PROVINCIAL ADMINISTRATION OF KWAZULU-NATAL
DEPARTMENT OF PUBLIC WORKS

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

BILLS OF QUANTITIES

with GCC for Construction Works - Second Edition 2010

RETURNABLE DOCUMENT

ONE VOLUME APPROACH

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

Engineer/Principal Agent
Hospital Design Group
8 Farquhar Road
Ladysmith
Ladysmith
3370
036-631 4715 - Tel Number
036-631 1806 - Fax Number
kzn@hdg.co.za

Architect
Hospital Design Group
8 Farquhar Road
Ladymsith
3370
036-631 4715 - Tel Number
036-631 1806 - Fax Number
kzn@hdg.co.za

Employer:
Head: Public Works
KZN Department of Public Works
Private Bag X 9041
PIETERMARITZBURG
3200
Tel Number: 033 - 8971300
Fax Number: 033 - 8971399

Region:
Head Public Works: Operations
KZN Department of Public Works
X9041
Pietermaritzburg
3200
Tel Number: 033 - 8971300
Fax Number: 033 - 8971399

Tender Number:	ZNTL 05094W	Project Code:	WIMS No. 078856
CIDB Grading:	6CE	Document Date:	28-Aug-2023
ECDP Number:	N/A	Contract Period:	10 Calendar Months

Contracting Party: _____

CIDB Registration number: _____

Central Suppliers Database Registration Number: _____

PROVINCIAL ADMINISTRATION OF KWAZULU-NATAL
DEPARTMENT OF PUBLIC WORKS

BILLS OF QUANTITIES

FOR

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

Quantity Surveyor

EI & Sons Cost Consultants
P O Box 1251
Ladysmith
3370
Tel Number 036-631 1710
Fax Number 036-631 1601
oliver@elsons.co.za

Civil/Structural Engineer

Sivest SA (Pty) Ltd
P O Box 707
Pietermaritzburg
3231
Tel Number 033-347 1600
Fax Number 033-347 5762
simonj@sivest.co.za

Employer

Head: Public Works
KZN Department of Public Works
Private Bag X 9041
PIETERMARITZBURG
3200
Tel Number: 033 - 8971300
Fax Number: 033 - 8971399

Region

Head Public Works: Operations
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Tender Number: **ZNTL 05094W**

Project Code: **WIMS No. 078856**

CIDB Grading: **6CE**

Document Date: **28-Aug-23**

ECDP Number: **N/A**

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

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IMPORTANT NOTICE TO TENDERERS

Any reference to words Tender or Tenderder herein and/or in any other documentation shall be construed to have the same meaning as the words Tender or Tenderer. These forms are for internal and external use for the KZN Department of Public Works, Provincial Administration of KwaZulu-Natal.

"Quality" shall mean totality of features and characteristics of a product or service that bears on the ability of the product or service to satisfy stated or implied needs.

No alternativeTenders will be accepted.

The Total (Including Value Added Tax) on the Final Summary of the Bill of Quantities must be carried to the "Offer" part only of the Form of Offer and Acceptance - T2.21

"Enterprise" shall mean the legal Tendering Entity or Tenderer who, on acceptance of the Offer, would become the contractor"

KWAZULU-NATAL PROVINCE
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MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

THE TENDER

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
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MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

PART T1. - TENDER PROCEDURES

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

T1.1 - TENDER NOTICE AND INVITATION TO TENDER

T1.1 TENDER NOTICE AND INVITATION TO TENDER

THE KZN DEPARTMENT OF PUBLIC WORKS INVITES TENDERS FOR THE PROVISION OF:

Project title:	**- MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**
Advertisement date:	**18 August 2023**	**Closing date:**	**28 August 2023**
Closing time:	**11:00**	**Validity period:**	**84 Calender Days**

It is estimated that tenderers must have a CIDB contractor grading designation of 6CE or higher. No alternative Class of work, as refered to in Clause 25(3)(a)(i) of the CIDB Regulations, as amended, is anticipated for this project.

	It is estimated that Potentially Emerging enterprises should have a CIDB contractor grading of ***(N/A)*** and satisfy the criterion stated in the Tender Data. *(Only applicable if Client has an Official Mentorship programme in place to assist potentially emerging enterprises)* All Tenderer's should have a CIDB Class of Construction Contractor Grading Designation as indicated above. No Tenderer with a PE status can be considered If **"N/A"** is indicated above because the Department does not have an Official Mentorship Programme in place to assist a Potentially Emerging Enterprise.

Only Tenderder's who are responsive to the following responsiveness criteria are eligible to submit Tenders:

X	Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations for a : 6CE or higher, class of construction work, are eligible to have their Tenders evaluated.
X	Joint ventures are eligible to submit tenders provided that: 1 every member of the joint venture is registered with the CIDB; 2 the lead partner has a contractor grading designation in the 6CE or higher, class of construction work; or not lower than one level below the required the required grading designation in the class of works construction works under considerations and possess the required recognition status 3 the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a : **6CE** or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations.
X	Tender document must be properly received on or before the tender closing date and time specified on the invitation, fully completed and signed in ink (All as per Standard Conditions of Tender).
X	Submission of Compulsory Returnable Schedules documents as per List of returnable documents.
X	Tax Compliance Status (TCS) PIN number and Tenderder's or entity tax reference number.
X	Contractor's Safety, Health and Environmental Declaration.
X	Complete priced Bill of Quantities to be submitted on the day of the Tender closing date.
X	Proof of good standing with the Compensation Commissioner - In terms of Section 84(1)(b) of the Compensation for Occupation Injuries and Disease Act, 1993, a Tenderder may not be awarded a contract if he/she is not registered and in good standing with the Compensation Commissioner.
X	Certified Proof of Paid Municipal Rates and Taxes (Attach) (T2.23)
X	Certified Proof of UIF Registration (Attach) (T2.24)
X	Financial Standing and other resources of Business Declaration (T2.8)
X	Compulsory Enterprise Questionnaire (T2.18)
X	**Tenderers must meet the minimum qualifying score for functionality criteria first before they can be considered for price and preference by means of specific goals**
X	Invitation to Tender - SBD 1

Please note the following for POPIA:
By submitting this tender, I hereby acknowledge consent that the KZN Department of Public Works, may, from time to time, collect/store/use/destroy/delete/share or otherwise process my Company and Director's/Shareholders personal information as the context or circumstances may require and as contemplated in terms of POPIA.
(TICK)

THE FOLLOWING PARTICULARS MUST BE FURNISHED (FAILURE TO DO SO MAY RESULT IN YOUR TENDER BEING DISQUALIFIED)

Name of Tenderer: _____

Postal Address: _____

Street Address: _____

Telephone Number CODE _____ NUMBER _____

Cellphone Number: _____

Facsimile Number: CODE _____ NUMBER _____

E-mail Address: _____

VAT Registration Number: _____

TAX COMPLIANCE STATUS (TCS) PIN TO VERIFY ON LINE COMPLIANCE SUPPLIER STATUS VIA SARS e-FILING (T2.19) YES ☐ or NO ☐

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS / SERVICES / WORKS OFFERED? [If yes, enclose proof] YES ☐ or NO ☐

This tender will be evaluated according to the preferential procurement model in the Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2022:

☒ 80/20 Preference point scoring system ☐ 90/10 Preference point scoring system

NOTE Refer to T2.34 - Functionality Criteria

Functionality requirement:	60	Points
Price:	80	points

1. The Specific Goal/s Allocated Points in terms of this tender:

Preference points system:
Preferences are offered to Tenderder's who have attained points for the specific goals in accordance with the table below; Documentary Proof required to satisfy the points claimed are also indicated in the table below:

No	Specific Goal	Number of Points Allocated
1	Ownership by Black People Documentary Proof Required: 1) EME or QSE Sworn Affidavit; signed and dated by Commissioner of Oaths	**10 Points**
2	Exempted Micro-Enterprise (EME) Documentary Proof Required: 1) EME or QSE Sworn Affidavit; signed and dated by Commissioner of Oaths	**5 Points**
3	Promotion of enterprises located in a specific municipal area for work to be done or services to be rendered Documentary Proof Required: 1) Proof of Municipal Account depicting Physical Address of the business, which is less than 3 months old OR 2) Lease Agreement	**5 Points**
Total equal **20 points**		**20** Points

Notes:

1 The successful Tenderder will be required to fill in and sign a written GCC 2010 2nd Edition Contract.

2 Tenderders should ensure that Tenders are delivered timeously to the correct address. If the Tender is late, it will not be accepted for consideration.

3 The requirements in respect of the application of either 80/20 and 90/10 preference points scoring system, will apply and the points reflected above for preferences will be adjusted accordingly on a pro-rata basis if required.

4 The Tender box is generally open during official working hours.

5 All Tenders must be submitted on the official forms – (Not to be re-typed)

6 This Tender is subject to the PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT FOR CONSTRUCTION WORKS (GCC2010) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT

7 **The documentary proof required to satisfy the points claimed for specific goals in terms of this tender, are duly indicated on the table (1) above.**

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

Evaluate that non-financial proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals are to be opened.

Open only the financial proposals of tenderers who, in the Functionality evaluation score, have more than the minimum number of points for Functionality stated in the tender data, and announce the score obtained for the non-financial proposals and the total price and any preferences claimed. Return unopened financial proposals to tenderers whose non-financial proposals failed to achieve the minimum number of points for Functionality.

THE PHYSICAL ADDRESS FOR COLLECTION OF TENDER DOCUMENTS:

Tender documents may be collected during working hours at the following address :

Department of Public Works, 191 Prince Alfred Street, Pietermaritzburg, 3200

A non-refundable tender deposit of R450 is payable as per the tender advertisement , on collection of the Tender documents. The Tenderders must deposit the the above amount into the Department's bank account. The Account details are:

Account Name:	KZN PROV GOV-WORKS
Bank Name:	STANDARD BANK
Account Number:	052106446
Bank Code:	057525
Reference No:	Ref No 14019605

The Tenderder must attach the account statement with above reference, to this Tender as proof of payment of the deposit.

COMPULSORY CLARIFICATION MEETING

A Compulsory clarification Meeting with representatives of the Employer will take place as follows:

Madadeni Hospital – Patients Dining Hall (Next to SCM)

on: **Wednesday, 23 August 2023 @ 11h00**

QUERIES REGARDING THE TENDERING PROCEDURE OR TECHNICAL INFORMATION MAY BE DIRECTED TO:

DOPW Project Manager:	Mr. Rendani Nemavhandu	**Telephone no:**	033 - 8971300
Cell no:	082 046 6842	**Fax no:**	033 - 8971399
E-mail:	rendani.nemavhandu@kznworks.gov.za		

DEPOSIT / RETURN OF TENDER DOCUMENTS:

Telegraphic, telephonic, telex, facsimile, electronic, posted and / or late tenders will **not** be accepted.

Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the **Tender Data document**.

All tenders must be submitted on the official forms – (not to be re-typed)

TENDER DOCUMENTS MAY BE:

DEPOSITED IN THE TENDER BOX AT:

Head Office

191 Prince Alfred Street

Pietermaritzburg

3200

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

T1.2 - TENDER DATA

T1.2 TENDER DATA

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Project Code:	**WIMS No. 078856**		
Tender no:	**ZNTL 05094W**	**Closing date:**	**28 August 2023**
Closing time:	**11:00**	**Validity period:**	**84 Calender Days**

Clause number:		
	The conditions of Tender are the Standard Conditions of Tender as contained in Annexure C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts as per Board Notice **423 of 2019** in Government Gazette **42622 of 8 August 2019** as amended from time to time. (see www.cidb.org.za) Refer to Conditions of Tender as bound into this document. The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender. Each item of data given below is cross-referenced to the clause marked "C" in the above mentioned Standard Conditions of Tender.	
C.1.1	The Employer is the Head: Public Works (KZN Department of Public Works-Province of KwaZulu-Natal)	
	For this contract the single volume approach is adopted. This procurement document has been formatted and compiled under the headings for a single volume approach as contained in table 5 of the CIDB's "Standard for Uniformity in Engineering and Construction Works Contracts." The list of Returnable Documents identifies which of the documents a Tenderder must complete when submitting a Tender. The Tenderder must submit his Tender by completing the Returnable Documents including the priced Final Summary of the Bills of Quantities, signing the "Offer" section in the "Form of Offer and Acceptance" and delivering the whole of the procurement document back to the Department bound up as it was when it was received.	
C.1.2	The single volume procurement document issued by the Employer comprises the following:	
	TENDER	
	Part T1: Tendering procedures	
	T1.1 -	Tender Notice and Invitation to Tender
	T1.2 -	Tender Data
	T1.3 -	Annexure C - Standard Conditions of Tender
	Part T2: Returnable documents	
	T2.1 -	List of returnable documents
	T2.2 -	Returnable schedules (See different forms listed in ***T2.1 - Returnable Schedule***)
	CONTRACT	
	Part C1: Agreements and Contract Data	
	C1.1 -	Form of Offer and Acceptance
	C1.2 -	Contract Data
	C1.3 -	Form of Guarantee (C1.3)
	Part C2: Pricing data	
	C2.1 -	Pricing Instructions
	C2.2 -	Bills of Quantities
	Part C3: Scope of works	
	C3.1 -	Scope of Works
	C3.2 -	Specification for HIV/AIDS awareness
	C3.3 -	HIV/STI Compliance report
	C3.4 -	Project Specific Construction Safety, Health and Environmental Specification
	C3.5 -	Supplementary Preambles
	Part C4: Site information	
	C4.1 -	Site Information
	C4.2 -	Builders Lien Agreement

	Part 5: List of Drawings/Annexure's	
	C5.1 -	List of Drawings
	C5.2 -	Standard Preambles for all Trades (Rev 3) - DOH 2009
	C5.3 -	General Electrical Specifications
	C5.4 -	Lightning Protection Specifications
	C5.5 -	Specification for Electrical Installation and Work Instruction
	C5.6 -	Map of Bid submission location
	C5.7 -	Joint Venture Agreement
	C5.8 -	Health and safety Bill of Quantities
	C5.9 -	Builders Lien Agreement
	C5.10	EPWP Employment Contract
	C5.11	EPWP Preliminaries
	C5.12	EPWP Scope of Works
	C5.13	Attendance Register - Infrastructure and Other projects

C.1.4	The Employer's agent (Engineer/Principal Agent) is:	
	Name:	**Hospital Design Group**
	Capacity:	**Principal Agent/Engineer**
	Address:	**8 Farquhar Road , Ladysmith , Ladysmith , 3370**
	Tel:	**036-631 4715**
	Fax:	**036-631 1806**
	E-mail:	**kzn@hdg.co.za**
	Responsible person:	**Mr. Tertius Meintjes**
	The second sentence shall read "Communications can be in any of the official languages recognised in KwaZulu-Natal which is English, Afrikaans or Zulu but writing is preferred in English as this is generally accepted as a business language"	
C.1.6	**PP2-Competitive Selection Procedure**	**Design by Employer**
	PP2B-Open Procedure	
	Tenderers must meet the minimum qualifying score for functionality criteria first before they can be considered for price and preference.	
C.2.1	For eligibility refer to **T1.1 Tender Notice and Invitation to Tender**	
	A contract will only be entered into with a Tenderder who has in his employ management and supervisory staff satisfying the requirements of the scope of work for labour intensive competencies for supervisory and management staff during the contract validity of the contract.	
	Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations for a : 6CE or higher class of construction work, are eligible to have their tenders evaluated. Joint ventures are eligible to submit tenders provided that: 1 every member of the joint venture is registered with the CIDB; 2 the lead partner has a contractor grading designation in the 6CE or higher, class of construction work; or not lower than one level below the required the required grading designation in the class of works construction works under considerations and possess the required recognition status 3 the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a : 6CE or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations.	
	See end of T2.3 AUTHORITY FOR CONSORTIA OR JOINT VENTURES TO SIGN TENDER for combinations of JV's arrangements.	
C.2.7	For particulars regarding a pre-tender site inspection meeting (clarification meeting), see **T1.1 Tender Notice and Invitation to Tender.**	
C.2.12	Alternative tender offer permitted:	**Yes** ☐ **No** ☒

	If a tenderer wishes to submit an own alternative tender offer, the only criteria permitted for such alternative tender offer is that it demonstrably satisfies the Employer's standards and requirements. A tenderer may submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted. Provided that the tenderer's main tender offer is according to specification and would under normal circumstances be recommended for acceptance, his alternative tender offer may also be considered for the purpose of the award of the contract. Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal. Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer's standards and requirements. The modified Pricing Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the Employer's costs of confirming the acceptability of the detailed design before it is constructed.
	Only the complete Service as per the Bills of Quantities
C.2.13.2	Tenderers are to ensure that their company details appear on the entire relevant Tender documentation and must be legible.
C.2.13.3	Part of each tender offer communicated on paper shall be submitted as an original, plus ONE copy of the tender document including supporting documents and priced Bill of Quantities where applicable, scanned onto a readable compact disk (CD) in pdf format, at the Tenderders own cost. The CD must be clearly marked with the tender information and company details.
C.2.13.4	The second sentence shall read as follows "The Employer will hold all authorised signatories jointly and severally liable on behalf of the tenderer". Tenderders proposing to contract as a Joint Venture shall submit a valid Joint Venture Agreement before the Joint Venture's offer could be accepted. Individuals, Partnerships and Companies proposing to contract as a party to a Joint Venture shall be jointly and severally liable on behalf of the Joint Venture.
C.2.13.5	The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are as per **T1.1 Tender Notice and Invitation to Tender.**
	A Open Procedure will be followed
C.2.15	The closing time for submission of tender offers is as per **T1.1 Tender Notice and Invitation to Tender.**
C.2.16	The tender offer validity period is as per **T1.1 Tender Notice and Invitation to Tender.**
C.2.17	Sub-clause C2.17 does not preclude the negotiation of the final terms of the contract with the preferred tenderer, following a competitive selection process, should the Employer elect to do so and provided that the competitive position of the preferred tenderer is not affected.
	The tenderer is to submit the Priced Bills of Quantities with the Returnable's at the closing of the tender.
	The tenderer must submit to the Employer, names of all management and supervisory staff that will be employed to supervise the labour-intensive portion of the works together with satisfactory evidence that
C.2.19	Access shall be provided for inspections, tests and analysis as may be required by the Employer.
C.2.22	Tenderers **do not** have to return all retained tender documents within 28 days after expiry of the Tender validity period.
	Tenderers are to refer to **List of Returnable Schedules** and **Scope of Works** to establish what is required to be submitted with this tender.
C.3.4	The location for opening of the tender offers, immediately after the closing time thereof shall be at: **KZN Department of Public Works, 191 Prince Alfred Street, Pietermaritzburg, 3200 at the time indicated on T1.1 Notice and Invitation to Bid**
C.3.8	The employer must determine, on opening and before detailed valuation, whether each Tender offer properly received: a) complies with the requirements of the Conditions of Tender. b) has been properly and fully completed and signed, and c) is responsive to the other requirements of the Tender documents. A responsive tender is one that conforms to all the terms, conditions and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would:

	a) detrimentally affect the scope, quality, or performance of the Works, services or supply identified in the Scope of Work or b) significantly change the Employers or the Tenderers risks and responsibilities under the contract, or c) affect the competitive position of other Tenderers presenting responsive tenders, if it were to be rectified. Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.
C.3.13	**Tender offers will only be accepted if:** (a) Tenderders must be registered on Government's Central Supplier Database (CSD) and include their master registration number (MAAA number) on the cover page of the tender document in order to enable the institution to verify the tenderers tax status on the CSD (b) the Tenderder is registered with the Construction Industry Development Board in an appropriate contractor grading designation is required for this tender and the Tenderder has submitted a CIDB certificate of registration which clearly indicates the status "Active" (c) the Tenderder is not in arrears for more than 3 months with municipal rates and taxes and municipal services charges. (d) the Tenderder has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the Tenderder's ability to perform to the contract in the best interests of the employer or potentially compromise the Tender process. (e) the tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act, 2004 (Act No. 12 of 2004) as a person prohibited from doing business with the public sector; and (f) the Tenderder has not: i) abused the Employer's Supply Chain Management System; or ii) failed to perform on any previous contract and has been given a written notice to this effect. (g) the Tenderder is registered with: i) the Unemployment Insurance Fund (UIF); and ii) the Workmen's Compensation Fund (h) the Tenderder submitted Authority to Sign the tender. (i) the Tenderder submitted Financial standing & other resources of Business Declaration. (j) the Tenderder submitted Equipment Schedules, if applicable. (k) the Tenderder signed the Form of Offer that is part of the Form of Offer and Acceptance. (l) the Tenderder submitted Preference Certificate, if applicable. (m) the Tenderder submit Final Summary of Bill of Quantities at tender closing. (n) the Tenderder submitted Bidder's Disclosure. (o) the Tenderder submitted Site Inspection Certificate from the Compulsory Briefing Meeting (p) All information required to assess 'Functionality" as per Tender Data scheduled requirements Providing the form of offer and acceptance does not contain any qualifying statements, it will constitute the formation of a contract between the employer and the successful Tenderder as described in the form of offer and acceptance.
C.3.15	Tenderders are informed that any formal dispute shall be resolved by being referred to Arbitration only.
C.3.17	Provide to the successful Tenderder one copy of the signed contract document and one copy of an unpriced bills of quantities

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

T1.3 - Annexure C - Standard Conditions of Tender

T1.3 - Annexure C - Standard Conditions of Tender

Note: Where this document refers to Bid or Bidder it shall be read as tender or tenderer

C.1 General

C.1.1 Actions

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

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

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

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

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

C.1.2 Tender Documents

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

C.1.3 Interpretation

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

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

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

a) **conflict of interest** means any situation in which:
   i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially;
   ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
   iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

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

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

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

C.1.4 Communication and employer's agent

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

C.1.5 Cancellation and Re-Invitation of Tenders

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

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

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

c) no acceptable tenders are received.

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

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

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

C.1.6 Procurement procedures

C.1.6.1 General

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

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the **tender data** requires that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.3.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers, or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the **tender data**, shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information. Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

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

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

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 **Option 1**

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

F.1.6.3.2 **Option 2**

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

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

C.2 Tenderer's obligations

C.2.1 Eligibility

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

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

C.2.2 Cost of tendering

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

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

C.2.3 Check documents

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

C.2.4 Confidentiality and copyright of documents

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

C.2.5 Reference documents

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

C.2.6 Acknowledge addenda

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

C.2.7 Clarification meeting

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

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the **tender data**.

C.2.9 Insurance

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

C.2.10 Pricing the tender offer

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

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

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

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

C.2.11 Alterations to documents

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

C.2.12 Alternative tender offers

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

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

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

C.2.13 Submitting a tender offer

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

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

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

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

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

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

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

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

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

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

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

C.2.15 Closing time

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

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

C.2.16 Tender offer validity

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

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

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

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

C.2.17 Clarification of tender offer after submission

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

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

C.2.18 Provide other material

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment. Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employers request, the employer may regard the tender offer as non-responsive.

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

C.2.19 Inspections, tests and analysis

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

C.2.20 Submit securities, bonds and policies

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

C.2.21 Check final draft

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

C.2.22 Return of other tender documents

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

C.2.23 Certificates

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

C.3 The employer's undertakings

C.3.1 Respond to request from the tenderer

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

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

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

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

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

C.3.2 Issue Addenda

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

C.3.3 Return late tender offers

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

C.3.4 Opening of tender submissions

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

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

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

C.3.5 Two-envelope system

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

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

C.3.6 Non-disclosure

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

C.3.7 Grounds for rejection and disqualification

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

C.3.8 Test for responsiveness

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

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

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

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

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

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

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

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

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

C.3.9 Arithmetical errors, omissions and discrepancies

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

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

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

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

c) arithmetic errors in:

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

ii) the summation of the prices.

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

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as

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

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

C.3.10 Clarification of a tender offer

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

C.3.11 Evaluation of tender offers

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

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

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

The activities associated with evaluating tender offers are as follows:

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

C.3.11.1 General

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

C.3.12 Insurance provided by the employer

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

C.3.13 Acceptance of tender offer

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

a) Is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,

b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,

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

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

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

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

C.3.14 Prepare contract documents

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

a) addenda issued during the tender period,

b) inclusion of some of the returnable documents, and

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

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

C.3.15 Complete Adjudicator's Contract

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

C.3.16 Registration of the Award

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

C.3.17 Provide copies of the contracts

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

C.3.18 Provide written reasons for actions taken

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

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

PART T2 - RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Project Manager:	**Mr. Rendani Nemavhandu**	**Tender no:**	**ZNTL 05094W**

1. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES

(Tenderer to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the tender)

Tender document name	Returnable document	
Bidder's Disclosure - SBD 4 (T2.11)	Yes	
Authority to Sign Tender (T2.2)	Yes	
Authority for Consortia or Joint Venture's to Sign Tender (T2.3)	Yes	
Special Resolution of Consortia or Joint Venture's (T2.4)	Yes	
Schedule of Proposed Sub-Contractors (T2.6)	Yes	
Joint Venture Involvement Declaration (T2.5)	Yes	
Capacity of Tenderer (T2.7)	Yes	
Annual Financial Statement for past financial year (2.15)	Yes	
Site Inspection Certificate as proof for attendance of compulsory briefing meeting (T2.10)	Yes	
Preference Points Claim Form (T2.9)	Yes	
Compulsory Enterprise Questionnaire (T2.18)	Yes	
Financial Standing and other resources of Business Declaration (T2.8)	Yes	
Contractor's Safety, Health and Environmental Declaration (T2.17)	Yes	
Complete Priced Bill of Quantities (T2.22)	Yes	
Certified Proof of CIDB Registration Number (T2.27)	Yes	
Contract Form - Purchase of Goods/Works - Part 1 (T2.29)	Yes	
Contract Form - Purchase of Goods/Works - Part 2 (T2.30)	Yes	
Functionality Criteria (T2.34)	Yes	
Invitation to Tender - SBD 1 (T2.35)	Yes	

2. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES BUT TO BE SUPPLIED BY THE TENDERER

(Tenderer to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the tender)

Tender document name	Returnable document	
Tax Compliance Status (TCS) PIN to verify on line Compliance Supplier Status via e-Filing (T2.19)	Yes	
Certified Proof of Good Standing with the Compensation Commissioner (Attach) (T2.20)	Yes	
Proof of payment of Tender deposit (T2.28)	Yes	
Certified Proof of Paid Municipal Rates and Taxes (Attach) (T2.23)	Yes	
Certified Proof of UIF Registration (Attach) (T2.24)	Yes	
Certified Proof of Registration Number on the Central Suppliers Database (T2.26)	Yes	
Annual Financial Statement for past financial year (2.15)	Yes	
Entire tender document including returnable and supporting documents, scanned as PDF onto a CD, clearly marked with the Tender information.	Yes	

3. RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT

(Tenderder to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the Tender)

Tender document name	Returnable document	
Form of Offer and Acceptance (Bound into Section 1 of 2) (T2.21)	Yes	
Record of Addenda to Tender Documents (T2.12)	Yes	
Particulars of Electrical Contractor (T2.13)	Yes	
Equipment Schedules-Mechanical / Electrical / Security Material (T2.16)	Yes	
Schedule of Imported Materials and Equipment (T2.14)	Yes	
Confirm Receipt of Offer and Acceptance (T2.21a)	Yes	

4. OTHER DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT

(Tenderder to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the Tender)

Tender document name	Returnable document	
Bill of Quantities (T2.22)	Yes	
Form of Guarantee (C1.3)	Yes	
List of Drawings/Annexure's (C5.1)	Yes	
The National Industrial Participation Programme (T2.25)	Yes	
Required Structure of Contractor's detailed OHSE Plan (T2.31)	Yes	
Client's specific requirements for the Contractor's detailed OHSE Plan (T2.32)	Yes	
Base line Risk Assessment (T2.33)	Yes	

5. DOCUMENTS REQUIRED FOR THE EVALUATION OF FUNCTIONALITY

(Tenderder to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the Tender)

Tender document name	Returnable	
Proof of working capital of at least 25% of project value	Yes	
Letters of credit reference from suppliers and credit limits to be stipulated with supporting documents	Yes	
Annual/Audited Financial Statement/Management Account/income and Expenditure Statements	Yes	
Detailed schedule of resources at all levels	Yes	
Schedule of years of experience on similar projects	Yes	
Schedule of experience on projects of similar value and duration (Past 3 years) – letters of award to be attached and practical completion certificate for all work completed in the preceding 3 years	Yes	
Demonstrated ability to work on an accelerated programme	Yes	
Experience in projects that have operational challenges i.e. public interface	Yes	
Submission of a detailed organogram	Yes	
All key project resources have more than (5) years' experience in the construction industry. All key project resources have experience in projects of a similar value and nature	Yes	
Detailed CV. Traceable reference. Certificates of qualified professionals in their full employment to be attached.	Yes	
Detailed CV of each team member (Category) and Traceable references to be detailed	Yes	
All key project resources are dedicated full time for the duration of the project including proof of UIF contributions	Yes	
Tenderer to demonstrate key/resource deployment over the various work package	Yes	
Letter from a registered financial institution confirming intention to issue a provision of a guarantee	Yes	
Site establishment indicating proposed layout for all prescribed facilities, hoarding, etc.	Yes	
Resourcing strategy for the various work breakdown structures including resource deployment plan (PS)	Yes	
Material storage, handling and distribution	Yes	
Productivity, programming, resource investment, progress tracking, corrective action plans, etc.	Yes	
Programme and progress reporting, including tracking of long lead procurement items	Yes	
OHS Management, compliance and reporting	Yes	
Site documentation control, filing and archiving	Yes	
Queries and information required approach	Yes	
Procurement of outsourced resources e.g. sub-contractors	Yes	
	No	N/A
	No	N/A

T2.2 AUTHORITY TO SIGN TENDER

RESOLUTION of a meeting of the Board of *Directors / Members / Partners of:

_____

_____

(Legally correct full name and registration number, if applicable, of the Enterprise)

held at *(town)*: _____ on *(date)*: _____

RESOLVED that:

1. The Enterprise submits a Tender to the KZN Department of Public Works in respect of the following project:

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

Tender Number: **ZNTL 05094W**

2.
*Mr./Mrs./Ms: _____

in *his/her capacity as: _____ *(Position in the Enterprise)*

and who will sign as follows: _____ (Authorised Signatory)

be, and is hereby, authorised to sign the Tender, and any and all other documents and/or correspondence in connection with and relating to this Tender, as well as to sign any Contract, and any and all documentation, resulting from the award of the Tender to the Enterprise mentioned above.

	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			

Note:

*1. * Delete which is not applicable.*

2. NB. This resolution / Power of Attorney must be signed by all the Directors / Members / Partners of the Legal Tendering Enterprise authorising the Representative to make this Offer.

3. Should the number of Directors / Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

*4. In the case of the tendering Enterprise being a Close Corporation, a **certified copy of the Founding Statement** of such corporation must be attached to this tender.*

ENTERPRISE STAMP (If Any)

T2.3 AUTHORITY FOR CONSORTIA OR JOINT VENTURES TO SIGN TENDER

RESOLUTION of a meeting of the Board of *Directors / Members / Partners of:

_____

_____

(Legally correct full name and registration number, if applicable, of the Enterprise)

held at *(town)*: _____ on *(date)*: _____

RESOLVED that:

1. The Enterprise submits a Tender, in consortium/Joint Venture with the following Enterprises:

   _____

   _____

   (List all the legally correct full names and registration numbers, if applicable, of the Enterprises forming the Consortium/Joint Venture)

   to the KZN Department of Public Works in respect of the following project:

   MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

   Tender Number: **ZNTL 05094W**

2. * Mr. / Mrs. / Ms.: _____ in

   *his/her Capacity as: _____ *(Position in the Enterprise)*

   and who will sign as follows: _____
   be, and is hereby, authorised to sign a consortium/joint venture agreement with the parties listed under item 1 above, and any and all other documents and/or correspondence in connection with and relating to the consortium/joint venture, in respect of the project described under item 1 above.

3. The Enterprise accepts joint and several liability with the parties listed under item 1 above for the due fulfilment of the obligations of the joint venture deriving from, and in any way connected with, the Contract to be entered into with the Department in respect of the project described under item 1 above.
4. The Enterprise chooses as its *domicilium citandi et executandi* for all purposes arising from this joint venture agreement and the Contract with the Department in respect of the project under item 1 above:

   Physical address: _____

   _____

   _____

   _____ (Postal Code)

   Postal Address: _____

   _____

   _____

   _____ (Postal Code)

Telephone number: *(Dialling Code followed by number)* _____

Fax number: *(Dialling Code followed by number)* _____

Email Address : _____

***BOARD OF DIRECTORS / MEMBERS / PARTNERS in Consortium of Joint Venture**

	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Note:

*1. * Delete which is not applicable.*

2. NB. This resolution / Power of Attorney must be signed by all the Directors / Members / Partners of the Tendering Enterprise.

3. Should the number of Directors / Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

ENTERPRISE STAMP (If Any)

Deemed to satisfy joint venture arrangements	Designation
Grading 2 + Grading 2 + Grading 2	= 3
Grading 3 + Grading 3 + Grading 3	= 4
Grading 4 + Grading 4	= 5
Grading 4 + Grading 3 + Grading 3	= 5
Grading 5 + Grading 5	= 6
Grading 5 + Grading 4 + Grading 4	= 6
Grading 6 + Grading 6	= 7
Grading 6 + Grading 5 + Grading 5	= 7
Grading 7 + Grading 7 + Grading 7	= 8
Grading 8 + Grading 8 + Grading 8	= 9

Tenderers who envisage entering into a Joint Venture shall complete a submit a Joint Venture Agreement (see copy of CIDB's agreement elsewhere in this document) with this Tender.

THE CIDB JOINT VENTURE GRADING DESIGNATION CALCULATOR sums the capacity of all joint venture partners and calculates a grading designation for the joint venture

T2.4 SPECIAL RESOLUTION OF CONSORTIA OR JOINT VENTURES

RESOLUTION of a meeting of the duly authorised representatives of the following legal entities who have entered into a consortium/joint venture to jointly tender for the project mentioned below: *(legally correct full names and registration numbers, of the Enterprises forming a Consortium/Joint Venture)*

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

held at: _____ *(place)* on _____ *(date)*

RESOLVED that:

A. The above-mentioned Enterprises submits a Tender in Consortium/Joint Venture to the KZN Department of Public Works in respect of the following project:

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

Tender Number: **ZNTL 05094W**

Project Code: **WIMS No. 078856**

B. Mr/Mrs/Ms: _____ in _____

*his/her Capacity as: _____ *(Position in the Enterprise)*

and who will sign as follows: _____
be, and is hereby, authorised to sign the Tender, and any and all other documents and/or correspondence in connection with and relating to the Tender, as well as to sign any Contract, and any and all documentation, resulting from the award of the Tender to the Enterprises in Consortium/Joint Venture mentioned above.

C. The Enterprises constituting the Consortium/Joint Venture, notwithstanding its composition, shall conduct all business under the name and style of:

_____

D. The Enterprises to the Consortium/Joint Venture accept joint and several liability for the due fulfilment of the obligations of the Consortium/Joint Venture deriving from, and in any way connected with, the Contract entered into with the Department in respect of the project described under item A above.

E. Any of the Enterprises to the Consortium/Joint Venture intending to terminate the consortium/joint venture agreement, for whatever reason, shall give the Department 30 days written notice of such intention. Notwithstanding such decision to terminate, the Enterprises shall remain jointly and severally liable to the Department for the due fulfilment of the obligations of the Consortium/Joint Venture as mentioned under item D above.

F. No Enterprise to the Consortium/Joint venture shall, without the prior written consent of the other Enterprises to the Consortium/Joint Venture and of the Department, cede any of its rights or assign any of its obligations under the consortium/joint Venture and of the Department, cede any of its rights or assign any of its obligations under the consortium/joint venture agreement in relation to the Contract with the Department referred to herein.

G. The Enterprises choose as the *domicilium citandi et executandi* of the consortium/joint venture for all purposes arising from the consortium/joint venture agreement and the Contract with the Department in respect of the project under item A above:

Physical address: _____

_____

_____

_____ (Postal Code)

Postal Address: _____

_____

_____

_____ (Postal Code)

Telephone number: *(Dialling Code followed by number)* _____

Fax number: *(Dialling Code followed by number)* _____

Email Address : _____

***BOARD OF DIRECTORS / MEMBERS / PARTNERS in Consortium of Joint Venture**

	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Note:

1. ** Delete which is not applicable.*

2. ***NB.*** *This resolution / Power of Attorney must be signed by all the Duly Authorised Representatives of the Legal Entities to the Consortium/Joint Venture submitting this Tender.*
3. *Should the number of Duly Authorised Representatives of the Legal Entities joining forces in this Tender exceed the space available above, additional names and signatures must be supplied on a separate page.*
4. *Resolutions, duly completed and signed, from the separate Enterprises who participate in this Consortium/Joint Venture must be attached to the Special Resolution.*

T2.5 JOINT VENTURES INVOLVEMENT DECLARATION

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

DECLARATION RELATING TO A TENDER SUBMITTED BY A JOINT VENTURE :

I/We the undersigned parties do hereby declare that our respective involvement in the Works, of which I/we tender by Joint Venture, would be as follows :-

Party No. 1	
CENTRAL SUPPLIERS DATABASE REGISTRATION NO:	
TenderDERS CIDB REGISTRATION NUMBER:	
Name	
Address	
Percentage involvement	%

Party No. 2	
CENTRAL SUPPLIERS DATABASE REGISTRATION NO:	
TENDERERS CIDB REGISTRATION NUMBER:	
Name	
Address	
Percentage involvement	%

Party No. 3	
CENTRAL SUPPLIERS DATABASE REGISTRATION NO:	
TenderDERS CIDB REGISTRATION NUMBER:	
Name	
Address	
Percentage involvement	%

Signed - Party No. 1

I/We *(Full Name)* _____

duly authorised in my capacity as _____

of *(Enterprise name)*: _____

do jointly and severally accept responsibility for the due performance of the Works contained in the above project should such Tender submitted by the Joint Venture be accepted.

_____ _____

Signed by Authorised Representative Date

Signed - Party No. 2

I/We *(Full Name)* _____

duly authorised in my capacity as _____

of *(Enterprise name)*: _____

do jointly and severally accept responsibility for the due performance of the Works contained in the above project should such tender submitted by the Joint Venture be accepted.

_____ _____

Signed by Authorised Representative Date

Signed - Party No. 3

I/We *(Full Name)* _____

duly authorised in my capacity as _____

of *(Enterprise name)*: _____

do jointly and severally accept responsibility for the due performance of the Works contained in the above project should such tender submitted by the Joint Venture be accepted.

_____ _____

Signed by Authorised Representative Date

T2.6 SCHEDULE OF PROPOSED SUBCONTRACTORS

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

We notify you that it is our intention to employ the following Subcontractors for work in this contract. The Subcontractors will all be CIDB registered and their CIDB Registration number shall be submitted below.

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

We confirm that all subcontractors who are contracted to construct a house **are registered as home builders with the National Home Builders Registration Council**.

No	Name and address of proposed Subcontractor	Nature and extent of work	Year Completed	Value (R):	Contact Tel No:	Previous experience with Subcontractor
1	CIDB Registration Number:					
2	CIDB Registration Number:					
3	CIDB Registration Number:					
4	CIDB Registration Number:					
5	CIDB Registration Number:					

Name of authorised representative	**Signature**	**Capacity**	**Date**
Name of Enterprise:			

T2.7 CAPACITY OF TENDERER				
Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**			
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**	**Please do a print preview before printing.**

1. **WORK CAPACITY:** (The Tenderer is requested to furnish the following capacity particulars and to attach additional pages if more space is required. Failure to furnish the particulars may result in the Tender being disregarded.)

1.1. Artisans and Employees: *(Artisans and Employees to be ,or are ,employed for this project)*

Categories of Employee - Key Personnel (part of Business Enterprise)	Professional Registration No.	Date of Employment	Number
Site Agent			
Project Manager			
Foreman			
Quality Control & Safety Officer-Construction Supervisor			
Artisans			
Unskilled employees			
Others			

1.2. Provide full particulars of the following Assets: *(Assets owned and to be hired - Indicate owned assets)*

Machinery	Plant	Equipment	Vehicles

1.3. Workshops:

Address of Main Workshop:	Address of Regional Workshop (If Applicable):

1.4. **Other offers submitted at time of this tender for which results are pending:**
(Any other client's tender must also be included)

Tender No.	Project Name	Client Name & Contact No.	Value Tendered in R's	Date Tender submitted	Contact Detail

2. PARTICULARS OF THE TENDERERS CURRENT AND PREVIOUSLY COMPLETED COMMITMENTS:

2.1. Current private sector projects: *(List the 5 projects closest to the contractor grading designation of this project)*

1	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
2	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
3	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
4	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
5	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	

2.2. Current Government sector projects: *(List the 5 projects closest to the contractor grading designation of this project)*

1	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
2	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	

3	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
4	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
5	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	

2.3. Previously completed projects: *(List the 5 projects closest to the contractor grading designation of this project)*

1	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	
2	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	
3	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	
4	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	
5	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	

Name of Tenderer	Signature of authorised representative	Date

T2.8 FINANCIAL STANDING AND OTHER RESOURCES OF BUSINESS DECLARATION

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

(a) Based on the track record determined on the Minimum Average Annual Turnover coupled to the assessed Works Capabilities of Contracting Enterprises, the Construction Industry Development Board (CIDB) awards Grading Designations and accordingly registers it on the system.

(b) However, it regularly occurs that a Contractor will at the same time submit tenders for a number of projects that are advertised during an overlapping period. Moreover, the Contractor may be busy with a Contract that is of the registered CIDB Grading Designation (value) or is even attending to a number of smaller valued Contracts.

(c) It therefore becomes the prerogative of a Tenderer in such instances to prove to the Department that the Enterprise has the capacity in every respect to attend to more than one (1) contract at a time.

(d) A Tenderer who wishes to be considered for this tender Contract award, over and above other tenders that they have submitted, shall submit when requested by the DoPW the necessary proof that:

(i) he/she has access to additional finance (inclusive of a PERFORMANCE GUARANTEE BY A REGISTERED FINANCIAL INSTITUTION),

(ii) he/she has additional Human Resources available to successfully complete this project.

(iii) he/she has adequate Equipment, Plant and Machinery that all of the above can, undoubtedly, be sourced for this tender. (Please submit to the DoPW the name and contact details of the supplier if the Tenderer is going to hire Equipment, Plant or Machinery, when requested.)

(e) Tenderer to submit their latest 12 months audited financial statements with the returnable documents.

I, the undersigned,

_____

(name of person authorized to sign on behalf of the Tenderer

understand that it is the responsibility of the Tenderer to prove and provide when requested by the DoPW, evidence of the good Financial Standing of the Business to complete the Contract successfully.

Furthermore, it is understood that failure to provide when requested by DoPW, at least the information as stated in paragraphs (d)(i)(ii) AND (iii) above will not enable the Evaluation Team to assess the CURRENT financial standing of the Business and the failure to provide said information when requested will, therefore, invalidate the Tender.

I accept and understand that the KZN Department of Public Works, as representative of the Provincial Administration of KwaZulu-Natal in this tender, may act against me and the Tenderer, jointly and severally, should this declaration and/or any information provided be found to be false.

Duly signed at..... on this the..... day of..... 20..

Full Name of Signatory	Name of Enterprise
Capacity of Signatory	Signature of authorised representative

T2.9 PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

Project Title:	MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT
Tender Number:	ZNTL 05094W
Project Code:	WIMS No. 078856

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

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

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

1. GENERAL CONDITIONS

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

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

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

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

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

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

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

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

(a) Price; and

(b) Specific Goals.

1.4 **To be completed by the organ of state:**

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	**80**
SPECIFIC GOALS	**20**
Total points for Price and SPECIFIC GOALS	**100**

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

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

2. DEFINITIONS

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

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

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

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

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

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. **POINTS AWARDED FOR PRICE**

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

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

80/20 or 90/10
$Ps=80(1-(Pt-P\ min)/(P\ min)$ or $Ps=90(1-(Pt-P\ min)/(P\ min)$

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

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

3.2.1. **POINTS AWARDED FOR PRICE**

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

80/20 or 90/10
$Ps=80(1+(Pt-P\ max)/(P\ max)$ or $Ps=90(1+(Pt-P\ max)/Pmax)$

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

4. POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

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

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

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

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

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

The specific goals allocated points in terms of this tender	Number of Points allocated (90/10 system) (to be completed by the Organ of State)	Number of Points allocated (80/20 system) (to be completed by the Organ of State)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
Ownership by Black People				
Exempted Micro-Enterprise (EME)				
Promotion of enterprises located in a specific municipal area for work to be done or services to be rendered				

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm.....

4.4. Company Registration Number :.....

4.5. TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

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

i) The information furnished is true and correct;

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

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

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

(a) disqualify the person from the tendering process;

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

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

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

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

.....
SIGNATURE(S) OF TENDERER(S)
SURNAME AND NAME: .....
DATE: .....
ADDRESS: .....
.....
.....
.....

T2.10 SITE INSPECTION MEETING CERTIFICATE			
Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**
Site Inspection Date:		**23 AUGUST 2023 @ 11H:00**	

This is to certify that I, _____ *(Name of authorised Representative)*

representing _____ *(Name of Enterprise)*

visited the site on: _____ *(Date)*

I have made myself familiar with all local conditions likely to influence the work and the cost thereof. I further certify that I am satisfied with the description of the work and explanations given at the site inspection meeting and that I understand the work to be done, as specified and implied, in the execution of this contract.

I declare that the representative, named above, is my authorised representative and **not** a third party agent and that my representative's attending of this site meeting, shall be deemed conclusive proof that my Enterprise are fully aware of what was said and discussed at this meeting.

Name of Tenderer	Signature	Date

Name of DOPW Representative	Signature	Date

This form is only to be completed when applicable to the tender and if a Compulsory Briefing meeting has been called.

Departmental Stamp:

T2.11 BIDDER'S DISCLOSURE - SBD 4

SEE ATTACHED

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

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

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

2. Bidder's declaration

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

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

Full Name	Identity Number	Name of State institution

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

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

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

2.2.1 If so, furnish particulars:

.....

.....

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

2.3.1 If so, furnish particulars:

.....

.....

3 DECLARATION

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

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

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

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

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

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

3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring

---

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

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

3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.
I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....	.....
Signature	Date
.....	.....
Position	Name of bidder

T2.12 RECORD OF ADDENDA TO TENDER DOCUMENTS

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

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

	Date	Title or Details	No. of Pages
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

Attach Additional Pages if more space is required

Tenderer to attach proof of receipt of above listed addenda

Signed		**Date**	
Name		**Position**	
Tenderer			

T2.13 PARTICULARS OF ELECTRICAL CONTRACTOR			
Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

Name of Electrical Contractor: _____

Address: _____

_____

_____

_____

Telephone Number: _____
(Area Code)(Number)

Fax Number: _____
(Area Code)(Number)

Registration number at the Department of Labour:	

Name of authorised representative	**Signature**	**Date**

T2.14 SCHEDULE FOR IMPORTED MATERIALS AND EQUIPMENT

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

This schedule should be completed by the tenderer. *(Attach additional page(s) if more space is required)*

Item	Material / Equipment	Quotation (Excluding VAT)
1		R
2		R
3		R
4		R
5		R
6		R

The Contractor shall list imported items, materials and/or equipment which shall be excluded from the Contract Price Adjustment Provisions (if applicable) and shall be adjusted in terms of currency fluctuations only. Copies of the supplier's quotations for the items, materials or equipment (provided that such costs shall not be higher than the relevant contract rate as listed above) should be lodged with the Principal Agent / Engineer of the Department of Public Works within 60 (sixty) days from the date of acceptance of the tender. No adjustment of the local VAT amount, nor the contractor's profit, discount, mark-up, handling costs, etc. shall be allowed. (See P&G E16)

These net amounts will be adjusted as follows:

FORMULA:

The net amount to be added to or deducted from the contract sum:

$$A = V\left(\frac{Z}{Y} - 1\right)$$

A = the amount (R) of adjustment

V = the net amount (supplier's quotation) (R) of the imported item

Y = exchange rate 14 days prior to closing date of tender submission

Z = exchange rate on the date of the Bill of Lading* of exporters invoice.

** A bill of lading (sometimes abbreviated as B/L or BoL) is a document issued by a carrier which details a shipment of merchandise and gives title of that shipment to a specified party. Bills of lading are one of three important documents used in international trade to help guarantee that exporters receive payment and importers receive merchandise. A straight bill of lading, which is referred to above, is used when payment has been made in advance of shipment and requires a carrier to deliver the merchandise to the appropriate party. It is therefore the date of the paid up invoice when the shipment leaves the exporter's location.*
[http://en.wikipedia.org/wiki/Bill_of_lading]

Name of authorised representative	Signature	Date

T2.15a LATEST 12 MONTH ANNUAL FINANCIAL STATEMENT

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

ATTACH A CERTIFIED COPY OF THE ANNUAL FINANCIAL STATEMENT OF THE COMPANY FOR THE PAST FINANCIAL YEAR TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of the annual financial statements of the past financial year in respect of each party to the Joint Venture must be attached to this page

ATTACH COMPANY LATEST 12 MONTHS ANNUAL FINANCIAL STATEMENTS TO THIS PAGE

T2.16 EQUIPMENT SCHEDULES

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

The Tenderer shall complete the following schedules giving details of the various items of materials or equipment that he includes in his offer.

TECHNICAL DATA: STANDBY GENERATOR

Manufacturer:	
Model number:	
Serial number:	

Voltage	
KVA	
Frequency	
RPM	
Cylinder/stroke	
Fuel capacity and consumption	
Sound pressure level	
Condenser air flow rate	
Attenuation type	
Battery Type	
AMF Change Over Panel Type	
Starter Motor Type and Voltage	
Standard Compliance	

T2.17 CONTRACTOR'S SAFETY, HEALTH AND ENVIRONMENTAL DECLARATION

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

In terms of Regulation 5(1)(h) of the Construction Regulations of February 2014 a Contractor may only be appointed to perform construction work if the Client is satisfied that the Contractor has the necessary competencies and resources to carry out the work safely in accordance with the Occupational Health and Safety Act, Act 85 of 1993 and the Construction Regulations of February 2014. In line with this requirement the Contractor is required to read through this document carefully, sign it and submit it with his/her Tender.

DECLARATION

1. I, the undersigned hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act, Act 85 of 1993 and the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specifications attached to this document.
2. I hereby declare that my company and its employees has the necessary competency and resources to safely carry out the construction works under this contract in compliance with the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specifications.
3. I hereby confirm that adequate provisions has been made in my Tender to cover the cost of all Safety, Health and Environmental duties and responsibilities imposed on me by the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specifications.
4. I hereby undertake that if my Tender is accepted, to provide before commencement of the Works under the contract or as required by the Conditions of the Contract, a suitable and sufficiently documented Construction Safety, Health and Environmental Management Plan in accordance with Regulation 7(1)(a) of the Construction Regulations of February 2014, which shall be subject for approval by the Client.
5. I confirm that I may not commence with any part of construction work under the contract until my Construction Safety Health and Environmental Management Plan has been approved in writing by the Client.
6. I hereby confirm that copies of the following documentation will be kept on site for viewing and inspection purposes for the duration of the construction work:
   a) Client's Construction Safety, Health and Environmental Specification.
   b) Approved Construction Safety, Health and Environmental Plan.
   c) Occupational Health and Safety Act, Act 85 of 1993.
   d) Construction Regulations of February 2014.
7. I agree that my failure to complete and execute this declaration to the satisfaction of the Client will mean that I am unable to comply with the requirements of the Occupational Health and Safety Act, Act 85 of 1993 and the Construction Regulations of February 2014, and accept that my Tender will be rejected.

Duly signed at..... on this the..... day of..... 20.....

Full Name of Signatory

Name of Enterprise

Capacity of Signatory

Signature of authorised representative of Tenderer

T2.18 Compulsory Enterprise Questionnaire

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

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

Section 1: Name of enterprise:	
Section 2: VAT registration number, if any:	
Section 3: CIDB registration number, if any:	
Section 4: CSD Number:	

Section 5: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

** Complete only if sole proprietor or partnership and attach separate page if more than 6 partners*

Section 6: Particulars of companies and close corporations

Company registration number	
Close corporation number	
Tax reference number	

Section 7: SBD4 issued by National Treasury must be completed for each tender and be attached as a tender requirement

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

i) authorizes the Employer to verify the tenderers tax clearance status from the South African Revenue Services that it is in order;

ii) confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;

iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;

iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and

iv) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed		**Date**	
Name			
Position			
Enterprise name			

T2.19 TAX COMPLIANCE STATUS (TCS) PIN TO VERIFY ON LINE COMPLIANCE SUPPLIER STATUS VIA SARS e-FILING

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

TAX CLEARANCE REQUIREMENTS

It is a condition of Tender that the taxes of the successful tenderer must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the tenderer's tax obligations. It is a condition of this Offer of Commission that your practice remains in good standing with SARS (South African Revenue Services) in terms of its tax clearance.

1. In order to meet this requirement Tenderders are required to apply via e-filing at any SARS branch office nationally. The Tax Complance Status (TCS) requirements are also applicable to foreign Tenderders / individuals who wish to submit tenders.
2. SARS will then furnish the tenderer with a Tax Compliance Status (TCS) **PIN** that will be valid for a period of 1 (one) year from the date of approval.
3. In tenders where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Compliance Status (TCS) PIN.
4. Application for Tax Compliance Status (TCS) PIN can be done via e-filing at any SARS branch office nationally or on the website www.sars.gov.za.
5. Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

IMPORTANT NOTICE

1. The South African Revinue Services (SARS) has phased out the issuing of paper Tax Clearance Certificates.
2. From 18 April 2016 SARS introduced an enhanced Tax Compliance (TCS) system.
3. The new system allows taxpayers to obtain a Tax Compliance Status (PIN), which can be utilised by authorised third parties to varify taxpayers compliance status online via SARS e-filing.
4. Tenderers are required to fill in clearly, legibly, in bold print and black ink the SARS (TCS) PIN number and Tax Reference number in the space hereunder:

Tax Compliance Status(TCS) PIN Number	
Company / Tendering Entity Tax Reference Number	

Name of Tenderer: .....

Signature of tenderer: .....

Date: .....

T2.20 CERTIFIED PROOF OF GOOD STANDING WITH THE COMPENSATION COMMISSIONER

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

ATTACH A CERTIFIED COPY OF PROOF, THAT THE TENDERER IS IN GOOD STANDING WITH THE COMPENSATION COMMISSIONER, TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of proof of Good Standing with the Compensation Commissioner in respect of each party to the Joint Venture must be attached to this page

T2.21 - FORM OF OFFER AND ACCEPTANCE

Tender no: ZNTL 05094W

OFFER

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

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

The Tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and Addenda thereto as listed in the Returnable Schedules, and by submitting this Offer has accepted the Conditions of Tender.

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

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

Amount (in words):	
Amount in figures:	**R**

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

Signature (s)				
Name (s)				
Capacity				
For the tenderer				
	(Name and address of tenderer)			
Name and signature of witness			**Date**	

ACCEPTANCE

By signing this part of this Form of Offer and Acceptance, the Employer identified below, accepts the Tenderer's offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the Conditions of Contract identified in the Contract Data. Acceptance of the Tenderer's offer shall form an agreement between the Employer and the Tenderer upon the terms and conditions contained in this Agreement and in the contract that is the subject of this Agreement.

The terms of the contract, are contained in:

Part C1	Agreement and Contract Data, (which includes this agreement)
Part C2	Pricing data
Part C3	Scope of work.
Part C4	Site information and drawings and documents or parts thereof, which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the returnable schedules as well as any changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this form of offer and acceptance. No amendments to or deviations from said documents are valid unless contained in this schedule.
The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

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

Signature (s)			
Name (s)			
Capacity			
For the employer			
	(Name and address of employer)		
Name and signature of witness			

Schedule of Deviations

Notes:

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

1.1.1. Subject:
Details:

1.1.2. Subject:
Details:

1.1.3. Subject:
Details:

1.1.4. Subject:
Details:

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

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

T2.21a CONFIRMATION OF RECEIPT

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

Tender no.:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

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

the _____ (day)

of _____ (month)

_____ (year)

at _____ (Place)

For the Contractor:

_____
Signature

_____
Name

_____
Capacity

Signature and name of witness:

_____
Signature

_____
Name

T2.22 - FINAL BILL OF QUANTITY SUMMARY

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

ATTACH SUMMARY PAGE OF THE BILL OF QUANTITIES

FINAL SUMMARY

Section No		Page No	Amount
1	PRELIMINARIES AND GENERAL	18	
2	BUILDING WORKS	40	
3	ELECTRICAL INSTALLATION & LIGHTNING PROTECTION (PROVISIONAL)	68	
4	EXTERNAL WORKS (PROVISIONAL)	123	
	Sub Total		R
	ADD: VALUE ADDED TAX		R
	Carried to Form of Offer and Acceptance		R

T2.23 - PROOF OF PAID MUNICIPAL RATES & TAXES

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

ATTACH PROOF OF PAID MUNICIPAL RATES & TAXES TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Quotation by a Joint Venture, proof of paid municipal rates and taxes for each member of the Joint Venture should be attached to this form.

T2.24 - CERTIFIED PROOF OF VALID UIF REGISTRATION

Project title:	**MADADENI HOSPITAL:"REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

ATTACH A CERTIFIED COPY OF PROOF, THAT THE TENDERER IS IN GOOD STANDING WITH THE **UIF** TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of proof of Good Standing with the **UIF** in respect of each party to the Joint Venture must be attached to this page

The contractor must submit proof of UIF Contributions made to the fund to the Principal Agent on a monthly basis for the duration of the contract.

Should the contractor default on his monthly payments, the Employer will pay the outstanding payments due and the contractor will be liable for payments made by the Employer on behalf of the contractor, plus any additional cost associated with this process.

T2.25 THE NATIONAL INDUSTRIAL PARTICIPATION PROGRAMME

This document must be signed and submitted together with your tender

INTRODUCTION

The National Industrial Participation (NIP) Programme, which is applicable to all government procurement contracts that have an imported content, became effective on the 1 September 1996. The NIP policy and guidelines were fully endorsed by Cabinet on 30 April 1997. In terms of the Cabinet decision, all state and parastatal purchases / lease contracts (for goods, works and services) entered into after this date, are subject to the NIP requirements. NIP is obligatory and therefore must be complied with. The Industrial Participation Secretariat (IPS) of the Department of Trade and Industry (DTI) is charged with the responsibility of administering the programme.

1 PILLARS OF THE PROGRAMME

1.1 The NIP obligation is benchmarked on the imported content of the contract. Any contract having an imported content equal to or exceeding US$ 10 million or other currency equivalent to US$ 10 million will have a NIP obligation. This threshold of US$ 10 million can be reached as follows:

(a) Any single contract with imported content exceeding US$10 million.

or

(b) Multiple contracts for the same goods, works or services each with imported content exceeding US$3 million awarded to one seller over a 2 year period which in total exceeds US$10 million.

or

(c) A contract with a renewable option clause, where should the option be exercised the total value of the imported content will exceed US$10 million.

or

(d) Multiple suppliers of the same goods, works or services under the same contract, where the value of the imported content of each allocation is equal to or exceeds US$ 3 million worth of goods, works or services to the same government institution, which in total over a two (2) year period exceeds US$10 million.

1.2 The NIP obligation applicable to suppliers in respect of sub-paragraphs 1.1 (a) to 1.1 (c) above will amount to 30 % of the imported content whilst suppliers in respect of paragraph 1.1 (d) shall incur 30% of the total NIP obligation on a pro-rata basis.

1.3 To satisfy the NIP obligation, the DTI would negotiate and conclude agreements such as investments, joint ventures, sub-contracting, licensee production, export promotion, sourcing arrangements and research and development (R&D) with partners or suppliers.

1.4 A period of seven years has been identified as the time frame within which to discharge the obligation.

2 REQUIREMENTS OF THE DEPARTMENT OF TRADE AND INDUSTRY

2.1 In order to ensure effective implementation of the programme, successful tenderers (contractors) are required to, immediately after the award of a contract that is in excess of R10 million (ten million Rands), submit details of such a contract to the DTI for reporting purposes.

2.2 The purpose for reporting details of contracts in excess of the amount of R10 million (ten million Rands) is to cater for multiple contracts for the same goods, works or services; renewable contracts and multiple suppliers for the same goods, works or services under the same contract as provided for in paragraphs 1.1.(b) to 1.1. (d) above.

3 Tender SUBMISSION AND CONTRACT REPORTING REQUIREMENTS OF TenderDERS AND SUCCESSFUL TenderDERS (CONTRACTORS)

3.1 Tenderders are required to sign and submit this Standard Tenderding Document (SBD 5) together with the Tender on the closing date and time.

3.2 In order to accommodate multiple contracts for the same goods, works or services; renewable contracts and multiple suppliers for the same goods, works or services under the same contract as indicated in sub-paragraphs 1.1 (b) to 1.1 (d) above and to enable the DTI in determining the NIP obligation, successful Tenderders (contractors) are required, immediately after being officially notified about any successful Tender with a value in excess of R10 million (ten million Rands), to contact and furnish the DTI with the following information:

- Tender / contract number.
- Description of the goods, works or services.
- Date on which the contract was accepted.
- Name, address and contact details of the government institution.
- Value of the contract.
- Imported content of the contract, if possible.

3.3 The information required in paragraph 3.2 above must be sent to the Department of Trade and Industry, Private Bag X 84, Pretoria, 0001 for the attention of Mr. Elias Malapane within five (5) working days after award of the contract. Mr. Malapane may be contacted on telephone (012) 394 1401, facsimile (012) 394 2401 or e-mail at Elias@thedti.gov.za for further details about the programme.

4 PROCESS TO SATISFY THE NIP OBLIGATION

4.1 Once the successful Tenderder (contractor) has made contact with and furnished the DTI with the information required, the following steps will be followed:

a. the contractor and the DTI will determine the NIP obligation;
b. the contractor and the DTI will sign the NIP obligation agreement;
c. the contractor will submit a performance guarantee to the DTI;
d. the contractor will submit a business concept for consideration and approval by the DTI;
e. upon approval of the business concept by the DTI, the contractor will submit detailed business plans outlining the business concepts;
f. the contractor will implement the business plans; and
g. the contractor will submit bi-annual progress reports on approved plans to the DTI.

4.2 The NIP obligation agreement is between the DTI and the successful Tenderder (contractor) and, therefore, does not involve the purchasing institution.

Tender number:	_____	Closing date:	_____
Name of tenderer:	_____		
Postal address:	_____		
	_____		
Signature:	_____	Name (in print):	_____
Date:	_____		

T2.26 - CERTIFIED PROOF OF REGISTRATION ON CENTRAL SUPPLIERS DATABASE

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Bid no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

ATTACH A CERTIFIED COPY OF PROOF, THAT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIERS DATABASE TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of proof of registration on the Central Suppliers Data Base in respect of each party to the Joint Venture must be attached to this page

T2.27 - CERTIFIED PROOF OF CIDB REGISTRATION NUMBER

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

ATTACH A CERTIFIED COPY OF PROOF, THAT THE TENDERER IS REGISTERED WITH THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD (CIDB) TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of proof of registration with the CIDB in respect of each party to the Joint Venture must be attached to this page

Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations for a :

6CE or higher, class of construction work, are eligible to have their Tenders evaluated.

T2.28 - PROOF OF PAYMENT OF TENDER DEPOSIT

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

ATTACH A COPY OF PROOF OF PAYMENT WHERE AVAILABLE OF THE TENDER DEPOSIT BY THE TENDERER, TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture a certified copy of proof of payment where available of the tender deposit is only necessary in respect of any one party to the Joint Venture and must be attached to this page

T2.29 CONTRACT FORM - PURCHASE OF GOODS/WORKS-Part 1

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

PART 1 (TO BE FILLED IN BY THE TENDERER)

1. I hereby undertake to supply all or any of the goods and/or works described in the attached tendering documents to Head: Public Works (Department of Public Works: Province of KwaZulu-Natal) in accordance with the requirements and specifications stipulated in tender number ZNTL 05094W at the price/s quoted.
2. The following documents shall be deemed to form and be read and construed as part of this agreement:
   (i) Tendering documents, viz
   - Invitation to tender;
   - Tax Compliance Status (TCS) **PIN**;
   - Pricing schedule(s);
   - Technical Specification(s);
   - Preference claims for SPECIFIC GOAL/S, for this tender in terms of the Preferential Procurement Regulations 2022;
   - Bidder's Disclosure;
   - Special Conditions of Contract;

   (ii) General Conditions of Contract for construction works Edition 2 - GCC2010; and
3. (iii) Other (specify)
4. I confirm that I have satisfied myself as to the correctness and validity of my Tender; that the price(s) and rate(s) quoted cover all the goods and/or works specified in the Tenderding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.
5. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfilment of this contract.
6. I declare that I have no participation in any collusive practices with any Tenderder or any other person regarding this or any other Tender.

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

NAME (PRINT): _____

CAPACITY: _____

SIGNATURE: _____

NAME OF FIRM: _____

DATE: _____

Witnesses:

1. _____

2. _____

Date:

T2.30 CONTRACT FORM - PURCHASE OF GOODS/WORKS-Part 2

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I _____ in my capacity as

_____

accepts your tender under reference ZNTL 05094W dated _____for the supply of goods/works indicated hereunder and/or further specified in the annexure(s).

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

ITEM NO.	PRICE (ALL APPLICABLE TAXES INCLUDED)	BRAND	DELIVERY PERIOD	B-BBEE STATUS LEVEL OF CONTRIBUTION	MINIMUM THRESHOLD FOR LOCAL PRODUCTION AND CONTENT (if applicable)

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

SIGNED AT _____ ON _____
[Place] *[Date]*

NAME (PRINT): _____

SIGNATURE: _____

OFFICIAL STAMP:

Witnesses:

1. _____

2. _____

Date:

T2.31 - OHSE PLAN STRUCTURE

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

A detailed OHSE Plan is to be submitted by the successful tenderer as per Construction Regulation 7(1)(a). The following are the minimum standard legal documentation that must form part of the OHSE Plan based on the risks attached in executing this project titled;

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION: STRUCTURE OF THE DETAILED OHSE PLAN

REFER TO ANNEXURE A OF OHS SPECIFICATION (2 PAGES)

REFERENCE NR	070606
Revision	3
Date	06 July 2020

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

06 July 2020

OHS DESIGN RISK REPORT AND SPECIFICATION
(COVID – 19 GUIDELINES)

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK

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    - 5.2. CONDUCTING A HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA)

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5.4. METHODOLOGY (METHOD USED TO CONDUCT RISK ASSESSMENT

6. RISK ASSESSMENT PROFILE

7. SPEC AND BASELINE RISK ASSESSMENT

1. INTRODUCTION

- This Report of OHS Design Risk aims to develop a greater recognition of the role of OHS design Risk in improving occupational health and safety performance in the workplace.

- The OHS Design Risk report is aimed at the following groups: ·
  - **The Client,**
  - **Contractors involved in the Construction of the Structure**
  - **Future occupants of the building,**
  - **Maintenance personnel, and**
  - **Persons responsible for the eventual demolition of the structure**

2. PURPOSE OF OHS DESIGN RISK REPORT

- The purpose of this OHS Design Risk Report is to specify the hazards relating to the architectural component of the design of this structure that create a risk to the health and safety of persons who are to carry out any construction work on the structure.

- The report also covers hazards associated with other stages of the lifecycle of the structure when it is used as a workplace.

3. WHO SHOULD RECEIVE THE OHS DESIGN RISK REPORT?

- The Designer has a statutory duty to provide a report on the potential hazards relating to the construction to the client who is required under Construction Regulation 2014 to pass the report on to the Principal Contractor.
- This information detailing how the structure has been designed to be without risk to health and safety, should also be given to each person who is provided with the design for the purpose of giving effect to it.
- The Designer must also, on request, supply this information to anyone who constructs, uses, maintains or demolishes that structure.

4. LEGISLATION

- ❖ The Construction Regulations 2014 require the Designer to provide a written safety report to the client.
- ❖ The Client then has a responsibility to provide this OHS design Risk report to the Principal Contractor.
- ❖ All parties have a duty to consult with each other to ensure communication of this information.

5. HAZARD IDENTIFICATION AND RISK ASSESSMENT PROCESS

The Hazard Identification and risk Assessment process involves the identification of hazards, which is anything which may cause harm, injury, damage, work interruptions etc and risks, the likelihood of such outcomes of the hazards being realised and should it be realised what would the severity be, or in other words the consequence.

