishments for this report period are:	
We are <input type="checkbox"/> ahead, <input type="checkbox"/> behind, <input type="checkbox"/> on schedule	
Budget: <input type="checkbox"/> in budget, <input type="checkbox"/> budget overspent, <input type="checkbox"/> budget underspent	
Changes to project objectives:	
Problems re encountered that were originally unanticipated?	
Changes needed?	
Additional problems <i>anticipated</i> :	
Action steps planned to take:	
Comments:	

Signature:

1 SKETCH/MAP	

BOREHOLE DESIGN	
SPECIFICATIONS	
	

STEP DRAWDOWN TEST FORM

App.3.4

Contractor Name: _____ Page: _____ of: _____
 Location: _____ Borehole No: _____
 Map Sheet No: _____ Elevation: _____ masl
 Latitude: _____ Longitude: _____
 Test: _____ Step test Duration: _____ hours
 Test borehole/observation: _____ Date: _____ / _____ /19 _____
 Rest water level before start if test: _____ m Date: _____ / _____ /19 _____
 Pumping depth: _____ m Borehole depth: _____ m
 Diameter: _____ mm Distance from pumped borehole: _____ m
 Direction from pumped borehole: _____ m Water samples: _____

PUMPING WATER LEVELS					RECOVERING WATER LEVELS			COMMENTS
Clock Time [hh:mm]	Pump Time [min]	Water Level [m b collar]	Flowmeter Reading [m ³ /h]	EC [S/cm]	Start Time [min]	Recovery Time [min]	Water Level [m b collar]	
	1					1		
	2					2		
	3					3		
	4					4		
	5					5		
	7					7		
	10					10		
	15					15		
	20					20		
	25					25		
	30					30		
	35					35		
	40					40		
	50					50		
	60					60		
	70					70		
	80					80		
	90					90		
	100					100		
	110					110		
	120					120		
Drawdown:					Recovery:			
	1					1		

	2					2		
	3					3		
	4					4		
	5					5		
	7					7		
	10					10		
	15					15		
	20					20		
	25					25		
	30					30		
	35					35		
	40					40		
	50					50		
	60					60		
	70					70		
	80					80		
	90					90		
	100					100		
	110					110		
	120					120		

 = fields don't need to be completed

MAIN DISCHARGE TEST FORM

Pumptest Readings SR _____
 FROM _____

Borehole at: _____ Borehole
 Nr: _____

TEST: _____

DURATION: _____ TIME: _____ DATE: _____

Rest Water Level: _____ Borehole depth: _____

Diameter: _____ Pump depth: _____ Observation-/Test borehole ?

Distance from production hole: _____ Water

Samples: _____

PUMP					RECOVERY			REMARKS
Clock Time [hh:mm]	Pump Time [min]	Water Level [m b collar]	Flowmeter Reading [m ³ /h]	EC [S/cm]	Start Time [min]	Recovery Time [min]	Water Level [m b collar]	
	1					1		
	2					2		
	3					3		
	4					4		
	5					5		
	7					7		
	10					10		
	15					15		
	20					20		
	25					25		
	30					30		
	35					35		
	40					40		
	50					50		
	60					60		
	75					75		
	90					90		
	105					105		
	120					120		
	150					150		
	180					180		
	210					210		
	240					240		

FORM FOR GROUNDWATER SAMPLING

Contractor:		Name:	
Project:			
File-No.:		WW-No.:	TopoWell No.:

DESCRIPTION OF SAMPLED SITE

Diameter of casing:	<input type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 5" <input type="checkbox"/> 6" <input type="checkbox"/> 8" <input type="checkbox"/> 10" (25.4 cm)		
	other _____		
Description of casing:	<input type="checkbox"/> steel <input type="checkbox"/> concrete	<input type="checkbox"/> PVC <input type="checkbox"/> open borehole	Well Cap <input type="checkbox"/> SEBA <input type="checkbox"/> other _____ <input type="checkbox"/> none

DETAILS OF SAMPLING

Date (DD/MM/YY)		Time (hh:mm)	
Sample bailed	<input type="checkbox"/> yes <input type="checkbox"/> no	Pumped	<input type="checkbox"/> yes <input type="checkbox"/> no
Bailed with		Pump type	<input type="checkbox"/> suction pump <input type="checkbox"/> submersible pump <input type="checkbox"/> mono pump
free flow (artesian)	<input type="checkbox"/> yes <input type="checkbox"/> no		
Estimated yield	m ³ /h	Pump rate	m ³ /h
Other:			
time (hh:mm)	temp (°C)	cond* (mS/m)	pH
waterlevel (m b. TC)	Colour	odour	Sediments
			<input type="checkbox"/> yes <input type="checkbox"/> no

* 10 microsiemens/centimetre = 1 millisiemens/meter

Manner of sample transport	<input type="checkbox"/> cooled <input type="checkbox"/> not cooled	Date of Submission to Laboratory	
-----------------------------------	--	---	--

Signature: _____ Date: _____