5.1. REASONS TO DO A RISK ASSESSMENT

- It is a legislative requirement.
- It is a moral obligation.
- To ensure the most cost effective design are developed and reducing the cost of changes at the early stage of design.

5.2. CONDUCTING A HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA

- Identifying Hazards and Risks associated with design applicable to the Construction, Use Maintenance and eventual demolition stages of the design
- Considering Legislative, Codes of Practise, Bylaws etc. applicable to the design and evaluating compliance with such requirements
- Applying the Hierarchy of Risk Control to the design and striving to eliminate such hazards and risk levels to as low as is reasonably practicable by considering issues such as redesign, substitution etc.

5.3. DIFFERENT TYPES OF RISK

Risks could be associated with:

- Injury or illness to people;
- Damage to property;
- Effects on the environment;
- Productivity;
- Cost;

- Insurance; and
- Reputation.

5.4. METHODOLOGY (METHOD USED TO CONDUCT RISK ASSESSMENT)

a. Risk Value

➢Is a value calculated by allocating a value extracted from a table in terms of the likelihood of the risk being realised and multiplying it with a value associated with the consequence, which is also extracted from a table. The value obtained is known as the Risk Value or otherwise known as the Pure Risk. Pure risk is a level of risk which has not been subjected to any risk reduction or elimination measures.

After the application of Risk Control measures to the identified Pure Risk the Residual Risk level is calculated in the same manner which will result in obtaining a lower numerical outcome as that of the Pure Risk.

Risk value= Likelihood x consequence

➢likelihood

- **It covers a range from 1 to 5:**
  1 = Rare.
  2 = Unlikely.
  3 = Possible.
  4 = Likely
  5 = Almost certain

➢Consequence

- **It covers a range from 1 to 5:**
  1 = Negligible
  2 = Minor
  3 = Moderate
  4 = Major
  6 = Severe

6. RISK PROFILE

SITE SPECIFIC OHS RISK PROFILE		
Activity	**Recommended risk control measure**	**Risk Prioritisation Number**
Demolition of water tower	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records, Competent Operators Medical Fitness Certificates, continuous housekeeping signage and solid barricading, training. PPE etc.	**2**
Cutting of pipes	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	2
Pipe trenching and laying, backfilling	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2**
Excavate trenches and Lay new bulk supply and water reticulation pipelines	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2**
Construct new hydrants, hose reels concrete base.	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2**
Construct new fire house pump house.	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2**
Install and commission of fire pumps	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2**
Construction of new elevated water tank.	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2**

REFERENCE NR	070606
Revision	3
Date	06 July 2020

06 July 2020

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Occupational Health and Safety Specification

(OHSE SPEC)

Project Name : **MADADENI HOSPITAL – REPLACEMENT OF RESERVOIR TANK (COVID – 19 GUIDELINES)**

WIMS no. : 070606

Client OHS Representative : NS Mbatha

Region : Midlands Region

District : Amajuba

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1. Introduction

The *KwaZulu Natal Department of Public Works* is deemed as the **"Client"** in terms of the definitions of Construction Regulations of 2014 as published in *Government Gazette No. 37305*.The Construction Regulations of 2014 under *CR(5)(1)* stipulates that that the client must prepare a suitable, sufficiently documented and coherent site specific Occupational Health and Safety Specification for the intended construction work based on the baseline risk assessment.

The purpose of this Occupational Health and Safety Specification document (which hereinafter will be referred to as OHSE Spec) is to provide designers and the successful tenderer with essential OHS information to ensure effective safety management during the design and construction phase of the project.

This OHSE Spec forms an integral part of the contract between the Client and the Principal Contractor, so as to ensure compliance with the Occupational Health and Safety Act, Act 85 of 1993 and its applicable regulations and must serve as the basis for the Principal Contractor to develop his/her Project Safety, Health and Environmental Management Plan. As with any other plan for it to be implemented and managed effectively it requires the allocation of sufficient funds to achieve the objectives set out in the plan. In line with this requirement Construction Regulation 5(1)(g) requires the Client to ensure that the Principal Contractor has made adequate provisions for the cost of Health and Safety Measures in their tenders.

It must be noted that this OHSE Spec as much as it is detailed it is not exhaustive and the onus is on the Principal Contractors to ensure that they comply with Section 8 of the OHS Act, Act 85 of 1993 which states that *"Every Employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees."* this means that Principal Contractors as they are employers in their own right must at all times ensure continuous assessments are done for continued provision and maintenance of a healthy and safe working environment.

2. Definitions

For the purpose of the OHSE Spec, the abbreviations or definitions given hereunder shall apply and the reference to on gender will also apply to the other gender.

"CR" refers to the Construction Regulations 2014

"Agent (*Pr.CHSA*)**"** means a competent person who acts as a representative for a Client in terms of regulation (5)5.

"Client" means Department of Public Works

"Competent person" means a person who-

(a) Has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific for that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualifications Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and

(b) Is familiar with the OHS Act, Act 85 of 1993 and with the applicable regulations made under the Act;

"Construction Manager (*Site Agent***)"** means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

"Construction Site" means a work place where construction work is being performed;

"Construction Supervisor" means a competent person responsible for supervising construction activities on a construction site;

"Construction Vehicle" means a vehicle used as a means of conveyance for transporting persons or material, or persons and material, on and off the construction site for the purposes of performing construction work;

"Construction work" means any work in connection with –

(a) The construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or
(b) the construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work;

"Construction Work Permit" means a document issued in terms of regulation 3 of the Construction Regulations 2014;

"Contractor" means an employer who performs construction work;

"Demolition Work" means a method to dismantle, wreck, break, pull down or knock down of a structure or part thereof by way of manual labour, machinery, or the use of explosives;

"Fall Protection Plan" means a documented plan, which includes and provides for-

(a) All risks relating to working from a fall risk position, considering the nature of work undertaken;

(b) The procedures and methods to be applied in order to eliminate the risk of falling; and

(c) A rescue plan and procedures;

"Health and Safety File" means a file, or other record containing the information in writing required by these Regulations;

"Health and Safety Plan" means a site, activity or project specific documented plan in accordance with the client's health and safety specification;

"Health and Safety Specification" means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work;

"Medical Certificate of Fitness" means a certificate contemplated in regulation 7(8) of Construction Regulations 2014;

"Principal Contractor" means an employer appointed by the client to perform construction work;

"Safety Officer" – a person deemed competent by SACPCMP under the relevant category of registration.

"Professional Engineer or Professional Certificated Engineer" means a person holding registration as either a Professional Engineer or Professional Certificated Engineer in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);

3. Scope of Application

This OHSE Specification document stipulates the minimum Occupational Health, Safety, and Environmental requirements that the tenderer need to address in his/her OHSE Plan. This Specification also addresses legal compliance, hazard identification, risk assessment, risk control, and the promotion of a Health and Safety culture amongst those working on the project.

This Specification also makes provision for the protection of persons other than employees. This OHSE Spec is exclusively applicable to the following project pending any change of scope which may necessitate changes to the OHSE Specification;

MADADENI HOSPITAL - REPLACEMENT OF RESERVOIR TANK

This OHSE Specification further seeks to achieve the following;

a) To provide Principal Contractors with the Structure of the Detailed OHSE Plans they will have to prepare and submit for this project. ***See Annexure A***

b) Provide the overarching framework within which the Principal Contractor is required to demonstrate compliance with certain requirements for occupational health and safety established by the Occupational Health and Safety Act, Act 85 of 1993, all applicable regulations and Client Specific Requirements. ***See Annexure B***

c) To bring to the attention of the Bidding Principal Contractors that they need to make an undertaking that the costs for executing the project includes the costs of complying with the OHS Act, Act 85 of 1993, all applicable regulations including Client Specific requirements. Such undertaking is made by appending signatures on the OHS Declaration for Tenders. ***See Annexure C***

d) Ensure that the Principal Agent as the Professional Service Provider appointed by the Department to manage the project on its behalf in terms of the Conditions of Contract applicable to this project ensures that the contents of this document and the attached Baseline Risk Assessment are taken into consideration during design by all professions appointed and that the OHSE Specification is incorporated into the tender documents. ***See Annexure D***

3.1. Site description

The site is located Newcastle – Madadeni hospital

3.2. Summary of Scope of work

Upgrade the bulk water supply lines, storage and connections.
Provide a dedicated fire water system with pumps, hose reels, hydrants, dedicated and possibly combined fire storage and new pipework.
Construct concrete base and erect new sectional steel water tank.

3.3. Project team

The Project Team is as follows:

Initials and Surname	Organisation	Discipline	Tel	Email
R Nemavhandu	DOPW	Project Leader	071 865 2153	rendani nemavhandu@kznworks.gov.za
V Khanyile	DOH	Project Leader	083 575 4486	Vuyolwetu.Khanyile@kznhealth.gov.za
N Roy	Hospital Design Group	Architect/Principal Agent	084 527 2649	naresh@bartschkzn.co.za
O Arthur	EL & Sons Quantity Surveyors	Quantity Surveyors	060 973 3579	oliver@elsons.co.za
NS Mbatha	DOPW	Client Health and Safety Representative	063 201 9309	Nhlanhla.Mbatha@kznworks.gov.za

4. Contractual Issues

Acceptance by the Principal Contractor of the contract with KZN DOPW shall constitute acknowledgement that the Principal Contractor has familiarised him/herself with the contents of the OHSE Spec and that he/she will comply with all its obligations in respect thereof.

Due to fact that this document is based on legislative requirements, the Client requires that all Contractors comply with the requirements of this document and all other relevant legislative requirements not covered by this document.

The Client or its duly appointed Construction H&S Agent reserves the right to stop any Principal Contractor or Sub-Contractors from working whenever Safety, Health or Environmental requirements are being violated as required by regulation 5(1)(q). Any resultant costs of such work stoppages will be for the relevant Contractor's account.

The requirements as specified by the Client in this document must not be deemed to be exhaustive and the Client reserves the right to make changes as and when the Client deems fit to address issue of OHSE Compliance.

The Client will not entertain any claim of any nature whatsoever which arises as a result of costs incurred or delays being experienced due to the Contractor not complying with the requirements of this document and/or any other applicable legislative requirements imposed on the Contractor.

5. Administrative Requirements

5.1. Notification of Construction Work

The successful Tender must submit within 7 days a completed Annexure A to the closest DOL Office, obtain proof of submission and return it to the DOPW OHS Representative responsible for this project.

6. Appointment of a Part time / Fulltime Safety Officer

a) The Principal Contractors will have to appoint a competent Part Time Construction H&S Officer who must be present on site at least 2 days per week.

b) Further to the abovementioned appointment, should the Client or its Representative having considered the risks present and lack of compliance to the Occupational Health and Safety Act, Act 85 of 1993 and its applicable Regulations the Client or its Representative may issue an instruction that a Full Time Construction Health and Safety Officer must be appointed, such a requirement will have to be met.

7. Covid-19 Site Management Safety Requirements

The KZN Department of Public Works has developed the COVID-19 site management guidelines to assist contractors in relation to managing and prevention of the Coronavirus Disease (COVID–19) on construction sites. The contractor as employer has an obligation to assist government in limiting the spread of COVID-19 on site. In view of the COVID-19 pandemic the contractor is mandated to continuously review and update the Risk Assessment and provide training to employees. Contractors are advised to develop an emergency response plan in case someone displays signs of COVID-19 at the workplace (dry cough, fever, headache, shortness of breath). Allocate a room or area where someone who is feeling unwell or has symptoms can be safely isolated. Immediately stop all activities on site and contact the nearest health facility or the COVID-19 centre. If you are advice by the Department of Health to transport the worker to a health facility, you must have a plan for how they can be safely transported from there to a health facility. All activities on site must be ceased and all the details. A site emergency plan to dealing with COVID-19 must be conspicuously displayed onsite.

7.1. Appointment of a COVID-19 compliance officer

The Principal Contractors will have to appoint a COVID-19 compliance officer to oversee the implementation of the COVID-19 site management plan and conduct daily inspection of the work areas.

7.2. Onsite Record keeping and management requirements

Every employer (contractor) has an obligation to assist government in enabling contact tracing in the workplace. These obligation include the following measure:

- Contractors are advice to observe confidentiality of employee's details and medical results at all times.
- A register containing the details of employees, visitors and service providers that enter the site in a particular day to be kept in a secured environment only accessible to authorised personnel.
- The following details should be contained in the register, date, time (of entry and departure), name, surname, identity number, residential address, mobile number and next of kin details.
- All employees, service providers, sub-contractors, visitors and consultants must sign the register with the above details on entering the site.
- Adequately trained health and safety personnel, to perform daily workplace COVID-19 symptom screening.
- Provide compulsory medical screening equipment
- Provide prescribed personal protective equipment (PPE) to all employees onsite.
- All personnel and visitor entering the site must be temperature screened with a laser temperature scanner and records must be kept of the site register. If the temperature is above 37.3 C or more, advice the individual to stay at home, self-isolate, and observe the symptoms. They should also telephone the nearest health facility or the COVI-19 centre; provide them details of their recent travel and symptom.

Annexure A

Structure of the Detailed OHSE Plan

A detailed OHSE Plan is to be submitted by the successful tenderer as per section 8 above. The following are the minimum standard legal documentation that must form part of the OHSE Plan based on the risks attached in executing this project –

MADADENI HOSPITAL – REPLACEMENT OF RESERVOIR TANK

1. The notification to commence with construction work made to the Provincial Director of Labour using Annexure 2. (*Filled in only to be submitted on approval of the Safety Plan*)
2. Letter of Good Standing with Compensation Commissioner or Compensation insurer
3. The Contractor's Health, Safety & Environmental Policy, signed by the chief executive officer, which outlines the Contractor's OHSE compliance objectives and how they will be achieved.
4. Pre-Construction risk assessment *(Site specific)* and method statement of priority Risk as per the Risk Profile.
5. Relevant checklists and registers.
6. Site specific OHSE Organogram
7. Preliminary Induction Program
8. Environmental Management Plan
9. Public Safety Management Plan
10. Proof of competency for the following legal appointees;
    - *10.1. Construction Manager – (Detailed CV reflecting qualification, relevant experience and references from previous clients)*
    - *10.2. Construction Work Supervisor – (Detailed CV reflecting qualification, relevant experience and references from previous clients)*
    - *10.3. Construction H&S Officer – SACPCMP proof of registration*
    - *10.4. Risk Assessor – SAMTRAC or equivalent*
    - *10.5. Accident Investigator - SAMTRAC or equivalent*
    - *10.6. Fall Protection Planner – SAQA US 229994*
    - *10.7. Demolition work inspector – (Detailed CV reflecting qualification, relevant experience and references from previous clients)*
    - *10.8. Electrician – wireman's licence*

Legal appointments to be appointed	
Prior Site Handover	**After Site Handover on commencement with Construction work**
• Construction Manager • Construction Work Supervisor • Construction H&S Officer • Risk Assessor • Fall protection Planner • COVID-19 compliance officer	• Scaffold Erectors • Scaffold Inspectors • First Aiders • Emergency co-ordinator • Fire Marshalls • Fire team members • Portable Electrical tool inspector • Hand tools inspector • Housekeeping inspector • Stacking and storage inspector • Construction Vehicle and mobile plant inspector • Traffic Controller (Flagman) • Temporary electrical installation inspector • Flammable liquids Storage Inspector • Hazardous substance storage inspector • Ladder inspector • Health and safety representatives • Accident investigator

T2.32 - OHSE CLIENT SPECIFIC REQUIREMENTS	
Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**
Tender no:	**ZNTL 05094W**
Project Code:	**WIMS No. 078856**

OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION:
CLIENT SPECIFIC REQUIREMENTS

REFER TO ANNEXURE B OF OHS SPECIFICATION (8 PAGES)

Annexure B

Client Specific Requirements

Items	Client Specific Requirements
Site Office location	• The location of the site office should be in an area that will not require visitors to pass through or enter area where construction work is active and will not require .the re-location of the office as the project progresses.
Medical Certificates	• In compliance with the requirements of the Construction Regulations 2014 section 7(8) the Contractor must ensure that all of his employee's onsite have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.
Appointment of a full - time safety officer	• The Principal Contractors will have to appoint a competent full - Time Construction H&S Officer for this project.
Extreme weather conditions	• If the weather condition poses a threat to the health & safety of employees be it extreme heat, cold, lighting or any adverse weather condition appropriate safety measures have to be taken.
Change to scope of work	• Should there be changes to the original scope of work, the Principal Agent must inform appointed Construction Health and Safety Agent to effect changes to the OHSE Specification.
Safety Plan Submission	• The successful Tenderer must submit a copy of the detailed OHSE Plan for approval and keep the original for onsite use during construction. The principal Contractor will not be allowed to start site establishment before his/her SHE Plan has been approved in writing.
Bylaws	• The Principal Contractor must incorporate any aspects of the Local Municipal bylaws which affect the, Safety and Environmental wellbeing of the employees and the public into his/her OHSE Plan and ensure compliance to such bylaws.
Risk assessment for construction work	• To comply with CR(9) and to also address environmental issues • To also include exposure to hazardous gases *See the attached baseline risk assessment to be considered by both the designer and the principal contractor.*
Fall protection	• To comply with CR (10), • Edge protection and protection of floor openings need to be of such a manner as to properly protect employees from falling off elevated positions or falling into floor openings
Structures	• To comply with CR (11)

Construction employees' facilities	• To comply with CR (30) and the following; • Gender signs to be placed at appropriate locations • All welfare facilities to be kept in a hygienic condition at all times • Employees to be trained in good hygiene practices
Public Safety & Signage	• The Principal Contractor engaged in construction work must ensure that each person working on or visiting a site, and the general public in the vicinity of the construction site, shall be made aware of the dangers likely to arise from onsite activities and the precautions to be observed to avoid or minimise those dangers. • Appropriate signage shall be posted at conspicuous points within and around the perimeter of the site. The steps to comply with this requirement must be outlined in the OHSE Plan. • The public or visitors may only be permitted on site if they go through an appropriate health and safety induction detailing hazards and risks they may be exposed to and what measures are in place to control these hazards and risks • The entire project site must be secured against unauthorized access and provided with appropriate warning signage. Where roadways or walkways must be encroached or closed due to work, adequate barriers shall be installed to safely redirect the flow of vehicles and pedestrians and protect them from construction activities. • Whenever it is necessary to maintain public use of work areas (such as sidewalks, ramps, entrances to buildings, corridors, or stairways), the public shall be protected with appropriate guardrails, barricades, temporary fences, overhead protection, or temporary partitions and hoarding. The public must also be adequately protected from any work created hazards, such as excavations. Appropriate warnings, signs, warning lights and instructional safety signs shall be conspicuously posted and placed where necessary. • The public must also be protected from falling debris and objects from the project site. Overhead protection shall be provided that will fully protect the public and be capable of withstanding the maximum forces that could be applied from potential falling objects. Special attention shall also be given to developing adequate means to protect against wind-blown debris and construction-related materials.
On Site Health and Safety Training & Induction	• The Principal Contractor shall ensure that all site personnel and visitors undergo a risk-specific health & safety induction training session before starting work or being permitted to enter the site. A record of attendance shall be kept in the health & safety file. • The Principal Contractor shall ensure that, on site periodic toolbox talks take place at least once per week. These talks should deal with risks relevant to the construction work at hand. A record of attendance shall be kept in the health & safety file. The above should also cover all sub-contractors that are onsite. • • All Contractors have to comply with this minimum requirement.

	Environmental issues to be included in toolbox talks where required.
General Record Keeping	• The Principal Contractor and all Sub Contractors must keep and maintain Health and Safety records to demonstrate compliance with this Specification, The OHS Act 85/1993; and with the Construction Regulations of 2014. The Principal Contractor shall ensure that all records of incidents/accidents, training, inspections; audits, etc. are kept in a health & safety file held in the site office, which must be present on site at all times. • The Principal Contractor must ensure that every Sub Contractor opens its own health & safety file, maintains the file and makes it available on request.
Health & Safety Audits, Monitoring and reporting	• The Client or its duly appointed Agent shall conduct monthly health & safety audits. The Principal Contractor is obligated to conduct similar audits on all Sub Contractors appointed by them at least once a month. Detailed audit reports must be presented and discussed at all levels of project management meetings and a copy of such audit will be provided to the Client or its duly appointed Agent within 7 working days of such audit. Copies of the Client's audit reports shall be kept in the Principal Contractors Health & Safety File.
Emergency Procedures	• The Principal Contractor shall submit a detailed Emergency Plan for approval by the Client prior to commencement on site. The plan shall detail the response procedure including the following key elements: 1. List of key competent personnel; 2. Details of emergency services; 3. Actions or steps to be taken in the event of the specific types of emergencies; 4. Information on hazardous material/situations.
First Aid Boxes and First Aid Equipment	• The appointed First Aider(s) to be in possession of a valid first aid training certificate Level 2. Valid certificates are to be kept in the Site Safety File. All Sub Contractors with more than 5 employees shall supply their own first aid box, except if otherwise agreed upon between Principal and Sub- Contractor in writing.
Accident / Incident Reporting and Investigation	• Injuries are to be categorised into Near miss, first aid, LTI, fatal etc. Fatal accidents to be reported in addition to applicable legislative requirements to the Client or its duly appointed Agent with immediate effect. The Principal Contractor must stipulate in its construction phase OHSE Plan how it will handle each of these categories. When reporting injuries to the Client, these categories shall be used. The Principal Contractor shall investigate all injuries, with a report being forwarded to the Client immediately. All Sub- Contractors have to report on the abovementioned categories of injuries to the Principal Contractor at least monthly. All categories of incidents/accidents must be in the Statistics Section of the Monthly Audit Reports, submitted to the Client

	or it's duly appointed Agent.
Hazards and Potential Situations	• The Principal Contractor shall immediately notify other Sub Contractors as well as the Client of any hazardous or potentially hazardous situations that may arise during performance of construction activities. • Should a hazardous situation require work stoppages, the work must be stopped and corrective steps taken such as the issue of Written Safe Work Procedures and the issue of Personal Protective Equipment.
Personal Protective Equipment (PPE) and Clothing	• The Principal Contractor must ensure that all workers are issued with the required PPE as required by the risks associated with the activities they perform .The minimum PPE to be worn on site will be Safety Shoes/Boots, Hard Hats, Overalls and reflective vests. No Visitors may enter the site without Safety Shoes/Boots and Hard hats. The Principal Contractor and all Sub Contractors shall make provision and keep adequate quantities of SABS approved PPE on site at all times. All employees issued with PPE to be trained in correct use, records of training and issue to be kept in the Site SHE File .Procedure to be in place to deal with: • 1 Lost or stolen PPE; • 2 Worn out or damaged PPE replacement. • 3. Employees not utilising PPE as required • The above procedure applies to Principal Contractors and their appointed Sub- Contractors, as they are all employers in their own right.
Permits	1) The Principal Contractor shall prepare and issue the required written permits relating to but not limited to the following: • Hot Work • Roof Work; and • Electrical work (both temporary and permanent) 2) The Principal Contractor must ensure that where permits are required that they are properly implemented and adhered to.
Speed Restrictions and Protections	Unless otherwise stipulated, the maximum speed limit on sites must be limited to 10 km/h. 1) Vehicle movement routes on site must be clearly indicated where applicable. 2) Signage to ensure the safe movement of vehicles on site, as well as to ensure the health and safety of all employees and visitors on site, must be displayed in strategic locations.
Hazardous Chemical Substances (HCS)	1) To comply with Hazardous Chemical Substances Regulations as published in Government Notice No. R. 1179 dated 25 August 1995. 2) In addition to the abovementioned, Material Safety Data Sheets must be kept on site for all materials, which may contain hazardous chemical substances

Fire Extinguishers and Fire Fighting Equipment	1) The Principal Contractor and Sub-Contractors must allow for and provide adequate provision of regularly serviced temporary fire fighting equipment located at strategic points on site, specific for the classes of fire likely to occur. 2) The appropriate notices and signs must be allowed for and be erected as required 3) Contractors may not utilize fire protection equipment belonging to the Client without prior consent
Ladders and Ladder Work	1) The Principal Contractor must allow for and ensure that all ladders are inspected at least monthly, are in a good safe working order, are the correct height for the task, extend at least 1m above the landing, are fastened and secured and are placed at a safe angle. 2) Records of inspections must be kept in a register on site.
General Machinery	To comply with Driven Machinery Regulations as published in Government Notice No. R. 1010 dated 18 July 2003
Portable Electrical Tools and Hand Tools	1) The Principal Contractor shall ensure that all electrical tools, electrical distribution boards, extension leads, and plugs are kept in a safe working order. 2.) The Principal Contractor shall ensure that all portable electrical Equipment, is clearly numbered, inspected by a Competent appointed person and records of such inspections to be kept on record in an appropriate register on the site SHE file 3) The Principal Contractor shall allow for and ensure the following in relation to hand Tools: That a "Competent Person" undertakes routine inspections and records are kept on site. That only authorized trained persons use the tools. That safe working procedures apply. That PPE is provided and used.
High Voltage Electrical Equipment Installations and Equipment	1) All Employees must be made aware of the presence and location of High Voltage Equipment such as underground cables and overhead lines, and ensure that the necessary precautionary steps are taken where work has to be executed in the vicinity of such equipment. 2) Precautionary measures such as Isolation and Lock-Out of electrical systems or the use of electrically isolated tools must be used.
Adequate Lighting	All Contractors must allow for and ensure that adequate lighting is provided to allow for work to be carried out safely.
Transportation of	1) In addition to CR 23 the following will apply The Principal Contractor and Sub-Contractors shall not:

Workers	• Transport persons together with goods or tools unless there is an appropriate area or section of the vehicle in which to store such goods. • Transport persons on the back of trucks except if a proper canopy (properly covering the sides and top) has been provided with suitable seating areas. • Permit workers to stand or sit on the edge of the transporting vehicle. • Transport workers in LDVs unless they are closed/covered and have the correct number of seats for the passengers • No driver may transport more than six people on the back of a 1 Ton LDV and more than four passengers on the back of a ½ Ton LDV. 2) The driver of any LDV may not permit more than two passengers to occupy the cab of any LDV. 3) Drivers of such vehicles must have a valid driver's license for the code of vehicle being driven by them. 4) No servicing of vehicles will be permitted on a Construction Site. No Vehicles or machinery leaking oil will be permitted on site due to the risk posed to the environment. 5) Any oil or diesel spilled on site must be cleaned up as per accepted environmental practice. **In the event that Earth Moving Machinery is present on site the following must be adhered to:** • Drivers of vehicles must be instructed to avoid parking behind earth moving machinery in order to ensure that their vehicles are visible to the operators of earth moving machinery. • Right of way must be afforded to earth moving machinery at all times. • Vehicles must only be permitted to park, where possible, in designated areas
Occupational Hygiene	1) Occupational exposure is a major problem and all Contractors must ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards. 2) All Contractors must prevent inhalation, ingestion and absorption of any harmful chemical or biological agents 3) Water to be utilized for drinking purposes may only be drawn from taps designated for drinking water purposes. Fire hydrants and fire hose reels may not be utilized for drinking water purposes.
Environmental Management	• The Principal Contractor and Sub-Contractors must comply with the requirements of NEMA Act. • The Principal Contractor must develop a waste management plan, implement and maintained it onsite • Cement mixing to be done at a predetermined location on site which must include a solid, slab, and bunded edges to prevent runoff • Contaminated run off water from the site must be treated such as to ensure that it does not pose a risk to the environment • Any material which may have a harmful effect when disposed of by

	normal means must be disposed of in an appropriate manner to eliminate its harmful effect on the environment after disposal. • The Principal Contractor must allow for and ensure that adequate procedures are implemented and maintained to ensure that waste generated is placed in suitable receptacles and removed from the site promptly. • Plans to deal with spillages must be in place and maintained. • No waste materials (liquid or solid) may be disposed of in drains. • No burning of waste material may take place on site as such material being burned may result in pollution of the air or give off toxic vapours which could be harmful to the health of employees or any other person present on site.
Alcohol and other Drugs	• No alcohol and other drugs will be allowed on site without the express permission of the Principal Contractor • No person may be under the influence of alcohol or any other drugs while on the construction site. • Any person on the construction site who is on prescription drugs must inform his/her Employer accordingly and the Employer shall in turn report this to the Principal Contractor immediately. • Any person on the construction site who is suffering from any illness/condition that may have a negative effect on his/her safety performance must report this to his/her Employer, who in turn must report this to the Principal Contractor forthwith. • Any person on the construction site who is suspected of being under the influence of alcohol or other drugs must be removed from site immediately and be instructed to report back the next day for a preliminary inquiry. A full disciplinary procedure must be followed by the Contractor concerned and a copy of the disciplinary action must be forwarded to the Principal Contractor for his records.

T2.33 - BASELINE RISK ASSESSMENT			
Project title:	MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT		
Tender no:	ZNTL 05094W	Project Code:	WIMS No. 078856

OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION: BASELINE RISK

REFER TO ANNEXURE D OF OHS SPECIFICATION (51 PAGES)

Annexure D

Baseline Risk Assessment

Please note that this is a Baseline Risk Assessment and not a detailed Risk Assessment.
Activities as listed below may not be in the sequence preferred by the Contractor or may be conducted at the same time
(Covid -19 Guidelines)

Project:	Madadeni Hospital: - **Replacement of Reservoir tank** WIMS No:- **070606**

REF N0				**RISK ASSESSOR**	N S MBATHA	REVISION	2	DATE	09/11/2019	
Likelihood		**Consequence**		**RISK VALUE= LIKELYHOOD X CONSEQUENCE**	**RISK RANKING**					
					Score			**RANKING**		
Rare	**1**	**Negligible**	**1**							
Unlikely	**2**	**Minor**	**2**		**6-10**			**2**		
Possible	**3**	**Moderate**	**3**							
Likely	**4**	**Major**	**4**		**17-20**			**4**		
Almost certain	**5**	**Severe**	**5**							
MAIN ACTIVITY	**Site establishment**									
REF NO	**SUB ACTIVITY**	**HAZARDS SHE**	**HEALTH RISK**	**ENVIRO MENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**Risk Prioritisation Number**	

MAIN ACTIVITY	SITE ESTABLISHMENT								
REF NO 1	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
1.1	Fencing/ Hoarding the site	1.Manual Handling 2.Struck by 3.Sharp edges 4.Physical exertion 5.Tripping Hazards 6. Hidden services , etc.	1. Muscular strain 2.Brusing, fractures 3.Cuts, abrasion 4.Dehydration 5.Fractures, 6. Electrocution, death etc.	None	1.Tripping, cuts etc.	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Cable Detection Equipment usage, Medical Fitness Certificates, signage and barricading, training. PPE etc.	1x2=2	1
1.3	Loading/Off-loading materials and equipment (Mechanical)	1.Uncontrolled movement of loads 2. Limbs caught between surfaces 3.Heated surfaces, 4. HCS 5. Sharp edges. 6.Moving vehicles.	1.Fractures,death,damage 2. Abrasions. Fractures, Cuts. 3.Burns 4. Dermatitis 5. Cuts 6.Vehicle/property Equipment damage, Fractures, Death etc.	1.Contamination of resources – oil leaks, fuel spillage	1.Death, Fractures , Damage etc.	4x4=16	HIRA,,Competent Management, Competent Supervision, safe systems of work, competent operators, Flagmen, Medical Fitness Certificates ,Vehicle maintenance records, signage and barricading, training. PPE etc.	3x3=9	2

1.4	Loading/Off Loading materials and equipment (Manual)	1. Uncontrolled Movement. 2.Sharp edges 3.Caught Between Surfaces 4.Falling Materials 5.Incorrect Lifting methods 6. Spillage etc.	1.Muscular strain 2.Cuts, abrasions 3.Brusing, fractures 4.Crushing ,cuts 5.Lower back injuries 6.Dermatitis etc.	1.Contamination of resources due to spillage of HCS, oil leaks,etc if present.	none	**4x5=20**	HIRA,,Competent Management, Competent Supervision, safe systems of work, competent operators, Medical Fitness Certificates ,Vehicle maintenance records, signage and barricading, training in collect lifting methods, PPE etc.	**3x3=9**	**2**
1.5	Positioning of equipment and site office on site (mechanical)	1.Uncontrolled movement of loads 2. Limbs caught between surfaces 3.Heated surfaces, 4. HCS 5. Sharp edges. 6.Moving vehicles.	1. Fractures, death, damage. 2. Abrasions. Fractures, Cuts. 3.Burns 4. Dermatitis 5. Cuts 6.Vehicle/property Equipment damage, Fractures, Death etc.	1.Contamination of resources – oil leaks, fuel spillage	1.Death, Fractures , Damage etc.	**4x5=20**	HIRA,,Competent Management, Competent Supervision, safe systems of work, competent operators Flagmen, Medical Fitness Certificates ,Vehicle maintenance records, signage and barricading, training. PPE etc.	**3x3=9**	**2**
1.6	Electrical Connection to the Site Office	1.Electricity 2.Sharp edges, 3.Physical Exertion 4. Poor working posture etc.	1. Electrocution, death 2.Cuts 3.Muscular strain, etc.	None	None	**4x5=20**	HIRA ,Competent Supervision and Management, Insulated tools ,Lock out, testing and tagging , permit issue, PPE etc.	**2x3=6**	**2**

1.7	Water connection to site office area	1.Sharp edges ,2.Hot climatic conditions, 3.Physical exertion, 4.Poor working posture etc.	1.Cuts, 2. Heat stroke, 3.Muscular strain, 4. Back strain etc.	None	None	2x2=4	HIRA, Competent Management, Competent Supervision, safe systems of work, Medical Fitness Certificates, training. PPE etc.	1x1=1	1
	TOTAL VALUE OF ACTIVITY					89		36	

MAIN ACTIVITY	SCAFFOLD , SCREEN, BARRICADING SIGNAGE ETC. ERECTION								
REF NO 2	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
2.1	Collection and placement of materials	1. Struck by sharp edges, 2. Physical exertion, 3. Manual handling etc.	1. Abrasions 2.Cuts 3.Muscular strain 4.Fractures etc.	none	1. Struck by falling objects 2. Slipping, tripping etc.	4x5=20	HIRA ,Competent Supervision and Management, Insulated tools ,Lock out, testing and tagging , permit issue, PPE etc.	2x3=6	2

2.2.	Erection of scaffolding structure/s and hoarding	1. Falls from height, dropping of items 2. Sharp edges, 3.Scaffolding collapse, struck by falling items etc.	1. Back strain, 2. bruising, 3. cuts, 4.abrasions, 5.Fractures, death	none	1.Struck by falling items	**3x3=9**	Safe system of work, use of fall arrest equip, erection of safe scaffolding, Supervision, etc.	**1x1=1**	**1**
2.3.	Erection of barricading	1.Hidden services 2.Physical exertion, 3.Struck by sharp edges etc.	1.Abrasions 2.Cuts 3.Muscular strain, 4.Fractures, 5.Electrocution etc.	None	1. Struck by falling objects, slipping, tripping etc.	**4x4=16**	HIRA, Supervision, PPE, Safe Systems of work etc.	**3x3=9**	**2**
2.4.	Fitment of signage	1.Physical exertion, 2.Sharp edges etc.	1.Muscular strain , 2.Cuts etc.	None	1.Struck by falling objects, slipping, tripping etc.	**2 x2=4**	HIRA, Supervision, PPE, Safe Systems of work etc.	**1 x1=1**	**1**
	TOTAL VALUE OF ACTIVITY					**49**		**17**	

MAIN ACTIVITY	DEMOLITION OF EXISTING CONCRETE WATER TOWER								
REF NO 3	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
3.1	Termination of services (Electrical)	1.Electricity, 2.Sharp edges, 3.Physical exertion, 4.Poor working posture, 5.Elevated work, etc.	1.Electrocution, 2.Death 3.Cuts 4.Muscular strain, 5.Lower back strain, 6.Fractures etc.	None	None	4x5=20	HIRA, Competent Supervision and Management, Insulated tools, Lock out, testing and tagging, permit issue, PPE etc.	2x3=6	2
3.2	Demolition of concrete water tower	1.Caught in-Between demolished structure. 2.Flying particles, 3.Struck against surface. 4.Abrasive surfaces, 5.Dust 6.Excessive environmental temperatures 7.Noise,, etc.	1.Fractures, 2.Death 3.Eye injuries, 4.Abrasions, 5.Dust inhalation, 6.Dehydration, 7.Noise induced hearing loss etc	None	None	4x4=16	HIRA, Engineers Recommendation, Competent Management, Competent Supervision, Demolition Plan, safe systems of work, Medical Fitness Certificates, continuous housekeeping signage and barricading, training. PPE etc.	2x3=6	2

3.3	Rubble removal	1.Flying particles, 2.Dust, 3.Struck by falling objects, 4.Noise, 5.Fall from heights and elevated positions, etc	1.Fracture 2.Dearth 3.Abrasions 4.Dust inhalation 5.Dehydration 6.Noise induced hearing loss etc.	Contamination of resources	Dust Noise	**4x4=16**	HIRA, Appointment of Accredited and Specialized Asbestos Contractor, Competent Management, Competent Supervision, SHE Plan, safe systems of work, Medical Fitness Certificates, continuous housekeeping signage and barricading, training. PPE etc.	**2x3=6**	**2**
	TOTAL VALUE OF ACTIVITY					**52**		**18**	

MAIN ACTIVITY	STAGE 1 - BRICK / CONCRETE WORK								
REF NO 4	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
4.1	Setting out foundations	1.Manual Handling 2.Dust 3.Flying particles 4. Sharp objects 5.tripping 6.Hazardous chemical substances etc.	1.Dust inhalation 2. Eye injuries 3.Fractures 4.Burns 5.Respiratory irritation 6.Dermaitis etc.	1.Contamination of natural resources – Hazardous chemical substance etc.	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work, Medical Fitness Certificates, continuous housekeeping signage and barricading, training. PPE etc.	1x1=1	1

4.2	Excavation for Surface Trenches(manually)	1.Physical exertion 2.Sharp edges 3.Dust 4.Abrasive Materials 5.Hot climatic Conditions 6.Bump against Etc.	1.Muscular strain 2.Cuts, lacerations 3. Dust inhalation 4.Abrasions 5.Heat exhaustion 6. Bruising etc.	None	None	**4x3=12**	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	**3x3=9**	**2**

4.3	Excavate trenches and Lay new bulk supply and water reticulation pipelines.	1. Entrapment due to fall / roll of pipe 2.Failure of lifting equipment. 3. Defective and broken skids. 4.Manual handling 5. Dust 6.Hands caught in between pipes 7.Physical exertion 8.Sharp edges 9.Dust 10.Abrasive Materials etc.	1.Back strain 2.Cuts & abrasion 3.Falls 4.Inhalation of dust 5. Muscular strain	none	none	**4x4=16**	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	**3x3=9**	**2**

4.4	Excavate trenches and lay new fire pipe lines	1. Entrapment due to fall / roll of pipe 2.Failure of lifting equipment. 3. Defective and broken skids. 4.Manual handling 5. Dust 6.Hands caught in between pipes 7.Physical exertion 8.Sharp edges 9.Dust 10.Abrasive Materials etc.	1.Back strain 2.Cuts & abrasion 3.Falls 4.Inhalation of dust 5. Muscular strain	none	none	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	**3x3=9**	**2**
4.5	Backfilling	1.Falling into trenches 2.Struck by tools. 3. Dust etc.	1.Inhalation of dust; 2.Eye injuries from flying soil particles; etc.	None	none	**4x4=16**	Training, PPE, safe systems of work and supervision	**3x3=9**	**2**

4.6	**Construct concrete base and erect new sectional steel water tank**	1.Sharp edges, 2.Physical exertion, 3.Hazardous chemical substance 4.Abrasive surfaces 5.Poor working posture 5.Cement Dust 6. Elevated work, 7. Manual handling 8.Trips & falls 9.Cuts etc.	1.Muscular strain 2.Cuts 3.dermatitis 4. Dust inhalation 5. Falls, fractures etc.	None	Struck by falling objects, slipping, tripping etc.	**4x4=16**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x3=6**	**2**
4.7	**Construct new hydrants, hose reels concrete base.**	1.Sharp edges, 2.Physical exertion, 3.Hazardous chemical substance 4.Abrasive surfaces 5.Poor working posture 5.Cement Dust 6.HCS etc etc.	1.Muscular strain 2.Cuts 3.dermatitis etc.	None	1.Struck by, falling objects 2.Slipping 3.Tripping etc.	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x3=6**	**2**

4.8	Construct new fire house pump house.	1.Abrasive surfaces, 2.Sharp edges 3.Struck by tools 4.Sharp objects, 5. Caught between. 6.Dust, 7.noise 8. Physical exertion etc.	1.Falls 2. Fractures, 3.Muscular cuts, 4.Abrasion 5.Heat exhaustion, 6.Noise induced hearing loss, 7.Eye injuries 8. Dust inhalation etc.	None	None	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, screening, training. PPE etc.	**3x3=9**	**2**
4.9.	Repairs of concrete water tank	1. Falls of person to the edge of structures. 2. Use of incorrect Equipment. 3. Defective equipment. 4. Hit by falling Equipment. 5. Environmental conditions (Weather, wet ground, uneven surfaces etc.	1.Falls 2.Fractures 3. Cuts 4. Bruising etc.	none	none	**4x4=16**	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Medical Fitness Certificates, signage and barricading, training. PPE etc.	**3x3=9**	**2**

4.10.	Plaster of building	1.Physical exertion, 2.Hazardous chemical substances, 3.Abrasive surfaces etc.	1.Dermatitis 2.Abrasions, 3.Muscular strain etc.	1.Contamination of natural resources etc.	1.Struck by falling objects. 2.Slipping, 3.Tripping etc.	3x4=12	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	3x2=6	2
	TOTAL VALUE OF ACTIVITY					142	67		
MAIN ACTIVITY	BRICK / CONCRETE WORK (PUMP HOUSE)								
REF NO 5	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number

5.1.	**(Floors)** Remove existing floor paint, then apply approved primer.	1.Poor working position 2.Caught between surfaces, 3.Dust	1.Muscular strain 2.Dust inhalation, 3.Abrasions, 4.Dermatitis etc	None	None	**3x4=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**1x2=2**	**1**
5.2.	**(Skirting)** Installing of new skirting	1.Poor working posture, 2.Sharp edges, 3. Tripping. 4.Dust	1.Muscular Strain, 2.Dermatitis, 3.Lung infection.	1.Contamination of natural resources	None	**4x3=12**	HIRA, Competent Supervision and Management, Insulated tools, Lock out, testing and tagging, permit issue, PPE etc.	**1x1=1**	**1**

5.3.	Finish with approved primer and polyurethane enamel paint.	1.Hazardous substances 2.Flammable substance 3.Poor working posture etc.	1.Muscular Strain, 2.Dermatitis, 3.Lung infection.	1.Contamination of natural resources	None	**4x3=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x2=4**	**1**
5.4.	**(Walls internal)** Wash all existing walls with a sugar soap, using soft nylon brush.	1.Poor working posture, 2. Tripping.	1.Muscular Strain, 2.Dermatitis,	None	None	**4x3=12**	Risk assessment Training of employees; Supervisor, Safe work procedure. PPE etc.	**2x2=4**	**1**

5.5.	**(Walls external)** Remove any flaking or damaged mortar and repair to match existing	1.Abrasive surfaces 2.Poor working posture, 3.Hot climatic conditions, 4.Falls 5.Cement Dust, 6.HCS etc.	1.Abrasions, 2.Muscular strain, 3.Heat exhaustion, 4.Dermatitis, 5.Lung infection, 6.Fracture and Death etc.	Discarding of unused cement-contamination of natural resources	None	**3x4=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x2=6**	**2**
	TOTAL VALUE OF ACTIVITY					**·60**	**17**		
MAIN ACTIVITY	**ROOF SHEETING AND ROOF TRUSSES**								
REF NO 6	**SUB ACTIVITY**	**HAZARDS SHE**	**HEALTH RISK**	**ENVIRO MENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL . MEASURE**	**RESIDUAL RISK**	**Risk Prioritisation Number**

6.1.	Isolation of services	1.Electrocution; 2.Struck by tools; 3.Cuts; trip & fall; 4.Skin burn; etc.	1.Dust Inhalation; 2.Electrocution; 3.Death; etc.	Littering due to poor housekeeping; etc.	None	**3x4=12**	Risk Assessment; training to employees; Safe & proper use of portable electrical tools; Wearing required PPE	**3x2=6**	**2**
6.2.	Stripping of fixtures	1.Struck by tools, 2.Falls, 3.Tripping etc.	1.Cuts, 2.Abrasions, 3.Fractures etc.	None	None	**3x4=12**	Risk Assessment; training to employees; Safe & proper use of portable electrical tools; Wearing required PPE	**3x2=6**	**2**
6.3.	Use of hand tools	1.Struck by tools, 2.Falls, 3.Tripping etc..	Abrasions, burns, hand injuries, eye injuries, back injury, heat exhaustion etc.	none	none	**3x4=12**	Risk Assessment Training of employees; Supervision, Safe work procedures. PPE etc.	**3x2=6**	**2**
6.4.	Removing of rubble, machine and labour	1.ripping, struck by, bumping against,, machine colliding with vehicles &People	1.Back strain, 2.Heat exhaustion, 3.Bruising,, 4.Cuts, 5.Abrasions, 6.Death	Spilling of oil, diesel, petrol	Noise, dust, collisions, death	**3x4=12**	Training in pre-use inspection, maintenance; Training in using correct tools, inspection; Wearing required PPE *(i.e. Overalls, hard hats, safety shoes, goggles, etc.)*	**3x2=6**	**2**

6.5.	**(Roof sheeting)** Removing of roof Sheeting and timber purlins.	1.Falls from height; 2.Struck by tools; 3.Bumping against objects; 4. Cuts; 5.Trip & fall; etc.	1.Back strain; 2.Dust inhalation; 3.Heat exhaustion; 4.Exposure to noise; etc.	Littering due to poor housekeeping; etc.	None	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x3=9**	**2**
6.6.	Fitting of Timber Purlins and Roof Sheets.	1.Falls 2.Struck by falling objects 3.sharp edges 4. Climatic conditions 5.Manual Handling	1.Muscular strain, 2.Muscular strain 3.Cuts 4.Heat exhaustion 5. Facture and Death etc,	None	None	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc. Suspend work on gables and roof on extremely windy days and clear all personnel	**3x3=9**	**2**

6.7.	**(Roof trusses)** Existing roof trusses to receive 2 coats of carbolineum to assist with any dump. **(water proofing)**	1.Dermatitis from carbolineum, 2.Hazardous substances,	1.Chemical exposure, 2.lead poisoning, inhalations, 3. skin absorption of hazardous substances,	None	None	**3x3=9**	Medical Fitness Certificates, Training, PPE, safe systems of work, MSDS and supervision, etc.	**2x2=4**	**1**
	TOTAL VALUE OF ACTIVITY					**97**	**46**		
MAIN ACTIVITY	**BARGE BOARD**								
REF NO **7.**	**SUB ACTIVITY**	**HAZARDS SHE**	**HEALTH RISK**	**ENVIRO MENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**Risk Prioritisation Number**

7.1.	Remove of existing barge board and Fitting of new Badge Boards	1.Elevated work 2.Slippery surface 3.Over extension 4.Incorrect positioning 5. Climatic conditions etc.	1.Fractures, death 2. Heat exhaustion , etc.	None	1.Struck by falling material ,tripping etc.	3x4=12	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	2x2=4	1
	TOTAL VALUE OF ACTIVITY					12	4		
MAIN ACTIVITY	GUTTERS								
REF NO 8.	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number

8.1.	All gutters and downpipes to be removed.	1.Elevated work 2.Slippery surface 3.Over extension 4.Incorrect positioning 5. Climatic conditions etc.	1.Fractures, death 2. Heat exhaustion , etc.	None	1.Struck by falling material ,tripping etc.	**3x4=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	**2x2=4**	**1**
8.2.	Fitting of new aluminium seamless Gutters and Downpipes.	1.Elevated work 2.Slippery surface 3.Over extension 4.Incorrect positioning 5. Climatic conditions etc.	1.Fractures, death 2. Heat exhaustion , etc.	None	1.Struck by falling material ,tripping etc.	**3x4=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	**2x2=4**	**1**
	TOTAL VALUE OF ACTIVITY					**24**		**8**	

MAIN ACTIVITY	REPLACE UNDERGROUND ASBESTOS CEMENT PIPES (AC)								
REF NO 9.	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
9.1.	Implementation of precautionary steps to prevent dust becoming airborne such as dampening down, placing of containment asbestos cement pipes , warning signage, ppe etc	1.Poor working position 2.Caught between Surfaces 3.Dust 4.Struck by hand tools. 5.Tripping, etc.	1.Inhalation of respirable asbestos particles 2.Inhalation of moulds, bacteria or others similar contaminants 3.Cuts 4.Abrasions, 5.Fractures etc.	1.Release of asbestos contaminated dust into the surrounding environment	1.Inhalation of air contaminated with respirable asbestos, moulds etc	4x5=20	Risk Assessment Training to employees; Safe & proper use of hand tools; Wearing required PPE, Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, screening, etc	3x3=9	2

9.2.	Stripping of fixtures	1.Struck by tools, 2.Falls, 3.Tripping etc.	1.Cuts, 2.Abrasions, 3.Fractures	1.Littering from poor housekeeping	None	**4x5=20**	Risk Assessment Training to employees; Safe & proper use of hand tools; Wearing required PPE, practise of proper manual lifting of material	**3x3=9**	**2**
9.3.	Use of hand tools	1.Struck by tools, 2.Falls, 3.Tripping etc.	1.Abrasions, 2.Burns 3.Hand injuries 4.Eye injuries, 5.Back injury 6.Heat exhaustion etc.	None	None	**4x5=20**	Training in pre-use inspection, maintenance; Training in using correct tools, inspection; Wearing required PPE *(i.e. Overalls, hard hats, safety shoes, goggles, etc.)*	**3x3=9**	**2**
9.4.	Removing of rubble, machine and labour	1.Tripping, struck by, bumping against,, 2. Machine colliding with vehicles &People.	1.Back strain, 2.Heat exhaustion, 3Bruising, 4.Cuts 5.Abrasions 6. Death etc.	Spilling of oil, diesel, petrol	Noise, dust, collisions, death	**4x5=20**	Training in pre-use inspection, maintenance; Training in using correct tools, inspection; Wearing required PPE *(i.e. Overalls, hard hats, safety shoes, goggles, etc.)*	**3x3=9**	**2**

	TOTAL VALUE OF ACTIVITY					80	36		
MAIN ACTIVITY	PIPE TRENCHING AND LAYING, BACKFILLING								
REF NO 10.	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
10.1	Pipe trenching and laying.	1. Entrapment due to fall / roll of pipe 2.Failure of lifting equipment. 3. Defective and broken skids. 4.Manual handling 5. Elevated work 6.Dust 7.Hands caught in between pipes etc.	1.Back strain 2.Cuts & abrasion 3.Falls 4.Inhalation of dust	none	none	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	3x3=9	2

10.2	Backfilling	1.Falling into trenches 2. Struck by tools. 3. Dust etc.	1. Inhalation of dust; 2.Eye injuries from flying soil particles; etc.	None	none	4x5=20	Training, PPE, safe systems of work and supervision	3x3=9	2
	TOTAL VALUE OF ACTIVITY					40	18		
MAIN ACTIVITY	MECHANICAL WORK - CUTTING OF PIPES								
REF NO 11.	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
11.1	Selection of proper tools and equipment	1.Flying objects 2.Manual handling, 3.Trips & falls etc.	1.Finger and eye Injury etc.	None	None	3x2=6	Tools inspected and in good condition. HIRA, Supervision, PPE, Safe Systems of work etc.	1x1=1	1
11..2	Check electrics, mechanics and ensure guards are in place.	1.Electric shock 2.Loose blade and no guards etc.	1.Electrocution, 2.Death, 3.Cuts, etc.	None	None	4x4=16	Tools inspected and in good condition. HIRA, Supervision, PPE, Safe Systems of work etc.	2x3=6	2

11..3	Choose correct disk for task	1.Wrong disc could result fracture-high speed 2. Cuts	1..Fractures 2.Cuts	None	None	**3x2=6**	Training in pre-use inspection, maintenance; Training in using correct tools, inspection; Wearing required PPE *(i.e. Overalls, hard hats, safety shoes, goggles, etc.)*	**1x1=1**	**1**
11.4	Check pipe to be cut is secured	1.Blade jamming Suddenly. 2.Falling material etc.	1. Cuts 2.Abrasion 3.Falls 4..Fractures	None	None	**4x4=16**	Training in pre-use inspection, maintenance; Training in using correct tools, inspection; Wearing required PPE *(i.e. Overalls, hard hats, safety shoes, goggles, etc.)*	**2x3=6**	**2**

11.5	Cutting of pipes	1.Fire 2.Falling objects 3.Use of incorrect equipment. 4. Elevated work, 5.Manual handling 6.Sharp edges 7.Noise 8.Electricity 9.Dust 10. Vibration etc.	1. Electrocution; 2.Falls 3.Fractures 4. Cuts & abrasion 5. .Dust inhalation 6. Eye injuries from flying particles 7. Noise induced hearing loss etc.	none	none	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records, Competent Operators Medical Fitness Certificates, continuous housekeeping signage and solid barricading, training. PPE etc.	3x3=9	2
	TOTAL VALUE OF ACTIVITY					64		23	
MAIN ACTIVITY	EXISTING PUMP HOUSE								
REF NO 12.	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number

12.1.	Replacement of existing rusted roof sheeting with new chromadek	1.Falls 2.Struck by falling objects 3.sharp edges 4. Climatic conditions 5.Manual Handling 6.Dust Inhalation;	1.Muscular strain, 2.Muscular strain 3.Cuts 4.Heat exhaustion 5. Facture and 6.Death 7. Dust Inhalation etc.,	None	None	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x3=9**	**2**
12.2.	Replacement of rainwater goods, gutters and downpipes with aluminium items.	1.Elevated work 2.Slippery surface 3.Over extension 4.Incorrect positioning 5. Climatic conditions 6.Manual Handling 7. Struck by falling objects etc.	1.Fractures, death 2. Heat exhaustion , 3. Muscular strain 4.Cuts, etc.	None	1.Struck by falling material ,tripping etc.	**3x4=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	**2x2=4**	**1**

12.3.	Existing reservoir and pump house will be ring – fenced.	1.Struck by tools, 2.Sharp objects, 3.Tripping, 4.Hidden services , etc.	1.Cuts, 2.Abrasion, 3.Heat exhaustion	None	None	**3x3=9**	HIRA,Supervision, safe systems of work , use of cable detection equipment ,signage and barricading, training, PPE etc.	**2x2=4**	**1**
12.4.	Replacement of the floor screed with epoxy screed	1.Hazardous Substance 2.Flammable Substance 3.Poor Working posture 4.Fumes, etc	1.Muscular Strain 2. Dermatitis 3. Heat exhaustion 4. Lung infection	None	None	**4x3=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x2=4**	**1**
	TOTAL VALUE OF ACTIVITY					**33**		**21**	
MAIN ACTIVITY	**UGRADE THE BULK WATER SUPPLY LINES, STORAGE AND CONNECTIONS**								

REF NO 13.	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
13.1	Arrange material / pipes to installation area	1.Pipe falling 2.Tripping 3.Pinch point 4.Finger injury etc.	1.Muscular strain 2.Falls 3.Fractures etc.	None	None	4x4=16	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	3x3=9	2
13.2	Scouring, cleaning existing reservoir	1.High pressure steam 2.Flying materials 3. Electricity etc.	1.Biological hazardous 2.Electrocution 3.Skin penetration etc	None	None	4x3=12	Risk assessment Training of employees; Supervisor, Safe work procedure. PPE etc.	2x2=4	1

13.3	Repairs existing ground water reservoir	1.Cuts 2.laceration 3.electrical shocks from using unsafe angle grinders 4. Struck by sharp edges, 5. Physical exertion, 6. Manual handling 7. Caught between etc.	1. Abrasions 2.Cuts 3.Muscular strain 4.Fractures etc.	None	None	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x3=9**	**2**
13.4	Replace concrete elevated water tank	1. Falls of person to the edge of structures. 2. Use of incorrect Equipment. 3. Defective equipment. 4. Hit by falling Equipment. 5. Environmental conditions (Weather, wet ground, uneven surfaces etc.	1.Falls 2.Fractures 3. Cuts 4. Bruising etc.	none	none	**4x4=16**	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Medical Fitness Certificates, signage and barricading, training. PPE etc.	**3x3=9**	**2**

13.5	Install new water supply lines	1.Elevated work, 2. Manual handling 3.Sharp edges 4.Pressure 5. Vibration etc.	1.Falls 2.Fractures 3. Cuts etc.	none	none	**4x5=20**	HIRA, Training, PPE, safe systems of work and supervision etc.	**3x3=9**	**2**
13.6	Construction of new elevated water tank	1.Sharp edges, 2.Physical exertion, 3.Hazardous chemical substance 4.Abrasive surfaces 5.Poor working posture 5.Cement Dust 6. Elevated work, 7. Manual handling 8.Trips & falls 9.Cuts etc.	1.Muscular strain 2.Cuts 3.dermatitis 4. Dust inhalation 5. Falls, fractures etc.	None	Struck by falling objects, slipping, tripping etc.	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x3=6**	**2**

13.7	Working at height	1. Falls of person to the edge of structures. 2. Use of incorrect Equipment. 3. Defective equipment 4. Hit by falling Equipment. 5. Environmental conditions (Weather, wet ground, uneven surfaces etc.	1.Falls 2.Fractures 3. Cuts 4. Bruising etc.	none	none	**4x5=20**	Ensure access equipment is of adequate height and suitable for task. All access equipment suitable for purpose, inspected before use and maintained in good condition. Consideration given to environmental conditions prior to starting work. HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Medical Fitness Certificates, signage and barricading, training. PPE etc.	**3x3=9**	**2**

13.8	**Pressure test all new pipes**	1.Flying objects such as valves, flanges, gauges and fittings. 2.Flying shrapnel such as small pieces of pipe, pipe fittings. 3. Oxygen displacement from an inert gas used for testing. 4. Flooding in areas where energized electrical sources are present. 5. Elevated work, 6. Confined space 7. Falls hazardous etc.	1.Eye damage 2.Lacerations 3.Broken bones 4.Contusions 5.Concussion 6. Falls 7. Dust inhalation 8. Heat exhaustion 9.ELectrocution etc.	None	None	**4x5=20**	Competent Management, Competent Supervision, safe systems of work. Training, PPE,	**3x3=9**	**2**
13.6	Scouring and cleaning of the reservoir.	1.Hi pressure stream, 2.Flying materials, 3.Electricity etc.	1.Biological hazardous material exposure 2.Electrocution 3.Skin penetration,etc	None	None	**4x5=20**	Risk Assessment Training of employees; Supervision, Safe work procedures. PPE etc.	**3x3=9**	**2**

13.7.	Waterproofing the interior with a cementitious sealant.	1.Repetitive Motion 2.HCS 3. High environmental temperatures. 4.Serious physical injuries from falling; 5.Trips & falls; 6.Cuts & abrasion; etc.	1.Fractures, death 2. Heat exhaustion 3.Back strains; 4. Dust inhalation; 5.Nausea; 6.Heat exhaustion; etc.	Littering from poor housekeeping, etc.	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	2x1=2	1

13.8.	Access manhole cover to be replaced	1.Hazardous substance 2.Flammable Substance 3. Fumes 4.Weils disease 5.Abrasive surfaces, 6.heavy load 7.Poor working posture etc.	1.Biological hazardous material exposure. 2.Skin penetration 3.Muscular strain 4. Dermatitis 5. Heat exhaustion 6. Lung infection ,etc.	None	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, screening, training. PPE etc.	3x3=9	2
	TOTAL VALUE OF ACTIVITY					144		64	

MAIN ACTIVITY	SEPARATE FIRE & DOMESTIC SUPPLY / PROVIDE A DEDICATED FIRE WATER SYSTEM WITH PUMPS, HOSE REELS, HYDRANTS								
REF NO 14.	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
14.1	Install new fire lines	1.Cuts & abrasion; 2.Electrical shock; 3.Struck by unsafe portable electrical tools. 4.Falls & trips 5. Manual handling. 6. Elevated work 7.Sharp edges, 8.Physical exertion, 9.Dust, etc.	1.Electrocution; 2.Back pains 3.Heat exhaustion; 4.Dust inhalation etc.	None	Cuts & abrasion; electrical shock; struck by unsafe portable electrical tools; falls & trips; etc.	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	3x3=9	2

14.2	Install new hose reel and hydrants	1.Cuts & abrasion; 2.Electrical shock; 3.Struck by unsafe portable electrical tools. 4.Falls & trips 5. Manual handling. 6. Elevated work 7.Sharp edges, 8.Physical exertion 9.Dust, etc.	1.Electrocution; 2.Back pains 3.Heat exhaustion; 4.Dust inhalation etc.	None	Cuts & abrasion; electrical shock; struck by unsafe portable electrical tools; falls & trips; etc.	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x3=9**	**2**
14.3	Install new fire pipes	1.Elevated work 2. Manual handling 3.Sharp edges 4.Pressure 5. Falls & trips	1.Falls 2.Fractures 3. Cuts etc.	none	none	**4x5=20**	HIRA, Training, PPE, safe systems of work and supervision etc.	**3x3=9**	**2**

14.4	Install and commission of fire pumps	1.Elevated work, 2.Hazardous, sharp 3.Edges, 4.Struck by tools, 5.Sharp objects, 6.Caught between. 7.Dust, 8.Noise etc.	1.Falls 2.Fractures, 3.Muscular cuts, 4.Abrasion, 5.Heat exhaustion, 6.Noise induced hearing loss 7.Eye injuries 8.Dust inhalation etc.	None	none	**3x4=12**	HIRA, Training, PPE, safe systems of work and supervision etc.	**3x3=9**	**2**
14.5	Install and commission of new pumps up to elevated tank	1. Falls from height 2.Falling objects 3. Sharp edges, 4.Scaffolding collapse, 5.Struck by falling items 6. Caught between. 7. Struck by tools, 8. Dust, 9.Noise etc.	1.Falls 2.Fractures, 3.Muscular cuts, 4.Abrasion, 5.Heat exhaustion, 6.Noise induced hearing loss 7.Eye injuries 8.Dust inhalation etc.	None	none	**3x4=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, screening, training. PPE etc.	**3x3=9**	**2**
	TOTAL VALUE OF ACTIVITY					**84**		**24**	

MAIN ACTIVITY	(ELECTRICAL WORK) EXISTING PUMP HOUSE								
REF NO 15.	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
15.1.	Replace Distribution Boards,/ Main DB-N/ESS.	1. Noise 2. Dust 3. Electricity 4. Bumping against 5. Struck by flying items 6. Entanglement 7. Moving parts etc.	1. Noise induced hearing loss 2. Dust inhalation 3. Electrocution 4. Cuts and abrasions	None	none	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	3x3=9	2

15.2.	Replace / Upgrade street lights	1. Elevated work 2. Physical exertion, 3.Incompetent operator 4.Unsafe Portable electrical tools, 6. Dust	1. Falls from height =fractures etc. 2,Fractures, sprains as result of lack of control of machine by the operator 3. Muscular strain 4. Electrocution due to contact with exposed wiring etc. 5.Dust inhalation	None	None	**4x5=20**	HIRA, Method Statement, Safe Work procedure, Medical fitness certificates, Training of operators, Inspection of equipment, PPE etc.	**3x3=9**	**2**
15.3.	Install cable support to equipment connection	1.Live wires 2. unsafe tools 3.Trips & falls 4.Falls from ladders 5.Collapse of ladder; 6.Extension cords 7.Entanglement; etc.	1.Electrocution; 2.Dust inhalation 3.Electrocutio 4 Back strain;.; etc.	None	None	**4x4=16**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x3=6**	**2**

15.4.	Install new circuit for new heat pump	1.Electricity, 2.Cuts / laceration 3.Confined space, 4.Falls from height, etc.	1.Abrasions, 2. Electrocution 3.Heat exhaustion	None	None	**3x2=6**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x1=2**	**1**
15.5.	Circuit No labels to be installed.	1.Electricity, 2.Cuts / laceration 3.Confined space, 4.Falls from height, etc.	1.Abrasions, 2. Electrocution 3.Heat exhaustion	None	None	**3x2=6**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x1=2**	**1**

15.6.	Install new lightning protection	1.Falls 2.Struck by items 3.Hands caught between objects 4.Poor working posture 5.Dust, 6.Electrical shock, 7.Electrocution, 8.Elevated work 9.Physical exertion etc.	1.Cuts 2.Abrasions, 3.Electrocution, 4.Fractures, 5.Muscular strain, 6.Dust Inhalation, 7.Bruising & Grazing, etc.	None	None	**4x4=16**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x3=6**	**2**
15.7.	Install surge arrestors	1. Elevated work 2. Physical exertion, 3.Unsafe Portable electrical tools, 4. Noise 5. Dust 6. Vibration etc.	1. Falls from height =fractures etc. 3. Muscular strain 4. Electrocution due to contact with exposed wiring etc. 5.Noise induced hearing loss 6.Dust inhalation 7. White finger syndrome	None	None	**4x4=16**	HIRA, Method Statement, Safe Work procedure, Medical fitness certificates, Training of operators, Inspection of equipment, PPE etc.	**2x1=2**	**1**
	TOTAL VALUE OF ACTIVITY					**84**		**30**	

GENERAL SITE ACTIVITIES									
REF NO **16.**	**SUB ACTIVITY**	**HAZARDS SHE**	**HEALTH RISK**	**ENVIRO MENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**Risk Prioritisation Number**
16.1	Sweeping	1.Repetitive motion 2.Dust, 3. Excessive environmental temperatures etc.	1.Muscular strain, 2.Dust inhalation 3.Heat exhaustion etc.	None	None	**2x2=4**	Hira, Training, PPE e.g. respiratory protection , etc.	**2x2=4**	**5**
16.2	Lifting and Lowering	1.Heavy loads difficult to grasp items 2.Incorrect lifting methods, caught between etc.	1.Muscular strain, 2.lower back injuries , etc.	None except if item is dropped and poses an environmental risk due to its chemical properties	None	**1x2=2**	HIRA ,Training , etc.	**1x1=1**	**1**
16.3	Painting	1.Poor working posture 2.Repetitive motion 3.Hazardous chemical substances etc.	1.Dermatitis 2.Muscular strain etc.	Contamination of natural resource, spillage and disposal	None	**1x2=2**	HIRA, Training, Supervision, PPE etc.	**1x2=2**	**1**
16.4	Ladder work	1. Elevated position, 2.Incorrect positioning, 3.Poor location slippery surfaces etc.	1.Fractures 2.Death etc.	None	Minor bruising etc.	**1x4=4**	HIRA, Training, Supervision, PPE etc.	**2x2=4**	**1**

16.5	Use of Portable Electrical equipment	1.Electricity, 2.Faulty equipment, 3.High speed rotating equipment, 4.Tripping 5. Vibration, 6. Noise etc.	1.Electro-caution 2.Cuts, 3.Abrasions 4.Noise induced hearing loss etc.	None	Noise exposure, fractures, bruising	**1x4=4**	HIRA, Training, Supervision, PPE etc.	**2x1=2**	**1**
16.6	Driving vehicles on site	1.Collisions 2.Flammable substances etc.	1.Fractures 2.Death, etc.	Contamination of resource due to fuel and oil leakage etc.	Fractures, death, etc.	**3x4=12**	HIRA, Training, Supervision, PPE etc.	**2x2=4**	**1**
16.7	Extension cords	1.Electricity 2.Tripping hazards	1.Electrocution , 2.Fractures etc	none	None	**1x2=2**	HIRA, Training, Supervision, PPE etc.	**1x1=1**	**1**
16.8.	Hand tools	1.Tripping 2.Struck by items 3.Bumping against, 4.Abrasions 5.Sharp edges 6.Caught between surfaces 7. Flying metal particles etc	1.Cuts 2.Bruising 3.Foreign material in eyes etc.	none	None	**1x4=4**	HIRA, Training, Supervision, PPE etc.	**2x1=2**	**1**
16.9	Scaffolding erection, dismantling	1.Falls from height, 2.Dropping of items, 3.Sharp edges, 4.Scaffolding collapse, etc	1.Back strain, 2.Bruising 3.Cuts 4.Abrasions 5. Broken bones, 6.death etc.	none	None	**3x4=12**	HIRA, Training, Supervision, PPE etc.	**2x2=4**	**1**
	TOTAL VALUE OF ACTIVITY					**46**		**24**	

COVID-19 BASELINE RISK ASSESSMENT The COVID-19 hazard identification and risk assessment aims to determine the level of risk exposure on site and for contractors to implement the control measures.			
ACTIVITY / IDENTIFIED POTENTIAL AREA OF EXPOSURE COVID-19	**HAZARDS SHE**	**HEALTH RISK**	**RECOMMENDED RISK CONTROL MEASURE**
Exposure of employees entering the workplace with CV19	1.Transmitting the virus on to other employees, causing illness and possible death 2.Exposure at site access point (security control)	1.Respiratory infection that can lead to fatality's 2. Fever, cough, fatigue	1. Symptomatic individuals will not be allowed entry. 2.Hygiene requirements (handwashing etc.) and symptoms of 3. CV19 included with Induction. 4.CV19 Information posters placed in accessible locations in the workplace 5.All employees and visitors, to receive induction training 6.Adequately train identified personnel to perform regular COVID-19 screenings 7. Provide compulsory medical screening equipment and keep documented record of screenings and should an employee be tested positive, then such an
Display symptoms within the workplace	1.Transmitting the virus on to other employees, causing illness and possible death 2. Enhancing the possibility of spreading the Covid 19 pandemic	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. Worker removed to a designated area at least 2 metres away from other people. 2. The individual will be sent home and advised to follow Governmental guidance. 3. Workplace decontaminated following accepted standards. 4.Relevant PPE to be issued All employees to receive awareness training on COVID-19 and personal hygiene (Toolbox talks) 5.Adequately train identified personnel to perform regular COVID-19 screenings 6.compulsory medical screening equipment and keep documented record of screenings

Contaminated workplace	Workers catching CV19 due to contaminated surfaces, causing illness and possible death	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1.cleaning equipment and facilities frequently. 2.Hand sanitisers to be been placed in readily accessible locations. Extra hygiene requirements enforced. 3.PPE to be issued Clean and disinfect objects that are regularly touched
Overcrowded work areas	Workers catching CV19 due to working closely with infected colleagues, causing illness and possible death	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. Social Distancing policy implemented. All work areas and activities been revaluated for the possibility of implementing social distancing (no handshaking, deferring large meetings etc.) 2.Relevant PPE to be issued Clean and disinfect objects that are regularly touched 3.CV19 Information posters placed in accessible locations in the workplace 4.Employees and visitors, to receive induction training 5.Employees to receive awareness training on COVID-19 and personal hygiene (Toolbox talks) 6.Adequately train identified personnel to perform regular COVID-19 screenings
Use of handtools or equipment onsite	Workers catching CV19 due to working closely with infected colleagues, causing illness and possible death	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. Daily disinfecting of all work surfaces, construction work vehicles, portable working tools and equipment prior to resuming construction work. 2. Hand sanitisers to be been placed in readily accessible locations. 3. A formal training program implemented to cover risks, symptoms and control measures. 4.All employees to receive awareness training on COVID-19 and personal hygiene (Toolbox talks)
Transportation of workers to workplace	Workers catching CV19 due to sitting closely with infected	1.fever, dry cough 2.Tiredness, aches and pains	1. Adhere to general travel ban by SA Government no over crowding in the transport 70% load capacity 2. Social Distancing policy implemented. All work areas and activities been revaluated for the

	colleagues, causing illness and possible death	sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	possibility of implementing social distancing (no handshaking, deferring large meetings etc.) 3.Relevant PPE to be issued Clean and disinfect objects that are regularly touched 4.CV19 Information posters placed in accessible locations in the workplace 5.All employees and visitors, to receive induction training
Change rooms and dinning facility	A worker catches CV19 because a Colleague continues working despite being unwell, causing further spread of disease and possible death	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1.decontamination of all facility regularly and provide hygiene requirements (handwashing etc.) and 2.CV19 Information posters placed in accessible locations in the workplace 3.Relevant PPE to be issued Clean and disinfect objects that are regularly touched 4. Provision of hand sanitisers, paper towel, soap and water for employee's onsite. 5. Hand sanitizers should be strategically placed at entrances and common areas. 6. Dining facilities and change rooms onsite be arranged to allow for half a meter physical distancing.
First Aid Training	Workers exposed to CV19 due to providing First Aid in the workplace or during CPR	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1.Proper training of First Aid staff 2.Use of correct equipment while giving First Aid 3.Maintaining proper mannequin hygiene 4.Relevant PPE to be issued Clean and disinfect objects that are regularly touched

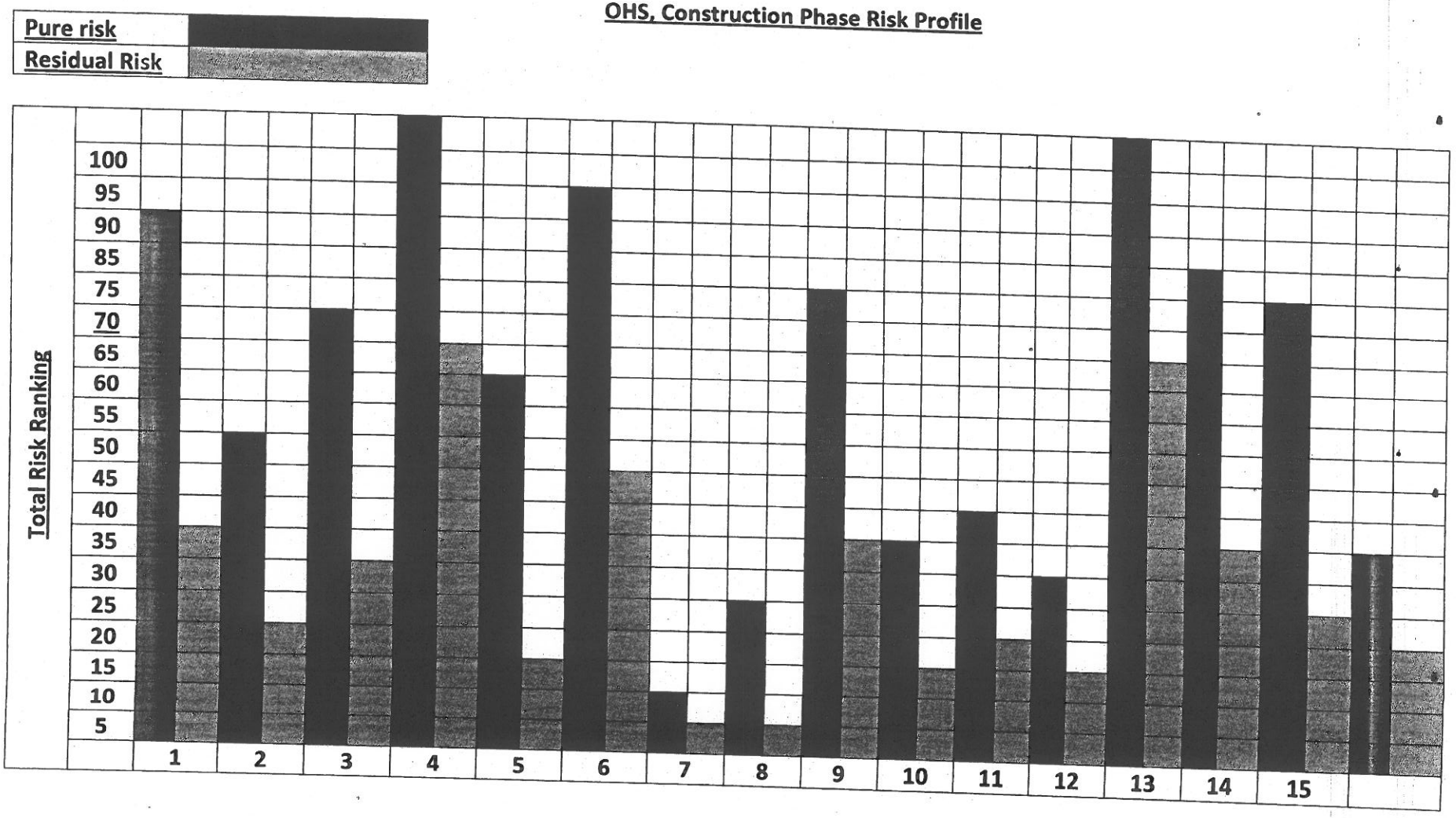
Note:

CR 7 (8) A contractor must ensure that ***all his or her employees*** *have a* ***valid medical certificate of fitness*** *specific to the construction work to be performed, and* ***issued by an Occupational Health Practitioner in the form of Annexure 3.***

RISK PROFILE

Project:	Replacement of Reservoir tank.							
REF N0	068751	RISK ASSESSOR		REVISION	3	DATE	06 July 2020	
Likelihood		Consequence		RISK VALUE= LIKELYHOOD X CONSEQUENCE		RISK RANKING		
Rare	1	Insignificant	1			0-5	1	
Unlikely	2	Minor	2			6-10	2	
Possible	3	Moderate	3			11-16	3	
RISK RANKING IN TERMS OF PRIORITY ⇨		L		M		H		

OHS, Construction Phase Risk Profile



T2.34 – Quality Criteria

TENDERER EVALUATION CRITERIA AND SCORING

The weighting for Quality is a minimum of 60 out of 100 sub-points is as follows:

Quality Criteria		Deliverables	Max Points	Sub-Points		Sub-Criteria
1	Financial Standing	The submission of all financial requirements stipulated in the tender	20 Points	15	Sub-points	Proof of working capital of at least 10% of project value together with 12 months certified bank statements in support. **= 15 points**
					Sub-points	Proof of working capital of at least 5% of project value together with 12 months certified bank statements in support **= 8 points**
				5	Sub-points	Letters of credit reference from two different suppliers with credit limit of R2.0million or more. **(Not older than 6 months and related to the project)** **2 Letters or more = 5 points** **1 Letter = 3 points**
2	Tenderer's Project Management Structure and Organogram and Experience of Resources Proposed for the Project.	A tenderer that submits a detailed project organogram that sets out the roles and responsibilities of each proposed team member, which is backed up by their **curriculum vitae and proof of registration** with the relevant bodies that demonstrates extensive experience, together with a project implementation structure shall be allocated maximum sub-points. In all other instances zero (0) sub-points shall be allocated.	30 Points	30	Sub-Points	Submission of a detailed organogram for top management and project the team. Each management staff member must be registered with: Project manager: SACPCMP Safety Agent: SACPCMP Site foreman: SAQA (N6) and must have five years or more post registration experience. <u>MANAGEMENT STAFF</u> **Project Manager = 10 point** **Site Foreman = 15 points** **Safety Agent = 5 points**

Quality Criteria		Deliverables	Max Points	Sub-Points		Sub-Criteria
3	Competency and construction Experience: **Only work completed by main contractor with 6CE CIDB grading or higher and work completed of similar size and nature will be considered.**	Tenderer to demonstrate their technical competency and relevant project experience. Letters of award to be attached and valid practical completion certificate for each project completed in the preceding 5 years. Traceable references for the above to be provided, otherwise it will not be considered.	30 Points		Sub-points	Schedule of experience on projects of similar value and duration in the past 5 years – letters of award and practical completion certificates for all work completed to be attached. List projects with specific reference to: Project name Project type (Nature) Description Project value **3 Projects = 30 points** **2 Projects = 20 points** **1 Project = 10 points**
4	Methodology and Approach	Detailed method statement and programme to be submitted. **Programme:** 1.) Programme divided into work zones, both vertically and horizontally 2.) Programme fully resourced and linked- critical path clearly indicated 3.) Milestone dates highlighted and Practical, works and Final completion shown. **Method statement:** 4.) Site establishment with layout indicating proposed positions of all prescribed facilities, hoarding, etc. 5.) Resource strategy for the various work breakdown structures including resource deployment plan (PS) 6.) Material storage, handling and distribution strategy with detailed written plan	15 Points		Sub-points:	**Very Good = 15 points** **Good = 10 points** **Satisfactory = 5 points** **Poor = 2 points** **No Response = 0 points**
					REFER TO KEY 1 BELOW	

Quality Criteria		Deliverables	Max Points	Sub-Points		Sub-Criteria
		7.) OHS Management, compliance and reporting 8.) Site documentation control, filing and archiving. 9.) Approach to queries and information required (RFI)				
5	Tenderers ability to provide a Letter of Intent for the provision of a guarantee.	Original letter of intent on a registered financial institution or bank's letterhead.	5 Points	5	Sub-points	Letter from a registered financial institution confirming intention to issue a provision of a guarantee
				0	Sub-points	Failure to provide

KEY 1

Very Good: Programme and method statement detailing all the 9 points listed under item 4.

Good: Programme and method statement detailing 6 of the 9 points listed under item 4.

Satisfactory: Programme and method statement detailing 4 of the 9 points listed under item 4.

Poor: Programme and method statement detailing 2 of the 9 points listed under item 4.

No Response: Tenderer failed to provide information.

TENDER EVALUATION CRITERIA AND SCORING PRICE AND SPECIFIC GOALS

Preference Criteria	Deliverables	Points	
Price	**The lowest responsive and responsible priced offer shall be allocated 80 points. All other responsive and responsible offers shall be allocated a prorated point value based on the lowest responsive and responsible priced offer.**	**80 Points**	**Points**
SPECIFIC GOALS	**Documentary proof required for the claiming of points for specific goals**	**20 Points**	**Points**
· Ownership by Black People	Documentary proof in the form of original or certified original of a sworn affidavit dated and signed by a commissioner of oath to support ownership by Black People	10 Points	Points
· Exempted Micro Enterprise (EME's)	Documentary proof in the form of an original or certified original of sworn Affidavit; signed and dated by Commissioner of Oaths	5 Points	Points
· Promotion of enterprise located in a specific municipal area (Newcastle Local Municipality)	Documentary proof in the form of: 1) Proof of Municipal Account depicting Physical Address of the business OR 2) Lease Agreement	5 Points	Points

PART A
INVITATION TO TENDER - SBD 1

YOU ARE HEREBY INVITED TO TENDER FOR REQUIREMENTS OF THE KWA-ZULU NATAL DEPARTMENT OF WORKS					
TENDER NUMBER:	ZNTL 05094W	**CLOSING DATE:**	28-Aug-23	**CLOSING TIME:**	11:00
DESCRIPTION	MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT				
THE SUCCESSFUL TENDERER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT					
TENDER RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE TENDER BOX SITUATED AT *(STREET ADDRESS)*					
Department of Public Works, 191 Prince Alfred Street, Pietermaritzburg, 3200					

SUPPLIER INFORMATION				
NAME OF TENDERER				
POSTAL ADDRESS				
STREET ADDRESS				
TELEPHONE NUMBER	CODE		NUMBER	
CELLPHONE NUMBER				
FACSIMILE NUMBER	CODE		NUMBER	
E-MAIL ADDRESS				
VAT REGISTRATION NUMBER				
	TCS PIN:		**CSD No:**	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE (Tick YES or NO)	Yes		B-BBEE STATUS LEVEL SWORN AFFIDAVIT (Tick YES or NO)	Yes
	No			No
If YES, State the name of the verification agency accredited by SANAS				
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	Yes	NO	ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES**	YES / NO
	[IF YES ENCLOSE PROOF]		**(IF YES ANSWER PART B:3 BELOW)**	
SIGNATURE OF TENDERER			**DATE**	
CAPACITY UNDER WHICH THIS TENDER IS SIGNED (Attach proof of authority to sign this tender; e.g. resolution of directors, etc.)				
TOTAL NUMBER OF ITEMS OFFERED			**TOTAL TENDER PRICE (ALL INCLUSIVE)**	

TENDERING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		**TECHNICAL INFORMATION MAY BE DIRECTED TO:**	
DEPARTMENT/ PUBLIC ENTITY		CONTACT PERSON	
CONTACT PERSON		TELEPHONE NUMBER	
TELEPHONE NUMBER		FACSIMILE NUMBER	
FACSIMILE NUMBER		E-MAIL ADDRESS	
E-MAIL ADDRESS			

PART B
TERMS AND CONDITIONS FOR TENDERING - SBD 1

1. TENDER SUBMISSION:

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

1.2. ALL TENDERS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED (NOT TO BE RE-TYPED) OR ONLINE

1.3. TENDERERS MUST REGISTER ON THE CENTRAL SUPPLIER DATABASE (CSD) TO UPLOAD MANDATORY INFORMATION NAMELY: (BUSINESS REGISTRATION/ DIRECTORSHIP/ MEMBERSHIP/IDENTITY NUMBERS; TAX COMPLIANCE STATUS; AND BANKING INFORMATION FOR VERIFICATION PURPOSES). B-BBEE CERTIFICATE OR SWORN AFFIDAVIT FOR B-BBEE MUST BE SUBMITTED TO TENDERING INSTITUTION.

1.4. WHERE A TENDERER IS NOT REGISTERED ON THE CSD, MANDATORY INFORMATION NAMELY: (BUSINESS REGISTRATION/ DIRECTORSHIP/ MEMBERSHIP/IDENTITY NUMBERS; TAX COMPLIANCE STATUS MAY NOT BE SUBMITTED WITH THE TENDER DOCUMENTATION. B-BBEE CERTIFICATE OR SWORN AFFIDAVIT FOR B-BBEE MUST BE SUBMITTED TO TENDERING INSTITUTION.

1.5. THIS TENDER IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT ARE THE CLAUSES CONTAINED IN THE GENERAL CONDITIONS OF CONTRACT (2010) (SECOND EDITION) PUBLISHED BY THE SOUTH AFRICAN INSTITUTION OF CIVIL ENGINEERING. COPIES OF THESE CONDITIONS OF CONTRACT MAY BE OBTAINED THROUGH MOST REGIONAL OFFICES OF THE SOUTH AFRICAN INSTITUTION OF CIVIL ENGINEERING, OR BY VISITING THEIR WEBSITE AT WWW.SAICE.ORG.ZA; AND, IF APPLICABLE, ANY OTHER LEGISLATION OR SPECIAL CONDITIONS OF CONTRACT.

2. TAX COMPLIANCE REQUIREMENTS

2.1 TENDERERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

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

2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.

2.4 TENDERERS MAY ALSO SUBMIT A PRINTED TCS TOGETHER WITH THE TENDER.

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

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

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

3. QUESTIONNAIRE TO TENDERING FOREIGN SUPPLIERS

3.1. IS THE TENDERER A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	YES		NO	
3.2. DOES THE TENDERER HAVE A BRANCH IN THE RSA?	YES		NO	
3.3. DOES THE TENDERER HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	YES		NO	
3.4. DOES THE TENDERER HAVE ANY SOURCE OF INCOME IN THE RSA?	YES		NO	

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

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE TENDER INVALID.

PROVINCIAL ADMINISTRATION OF KWAZULU-NATAL
DEPARTMENT OF PUBLIC WORKS

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

BILLS OF QUANTITIES

with GCC for Construction Works - Second Edition 2010

CONTRACTUAL SECTION

ONE VOLUME APPROACH

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

Engineer/Principal Agent
Hospital Design Group
8 Farquhar Road
Ladysmith
Ladysmith
3370
036-631 4715 - Tel Number
036-631 1806 - Fax Number
kzn@hdg.co.za

Architect
Hospital Design Group
8 Farquhar Road
Ladymsith
3370
036-631 4715 - Tel Number
036-631 1806 - Fax Number
kzn@hdg.co.za

Employer:
Head: Public Works
KZN Department of Public Works
Private Bag X 9041
PIETERMARITZBURG
3200
Tel Number: 033 - 8971300
Fax Number: 033 - 8971399

Region:
Head Public Works: Operations
KZN Department of Public Works
X9041
Pietermaritzburg
3200
Tel Number: 033 - 8971300
Fax Number: 033 - 8971399

Tender Number: ZNTL 05094W
CIDB Grading: 6CE
ECDP Number: N/A

Project Code: WIMS No. 078856
Document Date: 28 August 2023

Contracting Party: _____
CIDB Registration number: _____
Central Suppliers Database Registration Number: _____

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

THE CONTRACT

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

C1 - AGREEMENT AND CONTRACT DATA

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

FORM OF OFFER AND ACCEPTANCE

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

FORM OF OFFER AND ACCEPTANCE

Tender No - ZNTL 05094W

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

C.1.1 - FORM OF OFFER AND ACCEPTANCE

THE OFFER AND ACCEPTANCE FORM IS BOUND INTO **SECTION 1** (See end of Returnable Documents) OF THIS DOCUMENT AS PART OF THE RETURNABLE DOCUMENTS. ONCE A CONTRACT IS CONCLUDED WITH A SUCCESSFUL TENDERER, THIS PAGE WILL BE REPLACED WITH THE FILLED AND SIGNED OFFER AND SIGN ACCEPTANCE BY THE EMPLOYER AND IT WILL BECOME PART OF THE CONTRACT.

PLEASE SUBMIT THE OFFER AND ACCEPTANCE FORM WITH THE OTHER RETURNABLE DOCUMENTS.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

C1.2 - CONTRACT DATA

C 1.2 CONTRACT DATA:
with GCC for Construction Works - Second Edition 2010

CONTRACT DATA FOR:

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

Tender no: **ZNTL 05094W**

The General Conditions of Contract are the clauses contained in the General Conditions of Contract (2010) (Second Edition) published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained through most regional offices of the South African Institution of Civil Engineering, telephone number 011 805 5947 or by visiting their website at www.saice.org.za.

CONTRACT SPECIFIC DATA
The following contract specific data are applicable to this contract:

CONTRACT VARIABLES

This schedule contains all variables specific to this document and is divided into pre-tender and post-tender categories. The pre-tender category must be completed in full and included in the tender documents. Both the pre-tender and post-tender categories form part of this **agreement.**

Spaces requiring information must be filled in, shown as 'not applicable' or deleted but not left blank. Where choices are offered, the non-applicable items are to be deleted. Where insufficient space is provided the information should be annexed hereto and cross referenced to the applicable clause of the schedule. Key cross reference clauses are italicised in *[ ]* brackets.
The Engineer/Principal Agent, in accordance with Clause 1.1.1.16, shall obtain the specific approval from the Employer before executing any of his functions according to the "Conditions under which Consultants are appointed", or in the event where an employee of the Employer represents the Employer, the relevant General Delegations applicable at the time of executing his/her duties as described in Clause 3.1.2.

Part 1: CONTRACT DATA PROVIDED BY THE EMPLOYER:

PRE-TENDER INFORMATION

CONTRACTING AND OTHER PARTIES

[1.1.1.15] **Employer:**

Head: Public Works (KZN Department of Public Works: Province of KwaZulu-Natal)

Postal address:
Private Bag X 9041
PIETERMARITZBURG
3200

Tel: ***033 - 8971399*** Fax: ***033 - 8971300***

[1.2.1.2] Physical address:
191 Prince Alfred Street
PIETERMARITZBURG
3200

[1.1.1.16] **Employers Agent 1**
Hospital Design Group

Agent's service:
Architect

Postal address:
8 Farquhar Road
Ladymsith
3370

Tel: ***036-631 4715*** Fax: ***036-631 1806***

Employers Agent 2
EI & Sons Cost Consultants

Agent's service:
Quantity Surveyor

Postal address:
P O Box 1251
Ladysmith
3370

Tel: ***036-631 1710*** Fax: ***036-631 1601***

Employers Agent 3
Sivest SA (Pty) Ltd

Agent's service:
Civil/Structural Engineer

Postal address:
P O Box 707
Pietermaritzburg
3231

Tel: ***033-347 1600*** Fax: ***033-347 5762***

Employers Agent 4
Isimo Engineers

Agent's service:
Electrical Engineer

Postal address:
59 Harding Street
Newcaslte
2940

Tel: ***034-312 5767*** Fax: ***034-312 9879***

	PART 1: DATA PROVIDED BY THE EMPLOYER	
[1.1.1.13]	**Defects Liability Period**	
	The defects liability period is: **A time measured from the date of the Certificate of Completion.**	
	Defects Liability Period is 12 Months for the whole of the Works	
	Latent Defect Period	
[5.16.3]	The latent defect period is:	5 years after the Final Approval Certificate
	Documentation required before Commencement of the Works:	
[5.3.1]	The documentation required before commencement with the Works execution are;	
[4.3]	Health and Safety Plan	The Contractor shall deliver his Health and Safety Plan of the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
[5.6]	Initial Programme	The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.
[6.2]	Guarantee	The Contractor shall deliver his chosen Guarantee (security) for this Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
[8.6]	Insurance	The Contractor shall deliver his insurance for the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Cash flow by contractor	The Contractor shall deliver his Cash flow for the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Priced Bill of Quantity	The Priced Bill of Quantity shall be submitted with the tender document on the closing date of tender.
	Programme	The Contractor is required to submit his Programme of Works in terms of Clause 5.6.1 and 5.3.1 and the Principal Agent is required to approve this within 7 days in terms of Clause 5.6.3
	Other requirements	
[5.3.2]	The time to submit the documentation required before commencement with Works execution is:	14 calendar days
	Non-Working days	
[5.8.1]	Non-Working days	**Sundays**
	Special non- working days	**All Nationally Recognized Public Holidays and the year end break**
[5.8.1]	First Year end break - commences	***16-Dec-23***
	ends on	***08-Jan-24***
	Second Year end break - commences	***16-Dec-24***
	ends on	***13-Jan-25***
	Third Year end break - commences	***16-Dec-25***
	ends on	***12-Jan-26***
	Fourth Year end break - commences	***16-Dec-26***
	ends on	***11-Jan-27***
	Engineer/Principal Agent to consult with Employer	
[3.1.3]	The Engineer shall obtain the specific approval from the Employer before executing any of his functions according to the "Conditions under which Consultants are appointed", or in the event where an employee of the Employer represents the Employer, the relevant General Delegations applicable at the time of executing his/her duties.	
	Security	
[6.2.1]	The time to deliver the deed of guarantee is Prior to site hand over in terms of clause 5.3.1 and 5.3.2.	
[6.2.1]	Please see CONTRACT DATA - below to select Guarantee Option	
	Commencement Date	
	Commencement date means the date of Site Hand over that should not occur prior to the tenderer receiving one fully signed copy of the Offer and Acceptance in terms of the Form of Offer and Acceptance.	
	*The **Agreement comes into effect** on the date when;* *The tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any)* *The agreement ("this document") consists of;* *1. Agreement and Conditions of Contract.* *2. Form of Offer and Acceptance.* *3. Contract Data.* *4. Scope of Works.* *5. Site Information.* *6. Drawings & documents referred to in the 1 to 4 above.* *(See Form of Offer and Acceptance)*	
[5.3.1]	The contractor shall commence executing the Works within 7 calendar days from the Commencement Date.	
[5.4.1]	***Possession of the* site** will be given within 10 calendar days after the **contractor** has fulfilled the conditions (4.3, 5.6, 6.2, 8.6) and received the notification from the Employer of Site Hand Over where the contractor will receive one fully signed copy of the Form of Offer and Acceptance from the **employer.**	
[5.6.1]	The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.	

	CONTRACT DETAILS
[1.1.1.33]	***Works*** description: Refer to document C3 – Scope of Work.
[1.1.1.30]	***Site*** description: Refer to document C4 – Site Information.
	Specific options that are applicable to a **State** organ only Where so :
[6.10.6.2]	***1)*** Interest rate legislation: ***(a)*** in respect of interest owed by the **employer**, the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975), will apply; and ***(b)*** in respect of interest owed to the **employer**, the interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply
	2) Lateral support insurance to be effected by the contractor: — ***Yes*** / ***No X***
	3) Payment will be made for materials and goods — ***Yes X*** / ***No***
	4) Dispute resolution by litigation — ***Yes*** / ***No X***
	5) Extended **defects** liability period applicable to the following elements: ***Electrical, Mechanical and Civil work***
[8.6.1.1.2]	The Value of material, supplied by the Employer, and not included in the Contract Price, is: ***R0.00***
[8.6.1.1.3]	The amount to cover Professional Fees, not included in the Contract Price, for repairing damage and loss to be included in the insurance: ***30% of the Contract Price***
[8.6.1.3]	The limit for indemnity for liable insurance is: ***Unlimited***
[6.5.1.2.3]	The percentage allowance to cover overhead charges for contractor and subcontractors, is: ***33.30%***
[1.1.1.14]	**Practical Completion Date** The Practical Completion date is: **A time measured from the Commencement date.**
	For the **works** as a whole: The whole of the works shall be completed within: ***10*** *Months (which shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods).*
[5.5.1]	The date for **practical completion** shall be ***To be determined***
[5.13.1]	The penalty per calendar day shall be : ***0.04% of the Contract Price, rounded to the nearest R10***
	For the **works** in **sections:** ***The date for*** **practical completion** from the **commencement date** and the **penalty** per **calendar day:**
	Portion 1:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 2:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 3:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 4:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 5:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 6:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
[1.3.2]	***The*** **law** applicable to this **agreement** shall be that of the: **Republic of South Africa**
[6.10.1.5]	The percentage advance on materials not yet built into the Permanent Works is: ***80.00%***
[6.10.3]	Percentage retention on amounts due to contractor is: ***The Percentage retention is nil. The only security required by the Employer will be such as selected by the Contractor on the Form of Offer and Acceptance and Part 2: CONTRACT DATA PROVIDED BY THE CONTRACTOR, point 2 - Documents, of the Contract Data.*** Maximum retention is: ***0.00%*** *of the Contract Price*
[6.8.1]	Notwithstanding anything to the contrary contained in the General conditions of Contract and Preliminaries, this contract could only, when the construction period exceeds 6 months **and** the contract exceeds R1,000,000.00, be subject to a Contract Price Adjustment Factor.
[6.8.2] [6.8.3]	Clause 6.8.2 the last part of the sentence saying *"calculated according to the formula and the conditions set out in the Contract Price Adjustment Schedule."* must be replaced by *"calculated according to the Contract Price Adjustment Provisions (CPAP) Indices Application Manual for use with P0151 indices (Revised 1 January 2013)" as published by Statistics South Africa. The Contract Price Adjustment Provision (CPAP) will be subject to the most recently released indices by Statistic South Africa. Tenderers are advised that with reference to Clause 3.4.6 of the Contract Price Adjustment Provisions (CPAP) Indices Applications Manual, the Head: Public Works will not accept the submission by Tenderers of lists of additional items."*
[6.8.2] [6.8.3]	Where this contract is a Lump Sum contract, the contract will only be subject to Contract Price Adjustment Provisions (CPAP)(Revised 1 January 2013) where the contract period equals or exceeds 6 calendar months. The applicable work group shall be WG 180 for domestic buildings or WG 181 for commercial and industrial buildings only.
[5.14.5]	***The following clause must be added to clause 5.14.5:*** *[5.14.5.6]* The employers agent shall submit the **final account** within 3 calendar months to the principal agent.

[10.5]	The determinations of disputes shall be by ARBITRATION ONLY.
[10.5.3]	The number of Adjudication Board Members to be appointed is: **One**
[10.9.1]	Replace the last part of the clause with the following: *"..on the application of either party, by the Chairman, or his nominee of the Association of Arbitrators."*

Where **CPAP** is applicable, the **contract sum** will be adjusted in accordance with the Contract Price Adjustment Provisions (**CPAP**) as set out in the **CPAP** Indices Application Manual as published by Statistics South Africa, dated 1 January 2013 and any amendments thereto:

1) Glass etc. measured in specialist section Metalwork, will be adjusted in terms of the index for that work group unless specifically stated otherwise in the bills of quantities.
2) In case of uninterruptible power supplies, elevators, escalators and hoists, generating sets, motor-alternator sets and intercommunication systems shall be adjusted in accordance with Work Group 170.
3) Further to clause 3.4.6 of the CPAP Indices Application Manual, the listing of additional items for exclusion by Tenderer's, will not be permitted.

Alternative Indices: **Not Applicable**

Details of changes made to the General Conditions of Contract for construction works (2010) Second Edition

Clause	
[1.1] [1.1.1.5]	**COMMENCEMENT DATE** – means the actual date of Site Hand over that should not occur prior to the Tenderer receiving one fully signed copy of the Offer and Acceptance in terms of the Form of Offer and Acceptance.
[5.12.2.2]	**ABNORMAL CLIMATIC CONDITIONS** - means conditions over and above what could reasonably be expected for the specific locality where the Works are being executed and include inter alia exessive rain, heat, cold, wind and any other climatic condition that would not normally be experienced during the season that the Works are executed in that area. The South African Weather Service's (http://www.weathersa.co.za) 10 year average climatic conditions statistics would be what could be reasonably expected for the specific locality where the Works are executed.
[6.2.1]	**CONSTRUCTION GUARANTEE** – means an on demand guarantee at call obtained by the **contractor** from an institution approved by the **employer** in terms of the **employer's** construction guarantee form as selected in the Offer and Acceptance Form and the **contract data.**
	CONSTRUCTION PERIOD – means the period commencing on the **commencement date** and ending on the date of **due completion date.** This period will be deemed to commence on actual site hand over date to the contractor and end on the date of practical completion and shall include all annual industrial holiday periods, Sundays and public holidays.
	CORRUPT PRACTICE – means the offer, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.
	FINAL ACCOUNT - The document prepared by the principal agent, which reflects the contract value of the works at final approval or termination.
	FRAUDULENT PRACTICE – means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any tenderer and includes collusive practise among tenderers (prior to or after the tender submission) designed to establish tender prices at artificial non-competitive levels and to deprive the tenderer of the benefits of free and open competition.
	INTEREST – the interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be in terms of the legislation of the Republic of South Africa, and in particular:
	(a) in respect of interest owed by the **employer,** the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975), will apply; and
	(b) in respect of interest owed to the employer, the interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply
[1.1.1.16]	**ENGINEER/PRINCIPAL AGENT –** means the person or entity appointed by the **Employer** and named in the **Contract Data** as the **Engineer /Principal Agent** to act as agent of the **Employer**. In the event of an Engineer/**Principal Agent** not being appointed, then all the duties and obligations of an Engineer/**Principal Agent** as detailed in the **Contract** shall be fulfilled by a representative of the **Employer** as named in the **Contract Data. (Hereafter referred to as Engineer)**
[1.1.1.21]	**GENERAL ITEMS -** or preliminaries means items stipulated in the Pricing Data relating to general obligations, site services, facilities and/or items that cover elements of the cost of the work which are not considered as proportional to the quantities of the Permanent Works.
[4.4.1]	Add the following to the clause 4.4.1: *"The Contract shall only use subcontractors who are duly registered with the CIDB and who has an ACTIVE status at the time of submitting the tender"*
[6.2.1]	Refer to Offer and Acceptance form for the various options that the contractor may choose from in providing a form of **Guarantee** under "GUARATEE OPTIONS".
[6.10.6.2]	Replace *"at the prime overdraft rate, as charged by the Contractor's Bank,"* with *"..at the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975)."* Omit *",on all overdue payments from the date on which the same should have been paid..."* and replace with *" only after 30 calendar days from receiving written notice from the Contractor that the amount is overdue,.."*

SPECIAL CONDITIONS OF CONTRACT

[5.12.3] Omit clause 5.12.3 and add the following:

"5.12.3. If an extension of time is granted, the Contractor shall be paid such additional time-related General Items, including for special non-working days, if applicable as are appropriate regarding to any other compensation which may already have been granted in respect of the circumstances concerned.The reasons for extension of time that would invoke payment of time related General Items are inter alia;

5.12.3.1 Failure to give possession of the site to the contractor.
5.12.3.2 Making good physical loss and repairing damage to the works where the contractor is not at risk.
5.12.3.3 Contract instructions not occasioned by default by the contractor.
5.12.3.4 Failure to issue construction information timeously or the late issue of a contract instruction following a request from the contractor.
5.12.3.5 Late acceptance by the principal agent of a design undertaken by a selected subcontractor where the contractor's obligations have been met.
5.12.3.6 Suspension or cancellation termination invoked by a nominated or selected n/s subcontractor due to default by the employer or the principal agent.
5.12.3.7 Insolvency of a nominated subcontractor.
5.12.3.8 A direct contractor.
5.12.3.9 Opening up and testing of work and materials and goods where such work is according to in accordance with the contract documents.
5.12.3.10 The execution of additional work for which the quantity included in the bills of quantities is not sufficiently accurate.
5.12.3.11 Late or failure to supply materials and goods for which the employer is responsible.
5.12.3.12 Suspension of the works."

[5.14.5.1] Omit entire clause 5.14.5.1

[5.16.4] Add the following new clause *"5.16.4. Upon the issue of a Final Approval Certificate, unless otherwise provided in the Contract:*
5.16.4.1. The performance Guarantee (if any) shall be returned within 14 days to the guarantor in terms of Clause 7."

[6.2.2] Replace the following *"..it shall be deemed that the Contractor has selected a security of ten percent retention of the value of the Works."* with *"..it shall be deemed that the Contractor has selected a security of a bank or insurance guarantee of 5% of the value of the Works and a payment reduction of 5% of the value certified in the payment certificate excluding value added tax."*

[6.2.3] Add to clause 6.2.3 the following "*The Contractor shall provide proof of paid-up premium payments to accompany his payment certificate as proof that his performance guarantee has not expired yet. The Contractor will not receive payment without proof of the validity of their performance*

[9.3.2.2] Omit *"without prejudice to the exercise of any lien the Contractor may have acquired over the Employer's property."*

Duties and functions of the **Engineer** requiring the specific approval of the **Employer** BEFORE execution of any part of these duties are as follows:

(a) Determinations of contractors claims for extension of time (revision of the contract completion date). All claims for extension of time shall be submitted by the **Engineer,** together with the **Engineer's** recommendations, to the **Employer** for determination. Omit "Engineer" in clause 42.2

(b) Drawings, instructions or communications of any kind requiring variations of the works and involving EXTRA's shall NOT be given effect by the **Contractor** UNTIL BOTH the "Official Variation Order" and the "Financial Request for Variation Order and Additional Funds" form, as issued by the Department of Public Works, have been approved and signed by the **Employer**.

(c) Insurance policies to be approved by the **Employer** within 21 days of the date of the **Commencement** of the Works.

(d) Any notice of disagreement raised by the **Contractor** or written Dispute Notice given by the **Contractor** to the **Engineer** shall be submitted by the **Engineer**, together with the **Engineer's** recommendations, to the **Employer** for determination.

(e) The issue of the certificate of practical completion, certificate of completion and the final approval certificate shall be signed and submitted by the **Engineer**, to the **Employer** for final approval and signature. The certificates shall not be considered as officially issued until signed by the

MANAGING PROJECT DURATION

(a) The Contractor shall co-ordinate his programme with all other contractors whose work may precede or be executed simultaneously to his own. The Contractor will be called upon to plan and control the project using the Project Evaluation and Review Technique (PERT) or other approved Critical Path Method (CPM) network analysis of his events and activities and those of the dub-contractors in his employ and must co-ordinate his planning with any other contractor employed on the project. A fortnightly project control report will be expected from the Contractor in writing, evaluating any gains or delays against the critical path and he should allow for all costs involved in planning reviewing and updating the programme to the satisfaction of the Principal Agent against this item.

(b) Activity-and total float shall belong to the Employer.

(c) The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.
It is a condition of this contact that, the contracter submit to the Engineer/principal agent a detailed CPM Programme which shall be to the approval of the Engineer/principal agent. In this regard tenderers are advised to consult with the Engineer/Principal Agent as to the format and requirements of the programme as no claim whatsoever will entertained should the programme fail to meet the requirements of the Engineer/Principal Agent. Failure to submit the programme within the stipulated time may result in the contractor being held in breach of contract.

The approved programme will form the basis of time management of the project and extension of time will not be guaranteed unless the Contractor has strictly complied with this provision.

The programme shall make allowance for rain and the number of rain days allowed within the critical path shall be on the provisions of the clause dealing with inclement weather and claiming for delays in performance in this bill.
Allowance for the above must be made under this item as no claims for failing to comply with this precondition will later be entertained.

INCLEMENT WEATHER AND CLAIMS FOR DELAYS IN PERFORMANCE

(a) The Contract Sum includes a monthly allowance of 3 working days inclement weather during which rainfall exceeds 10mm per day for months as indicated in the Scope of Works. These days shall be reflected on the critical path of the Contractor's programme as specified in MANAGING PROJECT DURATION above.

(b) Claims for delays in performance due to inclement weather shall be calculated separately for each calendar month and for the project as a whole. Delays or gains to the critical path shall be reflected in all revisions of the programme. An extension of time will only be granted where the following conditions are met:

(i) The criteria to be used for WORK stoppages shall be for safety hazards or poor quality of work.
(ii) The Employer's site representative or the Employer's Principal Agent, if the site representative is not available shall be notified when the Contractor stops the work and intends to claim performance delays. The Employer representative shall inspect the situation together with the Contractor and give an immediate decision.

1. The stoppage claimed must cause a delay in the Completion Date of work. If the critical activities can proceed and a non-critical activity is delayed due to inclement weather no claims for delay shall be granted.
2. No claims for stoppages less than 2(two) hours per day shall be considered.
3. Claims granted for more than 2 (two) hours, but less than 10 (ten) hour (lunch included) day, shall be added together and expressed as full days.
4. All claims shall be submitted in writing to the Principal Agent within one working day of the actual stoppage.
5. The total delay in performance granted to the Contractor expressed in days shall be added to the contractual Completion Date of each section of the Works. The contractual penalty clause shall only come into effect after this newly arrived date.
6. Total delays (in hours) will be rounded up or down to the nearest integer for the calculation of Working Days. The total hours (including lunch) per Working Day shall be 10 unless otherwise indicated on the Contractor's programme.
7. Where the programmed delays for inclement weather exceed the actual delays incurred the Completion Date(s) will not be adjusted.
8. Where the project includes builder's holidays the programmed durations for inclement weather shall be adjusted pro-rate to the actual Working Days.
9. The total of all monthly delays due to inclement weather shall be calculated in accordance with the example given below:

Description		Months					Total
		Sept	Oct	Nov	Dec	Jan	
		Hours	Hours	Hours	Hours	Hours	Hours
Programmed	Rain days	0	30	30	15	15	90
Actual	Rain days	16	22	35	15	18	106
Difference		-16	8	-5	0	-3	-16
8 hrs/day*						Estimated Extension of time - in working days	2

See point 5.2 in the Scope of Works for the specific days the tenderer must allow for in this contract.

Tender no: **ZNTL 05094W** **Part 2: CONTRACT DATA PROVIDED BY THE CONTRACTOR:**

POST-TENDER INFORMATION

Note: All information for this section requires consultation with the **Contractor**. The **Engineer/Principal Agent** shall not pre-select any of the alternatives available to the **Contractor.**

1 CONTRACT DETAILS

[1.1.1.9] **Contractor Name:** .....

[1.2.1.2] Postal address:

.....

.....

.....

Tel no ..... Fax no .....

Tax / VAT Registration No: ..... e-mail .....

Physical address:

.....

[1.1.1.10]	The accepted **contract price** inclusive of **tax** is R :
	[Amount in words]

Payment Of Preliminaries (Clause 6.7, 6.8, 6.10 and 6.11)

The preliminaries amounts shall be paid in terms of:		
	***Alternative A**	**Yes**
	****Alternative B**	**N/A**

** Assessed by the Engineer/Principal Agent as an amount prorated to the value of the Work duly executed in the same ratio as the Preliminaries bears to the Contract Price excluding VAT, Preliminary amount, Contingencies and any CPAP.*

*** Calculated from the priced Bill of Quantity/Lump Sum document. The Contractor and the Engineer/Principal Agent shall agree on a division of the priced Preliminaries items into: initial establishment charge, monthly charge and final disestablishment charge.*

If the Contractor and the Engineer/Principal Agent can not agree, within 10 Working Days from the Commencement Date, on such a division then the Engineer/Principal Agent shall make a division of the Preliminaries to be incorporated in the valuations for each monthly payment certificate as follows;

10% of the General Items/Preliminaries amount shall not be varied

15% of the General Items/Preliminaries shall only be varied in proportion of the Contract Price to the Contract Sum

75% of the General Items/Preliminaries shall be varied in proportion to the revised Construction Period compared with the initial Construction Period.

Alternative A

Adjustment of Preliminaries (Clause 6.7, 6.8, 6.10 and 6.11)

For the adjustment of Preliminaries both the Contract Sum and the Contract Value (including tax) shall exclude the amount of Preliminaries, all Contingency Sum(s) and any provision for Cost Price Adjustment Provisions:-

- An amount which shall not be varied.

- An amount varied in proportion to the contract value as compared to the Contract Sum.

- An amount varied in proportion to the Construction Period as compared to the initial Construction Period (excluding revisions to the Construction Period to which the Contractor is not entitled) to adjustment of the Contract Value in terms of the agreement.

The Contractor shall provide a breakdown of charges (including tax) within 15 working days of the date of acceptance of tender and, where applicable, an apportionment of Preliminaries per section

If the Contractor and the Principal Agent cannot agree, within ten (10) Working Days from the Commencement Date, on such a division then the Principal Agent shall make a division of the Preliminaries to be incorporated in the valuations for each monthly payment certificate as follows;

10% of the amount shall not be varied

15% varied in proportion of the Contract Value to the Contract Sum

75% varied in proportion to the revised Construction period compared with the initial Construction Period

Sectional Completion : Subdivision of Preliminaries Costs

For the adjustment of preliminaries for sections of the work the value of fixed, value, and time related amounts of the preliminaries for each section is required. The contractor is to provide such information within fifteen (15) working days of taking possession of the site, failing which the categorised preliminaries amounts shall be prorated to the value of each section.

The above shall apply equally for projects where sectional completion was not contemplated at tender stage but subsequently occurred on an adhoc basis during construction of the works as agreed between the client and the employer. The original priced categorised amounts for fixed, value, and time related amounts shall be prorated to the value of each section.

When an extension of time has been granted in terms of the GCC and the preliminaries require to be adjusted accordingly, the pertinent sectional (subdivided) categorised preliminaries amounts shall be utilised, where applicable and not the overall preliminary amounts.

Where sectional completion is required in terms of the agreement, the Contractor shall provide the Principal Agent with the division of the above categorized amounts into sections. Should the Contractor fail to provide such information within the period stipulated the categorized amounts shall be prorated to the value of each section.

YES *yes / no*

or

Alternative B

The Contractor shall within 15 working days of the date of possession of the site provide the Principal Agent with a detailed breakdown of Preliminaries amounts for the works as a whole, or per section where applicable, including administrative and supervisory staff charges and for the use of construction equipment in terms of the programme.

NO *yes / no*

The contractor is informed that only option 'A' shall apply

2 DOCUMENTS

Contract documents marked and annexed hereto:

Priced **Bills of Quantities:**	**Yes**	X	**No**	
Lump Sum document: :	**Yes**		**No**	X

Guarantee Options:

10% Cash Deposit		10% Bank Guarantee	
5% Cash Deposit & 5% Payment Reduction		5% Bank Guarantee & 5% Payment Reduction	

2.2 DESIGN BRIEF

Not applicable

2.3 DRAWINGS — YES — YES or NO

See list of drawings/Annexure's attached to this document.

2.4 DESIGN PROCEDURES — NO — YES or NO

Not applicable

Contract drawings: Yes [X] No [ ]
Other documents:

Waiver of the Contractors lien or right of continuing possession is required. **YES**

GUARANTEE OPTIONS

The Tenderer agrees to provide a bank or insurance guarantee in accordance with clause 6.2.3 of the Conditions of the GCC2010 Contract within the period stated in the Contract Data. This guarantee shall be for a sum equal to an amount stated in the Contract Data.

Guarantees submitted must be issued by either an insurance company duly registered in terms of the Insurance Act (Long Term Insurance Act No 52 of 1998 or Short Term Insurance Act No 53 of 1998) or by a bank duly registered in terms of the Banks Act No 94 of 1990, on the pro-forma referred to above. No alterations or amendments of the wording of the pro-forma will be accepted.

(a) the tenderer accepts that in respect of contracts up to R1 million, a payment reduction of 5% of the contact value will be applicable and will be reduced by the Employer in terms of the applicable conditions of contract.

(b) in respect of contracts above R1 million, the Tenderer offers to provide security as indicated below: select one option

(i) cash deposit of 10 % of the Contract Price	
(ii) bank or insurance Performance Guarantee of 10 % of the Contract Price	
(iii) cash deposit of 5% of the Contract Price and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)	
(iv) bank or insurance guarantee of 5% of the Contract Price and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)	

NOTE: Where the Tenderer has not selected one of the guarantee options above, the default option will be as if the Tenderer has selected a security of a bank or insurance guarantee of 5% of the value of the Works and a payment reduction of 5% of the value certified in the payment certificate excluding value added tax. - See GCC2010 clause 6.2.2 as amended in Contract Data.

3 SIGNATURES OF THE CONTRACTING PARTIES

Thus done and signed at.....on .....of.....20.....

Name of signatory — for and behalf of the **Employer** who by signature hereof

Capacity of signatory — as Witness.

Thus done and signed at.....on .....of.....20.....

Name of signatory — for and behalf of the **Contractor** who by signature hereof

Capacity of signatory — as Witness.

IMPLEMENTATION OF SWITCHOVER PLAN

Tenderers are to price for switching over and connecting the new system to the existing system including all ancillary items as per the Architectural, Electrical and Civil implementation plans. Tenderers are to price for these items and any items that may be required to connect the new system to the existing internal/ external reticulation.

Any cost that may be associated with executing the implementation plans shall be fully allowed for in the preliminaries section of these bills of quantities. No additional cost will be entertained during construction.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

C1.3 - FORM OF GUARANTEE

C1.3 PERFORMANCE GUARANTEE - GCC FOR CONSTRUCTION WORKS (2nd Edition - 2010)

Head: Public Works
KZN Department of Public Works:
Private Bag X 9041
PIETERMARITZBURG
3200

Sir,

ON DEMAND PERFORMANCE GUARANTEE

Tender Number ZNTL 05094W	**Project Code WIMS No. 078856**

For use with the General Conditions of Contract for Construction Works, Second Edition, 2010.

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means: _____

Physical Address: _____

"Employer" means: The Provincial Administration of KwaZulu-Natal in its Department of Public Works

"Contractor" means: _____

"Engineer" means: _____

"Works" means: **MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**

"Site" means: _____

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

"Contract Sum" means: The accepted amount inclusive of tax of: _____

Amount in Words:

"Guaranteed Sum" means: The maximum aggregate amount of: 10% _____
Of Contract Sum

Amount in Words: _____

"Expiry Date" means: _____

CONTRACT DETAILS

Engineer Issues: Interim Payment Certificates, Final Payment Certificates and the Certificate Completion of the Works as defined in the Contract.

PERFORMANCE GUARANTEE

1 The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.

2 The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.

3 The Guarantor hereby acknowledges that:

3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;

3.2 its obligation under the Performance Guarantee is restricted to the payment of money.

4 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:

4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;

4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;

4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum Certified in 4.

5 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:

5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or

5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and

5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.

6 It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.

7 Where the Guarantor has made payments in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Payment Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.

8 Payment by the Guarantor in terms of 4 or 5 shall be made with seven (7) calendar days upon receipt of the first written demand to the Guarantor.

9 Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.

10 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.

11 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.

12 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.

13 This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.

14 Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Court Act No 32 of 1944, as amended, to this jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at _____

Date _____

Guarantor's signatory (1) _____

Capacity _____

Guarantor's signatory (2) _____

Capacity _____

Witness signatory (1) _____

Witness signatory (2) _____

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

PART C2 - PRICING DATA

C2.1 PRICING INSTRUCTIONS GCC FOR CONSTRUCTION WORKS (Second Edition 2010)			
Project title:	MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT		
Tender no:	ZNTL 05094W	Project Code:	WIMS No. 078856

C2.1 Pricing Instructions

Where any item is not relevant to this specific contract, such item is marked N/A (signifying "not applicable")

The adjustment of the preliminaries each item priced is to be allocated to one or more of the three categories by insertion of "F", "V", "T" as the case may be against the price in the "rate" column immediately preceding the "amount" column, where "F" denotes a fixed amount (amount not varied), "V" denotes an amount variable in proportion to value and "T" denotes an amount variable in proportion to time.

1 MASSES AND MEASURING UNITS

These shall be in accordance with the Measuring Units and National Measuring Standards Act No. 76 of 1973 and amendments thereto.

The pages of each of these documents are numbered consecutively and before the Tenderer submits his tender he should check the number of pages, and if any are found missing or duplicated, or the figures or writing indistinct, or the documents contain any obvious error, he should apply to the Head : Public Works AT ONCE and have same rectified as no liability whatsoever will be admitted by the Administration in respect of errors in Tender due to the foregoing.

2 PRICES FOR VARIATIONS

Where prices or quotations for variations are submitted by the Contractor during the currency of the Contract, it is to be clearly understood that these are for the purpose of consideration by the Head : Public Works and that there is no assumption of acceptance. The Contractor will be notified of acceptance of prices or quotations either by insertion of the amount on the variation order or by written intimation.

3 SCALE

The scale to which the Drawings are made is only to be made use of when no figured dimensions are given either on the Drawings or in the tender documents and the figured dimensions are always to be followed though they may not coincide with the scale of the Drawings, but dimensions where possible are to be taken from the buildings.

4 PROVISIONAL ITEMS

All items described as "Provisional" shall be used as directed by the Employer and measured and valued or paid for.

No work for which "Provisional" items are allowed shall be commenced without written instructions from the Head : Public Works.

5 TIMELY ORDERING OF MATERIALS

The Contractor is warned to place all orders for materials or special articles as early as possible, as he will be held solely responsible for any delay in the delivery of such goods.
Nevertheless this tender is conditional upon no liability being attached to the Contractor if delivery of materials is rendered impossible by reason of any act of the Government.

6 ELECTRICAL LIGHTING, POWER AND WATER

The Contractor shall provide any artificial lighting which may be necessary or required for the proper execution of the works, and provide electric power and water required by all Sub-Contractors, Nominated Sub-Contractors and Sub-Contractors appointed directly by the Employer.

The Contractor shall give all notices and pay all fees in connection with temporary electrical and water connections and shall connect temporary Electrical and Water meters for and pay for all current and water consumed.

Tenderers are advised that the permanent light fittings and water points of any kind installed in the Works are not to be used to provide temporary lighting and supplement water requirements for construction purposes.

7 IMPORT PERMITS, DUTIES AND SURCHARGES.

All tenders by means of which imported products are being called for, must use the rate of exchange 14 days prior to the closing date indicated in the tender documents. If this day falls on a weekend or public holiday, the next working day must be used.

Furthermore, Tenderers must submit documentary proof (in the form of a certified copy) from their bank or legally recognised financial institution, clearly indicating what the rate of exchange was 14 days prior to the closing date, as mentioned above.

Together with this, the Tenderer must confirm that the tender price relating to an imported product, was based on the rate of exchange 14 days prior to the closing date as mentioned above.

8 STANDARD SYSTEM OF MEASUREMENT WHERE BILLS OF QUANTITIES FORM PART OF THE TENDER DOCUMENTS

The work executed under this Contract has been measured in accordance with the;

Standard System of Measuring Builders Work (7th Edition)

including all amendments unless descriptions of items indicate a deviation and it shall be understood that the system of measurement which is herein adopted is the only system of measurement which will be recognised in connection with this contract. Any contradictions to this system of measurement contained in the "Model Preambles for Trades 2008" shall be disregarded (unless same have been accommodated in the system of measurement) but applicable rates shall be included for all requirements stated and not measured separately in compliance with this system.

9 PRICING OF ROCK EXCAVATIONS

It is a condition of this tender that should the tenderer elect to price the Rock Excavation included in this tender, the rates must be market related and should be identically priced for the same classification of excavations and not vary for similar billed items in the different sections.

10 BROAD BASED BLACK ECONOMIC EMPOWERMENT

1. It is the deliberate policy of the Provincial Administration of KwaZulu-Natal to foster and to encourage the economic empowerment of Black South Africans. This policy will be implemented without prescription and without prejudicing the principles and the integrity of the Provincial Administration of KwaZulu-Natal. Subject to these constraints and also subject to good business practise and commercial consideration, it is therefore considered appropriate that the Provincial Administration of KwaZulu-Natal should encourage business relationships with companies which actively pursue Affirmative Action and Black Economic Empowerment Programmes.

2. In responding to this tender you are therefore encouraged to devote attention to these two subjects of Affirmative Action and Economic Empowerment. In addition, in considering the appointment of sub-contractors, you are requested to extend the spirit of these policies.

3. The foregoing enunciations of this policy are not intended to be prescriptive nor to preclude any individual or operation from responding to this tender.

11 REGISTRATION ON THE CENTRAL SUPPLIERS DATABASE

1. In terms of the Public Finance Management Act (PFMA), 1999 (Act No 1 of 1999) Section 38 (1) (a) (iii) and 51 (1) (iii) and Section 76 (4) of PFMA National Treasury developed a single platform, The Central Supplier Database (CSD) for the registration of prospective suppliers including the varification functionality of key supplier information.
2. Prospective suppliers will be able to self - register on the CSD website: www.csd.gov.za
3. Once the supplier information has been varified with external data sources by National Treasury a unique supplier number and security code will be allocated and communicated to the supplier. Suppliers will be required to keep their data updated regularly and should confirm at least once a year that their data is still current and updated.
4. Suppliers can provide their CSD supplier number and unique security code to organs of state to view their varified CSD information.
5. Tenderers are required to fill in clearly, legibly, in bold print and black ink their CSD supplier number in the space hereunder:

Name of Supplier	
Central Supplier Database (CSD) Supplier Number:	

12 TAX CLEARANCE REQUIREMENTS

It is a condition of tender that the taxes of the successful tenderer must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the Tenderder's tax obligations. It is a condition of this Offer of Commission that your practice remains in good standing with SARS (South African Revenue Services) in terms of its tax clearance, during the project, which is required to process your payment certificates.

1. In order to meet this requirement tenderers are required to apply via e-filing at any SARS branch office nationally. The Tax Complance Status (TCS) requirements are also applicable to foreign Tenderders / individuals who wish to submit Tenders.
2. SARS will then furnish the Tenderder with a Tax Compliance Status (TCS) PIN that will be valid for a period of 1 (one) year from the date of approval.
3. In tenders where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Compliance Status (TCS) PIN.
4. Application for Tax Compliance Status (TCS) PIN can be done via e-filing at any SARS branch office nationally or on the website www.sars.gov.za.
5. Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

6 Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

Security PIN Number	
Company / Entity Tax Reference Number	

13 BILLS OF QUANTITIES/LUMP SUM DOCUMENT

The Bills of Quantities document forms part of and must be read and priced in conjunction with all the other documents forming part of the contract documents, the Standard Conditions of Tender, Conditions of Contract, Standard Preambles to all Trades, Specifications, Drawings and all other relevant documentation.

14 VALUE ADDED TAX

The tender price must include for Value Added Tax (VAT). All rates, provisional sums, etc. in the Bills of Quantities must however be net (exclusive of VAT) with VAT calculated and added to the Total Value thereof in the Final Summary.

15 FIXED PRICE CONTRACT

The bid is subject to contract price adjustment using the Haylett Formula

16 PHASING OF CONTRACT (ELECTRICAL WORKS)

The electrical works will be done in phases as per the electrical implementation plan.
The tenderers are advised to study the Electrical Implementation Plan for details. Any cost that may be associated with the executing of the electrical works in phases shall be fully allowed for in the preliminaries section of these bills of quantities. No additional cost will be entertained during construction.

17 IMPLEMENTAING THE SWITCHOVER PLAN

Tenderers are to price for switching over and connecting the new system to the existing system including all ancillary items as per the Architectural, Electrical and Civil implementation plans. Tenderers are to price for these items and any items that may be required to connect the new system to the existing internal/ external reticulation.

Any cost that may be associated with executing the implementation plans shall be fully allowed for in the preliminaries section of these bills of quantities. No additional cost will be entertained during construction.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

C2.2 - Preliminaries for GCC for Construction works - 2nd Edition 2010

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

BILL NO. 1
C2 .2 PRELIMINARY AND GENERAL

	NOTES	UNIT	QUANTITY	RATE	AMOUNT
i)	The agreement is to be the General Conditions of Contract for Works of Civil Engineering Construction (2010) (Second Edition) , published by the S. A. Institution Of Civil Engineering.				
ii)	The Preliminaries are to be the Construction and management requirements for works contracts - Part 1: General engineering and construction works (SANS 1921-1: 2004 Edition 1) prepared by Standards South Africa and shall be deemed to be incorporated herein.				
iii)	Tenderers are referred to the abovementioned documents for the full intent and meaning of each clause thereof (hereinafter referred to by heading and clause number only) for which such allowance must be made as may be considered necessary.				
iv)	Where standard clauses or alternatives are not entirely applicable to this contract such modifications, corrections or supplements as will apply are given under each relevant clause heading.				
v)	Where any item is not relevant to this specific contract such item is marked N/A (signifying "not applicable").				
vi)	Adjustment of the preliminaries: each item priced, is to be allocated to one or more of the three categories, where "F" denotes a fixed amount (amount not to be varied), "V" denotes an amount variable in proportion to value and "T" denotes an amount in proportion to time.				
vii)	Time (T) related Preliminaries will only be adjusted for omissions or additions, issued by the Employer, or delays caused by the Employer, for which variation and extension of time has been granted. ***See Contract Data*** .				
	SECTION A: GENERAL CONDITIONS OF CONTRACT				
A1	General (clause 1) F:..... V:..... T:.....	Item			
A2	Basis of Contract (clause 2) F:..... V:..... T:.....	Item			
A3	Engineer (clause 3) F:..... V:..... T:.....	Item			
A4	Contractor's General Obligation (clause 4) F:..... V:..... T:.....	Item			
A5	Time and Related Matters (clause 5) - As referred to in the Contract Data under Special Condition of Contract. The Contract Period shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
A6	Payment and Related Matters (clause 6)	Item			
	F:..... V:..... T:.....				
A7	Quality and Related Matters (clause 7)	Item			
	F:..... V:..... T:.....				
A8	Risk and Related Matters (clause 8)	Item			
	F:..... V:..... T:.....				
A9	Termination of Contract (clause 9)	Item			
	F:..... V:..... T:.....				
A10	Claims and Disputes (clause 10)	Item			
	F:..... V:..... T:.....				
	SECTION B: SANS 1921-1:2004 (Edition 1): CONSTRUCTION AND MANAGEMENT REQUIREMENTS FOR WORKS CONTRACTS: PART 1				
	Refer to the SCOPE OF WORK for detail requirements:				
B1	Scope				
	F:..... V:..... T:.....	Item			
B2	Normative references				
	F:..... V:..... T:.....	Item			
B3	Definitions				
	F:..... V:..... T:.....	Item			
B4	Requirements for construction and management				
	F:..... V:..... T:.....	Item			
B4.1	General				
	F:..... V:..... T:.....	Item			
B4.2	Responsibilities for design and construction				
	F:..... V:..... T:.....	Item			
B4.3	Planning, programme and method statements				
	F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
B4.4	Quality assurance F:..... V:..... T:.....	Item			
B4.5	Setting out F:..... V:..... T:.....	Item			
B4.6	Management and disposal of water F:..... V:..... T:.....	Item			
B4.7	Blasting F:..... V:..... T:.....	Item			
B4.8	Works adjacent to services and structures F:..... V:..... T:.....	Item			
B4.9	Management of the Works and site F:..... V:..... T:.....	Item			
B4.10	Earthworks F:..... V:..... T:.....	Item			
B4.11	Testing F:..... V:..... T:.....	Item			
B4.12	Materials, samples and fabrication drawings F:..... V:..... T:.....	Item			
B4.13	Equipment F:..... V:..... T:.....	Item			
B4.14	Site establishment F:..... V:..... T:.....	Item			
B4.15	Survey control F:..... V:..... T:.....	Item			
B4.16	Temporary works F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
B4.17	Existing services F:..... V:..... T:.....	Item			
B4.18	Health and safety F:..... V:..... T:.....	Item			
B4.19	Environmental requirements F:..... V:..... T:.....	Item			
B4.20	Alterations, additions, extensions and modifications to existing works F:..... V:..... T:.....	Item			
B4.21	Inspection of adjoining structures, services, buildings and property F:..... V:..... T:.....	Item			
B4.22	Attendance on nominated and selected subcontractors F:..... V:..... T:.....	Item			
	SECTION C: SCOPE OF WORK in accordance with SANS 10403 *(The reference to Clauses refer to Table B.1 of SANS 1921-1:2004)*				
C1	Certification by recognised bodies - CLAUSE 4.4 F:..... V:..... T:.....	Item			
C2	Agrément certificates - CLAUSE 4.5 F:..... V:..... T:.....	N/A			
C3	Other services and facilities - CLAUSE 4.8 F:..... V:..... T:.....	Item			
C4	Recording of weather - CLAUSE 5.2 F:..... V:..... T:.....	Item			
C5	Management meetings - CLAUSE 5.3 F:..... V:..... T:.....	Item			
C6	Daily records CLAUSE 5.6 F:..... V:..... T:.....	Item			
C7	Bond and guarantees - CLAUSE 5.7 F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
C8	Permits - CLAUSE 5.9 F:..... V:..... T:.....	Item			
C9	Proof of compliance with the law - CLAUSE 5.10 F:..... V:..... T:.....	Item			
	SECTION D: SPECIFICATION DATA ASSOCIATED WITH SANS 1921-1:2004 (Table A.1)				
D1	Requirements for drawings, information and calculations for which the contractor is responsible CLAUSE 4.1.7 F:..... V:..... T:.....	Item			
D2	The responsibility strategy assigned to the contractor for the works CLAUSE 4.2.1 F:..... V:..... T:.....	Item			
D3	The planning, programme and method statements - CLAUSE 4.3 F:..... V:..... T:.....	Item			
D4	Samples of materials, workmanship and finishes - CLAUSE 4.12.1 F:..... V:..... T:.....	Item			
D5	Fabrication drawings that the contractor is to provide and deliver to the employer - CLAUSE 4.12.2 F:..... V:..... T:.....	Item			
D6	Office for the foreman CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
D7	Telephone - CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
D8	Office for inspector of works - CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
D9	Telephone in office for inspector of works - CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
D10	Sheds - CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
D11	Provision and erection of signboards - CLAUSE 4.14.6 F:..... V:..... T:.....	Item			
D12	Termination, diversion or maintenance of existing services - CLAUSE4.17.1 F:..... V:..... T:.....	Item			
D13	Services which are known to exist - CLAUSE 4.17.3 F:..... V:..... T:.....	Item			
D14	Detection apparatus - CLAUSE 4.17.4 F:..... V:..... T:.....	Item			
D15	Additional health and safety requirements - CLAUSE 4.18 F:..... V:..... T:.....	Item			
	SECTION E: SPECIFIC PRELIMINARIES Section E contains Specific Preliminary items which apply to this contract except where "N/A" (Not Applicable) appears against the item.				
E1	**PROPRIETARY BRANDED PRODUCTS** The contractor shall take delivery of, handle, store, use apply and/or fix all proprietary branded products in strict accordance with the manufacturers' instruction after consultation with the manufacturer's authorised representative. F:..... V:..... T:.....	Item			
E2	**OVERTIME** Should overtime be required to be worked for any reason whatsoever, the costs of such overtime are to be borne by the Contractor unless the Engineer/Principal Agent has specifically authorised in writing, prior to the execution thereof, that costs for such overtime are to be borne by the Employer. F:..... V:..... T:.....	Item			
E3	**AS BUILT DRAWINGS** The position of construction breaks and the extent of individual concrete pours are to be recorded by the Contractor on the Structural Engineer's drawings and are to be submitted to the Engineer/Principal Agent and the Structural Engineer for their records. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

	SECTION E: SPECIFIC PRELIMINARIES	UNIT	QUANTITY	RATE	AMOUNT
E4	**SITE INSTRUCTIONS** Site Instructions issued on site are to be recorded in triplicate in a Site Instruction book which is to be maintained on site by the Contractor. F:..... V:..... T:.....	Item			
E5	**LABOUR RECORD** At the end of each week the Contractor shall provide the Engineer/Principal Agent with a written record, in schedule form, reflecting the number and description of tradesmen and labourers employed by him and all sub-contractors on the works each day. F:..... V:..... T:..... *Note : In the event that the contractor fails to satisfy the requirements of this specification, the Employer (Head: Public Works) may apply any of the sanctions provided in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum per calendar day of which the required report has not been submitted.*	Item			
E6	**PLANT RECORD** At the end of each week the Contractor shall provide the Engineer/Principal Agent with a written record, in schedule form, reflecting the number, type and capacity of all plant, excluding hand tools, currently used on the works. F:..... V:..... T:.....	Item			
E7	**NON CESSION OF MONIES** The Contractor shall not cede nor assign his rights or claims to any monies due or to become due under this contract. F:..... V:..... T:.....	Item			
E8	**SECTIONAL COMPLETION** When it is required that the contract be executed in sections or portions, the tenderer shall allow for all costs in this regard as no claim for additional costs will be entertained. F:..... V:..... T:.....	Item			
E9	**LOCAL LABOUR** It is a general requirement of this contract that persons normally resident in the locality of the works (Local Labour) be given preference for employment on the contract. Provided, however, that should adequate and appropriate Labour not be available within the locality, others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ Local Labour. The Contractor shall identify the local community leaders with the purpose of negotiating with them regarding the utilization of Local Labour in the construction process. In this regard, the Contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth. The Contractor shall, in general, maximize the involvement of the local community. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E10	**IMPORT PERMITS AND DUTIES** The responsibility for obtaining the necessary import permits shall rest with the successful Tenderer. No foreign exchange will be arranged or provided by the Administration. Tenderers are to allow in their tenders and pay the ordinary levy imposed on imported items in terms of item 196.10 of Part 8 of Schedule No. 1 of the Customs and Excise Act, 1964 with effect from 1 October 1989. F:..... V:..... T:.....	Item			
E11	**CONTRACT PRICE ADJUSTMENT PROVISIONS (CPAP)** Notwithstanding anything to the contrary contained in the GCC for Construction Works 2010 2nd Edition, this Contract shall only when the Construction Period exceeds 6 months and the Contract sum exceeds R1,000,000,00 be subject to the Contract Price Adjustment Provisions Indices Application Manual for use with P0151 indices (CPAP) (Revised 1 January 2013) as published by Statistics South Africa. Tenderers are advised that with reference to Clause 3.4.6 of the Contract Price Adjustment Provisions (CPAP) Indices Applications Manual, the Head: Public Works ***will not accept the submission by Tenderers of lists of additional items.*** Where this contract is a Lump Sum contract, the contract will be subject to Contract Price Adjustment Provisions (CPAP) only where the contract period equals or exceeds 6 calendar months. The applicable work group shall be WG 180 for domestic buildings or WG 181 for commercial and industrial buildings. F:..... V:..... T:.....	Item			
E12	**EPWP CONDITIONS AND SPECIFICATIONS** **12.1 EMPLOYMENT TARGETS** E12.1 a Employment Targets The contractor needs to provide a realistic estimate on the number of jobs that the project has the potential to create throughout the project duration as the project will be implemented using labour intensive construction methods on elements where it is economical and feasible for this construction method. No of jobs to be created = ... *[Contractor to fill in an estimated number]* F:..... V:..... T:.....	Item			
	E12.1 b Employment requirements Tenderers are advised that this contract will be subject to the Expanded Public Works Program (EPWP) aimed at alleviating and reducing unemployment. Tenderers must allow for any costs for the employement of unskilled labour as per the requirements of the EPWP program; 1. 55% of unskilled labour to be women 2. 55% of unskilled labour to be youth aged between 18 and 35 years 3. 2% of unskilled labour to be people living with disability 4. 100% Unskilled labour utilised must reside within the boundries of the Municipality Ward where this contract is executed, with preference to the local community closest or at the walking distance to the contract site. Wherever possible local skilled tradesmen are to be employed on this contract with the view to maximize utilization of local resources. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	E12.1 c Labour rate and payment intervals The contractor should ensure that labour rate paid to unskilled local labour is commensurate to the daily task. When determining the rate, consideration should be given to that EPWP beneficiaries are mostly bread winners in their families, as the program intends alleviating poverty. There should also be consideration that the labour rate promotes creation of expanded number of jobs created and person days of work. Contractors should make endeavours to ensure that labourers, particularly unskilled are remunerated on fortnight basis and prior notification be made should there be a shortfall on their wages. The labour rate for local unskilled shall also be determined in consideration of the location of the project, i.e. for projects implemented in urbanized municipalities will not be the same as that for rural municipalities. F:..... V:..... T:.....	Item			
	12.2 LABOUR INTENSIVE CONSTRUCTION METHOD E12.2 a Labour Intensive Construction (LIC) method On site there must a person(s) having competency in managing and implementing LIC methods. *Foreman @ NQF Level 4 the Unit Standard on Implementing LIC methods on site. *Site Agent/ Managers @ NQF level 5 the Unit Standard on Manage Labour-Intensive Skills Programme both must be CETA accredited F:..... V:..... T:.....	Item			
	E12.2 b Labour Intensive Construction Method Those parts of the contract to be constructed using Labour Intensive methods will be marked in the BoQ with letter LI (indicating Labour Intensive) against every item so designated. Such works will only be constructed using method so indicated. Reference to be made to Guidelines for the implementation of Labour Intensive Infrastructure projects under EPWP. "Scope of Work in Respect of Work Relating to the Expanded Public Works Programme (EPWP)" F:..... V:..... T:.....	Item			
	E12.3 RECORD KEEPING 12.3.1 Every employer must keep in the project site office the following minutes of site progress minutes; contractors' monthly site progress reports; accurately recorded attendance register; proof of payment as means to verify authenticity of data in the EPWP Beneficiary form submitted with payment certificates. Copies of submitted EPWP beneficiary data forms should also be kept in the site office. F:..... V:..... T:.....	Item			
	12.3.2 The employer must keep this record for a period of at least three (3) years after the completion of the project in his/her office as the project site office would have been relocated. This should be safely kept for job creation data verifications and periodical audits on projects conducted by National and Provincial Department of Public Works after one (1) or two (2) quarters of submitting captured EPWP Data to the National EPWP coordinating Department. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	E12.4 EPWP REPORTING as per EPWP DATA FORM At the end of each month as part of site progress report and to be attached to every contractors' progress payment certificate; the contractor shall provide the principal agent & Public Works with a written records, as per EPWP data form;. which will be reflecting, beneficiaries full name & surname; ID No and job description of labour employed by main contractor and sub-contractors on site. At the end of each month the contractor must submit the following documents to be attached to the Progress payment certificate: 1. EPWP monthly data collection form 2. Worker monthly payment upload 3. Worker monthly proof of payment i.e 3.1 Acknowledgement of receipt of payment or 3.2 Payslips 3.3 Bank statement highlighted the workers paid 4. Worker monthly training form 5. Monthly attendance register 6. Certified copies of ID's (once off) 7. ID size photos (once off) 8. Proof of UIF 9. Proof of COIDA F:..... V:..... T:.....	Item			
	E12.5 EPWP PROMOTION <u>12.5.1 EPWP signage board</u> EPWP Program at the project level shall always be promoted through have the projects signage board that embrace EPWP logo at the bottom, correct measurement for this signage board will be provided by the project leader during the site handing over meeting. the standard "HELVETIVA MEDUIM " letters are to be used . Professional title to be 10 mm above line . Line thickness to be 8 mm thick . Space between bottom of the line and bottom of the lettering below the line has to be 100 mm. Letter sizes are as follows : Helvetica meduim 100 mm black upper case to be for project name and owner . Helvetica meduim 75mm black upper case only to be used for professional titles.Project name and owner shall be black lettering on white background.board sizes are as follows : Board to be minomum 2000mm from ground level and to be constructed from reinforced formed chromadek panels minimum 0,6mm thick chromadek. The contractor is responsible for ensuring that the project board remains neatly and safely erected for the full duration including maintenance period,after which the project board and post are to be dismantled and handed to the client in good order. F:..... V:..... T:.....	Item			
	<u>12.5.2 Branding of labour apparel</u> Contractor & Sub-contractors' labourers shall be provided with EPWP branded Personal Protective Equipment (PPE), reflector vest with EPWP wording at the back is an ideal and cost effective means of promoting program on site. The contractor is then advised to price for both item 17.5.1 and 17.5.2 F:..... V:..... T:.....	Item			
	E12.6 COMMUNITY LIAISON OFFICER (CLO) <u>UTILISATION OF A COMMUNITY LIAISON OFFICER</u> In addition to the requirements of Clause E9, contained in this document; The Contractor shall allow for and pay any and all costs necessary for the engagement of the services of a Community Liaison Officer (CLO) for the full duration of this contract				
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	In the interest of providing a sound service to both the community and the Contractor, a CLO may only manage one project at a given time. A CLO will be identified by the local structures of the ward areas and appointed following fair and transparent interviewing process, to be conducted in the presence of local structures and the contractor representative, in order to assist the Contractor in the procurement of any local labour, etc. required for this project. The Contractor is to liaise with the CLO and afford him any assistance needed in ensuring sound working relations with the local community. **Key Responsibilities of the CLO are envisaged to include and not necessary be limited to:** 1. Assisting local leadership in conducting skills and resources audit which facilitates sourcing labour from within the ward or targeted areas for employment, as required by contractor. 2. Assisting in sourcing labour-only domestic sub-contractors and the procurement of materials from local resources, as required by the contractor. 3. Assisting the contractor by identifying areas of potential conflict and or threats to the project or to stakeholders in the project and recommend appropriate action to the contractor. 4. Assisting contractor and stakeholders in the project in the resolution of any conflict which may arise. 5. Establishing and ensuring that sufficient and open communication channels between the contractor and the work force are maintained. 6. Establish and ensuring that efficient and open communication channels between the contractor and the community are maintained 7. Identifying and reporting to the Contractor regarding issues where communication between stakeholder is necessary, recommend courses of action and facilitate such communications				
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	8. Assisting the Contractor and the work force in the establishment of grievance procedures and necessary recommenda-tion to the Contractor regarding the grievances and solution thereto. 9. Attending to site meetings and project implementation meetings as required by the Contractor and prepare periodic reports as may be required by the Contractor from time to time. 10. Attending to such other duties which are consistent with the functions of a CLO, as may be required by the Contractor from time to time. Tenderers are to price twice the rate of unskilled local labour rate against this item for any and all costs arising out of compliance with the foregoing and in the event of a Tenderer failing to price against this item or making inadequate financial provision against this item for compliance as aforesaid, then no claim for costs or additional cost incurred will be entertained by the Head: Works F:..... V:..... T:.....	Item			
	E12.7 SKILLS DEVELOPMENT ON SITE Contractor in conforming to the object of EPWP that its beneficiaries need to be capacitated with skills that will render them employable in the future. It is then the responsibility of the Contractor that mandatory life skills are provided to 100% of workforce on site and on the job training to labourers from whom the potential for further development has been identified. The latter is not mandatory to all as it covers technical skills. Contractor should also make provision for the possibility that there might be local youth that will need to be placed on the project with an intention to be provided support towards improving their level of competency and productivity. Contractor shall also provide all necessary on-the-job training to targeted labour to enable such labour to master and advance on techniques required to undertake the work in accordance with requirements of the contract in a manner that does not compromise workers health and safety. F:..... V:..... T:.....	Item			
	E12.8 LABOUR ONLY Sub Contracting for local emerging enterprises Tenderer's are advised that this contract is subject to the Expanded Public Works Programme (EPWP) and the following criteria will apply: <u>African Equity Ownership</u> a) The Tenderer is to allow for 5% of the total value of works to be undertaken by a Priority Population Group. This percentage excludes the costs of employing local unskilled labour. The allocation of this percentage from the Project, the screening of people, the selection of skills, will be for the Contractor to adjudicate. b) The Priority Population Group consists of women, youth and disabled people. c) The Contractor is to give first option for prospective PPG's from the surrounding areas of the Project. Should there be insufficient suitable people fitting the criteria of PPG's, the Contractor may hire people from further afield. This is to be done only after consultation with the Department of Works EPWP Co-ordinator and the Community Liaison Officer (CLO). d) A Mentor is to be employed by the Contractor, in consultation with the Department of Works for the purposes of quality control and liaison between the Contractor and the selected PPG's on site. The mentor will be responsible for ensuring an acceptable level of quality workmanship and that such work carried out by the PPG's is executed within the time frames stipulated. In so far as possible, the Contractor is encouraged to expand the PPG's skills, knowledge and performance levels. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	TENDERER'S TO NOTE CONDITIONS a) The contract to be entered into between the Contractor and the PPG's will be a LABOUR ONLY sub-contract. b) The Contractor will be responsible for ensuring that all materials for use by the PPG's in the works are to be on site timeously. The Contractor shall liaise with The Mentor and PPG to determine the nature and extent of materials required and the lead time necessary. c) The Contractor shall be responsible for the overall programming of the Works and he is to allow for monitoring the PPG's programme and progress. d) In conjunction with the Mentor, he is to allow for the supervision and mentoring (where necessary) of the PPG to ensure quality and adherence to standard building practice e) The Contractor is to allow for extra storage facilities on site for the PPG's tools and equipment. f) Basic tools shall be provided by the PPG's and where these are not available; the Contractor will supply him with the necessary tools and equipment and deduct the costs thereof from the interim claims made by the PPG. g) Work requiring specialized tools will be provided free of chargeby the Contractor with the provision that these be returned upon completion of the Work. CO-ORDINATION The Contractor is to co-ordinate the work of all the PPG's, Sub-Contractors and Nominated Sub- Contractors appointed direct by the Employer in such a manner and at all times as will suit the building programme and he is to allow adequate access, for the PPG's, where required, to carry out their work in an efficient manner as no claims for extras in this connection will be entertained. F:..... V:..... T:.....	Item			
	ATTENDANCE The Contractor may allow for attendance upon the PPG's concerned to execute the work. The Contractor is to allow the PPG's the use of any scaffolding belonging to him while it remains so erected on the site. Where scaffolding is necessary for the use by any PPG and the Contractor has not erected any for his own use or has removed same after his own use, the Contractor shall supply sufficient scaffolding to the PPG to be erected and dismantled by the PPG and returned to the Contractor. This attendance upon PPG's to execute the work is to include for the scaffolding provisions as aforesaid and, in addition, is to include for co-operating to the fullest extent with all the parties, attending on off-loading materials, providing suitable storage for tools and materials used by the PPG's, use of general facilities such as latrines, etc., supply and cost of power, lighting, water and the like. F:..... V:..... T:.....	Item			
	E12.9 EPWP CONTRACT FOR LABOUR It is compulsory that shortly after the contractor and or sub contractor has appointed local labour, the employment contract should be signed by both parties, prior to commencement with works on site. The employment contract forms part of the Ministerial Determination or from the regional EPWP officials. Each contract will lapse at the end of each financial year therefore requiring the Contractor to do a renewal of each contract should the need of employment still exist for that particular labourer. F:..... V:..... T:.....				
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	E12.10 EPWP SCOPE of WORK **Note:** Contractors are to price any item on the Bill of Quantities having below, bearing in mind that they are regarded as main sources of job creation, whether sub contracted or undertaken by the main contractor. Elements on the scope of work where application of Labour Intensive Construction methods as will indicated with letters (LI) are regarded feasible are as follows; i) Excavating trenches for foundations and any other civil works with the depth not more than 1.5 m ii) All masonry works which include concrete mixing on site; brickwork; plastering; screed works; jointing; etc. iii) Painting, Plumbing, Ironmongery; roof cladding; glazing; tilling; carpentry; flooring; waterproofing; etc. F:..... V:..... T:.....	Item			
	Note: It is a general requirement of this contract that persons normally resident in the ward of the works (local labour) be given preference for employment on the contract. Provided, however, that should adequate and appropriate labour not be available within the ward, others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ local labour (Local Sub-contractor(s); Skilled; Semi-Skilled and Unskilled). The contractor shall in consultation with the local community leaders with the purpose of negotiating with them regarding the utilization of local resources in the construction process. In this regard, the contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth as well as families declared as most indigent by War on Poverty/ Sukuma Sakhe program profiling process. The contractor should aim, in general, to maximise the involvement of the local community, however workers from other communities should not exceed 20% of all persons working on the project, where local employees possess skills at level of competency that meet contractors requirements. <u>Payment for the labour-intensive component of the works</u> Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the Scope of Work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict. <u>Linkage of payment for labour-intensive component of works to submission of project data</u> The Contractor's payment invoices shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframe stipulated by the Employer. The contractor's invoices shall not be paid until all pending labour information has been submitted. <u>Applicable labour laws</u> The current Ministerial Determination (also downloadable at <u>www.epwp.gov.za</u>) Expanded Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice , shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled or semi-skilled workers. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E13	**HIV/AIDS AWARENESS** Tenderers are to price against the following items for compliance with the SPECIFICATION FOR HIV/AIDS AWARENESS bound into this document (The clauses referred to are those of the Specification for HIV/AIDS)				
E13.1	Provide and maintain a condom dispenser in terms of Clause 5.1a) F:..... V:..... T:.....	Item			
E13.2	Provide and maintain HIV/AIDS awareness posters terms of Clause 5.1b) F:..... V:..... T:.....	Item			
E13.3	HIV /Aids Awareness Programme on Site for not less than 90% of workers inclusive of all direct and indirect costs; Engage a qualified service provider as described in the scope of works to conduct an HIV Awareness Programme in terms of Clause 5.2.1a) F:..... V:..... T:.....	Item			
E13.4	Arrange for workers to attend the HIV Awareness Programme in terms of Clause 5.2.1b) F:..... V:..... T:.....	Item			
E13.5	**Reporting** Prepare and attach to claims for payment a brief report in terms of Clause 5.3 (see also HIV/STI Compliance Report included with this document). F:..... V:..... T:..... ***Note: In the event that the contractor fails to satisfy the requirements of this specification, the employer (Head: Public Works) may apply any of the sanctions provided for in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum per calendar day of which the required reports has not been submitted.***	Item			
E14	**OCCUPATIONAL HEALTH AND SAFETY ACT NO. 85 OF 1993** Tenderers are to allow for costs in providing a project specific ' Construction Phase Safety, Health and Environmental Plan' in accordance with "Section 2 - Specification Data associated with SANS 1921-1:2004" clause C4.18 in "Part C3 - Scope of Work" F:..... V:..... T:.....	Item			
E15	**NOTICE BOARD, SITE OFFICE, ETC.** Tenderers are to allow for the provision and removal of a project notice board and a site office in accordance with the Principal Agent's requirements. F:..... V:..... T:.....	Item			
E16	**IMPORTED MATERIALS AND EQUIPMENT** Where imported items are listed in the tender documents, the tenderer shall provide all information called for, failing which the price of any such item, material or equipment shall be excluded from currency fluctuations. (***Refer to T2.14 - Schedule of Imported Materials and Equipment***. F:..... V:..... T:.....	Item			
E17	**CONTRACT DOCUMENTS** The drawings issues with these Tender documents do not comprise the complete set but serves as a guide only for tendering purposes and for indicating the scope of works to enable the Tenderer to acquaint him with the nature and extent of the works and the manner in which they are to be executed. Should any part of the drawings not be clearly legible to the Tenderer he shall, before submitting his Tender, obtain clarification in writing from the principal agent. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E18	**GENERAL PREAMBLES** The Document Preambles will be the "ASAQS Model Preambles for Trades – 2008" and is obtainable from the various Regional Office's of the Department of Public Works and shall be read in conjunction with the Bills of Quantities and be referred to for the full descriptions of work to be done and materials to be used. F:..... V:..... T:.....	Item			
E19	**TRADE NAMES** Wherever a Trade Name for any product has been described in the Bills of Quantities the Tenderer's attention is drawn to the fact that any other product of equal quality may be used subject to the written approval of the Principal Agent being obtained prior to the closing date for submission of Tenders. F:..... V:..... T:.....	Item			
E20	**EXISTING PREMISES OCCUPIED** Refer to Scope of Works Part C3 of this Tender Document for information on the occupation of existing buildings. F:..... V:..... T:.....	Item			
E21	**INACCURATE AND DEFECTIVE WORK EXECUTED UNDER PREVIOUS CONTRACT** The contractor shall, after taking possession of the site and before commencing the work, check all levels, liners, profiles and the like and satisfy himself as to the dimensional accuracy of all work executed under the previous contract which may affect his work. Should any inaccurate or defective work be found, the contractor shall immediately notify the principal agent in writing requesting his instructions with regard thereto and afford every facility to those rectifying such inaccurate or defective work. F:..... V:..... T:.....	Item			
E22	**VIEWING THE SITE IN SECURITY AREAS** If the site is situated in a security area and the Tenderder must arrange with the Authorities to obtain permission to enter the site for Tenderding purposes. F:..... V:..... T:.....	Item			
E23	**COMMENCEMENT OF WORKS IN SECURITY AREAS** If the works falls within a security area, the contractor must arrange with the Authorities and give the necessary notices before commencement of the works. Should the contractor fail to make such arrangements, admission to the site may be refused and any additional costs will be for the contractor's account. F:..... V:..... T:.....	Item			
E24	**ENTRANCE PERMITS TO SECURITY AREAS** If the works fall within a security area, the contractor shall obtain entrance permits for his personnel and workmen entering the area and shall comply with all regulations and instructions which may be issued from time to time regarding the protection of persons and property under control of the Authority. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E25	**SECURITY CHECK OF PERSONNEL** The principal agent may require the contractor to have his personnel and workmen, or a certain number of them, security classified. In the event of the principal agent requesting the removal of a person or persons from the works for security reasons, the contractor shall do so forthwith and shall thereafter ensure that such person or persons are denied access to the works and the site and/or to any document or information relating to the works. F:..... V:..... T:.....	Item			
E26	**PROHIBITION ON TAKING PHOTOGRAPHS** In terms of article 119 of the Defence Act, 44 of 1957, it is prohibited to sketch or to take photographs of any military site or installation or any building or civil works thereon or to be in possession of a camera or other apparatus used for taking photographs, except when authorised thereto by or on behalf of the Minister. The same prohibition is also applicable to all Correctional Institutions in terms of article 44.1(e) of the Correctional Services Act 8 of 1959. F:..... V:..... T:.....	Item			
E27	Management of Water Water for Construction purposes must be obtained from alternative water sources (i.e. supply other than water that is produced and distributed by a regulated water service authority from a licenced water treatment works for human consumption), eg dams, rivers, boreholes, springs, rainwater harvesting, recycled sewerage water,etc. The alternative water source shall not be of an inferior quality / standard than that required for construction purposes. The client reserves the rigfht through his agents to test such supplies or request certificates confirming the grade and nature of the water supply. Relevant knowledge of the respective area will be an advantage.				
	Carried forward to collection			R	

SECTION 1

SUMMARY – PRELIMINARY & GENERAL

Collection	Page No.	Amount
	1	R
	2	R
	3	R
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	7	R
	8	R
	9	R
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	11	R
	12	R
	13	R
	14	R
	15	R
	16	R
	17	R
Carried forward to Final Summary		R

Section No. 1
Preliminary & General
Summary

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

PART C2.3 BILL OF QUANTITIES

Item No		Quantity	Rate	Amount

SECTION NO. 2:

BUILDING WORKS

BILL NO. 1

ALTERATIONS (PROVISIONAL) (WORK GROUP 102)

The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.

Trade Names and Proprietary Products:
All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase 'or other approved'.

Note: Unless otherwise described the preambles and full descriptions of all items appearing in all the subsequent bills are to apply equally to this bill.

ALTERATIONS

Tenderers are advised to visit the site prior to tendering and satisfy themselves as to the nature and extent of the work to be done, also to examine the condition of all existing buildings, boundary walls, site conditions, etc., as no claim will be entertained on the grounds of ignorance of the conditions under which the work was to be executed.

Old materials from alterations except where described to be re-used or handed over, as well as rubbish, etc. must be regularly carted from the site and not be allowed to accumulate on or around the site and pricing thereof must be included in the Contractor's rates as no extras in this regard will be entertained. Items described as "removed" shall mean removed from the site.

None of the old materials are to be used for new work

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except where specifically described as being set aside for re-use.

Where certain materials or articles from alterations are described as to be handed over by the Contractor to the Principal Agent, such material or articles shall be properly stored by the Contractor until handing over thereof. The Contractor shall obtain an official receipt listing the materials or articles and dates of handing over. If the Contractor fails to submit the receipt when requested to do so it shall be deemed that the materials or articles are still in his possession and he will be held liable to the Client for the full replacement value thereof which amount will be deducted from any monies due to the Contractor.

The Contractor is to take dimensions affecting the existing buildings, boundary walls, precast concrete paving, etc., on the site as he will be solely responsible for all new work being to the correct sizes.

The Principal Agent is to be notified immediately of any discrepancies between the drawings and the existing work and all work affected by these discrepancies is to be suspended until such time as the Principal Agent shall authorise its continuance.

Before commencing the alterations the Contractor shall comply with any regulations in force in respect of rodent extermination and he shall obtain the requisite Rodent Extermination Clearance Certificate and pay any fees in connection therewith.

In addition, before commencing any work related to this alteration trade and any sub-sequent trades in these bills of quantities, the Contractor shall comply with any regulations in force in respect of the Occupational Health & Safety Act of 1983 and will ensure that all rates including the Preliminaries and General items cover him in this regard as no extras or claims will be entertained on the grounds of ignorance of the conditions under which the work for this Contract is to be executed in regards to the latest Construction Regulations and Occupational Health & Safety Act.

Tenderers are advised that the adjoining buildings will be in occupation during the time that the works are in progress and due allowance must be made for the work being carried out at such times and in such a manner as will least interfere with the general routine of the occupants.

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BUILDING WORKS
Bill No. 1
ALTERATIONS (PROVISIONAL)

All existing floors, doors, windows, fittings, boundary fence, electrical and mechanical plant, etc., must be adequately protected from damage during the progress of the works and any damage resulting from the building work must be made good by the Contractor at his own expense.

The Contractor will be held solely responsible for any injury to persons, damage to property and for the safety of the structures throughout the duration of the Contract and must make good at his own expense any damage that may occur.

Any existing works damaged or disturbed through alterations, etc. shall be made good with all necessary new materials to match existing and left complete and perfect in every respect to the satisfaction of the Principal Agent and the Contractor will bear all costs.

Any temporary tarpaulins, dust and weatherproof screens and barriers that may be necessary for the protection of the Works must be supplied, erected and maintained during the progress of the Works, all to the satisfaction of the Principal Agent and be removed on completion.

All shoring, needling, or strutting required to ensure the stability of the premises, must be supplied, erected and maintained during the progress of the Works and removed on completion, or when directed. The shores, needles or struts must be constructed from suitable and substantial timber and any other suitable materials necessary and must be to the satisfaction of the Principal Agent.

Wherever and whenever necessary, or at the direction of the Principal Agent, the works must be well watered with a jet or spray from a hose sufficient to prevent any nuisance from dust.

The Contractor must not remove or interfere with any furniture, furnishings, fittings, or similar moveable articles belonging to the Client and must give adequate notice to the Principal Agent if the removal of any such articles from parts of the building to be altered are necessary, so that they may have same removed before the Contractor commences work.

The Contractor must conform to the instructions of the Principal Agent in carrying out any portion of the work,

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Section No. 2
BUILDING WORKS
Bill No. 1
ALTERATIONS (PROVISIONAL)

	which in his opinion requires expediting, and the Contractor must give priority to such work as and when directed.			
	Prices			
	Prices are to include for carting away from site all materials not specifically mentioned as being stored on site for re-use or handed over to the Principal Agent and all rubbish, debris, etc., arising from the demolitions, alterations, etc., and for making good all work damaged or disturbed to the approval of the Principal Agent.			
	Prices are in addition to the above to include for the temporary removal and on completion setting back in position of all loose furniture, fittings, etc., all to the approval of the Principal Agent and no extras in this regard will be entertained.			
	ALTERATIONS			
1	Allow for watering the works by spraying to prevent any nuisance from dust, etc., and supply, erect and remove at completion all temporary dust screens, etc. , required		Item	
2	Allow for protecting all existing work liable to suffer damage (i.e. walls, finishes, floors, windows, etc.) during the building operations, alterations, etc., and make good all work damaged with new materials to match existing to the approval of the Principal Agent		Item	
	NOTE: The Contractor is advised that he will be held responsible for all damage, howsoever caused to wall, floor and ceiling finishes, fittings, electrical and mechanical plant, etc., inside the existing buildings where the existing roof coverings have been removed for alterations, etc., and he must make good all damage at his own expense to the approval of the Principal Agent.			
	REMOVAL OF EXISTING WORK			
	Taking out and removing doors and frames (new door and frame elsewhere measured):			
3	Steel single louvre door and frame not exceeding 2,5m2 (LI)	No	2	
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Section No. 2
BUILDING WORKS
Bill No. 1
ALTERATIONS (PROVISIONAL)

4	Steel double louvre door and frame exceeding 2,5m2 and not exceeding 5m2 (LI)	No	1	
5	Steel louvre window exceeding 2,5m²	No	1	
	Hacking up and removing existing Derbigum waterproofing membrane from:			
6	Remove 19mm concrete stones and hack up waterproofing and screed under and prepare concrete slab for new screed (elsewhere measured) (LI)	m2	290	
	PREPARATORY WORK TO EXISTING SURFACES			
	Making good concrete work:			
7	Chase out concrete cracks to expose steel reinforcement and fill with 1:4 cement mortar, including floating up smooth to match existing. (LI)	m	250	
	Making good internal cement plaster:			
8	Chase out plaster cracks to form recess 25mm wide and 20mm deep, and fill with 1:4 cement mortar, including floating up smooth to match existing. (LI)	m	60	
	Preparation to existing horizontal surfaces:			
9	Make good defects in existing floor screed including preparing existing screed by removing all spoiled material and scrubbing floors to remove all trace of foreign matter.	m2	12	
	Preparation to existing vertical surfaces by washing thoroughly with a solution of sugar soap, removing old paint where necessary and bringing to original clean state:			
10	Clean existing face brick walls using a water pressure cleaning system and steel brushes and remove all dirt and loose particles. (LI)	m2	38	
11	Clean existing internal wall and floor surfaces of reservoir using a water pressure cleaning system and steel brushes and remove all dirt and loose particles. (LI)	m2	530	
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Section No. 2
BUILDING WORKS
Bill No. 1
ALTERATIONS (PROVISIONAL)

12	Clean existing external wall surfaces of reservoir using a water pressure cleaning system and steel brushes and remove all dirt and loose particles, prepare surface and apply bagwash. (LI)	m2	120	
	REMOVAL OF EXISTING WATER PIPES, ETC.			
	Take out and remove fire hose reel including pipework and making good wall and floor finishes and stop off services			
13	Wall mounted rotary fire hose reel and cabinet (LI)	No	105	
	Take out and remove fire hydrant and pedestal including pipework, fill and ram and stop off services			
14	Above ground fire hydrant (LI)	No	14	
	Take out and remove steel reservoir or manhole cover			
15	1500 x 1000mm Steel cover	No	2	
	Sundries			
16	Take out and remove air vent to concrete reservoir, prepare surfaces and install new approved stainless steel air vent to the Engineer's approval	No	8	
	CUTTING THROUGH FLOORS AND CEILINGS, ETC.			
17	Cutting through 150mm thick concrete surface bed for trenching for piping not exceeding 150mm wide, including making good concrete, screed and vinyl sheeting.	m	62	
18	Cutting through Gypsum plasterboard or fibre cement ceiling and brandering for pipework including making good ceiling	m	51	
19	Opening through existing one brick for pipe not exceeding 150mm, including making good finishes both sides	No	42	
20	Opening not exceeding 150mm diameter through roof sheeting and make good	No	50	
	Carried to Collection			R

	MAKING GOOD OF FINISHES,ETC.			
	Making good brick wall, etc:			
21	Make good brick wall where pipe, not exceeding 150mm diameter, removed, including matching face brickwork or plasterwork and paint .	No	40	
	Making good "Rhino" gypsum plasterboard ceilings and brandering:			
22	Ceilings in small areas	m2	114	
23	Refixing coved cornice	m	106	
	Making good vinyl sheet floor covering:			
24	Vinyl flooring in small areas	m2	107	
	Making good internal cement plaster :			
25	To brick walls in small areas	m2	20	
	Making good 150 x150mm white glazed ceramic wall tiles:			
26	Walls in small areas.	m2	38	
27	Budgetary allowance of R50,000.00 (Fifty Thousand Rand) for rectifying defect work from previous contract			SUM
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Section No. 2

BUILDING WORKS

Bill No. 1

ALTERATIONS (PROVISIONAL)

COLLECTION

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Section No. 2
BUILDING WORKS
Bill No. 1
ALTERATIONS (PROVISIONAL)

Item No			Quantity	Rate	Amount
	SECTION NO. 2:				
	BILL NO. 2				
	WATERPROOFING (WORK GROUP 120)				
	The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.				
	Trade Names and Proprietary Products: All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase 'or other approved'.				
	Note: Unless otherwise described the preambles and full descriptions of all items appearing in all the subsequent bills are to apply equally to this bill.				
	CONCRETE FLAT ROOFS				
	The following waterproofing to roofs shall be "Sikalastic 8800" Liquid applied pure polyurea membrane or Other Approved. All work is to be executed by a specialist approved by the manufacturer and in accordance with the manufacturer's specifications and SANS 10400 Part L subsection LL5.1 and LL5.2. Waterproofing to be SABS approved and must have a ten-year maintenance guarantee.				
1	Clean down and prepare screeded surfaces, repairs screeds ensuring that there are no cracks, depressions, or protrusions and check that the screed has a consistent fall towards the full-bore outlets, fall should not be less than 1:80.				
	Prime with one coat Sikafloor -161, one scraper coat Sikafloor 161 and 2mm Sikalastic 8800 at 2mm thick.	m2	302		
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Section No. 2
BUILDING WORKS
Bill No. 2
WATERPROOFING

Item No			Quantity	Rate	Amount
	SECTION NO. 2:				
	BILL NO. 3				
	IRONMONGERY (WORK GROUP 132)				
	The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.				
	SIGNS				
	The following signs are to be to detail, formed of 3mm clear perspex with white background, reverse engraved on the reverse side with red or black numerals and letters, each sign is to be twice countersunk holed for and tap screwed to pressed steel door frame with two chromium plated semi-raised head countersunk screws. All pictograms are to be four times holed and screwed as before described - all to the approval of the Principal Agent.				
	3mm Thick white perspex signs reverse engraved with 30mm high 'Helvetica Medium' letters or numerals:				
1	70mm High sign denoting "PLANTROOM 1"	No	2		
2	70mm High sign denoting "PLANTROOM 2"	No	2		
	150 x 150mm Anodised silver aluminium plate with symbols according to international colour codes, plugged:				
3	Fire Extinguisher symbol	No	2		
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Section No. 2
BUILDING WORKS
Bill No. 3
IRONMONGERY

Item No			Quantity	Rate	Amount
	SECTION NO. 2:				
	BILL NO. 4				
	METALWORK (WORK GROUP 136)				
	The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.				
	Steel Expanding Bolts				
	Where steel expanding bolts are specified these are to be to the approval of the Principal Agent and are to be fixed in accordance with the manufacturers instructions and prices are to include for drilling mortices for sockets in brickwork or concrete.				
	STEEL LOUVRE DOORS AND WINDOWS				
	Mild steel louvre doors				
1	914 x 2134mm High mild steel single louvre door type BV with full high ventilation panel comprising of 2.5mm louvre strips and vermin proof backing with 1.2mm solid steel slats, cabin hooks, earth straps, shooting bolt housing and night latch including perimeter framing plugged and screwed to reveal at maximum 300mm centres to concrete or brickwork using concealed rivets. (Refer to Architect's drawing no. 3372/B/201)	No	1		
2	914 x 2438mm High mild steel single louvre door type HVA with full high ventilation panel comprising of 2.5mm louvre strips and vermin proof backing with 1.2mm solid steel slats, cabin hooks, earth straps, shooting bolt housing and night latch including perimeter framing plugged and screwed to reveal at maximum 300mm centres to concrete or brickwork using concealed rivets. (Refer to Architect's drawing no. 3372/B/200)	No	1		
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3	1829 x 2050mm High mild steel double louvre door with two equal leaves with full high ventilation panel size 480 x 1620mm high in each leaf comprising of 2.5mm louvre strips and vermin proof backing with 1.2mm solid steel slats, cabin hooks, earth straps, shooting bolt housing and night latch with and including perimeter framing plugged and screwed to reveal at maximum 300mm centres to concrete or brickwork using concealed rivets. (Refer to Architect's drawing no. 3372/B/200)	No	1	
	Mild steel louvre windows			
4	1800 x 1900mm High purpose-made galvanised mild steel louvre window, comprising of "Z" profile louvre blades and vermin proof backing fitted full length and width built into 100mm wide framing built into concrete or brickwork. (Refer to Architect's drawing no. 3372/B/200)	No	2	
	GALVANISED STEEL GANTRY			
	Mild steel crawl beam			
5	200 IPE crawl beam built into brickwork on both ends	m	8	
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Section No. 2
BUILDING WORKS
Bill No. 4
METALWORK

Section No. 2

BUILDING WORKS

Bill No. 4

METALWORK

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Section No. 2
BUILDING WORKS
Bill No. 4
METALWORK

Item No			Quantity	Rate	Amount
	SECTION NO. 2:				
	BILL NO. 5				
	PLASTERING (WORK GROUP 142)				
	The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.				
	PAVINGS				
	Cement (1:3) steel trowelled to a smooth even surface on concrete:				
1	Skirting 100mm high	m	14		
2	50mm (Average) screed on flat roofs, dressed to falls and currents for mastic sheet roof coverings	m2	290		
3	Extra over last for turn-up against existing brick or concrete	m	61		
	PLASTERING				
	Internal Plaster				
	Render one coat plaster composed of four parts sand to one part cement steel trowelled to a smooth even surface on concrete or brickwork:				
4	On walls	m2	2		
5	On narrow widths	m2	1		
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Item No		Quantity	Rate	Amount

SECTION NO. 2:

BILL NO. 6

PLUMBING (PROVISIONAL) (WORK GROUP 148)

The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.

Note:

All notes and supplementary preambles in the various trades shall apply equally to this trade insofar as they are relevant.

SUPPLEMENTARY PREAMBLES

Fixing of pipes:

Unless specifically otherwise stated, descriptions of pipes shall be deemed to include for fixing to walls, etc., casting in, building in or suspending not exceeding 1m below suspension level.

Unless specifically otherwise stated, descriptions of pipes shall further deemed to include for chasing into new walls, etc.

Wire gratings:

Descriptions of gutter outlets, etc., shall be deemed to include wire balloon gratings.

FIRE APPLIANCES ETC.

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	Fire extinguishers:				
1	Portable 4,5kg dry chemical powder all-purpose hand fire extinguisher complying with SABS 1151 including charging and complete with wall mounting bracket and fixing to hardwood backboard (elsewhere measured)	No	2		
2	19 x 225mm Wrot all red meranti chamfered and oil polished backboard 750mm long four times plugged and countersunk screwed to plastered wall	No	2		
	TESTING				
	Testing:				
3	Allow for testing the whole of the sanitary plumbing, water supplies and fire services to the satisfaction of the Principal Agent and Local Authorities. All defective work is to be taken out and replaced at the Contractor's expense and the whole re-tested until found perfect		Item		
	Carried to Collection			R	

Section No. 2
BUILDING WORKS
Bill No. 6
PLUMBING (PROVISIONAL)

Section No. 2

BUILDING WORKS

Bill No. 6

PLUMBING (PROVISIONAL)

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Item No			Quantity	Rate	Amount
	SECTION NO. 2:				
	BILL NO. 7				
	PAINTWORK (WORK GROUP 152)				
	The Tenderer is referred to the relevant Clauses in the Standard Preambles to all Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.				
	Note: A colour scheme comprising colours and the blending of colours approved by the Principal Agent shall be used for the paintwork and the Contractor must allow for this in his pricing. Colour samples of the finishing coats shall be provided in all cases. Under no circumstance will there be an adjustment of rates for any colour whatsoever specified.				
	PAINTWORK TO NEW WORK				
	PAINT ON WALLS, CEILINGS, ETC				
	Prices are to include for all necessary preparation, stopping, filling and priming of surfaces in order to achieve a high quality finish with materials recommended by the manufacturers of the finishes as being suitable for use with their products. Prices are to include for all cutting in and masking required.				
	The Contractor will be required to provide sample panels of the various types of finishes for the approval of the Principal Agent and all finished work must be equal to the approved samples.				
	Prepare and apply one coat plaster primer, one universal coat and two finishing coats enamel paint on:				
1	Cement plastered walls	m2	37		
	Carried to Collection			R	

	Prepare and apply one coat approved primer and two finishing coats non-slip polyurethane enamel paint on:			
2	Screeded floors	m2	12	
	PAINT ON METAL			
	Prepare and apply one coat "Dulux" steel primer, one "Dulux Trade Universal" undercoat and two finishing coats "Dulux Pearl Glo" eggshell enamel paint on:			
3	Louvred steel windows	m2	14	
4	Louvred steel door and frame	m2	16	
	REDECORATION OF PREVIOUSLY PAINTED WORK			
	Prices for redecoration, etc., of all surfaces previously painted are to include for washing down with sugar soap in hot water, rinsing with clean water, removing existing polish or sealer where this occurs, and for rubbing down with sandpaper to remove all loose or flaking paint, varnish, etc., stopping and bringing forward all bare patches before application of finish specified.			
	All proprietary cleaning agents, sealers, paint finishes, etc., specified are to be mixed and applied strictly in accordance with the manufacturer's instructions.			
	Prices for redecoration of plastered surfaces are to include, in addition, for making good all damaged arises and minor cracks in plaster.			
	Prices for redecoration of all external plastered surfaces are to include, in addition, for the application of an approved fillercoat and to ensure area is clean, dust free with a moisture content of less than 15%.			
	Prices for redecoration of all steel components are to include, in addition, for removing all rust and paint, application of an approved rust remover to rusted areas, applying an approved rust converter and cleaning down before applying finishing coats.			
	Carried to Collection			R

Section No. 2
BUILDING WORKS
Bill No. 7
PAINTWORK

PAINT ON WALLS, CEILINGS, ETC

Flexible waterproofing slurry

Prepare internal surfaces of water tank with "Duraflex" approved repair mortar. Chase out cracks wider than 0.3mm to 4 x 15mm deep and fill with "Duraflex" filler and apply two component, polymer modified, cementitious coating applied in accordance with the manufacturers recommendation:

5	Concrete surfaces	m2	240	
6	Tank floor	m2	290	

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Section No. 2
BUILDING WORKS
Bill No. 7
PAINTWORK

Section No. 2

BUILDING WORKS

Bill No. 7

PAINTWORK

COLLECTION

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Section No. 2
BUILDING WORKS
Bill No. 7
PAINTWORK

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Section No. 2
BUILDING WORKS

Item No		Quantity	Rate	Amount

SECTION NO. 3:

ELECTRICAL INSTALLATION (PROVISIONAL)

BILL NO. 1

The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.

Trade Names and Proprietary Products:
All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase 'or other approved'.

Note: Unless otherwise described the preambles and full descriptions of all items appearing in all the subsequent bills are to apply equally to this bill.

The Tenderer must take note of the Engineers Project Implementation Plan. All work is to be completed in phases as set out in the Project Implementation Plan and the Tenderer is hereby notified to that the works must be programmed and priced according to the implementation plan as outlined for all the stages of works.

Each stage of work must be completed before the next stage of work can commence, unless otherwise priorly approved by the engineer.

The completion of a stage of works, does not constitute sectional completion, but provide the guidance for the particular programming of works.

ALTERATIONS (WORK GROUP 102)

IDENTIFICATION AND TAGGING OF CIRCUITS AND CABLES

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	Power Circuits and cables:			
1	Switch off and isolate DB both NORMAL and ESSENTIAL sections. With DB cover plates removed, identify and mark/ tag all affected cables and circuits from the relevant DB N/ESS and trunking. Place back DB cover plates and switch back on	No	14	
2	Switch off and isolate the ESSENTIAL supply from the main ESSENTIAL panel in the plantroom. Switch off and isolate NORMAL power to the DB from the old MINI-SUB 10. Remove DB cover plates, identify and mark/tag all affected cables and circuits connecting to Main DB-1 N/ESS. Place back DB cover plates and switch back on the NORMAL supply from old MINI-SUB 10 and ESSENTIAL supply from the plantroom	No	1	
3	Switch off and isolate the ESSENTIAL supply from the main ESSENTIAL panel in the plantroom. Switch off and isolate NORMAL power to the DB from the old Mini-sub 10. With DB cover plates removed, identify and mark/ tag all affected cables and circuits connecting to Main DB-1 N/ESS and trunking. Place back DB cover plates and switch back on	No	1	
	Telephone and Data circuits and cables. All work to be preformed by SITA registered contractor only:			
4	Identify and mark / tag all affected Telephone and Data cables and circuits from the relevant trunking	No	14	
	RE-ROUTING OF CIRCUITS AND CABLES			
	Power Circuits and cables:			
5	Switch off and isolate DB both Normal and Essential sections. Disconnect all of the affected cables and circuits. Pull them out of the trunking up to the point of re-routing. Re-connect all those cables and circuits to the DB via temporary support (elsewhere measured) underneath water pipe. Install cable and wire joints and extensions of up to 2m in length and for cable sizes up to 50mm2 where applicable and switch back on.	No	14	
6	Tidy up and affix existing cable to existing cable tray	m	10	
	Carried to Collection			R

	Telephone and Data circuits and cables. All work to be preformed by SITA registered contractor only:			
7	Disconnect all affected telephone and date cables and circuits. Pull them out of the trunking up to the point of re-routing. Connect back all those cables via temporary support (measured elsewhere) underneath water pipe. Install cable and wire joints and extensions where applicable. All as per Engineers specifications	No	14	
8	Lay back into the new trunking the re-routed **TELEPHONE and Data cables** and circuits by SITA Registered contractor only.	No	14	
	TEMPORARY SUPPORT			
9	Supply and installation, as well as the removal of the temporary support for the **power wiring and cables** underneath the water pipe at each of the re-routed trunking.	No	14	
10	Supply and installation, as well as the removal of the temporary support for the **telephone and data wiring and cables** underneath the water pipe at each of the re-routed trunking.	No	14	
	REMOVAL OF REDUNDANT MATERIAL			
	Taking out and removing existing local distribution board, including switchgear. The rate shall include the safe isolation, disconnection the normal and essential cables supplies and the removal of the old DB off site.			
11	Existing Surface mounted Distribution board (**DB-1/N, DB-1/ESS) (LI)**	No	2	
	Removal of redundant Mini-substation			
12	Safe isolation and disconnection of the redundant 100kVA miniature substation and removal off site including clearing and backfilling of sub-base with soil stockpiled on site. The rate must include all specialised equipment, including cranes, forklifts, trucks, etc, as required the perform the task.		Item	
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Section No. 3
ELECTRICAL INSTALLATION & LIGHTNING PROTECTI
Bill No. 1
ELECTRICAL INSTALLATION, ETC (PROVISIONAL)

	Switching off, isolating and removal of redundant control panel			
13	Existing redundant pump control panel from the new Main DB-1/ESS		Item	
14	Take out and remove redundant pumps and control panel	No	1	
	Existing Concrete water tower			
15	Allow for the safe isolation and disconnection demolition and removal off site of electrical installation at the existing concrete water tank including working at heights.		Item	
	Cutting through concrete or paving			
16	Allow to cut through 150mm thick concrete aprons or paving(LI)	m2	20	
17	Repair or reinstate 150mm thick concrete aprons or paving including compaction, weedkiller, ref 193 mesh, formwork, wood float, etc.(LI)	m2	30	
18	Budgetary allowance of R35,000.00 (Thirty Five Thousand Rand) for rectifying electrical defect work from previous contract			SUM
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EARTHWORKS (WORK GROUP 104)

The Contractor is advised that the term 'earth' includes natural ground and 'made-up' ground and he must allow in his prices for excavations for trenches, bases, etc., for excavation in natural ground and 'made-up' ground and for backfilling trenches, bases, etc., to reduced or natural ground level with the same material removed from below the reduced or natural ground level and backfilling over with the imported material used in filling under floors. No material from below the reduced or natural ground level is to be used in filling above the reduced or natural ground level and no imported material is to be used in filling below the reduced or natural ground level.

Working Space

The Contractor is to allow against the item of 'excavate to provide working space' for excavating beyond the extent of the nett excavations measured to provide the necessary working space for the carrying out of such work as described in the items. Rates are to include, in addition to the extra excavation, for any additional risk of collapse so incurred and for filling back and compacting the excavated material.

No separate item for working space is provided or will be considered where the face of the measured excavation is 750mm or more away from the finished face of the concrete structure.

In the case of column base excavations, where the dimension between the column face and the excavation face is less than 500mm, working space has been measured for the width of the column base from the commencing level of excavations to the top of the column base only where the top of the base exceeds 1,5m below the commencing level of excavations.

Disposal of excavated material

Prices for all excavations are to include for depositing excess material on site where directed and roughly spreading and levelling.

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	Excavation in earth not exceeding 2m deep for:			
19	Trenches and holes (LI)	m3	83	
	Extra over trench and hole excavations in earth for excavation in:			
20	Soft rock (LI)	m3	18	
21	Hard rock (LI)	m3	9	
	Extra only over all excavations for loading and carting away:			
22	Surplus spoil away from site (LI)	m3	23	
	Keeping excavations free of water:			
23	Allow for keeping all excavations free of water		Item	
	Risk of collapse of excavations:			
24	Vertical sides of excavation for trenches, etc., from ground level to not exceeding 1,5m deep	m2	210	
	Selected earth filling from the excavations deposited in layers not exceeding 150mm thick after compaction and compacted to a density of 95% Modified AASHTO maximum density:			
25	Backfilling to trenches, holes, etc (LI)	m3	51	
	Selected coarse river sand filling material supplied and carted onto the site by the Contractor:			
26	Clean river sand bedding into trench and filing around cables (LI)	m3	15	

LOW TENSION DISTRIBUTION (PROVISIONAL) (WORK GROUP 160)

The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.

Carried to Collection R

	Electrical Infrastructure Sleeves			
	Supply and Install PVC sleeves with and including 1,5mm2 galvanised draw wire as specified complete with all accessories, consumables, hospital saddles and mounting accessories and couplers.			
27	50mm Diameter PVC	m	15	
28	75mm Diameter PVC	m	1	
29	110mm Diameter PVC	m	76	
	CABLES JOINTS			
	Provisionally allow for the supply and installation of insulated CABLE joints, complete with terminations and equipment and accessories			
30	Cable joints up to 50mm2	No	14	
	CABLE LADDERS			
	Supply and install galvanised steel Cable Ladder complete with splicing, jointing and accessories for suspended type mounting			
31	450mm wide to Cabstrut or other approved.	m	25	
32	200mm wide to Cabstrut or other approved.	m	6	
33	41 x 20mm, 2.5mm thick to CABSTRUT P2000 or other approved, complete with hanger system for up to 400mm long suspension rods.	m	46	
34	Purpose made 45 degree angles complete with all accessories and mounting accessories	No	64	
	CABLES			
	Supply and install LV Distribution cable 600/1000V PVC/PVC/SWA/PVC with ECC cables with stranded copper conductors as specified. Cables shall be laid in open trench or pulled into sleeves or fixed onto cables trays or directly saddled.			
35	2.5 mm² x 4 core ECC	m	30	
	Carried to Collection			R

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36	6 mm² x 4 core ECC	m	10	
37	10 mm² x 4 core ECC	m	92	
38	16 mm² x 2 core ECC	m	130	
39	70mm² x 4 core ECC	m	200	
40	150mm2 x 4 Core	m	80	
	CABLE TERMINATIONS			
	Termination for 600/1000 V PVC/PVC/SWA/PVC copper cables including glands, shrouds, lugs, connections and commissioning.			
41	2.5 mm² x 4 core ECC	No	2	
42	6 mm² x 4 core ECC	No	2	
43	10 mm² x 4 core ECC	No	4	
44	16 mm² x 4 core ECC	No	25	
45	70 mm² x 4 core ECC	No	2	
46	150mm2 x 4 Core	No	8	
	SUNDRIES			
47	PVC Cable warning tape placed 150mm above cables in excavations	m	190	
	ELECTRICAL DISTRIBUTION BOARDS			
	Carried to Collection			R

	Supply and install distribution board, including switchgear. The rate shall including the safe isolation, (DB-1/N, DB-1/ESS)				
48	Supply and deliver the **Normal Power** Distribution board complete described on the drawings and specifications unless other wise approved. Distribution board must be sized to fit the switchgear listed below. Switchgear measured and priced separately.(DB-1/N) 10kA Switchgear: 1 X 350 Amp Three phase Main Isolator 1 X 300 Amp Three phase Circuit Breaker 3 X 125 Amp Three phase Circuit Breaker 1 X 100 Amp Three phase Circuit Breaker 1 X 60 Amp Three phase Circuit Breaker 2 X 30 Amp Single Pole Circuit Breaker 1 X 30 Amp Double Pole Circuit Breaker 2 X 5 Amp Single Pole Circuit Breaker 1 X 30 Amp Three phase Circuit Breaker 1 X Set of Class 2, 10kA Surge Arrestor, 3-phase and neutral with indicator 1 X 30 Amp Three phase 230V Coil Contactor	No	1		
49	Supply and deliver the **Essential Power** Distribution board complete as described on the drawings and specifications unless other wise approved. Distribution board must be sized to fit the switchgear listed below. Switchgear measured and priced separately. (DB-1/ESS) 10kA Switchgear: 1X 350 Amp Three phase Main Isolator 1 X Set of LED phase indicators 1 X 250 Amp Three Phase Circuit Breaker 1 X 150 Amp Three Phase Circuit Breaker 2 X 125 Amp Three Phase Circuit Breaker 1 X 60 Amp Single Pole Circuit Breaker 1 X 50 Amp Single Pole Circuit Breaker 6 X 20 Amp Single Pole Circuit Breaker 4 X 25 Amp Single Pole Circuit Breaker 4 X 5 Amp Single Pole Circuit Breaker 1 X Set of Class 2, 10kA Surge Arrestor, 3-phase and neutral with indicator 2 X 20 Amp Three phase 230V Coil Contactor	No	1		
	Carried to Collection			R	
	Section No. 3 ELECTRICAL INSTALLATION & LIGHTNING PROTECTI Bill No. 1 ELECTRICAL INSTALLATION, ETC (PROVISIONAL)				

50	Surface mounted 3CR12 Orange powder coated panel with red cover plate for essential section, Pad-lockable doors, engraved labels, to fit switchgear as specified below. Switchgear measured and priced separately.(DB-FP/ESS) 6kA Switchgear: 1 X 160 Amp Three phase Main Isolator 1 X 125 Amp Three Phase Circuit Breaker 1 X 40 Amp Three Phase Circuit Breaker 1 X 60 Amp Single Pole Circuit Breaker 1 X 20 Amp Single Pole Circuit Breaker 3 X 10 Amp Single Pole Circuit Breaker 1 X 60Amp 30mA Double pole Earth leakage Isolator unit 1 X Set of Class 2, 10kA Surge Arrestor, 3-phase and neutral with indicator 1 X Set of 3-phase line-on indicators 3 X Analogue maximum demand type ammeter, complete with CT's and accessories. 1 X Analogue type Volt meter, complete with accessories.	No	1	
51	Surface mounted 3CR12 Orange powder coated panel with red cover plate for essential section, Pad-lockable doors, engraved labels, to fit switchgear as specified below. Switchgear measured and priced separately.(DB-WP/ESS) 6kA Switchgear: 1 X 60 Amp Three phase Main Isolator 1 X 60 Amp Single Pole Circuit Breaker 2 X 20 Amp Single Pole Circuit Breaker 2 X 10 Amp Single Pole Circuit Breaker 1 X 60Amp 30mA Double pole Earth leakage Isolator unit 1 X Set of Class 2, 10kA Surge Arrestor, 3-phase and neutral with indicator 1 X Set of 3-phase line-on indicators 3 X Analogue maximum demand type ammeter, complete with CT's and accessories. 1 X Analogue type Volt meter, complete with accessories.	No	1	
	Installation of switchgear inside new distribution board. The rate shall include for all the required wiring, connection and termination of panel wiring and modification adaptor plates or clip tray where required.			
52	350 Amp Three phase Main Isolator 10kA	No	2	
	Carried to Collection			R

53	60 Amp Three phase Main Isolator 6kA	No	1
54	300 Amp Three Phase Circuit Breaker 10kA	No	1
55	250 Amp Three Phase Circuit Breaker 10kA	No	1
56	150 Amp Three Phase Circuit Breaker 10kA	No	1
57	125 Amp Three Phase Circuit Breaker 10kA	No	5
58	100 Amp Three Phase Circuit Breaker 10kA	No	1
59	60 Amp Three Phase Circuit Breaker 10kA	No	1
60	60 Amp Single Pole Circuit Breaker 10kA	No	1
61	60 Amp Single Pole Circuit Breaker 6kA	No	1
62	50 Amp Single Pole Circuit Breaker 10kA	No	1
63	30 Amp Single Pole Circuit Breaker 10kA	No	2
64	25 Amp Single Pole Circuit Breaker 10kA	No	4
65	20 Amp Single Pole Circuit Breaker 10kA	No	6
66	20 Amp Single Pole Circuit Breaker 6kA	No	3
67	10 Amp Single Pole Circuit Breaker 6kA	No	5
68	5 Amp Single Pole Circuit Breaker 10kA	No	6
69	30 Amp Double Pole Circuit Breaker 10kA	No	1
70	30 Amp Three Phase Circuit Breaker 10kA	No	1
71	Set of 3-phase and neutral 10kA Class-2 Surge Arrestor with indicator	No	4
72	20 Amp Three Phase 230V Coil Contactor 10kA	No	2
73	30 Amp Three Phase 230V Coil Contactor 10kA	No	2
74	Set of LED phase indicators	No	1
75	60Amp 30mA Double pole Earth leakage Isolator unit	No	2

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Section No. 3
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76	Set of 3-phase line-on indicators	No	2	
77	Analogue maximum demand type ammeter, complete with CT's and accessories.	No	6	
78	Analogue type Volt meter, complete with accessories.	No	2	
	LABELS AND ENGRAVING			
	Supply and install engraved bi-colour ivorine labels on Distribution Boards and the PVC cover plates of all switches, sockets and isolators, all relevant circuits complete as per Dept. of Health KZN specification to indicate the relevant circuit numbers and information.			
79	DB-1/N	No	1	
80	DB-1/ESS	No	1	
81	DB-FP/ESS	No	1	
82	DB-WP/ESS	No	1	
	HIGH TENSION DISTRIBUTION (WORK GROUP 160)			
	MINIATURE SUBSTATION			
	Supply, install and commission new 200kVA, 11kV / 400V Miniature Substation as specified onto the new concrete base, complete with Vacuum technology 3-way ring main unit, fuses, Transformer, LV switchgear and all accessories. The rate must include for any specialised equipment, including cranes, forklifts, trucks, etc, as required to deliver and place the mini-sub into its final position.			
83	200kVA, 11kV / 400V Miniature substation, placed in final position	No	1	
	10 kA LV SWITCHGEAR			
84	300Amp three phase circuit breaker	No	1	
	TRANSFORMERS FUSES			
	Carried to Collection			R

	11Kv Transformer fuses			
85	Replace the transformer fuses with 11kV, 15Amp, 40kA fuses into existing free standing Ring Main Unit No 10.	No	3	
	CABLES			
	Allow for the provisional supply and installation 11kV, 3 Core General purpose belted cable, fully impregnated armoured and served, paper insulated cable as specified. Cables shall be laid in open trench.			
86	70 mm² 3-Core	m	110	
87	25 mm² 3-Core	m	10	
	CABLES JOINTS			
	Provisionally allow for the supply and installation of 11kV Paper insulated CABLE joint, complete with terminations and equipment and accessories			
88	70 mm² 3-Core	No	1	
	TERMINATIONS			
	Allow for the 11kV Paper insulated cable termination and connection to ring main unit, complete with lugs and all accessories and equipment.			
89	70 mm² 3-Core	No	2	
90	25 mm² 3-Core	No	2	
	EARTHING			
91	Supply and Install new MV- & LV- and complete 1 Ohm earthing to the new mini-sub, compliant to SANS 10199, SANS10209, SANS 10292, Including the submission of test certificates. The allowance shall include for soil resistivity testing, 70mm2 bare copper earth conductor, all terminations, 1.5m long earth electrodes, cad welding, excavations, backfilling and compacting and commissioning.			SUM
	SUNDRIES			
	Carried to Collection			R

	Trench covers, cable markers, bollards,etc.			
92	Supply and installation of General Purpose precast concrete trench cover as specified to be laid into trench above the cable, to VANSTONE PRECAST or other approved. Overall size 900 x 300 x 75mm thick.	No	65	
93	Supply and install 25MPA unreinforced concrete cable markers complete with aluminium punch plate and punching, size 150 x 150mm top, 220 x 220mm bottom x 300mm high (Eskom DDT 8012 marker), all to VANSTONE PRECAST, or other approved.	No	3	
94	Supply and install concrete filled steel painted bollards protruding 1200mm above ground level, all to VANSTONE PRECAST, or other approved to be installed around Ring Main Unit RMU 9.	No	5	
95	Supply and install HA1 Security brass Pad Lock.	No	10	
	Removal of redundant 11kV-Cable			
96	Provisionally allow for the removal of the redundant cable, including the excavation, backfilling and spreading and making good of the soil		Item	
	Switching, testing, commissioning, etc.			
97	Allow for the Licensed ring main unit safe switching and isolation, notices and programming.		Item	
98	Allow for the switching off and isolation of the old street lighting and switching on and commissioning of new street light system.		Item	
99	Safely Switch off and on & Isolate Old MINI-SUB from Ring Main Unit RMU-10.		Item	
100	Safely Disconnect MV-Cable from existing Ring Main Unit No. 10.		Item	
101	Safely disconnect and remove LV-Cable between the Mini-sub LV-Section and new Main DB-1/N		Item	
102	Switch back ON from existing RMU-10		Item	
	Carried to Collection			R

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Bill No. 1
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103	Test and commission the complete cable, mini-sub, street lighting system installation, and submission of a test certificates		Item		
	SIGNAGE, LABELS AND ENGRAVING				
	Supply and install all signage, labels and engraved bi-colour ivorene labels as specified and compliant to SANS 10142-2 and DOH KZN Policy, including the new or updating legend cards.				
104	Mini-Sub	No	1		
	THE FOLLOWING IN GENERATOR INSTALLATION (WORK GROUP 160)				
	TEMPORARY CONNECTION OF EXISTING GENERATOR				
105	Temporary connect the existing generator cables and circuits to restore full functionality of the Auto Change-over system as per the existing back up system.	No	1		
	TEMPORARY GENERATOR				
	Supply , install connect up to existing Distribution Board a temporary generator.				
106	100kVA Machine rental per day	No	4		
107	50kVA Machine rental per day	No	1		
108	Allow for transportation for 100km	No	3		
109	Technician	No	3		
110	Cabling		Item		
111	Diesel Fuel	l	1,406		
	NEW GENERATOR & BULK FUEL TANK				
	Carried to Collection			R	

	Diesel Generator Standby Set				
112	Supply and installation of 200kVA, 400V, 50 Hz outdoor type standby diesel generator set, complete with all accessories, day tank, sound attenuation system and Automatic Mains Failure change over panel etc. as specified.	No	1		
	Bulk Fuel Tank				
113	Supply and install onto the new concrete bases from approved tank manufacturers a 3000 Litre self-bunding bulk fuel tank above ground, compliant to SANS 10131: 2004 and approved by the Newcastle Local Authority, complete with all accessories and equipment as specified	No	1		
114	Supply and install UV rated flexible fuel pipe system as specified between bulk tank and generator, complete with all accessories and mounting accessors, joints, elbows etc. , as for a length of 8m		Item		
115	Supply and install Pad-lockable fuel isolating valve as specified.	No	2		
	Approved concrete sealant as per Engineers specification				
116	Supply and install sealant to generator concrete base and tank bunding as specified, suitable for the containment of Diesel and oil. (Provisional)	m2	30		
	Earthing				
117	Supply and Install complete 1 Ohm earthing to the new generator, compliant to SANS 10199, SANS10209, SANS 10292, Including the submission of test certificates. The allowance shall include for 70mm2 bare copper earth conductor, all terminations, 1.5m long earth electrodes, cadwelding, soil excavations, backfilling and compacting.			SUM	
	Fire Protection				
118	Supply and installation of 9kg dry chemical portable fire fighting equipment, complete with enclosure, at both the bulk tank and generator, as approved by the local fire chief and compliant to SANS 10131.	No	4		
	Carried to Collection			R	

Section No. 3
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	Signage, labels & colour code painting			
119	Supply and installation of all signage, labels and colour code painting as per SANS 10131 and approved by the Fire Department.		Item	
	Remote Audible Alarm			
120	Supply and install audible alarm system complete as specified	No	1	
121	Supply and install Audible alarm cables	m	150	
	Remote control generator switch			
122	Supply and install remote control generator on/off/Auto switch system as specified	No	1	
123	Supply and install remote control generator cables.	m	150	
	Registration			
124	Registration of the bulk fuel tank with the local authority as required by SANS 10131:2004		Item	
	First fill diesel			
125	Supply and fill the first batch Diesel	l	2,000	
	LIGHTING AND SMALL POWER (PROVISIONAL) (WORK GROUP 160)			
	The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.			
	Trade Names and Proprietary Products: All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase 'or other approved'.			
	Note: Unless otherwise described the preambles and full descriptions of all items appearing in all the subsequent bills are to apply equally to this bill.			
	Carried to Collection			R

	CONDUIT AND ACCESSORIES			
	Conduit and conduit accessories shall fully comply to SANS10142 as amended			
	CONDUIT			
	Supply and Install PVC conduit as specified complete with all accessories, consumables, hospital saddles and mounting accessories and couplers.			
126	20mm Diameter PVC	m	20	
	WALL BOXES			
	Supply and install the following pressed steel wall boxes. Rate must allow for the termination of conduit ends.			
127	65 mm dia round PVC Box to fit 20mm dia conduit PVC	No	8	
128	100 x 100 x 50mm galvanised switch box	No	2	
129	100 x 50 x 50mm galvanised switch box	No	4	
	TRUNKING			
	Supply and install or replace powder coated steel Trunking complete with covers and surface mounting accessories. Trunking to be grey in colour.			
130	76 x 76mm Nominal x 0.8mm thick to CABSTRUT P8000 or other approved	m	210	
131	41 x 20mm, 2.5mm thick to "CABSTRUT P2000" or other approved, complete with hanger system for up to 400mm long suspension rods x 200mm wide.	m	11	
132	Purpose-made 45 degree angles complete with all accessories and mounting accessories	No	64	
	CONDUCTORS			
	Carried to Collection			R

Section No. 3
ELECTRICAL INSTALLATION & LIGHTNING PROTECTI
Bill No. 1
ELECTRICAL INSTALLATION, ETC (PROVISIONAL)

	Supply and install 600/1000Vgrade PVC insulated stranded copper conductors drawn in conduit.			
133	2,5mm2	m	45	
134	4mm2	m	25	
	EARTH CONDUCTORS			
	Supply and installation of the following copper earth conductors.			
135	2,5mm2 PVC insulated earth	m	35	
	SWITCHES, SOCKETS AND ISOLATORS			
	Supply and install or replace existing equipment complete with PVC cover plates fixed in flush or surface mounted boxes (boxes elsewhere measured)			
	LIGHT SWITCHES			
	Supply and install light switch			
136	16 Ampere 250 V grade single lever one way IP55 light switch	No	1	
	DAYLIGHT SWITCHES			
	Supply and install			
137	Daylight switch mounted inside an empty bulkhead. The daylight switch shall have a rating of not less than 15 amp and must switch on at a light level of approximately 50 lux and off at approximately 100 lux.	No	1	
	SOCKETS			
	Supply and install sockets			
138	16 Ampere, 230V grade double pin single switched socket outlet mounted inside ABS enclosure with sliding lid.	No	2	
	ISOLATORS			
	Carried to Collection			R

	Supply and install isolators			
139	32Amp 230V grade Double pole IP55 to WACO ERA or other approved	No	1	
140	32 Amp, 400 Volt grade, Three Phase, IP55 surface mounted Isolator	No	1	
	LUMINARIES AND MASTS			
	Supply and install Luminaire and glass re-enforced mast complete with 5Amp Circuit Breaker and 2.5mm2 connecting wiring and all accessories and equipment as specified.			
141	Type A2: IP66, 6995lm, nominal, 55W, 3000K, 20kV/20kA Surge Arrestor to BEKA LEDLume -mini XP or other approved, mounted to 8m mounting height GRP pole, single version to BEKA 187680	No	14	
	Supply and install all Luminaries as specified complete with lamps, control gear, diffusers, and all accessories as specified.			
142	Type B1: Surface mounted IP66 Dust Moisture and Corrosion proof LED luminaire with 5910lm output, 4000K, RA85, stainless steel diffuser clips and 5-year guarantee to Lighting Innovations / MITO or other approved.	No	2	
143	Type C1: Surface mounted IP65 Round Bulkhead LED luminaire with opal diffuser, die cast aluminium base, black trim ring, 1470lm, 4000K to BEKA / 31 / 9W, or other Approved.	No	1	
	Carried to Collection			R

LIGHTNING PROTECTION (PROVISIONAL) (WORK GROUP 160)

The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.

Trade Names and Proprietary Products:
All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase 'or other approved'.

Note: Unless otherwise described the preambles and full descriptions of all items appearing in all the subsequent bills are to apply equally to this bill.

LIGHTNING PROTECTION

Carried to Collection R

Section No. 3
ELECTRICAL INSTALLATION & LIGHTNING PROTECTI
Bill No. 1
ELECTRICAL INSTALLATION, ETC (PROVISIONAL)

Scope of Works

The complete Lighting Protection to structures system shall be supplied & installed to all the buildings or structures on site as specified

General Specifications

For steel roofs, the lightning protection system shall generally consist of 25mm2 insulated, stranded, copper down conductor, drawn in 20mm Diameter Galvanised conduit.

The conduit shall be mounted on the walls on hospital type saddles.

The down conductor shall be terminated onto the steel roof sheets and onto a test box connection.

The test box shall be mounted about 400mm above the final ground level.

The final connection shall terminate from the test box to the earth electrode, which shall be driven into the ground at 1m away from the wall and at least 200mm below the final ground level.

Where concrete aprons or storm water channels are encountered at the final connection, the channels shall be cut neatly to conceal the final connection.

The contractor shall repair these cuts and make good.

For concrete tiled roofs or slate, the aluminium ridge conductor system shall be installed.

The aluminium ridge conductors shall be 10mm Diameter and shall terminate to the insulated copper down conductors via bimetallic connectors.

The aluminium ridge conductor shall be held in position with off stand brackets .

The contractor shall allow for the bonding of elements on the roofs, such as satellite dish brackets, etc.

The installation shall comply with SANS 10313 as a basic level of protection and a SANS format certificate shall be submitted for each building or structure.

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Section No. 3
ELECTRICAL INSTALLATION & LIGHTNING PROTECTI
Bill No. 1
ELECTRICAL INSTALLATION, ETC (PROVISIONAL)

	SCHEDULE OF QUANTITIES			
	Supply and install complete Lightning Protection system fully compliant to SANS 10313 as to provide basic level of Lightning Protection of structures.			
	SOIL SURVEY			
144	Carry out Soil Survey and Submission of test to SANS 61312		Item	
	CONDUIT			
	Supply and install conduit surface mounted on hospital saddles, complete with accessories and mounting accessories and conduit ends.			
145	20mm Diameter Galvanised	m	6	
146	20mm Diameter PVC	m	1	
	CONDUCTORS			
	Supply and install copper down conductor in conduit and in ground for the connection to the earth electrode, as specified for steel roofs or aluminium ridge conductors complete with standoff brackets, joints, all accessories and mounting accessories for concrete tiled roofs.			
147	25mm2 PVC insulated stranded copper earth wire conductor	m	9	
148	50mm2 PVC insulated stranded copper earth wire conductor	m	1	
149	50mm2 Solid annealed Aluminium ridge conductor	m	60	
	EARTH ELECTRODE			
	Supply and install copper earth electrode at least 1m away from the wall and driven into ground at least 200mm below final ground level.			
150	1.5m long copper cladded earth electrode	No	10	
	TERMINATIONS			
	Carried to Collection			R

	Supply and install terminations, complete with crimping lugs and accessories.				
151	25mm2 Termination to roof sheeting and test box connection	No	4		
152	50mm2 Termination to test box connection and copper electrode	No	8		
153	25mm2 Bimetallic Termination between copper and aluminium conductors	No	1		
154	50mm2 Termination to column stud	No	1		
155	50mm2 Termination to parapet wall cladding	No	1		
156	50mm2 Termination / bonding to roof sheeting.	No	1		
	TEST BOX				
	Supply and install surface mount to the wall, 400mm above final ground level as specified.				
157	Weather proof test box 150 x 100mm and lid complete with conduit termination	No	2		
	GENERAL BONDING				
158	Allow for the bonding of elements		Item		
	TESTING AND CERTIFICATION				
159	Carry out final test and submission of SANS format compliance Certificate complete for each building	No	4		
	PUMP INSTALLATION (WORK GROUP 160)				
	WATER LEVEL CONTROL EQUIPMENT				
160	Supply and install tank float switch IP68 micro switch type with ABS housing, 230V grade complete with 20m long cord, suitable for domestic water supply to MATELEC FSW-12503-L or other approved.	No	1		
161	CCG IP68, Junction box complete with gland connections	No	1		
	Carried to Collection			R	

	TESTING AND COMMISSIONING (WORK GROUP 160)			
162	Test and certify the electrical installation including the submission of a Certificate of Compliance for each distribution board **NORMA**L Power Section.	No	15	
163	Test and certify the electrical installation including the submission of a Certificate of Compliance for each distribution board **ESSENTIAL** Power Section.	No	15	
164	Test and certify the **Telephone** installation including the submission of a Certificate of Compliance by SITA registered contractor only.	No	14	
165	Test and certify the **Data** installation including the submission of a Certificate of Compliance by SITA registered contractor only.	No	14	
166	Switch on from new **Main DB-1/ESS**, test and commission the complete electrical installation including the submission of a Certificate of Compliance for each distribution board	No	1	
167	Complete testing, commissioning and demonstration of the generator and AMF Panel and all associated equipment including the submission of certificate of compliance.	No	1	
168	Complete testing, commissioning and submission of compliance certificates for the **Mini-Sub**	No	1	
169	Complete testing, commissioning and submission of compliance certificates for the **Street lights**	No	1	
170	Test and commission the complete electrical reticulation installation including the submission of a Certificate of Compliance for each distribution board	No	1	
	OPERATING AND MAINTENANCE MANUALS (WORK GROUP 160)			
171	Complete and supply complete set of operating and maintenance manuals (3 copies required)	Sets	3.0	
172	Compile and supply a complete key plan, "As-Built drawings" (3 copies required)	Sets	3.0	
	Carried to Collection			R

	CONTRACTUAL MAINTENANCE (WORK GROUP 160)			
173	Maintenance and guarantee of the entire installation for a period of 12 months as specified.		Item	
174	Monthly visits to site for inspection, services, testing and updating logbook of the complete system, as specified	No	12	
175	Oil change and the fitment of one new set of all the various filters.		Item	
	TRAINING (WORK GROUP 160)			
176	Allow for training of employer's operators to enable them to be responsible for and capable of operating the plant		Item	
	Carried to Collection			R

Section No. 3

ELECTRICAL INSTALLATION & LIGHTNING PROTECTION (PROVISIONAL)

Bill No. 1

ELECTRICAL INSTALLATION, ETC (PROVISIONAL)

COLLECTION

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Section No. 3

ELECTRICAL INSTALLATION & LIGHTNING PROTECTION (PROVISIONAL)

Bill No. 1

ELECTRICAL INSTALLATION, ETC (PROVISIONAL)

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SECTION NO. 4:

EXTERNAL WORKS (PROVISIONAL)

BILL NO. 1

GENERAL SITE WORKS, ETC (PROVISIONAL) (WORK GROUP 104)

The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.

Trade Names and Proprietary Products:
All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase 'or other approved'.

Note: Unless otherwise described the preambles and full descriptions of all items appearing in all the subsequent bills are to apply equally to this bill.

Trade Names and Proprietary Products:
All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase "or other approved".

SITE CLEARANCE, ETC

Site clearance, etc:

Nature of Ground

The Contractor is advised to visit the site to ascertain and satisfy himself of the exact nature of the ground, etc., and other peculiarities of the site which may be encountered.

Checking Site Contours

Before commencing work the Contractor must check the

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existing contour levels as indicated on the site layout plan and must notify the Principal Agent immediately in writing of any discrepancies, failing which no claims for extras in this connection will be entertained once operations have commenced.

Excavation

Prices are to include for excavating with approved mechanical equipment in soft and intermediate classes of materials which may be encountered and no claims for extras in this connection will be entertained.

All excavation in excess of the levels shown on the drawings are to be made good to the approval of the Principal Agent.

Blasting

Blasting will only be permitted with the written authority of the Principal Agent and when permission is granted, it is to be executed only by persons holding the necessary Government Blasting certificate and subject to all regulations imposed by the Principal Agent and/or Local Authority. In addition, the Contractor is to indemnify the owners against all claims in respect of damage to persons and property resulting from such blasting operations.

Testing

Irrespective of the density tests or other checking done by the Principal Agent the Contractor shall satisfy himself completely that all the requirements such as levels, shape of layer, densities, thickness of layer, moisture content during compaction, etc. have been complied with in the construction of any layer or stage of work.

After the Contractor has submitted his check or control results showing that the work has been satisfactorily carried out, the Principal Agent will conduct tests or checks to ascertain whether the specifications have been met. The cost of the tests carried out by the Principal Agent will be borne by the Employer. The Contractor shall recompact at his own expense any section on which the specified densities have not been obtained.

Protection and Maintenance

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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 1
GENERAL SITEWORKS, ETX (PROVISIONAL)

	The Contractor shall protect and maintain the completed surfaces of each of the cut and filled areas at his own expense for the duration of the contract or until the following layer is applied (as applicable). Maintenance shall include immediate repairs of any damage or defects that may occur to the surface and shall be repeated as often as is necessary to keep the surface continuously intact. Repairs shall be made in a manner to ensure restoration to an even and uniform surface				
	Site Clearance				
	Note: The site clearance, etc., have been measured elsewhere.				
1	Allow for clearing the whole area of the site of all rubbish, rubble, boulders, debris, grass, shrubs, vegetable matter, trees and tree stumps not exceeding 200mm girth including excavation to remove roots and cart all spoil away from site and leave site clean.	m2	2,525		
	BULK EARTHWORKS, ETC				
	Excavation in earth not exceeding 2m deep for:				
2	Excavate to open face to reduce levels in forming stepped plateaux and banks to defined levels and slopes including roughly levelling plateaux, depositing, spreading and roughly levelling spoil on site to make up levels and compacting plateaux and forming banks to a fall of approximately 1:2.	m3	232		
	Extra over bulk excavations in earth for excavation in:				
3	Soft rock.	m3	23		
4	Hard rock.	m3	12		
	Extra only over all bulk excavations for loading and carting away:				
5	Surplus spoil away from site (by volume as measured for excavation - Contractor to make allowance for increase in bulk).	m3	10		
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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 1
GENERAL SITEWORKS, ETX (PROVISIONAL)

	Selected earth filling from the excavations deposited in layers not exceeding 150mm thick after compaction and compacted to a density of 95% Modified AASHTO maximum density:			
6	Topsoil from excavations, spread and levelled over site and abutting kerbs, walls, etc	m3	150	
	Risk of collapse of excavations:			
7	Sides of bulk excavations not exceeding 1,5m deep	m2	5	
	Selected granular G5 filling material supplied and carted onto the site by the Contractor and having a plasticity index of less than 12, deposited in layers not exceeding 150mm thick after compaction and compacted to a density of 96% Modified AASHTO maximum density:			
8	In filling under aprons and ramps, etc.	m3	5	
	Prescribed density tests on filling:			
9	Allow for the execution of all prescribed density tests on filling, etc., as pointed out by the Principal Agent on site.		Item	
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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 1
GENERAL SITEWORKS, ETX (PROVISIONAL)

Section No. 4

EXTERNAL WORKS (PROVISIONAL)

Bill No. 1

GENERAL SITEWORKS, ETX (PROVISIONAL)

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Item No			Quantity	Rate	Amount
	SECTION NO. 4:				
	BILL NO. 2				
	APRONS AND WALKWAYS, ETC (PROVISIONAL)				
	The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.				
	Trade Names and Proprietary Products: All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase 'or other approved'.				
	Note: Unless otherwise described the preambles and full descriptions of all items appearing in all the subsequent bills are to apply equally to this bill.				
	EARTHWORKS (WORK GROUP 104)				
	BULK EARTHWORKS, ETC				
	Excavation in earth not exceeding 2m deep for:				
1	Excavate to open face to reduce levels in forming stepped plateaux and banks to defined levels and slopes including roughly levelling plateaux, depositing, spreading and roughly levelling spoil on site to make up levels and compacting plateaux and forming banks to a fall of approximately 1:2. (LI)	m3	29		
	Extra over bulk excavations in earth for excavation in:				
2	Soft rock.	m3	3		
3	Hard rock.	m3	1		
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	Extra only over all bulk excavations for loading and carting away:			
4	Surplus spoil away from site (by volume as measured for excavation - Contractor to make allowance for increase in bulk) (LI)	m3	29	
	Risk of collapse of excavations:			
5	Sides of bulk excavations not exceeding 1,5m deep	m2	7	
	Selected granular G5 filling material supplied and carted onto the site by the Contractor and having a plasticity index of less than 12, deposited in layers not exceeding 150mm thick after compaction and compacted to a density of 98% Modified AASHTO maximum density:			
6	150mm Consolidated thickness base course filling under paving. (LI)	m3	8	
	Selected granular G7 filling material supplied and carted onto the site by the Contractor and having a plasticity index of less than 12, deposited in layers not exceeding 150mm thick after compaction and compacted to a density of 95% Modified AASHTO maximum density:			
7	In filling under solid floors. (LI)	m3	11	
	Selected coarse river sand filling material supplied and carted onto the site by the Contractor:			
8	50mm (Consolidated) layer of clean river sand well watered and rolled to a hard true and even surface under solid floors (LI)	m2	73	
	Compaction of surfaces:			
9	Stabilize in-situ reduced levels by scarifying to depth of 150mm and compacting to a density of 93% Modified AASHTO maximum density. (LI)	m2	117	
	Prescribed density tests on filling:			
10	Allow for the execution of all prescribed density tests on filling, etc., as pointed out by the Principal Agent on site.		Item	
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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 2
APRONS AND WALKWAYS (PROVISIONAL)

	Soil poisoning applied by a registered pest control company and guaranteed against termite infestation for five years:			
11	Ant proofing ground under solid floors ditto including raking out V-shaped channel 75mm wide against walls, etc., and thoroughly saturate with ant proofing solution and fill in and tamp down. (LI)	m2	117	
	VIBRATED REINFORCED CONCRETE (WORK GROUP 110)			
	25MPa/19mm concrete in:			
12	Aprons (LI)	m3	3	
13	Ramps (LI)	m3	9	
	CONCRETE TESTING (WORK GROUP 110)			
	Concrete test cubes:			
14	Allow for all necessary concrete test cubes size 150 x 150 x 150mm		Item	
	CONCRETE SUNDRIES (WORK GROUP 110)			
	Finishing top of concrete to a non-slip finish obtained by brushing with a stiff bristle broom before the concrete has set on:			
15	Aprons and ramps. (LI)	m2	117	
	FORMWORK (WORK GROUP 111)			
	Formwork (use and waste) to concrete to:			
16	Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	92	
	MOVEMENT JOINTS (WORK GROUP 110)			
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	10mm Bitumen impregnated insulation board expansion joint filler closely butt jointed at intersections including all cutting and waste and maintaining in position during concreting in:			
17	Expansion joint between abutting edges of concrete surface beds not exceeding 300mm high.	m	35	
	REINFORCEMENT (WORK GROUP 114)			
	Steel fabric reinforcement to concrete:			
18	Welded high tensile steel square mesh fabric reinforcement reference 193 (mass 1,93kg/m2) to ramp.	m2	117	
	VAPOUR BARRIERS (WORK GROUP 120)			
	The following vapour barriers are to be of one layer of 250 microns 'Gunplas USB Green' or other approved damp proof sheeting in accordance with SABS 952 type 'C'.			
	Care is to be taken to avoid puncturing or tearing the sheeting before and during placing of concrete; any damage to sheeting is to be made good to the satisfaction of the Principal Agent.			
	Prices are to include for all cutting and waste, laying in single sheets wherever possible, lapping 100mm at all intersections, sealing all laps with hyperlastic adhesive and proofweld flashing tape - all in strict accordance with the manufacturers instructions.			
	All measurements are nett			
	One layer of 250 micron 'Gunplas USB Green' or other approved waterproof sheeting sealed at laps with 'Gunplas Pressure Sensitive Tape'			
19	Under concrete surface beds including turning up edges against walls.	m2	73	
	EXPANSION JOINT SEALANTS (WORK GROUP 120)			
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	Polysulphide joint sealant:			
20	In filling to 10 x 15mm horizontal open joints including raking out softboard.	m	35	
	GALVANISED MILD STEEL BALUSTRADES (WORK GROUP 136)			
	Balustrades are to be constructed of 50 x 3mm thick hollow section galvanised mild steel top rail welded to 10 x 90mm steel pin with pin welded to 38mm steel post 880mm high with 150 x 150mm base plate bolted to floor and post filled in with 20 x 2,5mm mm thick hollow section horizontal steel rails spaced at 120mm centres.			
	Before leaving the works of the manufacturers all balustrades are to be thoroughly cleaned of all mill scale, oil, grease, etc., and after erection all damaged surfaces are to be thoroughly cleaned and touched up with approved paint all to the approval of the Principal Agent.			
	Prices are to include for fabricating to detail drawings, welding, filing welds smooth, erecting and bolting in position - all to the approval of the Principal Agent. (Refer to Architect's drawing no. 3372/B/502/01)			
	Mild steel balustrading:			
21	1,03m High raking balustrade with stancheons spaced at not exceeding 1,2m centres and fitted with intermediate rails as described and erecting in position circular on plan not exceeding 12m radius including painting to the Architect's approval (Refer to Architect's drawing no. 3372B/502)	m	39	
22	Extra over 50mm rail for rounded closed end	No	2	
23	Extra over 50mm rail for L-intersection	No	1	
24	Extra over 50mm rail for ramp or knee	No	4	
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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 2
APRONS AND WALKWAYS (PROVISIONAL)

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EXTERNAL WORKS (PROVISIONAL)

Bill No. 2

APRONS AND WALKWAYS (PROVISIONAL)

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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 2
APRONS AND WALKWAYS (PROVISIONAL)

Item No			Quantity	Rate	Amount
	SECTION NO. 4:				
	BILL NO. 3				
	ROADS AND PARKING AREAS, ETC (PROVISIONAL)				
	The Tenderer is referred to the relevant Clauses in the Model Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.				
	Unless otherwise described the preambles and full descriptions of all items appearing in all the preceding bills are to apply equally to this bill.				
	EXCAVATION, FILLING, ETC				
	Excavation in earth not exceeding 2m deep:				
1	Reduced levels (LI)	m3	496		
	Extra over all excavations for carting away:				
2	Surplus material from excavations and/or stock piles on site to a dumping site located within the school boundary to make up levels (LI)	m3	496		
	Earth filling (G5) supplied by the contractor in 150mm thick layers and compacted to 93% Mod AASHTO density:				
3	Under roads, pavings, etc	m3	576		
	Coarse river sand filling supplied by the contractor compacted to 95% Mod AASHTO density:				
4	Under floors, etc	m3	48		
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	Compaction of surfaces:			
5	Compaction of ground surface under roads, pavings, walkway, etc. including ripping and scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary, stabilised with 2% road lime by mass and compacting to 90% Mod AASHTO density	m2	2,435	
	Prescribed density tests on filling:			
6	Allow for the execution of all the prescribed density tests on filling, etc		Item	
	Weed killers:			
7	Approved weed killer applied to surfaces under pavings, roads, etc	m2	1,910	
	Soil poisoning applied by a registered pest control company and guaranteed against termite infestation for five years:			
8	Antproofing ground under precast concrete pavings.	m2	1,910	
	CONCRETE (WORK GROUP 110)			
	Unreinforced Concrete			
	25 MPa/19 mm Concrete in:			
9	Edge beam size 300 x 400mm high including all necessary excavation, formwork, chamfering, etc.	m	181	
	CONCRETE TESTING (WORK GROUP 110)			
	Concrete test cubes:			
10	Allow for all necessary concrete test cubes size 150 x 150 x 150mm cast from batches of concrete required for the entire contract.	No	5.00	
	Carried to Collection			R

PRECAST CONCRETE PAVING

Stock 230 x 115 x 80mm pavers complying with SABS 1058, of the colour stated, uniform in shape and colour, free from cracks, chips, twists and all other defects and equal to samples to be submitted to and approved by the Principal Agent.

Prices are to include for laying in strict accordance with the manufacturers instructions to the pattern stated, vibrating with a plate compactor to provide properly bedded even top surfaces and for sealing all joints with fine sand thoroughly brushed in, protecting from damage and cleaning down on completion - all to the approval of the Principal Agent.

Standard grey interlocking roadstone paving on and including 20mm thick consolidated layer of clean river sand including all square cutting and waste:

11	Paving to road areas, etc. to falls laid in herringbone pattern.	m2	705	
12	Fair circular cutting and waste to last.	m	25	
13	Mountable kerb (SABS 927 Fig. 8C) 300 x 200mm high in approximately 1m lengths with 150 x 150mm unreinforced concrete footing and haunching at back of each joint and with cement grouted joints including excavation, backfill, etc.	m	10	

Stock 230 x 115 x 60mm pavers complying with SABS 1058, of the colour stated, uniform in shape and colour, free from cracks, chips, twists and all other defects and equal to samples to be submitted to and approved by the Principal Agent.

Prices are to include for laying in strict accordance with the manufacturers instructions to the pattern stated, vibrating with a plate compactor to provide properly bedded even top surfaces and for sealing all joints with fine sand thoroughly brushed in, protecting from damage and cleaning down on completion - all to the approval of the Principal Agent.

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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 3
ROADS AND PAVING (PROVISIONAL)

	Standard grey interlocking roadstone paving on and including 20mm thick consolidated layer of clean river sand including all square cutting and waste:			
14	Paving to assembly areas, etc. to falls laid in herringbone pattern.	m2	1,205	
15	Fair circular cutting and waste to last.	m	55	

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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 3
ROADS AND PAVING (PROVISIONAL)

Section No. 4

EXTERNAL WORKS (PROVISIONAL)

Bill No. 3

ROADS AND PAVING (PROVISIONAL)

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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 3
ROADS AND PAVING (PROVISIONAL)

Item No			Quantity	Rate	Amount
	SECTION NO. 4:				
	BILL NO. 4				
	RETAINING WALLS (PROVISIONAL)				
	The Tenderer is referred to the relevant Clauses in the Standard Preambles to All Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.				
	Trade Names and Proprietary Products: All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase 'or other approved'.				
	Note: Unless otherwise described the preambles and full descriptions of all items appearing in all the subsequent bills are to apply equally to this bill.				
	EARTHWORKS				
	EXCAVATION, FILLING, ETC (WORK GROUP 104)				
	Excavation in earth not exceeding 2m deep for:				
1	Trenches. (LI)	m3	19		
	Extra over trench and hole excavations in earth for excavation in:				
2	Soft rock	m3	2		
3	Hard rock	m3	1		
	Extra over all excavations for carting away:				
4	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor (LI)	m3	19		
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	Risk of collapse of excavations:			
5	Sides of trench and hole excavations not exceeding 1,5m deep	m2	54	
	Keeping excavations free of water:			
6	Keeping excavations free of all water other than subterranean water		Item	
	Earth filling supplied by the contractor compacted to 95% Mod AASHTO density			
7	Backfilling behind retaining walls (LI)	m3	13	
	Compaction of ground surfaces:			
8	Stabilize in-situ reduced levels by scarifying to depth of 150mm and compacting to a density of 96% Modified AASHTO maximum density	m2	81	
	Prescribed density tests on filling:			
9	Allow for the execution of all prescribed density tests on filling, etc., as pointed out by the Principal Agent on site		Item	
	GRASSING			
	Grassing of roots in rows			
10	Cultivation and preparation of areas to be planted (LI)	m2	116	
11	"Kikuyu" grass over site and banks	m2	116	
12	Supplying and applying top dressing fertiliser broadcast evenly at the rate of 10 - 15g/m2. (LI)	m2	116	
	Maintenance			
13	Maintenance of grassed areas for a period of 12 months (total area approximately 116m2) including regularly weeding and irrigating as necessary (LI)		Item	
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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 4
RETAINING WALLS (PROVISIONAL)

	Soil poisoning applied by a registered pest control company and guaranteed against termite infestation for five years:			
14	Ant proofing ground under solid foundations and to vertical sides of excavations (LI)	m2	81	
	REINFORCED CONCRETE (WORK GROUP 110)			
	25MPa/19mm concrete:			
15	Foundation to walls cast against excavated surfaces	m3	8	
	CONCRETE TESTING (WORK GROUP 110)			
	Concrete test cubes:			
16	Allow for all necessary concrete test cubes size 150 x 150 x 150mm cast from batches of concrete required for the entire contract.		Item	
	PRECAST CONCRETE (WORK GROUP 112)			
	Precast concrete retaining wall blocks are to be "Terraforce L22" or other approved retaining system interlocking blocks of the type and size stated and equal to a sample to be submitted to and approved by the Principal Agent.			
	Blocks are to be laid in strict accordance with the manufacturer's instructions.			
	Prices are to include for dressing the slope to the required angle, filling in and compacting behind the blocks as necessary and filling the blocks with approved earth filling from the excavations as the work proceeds, all to the satisfaction of the Principal Agent.			
	Precast concrete retaining wall blocks:			
17	"Terraforce L22" precast concrete blocks size 300 x 230 x 200mm overall and laying as described in straight or curved retaining wall maximum 1,5m high	m2	58	
18	Extra over last for laying first course of blocks in top of surface of concrete whilst still wet	m	38	
	Carried to Collection			R

SUBSOIL DRAINAGE (WORK GROUP 146)

Agricultural Drainage

Perforated unplasticised polyvinyl chloride for underground use laid in filling:

19	110mm Slotted uPVC agricultural pipes laid behind retaining walls including 19mm crushed stone encasing size 600 x 600mm and geofabric filter blanket wrapped around encasing with 150mm side and 300mm end laps including stitching	m	38	
20	20mm Mesh galvanised wire netting stopper in end of 110mm pipe	No	2	

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EXTERNAL WORKS (PROVISIONAL)

Bill No. 4

RETAINING WALLS (PROVISIONAL)

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EXTERNAL WORKS (PROVISIONAL)
Bill No. 4
RETAINING WALLS (PROVISIONAL)

Item No			Quantity	Rate	Amount
	SECTION NO. 4:				
	BILL NO. 5				
	SECURITY FENCING AND GATES (PROVISIONAL)				
	The Tenderer is referred to the relevant Clauses in the Standard Preambles to all Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.				
	Note: A colour scheme comprising colours and the blending of colours approved by the Principal Agent shall be used for the paintwork and the Contractor must allow for this in his pricing. Colour samples of the finishing coats shall be provided in all cases. Under no circumstance will there be an adjustment of rates for any colour whatsoever specified.				
	Trade Names and Proprietary Products: All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase "or other approved".				
	ALTERATIONS				
	REMOVAL OF EXISTING WORK				
1	Carefully take out existing powder coated fence post and clean of concrete. Re-cast 400 x 400 x 600mm 15 MPa Concrete foundation base and install fence post. Include all excavations, formwork, concrete and backfilling, etc.	No	10		
2	Take out existing damaged 2.4m high fence panel and replace with new to match existing.	No	3		
	SITE CLEARANCE ETC (WORK GROUP 104)				
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	Site clearance			
3	Allow for all necessary clearing of fence line including grubbing up and removal of all grass, shrubs, rubbish, vegetable soil and trees not exceeding 200mm girth for a width of 500mm on either side of new fence line (LI)	m	40	
	SECURITY FENCING AND GATES, ETC.			
	Security Fence shall be Cochrane ClearVu or other approved fencing system as supplied by Cochrane steel Products, 125 Fitter Road, Sartan, Johannesburg, Tel No. +27 11 394 1788, Fax +27 11 975 7729, www.cochrane.com, Email:lcochrane@cochranesteel.co.za			
	SECURITY FENCING (WORK GROUP 136)			
	Fence shall be high density anti-climbing and anti-cut pressed mesh panel fencing 2.40m high, formed of 3mm diameter horizontal and 4mm diameter vertical high tensile wires galvanised Marine Fusion Bonding coating. Flanged to be 70 degrees on the sides, top bend to be 90 degrees to allow for toppings. Toe bend to be 30 degrees. Aperture size 76.2mm x 12.7mm. Reinforcing V-section ribs, bolted with vandal resistant bolts and clamping plates.			
	Security Fencing type ClearVu "Invisible Wall" or other approved Galvanised Marine Fusion Bond coated acid modified security fencing erected and constructed strictly in accordance with the manufacturer's instructions and specifications.			
4	ClearVu Invisible Wall Panels 2.4m High perimeter 3.5mm wire fencing in panels 3.305m long fixed to post (elsewhere measured)	m	40	
5	76 x 76 x 3mm Powder coated mild steel tubing post 3.0m high with sealed end cap, with post bedded in concrete (concrete elsewhere)	No	13	
6	85 - 45mm Powder coated taper locking post 3.0m high including locking recess mechanism at 3.382m centres with sealed end cap. 30 x 3mm x 250mm long angle section base anchors with post bedded in concrete base (concrete base elsewhere)	No	2	
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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 5
SECURITY FENCING (PROVISIONAL)

7	100mm High powder coated castle spike fixed to top of fencing	m	40	
8	Bitumen dipped anti-burrow 600mm deep including excavation, back filling, etc.	m	40	
	Gates as per Cochrane or other approved Galvanised Marine Fusion Bond coated acid modified gates erected and constructed complete strictly in accordance with the manufacturer's instructions and specifications.			
9	3.10 x 2.40m Powder coated double swing gate in two equal leaves formed with panels as per fencing and hung to steel post including locking and handle mechanism as per Architects detail (Drawing no. 3372/B/501)	No	1	
	UNREINFORCED CONCRETE (WORK GROUP 110)			
	Concrete bases:			
10	500 x 500 x 600mm Cement concrete (15MPa/19mm) base to gate posts, top surfaces smoothed down from post to the ground and rounded on salient angles and flushing with ground level, including necessary excavation, backfilling, ramming and formwork.	No	15	
	Sundries:			
11	Two coats tar on end of fence post 500mm long and 30 x 3 x 250mm long angle section base anchor.	No	15	
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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 5
SECURITY FENCING (PROVISIONAL)

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EXTERNAL WORKS (PROVISIONAL)

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SECURITY FENCING (PROVISIONAL)

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EXTERNAL WORKS (PROVISIONAL)
Bill No. 5
SECURITY FENCING (PROVISIONAL)

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SECTION NO. 4:

BILL NO. 6

WATER SUPPLIES IN GROUND (PROVISIONAL)

The Tenderer is referred to the relevant Clauses in the Standard Preambles to all Trades and to the Supplementary Preambles which are incorporated at the back of these Bills of Quantities.

Note: A colour scheme comprising colours and the blending of colours approved by the Principal Agent shall be used for the paintwork and the Contractor must allow for this in his pricing. Colour samples of the finishing coats shall be provided in all cases. Under no circumstance will there be an adjustment of rates for any colour whatsoever specified.

SUPPLEMENTARY PREAMBLES

uPVC pressure pipes and fittings:

Pipes for water supply shall be of the class stated

Pipes of 40mm diameter and smaller shall be plain ended with solvent welded uPVC loose sockets and fittings

Pipes of 50mm diameter and greater shall have sockets and spigots with push in type integral rubber ring joints.

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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

Copper pipes:

Pipes shall be hard drawn and half-hard pipes of the class stated. Class 0 (thin walled hard drawn) pipes shall not be bent. Class 1 (thin walled half-hard), class 2 (half-hard) and class 3 (heavy walled half-hard) pipes shall only be bent with benders with inner and outer formers. Fittings to copper waste, vent and anti-syphon pipes, capillary solder fittings and compression fittings shall be "Cobra Watertech" type. Capillary solder fittings shall comply with ISO 2016. Only compression fittings shall be used in walls or in ground

Steel pipes:

Pipes shall be galvanised steel with wall thickness; 80mm diameter (3.5mm thick walled), 100mm diameter (3.9mm thick walled), 150mm diameter pipe (4.2mm tick walled). Above ground fire shall be painted signal red to differentiate them from the domestic water pipework.

Fixing of pipes

Unless specifically otherwise stated, descriptions of pipes shall be deemed to include fixing to walls etc, casting in, building in or suspending not exceeding 1m below suspension level

Reducing fittings

Where fittings have reducing ends or branches they are described as "reducing". In the case of pipes with diameters not exceeding 60mm only the largest end or branch size is given. Should the contractor wish to use other fittings and bushes or reducers he may do so on the understanding that no claim in this regard will be entertained. In the case of pipes with diameters exceeding 60mm all sizes are given and no claim for extra bushes, reducers, etc will be entertained

Excavations

No claim for rock excavation will be entertained unless the contractor has timeously notified the quantity surveyor thereof prior to backfilling

Carried to Collection R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

	"Soft rock" and "hard rock" shall be as defined in "Earthworks"			
	Laying, backfilling, bedding, etc. of pipes			
	Pipes shall be laid and bedded and trenches shall be carefully backfilled in accordance with manufacturers' or Engineer's instructions			
	Where no manufacturers' instructions exist pipes shall be laid in accordance with the Engineer's specification.			
	The Tenderers should note that most of the pipes for fire and water reticulation are laid together in the same trenches and such pipes are measured excluding excavation and filling. The excavation and filling for such pipes are measured separately. Tenderers should take note of that to avoid pricing for the excavation and filling twice in such instances.			
	DOMESTIC WATER RETICULATION			
	ALTERATIONS (WORK GROUP 102)			
1	Locate, excavate, expose and cut into existing 100mm diameter water pipe for new valve chamber (elsewhere measured) (LI)	No	5	
2	Locate, excavate, expose and protect existing 100mm diameter water pipe during installation of new pipeline (LI)	No	14	
3	Locate, excavate, expose the pipe installation of the previous contractor(LI)	No	25	
	Take out and remove water piping, etc, including support, hangers, etc, disconnecting piping from fittings and making good wall and floor finishes			
4	80mm Diameter copper piping including fittings, supports and brackets (LI)	m	1,520	
5	110mm Diameter copper piping including fittings, supports and brackets (LI)	m	225	
	Carried to Collection			R

	Core drilling of hole into existing concrete tank and connecting pipes, etc.			
6	Core into existing reinforced concrete tank not exceeding 250mm thick for 100mm galvanised steel pipe, including preparing surface and applying "Sikagrout - 212" before casting 600 x 500 x 200mm thick thrust block at outlet secured with 12mm steel dowels drilled to tank and other end cast into thrust block and apply "Sika Cemflex" waterproofing around pipe to ensure water tightness (LI)	No	1	
7	Core into existing reinforced concrete tank not exceeding 250mm thick for 200mm galvanised steel pipe, including preparing surface and applying "Sikagrout - 212" before casting 600 x 500 x 200mm thick thrust block at outlet secured with 12mm steel dowels drilled to tank and other end cast into thrust block and apply "Sika Cemflex" waterproofing around pipe to ensure water tightness (LI)	No	1	
8	Budgetary allowance of R250,000.00 (Two Hundred and Fifty Thousand Rand) for rectifying defect work from previous contract			SUM
	EARTHWORKS (WORK GROUP 104)			
9	Excavate in earth not exceeding 1m deep for pipes trenches (LI)	m3	57	
10	Excavate in earth exceeding 1m and not exceeding 2m deep for pipe trenches (LI)	m3	352	
11	Extra over excavation in earth for pipe trenches, etc for excavation in soft rock	m3	56	
12	Extra over excavation in earth for pipe trenches, etc for excavation in hard rock	m3	43	
13	Backfilling to pipe trenches with selected excavated materials compacted to 90% Mod AASHTO density (LI)	m3	394	
14	Selected imported granular grade 0.6 - 19mm non-cohesive filling in bedding under and filling around pipes (LI)	m3	285	
	Carried to Collection			R

15	Selected imported G1 crushed stone in filling to excavation compacted to 93% MOD. AASHTO Density (LI)	m3	32	
16	19mm Crushed stone bedding around pipes (LI)	m3	61	
	WATER RETICULATION (WORK GROUP 146)			
	Class 2 copper pipes for domestic plumbing service, flanged at one end:			
17	80mm Diameter pipe fixed to walls, etc	m	40	
	Extra over copper pipes for the following fittings:			
18	80 x 75mm Capillary coupler	No	3	
	Galvanised steel pipes with and including screwed and socketed joints			
19	80mm Diameter pipe fixed to walls, etc	m	101	
20	100mm Diameter pipe fixed to walls, etc	m	18	
21	150mm Diameter pipe fixed to walls, etc	m	6	
22	200mm Diameter pipe fixed to walls, etc	m	4	
	Take from store existing galvanised steel piping and install as per engineering drawings. All pipes to be thoroughly cleaned and inspected by the contractor before installation.			
23	80mm Diameter pipe fixed to walls, etc	m	100	
24	100mm Diameter pipe fixed to walls, etc	m	15	
25	150mm Diameter pipe fixed to walls, etc	m	300	
26	200mm Diameter pipe fixed to walls, etc	m	20	
	Extra over galvanised steel pipes for the following fittings:			
27	80mm Elbow or bend	No	5	
28	80mm Flanged bend	No	1	
	Carried to Collection			R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

29	80mm Bend flanged at one end	No	1
30	100mm Elbow or bend	No	7
31	100mm Bend flanged at one end	No	10
32	100mm Bend flanged at both ends	No	1
33	150mm Elbow or bend	No	2
34	150mm Bend flanged at one end	No	1
35	200mm Bend flanged at one end	No	1
36	80mm Flanged equal Tee	No	9
37	80mm Grooved equal Tee with coupling	No	3
38	80mm Flanged and grooved equal Tee	No	1
39	80mm Flanged adaptor nipple with coupling	No	4
40	100mm VJ coupling	No	1
41	100mm NB VJ flange adaptor	No	1
42	100mm Flanged adaptor nipple with coupling	No	7
43	100 x 80mm Flanged reducer	No	4
44	150 x 80mm Flanged reducer	No	3
45	200 x 100 NB flanged concentric reducer	No	2
46	100 x 80mm Grooved reducer with coupling	No	1
47	100 x 80mm Grooved reducing Tee with couplings	No	1
48	150 x 100mm Grooved reducer with couplings	No	2
49	200 x 100mm Grooved reducer with couplings	No	1

Carried to Collection

R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

	Take from store existing galvanised steel fittings and install as per engineering drawings. All fittings to be thoroughly cleaned and inspected by the contractor before installation.			
50	80mm Elbow or bend	No	4	
51	80mm Grooved bend with couplings	No	71	
52	100mm Bend grooved at ends	No	14	
53	150mm Elbow or bend	No	2	
54	150mm Grooved Elbow or bend	No	10	
55	150mm Grooved coupling	No	120	
56	200mm Bend grooved one end	No	8	
57	100mm Grooved equal Tee and flanged at one end	No	5	
58	100mm Grooved equal Tee with coupling	No	28	
59	150mm Grooved equal Tee and flanged at one end	No	5	
60	100 x 80mm Flanged SG Iron reducer grooved with coupling	No	18	
	Take from store existing cast iron steel fittings and install as per engineering drawings. All fittings to be thoroughly cleaned and inspected by the contractor before installation.			
61	110mm Cast Iron Tee	No	4	
62	160mm Cast Iron Tee	No	12	
63	200mm Cast Iron Tee	No	9	
64	200x110m Cast Iron reducer	No	4	
65	200x150mm reducer	No	1	
	Galvanised steel pipes:			
66	100mm Diameter spool piece, 425mm long flanged at one end	No	1	
	Carried to Collection			R

67	100mm Diameter spool piece, 500mm long flanged both ends	No	1		
68	100mm Diameter pipe piece, 1200mm long grooved at both ends	No	1		
69	100mm Diameter pipe piece, 2000mm long grooved both ends	No	1		
70	100mm Diameter pipe piece, 1000mm long flanged on both ends	No	1		
71	100mm Diameter pipe piece, 1500mm long flanged on both ends	No	1		
72	100mm Diameter NB Puddle pipe, 750mm long, puddle flanged centred and flanged at both ends	No	2		
73	200mm Diameter pipe piece, 500mm long flanged on one end	No	1		
	Galvanised steel pipes grooved at both ends with couplings:				
74	80mm Diameter pipe piece, 2000mm long grooved at both ends with couplings fixed to walls etc.	No	4		
75	80mm Diameter pipe piece, 4000mm long grooved at both ends with couplings fixed to walls etc.	No	6		
76	100mm Diameter pipe piece, 2000mm long grooved at both ends with couplings fixed to walls, etc.	No	5		
77	100mm Diameter pipe piece, 4000mm long grooved at both ends with couplings fixed to walls, etc.	No	8		
	Galvanised steel pipes grooved with coupling and flanged at one end:				
78	80mm Diameter pipe piece, 500mm long grooved at one end with coupling and flanged at one end fixed to walls etc.	No	4		
79	100mm Diameter pipe piece, 500mm long grooved at one end with coupling and flanged at one end fixed to walls etc.	No	3		
	Carried to Collection			R	

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

	Galvanised steel pipes grooved at one end with "Viking Johnson" coupling:			
80	80mm Diameter pipe piece, 500mm long grooved at one end with "Viking Johnson" with couplings etc.	No	13	
	Galvanised steel pipes flanged at one end with "Viking Johnson" with coupling:			
81	80mm Diameter pipe piece, 500mm long flanged at one end with "Viking Johnson" with couplings etc.	No	26	
	Galvanised steel pipes flanged at both ends:			
82	150mm Diameter pipe piece, 5000mm long flanged at both ends walls, etc.	No	4	
	Galvanised mild steel pipes grooved at ends with couplings:			
83	150mm Diameter pipe piece, 1000mm long grooved at ends with couplings fixed to walls, etc.	No	2	
	Joints including all necessary saddles, tees, reducers, adaptors, etc. and cutting into existing lines			
84	Joint 80mm copper bend to 80mm copper pipe	No	5	
85	Joint 80mm Copper flanged adaptor nipple with coupling to copper pipe	No	18	
86	Joint 80mm grooved cross with couplings to copper pipe	No	2	
87	Joint 80mm grooved equal Tee with couplings to copper pipe	No	11	
88	Joint 80mm pipe flanged at one end with Viking Johnson with coupling to copper pipe	m	48	
89	Joint 80mm pipe flanged at one end	m	40	
90	Joint 80mm pipe flanged at one end 4000mm long	No	10	
91	Joint 80mm pipe grooved at one end with Viking Johnson with coupling	m	22	
92	Joint 80mm Flanged RSV gate valve to copper pipe	No	25	
	Carried to Collection			R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

	High density polyethylene class 10 pressure pipes including jointing with approved type fittings and couplings:			
	High density black polyethylene pressure pipes in accordance with SABS 533 Part II and unplasticised polyvinyl chloride pressure pipe fittings in accordance with SABS 966 and to the approval of the Principal Agent.			
	Prices are to include for all cuttings and excavation in ALL types of ground, filling in and ramming to ground level and laying in strict accordance with the manufacturers instructions.			
	Note: Diameters of pipes and fittings are outside diameters.			
93	32mm Diameter high density polyethylene Class 10 pressure piping and laying in ground	m	12	
94	50mm Diameter high density polyethylene Class 10 pressure piping and laying in ground	m	10	
	Extra over Class 10 HDPE pipes for the following fittings:			
95	32mm Elbow or bend	No	1	
96	50mm Elbow or bend	No	4	
97	50 x 32mm Reducer	No	3	
98	50mm Flanged adaptor	No	6	
	Brass valves, etc., including joints to pipes and fittings:			
99	75mm Diameter Socketed RSV Gate Valve	No	2	
100	80mm 'Vent - O - Mat' Flanged Air valve T/16 RBX1601	No	16	
101	100mm Diameter flanged RSV Gate Valve	No	6	
102	100mm Diameter grooved RSV Valve	No	1	
	Carried to Collection			R

103	100mm Ductile Iron non-rising spindle hand wheeled gate valve flanged	No	1	
104	100mm "Elster Kent H4010" inline strainer or similar approved	No	1	
105	100 NB "Elster Kent H4000" water meter or other approved	No	1	
106	110mm Non-return valve	No	1	
107	160mm Isolation valve	No	5	
108	"025 LW 16" Variant Double-Acting Air valve or similar approved with 25mm M/F brass ball valve	No	1	
109	50mm "Elster Kent" or other approved water meter 200mm long including all fittings to pipework	No	1	
	Take from store existing brass valves, etc., including joints to pipes and fittings and install as per engineering drawings. All fittings to be thoroughly cleaned and inspected by the contractor before installation.			
110	80mm Diameter flanged RSV Gate Valve	No	5	
111	110mm Diameter Socketted RSV Gate Valve	No	3	
112	160mm Non-return valve	No	1	
113	160mm Isolation valve	No	4	
114	200mm Isolation valve	No	4	
	Stop valve boxes, etc:			
115	Excavate for and build stop valve box size 250mm diameter x 1500mm deep comprising of 250mm diameter uPVC sleeve on and including 1105 x 450 x 200mm thick 15MPa/19mm concrete base and 800 x 800 x 300mm concrete collar, with CI valve box Type 3B cast into collar and projecting 8mm above slab including excavation, filling and ram around (Refer to Engineer's drawing no. 15406/7830)	No	11	
	Carried to Collection			R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

	The following in water meter manhole of 150mm thick 25MPa/15mm reinforced concrete base with and including mesh ref 193 to base, one brick walls in NFX hard burnt clay bricks rendered internally and including 3:1 cement screed to falls and 150mm thick 25MPa/15mm reinforced concrete roof slab with and including mesh ref 193 to roof slab with rebated opening for cast iron cover and frame (elsewhere) and with two 15MPa/19mm unreinforced concrete anchor blocks each 580mm long, 230mm wide and 710mm high for external walls and with two 330 x 330 x 350mm high brick piers inside chamber to carry water meter and isolating valves, including all excavations, backfilling, carting away, etc:			
116	Water meter chamber size 3740 x 2460mm and exceeding 1500mm and not exceeding 2000mm deep internally (Refer to Engineer's drawing no. 15406/7328)	No	1	
	Covers etc			
117	900 x 600mm Mild steel double seal manhole cover and frame to detail, frame bolted to concrete slab and bedded in 1-3 cement mortar and the cover set in grease (Refer to Engineer's drawing no. 15406-7910)	No	1	
118	1050 x 700mm Mild steel double seal manhole cover and frame to detail, frame bolted to concrete slab and bedded in 1-3 cement mortar and the cover set in grease (Refer to Engineer's drawing no. 15406-7910)	No	1	
119	1500 x 1000mm Mild steel double seal manhole cover and frame to detail, frame bolted to concrete slab and bedded in 1-3 cement mortar and the cover set in grease (Refer to Engineer's drawing no. 15406-7910)	No	1	
	Municipal connection			
120	Provide an amount of R50 000.00 for connection fees to the Municipal Water supply and leave in perfect working condition		Item	
121	Allow for profit on the above		Item	
	TESTING			
	Carried to Collection			R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

	Testing:				
122	Allow for testing the whole of the water supplies installation of the previous contractor to the satisfaction of the Principal Agent and Local Authorities. All defective work is to be taken out and replaced at the rates in the Bills of quantities and the whole re-tested until found perfect		Item		
123	Allow for testing the water supplies installation of the previous contractor to the satisfaction of the Engineer with an approved gas detection test. Gas detection allowance measured per volume of pipe. To be re-measured on site. Gas detection testing only to take place upon the instruction of the Engineer	m3	20		
124	Allow for testing the whole of the water supplies to the satisfaction of the Principal Agent and Local Authorities. All defective work is to be taken out and replaced at the Contractor's expense and the whole re-tested until found perfect		Item		
	FIRE RETICULATION (WORK GROUP 146)				
	Copper pipes:				
	Pipes shall be hard drawn and half-hard pipes of the class stated. Class 0 (thin walled hard drawn) pipes shall not be bent. Class 1 (thin walled half-hard), class 2 (half-hard) and class 3 (heavy walled half-hard) pipes shall only be bent with benders with inner and outer formers. Fittings to copper waste, vent and anti-syphon pipes, capillary solder fittings and compression fittings shall be "Cobra Watertech" type. Capillary solder fittings shall comply with ISO 2016. Only compression fittings shall be used in walls or in ground				
	Steel pipes:				
	Pipes shall be galvanised steel with wall thickness; 80mm diameter (3.5mm thick walled), 100mm diameter (3.9mm thick walled), 150mm diameter pipe (4.2mm tick walled). Above ground fire shall be painted signal red to differentiate them from the domestic water pipework.				
	Carried to Collection			R	

	Class 2 copper pipes for fire plumbing service, flanged at one end and painted signal red:			
125	50mm Diameter pipe fixed to walls, etc	m	210	
	Extra over copper pipes for the following fittings:			
126	50mm Bend	No	105	
127	50mm Equal Tee	No	50	
	Joints including all necessary saddles, tees, reducers, adaptors, etc. and cutting into existing lines			
128	Joint 50mm copper pipe to 50mm steel pipe	No	85	
	Galvanised steel pipes with and including screwed ends and socket jointed together with red lead and hemp fixed to support, wall or in roof structure:			
129	80mm Diameter pipe fixed to walls, etc	m	517	
130	100mm Diameter pipe fixed to walls, etc	m	264	
131	150mm Diameter pipe fixed to walls, etc	m	246	
	Take from store existing galvanised steel piping and install as per engineering drawings. All pipes to be thoroughly cleaned and inspected by the contractor before installation.			
132	80mm Diameter pipe fixed to walls, etc	m	278	
133	100mm Diameter pipe fixed to walls, etc	m	39	
134	150mm Diameter pipe fixed to walls, etc	m	438	
	Extra over galvanised pipes for the following fittings:			
135	80mm Elbow or bend	No	85	
136	100mm Elbow or bend	No	3	
137	150mm Flanged bend	No	2	
	Carried to Collection			R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

138	100mm Tee or reducing tee	No	49	
139	150mm Tee or reducing tee	No	75	
140	80mm Reducer	No	85	
141	100mm Reducer	No	1	
142	100mm End cap	No	2	
143	100mm Grooved equal Tee with coupling	No	2	
144	150 x 100mm Flanged reducer with coupling	No	2	
145	150 x 100mm Grooved reducing Tee with couplings	No	1	
146	150mm Grooved equal Tee with coupling	No	6	
147	100 x 80mm Flanged reducer	No	8	
148	100mm Bend flanged at one end	No	12	
149	100mm Grooved equal Tee and flanged at one end	No	8	
150	150 x 100mm Grooved reducer	No	4	
151	150 x 80mm Flanged reducer	No	6	
152	150mm Grooved equal Tee and flanged at one end	No	6	
	Galvanised steel pipes grooved at both ends with couplings:			
153	100mm Diameter pipe piece, 5000mm long grooved at both ends with couplings and fixed to wall	No	8	
	Galvanised steel pipes flanged at both ends:			
154	150mm Diameter pipe piece, 5000mm long flanged at both ends and fixed to wall	No	6	
	Joints including all necessary saddles, tees, reducers, adaptors, etc. and cutting into main lines			
155	Joint 50mm mild copper pipe to 50mm class 10 HDPE pressure pipe	No	124	

Carried to Collection R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

	High density polyethylene class 10 pressure pipes including jointing with approved type fittings and couplings:			
	High density black polyethylene pressure pipes in accordance with SABS 533 Part II and unplasticised polyvinyl chloride pressure pipe fittings in accordance with SABS 966 and to the approval of the Principal Agent.			
	Prices are to include for all cuttings and excavation in ALL types of ground, filling in and ramming to ground level and laying in strict accordance with the manufacturers instructions.			
	Note: Diameters of pipes and fittings are outside diameters.			
156	50m Diameter high density polyethylene Class 10 pressure piping and laying in ground	m	516	
	Extra over Class 10 HDPE pipes for the following fittings:			
157	50mm Elbow or bend	No	39	
158	50mm Straight adaptor for copper	No	105	
	Brass valves, etc., including joints to pipes and fittings:			
159	80mm 'Vent - O - Mat' Flanged Air valve	No	14	
160	150mm Non-return valve	No	1	
161	315mm Diameter Socketed RSV Gate Valve	No	4	
	Overhead pipe support			
162	Excavate for and cast 25Mpa/19mm mass concrete pedestal approximately 300 x 300mm wide at the base and 240 x 240mm wide at top x 1.5m high overall with all surfaces smooth in 3:1 cement mortar with top corners chamfered at 1:10 including all formwork, concrete, etc. (Refer to Engineer's drawing no. 15406-7840)	No	106	
	Carried to Collection			R

163	80mm Diameter hollow section galvanised mild steel column post approximately 2.55m high with 120 x 120 x 6mm flat section base plate welded on and cast in concrete and 210 x 210 x 6mm top plate welded on and holed twice for 10mm U-bracket to receive 80mm diameter steel pipe including 5mm neopreen packing, 2 x 50mm gasket, etc. (concrete and steel pipe elsewhere measured) (Refer to Engineer's drawing no. 15406-7840)	No	20	
164	100mm Diameter hollow section galvanised mild steel column post approximately 2.55m high with 120 x 120 x 6mm flat section base plate welded on and cast in concrete and 210 x 210 x 6mm top plate welded on and holed twice for 10mm U-bracket to receive 100 - 150mm diameter steel pipe including 5mm neopreen packing, 2 x 50mm gasket, etc. (concrete and steel pipe elsewhere measured) (Refer to Engineer's drawing no. 15406-7840)	No	86	
165	50 x 50 x 5mm Angle iron roof mounted support bracket, constructed with a 550mm long horizontal member, 550mm long vertical member and a connecting diagonal member, welded to and on a 80x120mm, 8mm thick base plate two times holed for and included 2no. M12 bolts. Finish to match existing. All as per Engineers detail included on CD.	No	100	
166	50 x 50 x 5mm Angle iron wall mounted support bracket, constructed with a 425mm long horizontal member, 350mm long vertical member and a connecting diagonal member. The vertical member is three times holed for and including 3no. M12 anchor bolts. Finish to match existing. All as per Engineers detail included on CD.	No	100	
	Fire fighting equipment			
167	Galvanised mild steel key and bar	No	64	
168	Approved, straight through, shielded spindle fire hydrant with 65mm diameter coupling per SABS 1128/SANS 1128-2 complete with operating device jointed to and including 2.5m length of 80mm diameter heavy duty galvanised steel pipe fixed to wall or support and joined to overhead 100mm diameter steel pipe including all joints, bends, flanges, reducing bushing and supported on concrete pedestal, etc. (concrete pedestal and 110mm steel pipe elsewhere measured) (Refer to Engineer's drawing no. 15406-7862)	No	15	
	Carried to Collection			R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

169	Approved, straight through, shielded spindle fire hydrant with 65mm diameter coupling per SABS 1128/SANS 1128-2 complete with operating device jointed to and including 2.5m length of 80mm diameter heavy duty galvanised steel pipe fixed to wall or support and joined to overhead 150mm diameter steel pipe including all joints, bends, flanges, reducing bushing and supported on concrete pedestal, etc. (concrete pedestal and 150mm steel pipe elsewhere measured) (Refer to Engineer's drawing no. 15406-7862)	No	17	
170	Approved, right angle, shielded spindle above-ground hydrant as per SABS 1128-2/SANS 1128-2 complete including 110 x 63mm HDPE reducer and brass reducer and transition coupler with brass male threaded and brass reducer bush to suit fire hydrant and 80mm tapered thread for B. S. P with operating device jointed to 2.0m long 110mm HDPE pipe including all joints, bends, flanges, etc. (concrete pedestal elsewhere measured) (Refer to Engineer's drawing no. 15406-7862)	No	32	
171	Reinforced 25MPa/19 concrete hydrant composite support including pedestal 750mm high with 400 x 400mm square at base and tapering 200 x 200 overall at top on 800 x 800 x 200mm base and including excavation, formwork, filling and two coats of paint to exposed surfaces (Refer to Engineers drawing no. 15406-7862)	No	32	
172	Reinforced concrete hydrant pedestal 1960 mm high, cast around vertical pipe with bottom 1260mm below ground, 440 x 440mm square at base and tapering to 220 x 220mm overall octagonal shaped top, including excavation, formwork and two coats of paint to exposed surfaces (Refer to Engineer's drawing no. 15406-7862)	No	32	
	Carried to Collection			R

	'Chubb' or other approved:			
173	Everyway non-swinging rotary hose reel complying with SANS 543 with 600mm diameter red enamelled steel side discs, special chromium plated swivelling roller, 30m length of 20mm diameter four-ply high pressure non-kinkable rubber hose, 20mm diameter chromium plated shut-off nozzle cock with chromium plated malleable iron screwdown water control valve and polished wall bracket with three bolts and bolting reel and swivelling roller to wall with ends of bolts cut and pinned to brickwork in 3-1 cement mortar and make good including connecting to 50mm copper water supply pipe	No	85	
174	Everyway non-swinging rotary hose reel complying with SANS 543 with 600mm diameter red enamelled steel side discs, special chromium plated swivelling roller, 30m length of 20mm diameter four-ply high pressure non-kinkable rubber hose, 20mm diameter chromium plated shut-off nozzle cock with chromium plated malleable iron screwdown water control valve and, set up and in position in and including red lockable fibre glass cabinet including connections to 50mm copper water supply pipe and make good plaster and paint or face brick	No	20	
	BOOSTER PUMPS, ETC.			
	Carried to Collection			R

	Take from store existing booster pumps, etc., including joints to pipes and fittings and install as per engineering drawings. All jointing material to be supplied by contractor. All fittings to be thoroughly cleaned and inspected by the contractor before installation.			
175	"NKV 45/2-2T IE3" or other approved booster pump system to operate at approximately 610 litres per minute each to a pressure head of 35 metres with the whole unit comprising of two vertical multi-stage pump units mounted on and including steel base plates bolted onto concrete pedestal (elsewhere measured) together with a three phase 4.0 kilowatt starter panel and a 300 litre pressure tank with both inlet and discharging points to be 50mm galvanised flanged with the whole unit having an optimum operating duty point of 610 litres per minute at 35 metres all to the approval of the Principal Agent	No	2	
	VALVE CHAMBERS, ETC.			
	Fire tank level control chamber			
176	Construct a brickwork fire tank level control chamber overall size 3740mm x 2460mm x 1960mm high, with 150mm thick concrete floor and roof slab, including all excavation, filling, backfilling, brickwork, plastering, waterproofing, concrete, formwork, reinforcing as well as all pipes, fittings and valves, controls, testing and commissioning, complete as per Engineering drawing 15406-7329	No	1	
	TESTING			
	Testing:			
177	Allow for testing the whole of the fire reticulation to the satisfaction of the Principal Agent and Local Authorities. All defective work is to be taken out and replaced at the Contractor's expense and the whole re-tested until found perfect	Item		
	SUNDRIES			
	Carried to Collection			R

	Sleeves to pipes:			
	All PVC-U CL12 and CL34 pipes inside sleeves to be glued with PVC weld cement on the outside 20mm of the socket, such that the rubber seal is not affected.			
	Sleeves to be Hydro-Filled with bedding sand where instructed by the Engineer and sealed off with brick or mass concrete as instructed.			
	Pipes to be clamped to sleeve with clamp and skid at 2.0m centres			
	Class 6 PVC-U pipe in sleeves for pipe not exceeding 100mm external diameter			
178	Sleeve exceeding 5750mm and not exceeding 6000mm long	No	5	
	Precast concrete markers			
	Precast concrete markers (Type 2) should be 35/13 grade concrete finished smooth on all sides and painted with 2 coats "Plascon Evans TP27" or approved ready mixed reflective roadline paint in the following colours:			
	Fire Hydrant - Yellow Valve - Red Pipeline - White			
	Marker letters should be embossed 10mm deep and painted black with letter size 50 x 75mm high and 10mm deep for the following:			
	PL - Pipeline V - Gate valve AV - Air valve SV - Scour valve FH - Fire Hydrant			
179	Type 2 Precast concrete markers including excavation, filling etc. (Refer to Engineer's drawing no. 15406/5000)	No	156	
	STORAGE AND TANK BASES, GENERATOR BASE, ETC.			
	DEMOLITIONS, ETC (WORK GROUP 104)			
	Carried to Collection			R

	Demolishing and removing			
180	Demolish and remove reinforced circular concrete elevated water tank and stand size 5.0m diameter x 25m high including breaking up and removing foundation, fill and ram hole. All work to be done by a Demolition Specialist approved by the Structural Engineer	No	1	
	EARTHWORKS (WORK GROUP 104)			
	Excavation in earth not exceeding 2m deep for:			
181	Reduce levels under solid floors (LI)	m3	21	
182	Base Holes (LI)	m3	388	
	Extra over trench and hole excavations in earth for excavation in:			
183	Soft rock	m3	22	
184	Hard rock	m3	11	
	Keeping excavations free of water:			
185	Allow for keeping all excavations free of water		Item	
	Risk of collapse of excavations:			
186	Vertical sides of excavation for trenches, etc., from ground level to not exceeding 1,5m deep	m2	122	
	Extra only over all excavations for loading and carting away:			
187	Surplus spoil away from site (by volume as measured for excavation - Contractor to make allowance for increase in bulk) (LI)	m3	206	
	Selected earth filling from the excavations deposited in layers not exceeding 150mm thick after compaction and compacted to a density of 95% Modified AASHTO maximum density:			
188	In backfilling to foundations around stub columns or tank base (LI)	m3	203	
	Carried to Collection			R

	Selected granular G5 filling material supplied and carted onto the site by the Contractor and having a plasticity index of less than 12, deposited in layers not exceeding 150mm thick after compaction and compacted to a density of 95% Modified AASHTO maximum density:			
189	In filling under solid floors (LI)	m3	19	
	Compaction of ground surfaces:			
190	Stabilize in-situ reduced levels by scarifying to depth of 150mm and compacting to a density of 90% Modified AASHTO maximum density	m2	566	
	Soil poisoning applied by a registered pest control company and guaranteed against termite infestation for five years:			
191	Ant proofing ground under solid foundations and to vertical sides of excavations.	m2	188	
192	Ant proofing ground under solid floors, and to vertical sides of excavations	m2	566	
	CONCRETE (WORK GROUP 110)			
	Unreinforced Concrete			
	15 MPa/19 mm concrete in:			
193	Elevated domestic water tank base	m3	12	
	Reinforced Concrete			
	25MPa/19mm concrete in:			
194	Generator and tank base	m3	13	
	30MPa/19 mm concrete in:			
195	Elevated domestic water tank base	m3	138	
196	Stub columns	m3	4	
	CONCRETE TESTING (WORK GROUP 110)			
	Carried to Collection			R

	Concrete test cubes:			
197	Allow for all necessary concrete test cubes size 150 x 150 x 150mm cast from batches of concrete required for the entire contract	No	15.00	
	CONCRETE SUNDRIES (WORK GROUP 110)			
	Finishing top of concrete smooth with a Class U2 Wood Float Finish:			
198	Surface beds	m2	278	
	Setting out of holding down bolts:			
199	Grout up solid in 1-1 non-shrink cement grout 25mm thick under steel base plates. (In No. 4)	m2	4	
200	Setting out to and including template and embed set of four holding down bolts (elsewhere measured) in exact position	No	12	
	FORMWORK CLASS F2 (SMOOTH FINISH) (WORK GROUP 111)			
	Formwork (use and waste) to concrete to:			
201	Sides of concrete stub columns	m2	52	
202	Form opening in slab for 300 x 300 x 200mm deep sump	No	1	
	Formwork (use and waste) to concrete to:			
203	Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	87	
	Sundries to formwork:			
204	Extra over formwork to columns for 25 x 25mm triangular fillet planted on to form chamfer.	m	29	
205	Extra over formwork to slabs for 25 x 25mm triangular fillet planted on to form chamfer.	m	26	
206	Extra over formwork to ring beam for 25 x 25mm triangular fillet planted on to form chamfer.	m	42	
	Carried to Collection			R

REINFORCEMENT (WORK GROUP 114)

Steel bar reinforcement to concrete:

207	Mild steel bars in various diameters in reinforcement to bases, etc	t	8.18	
208	High tensile steel bars ditto	t	6.83	

VAPOUR BARRIERS

The following vapour barriers are to be of one layer of 250 microns 'Gunplas USB Green' or other approved damp proof sheeting in accordance with SABS 952 type 'C'.

Care is to be taken to avoid puncturing or tearing the sheeting before and during placing of concrete; any damage to sheeting is to be made good to the satisfaction of the Principal Agent.

Prices are to include for all cutting and waste, laying in single sheets wherever possible, lapping 100mm at all intersections, sealing all laps with hyperlastic adhesive and proofweld flashing tape - all in strict accordance with the manufacturers instructions.

All measurements are nett

One layer of 250 micron 'Gunplas USB Green' or other approved waterproof sheeting sealed at laps with 'Gunplas Pressure Sensitive Tape'

209	Under concrete surface beds including turning up edges against earthfilling.	m2	46	

METALWORK (WORK GROUP 136)

Galvanised mild steel:

210	30mm Diameter galvanised mild steel holding down bolt 1300mm long overall with one end threaded and fitted with nut and two washers and other end bend at 90 degree for a length 150mm including creating 80 x 80 x 200mm pockets in concrete around holding down bolts (Refer to Engineer's drawing no. 15406/S/1001)	No	48	

Carried to Collection R

	GALVANISED STEEL TANK (WORK GROUP 136)			
	Approved sectional galvanised water tank and tank stand:			
211	Supply and install an approved 719 000 litres pressed steel water tank complete with 30m high galvanised steel tank stand and all necessary pipe connections, vented manhole cover, external and internal ladders, water level indicator, valves, balancing valves, platforms, safety cat ladder, walkway with safety handrail all round tank, all accessories, etc., including all controls, pipework, necessary fixings and hoisting and fixing tank on tank stand on holding down bolts (elsewhere measured) and testing and commissioning.	No	1	
	Loop outlet to existing ground level galvanised reservoir:			
212	Supply and install a complete loop pipe outlet complete with and including 500 x 500 x 300mm deep reinforced concrete base to the existing ground level galvanised reservoir as per the Engineers detail included on CD.	No	1	
	OPERATING AND MAINTENANCE MANUALS (WORK GROUP 146)			
213	Complete and supply complete set of operating and maintenance manuals (3 copies required)	Sets	3.0	
214	Compile and supply a complete key plan, "As-Built drawings" (3 copies required)	Sets	3.0	
	CONTRACTUAL MAINTENANCE (WORK GROUP 146)			
215	Maintenance and guarantee of the entire installation for a period of 12 months as specified.		Item	
216	Monthly visits to site for inspection, services, testing and updating logbook of the complete system, as specified	No	12	
	TRAINING (WORK GROUP 146)			
217	Allow for training of employer's operators to enable them to be responsible for and capable of operating the plant and installation		Item	
	Carried to Collection			R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

TESTING

Testing:

218	Allow for testing the whole of the fire and water supplies to the satisfaction of the Principal Agent and Local Authorities. All defective work is to be taken out and replaced at the Contractor's expense and the whole re-tested until found perfect	Item		

Carried to Collection R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

Section No. 4

EXTERNAL WORKS (PROVISIONAL)

Bill No. 6

WATER SUPPLIES (PROVISIONAL)

COLLECTION

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Section No. 4

EXTERNAL WORKS (PROVISIONAL)

Bill No. 6

WATER SUPPLIES (PROVISIONAL)

COLLECTION

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Section No. 4
EXTERNAL WORKS (PROVISIONAL)
Bill No. 6
WATER SUPPLIES (PROVISIONAL)

SECTION SUMMARY - EXTERNAL WORKS (PROVISIONAL)

Bill No		Page No	Amount
1	GENERAL SITEWORKS, ETC. (PROVISIONAL)	73	
2	APRONS AND WALKWAYS (PROVISIONAL)	79	
3	ROADS AND PAVING (PROVISIONAL)	84	
4	RETAINING WALLS (PROVISIONAL)	89	
5	SECURITY FENCING (PROVISIONAL)	93	
6	WATER SUPPLIES (PROVISIONAL)	122	

Carried to Final Summary R

Section No. 4
EXTERNAL WORKS (PROVISIONAL)

FINAL SUMMARY

Section No		Page No		Amount
1	PRELIMINARIES AND GENERAL	18		
2	BUILDING WORKS	40		
3	ELECTRICAL INSTALLATION & LIGHTNING PROTECTION (PROVISIONAL)	68		
4	EXTERNAL WORKS (PROVISIONAL)	123		
	Sub Total		R	
	ADD: VALUE ADDED TAX		R	
	Carried to Form of Offer and Acceptance		R	

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PART C3. SCOPE OF WORKS

C3.1 SCOPE OF WORKS
GCC FOR CONSTRUCTION WORKS (Edition 2 of 2010)

Scope of Works complied in accordance with SANS 10403 where reference is made to this part of SANS 1921-1:2004

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender no:	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

SECTION 1

1 EXTENT OF THE WORKS

1.1 EMPLOYERS OBJECTIVES

The project objective is to provide a new water and fire lines, improved storage system that will increase the efficiency of the network and also to comply with the latest National Building Regulations and regulations for pressurized vessels. It is anticipated that this work will be completed within 15 months.

1.2 OVERVIEW OF THE WORKS

Upgrade existing bulk water and fire reticulation by installing new pipes, water tanks, fire hydrants and associated ancillary works

1.3 EXTENT OF THE WORKS

The contract comprises of: New water and fire lines, repairs to existing pump house and reservoir, new pump house and reservoirs, perimeter fence, etc.

1.4 LOCATION OF THE WORKS

The site is situated within the premises of the Madadeni Hospital at Madadeni in Newcastle.
GPS Co-ordinates for the site is 27° 45' 50.94"S and 30° 03' 08.136"E is
.....

1.5 TEMPORARY WORKS

All temporary work to comply with the Occupational Health and safety Act (Act 85 of 1993)

2 ENGINEERING

2.1 EMPLOYER'S DESIGN

Design done by the consulting team on behalf of the Employer. Copies of the drawings are attached to these bills of quantities.

2.2 DESIGN BRIEF

Upgrades of existing water and fire reticulation including improved water storage facilities

2.3 DRAWINGS

See list of drawings/Annexure's attached to this document.

2.4 DESIGN PROCEDURES

Not applicable

3 PROCUREMENT

3.1 PREFERENTIAL PROCUREMENT PROCEDURES

This tender will be subject to the implementation of the Preferential Procurement Regulations, 2017 pertaining to the Preferential Procurement Policy Framework Act, Act Number 5 of 2000 and the relevant Supply Chain Management Legislation and the KwaZulu-Natal Supply Chain Management Policy Framework published by the KwaZulu-Natal Provincial Treasury. Tenderders are referred to www.kzntreasury.gov.za for access to the relevant documents.
Tenderders are advised to familiarize themselves with the contents of the KwaZulu-Natal Supply Chain Management Policy Framework regarding Preference Point Systems, evaluation of tenders appeals and other matters.

3.2 RESOURCE STANDARD PERTAINING TO TARGETED PROCUREMENT

NOTE : This project will be adjudicated as not exceeding R 50,000 000,00

3.3 SCOPE OF MANDATORY SUBCONTRACT WORK

Not applicable

3.4 PREFERRED SUBCONTRACTORS/SUPPLIERS

Contractors from the Eyesizwe Contractor Development Programme database

3.5 SUBCONTRACTING PROCEDURES

Tenderer to indicate the names of sub-contractors and the activities in each sub-contract work. The Tenderer is required to sub-let 30% of the works to domestic sub-contractors as per treasury regulations.

4 CONSTRUCTION

4.1 APPLICABLE SANS 2001 STANDARDS FOR CONSTRUCTION WORKS

The Contractor is referred to the "Model Preambles to Trades - 2008", any "Supplementary Preambles", the Electrical Specifications and Mechanical Specification for full descriptions of materials and methods referred to in these Bills of Quantities/Lump Sum documents, insofar as they apply. The Contractor is advised to study the "Standard Preambles to all Trades", any "Supplementary Preambles", the Electrical Specifications and Mechanical Specification, before pricing Bills of Quantities/Lump Sum documents.

Where the description in the Bills of Quantities/Lump Sum documents differ from those in the Standard Electrical Specifications, the descriptions in the Bills of Quantities/Lump Sum documents are to apply. No claim whatsoever will be allowed in respect of errors in pricing due to brevity of description of items in the Bills of Quantities/Lump Sum documents which are fully described when read in conjunction with the relevant Preambles and/or Specifications. Suppliers of materials and the like, whose quality systems apply with one or more of the SABS/SANS ISO 9000 Series should be used whenever possible in the absence of a particular SABS/SANS Specification Standard Mark.

Wherever the words "shall be deemed to be included in the description", "shall be stated" or other words having the same effect, appear in the Standard System, it shall be deemed that all descriptions in these Bills of Quantities/Lump Sum documents incorporated such inclusions and statements whether specifically stated or not.

The Contractor is hereby informed that where SABS/SANS Specifications are referred to in these Bills of Quantities/Lump Sums documents and Specifications thereto, then ONLY the Specification of Work Clauses will apply. The method of measurement and payment clauses will NOT apply to this Contract.

The Contractor is hereby informed that risk of collapse and keeping excavations free from water (excluding subterranean water) generally are deemed to be included in the descriptions unless accommodated in the system of measurement. Please refer to the Geotechnical Investigation report when included at the end of these tender documents.
Whenever reference is made to "Sub-Contractor", "Nominated Sub-Contractor" or the like in the specifications included or referred to in these Bills of Quantities/Lump Sums documents, it shall be deemed to mean "Contractor" as defined.

4.2 APPLICABLE NATIONAL AND INTERNATIONAL STANDARDS

See above 4.1

4.3 PARTICULAR / GENERIC SPECIFICATIONS

The Contractor is referred to the following documents whether attached to this document or not:

SPECIFICATION	PAGES
Specification for HIV/AIDS Awareness (CIDB)	HIV1 TO HIV3
Specific Construction, Safety, Health and Environmental Plan	
Standard Preambles for all Trades (Rev 3) - DOH 2009	1 to 95
General Electrical Specification	E/1 to E/20
Lightning Protection Installation	LP/1 to LP/6

4.4 CERTIFICATION BY RECOGNIZED BODIES

Only contractors registered with the Electrical Contracting Board of South Africa in accordance with the Regulations of the Occupational Health and Safety Act will be accepted and permitted to do work under this contract.

4.5 AGRÉMENT CERTIFICATES

Not applicable

4.6 PLANT AND MATERIAL PROVIDED BY THE EMPLOYER

Not applicable

4.7 SERVICES AND FACILITIES PROVIDED BY THE EMPLOYER

Not applicable

4.8 OTHER SERVICES AND FACILITIES

The Contractor shall provide any artificial lighting which may be necessary or required for the proper execution of the works, and provide electric power and water required by all Sub-Contractors, Nominated Sub-Contractors and Sub-Contractors appointed directly by the Administration.
The Contractor shall give all notices and pay all fees in connection with temporary electrical and water connections and shall connect temporary Electrical and Water meters for and pay for all current and water consumed.
The Contractor is advised that the permanent light fittings and water points of any kind installed in the Works are not to be used to provide temporary lighting and supplement water requirements for construction purposes.

5 MANAGEMENT

5.1 APPLICABLE SANS 1921 STANDARDS

Tenderders are referred to
SECTION 2 : SPECIFICATION DATA ASSOCIATED WITH SANS 1921-1:2004 IN THIS DOCUMENT

5.2 RECORDING OF WEATHER

The Contractor shall keep record of abnormal climatic conditions to facilitate the adjudication of claims for extension of the contract period.

The Contractor shall allow in his programme for the following number of days for rain days (rain > 10mm per day) as per the table below:

CURRENT YEAR			YEAR + 1	YEAR + 2
January	w/days		3	3
February	w/days		3	3
March	w/days		3	3
April	w/days		3	3
May	w/days		3	3
June	w/days		3	3
July	w/days		3	3
August	w/days		3	3
September	w/days	3	3	3
October	w/days	3	3	3
November	w/days	3	3	3
December	w/days	3	3	3

5.3 MANAGEMENT MEETINGS

In order to facilitate the smooth functioning of the Works and to ensure the closest co-operation between all the parties concerned, the Employer will call for regular meetings to be held on the site, at which a senior member of the Contracting firm and the General Foreman of the Works will always be required to be present.
In addition to the above, other persons will be required to attend these meetings as and when their presence is necessary, e.g., Consultants in all disciplines, representatives of the various Sub-Contractors, etc.
Proper minutes of these meetings will be kept by the Employer\Principal Agent and copies will be circulated to all persons attending the meetings and to others who need to be kept informed.

5.4 FORMS FOR CONTRACT ADMINISTRATION

The Employer shall provide all necessary forms.

5.5 ELECTRONIC PAYMENTS

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

5.6 DAILY RECORDS

The Contractor shall keep daily records of people and equipment employed as well as a site diary in respect of work performed on the site.
At the end of each week the Contractor shall provide the Principal Agent with a written record, in schedule form, reflecting the number and description of tradesmen and labourers employed by him and all Sub-Contractors on the works each day.
At the end of each week the Contractor shall provide the Principal Agent with a written record, in schedule form, reflecting the number, type and capacity of all plant, excluding hand tools, currently used on the works.

5.7 BONDS AND GUARANTEES

The Contractor shall within 10 calendar days after receiving notice from the Engineer and prior to receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the Employer's agent (whose details are given in the contract data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the Contract Data.

5.8 PAYMENT CERTIFICATES

Requirements will be in accordance with the Employers prescriptions.

5.9	**PERMITS** The Contractor is advised that, in the case of an existing building or institution, all security measures in force will remain in operation and he must acquaint himself and his Employees with them as he and his Employees will at all times be subject to these measures. The Contractor will on no account extend his operations beyond the confines of the building site as indicated by the Employer and must ensure that all his Employees are made aware of these limits. Any Employee disregarding this instruction and found outside the limit of the building site without authority, shall be redeployed immediately and shall not again be employed on this Contract. The Contractor will be responsible for ensuring that this instruction is strictly enforced and must provide and remove upon completion or when directed, such other necessary temporary barriers, fences, etc., as may be required and is to allow opposite this item for any charges he may wish to make in this connection. The Employer will accept no responsibility whatsoever for damage to or the loss of plant, materials, etc., from the site.
5.10	**PROOF OF COMPLIANCE WITH THE LAW** The following certificates must be provided before first delivery is taken: - HIV/STI Report (Bound into this document) - Electrical Compliance Certificate - Plumbing Compliance Certificate - Lightning Certificate - Soil Protection Certificate - Concrete test and cube certificates - Waterproofing Guarantee certificates - TR1 and TR2 prefabricated roof truss certificates - Soil compaction certificates - Electrical and Mechanical test certificates - Plumbing and drainage pressure test certificates - Fire Compliance Certificate - Entomology Certificate - SANS 10400-A:2010 compliance certificates - Latest National Building Regulation
5.11	**INSURANCE PROVIDED BY THE EMPLOYER** Not Applicable

SECTION 2

SPECIFICATION DATA ASSOCIATED WITH SANS 1921-2004

Clause Numbers	
4.1.7	**The requirements for drawings, information and calculations for which the Contractor is responsible are:**
	Prefabricated roof trusses design must be submitted for approval 30 days prior to erections.
4.2.1	**The responsibility strategy assigned to the Contractor for the works is:**
	Strategy A
4.2.2	**The structural engineer is:**
	Sivest SA (Pty) Ltd
4.2.3	**Drawings & other info are to be submitted in accordance with the contractors programme**
	Shop drawings for electrical works and prefabricated roof trusses design.
4.3	**The planning, programme and method statement are to comply with the following:**
	Refer to quality criteria T2.34

4.12.1	**Samples of materials**
	The work is to be executed with materials of the best specified and in the most substantial and workmanlike manner under the inspection of the Employer and to his satisfaction. The Contractor shall furnish, without delay, such samples as called for or may be called for by the Employer, who may reject all materials or workmanship not corresponding with the approved sample. The samples of materials, workmanship and finishes that the Contractor is to provide and deliver to the employer are: - Tile sample. - Brick sample. - Light fitting sample. - Screed panel 2m x 2m impact test. - Tested trial mix to be approved by the Engineer.
4.12.2	**Fabrication drawings that the contractor is to provide to the employer are:**
	None
4.12.3	**Office accommodation, equipment, accommodation for site meetings and other facilities for use by the employer and his agents are:**
	OFFICE FOR FOREMAN
	Provide, erect, maintain and remove at completion a suitable temporary office for the Contractor or his Foreman, perfectly secured, lighted and ventilated and having a desk with drawers.
	TELEPHONE
	The Contractor shall provide a telephone on the site for the use of the Contractor and all Sub-Contractors for the duration of the Contract, and must make the necessary application for connection, give all notices and pay all fees, rentals and charges for the service and also for all calls.
	OFFICE FOR INSPECTOR OF WORKS **NOT APPLICABLE**
	Provide, erect, maintain and remove at completion a well constructed temporary office for the Inspector of Works not less than 4 x 3 m on plan and 3 m high to eaves to the approval of the Employer. The office shall be constructed of wood framing covered externally with corrugated iron or corrugated asbestos and with a lean-to roof covered with the same material as the external wall covering. The office shall be lined internally with soft board or other approved material and a ceiling shall be provided of the same material as the internal lining. A suspended wood floor shall be provided and is to finish not less than 300 mm above the ground level. A lockable door and a window, which provides adequate light and ventilation, shall be fitted. An office constructed of 115 mm thick brick-work and provided with a screeded concrete floor and roofed and ceiled as above described may be accepted as an alterative but prior permission of the Employer will be necessary before construction of such an office is commenced and his requirements shall be stated and fulfilled by the Contractor. The office shall be fitted in an approved manner with a sloping topped desk of height and length suitable for the laying out and studying of drawings, a desk or table with not less than two lock-up drawers, shelves, seating and wash-stand, and the Contractor shall provide all necessary attendance.
	TELEPHONE IN OFFICE FOR INSPECTOR OF WORKS **NOT APPLICABLE**
	The Contractor shall arrange for the installation of a lockable telephone in the Office for the Inspector of Works for the duration of the Contract. The Contractor will be required to make the necessary application for connection and give all notices on behalf of the Employer. The Employer will, however, be responsible for the direct payment of all fees, rentals and other charges by Telkom for the service for the Inspector of Works and for all calls made from this telephone.

	SHED
	Provide, erect, maintain and remove at completion, ample temporary sheds for the proper storage of materials and for the use of the workmen, and remove when no longer required.
4.14.6	**The requirement for provision and erection of signboards are:**
	Supply, erect, maintain and remove at completion a painted notice board, size overall 2800 x 2345 mm high sign written to detail as Drawing No. T.9506 which drawing is available from offices of the Department of Public Works. Only the official notice board is to be displayed on the site and no Sub-Contractor's boards will be permitted. The Contractor, at his own cost, may provide a board on which all sub-contract firms' names may be sign written. The notice board is to be to the approval of the Employer and is to be maintained in first class condition and placed where directed at the entrance to the site and remain there for the duration of the Contract.
4.17.1	**Requirement for the termination, diversion or maintenance of existing services:**
	Should the Contractor come in contact with any underground cables or pipes during excavations, immediate notification must be made to the Employer and all work in the vicinity of such cables, pipes, etc., shall cease until authority to proceed has been obtained from the Employer. Should the Contractor damage underground cables or pipes resulting in a disruption of services to an existing institution such damage shall be repaired immediately.
4.17.3	**Services which are known to exist on the site:**
	Existing service including hot water lines, electrical underground cables, water pipes are not identified on the drawings. The tenderer will be expected to take all precuationary measures doing excavtions and execution of the works to avoid damaging any underground services. Any damage to such services will be repaired by the contractor at his own cost.
4.17.4	**Requirement for detection apparatus**
	None
4.18	**ADDITIONAL HEALTH AND SAFETY REQUIREMENTS ARE:**
	By the submission of a tender, any Tenderder will, if awarded the contract to which this tender document relates, be deemed to be the mandatory as envisaged by Section 37 (2) of the Act. As a mandatory the successful Tenderder will be deemed to be the "principal contractor" and an employer in his/her/their own right with duties as prescribed in the Act and accordingly will be deemed to have agreed to be solely responsible for ensuring that in connection with the service to which this tender document relates, all work will be performed and machinery and plant used in accordance with the Act. Should the Contractor, for whatever reason be unable to perform as required by the Act, the Contractor undertakes to inform the Employer accordingly. Tenderders are advised that it is a Condition of this Tender that a 'Construction Phase Safety, Health and Environmental Plan' specifically relates to the project for which tenders are being submitted and must be prepared by the Tenderder and submitted with the other tender documents at the time of tender. Failure to do so Tenderders are therefore advised to study the 'Construction Safety, Health and Environmental Specification' which is issued as part of this tender document, the Model Preambles to Trades - 2008, any project Specification included in this tender document and any and all drawings which are referred to and issued as part of this tender document before preparing their own project specific 'Construction Phase Safety, Health and Environmental Plan' . Tenderders are also advised that such a plan which is submitted with a tender but is incomplete or considered inadequate by the Employer or his Representative will invalidate the tender. The Contractor will be deemed to have satisfied himself with his obligations in terms of the Act and to have allowed for all costs arising from compliance with the Act as no claim for extra costs arising from compliance with, and obligations in terms of the Act will be entertained.
4.22	**WORK BY NOMINATED AND SELECTED SUBCONTRACTORS COMPRISE:**
	NOT APPLICABLE

C3.2 - SPECIFICATION FOR HIV/AIDS AWARENESS

1 Scope

This generic specification contains requirements applicable to the reduction of the risk of transfer of the HIV virus between and among construction workers and the local community through the following four strategies:

a) raising awareness about HIV/AIDS;

b) providing construction workers with access to condoms;

c) HIV counselling, testing and referral services; and

d) Sexually Transmitted Infection diagnosis and treatment.

2 Normative references:

The following standard contains provisions that, through reference in this text, constitute provisions of this standard:

SANS 4074 ISO 4074, *Condom Rubbers*

3 Definitions and Abbreviations

3.1 Definitions

Construction Worker: all persons in the employ of the contractor or in the employ of any of the subcontractors contracted by the contractor.

Local Community: the communities local to the site which are most likely to have contact with the construction worker and, in particular, sex workers in those communities.

Service provider: the natural or juristic person recognised by the South African Department of Health as specialist in conducting Aids Awareness Programmes.

3.2 Abbreviations

STI: Sexually transmitted infection

HIV: Human Immunodeficiency Virus

AIDS: Acquired Immune Deficiency Syndrome

4 Objectives

The objectives are to:

a) reduce the risk of transfer of the HIV virus between and among construction workers and the local community;

b) raise awareness amongst construction workers and the local community of the risk of infection with the HIV virus;

c) promote early diagnosis; and

d) assist affected individuals to access care and counselling.

5 Requirements

5.1 General requirement

The contractor shall, in order to satisfy the objectives stated in 4:

a) make condoms complying with the requirements of SABS ISO 4074 available to all construction workers at readily accessible points on the site, suitably protected from the elements, for the duration of the contract;

b) either place and maintain HIV/AIDS awareness posters of size of not less than A1 in areas which are highly trafficked by construction workers, or provide construction workers with a pamphlet, in languages largely understood by construction workers, which

c) encourage voluntary HIV/STI testing;

d) provide information concerning counselling, support and care of those that are infected services; and

e) comply with the requirements of 5.2.

***The* provisions *of* 5.1 c) *and d) do not apply to* this contract.**

5.2 HIV awareness programme

5.2.1 The contractor shall:

a) engage a qualified service provider as described in the scope of works to conduct an HIV Awareness Programme which is structured to achieve the outcomes stated in 5.2.3 for contract workers as soon as a construction workers camp is established and populated or, where no such camp is established, within two weeks of the commencement of a significant portion of the works and at subsequent intervals, if any, provided for in the scope of works; and

b) arrange for, provide a suitable venue, and instruct all construction workers to attend the HIV Awareness Programme and notify the Employer's Representative of the date, time and venue whenever a session with construction workers is conducted.

Note: The National Department of Public Works maintains a list of qualified service providers.

5.2.2 The contractor shall do nothing to dissuade construction workers from attending such an HIV Awareness Programme and shall take all reasonable steps to ensure that a minimum of 90% of construction workers engaged in the works attend such a programme, when it is conducted.

5.2.3 The outcomes of the HIV Awareness Programme shall as a minimum, result in contract workers exposed to such a programme being able to:

a) communicate the existence of problems of HIV and be able to outline the consequences of transmission of HIV to or from the local community;

b) recall and communicate the mode of HIV transmission and preventative measures including the proper use of the condom.

The HIV/ Aids awareness programme described in 5.2 is to be repeated at four month intervals throughout the duration of the contract. (Four times in total, including the initial one at the start of the contract)

5.3 Reporting

5.3.1 The contractor shall prepare and attach to his claims for payment a brief report which outlines how the actions taken by the contractor in the period for which payment is claimed satisfy the requirements and a schedule which lists the names, identity numbers, trade / occupation and name of employer of all construction workers exposed to the programme (see **HIV/STI Compliance Report**).

5.3.2 The employer's representative shall certify the report and schedule described in 5.3.1 whenever a claim for payment is issued to the employer.

Note: In the event that the contractor fails to satisfy the requirements of this specification, the employer (Head: Public Works) may apply any of the sanctions provided for in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum.

The *HIV /Aids* awareness programme *described* in 5.2 shall in addition *be conducted* for the benefit *of* the local community on two occasions in the community centre nearest to the building site. The contractor shall be *responsible* for inviting identifiable community-based *institutions and organisations, churches, and schools to participate in the* programme.

C3.3 - HIV/STI COMPLIANCE REPORT

Pro-forma reporting format in terms of the SPECIFICATION FOR HIV/AIDS AWARENESS

Project Code:	WIMS No. 078856		
Payment Claim number:		Period covered by payment claim:	

1. Distribution of condoms (briefly describe where and how condoms are distributed).

2. Posters / pamphlets (briefly describe where posters were placed / how pamphlets were distributed).

3. Voluntary testing (briefly describe the actions taken / information provided to promote testing).

4. Counselling, support and care (summarise information provided).

5. HIV awareness programme (briefly describe action).

6. Schedule of construction workers exposed to the HIV awareness programme.

Name	Identity number	Trade / occupation	Name of employer

I hereby declare the above to be a true reflection of actions taken to ensure compliance with the specification.

For Contractor:

Name: _____

Signature: _____

Date: _____

Employer's representative:

Name: _____

Signature: _____

Date: _____

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

PART C4. SITE INFORMATION

C4.1 SITE INFORMATION
GCC FOR CONSTRUCTION WORKS (2 Edition of 2010)

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Tender No.	**ZNTL 05094W**	**Project Code:**	**WIMS No. 078856**

C4.1 Site Information

C4.1 GENERAL

(a) The site is occupied by the employer and the hospital is run 24hours a day from Monday to Sunday . The buildings are in use and the Tenderer will be expected to programme the works in such a way as to minimize interruptions of the smooth running of the facility.

(b) The tenderer will be expected to liaise closely with the hospital management regarding decanting, etc.

(c) Refer to the implementation plan which is attached to these bills of quantities (Annexure 14)

C4.2 GEOTECHNICAL INVESTIGATION REPORT

(a) Refer to attached

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MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

PART C5 - DRAWINGS / ANNEXURES

C5.1 - LIST OF DRAWINGS/ANNEXURES

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

Tender No.:	ZNTL 05094W	Project Code:	WIMS No. 078856

(Where drawings/annexure's are issued, document compilers must insert the following paragraph and list the applicable drawings/annexure's below.)

The following drawings/annexure's shall be issued during the Tender period to form part of the tender documentation. Where applicable, drawings/annexure's could be re-issued to the Contractor at commencement of the construction phase.

DRAWING NO	DESCRIPTION
CIVIL/STRUCTRAL DRAWINGS	
15406-5001	DOMESTIC RETICULATION SHEET 1 of 4
15406-5002	DOMESTIC RETICULATION SHEET 2 of 4
15406-5003	DOMESTIC RETICULATION SHEET 3 of 4
15406-5004	DOMESTIC RETICULATION SHEET 4 of 4
15406-5005	FIRE RETICULATION LAYOUT
15406-5006	FIRE RETICULATION SHEET 1 of 4
15406-5007	FIRE RETICULATION SHEET 2 of 4
15406-5008	FIRE RETICULATION SHEET 3 of 4
15406-5009	FIRE RETICULATION SHEET 4 of 4
15406-5011	BULK WATER SUPPLY LINE AND RESERVOIR SITE
15406-5012	RESERVOIR SITE
15406-5013	RESERVOIR CHAMBER
15406-5014	DOMESTIC PUMPS
15406-5015	FIRE PUMPS
15406-7328	200MM DIAMETER METER CHAMBER.
15406-7329	FIRE TANK LEVEL CONTROL CHAMBER
15406-7810	TYPCIAL PIPE TRENCHING DETAILS
15406-7820	TYPICAL ANCHOR BLOCK DETAIL
15406-7830	TYPICAL ISOLATING VALVE DETAILS
15406-7840	OVERHEAD WATER PIPE SUPPORT
15406-7862	FIRE HYDRANT DETAILS
15406-7910	MANHOLE COVER TYPE 1
15406-7880	TYPICAL ROAD CROSSING DETAIL
15406-7825	TYPICAL PIPE MARKER POSTS DETAIL
15406-7700	POINT SKETCH LEGEND
15406-7701	POINT SKTECHES SHEET 1 OF 2
15406-7702	POINT SKTECHES SHEET 2 OF 2
15406-7703	CONNECTIONS SHEET 1 OF 2
15406-7704	CONNECTIONS SHEET 2 OF 2
DETAIL	100NB UOTLET LOOP
15406-S-1000	CONCRETE SPECIFICATIONS
15406-S-1001	ELEVATED WATER TANK BASE LAYOUT
15406-S-1002	GENERATOR AND TANK BASE LAYOUT
15406-S-1003	PUP HOUSE, RAMP, MINI SUB FOUNDATION & REBAR
ARCHITECTS DRAWINGS	
3372/B/000	Site Layout
3372/B/200	New pump house
3372/B/201	Existing pump house
3372/B/500	Fence & Gate details
3372/B/501	Fence & Gate details
3372/B/502	Ramp Details

ELECTRICAL DRAWINGS	
300222 NE-RES-SR-E01	ELECTRICAL SITE PLAN: DETAIL A: SOUTHERN
300222 NE-RES-SR-E02	ELECTRICAL SITE PLAN: DETAIL B: NORTHERN
300222 NE-RES-SR-E03	PUMP HOUSES ELECTRICAL LAYOUTS & DB LINE
300222 NE-RES-SR-E04	ELECTRICAL SITE PLAN: DETAIL C: PHILANI WARD AREA

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Annexure 2	General Electrical Specifications
Annexure 3	Lightning Protection Specifications
Annexure 4	Specification for Electrical Installation and Work Instruction
Annexure 5	Map of Bid submission location
Annexure 6	Joint Venture Agreement
Annexure 7	Health and safety Bill of Quantities
Annexure 8	Builders Lien Agreement
Annexure 9	EPWP Employment Contract
Annexure 10	EPWP Preliminaries
Annexure 11	EPWP Scope of Works
Annexure 12	Attendance Register - Infrastructure and Other projects
Annexure 13	EPWP Data Collection Tool
Annexure 14	Project Implementation Plan

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ANNEXURES

ANNEXURE 1:
STANDARD PREAMBLES FOR ALL TRADES (REV 3) – DOH 2009

KWAZULU-NATAL

DEPARTMENT OF HEALTH

STANDARD PREAMBLES TO ALL TRADES

REV 3 – JANUARY 2009

Compiled by:
Department of Health
Infrastructure Development
Engineering Services
Private Bag X9051
PIETERMARITZBURG
3201

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NOTE:

Only those clauses or portions of clauses in the following preambles, which refer to items in the Bills of Quantities, shall be considered as applying to the performance of this Contract.

2.

1. **ALTERATIONS**

SITE VISIT: — Tenderers are advised to visit the site prior to tendering and satisfy themselves as to the nature and extent of the work to be done, also to examine the condition of all existing buildings as no claim will be entertained on the grounds of ignorance of the conditions under which the work was to be executed.

MATERIALS FROM THE ALTERATIONS: — unless otherwise stated, will become the property of the Contractor and all these materials, together with all rubbish and debris must be carried away and the site left clean and unencumbered.

Items described as "removed" shall mean removed from the site.

Credit for the value of materials from the alterations is to be allowed for on the Summary/ Final Summary page.

Items described as to be re-used or to be handed over to the Administration are to be dismantled where necessary and stacked on site where directed, and the Contractor will be responsible for their removal and storage until required, and shall make good all items missing, damaged or broken at his own expense.

Unless otherwise described, no materials from the alterations shall be re-used in any new work without the written approval of the Department.

Prior to the removal of any timbers from the site, these are to be inspected by Government Entomologists. If any of these timbers are infested by wood destroying agencies, these timbers are to be disposed of in the manner prescribed by the Government Entomologist.

In taking down and removing existing work, particular care must be taken to avoid any structural or other damage to the remaining portions of the buildings.

ASBESTOS REGULATIONS 2001:

In terms of Asbestos Regulations 2001, no individual person, contractor or agent shall remove, demolish or strip any building containing asbestos or products containing asbestos (including asbestos roof sheeting, ceilings, guttering and down pipes) unless the work is performed by a **"Registered Contractor", registered with the Department of Labour**. All asbestos work shall be carried out under the supervision of an "Approved Inspection Authority".

It is a requirement that before any work involving asbestos removal is carried out, the following procedure and documentation is followed: -

1. Prior to the commencement of any demolition work, written notification shall be given to the Assistant Manager (Inspection and Enforcement), Durban Labour Centre, Masonic Grove, Durban, stating the name, address and details of the person(s) removing or stripping the asbestos. The notification shall include the date, time and place where the proposed work is to be carried out. (Regulation 3).

2. The name and details of the Approved Inspection Authority that is to supervise and confirm that the work is being carried out according to the specific requirements of the Asbestos Regulations 2001 (as amended), including the approved "written work procedure" document. This document shall be submitted and signed at least 14 days prior to commencement of demolition work by the Approved Inspection Authority. (Regulation 21).

3. The production of valid accreditation certification of training for all employees involved in the asbestos removal work.

4. On completion of the asbestos related work a "Clearance Certificate" which includes the asbestos disposal certificate shall be forwarded to the Department by the Approved Inspection Authority.

In terms of the above regulations, it is an offence to carry out any asbestos work as defined in the above regulations without the necessary approval / requirements being met.

Individual persons or contractors found to contravene these regulations will be issued with a **PROHIBITION NOTICE** which in effect will stop all work on site and the offenders will then be liable for prosecution.

Any employer found guilty under the Asbestos Regulations 2001 may be liable to a fine and or imprisonment not exceeding 12 months.

NOTICE OF DISCONNECTIONS: — The Contractor is to give ample notice to the Department and Local Authorities regarding any disconnections necessary prior to the removal or interruption of electrical or telephone cables, water supply and sanitary services, etc.

DUST: — The Contractor is to allow in his rates for taking all precautions necessary to prevent any nuisance from dust whilst carrying out the works.

SHORING: — Rates for shoring are to include for the use and waste of all props, needles, wedges, braces, nails and screws, etc. required and for all cutting, notching, framing and fitting, maintaining in position for the required periods and removing at completion. All shoring is to be executed in a manner approved by the Department.

MATCHING EXISTING WORK: — The terms "make good" or "making good" to existing work as described in the items shall mean making good with materials to match, all joined to existing.

FORMING NEW OPENINGS, ETC. IN EXISTING WALLS: — Rates for items of forming new or altering existing openings are, unless otherwise stated, to include for the following: -

a) Breaking out for and inserting adequate lintels over the new openings (except where stated in the items as being below an existing beam, slab or lintel), to the approval of the Department. The lintels are to be of in-situ concrete Class C, or of pre-cast pre-stressed concrete or of brickwork in 1:3 cement mortar, with a minimum bearing of 230mm at each end and suitably reinforced, and rates are to include for all necessary formwork, turning pieces, etc. and for wedging and pinning up to existing brickwork over in 1:3 cement mortar.
b) All shoring and propping required.
c) Facing up jambs in new brickwork in cement mortar properly bonded to existing,
d) Building up the portions of the openings stated in the items in new brickwork in cement mortar properly bonded to existing.
e) Formwork for concrete sills and thresholds where required.
f) Making good only to the finishes as stated in the items. (Note: — The making good of paint finishes has been measured separately).
g) Forming rounded angles, throats on external plastered soffits, mitres, etc. where required in all new plaster, render and granolithic finishes.

The supply, building in, fixing, etc. of all windows, doors, frames, etc. to the newly formed openings and the removal of all existing windows, doors, frames, etc. from openings to be altered, have been elsewhere measured.

2. EARTHWORKS

SITE CLEARANCE: —The item given in the Bills of Quantities for site clearance shall be deemed to include the removal from the site, or burning if permitted by the Local Authority, of shrubs and trees with trunks under 200mm girth measured at 1m above ground level,

hedges, bushes, other vegetation, rubbish and debris.
Holes left by roots are to be backfilled with earth and rammed.

EXCAVATIONS: — Rates for excavations are to include for forming and trimming to the correct levels; falls, slopes, curves, etc. for trimming sides, stepping, levelling and ramming bottoms, staging and disposing of the excavated material as described in the items. Rates for excavations to reduce levels over site are also to include for forming and trimming banks to the required batter. The Contractor is to allow in his rates for the bulking of excavated material.

The term "excavate", unless otherwise stated, shall mean excavate in "soft excavation" as defined below and for the purpose of classifying excavations the following will apply: —

a) **Soft excavation**: — shall be excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0, 10 kW per millimetre of tined-bucket width without the assistance of pneumatic tools such as paving breakers, or that can be efficiently loaded without prior ripping or stockpiling by a rubber tired front-end loader of approximately 15t mass and a flywheel power of approximately 100 kW.

b) **Intermediate excavation**: — shall be excavation in material that requires a back-acting excavator of flywheel power exceeding 0,10kW per millimetre of tined-bucket width and the assistance of pneumatic tools prior to removal by equipment equivalent to that specified in (a) above.

c) **Hard rock excavation**: — shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting prior to removal.

d) **Class A Boulder excavation**: — shall be excavation in material containing more than 40% by volume of boulders of size between 0.03m³ and 20m³ in a matrix of softer material or smaller boulders.
Note: — Excavation of solid boulders or lumps of size exceeding 20m³ will be classed as hard rock excavation. (2) Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock or intermediate excavation according to the nature of the material.

e) **Class B Boulder excavation:** — shall be excavation of boulders only in a material containing 40% or less by volume of boulders of size between 0.03m³ and 20m³ in a matrix of softer material or smaller boulders.
Note: — Those boulders requiring individual drilling and blasting in order to be loaded by a back-acting excavator as specified in (a) above, or by a track type front-end loader, will each be separately measured as Class B boulder excavation.
The excavation of the rest of the material will be classed as soft or intermediate excavation according to the nature of the material.

Method of Classifying: —The Contractor may use any method he chooses to excavate any class of material but his chosen method of excavation shall not determine the classification of the excavation. The Department will decide on the classification of the materials. The classification will be based on inspection of the material to be excavated and the criteria given in (a) to (e) above, as applicable. The decision of the Department shall be, subject to the relevant provisions of the contract, final and binding.

Should the Contractor consider that the excavation is other than "soft excavation" he must notify the Department immediately in order that an inspection be made and a decision arrived at by the Department as to the category of such excavation. Should the Contractor fail to give such notification, the excavation shall be deemed to be "soft excavation" and shall be measured and valued accordingly.

Blasting will only be permitted with the written authority of the Department, if and when permission is granted, it is to be executed only by persons holding the necessary Government Blasting Certificate and subject to all regulations imposed by the Department and/or Local Authority. In addition, the Contractor is to indemnify the Provincial Administration against all claims in respect of damage to persons and property resulting from such blasting operations.

Before commencing any excavations, the Contractor must satisfy himself as to the accuracy of any levels indicated on the drawings, as no claim will be entertained at a later date for any alleged inaccuracy in such levels.

Excavation shall be carried down to such depths as are necessary to obtain firm foundations, but before proceeding to greater depths than are shown on the drawings, the Department's approval must be obtained.

The Contractor will be responsible if he excavates wider or deeper than shown or required. If the excavations are deeper than shown or required such extra excavations are to be filled in with mass concrete at the Contractor's expense. If the excavations are wider than shown or required, any form-wait or mass concrete filling required to the side of the concrete foundations is to be executed at the Contractor's expense and to the approval of the Department.

Depths of excavations as approved shall be checked and recorded by the a Departmental Official and the Contractor's Foreman before any concrete is laid or the excavations are otherwise covered or filled in.

Notwithstanding such approval, any excavations which become waterlogged or otherwise spoilt after approval, shall be cleaned out and reformed, at the Contractor's expense and to the satisfaction of the Department, before any concrete, etc. is laid.

WATER: — The Contractor shall keep all excavations free from water or mud by pumping, baling or otherwise.

WORKING SPACE: — The Contractor is to allow against the items of "excavate to provide working space" for excavating beyond the extent of the net excavations measured to provide the necessary working space for the carrying out of such work as is described in the items. Rates are to include, in addition to the extra excavation, for any additional risk of collapse so incurred and for filling back and compacting the excavated material.

No separate item for working space is provided or will be considered where the face of the measured excavation is 750mm or more away from the finished face of the structure. Separate items for working space for the building of brick foundation walls on ordinary concrete wall footings will not be considered.

In the case of column base and pile cap excavations, where the dimensions between the column face and the excavation face is less than 500mm, working space has been measured for the width of the column face from the commencing level of excavation to the top of the column base or pile cap only where the top of the column base or pile cap exceeds 1.5m below the commencing level of excavation.

RISK OF COLLAPSE: — The Contractor shall maintain all excavated faces affecting the safety of the works and workmen. He must either provide all necessary temporary planking, strutting or shoring to all vertical excavated faces or carry the risk of collapse of these faces with all its implications. He must assume full responsibility in this connection and must allow in his rates accordingly. In addition, all excavated faces exceeding 1.5m deep are to be maintained in accordance with Government Regulations.

Quantities reflect the total superficial areas of the vertical excavated faces and will be subject to variation only in so far as these areas may vary, notwithstanding whether any temporary supports are used or not.

FILLING, ETC.: — All backfilling and filling under floors and paving must be of selected material from the excavations, unless otherwise stated, returned and compacted in layers as later described and with the top surface dressed to the correct levels and grades, all to the approval of the Department. Under no circumstances will the Contractor be allowed to use clay, peat or other unsuitable material for filling.

Rates for all items of filling with material from the excavations are to include haulage not exceeding 100m from the perimeter of the excavations.

Any filling supplied by the Contractor is to be of suitable material approved by the Department.

COMPACTION OF FILLING ETC.: — All filling and backfilling is to be done in layers not exceeding 200mm thick before compaction, with the layers level to ensure uniform compaction. Each layer is to be thoroughly compacted over the whole of the area to a dry density not less than 90% of Mod. A.A.S.H.O. density. The surface of each compacted layer shall be uniform and tightly bonded. Care is to be taken that no damage is done to foundation walls, drains and other services.

The densities of compaction referred to are to be determined by tests carried out in accordance with A.S.T.M. Designation D 1557-58 and at an optimum moisture content of not more or less than 5% of the required Mod. A.A.S.H.O. The Contractor shall be responsible for having sufficient tests taken of the density of the compacted filling to ensure that the required compaction is being attained to the satisfaction of the Department. These tests are to be undertaken by an independent testing authority nominated by the Contractor to the approval of the Department. The costs of all tests in this connection shall be borne by the Contractor and shall be allowed for in his rates.

PROTECTION AGAINST SUBTERRANEAN WOOD-DESTROYING TERMITES: — Where protection against termites is to be provided: —

a) Remove vegetable matter
All dead roots and other vegetable matter likely to encourage termites must be removed from the ground under, against the building and from all filling material.

b) Treating the ground
The ground under surface beds, and below suspended wood floors, must be treated by the application of Soil Insecticides of Chlordane or Aldrin types complying with SANS Specifications 1165 and 1164 respectively, mixed with water and applied at the rate of not less than 5 litres of solution per square metre uniformly over the whole surface. The concentration of the solution must be strictly in accordance with the manufacturer's instructions and to the approval of the Department.

The Department reserves the right to take samples of the diluted solution, at any time, in order to test the concentration of the chemicals used.

Where the ground to be treated is of earth filling, the upper 50mm layer of filling must be levelled by raking, but must not be rammed until after the solution has been applied, and where of natural ground, it must be loosened to a depth of not less than 50mm and similarly levelled, in order to enable the solution to penetrate into the soil. After the solution has been applied and allowed to penetrate the surface, the soil must be well rammed and consolidated.

Before applying the solution to the ground under the floors, splay back earth for a depth and width of 75mm from the internal faces of walls enclosing the floors, against internal walls, sleeper piers, etc. and thoroughly saturate with the solution. After the solution has soaked into the earth, the splayed grooves must be filled with earth and consolidated.

The treated layer of soil under suspended wood floors must be protected with a 75mm thick layer of approved clean gravel, finished to an even surface.

The treated layer of soil under concrete surface beds must be protected with a 25mm thick layer of well-consolidated approved grit prior to laying the waterproofing membrane.

Great care must be taken when laying concrete surface beds, protective layers, etc. in order to avoid rupturing the treated layer of soil. Should the treated layer be ruptured at any

point it must be made good and the area affected re-treated with the soil insecticide.

Contractors are advised that:

a. Special precautions must be taken to protect the workmen whilst using the soil insecticide.
b. The treatment of filling or ground under floors shall be done as soon as practicable, so that treatment may dry out before the floors are laid.
c. The treatment of the ground must be carried out under the supervision of the Department.
d. The soil insecticide to be delivered to the site in sealed drums clearly labelled or stamped with the name of the product.
e. In addition to the foregoing the application of the soil insecticide to be carried out in accordance with SANS Code of Practice 0124 — the application of Certain Soil Insecticides for the Protection of Buildings.
f. The protective layers of gravel or grit have been measured separately.

RE-USE OF EXCAVATED MATERIAL: — Material of any kind that may be discovered on the site during the excavation shall remain the property of the Administration. Such material may, if approved, be used for aggregate. Material so used shall be valued and the value deducted from the Contract Sum.

DEMOLITIONS: — The Contractor is referred to the preambles for "Alterations" insofar as they apply and the following: —

The demolition of existing buildings is to be done in a practical and safe manner, under the continuous supervision of a competent Foreman. Rates for the demolition of existing buildings are to include for breaking up and removing all external screen walls, steps and ramps, surface water channels, rainwater sumps, gulleys, etc. and grubbing up and removing all foundation walls and footings, disconnecting and removing all services to a point not less than 1m beyond the perimeter of the buildings, plugging off ends of all remaining pipes, and for filling in all holes with clean earth and ramming up to ground level. All movable fittings and furniture, fire extinguishers and electrical and other equipment in the buildings to be demolished are to remain the property of and will be removed by the Administration prior to the commencement of the demolition.

Before commencing the demolitions, the Contractor shall comply with any Local Authority regulations in force in respect of rodent extermination, etc. and he shall obtain the required Clearance Certificate. Items to cover the cost of obtaining the certificate and the fumigation, etc. of the buildings to be demolished have been provided elsewhere in the Bills of Quantities, and the fumigation is to be carried out by a firm specialising in this type of work. The fumigation of the buildings to be demolished shall only be carried out if called for by the Local Authorities and if not required the value of the relevant items in the Bills of Quantities will be deducted from the Contract Sum.

After handing over the site to the Contractor, the risk of any loss or damage to the buildings to be demolished and the materials therein, caused by theft, vandalism, etc. shall be the responsibility of the Contractor and he shall take such precautions as he deems necessary against such loss or damage.

GRASS PLANTING AND TURFING: — Is to be "Cape Kweek" or "Umgeni" grass scientifically known as *Cynodon dactylon* or other local fine grass approved by the Department. In areas where fine grass does not grow readily, Kikuyu grass *Pennisetum clandestinum* may be substituted. The areas must be identified and the approval of the Department obtained before Kikuyu grass is to be planted.

Grass Planting To Level Areas: — The areas to receive grass are to be weeded and raked free of stones and other superfluous matter and all depressions left by the earthworks plant are to be filled in with approved topsoil. The planting of grass is to be carried out in continuous root planting in rows 200mm apart. The method of planting called "sprigging" may be used as an alternative.

Immediately after completion of each strip or square, the area thus grassed is to be thoroughly watered and lightly rolled. Any drifting or piling up of the top soil due to wind or any other cause must be prevented as far as possible and should such piling up of soil against newly planted grass occur the soil must immediately be raked level and lightly rolled.

Turfing: — Banks are to be carefully trimmed to an even surface and weeded and raked free of stones, etc. and all depressions filled in with approved topsoil as before described. Turfing of banks is to be carried out with 25mm thick maximum 500mm x 1000mm weed-free grass sods, of grass as before described, and as approved by the Department. The grass sods are to be set in position in horizontal rows to broken bond and closely fitted together and tamped flat with a timber pummel, a maximum of two sods in every square metre of area covered being staked to the bank to maintain position, with and including one sharpened wood or bamboo skewer 250mm long and with all cavities between sods filled in with approved top soil and the whole area lightly top soil dressed on completion.

Established Lawn: — The use of established lawn in pieces size approximately 500mm x 1000mm x 25mm thick in lieu of grass sods on banks will be permitted provided that the established lawn is supplied and laid by a firm experienced in this type of work and to the approval of the Department. The fitting, tamping, staking and top dressing must all be as described for turfing, except that one piece per square metre is required to be staked as described.

Fertilizer: — An approved fertilizer of the following types— Type 2:3:2 for grass planted levelled areas and Type 3:2:1 for turfed or established lawn covered banks is to be supplied and applied by the Contractor at the rate of 400 kg per hectare. In the case of grass planted levelled areas the fertilizer is to be applied either before or after grass planting and in the case of turfed or established lawn covered banks the fertilizer is to be applied after the sods or pieces have been laid.

The fertilizer above described is to in addition to any fertilizer which may have been specified to be applied during either the operation of scarifying and grading the area to be grassed or the re-spreading of top soil.

A sample of the existing topsoil or the topsoil to be re-spread is to be sent to an approved fertilizer manufacturer for testing and advice on the acid or alkaline content of the soil. The cost of this test is to be borne by the Contractor if this is not provided free by the fertilizer manufacturer.

The requisite quantities of limestone ammonium nitrate for acidic soil or ammonium sulphate for alkaline soil as determined by the soil test will be supplied to the Contractor by the Department and the cost thereof is to be included in a Provisional Sum elsewhere in the Bills of Quantities. The application of this treatment is to be undertaken by the Contractor and his rates for grassing, etc. must include for same.

Weed killer: — "Weed Master or Turf Master" or other approved weed killer is to be applied to the entire grassed or turfed areas at a rate of 4 litres mixed with 200 litres of water per hectare, this being equivalent to 40-45 millilitres mixed with 5 litres of water per fifty square metres. The solution is to be sprayed on with a suitable spraying apparatus to achieve an even distribution. Six to eight weeks later, the operation is to be repeated. The application of weed killer is not to take place during wet weather. Weather conditions should be such as to allow a minimum of two hours or absorption before the likelihood of rain.

Watering and Rolling: — The entire turfed area is to be kept clear of weeds, lightly rolled and thoroughly watered throughout the period of the Contract and or at least three months from the time of acceptance of the grounds or until the grassing or turfing is well established if that is sooner, all to the satisfaction of the Department.

In the absence of rain, the initial watering of grassed or turfed areas is to be carried out as follows: —

Grass planted levelled areas: - at least twice a week.
Established lawn areas: - at least once a week.
Turfed areas: - at least once a day for the first ten to fourteen days, thereafter at least once a week.

The Contractor must allow in his rates for providing and removing at completion all necessary temporary water piping complete with fittings, sprinklers, hoses, etc. as required for the proper watering of the grassed or turfed areas of the plateaux and banks.

Cutting of Grass: — The Contractor must commence mowing as soon as possible once turfed areas have become established and undertake regular mowing at approximately one-week intervals up to the date of final delivery, except that, during the maintenance period, the mowing of the plateaux will be undertaken by the Institution.

Note: — All stages of grass planting and turfing are to be supervised on a full time basis by a competent person with the necessary experience and knowledge.

It shall be the responsibility of the Contractor to advise the Department when the following operations are to be carried out in order that his representative may be present: —

a) the application of fertilizer
b) the application of weed killer.

Should the Contractor fail to do so, the Department shall have the right to instruct the Contractor to repeat the operation at his own expense.

3. CONCRETE, FORMWORK AND REINFORCEMENT

GENERAL: — This specification applies to concrete work formed into its final shape and position in-situ.

All concrete and formwork shall be carried out in accordance with SANS Specification 1200 G — Concrete (Structural) (a copy of which the Contractor will be required to keep on the site so that it can be referred to at all times during the Contract), with the following amplifications and amendments: —

INTERPRETATIONS: — Clauses 2.1 and 2.2 of SANS Specification 1200G refer. This preamble, together with any other supplementary preambles appearing in these Bills of Quantities shall be deemed to be the project specification and are the "Portion 2" referred to in Clause 2.2.

DEFINITIONS: — Clause 2.3 of SANS Specification 1200 G refers. All references to the Engineer shall be deemed to mean the Department.

MATERIALS
Cement: —unless otherwise specified, shall be one or more of the following and shall, in each case, comply with the requirements of the relevant standard specification: —
Portland cement and rapid-hardening cement to SANS 471 Specification
Portland blast-furnace cement to SANS Specification 626.
Portland cement 15 to SANS Specification 831.
Nevertheless, no cement other than ordinary Portland cement shall be used without the approval of the Department. Cement containing more than 15% blast-furnace slag will not be permitted in columns or in members less than 50mm thick.

In addition (for the abovementioned items) where Ordinary Portland cement is used, blast-furnace slag (from separate containers) **must not** be added in any proportion whatsoever.

No mixing of two different types of cement in the same batch will be allowed, and unless otherwise approved by the Department, the same brand and type shall be used in all exposed concrete.

Lumpy cement, broken sacks and sweepings shall not be used.

Cement supplied in sacks shall be used in the order in which it was delivered and shall not be kept in storage for longer than six (6) weeks without the approval of the Department.

Water: — Shall be clean and free from injurious amounts of acids, alkalis, sugar, organic matter and other substances that could impair the strength or durability of the concrete. If so required by the Department, the suitability of the water shall be proved by tests carried out by an approved laboratory.

Aggregates: — Unless otherwise specified both the coarse aggregate (stone) and the fine aggregate (sand) shall comply with the requirements of SANS Specification 1083. The Contractor is to prove compliance by means of either a certificate from the supplier or by grading analysis tests.

Admixtures: — i.e. materials other than cement, aggregate and water shall not be used in the concrete mix without the approval of the Department. The onus for proof of satisfaction to the Department for any admixture proposed shall be with Contractor.

Reinforcement: — for concrete shall be as specified and shall, in each case, comply with one of the following: —

a) Type A hot rolled mild steel bars of plain round cross section to SANS Specification 920
b) Type C Class 2 hot rolled high yield stress Grade 1 deformed bars to SANS Specification 920
c) Type D Grade 1 cold worked deformed bars to SANS Specification 920.
d) Welded steel fabric to SANS Specification 1024 manufactured from plain hard-drawn mild steel wire.

A sample reinforcing rod, approximately 600mm long, may be taken from each consignment of rods of similar diameter, for testing. If any sample is found unsatisfactory the whole consignment of rods from which the sample was taken will be rejected.

No substitution of the bars specified shall be made without the prior approval of the Department.

REINFORCEMENT

Bending: — Reinforcing bars shall be cut and bent according to the dimensions shown on the working drawings and in accordance with SANS Specification 82.

Except as allowed for below, all bars shall be bent cold and bending shall be done slowly, a steady even pressure being used without jerk or impact.

If approved by the Department, hot bending of bars of diameter at least 32mm shall be permitted, provided that the bars do not depend for their strength on cold working. When hot bending is approved, the bars shall be heated slowly to a cherry red heat (not above 840 C°) and after bending shall be allowed to cool slowly in air. Quenching with water shall not be permitted.

Fixing: — All steel reinforcement, at the time of placing of the concrete, must be free from loose rust, scale, oil and other agents which will reduce the bond between the steel and the concrete or initiate corrosion of the reinforcement. Reinforcement exposed to sea spray shall be washed down, and the formwork drained, just prior to concreting.

Reinforcement shall be positioned as shown on the working drawings or as directed by the Department and maintained in those positions within the tolerances given in the Specification for Tolerances. It shall be secured against displacement by tying at intersections with 1.6 or 1.25mm diameter annealed wire or by the use of suitable clips or, if permitted by the Department, by welding in accordance with SANS 1856. Welding will not

be permitted on cold worked bars. Reinforcement shall be supported in its correct position by hangers, saddles or cover blocks and aligned by chairs and spacers all of approved design and material. Where such hangers, saddles, chairs or spacers are of steel, they will be detailed on the drawings or in bending schedules.

Cover: —The minimum cover of concrete over reinforcement, excluding any applied finish, shall be as shown on the working drawings, or as directed by the Department.

Cover shall be maintained by using cover blocks, which shall be made of small aggregate concrete, not mortar, using the same cement and aggregate type and ratio as the parent concrete. Alternatively, cover blocks may be of the plastic type provided that sufficient number are used to prevent their collapse, that they are of a colour compatible with that of concrete and that the prior approval of the Department is given. Metal cover blocks shall not be used.

If the concrete face has a Class F2 smooth finish or some other special finish as is described elsewhere, hemispherical or pyramid shaped concrete cover blocks shall be used unless otherwise specifically approved by the Department.

Splicing: — or joining of reinforcing bars shall be made only as and where shown on the working drawings or as otherwise approved. The length of the overlap in a splice shall be not less than that shown on the working drawings or forty-five times the diameter of the bar if not shown.

Protection of Exposed Bars: — If left exposed for future bonding of extensions to the works, reinforcement shall be protected from corrosion as specified by the Department.

Electric Current: — Reinforcement shall not be used as a means for conducting electric current unless there is conformity with the requirements of SANS Code of Practice 03.

Inspection of Reinforcement: — Reinforcement shall be subject to inspection by the Department after the Contractor is satisfied that it has been completely and correctly fixed. The amount of notice given by the Contractor to the Department before concreting commences that reinforcement is ready for his inspection shall be agreed between the Department and the Contractor at the commencement of the Contract.

FORM WORK

Design: — Formwork shall be so designed and constructed by the Contractor that the concrete can be properly placed and compacted and that the required shapes, finishes, positions, levels and dimensions shown on the working drawings are maintained, subject to the tolerances given in the Specification for Tolerances. Unless otherwise directed by the Department, all formwork to beams and slabs shall be evenly cambered, unless otherwise specified or shown on the drawings, to the mid-point of the span of the member at the rate of 2mm per metre of span, all to the approval of the Department and the full cross section of the member shall be maintained after placing of concrete.

The formwork and joints shall be capable of resisting the dead load and pressure of the wet concrete, effect of vibration equipment, wind forces and all other superimposed loads and forces it is necessary for it to carry.

Should it be necessary to support formwork off suspended or ground bearing slabs, the manner of execution of the support shall be agreed with the Department so that overstress of, or damage to, those members is prevented.

In structures having, in whole or part, two or more reinforced concrete floors, props to the approval of the Department shall be provided under the soffits of beams and slabs of any floor which is being used to support the formwork and new concrete of the floor above. These props shall not be removed until the formwork for the new concrete has been struck.

Wedges and clamps shall be used in preference to nails. Joints in forms shall be tight enough to prevent leakage of cement paste.

Finish: — The quality of the finished surface of the concrete shall be as shown on the working drawings or as otherwise specified, and the type of formwork used shall be adequate to provide such finishes.

Ties: — The type of ties used and their position shall be such that the finish required in terms of the clause "Finish" is achieved. Tie rods are preferable to wire ties and the forms shall not be secured to the reinforcement. No corrodible tie rod or wire tie shall be allowed within the depth of concrete cover, and in the case of water-retaining or tanked structures, no removable tie rod or wire shall pass right through the concrete member.

Preparation of Formwork: — Surfaces that are to be in contact with fresh (wet) concrete shall be so treated by coating with a non-staining mineral oil or other approved material, or, in the case of timber forms, by thoroughly wetting surfaces so as to ensure easy release and non-adhesion to formwork during stripping. If any substance other than water is used, every precaution shall be taken to avoid contamination of the reinforcement.

Re-use of Formwork: — Before re-use, all formwork shall be reconditioned, and all form surfaces that are to be in contact with the concrete shall be thoroughly cleaned without unduly damaging the surfaces of the formwork.

Openings: — Where necessary for the proper placing of the concrete, temporary openings for cleaning, inspection or placing purposes shall be provided, taking cognisance of the finishes specified.

Removal of Formwork: — Formwork shall not be removed before the concrete has attained sufficient strength to support its own mass and any loads that may be imposed on it. Except where the Contractor can prove by means of cube tests, at his own expense to the satisfaction of the Department that, because of its strength development characteristics the concrete has attained sufficient strength and that shorter periods are practicable, formwork shall not be removed within shorter periods than those given in Table A. The number of cube tests required shall be equal to the number required for testing at 28 days. Where full design loads are carried, no soffit forms and props may be removed until the full design strength is attained.

In structures having, in whole or part, two or more reinforced concrete floors, props to the approval of the Department shall be provided under the soffits of beams and slabs of any floor which is being used to support the formwork and concrete of the new floor above. These props shall not be removed until the formwork for the new concrete has been struck.

All formwork props shall have been removed from under beams and slabs before the commencement of construction of brickwork thereon, unless otherwise agreed with the Department. Formwork shall be removed carefully so that shock and damage to the concrete are avoided.

TABLE A—REMOVAL OF FORMWORK (MINIMUM TIMES IN DAYS (24 hrs))

1	2	3	4	5	6	7	8	9	10
Type of structural member or formwork	Type of cement used*								
	Portland cement and Portland cement 15			Rapid-hardening Portland cement* and rapid-hardening Portland cement 15			Portland blast-furnace cement		
				Weather					
	Hot or normal	Cool	Cold	Hot or normal	Cool	Cold	Hot or normal	Cool	Cold
(a) Beam sides, walls, and unloaded columns.	0,75	+	1,5	0,5	+	1	2	+	4
(b) Slabs with props left underneath	4	+	7	2	+	4	6	+	10
(c) Beam soffits with props left underneath, and ribs of a ribbed floor construction	7	+	12	3	+	5	10	+	17
(d) Slab props including cantilevers	10	+	17	5	+	9	10	+	17
(e) Beam props including cantilevers	14	+	21	7	+	12	14	+	21

* Shorter periods may be used for sections of thickness 300mm or more.
+ In cool weather, stripping times shall be determined by interpolation between the periods specified for normal and cold weather.

CONCRETE QUALITY

General: — Concrete shall comply with the requirements for "Strength Concrete" as specified. The type of aggregate and cement, and their sources of supply, shall not be altered during the currency of the Contract without the prior written agreement of or instruction from the Department.

Strength Concrete: — The Contractor shall be responsible for the design of the concrete mix and for the proportions of its constituent materials, measured as described, necessary to produce concrete that complies with the requirements specified by the Department thus:-

a) For each section of the work, the class of concrete and position on the Works, as shown on the drawings:
b) For each class of concrete:
   i) the minimum compressive strength at 28 days as shown in Table B
   ii) the maximum nominal size of coarse aggregate as shown in Table B

iii) the stump as shown in Table D
iv) the maximum cement/water ratios as shown in Table C.

At the earliest possible stage in the Contract, at least 35 (thirty-five) days before the first concrete is placed, or as otherwise agreed with the Department, the Contractor shall submit samples of the aggregates which he proposes to use on the works to the Department.

The Contractor, under the supervision of the Department, shall prepare trial mixes using these same aggregates, to establish his ability to achieve the strengths specified, and satisfactory workability of the concrete. The Contractor shall provide all necessary equipment for, and carry out tests of moisture content of aggregates at the time of preparation of the trial mixes, tests of the slump of the mixes and at the same time cast not less than six standard cubes from each mix for compression tests.

The target strengths to be achieved under trial mix procedure shall exceed the specified minimum compressive strengths by a factor which is acceptable to the Department.

The Contractor shall also, when required to do so, prove the concrete yield obtained per sack of cement by suitable measurement of batches after placing.

No structural concrete work shall be poured until trial mix procedure has been properly followed and satisfactory 7 (seven) day compression strengths achieved. (Equivalent 28 (twenty-eight) day strength = 4/3 x 7 day strength + 5 MPA).

Thereafter, the materials, preparation of and method of manufacture of subsequent concrete shall conform accurately to those used in the trial mixes. If materials vary in the course of the Contract from the samples first submitted, the Contractor shall, on the instructions of the Department, repeat the trial mix procedure and vary the proportions to attain the specified qualities.

The costs of preparation of trial mixes, with tests associated with them, shall be borne by the Contractor and must be allowed for in the pricing of the concrete.

A valid concrete test result shall be the average obtained from the testing of three test cubes of concrete in accordance with SANS Method 863.

TABLE B—CONCRETE CLASSES: STRENGTH, AGGREGATE SIZE AND COMPACTION

Class	Minimum 28 day cube compressive strength (MPA)	Maximum nominal size of coarse aggregate (mm)	Method of Compaction
50/26 50/19	50	26,5 19,0	Mechanical (see clause "Compaction")
45/26 45/19	45	26,5 19,0	
40/26 40/19	40	26.5 19,0	
35/26 35/19	35	26,5 19,0	
30/37 30/26 30/19 30/13	30	375 26,5 19,0 13,2	
25/37 25/26 25/19 25/13	25	37,5 26,5 19,0 13.2	
20/37 20/26 20/19 20/13	20	37,5 26,5 19,0 13,2	
15/37 15/26 15/19	15	37,5 26,5 19,0	Non-mechanical (See clause "Compaction")
10/37 10/26 10/19	10	37,5 26,5 19,0	

The Contractor shall be deemed to have satisfied himself, before tendering, of his ability to produce concrete of the required quality with available materials conforming to the specification, and mixed in the proportions on which his tendered rates are based. Any subsequent alterations of the mix proportions to meet these requirements shall be at the Contractors expense.

If, in the opinion of the Department, the concrete proportions are likely to lead to excessive segregation, honeycombing, bleeding or shrinkage cracking, he shall have the right to order the Contractor to amend the proportions at the Contractors own cost.

TABLE C — MAXIMUM CEMENT / WATER RATIOS FOR DIFFERENT CONDITIONS OF EXPOSURE

1	2	3	4	5
Type of structure	**Exposure Conditions**			
	Mild	**Moderate**	**Severe**	**Very Severe**
Thin sections; reinforced piles; all sections with less than 25mm cover reinforcement.	*	0.53	0.48	0.40
Moderate sections; retaining walls, piers, beams	*	*	0.53	0.43
Exterior portions of mass concrete	*	*	0.53	0.43
Concrete slabs laid on ground	*	0.53	0.48	*
Concrete protected from the weather, inside buildings, or in ground below frost level	*	*		*

* In these cases the ratio will be based on the strength for the workability desired.

Consistency and Workability: — Slump measurements taken in accordance with SANS Method 862 shall be within the limits given in Table D appropriate to the type of construction, or within such other limits as are laid down by the Department.

The concrete shall be of such workability that it can readily be compacted into the corners of the formwork and around reinforcement without segregation of the materials or excessive "bleeding" of free water at the surface.

TABLE D—SLUMP LIMITS

1	2	3	4	5
Type of construction	Slump, mm			
	Non-mechanical compaction		Mechanical compaction	
	Max.	mm.	Max.	mm.
Paving and pre-cast units	75	50	50	30
Heavy mass construction	75	25	50	20
Reinforcing foundation walls and footings	125	50	80	30
Slabs, beams, columns, and reinforced walls	125	50	80	30
Slabs and industrial floors on ground	125	75	80	50
Plain footings, caissons, and substructure walls	100	25	60	20

Ready-mixed Concrete: — This may be used subject to the approval of the Department. This approval may be withdrawn on 24 (twenty-four) hours notice to the Contractor if at any time if documents do not conform to the requirements of this Specification. Ready-mixed concrete shall also comply with the requirements of SANS Specification 878. Details of the

mix ingredients and tests thereon, the mix designs and relevant tests shall be forwarded to the Department for his approval. Ready-mixed concrete shall be cast within 3 (three) hours of placing all the ingredients in the mixing plant. Ready-mixed concrete shall be subject to the same sampling and testing at the site as that mixed on site and only the results of these tests will be regarded as valid.

TRANSPORTATION AND PLACING

Transportation: — Unless agreed with the Department, concrete shall not be pumped into its final position.

The Contractor must provide suitable runways for the distribution of concrete to the various parts of the structure and these must be solidly constructed in such a manner so as to obviate the possibility of interference with the steel reinforcement.

Placing: — Unless otherwise agreed with the Department, the Contractor shall give the Department at least 24 (twenty-four) hours notice of his intention to place concrete. No concrete shall be placed without the prior approval of the Department and without a representative of the Department being present. Concrete shall be placed within one hour of the time of its discharge from the mixer. Concrete shall not be re-tempered by the addition of water or other material. The forms to be filled shall be clean internally. All excavations and other surfaces of an absorbent nature that are to come into contact with the concrete shall be dampened with water. There shall be no free-water on the surface against which concrete is to be placed. Wherever possible, the concrete shall be deposited directly into its final position to avoid segregation and displacement of reinforcement and other items that are to be embedded. Deposited concrete shall not be so worked (whether by means of vibrators or otherwise) as to cause it to flow laterally in such a way that segregation occurs. Where possible, the concrete shall be brought up in horizontal layers of compacted thickness not exceeding 450mm and heaping shall be avoided.

Where a chute is used to convey the concrete, its slope shall be such as will not cause segregation, and a suitable spout or baffles shall be provided for the discharge of the concrete. Concrete shall not be allowed to fall freely through a height of more than 3 m, unless otherwise approved. Concrete shall not be placed during periods of heavy or prolonged rainfall.

Compaction: — The concrete shall be fully compacted by approved means during and immediately after placing. It shall be thoroughly worked against the formwork and around reinforcement and other embedded fittings without displacing them.

The concrete shall be free of honeycombing and planes of weakness. Successive layers of the same lift shall be thoroughly worked together.

The method of compaction shall be as specified. Mechanical compaction shall be undertaken by means of high frequency immersion vibrators of minimum frequency of 6000 vibrations per minute and a maximum acceleration of 4 g when under load, being capable of visibly affecting concrete over a radius of at least 500mm. Vibrators shall be inserted at about 500mm centres and withdrawn slowly to close the hole formed by the vibrator.

Non-mechanical compaction shall be undertaken by means of spading, rodding or forking.

Over-compaction resulting in segregation, surface laitance or leakage (or any combination of these) shall not be allowed.

Vibrators shall not be allowed to come within 30mm of the face of the formwork in the case of formed finishes, nor within 75mm of the face of the formwork in the case of special finishes.

Construction Joints: — Concreting shall be carried out continuously up to the construction joints shown on the working drawings or as prior approved by the Department, except that

if, because of an emergency (such as a breakdown of the mixing plant or the occurrence of unsuitable weather), concreting has to be interrupted a construction joint shall be formed at the place of stoppage in conformity with the detail shown on the drawings for construction joints generally and in the manner which will least impair the durability, appearance and proper functioning of the concrete. The Department shall approve the method adopted for forming the construction joints, one of the following methods being adopted, as relevant: —

a) Construction joints when concrete is not more than 24h old: —The surface of the concrete shall be brushed with a steel wire brush before new mortar and concrete are placed as specified in (b) below.
b) Construction joints when concrete is more than 24h but not more than 3 days old: — The surface of the concrete shall be sand-blasted or chipped with a light hammer, swept clean, and thoroughly wetted and covered with a 10mm thick layer of mortar composed of cement and sand mixed in the same ratio as the cement and sand in the concrete mixture. This mortar shall be freshly mixed and placed immediately before the new concrete is placed.
c) Construction joints when concrete is more than 3 days old: — The procedure specified in (b) above shall be followed, except that the old surface shall be prepared and kept continuously wet for at least 24h before the mortar and new concrete are placed.
d) Construction joints at tops of columns: — The procedure for brushing or cleaning specified in (a) or (b) above, as applicable, shall be followed before the steel reinforcement of the slab or floor to be cast on the columns is placed in position.

Curing and protection: — Formwork shall be retained in position for the appropriate period given in the clause "Removal of Formwork" and shall be considered as providing adequate curing on those surfaces for that period. Should this curing period still be less than that specified, alternatively, should surfaces not be cured by forms then all such concrete shall immediately be protected from contamination and loss of moisture by one or more of the following methods: —

a) ponding the exposed surfaces by means of water, except where atmospheric temperatures are low, i.e., less than 2°C,
b) covering the concrete with sand, or mats made of a moisture-retaining material, and keeping the covering continuously wet;
c) continuous spraying of the exposed surfaces with water;
d) covering with a waterproof or plastic sheeting firmly anchored at the edges,
e) using a prior approved curing compound applied in accordance with the manufacturer's instructions, provided that in this case, the presence of the compound is not detrimental to subsequently applied finishes.

Whatever method of curing is adopted, its application shall not cause staining, contamination, or marring of the surface of the concrete.

The curing period shall be at least 5 days for concrete made with Portland cement, at least 2 days for that made with rapid-hardening Portland cement and at least 7 days if Portland blast-furnace cement is used. When atmospheric temperatures are below 5° C these minimum curing periods shall be extended by 72, 36 and 72 hours respectively.

CONSTRUCTION DETAILS

Holes, Chases and Fixing Blocks: — No holes or chases other than those shown on the working drawings or approved by the Department shall be cut or otherwise formed in the concrete. No blocks for the attachment of fixtures shall be embedded in the concrete unless approved by the Department.

Pipes and Conduits: — No pipes or conduits other than those shown on the working drawings shall be embedded in the concrete without the approval of the Department. The clear space between any such pipes and the clear distance between such-a pipe and any reinforcement shall be at least 25mm or the maximum size of the coarse aggregate plus 5mm, whichever is greater. The amount of concrete cover over pipes and fittings shall be at least 25mm.

Honeycombing and Other Defects: — After removal of the forms, if the concrete shows any defect in terms of the Specification for Finishes for that concrete, the Contractor shall, on the instructions of the Department, make good the defect at his own cost, by either removing and replacing the defective concrete, or by patching, all as approved by the Department and to the standard of finish required. No remedial work shall be carried out by the Contractor without the prior approval of the Department.

Building on Concrete Footings: — No structural load shall be imposed on concrete footings until at least three days after depositing the concrete in the case of mass concrete footings and after seven days in the case of reinforced concrete footings, or as may be directed by the Department.

RECORDS: —The Contractor shall maintain written records indicating: —

a) the date on which each section was concreted, the time taken to place the concrete, and the position of that section in the Works and its construction joints;
b) daily weather conditions with temperatures being recorded by maximum and minimum thermometers and
c) the nature of samples and dates on which they were taken. In the case of cubes these shall also state the identification marks, test results and age, minimum strength required and position of parent concrete.

TESTS

Compressive Strength: — During the time in which each class of concrete, having a specified 28 day compressive strength equal to or greater than 20 MPA, is being placed, samples of the concrete shall be taken from the point of deposit at the rate of at least one sample from each 5m³ of concrete placed in columns, and from each 30 m³ or part thereof of concrete placed elsewhere, but in either case, nevertheless at least once a week. A group of at least three 150mm test cubes shall be made from each sample for testing at 28 days age. If the Contractor plans to execute further work which relies on previously completed work for support but for which the results of 28 day tests are not available, he is to prove the strength of that concrete by taking and testing at 7 days age an equal number of test cubes to that which is to be tested at 28 days age, prior to the commencement of the planned further work.

The cost of the necessary extra test cubes and testing will be for the Contractor's account. Each group of test cubes shall be deemed to represent the whole of the concrete from which sample was taken and shall be identifiable with the concrete.

The Contractor shall provide, at his own expense, sufficient moulds to keep pace with the rate of concreting. He shall also perform all tasks in respect of compressive strength testing except the actual crushing.

If ready-mixed concrete is used, site testing as specified herein shall still be undertaken, and only the results of such site testing shall be considered in determining the acceptance or otherwise of the concrete.

Grading Analysis: — If so directed by the Department, a grading analysis shall be made for each 40m³ of fine aggregate to be used and for each 75 m³ of the coarse aggregate to be used. The analysis shall be made by the method given in SANS Specification 1083.

Determination of Consistency: — When the slump test is used to measure the consistency of the concrete mix, it shall be carried out by the method given in SANS Method 862 with samples taken in accordance with SANS Method 861.

Costs of Tests: — to concrete, trial mixes, cement, aggregates, water and reinforcing steel shall be borne by the Contractor. The Contractor shall also bear the costs of any other tests (including load tests), which are required as a result of failure on the part of the Contractor to meet the requirements of the Specification.

An item against which the Contractor may allow for all costs in connection with tests on concrete cubes has been included elsewhere in these Bills of Quantities.

Testing Authority: — The crushing of cubes and testing of other samples except in the case of the clause "Determination of Consistency" shall be undertaken by an independent Authority as approved by the Department. The Contractor shall arrange with the Authority that copies of the results of all tests are sent direct to the Department.

ACCEPTANCE CRITERIA FOR STRENGTH OF CONCRETE: — Should any test result obtained from a set of three test cubes of concrete of a specific grade that have been made and tested as specified show that the strength is more than 3 MPA below the specified strength, the concrete represented by such results shall be deemed to have failed to meet the Specification. Should an examination carried out in terms of the clause "Procedure in the event of failure" satisfy the Department that the structural adequacy and durability of that part of the structure where the concrete concerned has been used, is not impaired, the concrete will be acceptable. The Contractor will however be required to review the mix design and any other factors influencing the quality to ensure that further concrete is acceptable.

Where three or more consecutive valid test results (i.e., results of sets of three test cubes that have been made and tested as specified) become available, the following criteria shall apply: —

a) The average of any three consecutive valid test results obtained on concrete of a specific grade must exceed the specified strength by at least 2 MPA.
b) If the criterion given in (a) above is not met but the average is at least equal to the specified strength, the concrete cast will be acceptable but the Contractor will be required to adjust the mix design and standard of control.
c) Should the average result be less than the specified strength, an examination must be carried out in terms of the clause "Procedure in the event of failure" on that part of the structure in which concrete represented by the result has been used.

Alternatively, should a concreting operation be of such size or the testing be of such frequency that thirty or more valid test results (i.e., results of sets of three test cubes that have been made and tested as specified) become available within three months, the Contractor may choose, subject to the approval of the Department, to have the results assessed statistically. In such a case, the average of all the test results of a specific trade of concrete at *any stage* must exceed the specified strength by at least 1,7 standard deviations, failing which the Contractor will be required to adjust the mix design to ensure compliance with this criterion.

PROCEDURE IN THE EVENT OF FAILURE: — If after the evaluation of the test results in terms of the clause "Acceptance criteria for strength concrete" an examination of the concrete in the structure is necessary, one or more of the following procedures in the sequence given may be adopted at the discretion of the Department, and for the account of the Contractor, to determine the acceptability or otherwise of the concrete in that particular part of the structure: —

a) An assessment of the stress level in the structure concerned in relation to the test result obtained.

b) Non-destructive testing, subject to the availability of similar concrete of proven acceptable quality in comparable members in the same construction as a reference.

c) The testing of drilled cores in accordance with the relevant SANS Standard Methods.

d) Full scale load tests in accordance with Section 6 of SANS Code of Practice 0100: Part II.

Where load tests are, in the opinion of the Department, unsuitable or impracticable, and if an examination carried out in terms of the above does not show the concrete strength

to be acceptable, or if a tested portion of the structure fails to pass the tests, the Contractor shall, on the instructions of the Department, replace or strengthen by approved means: —

a) each portion that failed or contains concrete that failed, as relevant, and
b) any other portion, irrespective of strength, the functional purpose of which is affected by the portion or concrete referred to in (a) above.

NON-STRUCTURAL PRESCRIBED MIX CONCRETE: — Concrete for non-structural purposes shall be "Prescribed mix concrete" produced in accordance with the requirements indicated in the table below, and the Contractor is also referred to the foregoing Preambles insofar as they apply: —

TABLE E – PRESCRIBED MIX CONCRETE FOR NON-STRUCTURAL PURPOSES

Class of Concrete	Estimated minimum compressive strength in MPA at 28 days	Maximum nominal size of coarse aggregate in mm	Proportion of Constituents		
			Cement (Parts)	Fine Aggregate (Parts)	Coarse Aggregate (Parts)
A	1	37,5	1	4	8
B	15	19,0	1	3	5
C	20	19,0	1	2 ½	3 ½

Cement and aggregates shall be mixed by volume and the contents of a 50 kg sack of cement shall be taken to be 0.033 m^3

The cement / water ratios and the maximum and minimum slumps for concrete shall be as previously listed in Tables C and D.

The Department shall have the right to vary the proportions of the constituents in any of the prescribed mixes as necessary to obtain the required compressive strength, optimum density and workability of the concrete. Any variation in the rates of the concrete will only be considered if the proportion of cement to the total volume of aggregate, in each case, is varied from that Specified.

Notwithstanding any requirements previously described, the Department may permit certain items of non-structural concrete in small quantities to be mixed by hand.

Where concrete is mixed by hand, the coarse aggregate shall be spread out on a timber, concrete or metal platform in a flat heap, the sand-then spread evenly over the heap, followed by the cement also spread evenly, and the whole thoroughly mixed by shovelling from the centre to the side to form a ring, then back to the centre and again to the side. Water shall then be poured into the ring and the materials mixed into it and then back into the ring, the remainder of the water then added slowly as materials are mixed into it. Mixing shall continue until the colour is uniform and the consistency the same throughout the pile.

"NO-FINES" CONCRETE: — shall consist of one part of cement to eight parts of 19mm aggregate (1:8— 19mm stone) with a water/cement ratio of approximately 0, 46. This water/cement ratio may be varied slightly to suit conditions on approval by the Department.

The quantity of water used shall be just sufficient to form a smooth grout, which shall completely coat every particle of aggregate, and also to ensure that the grout is just wet enough to form a small fillet at each point of contact between the stones. 'No-fines" concrete mixed with excessive water, which results in a thin grout which drops off the aggregate, will be rejected.

"No-fines" concrete shall be placed in its final position within 20 minutes of mixing and shall be placed in continuous horizontal layers. "No-fines" concrete shall be spade worked sufficiently to ensure that it fills the forms but vibrating, tampering or ramming will not be permitted.

BREEZE CONCRETE: — shall consists of one part cement to eight parts clean dry furnace ashes, the ashes being free from all coal or other foreign matter and graded up to particles which will pass a 26. 5mm ring from a minimum which passes a 4.75mm mesh. The finer materials from the screening to be first mixed with the cement into the mortar and the ashes added afterwards and thoroughly incorporated. The breeze concrete is to be mixed in batches not exceeding 0, 1 in 3 and each batch is to be immediately placed in position. The ashes for breeze concrete are to be obtained in an unscreened state and are to be kept dry so that sufficient fine material will be obtained from the screening to make the mortar.

FINISHES TO IN-SITU CONCRETE

Formed Finishes: — are the concrete surface finishes developed using formwork and whose standard of finish in each class shall be as described.

The Department shall be informed by the Contractor of any defect in terms of this Specification, and no remedial work shall be carried out by the Contractor without the prior approval of the Department. Any defect shall be made good at the Contractor's expense by either removing and replacing the defective concrete, or, in certain instances only, by patching, all as approved by the Department and to the standard of finish required.

Class F1 Ordinary Finish: — Formwork panels shall be of such quality that upon removal, the concrete is true and even, free from fins and recesses greater than 5mm size, honeycombing, large air holes and the like. Bolt holes shall be filled if so required by the Department.

Class F2 Smooth Finish: —This class of finish requires a high standard of concrete work, formwork and technique.

Concrete placed in any one structure to give this finish shall be made from cement and aggregates from the same source, and similarly, the grading of the aggregate shall be kept constant.

Formwork shall be metal or wrot timber in a new condition designed and constructed to suit the particular job in hand and with shutter bolts and joints between panes in a pattern approved by the Department. Joints between panels shall be watertight, but the use of sealing tape, which marks the concrete, shall not be permitted.

Construction joints shall be in the position and of the detail shown upon the working drawings. Should the Contractor wish to incorporate further construction joints or amend the position of those shown to suit his own requirements or technique, this may be allowed provided that all design considerations are met, that the prior approval of the Department is obtained and that any extra costs are borne by the Contractor. In the case of horizontal construction joints, the top edge of the concrete on the Class F2 smooth finish side is to be struck true and level with a trowel.

Special care shall be taken to ensure that forms are clean of all pieces of tying wire, nails and other debris at the time of concreting.

The standard of finish shall be such that, upon removal of the formwork, no further treatment, other than treatment of bolt holes if required shall be found necessary to provide a straight, smooth and uniform finish of good quality and consistent colour and texture, free of all honeycombing and large air holes.

UNFORMED FINISHES: — are those concrete surface finishes developed without the use of formwork -

Class U1 Ordinary Finish: — Immediately after placing, the concrete shall be finished by screeding with the edge of a wooden board of straight and true line and working between guides set accurately to level. No mortar shall be added and noticeable surface

irregularities caused by the displacement of coarse aggregate shall be made good by re-screeding after removing or tamping down the offending aggregate.

Class U2 Wood Float Finish: — The concrete surface shall first be brought to the standard Class U1 ordinary finish and then floated with a wood float. Floating shall be started as soon as the screeded finish is stiffened sufficiently and the bleed water has evaporated or been removed and it shall be the minimum necessary to produce a surface free from screed marks and uniform in texture.

Class U3 Steel Trowel Finish: — The concrete surface shall first be brought to the standard of Class U2 wood float finish with floating being continued until a small amount of mortar without excess water is brought to the surface and then when the floated surface has hardened sufficiently to prevent any more excess fine material from being drawn to the surface, troweling with a steel trowel. Troweling shall be performed with firm pressure such as will flatten the sandy texture of the floated surface and produce a dense uniform surface free from blemishes and trowel marks. Gradual surface irregularities shall not exceed 5mm over any 3m. The sprinkling of sand and/or neat cement on the surface to absorb excess moisture shall not be permitted.

Class U4 Power Float Finish: — The concrete surface shall first be brought to the standard of Class U1 ordinary finish using wooden screeding boards or steel rollers. After evaporation or removal of all bleed water and immediately the concrete is stiff enough to support the machine the surface shall be closed with a mechanical power float and then finished with a mechanical power trowel. The texture of the finished surface shall be either non-slip or polished as shown on the drawings. Irregularities shall be of long wavelength not exceeding a curvature of 2mm in 600mm. Under no circumstances shall sand and/or neat cement be sprinkled over the surface either to absorb excess moisture or to fill surface blemishes or irregularities. Power floats and trowels shall be operated by skilled operators.

TOLERANCES: — Clause 6 of SANS Specification 1200G refers. Unless otherwise agreed by the Department, 'Degree of Accuracy' shall apply to all concrete work and steel reinforcing.

SUPERVISION: — The construction of all concrete work shall, at all times, be under the supervision of a competent person experienced in the production and placing of high-grade concrete. He shall personally supervise all work relating to the concrete construction and pay special regard to: —

a) The quality, testing and mixing of materials.
b) The finish, stability and cleanliness of formwork and excavations.
c) The cleanliness, correct positioning and maintenance in position of steel reinforcement.
d) The transporting, placing, compacting and curing of the concrete. The construction and stripping of formwork.
e) The production of samples, test cubes, slump and other tests.

GENERAL

Measurement and Payment: — The provisions of Clause 8 of SANS Specification 1200G will NOT apply and the system of measurement that is adopted in these Bills of Quantities is the only system of measurement that will be recognised in this Contract.

No deductions have been made for pipes not exceeding 200mm internal diameter, reinforcement, conduits, structural steel, bolts and the like.

Rates for Concrete: — are to include for mixing, handling and depositing (by hoisting or lowering) in the forms. Rates for items of reinforced concrete are to include for thoroughly working and packing around the steel reinforcement. All reinforcement, except where otherwise described, has been measured separately.

Rates for concrete surface beds are to include for laying in suitable size panels not exceeding $20m^2$ or as may be directed. The Contractor is to allow in his pricing of the concrete for all construction joints.

Striking off and Curing: — of concrete slabs and surface beds has been measured separately. The rates for all other items of concrete including stairs and landings and concrete bindings, are, except where otherwise described, to include for all necessary striking off of surfaces and curing.

The rates for items of striking off and curing top surfaces of concrete shall, unless otherwise described, apply to level surfaces.

Where exposed sloping surfaces of concrete do not exceed the limits of pitches laid down for the measurement of back shuttering, the striking off and curing of the sloping top surfaces has been measured in the case of concrete slabs and surface beds, and in other cases provision has been made for dressing the concrete surfaces to splay.

Where items of striking off and curing are described as to falls or ramps this shall include cross-falls, etc.

The rates for striking off and curing of surface beds formed in panels must also include for all necessary temporary formwork in forming the panels.

Rates for Formwork: — are to be for use and waste only (except where described as "permanent") and are to include for fitting together in the required forms, propping, strutting, shoring, wedging, plumbing and fixing to true angles and surfaces, cambering formwork to slabs and beams where required, preparation and treatment of surfaces as necessary to ensure easy release during stripping, reconditioning as necessary before re-use, providing necessary temporary openings for the purpose of cleaning, inspection and placing of concrete, and for all straight cutting, splayed edges, intersections, notching and narrow widths, including waste and properly fitting at intersections, maintaining in position for periods as directed and for striking and removing.

Rates for items of formwork to soffits of slabs and to sides and soffits of beams, lintels and the like are to include for horsing exceeding 1,5m and not exceeding 4,5m high unless otherwise stated in the items.

Rates for formwork to soffits of stairs and landings are to include for all necessary horsing.

Rates for Permanent Formwork: — are to include for leaving in all formwork, props, etc. as permanent formwork shall be regarded as not being recoverable.

Rates for Steel Fabric Reinforcement: — are to include for lapping the reinforcement at all edges, as specified, for all cutting and waste, notching, etc. bending where required, wiring together at laps and for maintaining in position during placing of concrete.

Rates for Steel Bar Reinforcement: — are to include for all cutting, bending, hooked ends, wiring together at passing points, hoisting or lowering to the required levels, fixing in accordance with the detail drawings, cover blocks and maintaining in position during placing of concrete. The mass of mild and high yield stress steel bars shall be based on the values shown in Table El of SANS Specification 920— Appendix E (with no allowance being made for rolling margin and waste).

The mass of the binding wire required for fastening the reinforcement together is not included in the mass of the reinforcement. Provision for the cost of this wire shall be deemed to have been made by the Contractor in calculating the unit rate for the net mass (i.e. excluding the mass of binding wire) of the reinforcement.

4. BRICKWORK

SAND: — shall comply with the requirements of SANS Specification 1090, washed where necessary and screened through a 2360 micrometer mesh sieve.

CEMENT: — shall be Portland cement of normal setting quality complying with SANS

Specification 471 or Portland cement 15 complying with SANS specification 831. Cement containing more than 15 % blast furnace slag will not be permitted to be used.

LIME: — shall be hydrated lime complying with SANS Specification 523.

WATER: — shall be clean and free from injurious amounts of acids, alkalis, and other organic substances. If so required by the Department, the suitability of the water shall be proved by tests carried out by an approved laboratory.

CEMENT MORTAR: — unless otherwise described, shall be composed of one part by volume of cement to five parts by volume of sand.

COMPO MORTAR: — unless otherwise described, shall be composed of one part by volume of cement, one part by volume of lime to ten parts by volume of sand.

STRENGTH MORTAR: —where required, shall be of the class specified and as defined in Table C-I of SANS Code of Practice 0164—Part I.

MIXING OF MORTAR: — the materials are to be mixed dry on a non-absorbent and close jointed timber or iron platform until the mixture is of uniform colour with water added and the mixture turned over until the ingredients are thoroughly incorporated.

No cement mortar that has once commenced to set will be allowed to be used. Mixing platforms are to be cleaned and old mortar removed before any new batch of mortar is prepared for mixing. No mortar mixing by adding additional materials is permitted after 5 (five) hours.

TESTING OF STRENGTH MORTAR: — During the time brickwork is being laid samples shall be taken of the mortar being used as shall be directed by the Department. A group of three 70mm x 70mm x 70mm test cubes shall be made from each sample for testing at 28 days of age. Each group test cubes shall be deemed to represent the whole of the batch from which the sample was taken and shall be identifiable with the batch.

The testing shall be undertaken by an independent firm or institution nominated by the Contractor to the approval of the Department. An item for the testing of mortar cubes has been provided elsewhere in these Bills of Quantities.

BURNT CLAY COMMON BRICKS: — shall comply with SANS Specification 227 and are to be good quality, sound, hard, well burnt bricks, uniform in size and shape.

A sample load of bricks is to be approved by the Department and all subsequent loads are to be equal thereto.

BRICKS FOR FOUNDATIONS: — are to be as above but extra hard burnt bricks.
Reject facing bricks may be used in lieu of extra hard burnt foundation bricks provided they are equal to a sample to be submitted to and approved by the Department. These bricks are also to be used for septic tank walls.

BRICKWORK: —unless otherwise described is to be in burnt clay common bricks and wherever practicable is to be in stretcher bond with the skins tied together with and including galvanized crimped wire wall ties in accordance with SANS Specification 28. The wire ties are to be of sufficient length to allow each end to be built into brickwork built into every fourth course and spaced at 450mm staggered centres (seven ties per square metre). The bricks are to be well wetted before being laid and the course of bricks laid last is to be well wetted before bedding the next course of bricks upon it. The brickwork is to have all perpends flushed up solid and each course is to be laid on a solid bed of mortar. No false headers are to be used. Whole bricks are to be used except where bats or closers are legitimately required to form bond.

Unless otherwise described one brick walls are taken at a nominal thickness of 230mm.

The joints of all walls to be plastered are to be raked out as the work proceeds to form key for plaster. All walls are to be carried up regularly so that no part is built more than 1,2m higher than the adjoining walls.

Mortar joints generally are not to exceed 10mm thickness unless otherwise indicated on the drawings. If a specific brick scale is indicated on the drawings, either drawn or written, it must be adhered to.

Solid bricks to X-Ray Room walls are to be used. If hollow core bricks are used, these are to be grouted up solid.

HOLLOW WALLS: — are to be formed of two thicknesses of brickwork as specified with cavity between, tied together, unless otherwise specified, with and including A.I.S.I. Type 304 stainless steel wire butterfly type wall ties in accordance with SANS Specification 23, of sufficient length to allow each end to be built into brickwork, built into every fourth course and spaced at 450mm staggered centres (seven ties per square metre). Cavities are to be kept clear of all rubbish, mortar droppings and projecting mortar.

BRICK LININGS TO CONCRETE: — unless otherwise described are to be tied to concrete with and including A.I.S.I. Type 304 stainless steel wire wall ties complying with SANS Specification 28 with one end embedded is to deep into concrete and other end built into the brick joints and spaced not less than seven ties per square metre.

REINFORCED BRICK LINTELS: — unless otherwise detailed are to be constructed in accordance with KZN Public Works Type Drawing.

PRE-CAST AND PRE-STRESSED CONCRETE LINTELS: — where specified, are to be of approved manufacture and the Contractor is to provide the Department with a certificate issued by the manufacturer certifying that the lintels are adequate for the purpose in terms of span, loading and number of courses and construction of brickwork above the lintel. The manufacturer is also to specify the minimum bearing required at each bearing end and the nature and period of temporary propping required. Rates or pre-cast pre-stressed concrete lintels are to include for any cement mortar filling required and for temporary propping in accordance with the manufacturer's instructions.

BAGGING DOWN BRICKWORK: — shall be carried out when the mortar in joints is still soft by rubbing over with wet rough sacking until all joints and crevices are evenly filled, including additional mortar if necessary to obtain an even surface or, when the mortar in joints is set, by rubbing over as described but including cement grout as necessary to fill up the joints and crevices.

CRAMPS: — for timber door frames shall be 1.6mm thick galvanized hoop iron 32mm wide with one end turned up 50mm and twice screwed to stile of frame and built 450mm deep into wall with other end turned up into brick joint and cranked as necessary where built into cavity wall. Cramps shall be built in approximately 330mm from top and bottom of stile and intermediately at not exceeding 825mm.

TIES TO WALL PLATES, RAFTERS, ETC.: — shall be 1.6mm thick galvanized hoop iron 32mm wide and at least 1500mm long with one end turned up and built in not less than ten courses deep into brickwork or embedded in concrete beams or slab and with end left projecting and wrapped around timber rafter and spiked to timber wall plate. Where ties are embedded to concrete beam or slab, they must be wrapped around the bottom steel bar reinforcement of the beam or slab.

WELDED MESH BRICK REINFORCEMENT: — shall be 55mm, 80mm, 155mm or 235mm wide consisting of two 3.55mm main high tensile steel wires at 50mm, 75mm, 150mm or 230mm centres respectively with 2.80mm high tensile-steel cross wires electrically welded at 300mm centres, lapped 150mm at end joints, 75mm at angles and built 110mm into connecting walls. No allowance has been made for laps.

BITUMEN EMULSION WATERPROOFING TO BRICKWORK: — The inner thickness of external superstructure walls whether hollow or solid, behind facing bricks, is to be bagged and painted with two coats of approved bitumen emulsion waterproofing compound.

FACING BRICKS. PAVING BRICKS, QUARRY TILES, ETC.: — Facing bricks shall comply with SANS specification 227. Facing bricks, paving bricks, quarry tiles, terra cotta grille blocks, etc. are to be of the types and colours specified, specially selected, free from blemishes, square on all faces, uniform in size, shape and colour and equal to a sample to be deposited with and approved by the Department.

Special care must be taken to preserve the arrases and faces of facing bricks, paving bricks, quarry tiles, etc. during transit and handling.

FACED BRICKWORK: — Facing bricks shall be sorted to ensure proper mixing of the bricks within the colour range of each type of facing bricks. Sudden changes in the general colour of faced brickwork in any one type of facing brick will not be acceptable. Sand used in mortar for faced brickwork is to be clean washed sand and sand from the same source is to be used throughout to maintain a uniform appearance. Faced brickwork is to be pointed as specified as the work proceeds. Keyed-in joints are to be formed with a round jointing tool and square recessed joints are to be approximately 6mm deep formed with a square jointing tool. All perpends are to be accurately kept. The bond is to be broken, if necessary, in the centre of panels above and below windows, above doors, between openings and in the centre of sides to piers. No broken bond will be allowed at reveals or quoins. All cutting to face bricks is to be done with a carborundum or other approved high-speed brick saw. Faced brickwork is to be protected from injury, mortar splashes, etc. and cleaned down with spirits of salts and scrubbed down with water at completion to the approval of the Department.

PAVING BRICKS AND QUARRY TILES: — unless otherwise described are to be pointed as the work proceeds with 6mm wide keyed-in joints. Paving bricks and quarry tile paving, sills, etc. are to be protected from injury, mortar splashes, etc. and cleaned down with spirits of salts and scrubbed down with water at completion to the approval of the Department.

FIBRE CEMENT SILLS: — are to be of approved manufacture without fixing lugs, even in shape, uniform in colour, free from cracks, twists and other defects, in single length between reveals and of the thickness and colour specified and equal to approved sample.

RATES

Brickwork Generally: — Rates for brickwork are to include for hacking the face, or raking out the joints, of brickwork where necessary to form key for plaster, etc. and for plumbing angles and surfaces, all square cutting, wedging and pinning against columns, beams, slabs, etc. for all waste in cutting and wire ties required in tying skins together as described.

Rates for hollow walls are to include in addition to the above for keeping the cavities clean and free of mortar droppings and for butterfly type wall ties, all as described.

Where items are described as cut and pinned, built in, bedded, wedged and pinned, etc. rates are to include for grouting in or bedding solid with 1:3 cement mortar, unless otherwise stated.

Where window units, etc. are described for building in as composite, rates are to include for assembling of units as required and, unless otherwise described, for tap screwing to coupling mullions or transoms, including holes:

Faced Brickwork, etc.: — Rates for all fair and faced brickwork, brick paving, grille block walls and the like are to include in addition to the foregoing for building or laying to true surfaces and angles, all fair square cutting and fitting and cleaning down to approval at

completion.

Rates for brick sills, copings, steps, margins, thresholds and the like shall include for fair ends and angles unless different bricks or tiles are used or special cutting is required.

Rates for items described as "Extra over ordinary brickwork" are to be for the extra cost of the facing bricks specified over common brickwork built in stretcher bond, and are to include for building in cement mortar consisting of one part cement to five parts clean washed sand and for pointing as described.

Rates for items described as "Labour and Material" are to be for the full cost of the facing bricks specified, and otherwise as above described.

Rates for all cut face brick linings are to include for cutting and bonding at ends.

Quarry Tiles: —Rates are to include for all square cutting and fitting, bedding and jointing in cement mortar consisting of one part cement to three parts clean washed sand, for pointing as described as the work proceeds and cleaning down to approval at completion.

Rates for treads, sills, copings, cappings, skirtings etc. are to include for pointing to exposed edges, ends and projecting soffits.

Air Bricks: — Rates for air bricks and air vent, gratings are to include for forming openings through the walls, for all necessary jack arches and turning pieces, for plastering all round the openings in cement mortar, and where in hollow walls, for building cavity solid all round in addition.

Fibre Cement Sills: — Rates are to include for all square cutting, waste, and fitting and for bedding in an approved epoxy adhesive.

Terra Cotta Grille Blocks: — Rates are to include for all square cutting and waste and fitting, bedding and jointing in cement mortar consisting of one part cement to three parts clean washed sand and for pointing with keyed in joints on both faces and into reveals of openings as the work proceeds.

5. WATERPROOFING

GENERAL: — All measurements are nett — no allowance being made for laps in sheet materials or for waste in cutting.

WORKMANSHIP: — All work is to be carried out to the approval of the Department by skilled and qualified workmen and in accordance with the methods prescribed in SANS Code of Practice 021 for waterproofing of buildings.

All work is to be executed in accordance with the instructions issued by the manufacturer of the material being used. Roof coverings and linings are to be laid to the falls, cross falls, etc. provided in the screeds or other surfaces to which they are to be applied.

Surfaces to be waterproofed are to be dry and cleaned of all dust, chips, etc. immediately prior to the commencement of this work and are to be free of any contaminating substances or projections that may damage the waterproofing materials being used.

POLYETHYLENE SHEETING: — is to comply with SANS Specification 952 and bear the SANS mark. The sheeting is to be laid with a minimum lap of 150mm, unless otherwise specified, at angles and junctions with laps sealed in accordance with the manufacturer's instructions.

MASTIC ASPHALT ROOFING: — is to conform to SANS Specification 297 and is to be laid hot in two or three layers, as stated, with each layer of minimum 4mm thickness and laid to break joint with the underlying layer by not less than 150mm.

Prior to the commencement of any work, the specialists who lay the mastic asphalt roofing are to satisfy themselves as to the acceptability of the surfaces upon which the mastic asphalt is to be laid, as the said specialists will be held fully responsible therefore.
Mastic asphalt to surfaces not exceeding 10-degree slope is to be laid in two layers on and including one layer of approved reinforced waterproof building paper lapped 75mm at all edges. Rates are to include for all cutting and waste on building paper.

Mastic asphalt to surfaces exceeding 100 and not exceeding 200 slope is to be laid in two layers on surfaces which have been hacked, grooved or scoured to provide an adequate key. Rates are to include for the necessary preparation of the surfaces.

Mastic asphalt to vertical surfaces and surfaces exceeding 20-degree slope is to be laid in three layers on and including any necessary expanded metal lathing securely fixed to the surfaces to prevent creeping. Where vertical surfaces do not exceed 300mm in height the surfaces to receive mastic asphalt may alternatively be prime coated with a latex based bitumen emulsion primer prior to the application of the mastic asphalt.

Anile fillets to all internal angles are to be run in one operation.

Finishing coats of bituminous-based aluminium paint on mastic asphalt roofing have been measured separately.

FLEXIBLE GLASS-FIBRE REINFORCED POLYESTER WATERPROOFING: — shall be of the type specified, or other approved, supplied and laid in-situ by a specialist sub-contractor, all to the approval of the Department and shall carry a written 10 (ten) year guarantee.

The waterproofing applied in-situ shall consist of one layer of three-ply bituminous felt underlay bonded to the substrate and covered with flexible glass-fibre reinforced polyester waterproofing comprising a chopped strand glass-fibre mat having a minimum mass of 450g / m^2, impregnated with flexible unsaturated polyester resin and finished with two coats of abrasion-resistant flexible unsaturated polyester surface coating which shall not show any sign of the glass-fibre reinforcement. The total mass of the waterproofing (excluding the bituminous felt underlay) shall be not less than 1.8kg / m^2.

Chopped strand glass-fibre mat reinforcement is to comply with the requirements of SANS Specification 419.

All unsaturated polyester resins are to be suitable for their intended use and comply with SANS Specification 713 and are to be ultra-violet ray stabilised.

All flexible glass-fibre reinforced polyester waterproofing is to be finished to approved opaque colours (excluding red or orange tints), is to be properly cured, and is to be free from porosity, blisters, cracks, surface crazing or other defects which may affect its appearance or its performance, with the surface colours consistent throughout.

Samples of flexible glass-fibre reinforced polyester waterproofing are to be submitted to and approved by the Department and all work executed is to be equal to the approved samples.

EXPANSION JOINT SEALANTS: — Polysulphide sealants, where specified, are to be approved polysulphide sealants complying with SANS Specification 110 Type 2, well compacted into joint.

Rates are to include for priming joints where recommended by the manufacturer of the sealant being used with a suitable and approved primer.

All work is to be executed by the manufacturer of the material, or other specialist firm, all in accordance with the manufacturer's instructions.

RATES: — for all roofing and linings are to include for cleaning and preparing the surfaces to be waterproofed as before described, for protecting from damage and cleaning down, flood-testing if required and handing over in an acceptable and guaranteed watertight condition at completion.
Rates for sheet waterproofing materials are to include for all dressing, bending, narrow widths, angles, intersections, cutting and waste and where applicable for the extra material required for lapping and for sealing laps as described.

Rates for roofing described as laid on "flat" roofs are to include for laying to slopes not exceeding 100mm from the horizontal.

6. ROOF COVERINGS

CONCRETE ROOFING TILES: — shall conform to SANS Specification 542. The tiles are to be of pattern and colour specified and is to be even in thickness, uniform in shape and colour and free from cracks and blemishes. The tiles are to be laid to "straight bond" in accordance with SANS Code of Practice 062 with vertical joints and bottom edges of each course ranging perfectly straight.

Unless otherwise specified each tile in every third course, all tiles in eaves and ridge courses and tiles in every course on each side of hips and valleys shall be secured with copper clout headed nails driven into the battens or with approved non-corrodible tile clips and nails in accordance with the manufacturer's instructions. Where nail holes in tiles have been cut off at hips, valleys, top edges, etc. new holes are to be drilled.

All ridge and hip cappings are to be of the types specified and of colour to match the roofing tiles. The cappings are to be bedded, jointed, pointed and torched up over roofing tiles in 1:3 cement mortar tinted to match the tiles. Where cappings having butt jointed ends are specified, an approved damp proof course conforming to Type C of SANS Specification 952 is to be fixed under, laid over the roofing tiles in accordance with the manufacturer's instructions.

Barge cappings are to be of the types specified and of colour to match the roofing tiles. The barge capping tiles are, unless otherwise specified, to be bedded, jointed, pointed and touched up over roofing tiles in 1:3 cement mortar tinted to match the tiles with every tile drilled and secured with copper clout headed nails to timber barge boards or bearers (elsewhere measured).

Concrete tiles to residential units in non hail area's are permitted.

"CHROMODEK" ROOFING SHEETS: - Shall be the secret fixed type, supplied with all fittings in full-length sheets in the profile and colour as specified. Sheets shall be a minimum of .58mm and maximum of .8mm thickness. When .58 thick sheets are used, purlin spacings shall be a maximum of 1.2mtr¢ and maximum 1.5mtr¢ for .8 thickness. Sheets shall leave the factory in the specified colour and any scratches etc., due to handling are to be 'touched up' on site after installation. All fixings, valleys, cappings and securing clips shall be to manufacturers' recommendations and no variations shall be accepted without prior approval from the department.
0,58mm thick roof sheeting for purlins up to 1,2m spacing and 0,8mm thick roof sheeting for purlins exceeding 1,2m – 1,5m spacing.
In area's up to 30Km from the coast, metal roof sheeting to be 0,58mm thick with special corrosion protection as supplied in " Global- Duro" roofing sheets. All other area's to be 0,58mm as "Global-Tech corrosion protection. 0,58mm "Klip Lock 700 " or "Craflock " and 0,8mm " Brownbuilt ". (0,8mm is recommended for high rainfall and snow fall area's due to deeper trough.)

RATES: — for roof coverings, are to include for all necessary half tiles at verges and for all square cutting and waste at verges, abutments, and top and bottom edges and to both sides of ridges.

Rates for cappings, etc. are to include for all short lengths, cutting, waste and fitting at intersections.

All measurements are nett. No allowances have been made for overlaps.

CORRUGATED IRON ROOFING, CLADDING AND FITTINGS: — are to be of an approved brand and are to be manufactured from galvanized steel sheets of the thickness specified after galvanising and having a galvanized coating of "Iscor Coating Designation Z275" for inland areas and 'Z600" for coastal areas as specified.

Roofing, etc. shall be lapped one and a half corrugations at sides and 30mm at ends unless otherwise specified. Roofing, etc. shall be fixed to timber purlins, rails etc. with standard galvanized drive screws 65mm long and to steel purlins, etc. with 8mm galvanized hook bolts of the lengths stated.

Each screw or bolt shall be fitted with one lead washer and one bituminous felt washer and shall be spaced not less than one screw or bolt to every alternate corrugation across the width at end laps and ends of sheets and at each intermediate purlin or rail.

Rates for roofing, cladding and fittings are to include for: —
a) Fixing as described.
b) Bedding washers in an approved mastic sealing compound
c) Coating projecting ends of hook bolts and nuts with bitumen after fixing
d) All square notches, square cutting and waste, laps, fitting and drilling. All measurements are nett. No allowance has been made for laps.

FLUTED STEEL ROOFING, CLADDING AND FITTINGS: — are to be approved galvanized fluted steel sheets and fittings manufactured from galvanized steel sheets of the thickness specified after galvanising

(a) **Galvanized steel sheets and fittings**: — are to be manufactured from galvanized steel having a galvanized coating of "Iscor Coating Designation Z275" for inland areas and of "Z600" for coastal areas as specified with the sheets having a plain galvanized finish and the fittings an embossed galvanized finish.
Roofing, etc. shall be fixed to timber purlins, rails, etc. with standard drive crews of the lengths stated and to steel purlins, rails, etc. with 8mm galvanized hook bolts of the lengths stated. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the roofing

Vertical cladding shall be fixed with broad flutes externally - unless otherwise described - to timber rails with standard galvanized drive screws 50mm long and to steel rails with 6mm diameter x 25mm long galvanized sheet bolts. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the cladding including drilling steel rails as necessary.

(b) **Baked enamel finished galvanized steel sheets and fittings**: — are to be manufactured from un-passivated galvanized steel having a galvanized coating of "Iscor Coating Designation Z275" and finished where described in the items, with approved factory applied baked enamel finish of colours to be selected by the Department.

Roofing, etc. shall be fixed to timber purlins, rails, etc. with sherardised or stainless steel drive screws of the lengths stated and to steel purlins, rails, etc. with 8mm diameter sherardised or stainless steel hook bolts of the lengths stated. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the roofing.

Vertical cladding shall be fixed with broad flutes externally, unless otherwise described, to timber rails with sherardised or stainless steel drive screws 50mm long and to steel rails with 6mm diameter x 25mm long sherardised or stainless steel sheet

bolts. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the cladding including drilling rails as necessary.

(c) **Generally**: — where sheet lengths are in excess of 12m these have been measured separately.

Roofing, etc. shall be lapped one flute at sides and 230mm at ends unless otherwise specified. Fixing roofing sheets are to be spaced one every crest along purlins at top and bottom edges of roof slopes and one to every alternate crest along intermediate purlins. Fixings to vertical cladding are to be spaced one to even alternate trough to each rail.

Fittings, unless otherwise specified, are to be lapped a minimum of 150mm and where necessary are to be drilled for and fixed with the fixings securing the roofing and cladding sheets.

Rates for roofing, cladding and fittings are to include for: —

(a) Fixing as described and in accordance with the manufacturer's instructions.
(b) Seam bolting all side laps at not exceeding 450mm centres with 6mm diameter x 25mm long sheet bolts or with 20mm x No. 14 self-tapping screws and each screw or bolt is to be fitted with washers as recommended by the manufacturer of the roofing.
(c) Fixing of fittings where described as fastened to roofing, cladding, etc. with approved pop rivets spaced at not more than 340mm centres.
(d) Sealing side and end laps of sheeting and end laps of fittings with one continuous strip of approved 5mm diameter pre-formed flexible sealant strip.
(e) Coating the exposed heads of fixings and fasteners to baked enamel finished materials and cut edges of sheets and fittings with matching touch-up compound supplied by the manufacturer of the sheeting and in accordance with his instructions.
(f) All square notches, square cutting and waste, laps fitting and drilling. No punched holes will be permitted.
(g) Taking special care at all times to prevent damage to the finished surfaces of the baked enamel finished materials.

All measurements are nett. No allowance has been made for laps.

7. CARPENTRY AND JOINERY

NOMENCLATURE OF TIMBERS: — Timber described as "softwood" is to be South African softwood of the relevant type, grade, etc. as specified.

The names used for imported timbers are those given in Supplement No. 1 to SANS Code of Practice 12 under "Nomenclature of Standard Trade Names of Imported Commercial Timbers used in South Africa" and the Contractor is referred thereto.

TIMBER SIZES: — Sawn and wrot timbers are to be of the full sizes stated.

Where "out of" sizes have been shown for wrot timbers on the drawings, an allowance of 4mm for each wrot face off the sizes shown has been made.

Doors, fanlight, sashes, manufactured boarding, plywood, veneers, etc. must be of the full thickness specified.

Where doors, door frames, fanlights and frames; sashes, windows and frames are measured as numbered items, the overall sizes are given to the nearest 10mm.

Tolerances in nominal dimensions for imported timber shall not exceed the following:

a) For nominal dimensions up to 76mm the actual dimension may be 2.5mm under for each 25mm
b) For nominal dimensions 76mm and over the actual dimension may be 1.6mm under for

each 25mm.

STORAGE OF TIMBERS: — Timber delivered to the site is to be property stacked above ground, either on bearers or platforms under cover and protected from inclement weather.

ORDERS: — for timber, are to be placed immediately after the Contract is signed, as the Contractor will be held responsible for any delay in delivery.

PRE-TREATMENT OF TIMBERS: — All permanent timbers installed in the buildings are to be treated against borer, cryptotermes, termites, and all wood destroying agencies with an approved preventative, all in accordance with SANS Code of Practice 05.

Any surface subsequently exposed by cutting or planing must be touched up with the same preservative solution and rates are to include for all preservative required.

The Contractor is to obtain a certificate from the merchants supplying the treated timber, to the effect that the timber has been treated against wood destroying agencies. The Department has the right to remove samples of the treated timber to have tests carried out by the Division of Entomology or any other Authority.

Temporary timber on the site, e.g. shuttering props, etc. must be free from wood destroying agencies. Any timber so affected is to be immediately removed from the site.

Materials which do not comply with the above requirements or are in any way damaged or discoloured by the pre-treatment must be replaced by the Contractor at his own expense, if so directed by the Department.

STRESS GRADING OF SOFTWOOD TIMBER: —The Mechanical Stress Grading of Softwood Timber (Flexural Method) shall be in accordance with SANS Code of Practice 0149.

STRUCTURAL TIMBER: — for carpentry is to be South African softwood in accordance with SANS Specification 563 and, unless otherwise specified, of Stress Grade V4, and branded accordingly. If it is necessary to use sizes that have to be re-sawn, these shall be re-graded and stamped with the respective SANS stress grade mark. Unless this is done, timber which is re-sawn is no longer considered as complying with the specification and shall on no account be used.

BRANDERING / BATTENS: — of cross-sectional size 50 x 50mm and under shall be South African softwood in accordance with SANS Specification 653 and branded accordingly.

JOINERY AND SHELVING: — Softwood for joinery and shelving shall be South African softwood (S. A. Pine) in accordance with SANS Specification 1359 and branded accordingly. All timber for joinery is to be air or kiln-dried to a moisture content of approximately 12 %.
Shelving to linen stores to be timber slatted with wall bands or free standing units as specified.

STRUCTURAL LAMINATED TIMBERS: — are to be of the sizes detailed, wrot on all faces and are to be manufactured by an experienced fabricator to the approval of the Department. Adhesives used must meet the requirements of the current SANS 1204 for external use.

The surface appearance of members shall be Class C (Constructional) or Class S (Selected) as defined in SANS Specification 876 and as stated in the items

FINGER-JOINTED TIMBERS: — are to be manufactured in accordance with SANS Code of Practice 096— "The manufacture of finger-jointed structural timber".

Contractors wishing to use finger-jointed timber must supply a guarantee that the finger jointing complies with the above Code of Practice and that the glue is suitable for the particular member.

JOINTING OF PURLINS, FASCIAS, RAILS, BEAMS, ETC.: —shall, unless otherwise detailed, be as follows: —

Purlins, slating battens, etc. of cross-sectional size 50 x 76mm and under shall be jointed over the rafter. Larger sized purlins may be dealt with in the same way or by using some other suitable, recognised method. All purlins and battens shall be fixed to the supporting rafter by at least one nail skew driven from the direction of the ridge. Where the purlin or batten is fixed at more than 900mm centres, at least two nails shall be used at every fixing point.

Fascias shall be jointed over rafters.

Beams, rails, etc. shall be jointed over a support or at 1/5th span with a recognised joint using bolts, etc.

Roof and floor plates are to be halved at joints, angles and intersections and nailed together.

Floor joists and bearers are to have splayed heading joints nailed together and staggered to occur over bearers and sleeper piers respectively.

Sawn brandering is to be butt-jointed at heading joints and angles and where wrot, is to have splayed heading joints and mitred angles over all point of support.

HARD WOODS: — (Red Meranti and Sapele) are to be best quality, specially selected and well seasoned, free from all sapwood to the approval of the Department and are to be well kiln-dried.

Red Meranti is to be even in grain and colour, selected from "Standard and Better" grade from Malaysia. Sapele is to be *Entaindrophragma cylindrium* of F..A.S. grade.

PREFABRICATED TIMBER ROOF TRUSSES: -

Design: —The design of prefabricated roof trusses, bracing, and secondary members forming part of the total timber roof construction shall be prepared by a professional structural engineer (Truss Systems Engineer) strictly in accordance with SANS Code of Practice 0160 and the superimposed loading, unless otherwise specified, is to be taken as that for inaccessible roofs.

Analysis: — From the configuration and mechanism shown on the tender drawings the Truss System Engineer shall submit, through the Contractor, to the Department detailed calculations and working drawings showing timber sizes, connections, truss dimensions, etc.

This submission must include details of both trusses and bracing as specified below:

a) TRUSSES: The analysis of the truss system is to include diagrams of the trusses with marked up members and nodes showing dimensions, positions of supports and positions and values of applied loads, which, if not specified in the tender documents, must be derived from an approved source of reference which shall be indicated in the analysis. Due account must be taken of any eccentricity particularly at supports.

   The analysis must also indicate allowable stresses, internal axial forces, moments and resulting stresses, as well as timber sizes and grades and detailed plate sizes

(b) BRACING: Bracing must be designed to withstand the forces specified in SANS Code of

Practice 0163 clauses 6 and 7.

If the bracing system incorporates trusses, the additional forces must be shown in the analysis of the trusses.

The drawings must give all the information necessary for the construction of the bracing.

An outline of the bracing system, including temporary bracing must be shown on a working drawing giving clear details of fixings and anchorages into the supporting structure at wall plate level. Interference of bracing with truss members must be taken into account. Moments caused by forces applied between node points of bracing trusses and the axial forces must be given in the bracing calculations, also sizes and fixings of the bracing system.

Submissions: — A copy of letter reference TR1 (attached at the end of this document) completed and signed by the Truss System Engineer must be submitted by the Contractor at the same time as the list of Sub-Contractors. Two sets of calculations and drawings with pertinent erection instructions for the whole roof construction as presented by the Truss System Engineer must be submitted to the Department for consideration and permission to proceed.

This in no way absolves the Contractor of his responsibilities.

Any modifications to design or drawings are to be arranged directly between the Truss System Engineer and the Department. It will be the Contractor's responsibility to ensure that information is presented to the Department in good time and no claims will be entertained in respect of any delays resulting from the late approval of drawings, etc.

Any difference in cost between the roof system initially submitted by the Contractor and the finally accepted system to meet the original design requirements will be for the account of the Contractor.

The Truss System Engineer will be required to inspect the roof structure and certify on letter reference TR2 (attached at the end of this document) that the construction is in conformity with his design, and any costs in this respect must be included in rates for the truss system.

If, in the opinion of the Department, further visits are necessary due to errors or omissions on the part of the Contractor or the Truss System Engineer the costs of these inspections will be for the account of the Contractor.

Fabrication and Storage: — Fabrication shall not commence until written permission has been given by the Department. The prefabricated roof trusses shall be manufactured, supplied and delivered to site by an approved manufacturer with all members accurately mitre cut, close butted and rigidly fixed together by approved galvanized metal spike connectors applied simultaneously to both sides of every joint by use of a mechanical press in accordance with SANS Code of Practice 0163.

Permissible deviations in fabrication of trusses are to be as specified in SANS Code of Practice 0155.
The following will not be permitted at joints: —

b) knots, splits or finger joints
c) varying member thicknesses
d) plates not fully pressed into timber
e) gaps between members exceeding 1.5mm average over the width of the mitred members.

Stress grade marks must be clearly visible on all members.

Relevant dimensions must be checked on site before fabrication. Trusses must be stored off the ground and under cover both at the factory and on site.

Erection and Bracing: — Unless otherwise instructed, erection must be carried out as described in "The Erection and Bracing of Timber Roof Trusses" published by the Truss Plate Association of South Africa and the National Timber Research Institute - CSIR.

Where the overall lengths of trusses exceed 13 m, complete braced bays are to be assembled on level ground and lifted into position suspended at maximum 3m intervals from a spreader bar. Alternatively, braced bays may be assembled in position on a minimum of two lines of temporary intermediate supports below node joints. Temporary supports must be removed before roof covering is placed..

The erector must be suitably qualified and must satisfy the Department that he can meet the specification.

Where the roof incorporates a hipped end, the construction is to commence with the hip, otherwise erection is to be commenced with a fully braced bay.

Temporary bracing must be installed as erection proceeds in accordance with the accepted design.

The Contractor must notify the Department in sufficient time in order that an inspection may be made before the roof covering is placed.

The trusses will be subject to the following tolerances: —
a) maximum out of straight — length/400
b) maximum out of vertical at any point—height/200.

Rates: — The Contractor is to allow in his rates for the roof trusses for the design, manufacture, supply, hoisting and fixing of the roof trusses and permanent bracing, any necessary temporary bracing, and for the costs of all inspections by the Truss System Engineer.

Purlins or battens for roof coverings have been measured elsewhere. Rates for roof trusses are also to include for the exposed rafters at eaves overhangs to be wrot all round and trimmed and splay cut as required.

INSULATION, WATERPROOFING AND DUST PROOFING MATERIAL FOR ROOFS: — shall be of an approved aluminium foil faced both sides laminated Kraft Paper and synthetic reinforced material fixed in accordance with the manufacturer's instructions, lapped 150mm at all edge, unless otherwise specified.

GYPSUM PLASTERBOARD: — is to be in accordance with SANS Specification 266.

GYPSUM COVED CORNICES: — are to be in accordance with SANS Specification 622.

FIBRE CEMENT SHEETS: — are to be in accordance with SANS Specification 685.

FIBRE CEMENT CELLULOSE SHEETS: — are to be in accordance with SANS Specification 803.

HARDBOARD: — is to be in accordance with SANS Specification 540. Tempered and untempered hardboard is to be conditioned in accordance with the manufacturer's instructions before fixing in position.

VENEERS: — All decorative face veneers are to be selected kiln dried of best quality of the respective timbers, free from knots, cracks, patchwork, sapwood and other defects and bonded under heat and hydraulic pressure with water-resistant synthetic resin adhesive.

Commercial veneers are to be selected rotary cut hardwood veneers and otherwise as

described above.

PLYWOOD: — is to be long grain three or five-ply type manufactured with hardwood veneers with selected face veneers as described, bonded under heat and hydraulic pressure with water-resistant synthetic resin adhesive and sanded to a smooth finish.

CHIPBOARD: — All joinery fixtures shall be manufactured from 18mm Moisture resistant V313 Melamine Faced Chipboard (Particle Board) only with 32mm worktop as specified.

BATTEN BOARDING: — is to be long grain three-ply boarding manufactured with kiln-dried South African Meranti softwood core formed of laminations not exceeding 45mm wide and faced on both sides with selected veneers as described, bonded under heat and hydraulic pressure with water-resistant synthetic resin adhesive and sanded to a smooth finish.

DECORATIVE LAMINATE LININGS: — are to be 1.2mm thick approved general purpose quality high pressure decorative melamine laminate sheeting with satin finish and of selected colours and patterns, and rates are to include for all square cutting and waste and square notching, close cut and mitred external angle intersections where required and for bonding to the timber backings with an approved adhesive in accordance with the manufacturer's instructions.

The linings are to be cut out of single sheets in obviate joints but where joints are unavoidable, the sheets are to be butted to form a tight inconspicuous joint.

NAILS AND SCREWS: — Mild steel nails are to be in accordance with SANS Specification 820. Mild steel and brass screws are to be round headed, countersunk, etc. as appropriate and are to be in accordance with SANS Specification 1171. Nails and screws shall be of the size, length and type appropriate to their respective uses.

PLUGS, ETC.: — Where items of woodwork are described as "plugged", these may be nailed to timber plugs or slips built into the structure, and where described as "plugged and screwed" these may be screwed to timber or approved patent fixing plugs.

SHOT FIXING: — Where items of woodwork are described as "shot fixed" these are to be fixed with an approved cartridge-assisted tool, and rates are to include for all nails, spikes, blanks, washers, cartridges, accessories, etc.

CARPENTRY: — Timbers are to be the best of their respective kinds, free from sap, shakes, large, loose or dead knots, wavy edges and other defects and thoroughly seasoned. Wrot surfaces are to be finished clean, smooth and free from tool marks.

Timbers shall be in as long lengths as possible.

Rates for sawn and wrot structural timbers are to include for notching, splay and birds mouth cutting, housing, halving, scarfing, cutting timbers to the required lengths, spiking and clinching and or hoisting and fixing timber in position.

CEILINGS: — are to be of the types described, fixed to timber brandering, bearers etc. as described and with panels set out so as to give even width panels not less than half a sheet wide at edges. Brandering shall be spaced at not more than 400mm c/c and fixed at right angles to sheets.

FLUSH PLASTERED CEILINGS: — are to be formed of gypsum plaster board of the thickness stated, generally in 1200mm widths and long lengths, fixed grey side down to timber brandering, bearers, etc. as described, with butted joints between the boards covered with 65mm wide strips of galvanized wire scrim fixed along both edges, including all square notches and square cutting and waste, and the ceiling finished with two coats of approved retarded hemi hydrate gypsum plaster applied in accordance with the manufacturer's instructions to a finished thickness of not less than 6mm, including pressing into scrim over joints and finished to a smooth polished surface.

TRAP DOORS:- 900 x 600 Prefabricated hinged trap door.

SUSPENDED CEILINGS BOARDS: — are to be of the types described or as specified – normally 6mm x 600mm x 1200mm embossed fibre cement boards - and inclusive of their component parts must be of sufficient strength to perform the function for which they are to be used, manufactured from best quality materials and conform to the requirements of the Fire Master. The exposed surfaces of all ceiling panels and supporting members are to be uniform in colour and free from surface blemishes.

Hangers are to be galvanized and are to be at maximum 1, 2mtr centres to meet the requirements of the specification, each with one end fixed to the suspension grid main bearers and the other end fitted with suitable galvanized fixing straps to the roof structure. Fixing points must be agreed to by the Department before any power shot fixings are made. Hangers must not be suspended from air-conditioning ducts.
Hangers to be provided at all four corners of recessed light fittings.

Component parts and fixings other than aluminium must be non-corrosive and able to withstand atmospheric pollution. Surfaces of aluminium which are in contact with other materials when fixed, particularly ferrous metals, are to be suitably insulated to prevent electrolytic corrosion.

All work is to be executed by specialists in accordance with the manufacturer's instructions, and to the approval of the Department.

Rates for ceilings are to include for hangers, suspension systems, ceiling panels, for constructing the ceilings in a manner suitable for carrying air conditioning diffusers and light fittings in the positions required, for setting out the ceilings to layouts approved by the Department, for all non-standard size panels, for modifications to standard suspension systems as necessary to work around any air-conditioning ducts or pipes or light fittings, for all necessary square cutting and waste, notching and fitting around projections, columns, etc.

EXPOSED TEE-SYSTEM SUSPENDED CEILINGS: — are to be of the type described with main tees and cross tees spaced at the required centres to suit the sizes of panels used, with the cross tees fitted between and notched to form a flush fit with main tees unless otherwise described. All suspended ceilings to be fitted with shadow line trimming to perimeters.

Main and cross tees shall be holed as necessary and provided with timber wedges or steel clips to prevent ceiling panels from lifting.

CONCEALED TEE-SYSTEM SUSPENDED CEILINGS: — are to be of the type described with main and cross tee section bearers spaced at the required centres and all properly fitted together at intersections.

ALUMINIUM TRIMS TO CEILINGS: — are to be of extruded aluminium of 6063-TF or equivalent quality and temper, of the sections described. Anodised trims are to be of the colour stated.

Rates are to include for all cutting, fitting at intersections, mitres, etc. and rates for items described as fixed with screws are to include for countersunk drilling and fixing with approved countersunk stainless steel screws.

INSULATION MATERIAL FOR CEILINGS: — shall be 75mm thick resin bonded glass wool / mineral wool thermal insulation blanket complying with SANS Specification 1381 of the thickness specified, delivered to the site in unopened rolls in its original factory wrappings over solid gypsum boards or styrene of 25mm thickness as specified glued to suspended ceiling tiles.

DOORS: —

Flush Doors: - Semi-solid and solid laminated flush doors are to be of approved manufacture complying with SANS Specification 545.

The doors are to be finished on both sides with the facing veneers specified and concealed on both stiles unless otherwise specified, with hardwood edge strips and where doors are required to receive a transparent finish, the edge strips are to match the facing veneers.

Doors with rebated meeting stiles are to have edge strips to the meeting stiles not less than 19mm thick.

Each door or leaf of double door, described as hung to swing, is to be fitted with necessary hardwood reinforcing blocks for bottom shoe and top centre of spring hinge.

Unless otherwise specified, all flush doors are to be interior quality, but, where exterior doors are specified, the glue used must comply with Type WBP of SANS 2304.

FRAMED, LEDGED AND BRACED BATTEN DOORS, ETC.: — Doors described as filled in with V-jointed boarding are to be filled in flush on one side with tongued and grooved vertical boarding, V-jointed on one or both sides and of the thickness stated. The boarding is to be in narrow widths, closely cramped up, rebated on outer edge and housed to grooves in stiles and rails and twice brass countersunk screwed at each intersection.

Ledges and braces and inner edges of the abutting stiles and rails are to be chamfered to form a V-joint at junction with the boarding. Braces to fall from lock to hinge side.

ENTRANCES TO SECLUSION WARDS: - Entrances to seclusion ward buildings shall be fitted with remote controlled full height 'Man Trap' Security Cubicles with bell pushes fitted to both entry and exit sides and remote unlocking / release operation enabled from security booth.

Doors to Seclusion Rooms: - Doors to seclusion rooms are to be steel lined solid core units with 100mm x 100mm viewing panel, glazed with 40mm bullet proof glass in a steel frame. Steel lining for doors is to be epoxy laminated to doors and around edges. Internal steel lining to be primed and finished with approved epoxy paint. External face of doors to be finished in veneer as per DOH standard details. Doors to be hung to open inward on special 6mm galvanized steel door frames with lugs pre welded to frame to fit every third course of brickwork. The complete unit is to be hot dip galvanized and built into surrounding 230mm solid brick walls. No welding to be done on site.

NOTE: - Above Anti–Bandit Security doors are solely supplied by "Chubb" and "Bitcon Industries" as a complete unit with all fittings and ironmongery.

DOORS TO X-RAY UNITS

Entrance doors to X-Ray rooms shall be top hung sliding door size 1830 x 2032 x 40mm, complete with heavy duty sliding door track – 'Henderson' or other approved -, 2.2mm lead insert between panels and four door stoppers. Door is to overlap door opening 100mm each side when closed.

JOINERY: — All timbers shall be in as long lengths as possible. Lengths for joinery shall be single where possible and where joints are unavoidable, they shall be made as inconspicuous as possible.

Timber for grounds, firrings, blocks, plugs, etc. shall be sound and free from defects.

All joinery work is to include for work in connecting by mortise and tenon, dovetailing, housing, flush pinning, etc. as may be by required and for all screws, nails and glueing

together and for sinking flush all exposed screws unless otherwise specified.

Wrot surfaces and edges are to be steel scraped and sandpapered before and if necessary, after fixing.

Edges are to be arras rounded unless specified to be angle rounded.

"Arras rounded" denotes that the sharp edges are slightly rounded off and that no mitring is required.

"Angle rounded" denotes rounded from 3mm to 10mm radius and is to include for housed and mitred joints.

Hardwood doors, frames, jamb and soffit linings, etc. are to be treated on all surfaces with one coat of approved sealer before building in, etc. and rates for these items must include for this. Batten doors with tongued and grooved battens are to have the tongues and grooves well sealed before assembling. The sealer used shall be compatible with the finishing coats to be applied.

Horns of door frames are to be checked and splayed back where frames are fixed projecting or flush with surface and built in.

Where doors, fanlights or sashes are described as hung to butts on steel or aluminium frames, rates are to include for supplying necessary steel, brass or stainless steel screws.

Panel work is to be secured to the grounds, etc. with screws concealed behind the mouldings or by sinking the screws and pelleting as directed.

Joinery is to be framed up, but not glued or wedged, immediately the order is given to commence work. Wherever possible, joinery shall not be placed or fabricated in position until the plaster has dried out. Reasonable tolerance shall be provided at all connections between the joinery and building carcass so that any irregularities, settlements or other movements shall be adequately compensated. All joinery shall be accurately scribed to fit the contour of any irregular surface. Should the joints of any joinery open or give, such defective work is to be taken down, refitted and redecorated or replaced by new joinery at the Contractor's expense.

Only brass screws may be used for hardwood joinery.

The Contractor is to allow for cross-tonguing all solid wood sections unobtainable in single widths.

No joinery is to be primed until it has been inspected and approved by the Department.

All joinery liable to injury must be protected to the satisfaction of the Department. Rates must include for this temporary protection.

Rates for timber frames, mullions, transoms, linings, standards, rails, fascias, cornices, skirtings, beads, picture rails, etc. are to include for mitres, etc.

Rates for all items of timber-are to include for fixing and planting on as may be required with necessary panel pins or nails.

PARTITIONS:

These are to be of an approved system of standard construction, with an average sound rating of not less than 30 decibels taken over the whole face area.

Framing is to be natural finish anodised aluminium comprising posts at 1200mm centres unless otherwise described, with transom rails where specified, fitted between the posts, a

rail against ceiling and an aluminium standard skirting on each side at base, all neatly and securely fixed together.

Provision is to be made at the base of the partitions and in the ceiling rails and posts for electrical wiring, which will be installed under the electrical sub-contract, and the ceiling rails and end posts are to be fitted with continuous removable access plates.

Solid panelling is to be approved solid chip core panels of the thickness specified faced on both sides as described in the items.

Glazed panels are to be glazed as required, complete with all necessary natural finish anodised aluminium glazing beads and vinyl glazing strips.

Louver panels where specified are to be approved natural finish anodised aluminium adjustable louver sets each comprising head and sill weather bars and two jamb strips each fitted with louver brackets with spring loaded clips for and fitted with and including louvers as required and complete with tilt bars and operating lever handles. Where the openings are not the correct size to suit a full number of standard width louver blades, an alternate head weather bar must be provided to suit a fixed louver blade of the required width. The louver sets are to be fitted with the jamb strips positioned horizontally so that the louvers will be fixed vertically.

Partitions are to be in 1200mm modules, unless otherwise specified, except at ends where the odd lengths are to be made up by a narrow width at one end of the partition.

Ends of partitions against walls, window frames, etc. and the top edge of partitions against ceilings are to be fitted on both sides of partition with approved vinyl scribing sections fitted between the structure and the end post or top rail of the partition.

Plain openings are to have aluminium frames similar to door openings neatly fitted into the framing.
Doors are to be solid laminated flush doors complying with SANS Specification 545. The doors are to be finished on both sides with veneer as described in the items and concealed on both stiles with matching hardwood edge strips.

Where doors are described as having observation openings, these openings are to be of the sizes stated, glazed as specified with all edges bedded in approved neoprene gaskets and fixed with 10 x 25mm wrot matching hardwood rebated glazing beads mitred round and bradded to both sides.

Rates for doors are to include for all necessary additional aluminium framing to form door openings, and for hanging the doors on and including one and a half pairs of 102mm satin chrome finish brass hinges to each door.

All locks to doors in demountable partitions are to be supplied with two keys, and are to be controlled by the same master key as the mortise locks used elsewhere in the Contract when specified.

Unless otherwise specified all veneered solid panelling and doors are to be finished as follows: —

Prepare, stop with tinted stopping, apply an approved stain as necessary to achieve uniform colour appearance, and three coats of approved clear matt polyurethane finish including burnishing with steel wool between coats.

Rates for demountable partitions are to include for supplying, assembling, erecting, finishing, glazing and fixing complete between finished surfaces of concrete floors, plastered walls and ceilings, and all in accordance with the manufacturer's instructions.

DEMOUNTABLE PARTITIONS 50MM (NATURAL ANODISED).

Extruded Aluminium Sections

Supply and fit demountable "Kappa" partition system comprising anodized aluminium U-Channel fitted to suspended ceilings. Vertical split-post (mullion) to be fitted between floor and ceiling U-Channel at 1225mm c/c with angle brackets. Once framing is fixed, fit panels into place and secure with clip-on cover plates.
All aluminium sections may be anodized or powder coated in a variety of colours.

Panels

41mm thick semi solid core panels 2032 x 1200mm. The panels are made up of two outer skins of 3.2mm hardboard cladding. Lower panels to be provided with a 150mm wide solid mid-rail 850mm from the base of the panel to the centre of the mid- rail built in as part of the construction. The panels to be prepared before applying the final finish as specified.

Construction

Right angled corners to be formed with natural anodized aluminium radiused corner post fitted from floor to ceiling. Floor fixing to be angle brackets and ceiling fixing to be hidden block. The ceiling U-Channel butts up against radiused corner post.

Door Frames

Door frames to be natural anodized aluminium pre-fitted with woolpile gaskets, clipped into H-Profile at head and clipped into combination split post and cover plate at styles. The rebate on the door frame caters for standard doors of a thickness between 40mm and 44mm.

Glazing

Glazed panes to be framed with H-Profile fitted horizontally at top and bottom, butted against side of split-post and clip on cover plate combination and fixed with angle brackets. Glazing sections pre-fitted with woolpile gaskets and set into H-profiles and into post / cover plate combinations to form a neat glazing opening. Glazing beads pre-fitted with woolpile gaskets and then clipped into glazing section.

Termination

Openings for louver frames, sliding doors and windows, serving hatches and partition ends are to be lined with the aluminium termination section.

Skirtings

76mm high aluminium skirting to be glued to panels.

DRYWALL PARTITIONS:

Studs

50mm x 33.5mm x 0.5mm thick drywall galvanised steel studs are used. The studs to receive aluminium extrusions clipped onto both sides of the stud. Framing to be securely fixed to walls, floor and ceilings where necessary. Stud connectors to be used to join horizontal studs to vertical studs.

Floor Track

52mm x 25mm x0.6mm galvanised sheet steel track to be used.

Panels

12,7mm thick tapered edged gypsum plasterboard panels used and decorated in situ with panels secured to either side of framework.
Patient care areas to be 12mm Supa Wood panels in framework as specified.

Construction

Internal walls are constructed by fixing drywall studs to floor track @ 600mm c/c. Wall and ceiling junctions are formed by fixing 84mm x 19mm aluminium ceiling and wall channel to wall or ceiling. The floor track is then fixed into this; alternatively, these components may be fixed simultaneously. The studs are then fixed to floor.
The partitions, unless otherwise described are to be 75mm thick and covered both sides with 12,7mm thick tapered edged gypsum board in 1200mm widths to height specified.
The gypsum boards are screwed @ +/- 300mm c/c at all intersections to the floor and head wall tracks and vertical studs.
Using self-drilling, self-tapping, rust proofed countersunk screws, with screw heads and joints between boards and between abutting edges of boards flushed up with an approved jointing material.

Exposed Aluminium Framing
Door frames, glazing termination and ceiling and wall channels to be natural anodised aluminium. 25 x 25 x 1.5 aluminium angle stuck to external corners of partitioning. 80mm high aluminium skirting glued in position.

Glazing
Aluminium glazing section is clipped onto the flanged end of the stud around the glazing perimeter. The glazing section has a recess to accept a rectangular clip-in glazing bead which enables 3mm-8mm thick glass to be received in the system. The glass is retained with various sizes of PVC glazing gasket.

Termination
Openings for louver frames, sliding doors and windows, serving hatches and partition ends are to be lined with the aluminium termination section.

Skirting
The system is designed to accept recessed base, female, 60mm high aluminium skirting.

Sound Insulation
75mm Fibreglass Cavity Bat with a 35g glass tissue or 75mm Isotherm "Acoustisorb' mineral wool blanket is to be installed between studding before fixing final outer panel.

All work is to be executed by a firm specialising in this type of work and all to the approval of the Department.

8. FLOOR COVERINGS, PLASTIC LININGS, ETC.

FLOOR SHEETING: — are to be of the composition, type, size and thickness specified with colour, pattern, graining, etc, consistent throughout, all to the approval of the Department.

Thermoplastic floor tiles: — are not to be used.

Fully flexible vinyl floor sheeting: — are to comply with SANS Specification 786 and is to be 2.5 mm nominal thickness.

Recessed entrance mats with brass frame at main entrance into a health facility as "Belgotex" Grimbuster or other approved. This to be positioned outside before entering.
In patient care area's, no perforations to floor covering is to be made. Eg door stops, door barrel bolt floor keeps etc.
Where the specified sizes and/or thicknesses of floor sheeting differ from those in the SANS Specifications, such items of floor sheeting shall comply in all other respects with the relevant SANS Specifications.

SKIRTINGS, STAIR NOSINGS, EDGING STRIPS, ETC.: —are to be of the types and sizes specified and are to be of approved manufacture

CARPET TILES AND SHEETING: — are to be of the types specified and of approved colours and patterns all to approval of the Department.

LAYING: —
Vinyl Floor covering laying procedure and polishing.

Site conditions required before the layer commences an installing of a Resilient Floor covering. Some of these conditions may appear obvious, but they are not always complied with. If any of the following recommendations are ignored, it is likely that a number of problems will arise during or after installation of the flooring.

1. All building materials and equipment, e.g. sand, scaffolding, tools, etc. should be removed. (Do not allow heaps of sand, concrete, etc., to remain on the surface of the sub-floor since moisture transfer to the sub-floor takes place).

2. All resilient flooring materials require a smooth, hard, clean and level surface, not only for appearance but also for achieving a satisfactory adhesive bond and long-term durability. The Specifier and the Main Contractor shall ensure that the sub-floor is acceptable to receive the resilient flooring specified in respect of levelness, smoothness, soundness and cleanness. (The SANS Code of Practice 070/1991 as amended 1993 Section 9.3 details the requirements in this regard).
The flooring contractor shall ensure that the sub-floor is sufficiently dry prior to the installation of the flooring material. The floor should be tested by means of a Hygrometer or a Tramex. (Of the instruments available for determining moisture levels in sub-floors, the most practical and accurate is the hygrometer).

SHEETING
Ensure that the following steps are followed during the installation:

1. Trim off factory leading edge before laying sheeting.
2. Align the sheet in position that there is an opening no bigger than 1mm between adjacent sheets. For the best results, the width of a credit card is an acceptable measure.
3. Apply adhesive according to the manufacturers' specifications.
4. Roll the floor during and after installation with a 68kg roller to maximize the adhesion between the sheeting and the adhesive.
5. Complete the welding 24 hours after the installation. Groove the joins open with a suitable hand or electric groover to a width of not wider than 3mm and not deeper than 1.5mm. Weld the joins with a hot air welding gun with temperature settings of between 4-6 temperature setting and use a speed nozzle that will not burn the material or damage the coating. Use a sharp spatula and guide plate and remove the excess welding in two stages.
6. All vinyl sheeting needs to be stripped and sealed 72 hours after installation. Please ensure you use a good quality product.

2.1 **HYGROMETER**
When a hygrometer is positioned on a sub-floor surface, the reading of the relative humidity of the entrapped air space is obtained.

- A hygrometer reading of less than 70% indicates that the sub-floor is sufficiently dry for flooring to be laid upon it.
- If the hygrometer indicates a final reading of more than 70% when the initial reading of the atmosphere was less than 70% then the sub-floor is unacceptably damp and must be allowed to dry out before any flooring is installed.
- If the hygrometer indicates a final reading of more than 70% when the initial reading of the atmospheric humidity was also greater than 70%, as can occur in coastal areas, then the following applied:

1. If the final reading is significantly higher than the initial reading, then the sub-floor must be considered to be unacceptably damp.
2. If the final reading is similar to, or less than the initial reading, then the moisture content of both the atmosphere and the sub-floor are similar.

2.2 **TRAMEX CONCRETE MOISTURE ENCOUNTER (C.M.E.)**
Any reading on the C.M.E. of 60% or less indicates acceptable moisture content for the installation of any vinyl floor covering.

3. Floor Preparation – New and Existing (old) Screeds
3.1 Use of screed smoothing compounds should be avoided except for making minor repairs, however should a full skim be required, then the most common method in both instances is the use of a smoothing compound e.g. **Pavelite** in combination with **Pavelite Bonding Liquid**, mixed to the correct ratio and consistency. Only recommended products, mixed strictly in accordance with manufacturers instruction should be used. Do not use smoothing compound on power floated finishes. It is recommended that in new structures the screeding should be as specified by "Tal" using "Screedmaster", the pumped method.
A badly undulating floor may require grinding by mechanical means to improve the overall levelness. Although smoothing compounds such as **Pavelite** will improve the sub-floor it will not achieve perfection.
3.2 In cases where old vinyl floor coverings have been uplifted, leaving a bitumen adhesive residue, it is recommended that a strict procedure relating to the "Preparation of Sub Floors with Bitumen Residue", be complied with.
(This method may not constitute good flooring practice, but has proved to be successful on many occasions. No guarantee is however given or implied).

4. **Construction joints (saw cuts) and Expansion Joints**
4.1Construction joints (saw cuts) in the sub-floor should be cleaned out, and the sides of the saw cut be painted with **Pavelite Bonding Liquid** and allowed to dry. The joint should then be filled with a mixture of **Pavelite** and **Pavelite Bonding Liquid**. It is advisable to slightly overfill the joints, which when dry should be rubbed down with a carborundum stone.
4.2 Expansion joints should be filled with a suitable **Sealant** to prevent the ingress of dirt. **It is bad flooring practice to lay flooring over such a joint**. The flooring should stop at the edge of the joint and cover strips placed over the joint itself. Expansion joints and cover strips should be discussed and designed by a structural engineer.

5 Correct setting out is critical, and consideration should be given to the squareness of the area. It is safest to set out from the longest outside wall.
5.1. The recommended notching for a trowel to spread adhesive is a V notch of 1,5 x 1,5 x 1,5mm at 4,00mm centres. Consideration should however be given to the porosity of the sub-floor. Ensure the use of the recommended adhesive with the appropriate flooring. **Do not** spread the adhesive over a larger area than can be covered within the working/open time of the adhesive.
5.2 All installations must be rolled with a 68kg three sectional articulated metal floor roller on completion, within the working time of the adhesive.
5.3 Welding of sheeting is to be done only after 24 hrs after installation.
5.3. a. Trimming
While the welding rod is still warm, trim off most of the top half using a sharp spatula and spatula guide which fits over the welding rod. Carry out the final trimming using the spatula knife only, when the welding rod has cooled.
5.3.b **Glazing**
The trimmed welding rod will tend to soil more rapidly than the sheeting. It is therefore Important to glaze the surface of the trimmed welding rod.

6. After installation the flooring should be adequately protected, preventing damage caused by other trades working on the site.

7. The completed floor should not be washed or polished for a period of 72 hours after the installation in order to allow the adhesive to cure. This period will vary from one adhesive to another.
7.1 The vinyl floor covering must be cleaned with an approved water based floor Stripper, in order to achieve an acceptable standard of cleanliness for sealing. Avoid excessive use of water at all times

7.2 Foreign matter such as paint stains, tar, etc. which may not respond to the process must be removed by other means.

7.3 Three coats of a Water Based Emulsion floor dressing, shall then be applied on completely dry surface in accordance with the manufacturer's instructions, allowing one hour drying time between the first and second application of each dressing coat.

RATES: —for all floor coverings are to include for laying as described, for cleaning down backing surfaces before laying and or all square and raking cutting and waste and fitting, fair cutting at edges where no skirting occurs, protecting from injury, and for cleaning down, etc. as described, at completion.

Rates for all wall linings are to include for laying as described, cleaning down backing surfaces before laying, sizing backing surfaces if necessary to ensure proper adhesion, all square and raking cutting and waste and fitting, fair cutting at exposed edges, bending at angles and for all narrow widths and protecting from injury and cleaning down, etc. as described, at completion. Wall linings in widths not exceeding 300mm to returns, reveals and the like have not been measured separately, but have been included in the area of the general items of wall linings and rates must include or this.

Rates for skirting, stair nosing, edging strips, etc. is to include for fixing as described, cutting to lengths and fitting at intersections, mitres, ends, etc. and for cleaning down at completion.

9. IRONMONGERY

Ironmongery is to be to the approval of the Department and rates are to include for fixing screws of corresponding metal and finish and for oiling and easing as required at completion.

Where catalogue references are given, the articles are to be of the brand specified or other approved.

No two-lever mortise locks are to be used.

Mortise locks, cylinder locks, cupboard locks, etc. are to differ so that no key will pass a second lock, unless otherwise specified. Where mortise locks, cylinders, locks, etc. are specified to be "en-suite" they are to be made "en-suite" in the specified number of "suites". The "suites" are to be controlled by differing sub-master keys with a grand master key controlling all "suites", and no sub-master is to pass any lock of another "suite".

All locks are to be fitted with two keys and the locks are to be stamped with consecutive numbers and the keys to each are to be stamped to correspond with the lock.

Items of ironmongery specified as chrome plated or satin chrome finish are, unless otherwise specified, to be chromium plated or satin chrome finish on solid brass.

Items of ironmongery specified aluminium are to be natural anodised.

Where items of ironmongery are specified as fixed to pressed steel door frames, the Contractor is to ensure that the suppliers of the steel frames prepare the frames for all keeps and do all mortising and drilling required and receive all information necessary regarding ironmongery. Preparation of steel doorframes for ironmongery has been measured elsewhere.

Where tests of ironmongery are described as "plugged and screwed" these are to be screwed to patent fixing plugs of approved manufacture, and this shall include for plugging and screwing to brickwork or concrete.

Key tags are to be 40mm diameter x 3mm thick plaster of approved colour, engraved on face with the required number of letters and numerals finished in an approved colour, and the tag is to be holed for and fitted with a steel split ring and fixed to key.

Engraved plastic door signs and numeral plates are to be of 5mm thick clear plastic with square polished edges all round with an approved coloured background and sans-serif letters and numerals as described in the items, reverse engraved in the plate with splayed sides and flat reading face and finished in an approved contrasting colour. Each sign is to be twice drilled for and fixed to softwood or hardwood, unless otherwise described, with chromium plated round beaded brass screws. Unless otherwise described, the signs are to be 50mm high with 30mm high, engraved letters or numerals and are to allow a minimum margin of 25mm at both ends. All signs are to be equal to sample to be submitted to and approved by the Department.

Pictorial plastic signs are to be of 5mm thick clear plastic of the sizes stated in the items with square polished edges all round and with the silhouette described in the items applied to the back of the plate by means of the silk screen process in an approved colour and the whole back of the plate finished in an approved contrasting colour. Each sign is to be four times drilled and fixed to softwood or hardwood, unless otherwise described, with chromium plated round-headed brass screws. All signs are to be equal to sample to be submitted to and approved by the Department.

10. STRUCTURAL STEEL WORK

GENERALLY: — The fabrication, assembly and erection of structural steelwork is to be executed in accordance with SANS Specification 1200H — Structural Steelwork (a copy of which the Contractor will be required to keep on site so that it can be referred to at all times during the Contract) with the following amplifications and amendments: —

INTERPRETATIONS: — Clauses 2.1 and 2.2 refer. This preamble, together with any other supplementary preambles appearing in these Bills of Quantities shall be deemed the project specification and are the "Portion 2" referred to in Clause 2.2.

DEFINITIONS: — Clause 2.3 of SANS Specification 1200H refers. All references to the Engineer shall be deemed to mean the Department.

SUB-CONTRACTORS: —The Contractor shall either (a) have adequate satisfactory and approved experience in this type of work or (b) employ an approved specialist structural steelwork Sub-Contractor. The Contractor, in the case of (a), or the specialist Sub-Contractor, in the case of (b), shall employ at all stages of the Works both on and off site a competent Supervisor experienced in the work.

MATERIALS: — Unless otherwise shown on the drawings or hereunder, all rolled sections shall be hot rolled mild steel, and all materials shall comply with one of the following: —

a) Weldable Structural Steels to SANS 4360:
b) Hollow sections to SANS 4848 Part 2 and SANS 6323.
c) Cold rolled sections to SANS 2994.
d) Black bolts and nuts to SANS 135.
e) Precision bolts and nuts to SANS 136.
f) High-strength friction-grip bolts and nuts to SANS 1282.
g) Flat and tapered washers to SANS 1149.
h) Electrodes for welding to SANS 455.

SHOP DETAIL DRAWINGS: — The Contractor shall prepare shop detail drawings, in conformity with the details shown on the structural steelwork drawings and to show all information necessary for complete fabrication, assembly, ejection and painting. In the preparation of the shop detail drawings the Contractor is to comply with the requirements of SANS Code of Practice 0162.

The cost of preparing all necessary shop detail drawings and copies thereof is to be allowed for by the Contractor in his rates.

The Contractor shall submit two copies of his shop detail drawings to the Department for approval at least 10 days before fabrication of the member concerned is due to commence. Such approval does not imply that a complete and comprehensive check of the detail drawings has been carried out, and the Contractor shall remain responsible for ensuring that the steelwork is correctly fabricated, assembled, erected and painted.

SUBSTITUTION OF SIZES, ETC.: — No substitution of sizes or joints additional to those shown on the drawings shall be made without the prior approval of the Department. Except in cases of proven non-availability of materials specified, any additional costs involved due to substitution shall be for the Contractor's account.

FIXINGS: — The positions and manner of fixing the hangers for suspended ceiling air-conditioning ducts, pipe installations, etc. to the structural steelwork are to be approved by the Department before work on such installations commences.

FABRICATION, ASSEMBLY AND ERECTION

Welding: — shall be carried out in accordance with SANS Code of Practice 044 and the relevant recommendations of SANS Code of Practice 0162 and SANS 5135, and in any case of conflict, the SANS Codes of Practice shall be deemed as binding.

All welders employed on the Works shall be currently classified at least as grade 2 welders as defined by SANS Code of Practice 044. Should the Department so request, proof of the classification shall be produced.

Unless otherwise specified all welds are to be continuous fillet welds of 6mm leg length or not less than the thinnest plate or section being welded.

Handling, Storage and Erection: — of members is to be undertaken in such a manner to prevent overstress or damage. Should overstress or damage occur, the Department shall be informed and his instructions sought.

Storage shall be arranged such that damage to applied finishes is prevented.

All plant and equipment used in the erection of structural steelwork shall be adequate in every respect. The Contractor shall allow in his rates for all necessary temporary bracing, and for maintaining and finally removing such temporary bracing.

Fixing of Bolts, etc.: — Unless approved by the Department, no pre-drilled fixings for bolts, etc. will be permitted through hollow section members. Any hollow section member that has been drilled or punctured in any way shall be considered condemned and must be replaced to the satisfaction of the Department.

INSPECTION AND TESTING

Facility for Inspection: — The Contractor shall afford to the Department all reasonable access to inspect the steelwork at any stage of its fabrication, and shall give due notice before delivery of steelwork to the site to allow inspection and tests to be conducted if so required by the Department.

Cost of Tests: — The cost of all tests required by the Department shall be borne by the Administration, except that the costs of the following tests shall be borne by the Contractor:-
(a) Testing of welders and equipment
(b) Such tests (including load tests) as may be necessary by failure on the part of the Contractor to meet the requirements of the specification.

Procedure in the Event of Failure: — In the event of a failure of a test, the Contractor shall

either replace the defective item or prove its sufficiency by means of a load test carried out in accordance with Appendix B of Chapter 6 of the South African Standard Building Regulations. If so required by the Department, the Contractor shall also demonstrate by means of tests at his own cost that all like members meet the requirements of the Specification.

PRIMING OF STRUCTURAL STEELWORK

General

(a) Painting conditions.
No painting shall be undertaken when one or more of the following conditions exist: —
(i) The atmospheric or steel temperature is below 10^0 C,
(ii) The atmospheric or steel temperature is expected to fall below 7^0 C before the paint is dry,
(iii)The atmospheric or steel temperature is high enough to cause damage to the paint film,
(iv) In fog or mist,
(v)The relative humidity is greater than 90 %,
(vi) Surfaces are or will be wet or damp from rain or other causes,
(vii) Surfaces are contaminated by dirt, dust, grease, oil or other matter detrimental to painting,
(viii) Wind will deposit dust onto un-dried surfaces.

(b) Extent of shop painting.
All surfaces shall be primed as described in the shop except: —
(i) Those to be encased in concrete which are to be left as prepared metal; unless otherwise specified
(ii) Contact surfaces of high strength friction-grip bolt connections which are to be left as prepared metal
(iii) Edges or faces yet to be welded which are to be left as prepared metal over sufficient width from the weld to avoid contamination of the weld or damage to the paint by the effect of welding.

(c) Paint identification, storage and preparation.
All paint shall be supplied in unopened original containers showing the manufacturer's name and trademark date of manufacture and the relevant SANS or other specification number.

No paint shall be used past its maximum life span but otherwise oldest paint shall be used first. Containers shall not be opened until required and opened containers shall be used before unopened containers

Before use, paint shall be thoroughly stirred and prepared in accordance with manufacturer's instructions.

(d) Thinning.
No paint shall be thinned except strictly in accordance with manufacturer's instructions.

(e) Dry film thickness.
Where not specifically later stated this shall be in accordance with manufacturer's instructions for spreading rates. A tolerance of approximately 10% of that thickness will be allowed.

(f) Touching-up surfaces.
Surfaces shall be protected against damage, but should this occur, then the paint shall be rubbed down over the damaged and surrounding area to a sound surface and then restored by re-applying the removed coat properly feathered in with the existing.

Upon completion of site connections, these connections shall be stripe painted with the specified primer before any further painting is carried out.

Class P1 Preparation and Priming Coat: — Unless otherwise specified, rates for structural steel-work are to include for Class P1 Preparation and Priming Coat as follows:-

(i) Surfaces are to be cleaned in accordance with SANS Code of Practice 064 to remove all rust, scale, grease, oil, etc. endeavouring to bring the surface to a bright metallic condition, and painted, unless otherwise specified, with one coat of red -oxide zinc chromate primer in accordance with SANS Specification 909 prior to despatch from the works.

(ii) Upon delivery to the site and again after erection any bared or damaged surfaces are to be made good with similar primer.

The Contractor is advised that the finishing coats of paint to be executed after the erection of the structural steelwork have been measured elsewhere.

Class P2 Preparation and Priming Coat: — Where specified, rates for structural steelwork are to include for Class P2 Preparation and Priming Coat as follows: —

(i) Surfaces shall be thoroughly cleaned by sandblasting to Swedish Standard SIS 055900 standard Sa 2½ to give minimum peak to valley profile of 50 micrometer when measured by SANS Draft Test Method No. 772.

(ii) Surfaces shall be blown thoroughly clean with compressed air and within four hours of sandblasting, one coat of "Plascon SN 162 Ironguard-4-Zinc" or other approved primer of minimum dry film thickness of 75 micrometer shall be applied by pressure pot spray system in accordance with the manufacturer's instructions in the shop.

(iii) Upon delivery to the site and again after erection, any bared or damaged surfaces are to be made good with similar primer.

The Contractor is advised that the finishing coats comprising one intermediate coat and one finishing coat of chlorinated rubber paint to be executed after the erection of the structural steelwork have been measured elsewhere.

Class P3 Preparation and Priming Coat: — Where specified, rates for structural steelwork are to include for Class P3 Preparation and Priming Coat as follows: —

(i) Surfaces shall be thoroughly cleaned by sandblasting to Swedish Standard SIS 055900 standard Sa 2½ to give maximum peak to valley profile of 50 micrometer when measured by SANS Draft Test Method No. 772.

(ii) Surfaces shall be blown thoroughly clean with compressed air and within four hours of sandblasting, one priming coat of "Epidermix 352" or other approved epoxy coal tar of minimum dry film thickness of 75 micrometer shall be applied in the shop.

(iii) Upon delivery to the site and again after erection, any bared or damaged surfaces are to be made good with similar primer.

The Contractor is advised that the finishing coat comprising a further coat of epoxy coal tar to be executed after the erection of the structural steelwork has been measured elsewhere.

MEASUREMENT AND PAYMENT: — The provisions and Clause 8 will **NOT** apply and the system of measurement which is adopted in these Bills of Quantities is the only system of measurement which will be recognised in this Contract.

RATES FOR STRUCTURAL STEELWORK: — Rates for structural steelwork are to include for all necessary cutting to lengths, splay cut ends, shaping, holing, tapping, threading, forging, turning, assembling, welding, and fixing in position.

11. METALWORK

PROPRIETARY MATERIALS: — Where proprietary materials are specified, the materials used are to be of the type, specified or other approved by the Department.

RATES: — for all metalwork, unless otherwise stated, are to include for cutting to length, shaping, turning, threading, forging, fitting, assembling, riveting, welding, welded running joints, filing smooth, also for all screws and holes and hoisting and fixing in position. All screwed work is to have full threads.

WELDING AND BRAZING: — Where items are described as welded or brazed, rates must include neat welding or brazing by experienced workmen using a recognised process and for cleaning and filing or grinding off smooth, all to approval. All welding is to be continuous unless otherwise described.

SCREW FIXINGS: — Where items are described as tap screwed, grub screwed, set screwed, etc. rates must include for the necessary screws, for drilling all components and for tapping the components where necessary to receive such screws.

PIPE MEMBERS: — All galvanized mild steel pipe members are to be "medium" pipes complying with SANS 1387. Diameters of pipes, unless otherwise stated, are normal internal diameters.

PRIMING OF STEELWORK: — All items of fabricated mild steel except where described to be galvanized, are to be cleaned in accordance with SANS Code of Practice 064 to remove all scale, rust, grease, oil, etc. endeavouring to bring the surface to a bright metallic condition, and painted, unless otherwise specified, with one coat of red-oxide zinc chromate primer in accordance with SANS Specification 909 prior to despatch from the works.

GALVANISING OF STEELWORK: — All steel surfaces described to be galvanized are to be thoroughly sand, grit or steel shot blasted to white metal in accordance with SANS Code of Practice 064 and fluxed ready for galvanising, and the completed unit is to be hot dip galvanized after fabrication in accordance with SANS Specification 763 for general applications on the relative thicknesses of metal.

The zinc coating shall be continuous and of even thickness over all surfaces entirely free of bare spots, dull, rough patches, blisters and other imperfections and shall show no signs of peeling. Where site welding has to be done, the welds are to be properly cleaned down and cold galvanized to the approval of the Department.

If requested by the Department, the manufacturer shall carry out tests to prove that the requisite mass / thickness of zinc coating is applied and that it is of uniform thickness. The tests shall be made by attaching a test piece of mild steel, approximately 250 x 25 x 6mm, by means of wire, to an article being galvanized, and subjecting the test piece to the same cleaning, fluxing and galvanising treatment as the article being galvanized, and at completion, the test piece tested by a method approved by the South African Bureau of Standards, the cost of which will be borne by the Contractor.

CHROMIUM PLATING OF STEELWORK: — All items of fabricated mild steel described to be chromium plated are to be properly de-greased, cleaned and polished perfectly smooth before plating and all in accordance with SANS Specification 728. All items are to be first nickel-plated then chromium plated to provide a bright mirror finish and all plating is to be equal to sample to be submitted for the necessary approval by the Department.

PRESSED STEEL DOOR FRAMES: — shall be manufactured from mild steel sheet 1.60mm thick for single rebated frames and 1.20mm thick for double rebated frames. Rebates shall be suitable for 42mm thick doors and fanlights.

The sections are to be accurately bent to form the profiles. Corners are to be mitred and welded and reinforced at back with 1.60mm thick steel angle sections. Transoms for

fanlights are to be let into the jambs and welded. All welds are to be solid and cleaned off flush, leaving a perfect outside finish.

Each frame is to be fitted with one pair of sturdy angle or channel section tie bars at base, welded below the frame; and where required for additional strength, cross struts of the same section are to be welded between and at right angles to the main tie bars. Each frame is also to be fitted with one 'diagonal brace as temporary support, standard 230mm long corrugated adjustable building-in lugs at jambs, three rubber shock absorbers in rebate of lock jambs of frames for single doors and one rubber shock absorber, for each leaf in the rebate of the head or transom of frames for double doors.

All frames are to be primed on all surfaces with an approved red oxide zinc chromate priming coat in accordance with SANS Specification before leaving the manufacturer's works, unless specified to be hot dip galvanized, and rates are to include for touching up where necessary with similar primer after building in.

Where frames are specified to be galvanized they are to be hot dip galvanized after manufacture in accordance with the relevant provisions of SANS Specification 763 for general applications on the relative thicknesses of metal.

Frames, unless otherwise described, are to be fitted with one and a half pairs of 100mm five-knuckle loose pin steel hinges, unless otherwise specified for each door or each leaf of double door and with one pair of 75mm five-knuckle loose pin steel hinges for each fanlight. The three-knuckle leaf of each hinge is to be welded into the frame or transom.

Where frames are described to be fitted with brass butts, the frames are to be checked out and fitted, unless otherwise specified, with one and a half pairs of 100mm double bronze washered brass butts for each door or leaf of double door, unless otherwise described, as one pair of 75mm brass butts for each fanlight, with open leaf of each butt secured to the frame or transom by means of 6mm diameter countersunk headed brass set screws screwed to and including a 3mm thick steel backing plate of suitable size welded to frame or transom and drilled and tapped to receive the set screws.

Where frames are described to be fitted with aluminium hinges the frames are to be checked out for and fitted, unless otherwise specified, with one and a half pairs of 100mm five-knuckle aluminium hinges of 6082 alloy with nylon bushes for each door or leaf of double door, unless otherwise described, and one pair of similar hinges to each fanlight, with the three-knuckle leaf of each hinge secured to the frame or transom by means of 6mm diameter countersunk headed stainless steel set screws screwed to and including a 3mm thick steel backing plate of suitable size welded to frame or transom and drilled and tapped to receive the set screws.

Where frames are to be prepared for the top centres of floor spring hinges, a 6mm thick steel backing plate of suitable size is to be welded into the back of the frame and drilled and tapped to receive the fixing screws of the top centre.

The preparation of frames or all items of ironmongery, other than butts, has been measured separately and the rates against these items are to include for all drilling, mortising, tapping for screws, etc. required for the fixing of keeps, brackets, etc. of the items of ironmongery described. Preparation of frames for locks and latches is to include, in addition to the above, for recessing and fitting the frames with and including standard keeps and adjustable striking plates to suit the types of locks and latches used and with totally enclosed mortar guards 1, 15 metre high above finished floor.

Door and fanlight sizes are given to the nearest 10mm. The building in of frames has been measured separately.

STAINLESS STEEL DOOR FRAMES:- shall be manufactured from grade 304 stainless steel sheet 1.60mm thick for single and double rebated frames to profiles as per detailed drawings. Rebates shall be suitable for 42mm thick doors and fanlights. Stainless steel

frames to be used only in Patient Treatment facilities.

PRESSED STEEL CUPBOARD DOOR FRAMES: — shall be manufactured from 1.20mm thick mild steel sheet standard sections, having rebates for 42mm thick doors, and fitted with transoms and/or mullions where required and with sill section allowing the cupboard doors to be taken down to general floor level with the floor level inside cupboards not less than 12mm above general floor level. The frames are to be 102mm wide overall.

The sections are to be accurately bent to form the profiles. Corners are to be mitred and welded and reinforced at back with 1.60mm thick steel angle sections. Transoms, mullions and sills are to be neatly fitted at intersections and welded. All welds are to be solid and cleaned off flush, leaving a perfect outside finish.

All frames are to be fitted with rubber shock absorbers to the lock jambs of single doors, and to the head, transom and sill of double doors. Each door is to be fitted with standard corrugated adjustable building in lugs at jambs.

All frames are to be primed on all surfaces with an approved red-oxide zinc chromate priming coat in accordance with SANS Specification 909 before leaving the manufacturer's works, unless specified to be hot dip galvanized, and rates are to include for touching up where necessary with similar primer after building in.

Where frames are specified to be galvanized they are to be hot dip galvanized after manufacture in accordance with the relevant provisions of SANS Specification 763 for general applications on the relative thicknesses of metal.

Frames are to be fitted with one pair of 100mm five-knuckle loose pin steel hinges for each lower door or each leaf of lower double door and with one pair of 75mm five-knuckle loose pin steel hinges for each upper door or each leaf of upper double door. The three-knuckle leaf of each hinge is to be welded into the frame or mullion. Frames for single cupboard doors shall be prepared for locks or catches as specified and the frames for double doors are to be prepared for two barrel bolts for the first closing leaf of lower doors and one barrel bolt for the first closing leaf of upper doors.

Overall sizes are given to the nearest 10mm. Building in of the frames has been measured separately.

STEEL WINDOWS AND DOORS: — shall be in accordance with SANS Specification 727 and the frames are to be provided with fixing lugs or are to be holed for screwing as required.

Industrial type windows are to be suitable for glazing from the inside and all other windows from the outside, unless otherwise described.

Side hung and vertically pivot hung sashes shall open to at least 90 degree horizontally pivot hung sashes to at least 80 degree and bottom hung sashes to 30 degree. Unless otherwise stated, hinges for side hung opening out sashes are to be of the projecting type for easy cleaning.

All opening sashes are to have polished brass furniture.

The transoms and mullions of all purpose-made windows and doors are to be equally spaced between the outer frames of the windows and doors to form openings of equal size. Where this is not the case either the width or the height of the opening is stated, unless otherwise stated, the fixed lights and sashes of all purpose-made windows are to be in one square and the sashes and doors are to open out.

Windows and doors, unless otherwise specified, shall be of "one piece" construction. Composite windows and doors are to be supplied complete with all necessary standard coupling transoms or mullions.

Stock and purpose made residential type steel windows and school type windows of residential section shall be constructed of standard 25mm steel sections and of metal not less than 3mm thick.

Stock and purpose made industrial type steel windows shall be constructed with main frames of standard 35mm steel sections and of steel not less than 3mm thick, with sashes of standard 25mm steel sections and of steel not less than 3mm thick.

"Universal" sections, where specified, shall be not less than 33mm wide (measured over one opening section only) and of metal not less than 4mm. thick, and with all sight lines maintained (whether consisting of all fixed lights, all opening sashes, or portions of both) and with all glass in the same plane.

Stock and purpose made steel doors, sidelights and fanlights, shall be constructed with the doors of "Universal" sections as before described and the sidelights and fanlights of standard residential sections as before described. Bottom openings in doors and sidelights shall be fitted with kicking plates of one thickness of 1.60mm mild steel sheet fixed with metal beads. Frames of outward opening doors shall be fitted with bottom sills of door framing section (stepped sills) and of inward opening doors with metal ties welded to frames for embedding in threshold (flush sills)

Top Hung Sashes: — are to open out on a pair of steel hinges having brass pins and washers and fitted with brass peg stay, steel peg and locking bracket.

Outward Opening Side Hung Sashes: — are to open out on a pair of steel projection hinges having brass pins and washers and fitted with brass two-point handle and brass striking plate and brass sliding stay with friction fastener.

Inward Opening Side Hung Sashes: — are to open in on a pair of steel hinges having brass pins and washers and fitted with brass single point handle and steel engaging hook and brass sliding stay with friction fastener.

Bottom Hung Sashes: — are to open in on a pair of steel hinges having brass pins and washers and fitted with steel concealed side arms with brass guides and brass spring catch for long arm or hand operation and steel catch plate.

Horizontally Pivot Hung Sashes: — are to have brass adjustable friction ring centres and fitted with brass spring catch for long arm or hand operation and steel catch plate.

Projected Out Sashes: — are to be balanced on steel concealed side arms, the top of the sash fitted with spring loaded brass shoes to slide in brass guides and fitted at bottom with brass handle and brass striking plate.

Doors: — are to be hung on one and a half pairs per leaf of steel projection hinges with brass pins and washers and fitted with mortise lock set as specified, and each lock is to be provided with two keys.

Brass concealed bolts are to be fitted at top and bottom of meeting edge of first closing leaf of double doors. Sidelights and fanlights are to be hung as described for windows.

Adjustable Louver Sets: — are to be natural anodised aluminium louver sets of approved manufacture consisting of head and sill weather strips complete with neoprene gaskets and two jamb strips each fitted with louver brackets with spring loaded clips for the specified width of glass louver blades complete with tilt bars and operating lever handles. Where openings are not of a height to suit standard width louver blades an alternate head section with static clips must be provided to take a fixed louver blade of the required width. The louver sets are to be screwed to the steel window frame with stainless steel self-tapping screws and all portions of the louver set which come in contact with the window frame are to be insulated with approved pressure sensitive PVC tape to prevent electrolytic corrosion.

Burglar Bars: — are to be standard type burglar bars formed of 20 x 5mm mild steel bars riveted at intersections and riveted at ends to the window frames. The burglar bars to the small-pane type windows are to line through with the glazing bars and windows of the horizontal-pane type or of the no-glazing bar type are to be fitted with burglar bars which are divided as for the small-pane type window.

Fly screens: — are to be standard type fly screens suitable for residential opening-out type steel windows, unless otherwise described, and are to be constructed of stove enamelled pressed steel frames fitted with 0.25mm thick mosquito-proof mesh glass-fibre gauze. The fly screens are to be clipped onto the inner face of the steel window after all painting is completed.

All steel windows and doors are to be primed on all surfaces with an approved red oxide zinc chromate priming coat in accordance with SANS Specification 909 before leaving the manufacturer's works, unless specified to be hot dip galvanized, and rates are to include for touching up where necessary with similar primer after building in.

Where steel windows and doors are specified to be galvanized they are to be hot dip galvanized in accordance with the relevant provisions of SANS Specification 763 for general applications on the relative thicknesses of metal.

Loose metal glazing beads, where specified, are to be of an approved type and size, and are to be fixed with screws set in the correct positions for the type of glazing to be used, and neatly mitred at angles.

Immediately the windows and doors have been delivered on site, they are to be thoroughly overhauled and all necessary adjustments or repairs are to be made before they are fixed in position. A further inspection is to be made after building in and any further servicing required must be carried out in order to leave windows and doors in a satisfactory condition after glazing is completed.

All glass and glazing has been measured elsewhere.

Sizes of windows and doors are given to the nearest 10mm. The building in of windows and doors has been measured separately.

STAINLESS STEEL: — is to be of the thickness and grade specified and unless otherwise stated is to be buffed to an even satin finish to the approval of the Department.

All welding to stainless steel shall be by argon arc process and where filler rods are used these are to have properties not less than those of the parent metal. All welds are to be ground off smooth and uniform and the whole buffed to an even finish all over. Stainless steel is to be cut and bent in such a manner that a minimum of welding is required.

Where bending is required, all external angles are to be arras rounded and all internal angles are to be radiused.

All stainless steel work is to be of the highest quality and executed by specialists in this type of work and to the approval of the Department.

Note that where stainless steel fittings are specified and support work or fixings with bolts, nuts, rivets, etc, are required / specified, these fixings and support work are to be of stainless steel of the same rating / grade as the equipment specified.

ALUMINIUM AND ANODISED ALUMINIUM: — is to be of the brand specified or other approved and of 6063-TF or equivalent quality and temper.

Aluminium bars and sections shall comply with the relevant clauses of SANS 1476, extruded tube and hollow sections with the relevant clauses of SANS 1474, and sheet and

strips with the relevant clauses of SANS 1470. All alloys to be anodised are to be of anodising quality.

Aluminium is to be free from flaws, hammer and die markings or other imperfections.

Anodising of aluminium is to be carried out in accordance with SANS Specification 999 by an approved process. The average anodic film thickness shall be 25 micrometer, and at no point should the anodic film thickness fall below 22 micrometer or be thicker than 30 micrometer.

Prior to anodising, all surfaces are to be de-greased and cleaned, all irregularities removed and flushed off smooth and buffed where necessary.

All anodised aluminium must be coated with a suitable "non-yellowing" methylcrylate lacquer film, approved by the Department, over the entire surface. The lacquer film must be continuous and of a uniform average thickness not less than 10 micrometer. The lacquer thickness must be determined by use of a film meter or other instrument methods as described in ASTM B244-49T. Rates for anodised aluminium must include for this protective coating.

Before the work is put in hand, samples of finish are to be submitted to the Department for approval, and all finished work is to be equal in all respects to the approved samples.

The Contractor shall provide all samples required for testing in accordance with SANS Specification 999. If required, tests on the anodic film are to be carried out at the works of the anodised to verify that the work conforms to SANS Specification 999, the cost of which will be borne by the Contractor.

The surfaces of all aluminium which are jointed to or are in contact with other materials when fixed, particularly ferrous metals, are to be suitably insulated to prevent electrolytic corrosion.

Joints in all aluminium members are to be neatly formed in an approved manner with screw heads, pins, rivets, etc. concealed so that the joints are practically invisible. Screw or bolt jointing is to be kept to a minimum and will be permitted only when welding is impracticable. Unless otherwise described, stainless steel screws or bolts are to be used for jointing and fixing aluminium work. Welded joints are to be formed by argon arc process using SANS 1476/NS6 welding rods and finished off smooth.

Welding is to be executed in such a manner as not to affect the colour of the material or the anodic coating.

Exposed heads of screws, pins, rivets, etc. in coloured anodised aluminium are to be touched up with enamel paint to match the coloured anodised finish.

No deviation may be made from the general requirements or dimensions, but improvements in the general construction and design affecting neatness, strength or durability may be introduced. If any deviation is proposed, the Contractor must submit detailed drawings showing the particular construction and form or section he proposes to use and such drawings, details and samples of fittings, etc. are to be approved by the Department before manufacture is commenced and every facility must be given for the work to be inspected during manufacture.

No work may be fixed in position until it has been inspected and approved. Anodised aluminium work must be erected as near to the end of the Contract period as possible, to minimise the danger of damage or deterioration.

All work is to be suitably protected during building operations and left in a clean and satisfactorily finished condition on completion. In particular, all anodised aluminium work must be protected against damage, and against deterioration or discolouration caused by

mortar droppings, wax, paint, etc. all to the entire satisfaction of the Department. All work so damaged, deteriorated or discoloured must be replaced at the Contractor's expense.

Rates for aluminium work are to include for necessary cutting to lengths, shaping, turning, threading, forging, fitting, assembling, riveting, welding, welded running joints, filing smooth, also for all screws and holes and hoisting and fixing in position. All screwed work is to have full threads.

ANODISED ALUMINIUM WELDED WINDOWS AND DOORS: — are to be of an approved manufacture and design.

Windows and doors are to be fabricated from Medium Universal equal leg sections, unless otherwise specified, measuring 33mm over one opening section and not less than 4mm thick through the flanges and not less than 4.75mm through the web, unless otherwise stated.

The aluminium sections are to be of approved manufacture and of 6063-TF or equivalent quality and temper and are to be anodised after manufacture to the approval of the Department. Welds are to be electrically flash butt resistance welded, properly ground and cleaned off to give a uniform appearances.

Anodising, etc. is to be carried out as before described.

All windows and doors are to be suitable for internal glazing and are to be fitted with approved anodised aluminium glazing beads of the "clip on" type. Drilling for the fixing of glazing beads is to be done to suit the thickness of the glass used.

The frames are to be perfectly flat, square, butt-welded at joints (mechanical joints will not be permitted) and all opening sashes must fit perfectly on all faces and open or close freely without binding at any point. The glazing bars must be continuous with continuous intersections (mitred intersections will not be permitted) with ends scribed and fitted to the frames with shouldered ends passed through and riveted over. The sight lines of the main frame, whether consisting of all fixed lights, all opening sashes or portions of both and the glass plane must be the same throughout each window.
Weathering on sections is to be solid extruded with the sections (screwed or riveted on strips will not be permitted) except weather bars to sills of inward opening sashes which must be welded on and not screwed or riveted except in the approved designs of built-up transoms.

No steel is to be used in the manufacture of the windows unless it is stainless steel of quality to A.I.S.I. Type 316. All fittings, butt hinges, screws, nuts, bolts, etc. are to be of high quality aluminium or other approved non-corrosive material compatible with aluminium and of sufficient strength to perform the functions for which they are used. The handles, sliding stays and peg stays are to have nylon washers, bushes and pressure pads and are to be secured to the frames with screws having riveted ends. Pop rivet fixings will not be permitted.

The transoms and mullions of all purpose-made windows and doors are to be equally spaced between the outer frames to form openings of equal size. Where this is not the case, either the width or the height of the opening is stated. Unless otherwise stated, the fixed lights and sashes of all purpose-made windows and doors are to be in one square and the sashes and doors are to open out.

Frames must be provided with suitable fixing lugs bolted on to frame with aluminium alloy bolts or are to be holed for screwing as required with lugs or holes spaced one near top, one near bottom and not more than 750mm apart intermediately each side of frame. Frames more than 900mm wide are to be provided with similar fixings to top and bottom and not more than 750mm apart.

All composite windows, doors, etc. are to be supplied with suitable and approved coupling mullions or transoms. Rectangular hollow section transoms where specified are to be

25mm x 115mm in section manufactured from 3mm thick aluminium.

The Contractor must submit drawings showing details of sections he proposes to use and these drawings are to be approved by the Department before manufacture is commenced, and when requested, specimen windows and doors complete with all fittings as well as specimen coupling mullions, transoms etc. must be submitted for approval and all windows, doors, etc. supplied must conform to the approved samples.

The manufacturer of the windows and doors must supply a dimensioned set of drawings with the windows and doors, for use on the site, including clearance and strict fixing methods and details.

Windows and doors are to be delivered to the site in suitable protective wrappings or crates and are to be stacked on end and carefully handled at all times to prevent any marking or staining of surfaces.

Immediately the windows and doors have been delivered on the site, they are to be thoroughly overhauled and all necessary adjustments or repairs are to be made before they are fixed in position. A further inspection is to be made after fixing and any further servicing required must be carried out in order to leave the windows and doors in a satisfactory condition and waterproof after glazing is completed.

Side Hung Sashes: — are to open out on a pair of aluminium hinges complete with anti-friction weatherproof bushings fixed pin and nylon washers and fitted with anodised aluminium alloy sliding stay with friction fastener and an approved anodised aluminium two point handle and striking plate.

Bottom Hung Sashes: — are to open in on a pair of aluminium hinges complete with anti-friction weatherproof bushings, fixed pin and nylon washers and fitted with concealed side arms and strong lever action spring catch and keep.

Top Hung Sashes: — are to open out on a pair of aluminium hinges complete with anti-friction weather proof bushings, fixed pin and nylon washers and fitted with anodised aluminium peg stay with cranked locking stay.

Horizontally Pivot Hung Sashes: — are to be hung on a pair of approved weatherproof brass satin-chrome finished friction pivots of the greatest possible diameter permissible and fitted at top with strong lever action spring catch for long arm or hand operation and striking plate, unless otherwise stated.

Vertically Pivot Hung Sashes: — are to be hung on free pivot cups at the head incorporating nylon bearing sleeves and lever pivots at the sill and fitted with one two-point casement handle and striking plate.

Projected Out Sashes: — are to be balanced on approved concealed side arms with stainless steel shoes and channels and fitted at bottom with one approved bow handle with catch incorporated.

Projected In Sashes: — are to be balanced on approved concealed side arms with stainless steel shoes and channels and fitted at top with strong lever action spring catch for long arm or band operation and striking plate:

Doors: — are to be side hung to open out on one and a half pairs of aluminium hinges to each leaf complete with anti-friction weatherproof bushings, fixed pin and nylon washers and fitted with lock set as specified, and each lock is to be provided with two keys. Satin chrome finish flush bolts are to be fitted at top and bottom of meeting edge of first closing leaf of double doors.

Adjustable Louver Sets: — are to be approved anodised aluminium adjustable louver sets consisting of head and all weather strips fitted with neoprene gaskets and two jamb strips

each fitted with louver brackets with spring loaded clips for the specified width of glass louver blades and complete with tilt bars and operating lever handles. Where the openings are not of height to suit standard width louver blades an alternate head section with static clips must be provided to take a fixed louver blade of the required width. The sets-sets are to be tap screwed to the window frame with stainless steel self-tapping screws.

GLAZING TO DOORS / ALUMINIUM GLAZED SCREENS

No glazing permitted to any fitting below Lock Rail (ie 1,2m high.).

Burglar Bars: — are to be standard type burglar bars formed of 20mm x 5mm aluminium bars riveted at intersections and riveted at ends to the window frame with high strength aluminium rivets. The burglar bars to the small pane type window are to line through with the glazing bars, and windows of the horizontal-pane type or of the no-glazing bar type are to be fitted with burglar bars which are divided as for the small pane type window.

All exposed surfaces of anodised aluminium are to be protected by means of an approved fabric backed adhesive tape. The Contractor shall satisfy the Department that the tape he proposes to use can be easily stripped after long exposure to sunlight, and rates are to include or the final stripping of the protective tape and cleaning dawn to approval at completion.

All work is to be protected during building against deterioration or discolouration caused by mortar droppings, wax, paint, etc. and all work so damaged is to be replaced at the Contractor's expense to the approval of the Department.

All glass and glazing has been elsewhere measured. All sashes and openings, unless otherwise stated, are to be single panes without glazing bars.

All windows and doors must be fixed into preformed openings in the structure (the building-in of windows and doors will not be pen fitted) and rates are to include for supplying necessary templates for forming the openings. Fixing in position of windows and doors has been measured separately. Sizes of windows and doors are given to the nearest 10mm.

STRONG ROOM DOORS: — must comply in all respects with SANS Specification 1015 Category 1. Each door is to be provided with two keys and the keys must be forwarded by the supplier under registered cover direct to the Department, and the supplier must clearly indicate the institutions in which the door (or doors) is being installed.

BURGLAR RESISTING SAFES: — must comply in all respects with SANS Specification 751. The safes shall be "Office Safe Category 1" as laid down in SANS Specification 751. Each safe is to be provided internally with one shelf and two lockable drawers.

Where the mass of each safe is 680kg or less, provision must be made for securing it rigidly to prevent unauthorised removal; the means of securing shall be at least equal in effectiveness to that which would be provided by four 12mm bolts. Locks shall be lever locks with a minimum of six levers. Each safe is to be provided with two keys to each lock and the keys for any safe must be forwarded by the supplier under registered cover direct to the Department, and the supplier must clearly indicate the institution in which the safe (or safes) is being installed.

ADJUSTABLE LOUVER GEAR SETS: — are to be approved natural anodised aluminium adjustable sets consisting of head and sill weather strips fitted with neoprene gaskets and two jamb strips and fitted with sets brackets with spring loaded clips for the specified glass sets blades and complete with tilt bars and operating handles. Where the openings are **not** of a height to suit standard width sets blades an alternate head section with static clips must be provided to take a fixed sets blade of the required width.

RATES: — are to include for fixing in accordance with the manufacturers instructions for screwing head and sill weather strips and jamb strips with stainless steel screws to frames (Elsewhere measured) and for oiling and easing at completion.

12. PLASTERING

MIXING
The mixing of the materials is to be done on a hard surface.
Once all materials have been mixed, they are not to be remixed with new materials added after 5 (five) hours.

MATERIALS
Stone Chippings: — are to be approved clean stone chippings of the sizes stated complying with SANS Specification 1083.

River Sand: — for floor finishes and screeds is to be clean, sharp, coarse sand free from all impurities, washed if so directed and complying with SANS Specification 1090.

Plaster Sand: — is to be clean, sharp, free from all impurities, washed if so directed and is to comply with SANS Specification 1090.

Cement: — unless otherwise specified is to be Portland cement of normal setting quality, is to comply with SANS Specification 471, and must be used fresh. Cement containing more than 15% blast furnace slag will not be permitted to be used.

Lime: — is to comply with SANS Specification 523.

Water: — is to be clean, fresh and free from injurious amounts of acids, alkalis and other organic substances.

MEASUREMENT OF CONSTITUENT PARTS OF FLOOR FINISHES, TOPPINGS, SCREEDS AND PLASTER FINISHES: — Cement, sand and stone chippings are to be measured exactly by means of gauge boxes or purpose made wheelbarrows. Part filling or heaping of normal wheelbarrows will not be permitted.

Water is to be accurately measured for each batch, to approval.

Waterproofing compounds, where specified, are to be added to the mixture in the proportions recommended by and in strict accordance with the manufacturer's instructions.

PREPARATION OF SURFACES: — Prior to the application of floor finishes, toppings, screeds, plaster finishes etc. the surfaces of the new or existing concrete, brickwork, etc. are to be thoroughly cleaned, chipped, hacked, sloshed, etc. as necessary to ensure a satisfactory bond. The Contractor will be held entirely responsible for the proper and adequate preparation of the surfaces and any work which results in failure in this regard must be made good at the Contractor's expense to the satisfaction of the Department.

FLOOR SCREEDS, ETC: — Cement screeds are to consist of one part cement and three parts sand, unless otherwise described, and are to be steel towelled, unless otherwise stated, to true smooth and even surfaces, free from tool marks to the satisfaction of the Department to receive the finishes stated in the items. It is recommended that in new structures the screeding should be as specified by "Tal" using "Screedmaster", the pumped method.

GRANOLITHIC FINISH TO CONCRETE FLOORS, ETC: — Float up to within 6mm of finished surface with layers on concrete approximately 10mm thick, composed of one part cement, two and a half parts concrete and three and a half parts granite or other approved hard stone chippings. Form finished surface with one part cement and one part fine granite chippings or other approved hard stone graded up to particle, which will pass a 6mm mesh brought to a smooth surface with a steel trowel. The floating and finishing coats are to be performed in one operation.

The granolithic work is to be carried out by experienced workmen and is to be laid in panels

V-jointed and not and not exceeding $6m^2$ in area or as shown on drawings or described in the Bills of Quantities.

Thin strips if wood or other suitable materials are to be laid between panels to break contact.

Where granolith is described to be tinted, the requisite quantity of oxide of iron or other colouring materials is to be mixed with the finishing thickness.

All granolithic floors, etc. are to be covered up and protected from injury and discolouration during the progress of the work.

Rates for granolithic work are to include for cleaning down and for a coat of approved wax polish or stoep reviver well rubbed in at completion.

13. PLASTER

GENERAL

Except where otherwise described, all external plaster is to be finished with a wood float and internal plaster is to be finished with a steel trowel, unless otherwise described, all to true and even surfaces, free from tool marks and other defects to the satisfaction of the Department. No distinction has been made for brick or concrete surfaces.

CEMENT PLASTER

External cement plaster to wall is to consist on one part cement and four parts sand.

External cement plaster to ceilings is to consist of one part cement and three parts sand.

Internal cement plaster to walls is to consist of one part cement and five parts sand.

Internal cement plaster to ceilings is to consist if one part cement and three parts sand.

One coat cement plaster to walls shall not be less than 13mm or more than 16mm in thickness, and one coat cement plaster to ceilings shall not be less than 10mm or more than 13mm in thickness, unless otherwise described.

Where plaster is described as undecorated, the same type of approved sand the same brand of cement is to be used throughout to maintain a uniform colour and texture.

BARIUM PLASTER

Barium plaster shall consist of two coats plaster, the first coat 13mm thick consisting of one part cement and five parts sand, and the second coat 6mm thick consisting of one part cement and five parts Barium Sulphate. (This is to be applied only to X-Ray Room walls where holed bricks have been used).

All surfaces are to be plastered in one operation from ceiling to floor and corner-to-corner; breaks are to be made only in corners or at junctions of walls and ceilings.

CURING, PROTECTION, ETC.: — All floor finishes, paving, plaster finishes and screeds are to be properly cured to approval and all cracks, blisters and other defects which may occur are to be made good and the whole left in a satisfactory-condition at completion.

The finished surfaces are to be properly protected from damage and cleaned down at completion.

RATES: — Rates for floor finishes and screeds are to include for preparation of new or existing surfaces, dressing to falls where required, V-joints where specified, curing, protecting from damage and cleaning down at completion.

Rates for skirtings, risers, etc. are to include for internal angles at junction with floor, treads, etc. to be square or coved to not more than 50mm girth and in addition are to include for mitres, stops, etc. except where given separately in terms of the Standard System of Measuring Builders' Work.

Rates for plaster finishes are to include for preparation of new or existing surfaces, curing, protecting from damage and cleaning down at completion.

Rates for plastering are to include for internal angles to be square or coved to not exceeding 50mm girth.

Rates for rounded angles, fair edges and arrases and the like are to include for mitres, stops, etc. except where given separately in terms of the Standard System of Measuring Builders' Work.

Rates for mouldings, projecting bands, coves, weatherings and the like are to include for dubbing out.

Rates are to include for cutting back against frames and for V-joints cut where concrete abuts brickwork.

Rates generally are to include for all sundry making good and working around pipes, balusters, etc.

GENERALLY

Narrow Widths
Items described as "Extra over for narrow widths" include for all reveals, edges, soffits, treads, risers, etc. not exceeding 500mm wide, narrow widths not exceeding 500mm wide in general surfaces caused by openings or projections, all of which have been included in the areas of horizontal or vertical surfaces. No distinction has been made for finishes of differing thicknesses.

14. TILING

MATERIALS

River Sand: —is to be clean, sharp, coarse sand, free from all impurities, washed if so directed and complying with SANS Specification 1090.

Plaster Sand: — for wall backings is to be clean, sharp, free from impurities, washed if so directed and complying with SANS Specification 1090.

Cement: —unless otherwise specified, is to be Portland cement of normal setting quality complying with SANS Specification 471 and must be used fresh. Cement containing more than 15 % blast furnace slag will not be permitted to be used

Water: —is to be clean, fresh and free from injurious amounts of acids, alkalis and other organic substances.

MEASUREMENT OF CONSTITUENT PARTS OF BACKINGS, ETC.: — Cement and sand are to be measured exactly by means of gauge boxes or purpose made wheelbarrows. Part filling or heaping of normal wheelbarrows will not be permitted:

Water is to be accurately measured for each batch to approval.

Waterproofing compounds, where specified, are to be added to the mixture in the quantities recommended by and in strict accordance with the manufacturers' instructions.

PREPARATION OF SURFACES: — Prior to the application of the backing for tiles, the surfaces of the new or existing concrete, brickwork, etc. are to be thoroughly sloshed, etc. as necessary to ensure a satisfactory bond. The Contractor shall be held responsible for the proper and adequate preparation of the surfaces and any work which results in failure in this regard must be made good at the Contractor's expense to the satisfaction of the Department.

GLAZED CERAMIC WALL TILES AND FITTINGS: — shall comply with SANS Specification 22 of selected grade, free from defects and blemishes and of uniform colour.

Rates are to include for either bedding tiles on and including a solid cement mortar backing consisting of one part cement to three parts sand on brickwork or concrete, or fixed with an approved tile adhesive on and including a coat of cement plaster consisting of one part cement to five parts sand and finished to a surface to receive tiles.

Tiles are to have vertical and horizontal joints continuous with all joints solidly flushed up in neat white cement.

MOSAICS: — Glass or ceramic mosaics are to be of approved South African manufacture of the sizes and colours specified, fixed to paper panels for ease of handling.

Mosaics are to be bedded to a true even surface on and including a solid cement mortar backing consisting of one part cement and three parts sand on brickwork or concrete, or fixed with an approved mosaic adhesive on and including a coat of cement plaster consisting of one part cement to three parts sand finished to a surface to receive mosaics.

After setting, the paper panels are to be removed and all joints are to be solidly flushed up in neat white cement.

Samples of mosaics are to be submitted to the Department for approval before any work is put in hand.

UNGLAZED CERAMIC FLOOR TILES AND FITTINGS: — are to be unglazed acid and alkali resistant tiles and fittings of the types specified in the items, and of approved manufacture, uniform in size, shape and colour, free from cracks, twists and other defects and equal to samples to be deposited with and approved by the Department.

Floor tiles are to be laid with maximum 10mm wide joints continuous in both directions on and including a 15mm thick cement mortar bed consisting of one part cement to three parts sand, unless otherwise specified, to true levels and grades with the joints raked out and grouted up solid and flush pointed with an approved epoxy jointing compound.

Floor tiles are to be set out so as to have no long edges of tiles cut to suit room size.

RATES: — for tiles, mosaics, etc. are to include for all necessary preparation of surfaces, for laying in accordance with the manufacturer's instructions, all square cutting and waste and fitting, protecting from damage and cleaning down at completion.

Rates for tiles are also to include for laying, bedding, jointing and pointing as described and in accordance with SANS Code of Practice 0107 where applicable.

Rates for treads, risers, sills, copings, cappings, skirting etc. are to include for pointing to exposed edges and projecting soffits.

No distinction has been made for brick or concrete surfaces.

TRANSITION TRIMS:-
Aluminium Wide Tile-In Ramp splayed transition trims to be used at junction between ceramic / porcelain tiles and vinyl sheeting.

MOVEMENT JOINTS:-
Aluminium Structural Screed joints bolted to slab to be capable of total movement of minimum of 5mm either way with flexible PVC Hospital Insert.
Movement joints to be in high traffic area's as "Migua" FV35/1500 or "Kirk" ASSJ390H of approved height with hospital insert bolted to slab before screeding.
Metal movement joints in low traffic area's with hospital insert strips..

15. DRAINAGE AND PLUMBING

GENERALLY: —The Standard Preambles for other trades, with reference to Excavations, Concrete, Brickwork and Plastering, and, in particular for the full description intent and meaning of the classification for excavations, are to apply equally to this trade.

LICENSED DRAINLAYERS AND PLUMBERS: — Only licensed drain layers shall be employed on any drainage work and licensed plumbers on plumbing work.

SUBSOIL DRAINS

Unplasticised polyvinyl chloride (UPVC) slotted drainage pipes and fittings: — shall be of approved manufacture jointed in accordance with the manufacturer's instructions.

Pitch-fibre perforated or slotted drainage pipes and fittings: shall comply with SANS Specification 921 and shall be jointed in accordance with the manufacturer's instructions.

Filter fabric: — shall be non-woven, spun bonded, needle punched and continuous polyester fabric, resistant to the effects of alkalis, acids, saline solution and sunlight.

STORMWATER AND SOIL DRAIN PIPES

Reinforced concrete non-pressured pipes: shall comply, with SANS Specification 677 and must be Type SC of the class specified with spigot and socket ends with rubber insertion ring or with ogee joints with approved rubber collars. Pipes must be marked with the manufacturer's name, trade name or registered trade mark, nominal bore, class and type, date of manufacture, the letter "R" denoting reinforced and the SANS mark. Joints shall be made in accordance with SANS Code of Practice 058.

Unplasticised polyvinyl chloride (UPVC) drain and sewer pipes and fittings: — shall comply with SANS Specification 791. Joins shall be made with fittings in accordance with SANS Code of Practice 058.

CONCRETE BEDS AND ENCASEMENT TO DRAIN PIPES: — Where pipes are required to be bedded on concrete, the bed of concrete shall be Class B, a minimum of 500mm wider than the diameter of the pipe, laid to correct falls and levels with recesses formed in same for pipe joints including all necessary formwork and any additional excavation. The barrel of the pipe shall then be bedded on a thin cement mortar (1:3) bed and laid to falls. After jointing, the recesses previously formed shall be filled in with concrete Class B and the haunching or surrounding completed.

Where pipes are fixed vertically they shall be encased in concrete Class B having a minimum thickness of 150mm around the pipe and carried up to ground level and shall include for any necessary formwork.

PIPE LAYING: — All drain and sewer pipes are to be laid to a straight line to even gradients and jointed in accordance with SANS Code of Practice 058 except in the case of polyethylene or unplasticised polyvinyl chloride drain and sewer piping which is to be in accordance with SANS Code of Practice 01 12.

Before laying, each pipe shall be examined to ensure that the bore is clean and free of any foreign matter and shall be tested for soundness by striking with a wooden mallet, and any cracked or damaged pipes shall be rejected. Ends of all pipes must be clean before

jointing. Immediately after jointing a tight fitting wad or scraper shall be drawn several times through the bore of the pipe to ensure that it is left clean and free from obstructions. Whenever work is suspended, the open ends of pipes and junctions must be temporarily plugged to prevent the entrance of rubbish during construction.

GULLEY TRAPS: — Gulley trap assemblies must be of the material specified with "P" or "S" trap, jointed to drain and with hopper head with vertical and side inlets, the head fitted with 190mm diameter cast iron gulley grating complying with SANS Specification 1115 laid loose in socket. The trap, hopper head and vertical pipe shall be set on and encased in concrete Class B having a minimum thickness of 150mm at any one part, carried up 75mm above ground level as kerb, dished down to grating and finished on all exposed surfaces in 1:3 cement plaster with angles rounded, including necessary excavation and formwork.

GREASE TRAPS: — Grease trap assemblies of vitrified clay must consist of outlet junction jointed to trap with side inlet. Access openings of trap and junction shall be fitted with vitrified clay stoppers laid loose in socket of trap and set in bitumen in socket of junction. The trap and junction and vertical pipe shall be set on and encased in concrete Class B having a minimum thickness of 150mm at any one part, carried up 75mm above ground level as kerb, dished down to grating and finished, on all exposed surfaces in 1:3 cement plaster with angles rounded, including necessary excavation and formwork.

RODDING EYES: — Where pipes are carried up in ramps for rodding eyes, the head of the pipe at ground level must be fitted with an **"A.B.C."** cast iron cover and frame, complying with SANS Specification 746, jointed to pipe, the frame rebated for and including cover with raised letters "CE" cast on same, secured to frame with gun-metal screws and with the whole encased in concrete Class B having a minimum thickness of 150mm at any one part, carried up 75mm above ground Level and finished on all exposed surfaces in 1:3 cement plaster with angles rounded, including necessary excavation and formwork,

INSPECTION EYE BLOCKS: — Where inspection eye fittings are provided in pipelines, the position of these inspection eyes must be registered and demarcated with concrete Class C. block size 300 x 300 x 50mm thick finished on all exposed surfaces with 1:3 cement plaster with angles rounded and with sunk letters "I.E." formed in top and set in ground, including necessary excavation and formwork.

SURFACE WATER CHANNELS: —Concrete open surface water channels shall be formed with concrete Class B with segmental channel formed in same to the size and shape specified and finished on exposed surfaces in 1:3 cement plaster, steel towelled to a smooth even surface with all angles rounded, cast in lengths not exceeding 2m and laid to falls, including necessary excavation and formwork.

GRATINGS FOR GULLEYS AND STORMWATER DRAINS AND CAST IRON SURFACE BOXES AND MANHOLE COVERS AND FRAMES: — Cast iron or Polymer gratings for gulleys and storm water drains shall comply with SANS Specification 1115 and SANS 1882:2003 respectively.

Cast iron surface boxes and manhole covers and frames shall comply with SANS Specification 558.

All cast iron gratings, cast iron surface boxes and cast iron manhole covers and frame must be coated with approved preservative solution before leaving the manufacturer's works.

The masses stated are the combined mass of the grating and frame or the combined mass of the cover and frame.

STORM WATER SUMPS, JUNCTION BOXES, MANHOLES, INSPECTION CHAMBERS, CABLE INSPECTION CHAMBERS AND VALVE CHAMBERS: — shall be of the internal size specified and are to be constructed of one brick sides, unless otherwise specified, built in 1:3 cement mortar on a 150mm thick concrete Class C bottom and finished on top with an 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and bedded in

cement mortar. The cover slab, except to junction boxes, is to have a rebated opening formed in same, suitable for and fitted with a cast iron orating and frame, or cover and frame, of the size and mass specified with the frame bedded in cement mortar. The bottom of the sump, manhole, etc. and the exposed surfaces of the cover slab are to be finished smooth in 1:3 cement plaster with angles rounded. The internal brick surfaces are to be faced with smooth facing bricks and pointed with flush joints.

Inspection chambers and manholes with an invert not exceeding 1m shall have an internal dimension of 470mm x 700mm and those exceeding 1m shall have an internal dimension of 920mm X 920mm. Where the invert of the hole exceeds 1m, a 150mm thick reinforced concrete Class C corbel slab, reinforced as detailed, with opening size 470mm x 700mm formed in same and finished smooth off the formwork, is to be built into the brick sides at a height not exceeding 1, 5 inches above the concrete bottom with the reduced manhole shaft built off the top of the corbel slab. Cast iron step irons spaced at 300mm staggered centres vertically are to be built into one side of all manholes with an invert exceeding 1m.

Where measured in number, rates for all sumps, manholes, etc. are to include for excavating to the depths required, taking precautions against collapse of sides of excavations, staging, ramming, pumping and baling to keep excavations free from water or mud, filling around and ramming and depositing and levelling spoil on site or carted away as directed. Ends of pipes are to be built through the sides of the sumps, manholes, etc. and rates are to include for this.

SOIL DRAIN MANHOLES AND INSPECTION CHAMBERS: —are to be of the internal diameter and inverts specified and are to be constructed of pre-cast reinforced concrete manhole ring sections with walls a minimum of 50mm thick, pre-cast reinforced concrete cover slabs and spacer pieces complying with SANS Specification 677. The joints for the ring sections shall be of the ogee type. The bottom shall be of concrete Class C-cast in-situ.

The placing of the concrete bottom and benching shall be carried out in three stages with the initial stage being the laying of the concrete bottom projecting 100mm beyond the external diameter of the manhole on which is laid the inspection eye pipe, branches, etc. The second stage comprises the laying of concrete within the manhole to the height of the pipes and around the perimeter of the bottom to a height of not less than 25mm above the collar of the pipe at the highest end. This annular base is to be shuttered to provide a horizontal setting for the first ring section which is to be firmly bedded in the wet concrete. The third stage comprises the laying of the benching within the initial ring section and finished in 1:3 cement plaster with all angles rounded. Thereafter, the ring sections of the required standard height are joined together to form the required depth, with all joints primed with "Bituprime" and sealed with "Bitujoint Putty". A 125mm thick pre-cast reinforced concrete cover slab, rebated on underside to suit ring sections and with opening size 600mm x 600mm formed in same is to be bedded on top of the ring section. The shaft above the cover slab is to be constructed of either pre-cast reinforced concrete spacer units to suit the type of cast iron cover and frame specified, or one brick kerb walls faced internally with smooth facing bricks jointed with flush joints, and finished on top with an 85mm thick pre-cast concrete Class C cover stab, reinforced as detailed and bedded in cement mortar with the exposed surfaces finished smooth in 1:3 cement plaster with all angles rounded. The cover slab is to have a rebated opening formed in same suitable for and fitted with cast iron cover and frame of the size and mass specified, with the frame bedded in cement mortar.

MANHOLE COVERS AND FRAMES:- Cast iron, Concrete or Cultured Polymer covers and frames to be suitable for the area of usage.

SOAK PITS: — shall be of the lengths and widths specified and shall be a minimum of 900mm deep below the invert of the inlet pipe. A perforated pitch-fibre drainpipe, jointed to the inlet pipe and with other end capped, is to be laid level in a 19mm stone packing of a minimum thickness of 15mm below and at sites of pipe and a minimum thickness of 150mm below the top of the pipe. The remainder of the soak pit is to be filled with stone graded

from 50mm to 75mm, to a level of 50mm above the top of the pipe. The stone is to be covered with corrugated asbestos cement sheets extending 150mm beyond the walls of the soak pit all round. The trench shall be backfilled above the sheeting to a minimum depth of 300mm lightly rammed with the final 100mm of backfilling being approved topsoil from the excavations.

SEPTIC TANKS: —shall be of the internal sizes specified and are to be constructed of one brick sides built in 1:3 cement mortar on 150mm thick concrete Class C bottom laid to falls. A half brick baffle wall finished 75mm below underside of concrete cover slab and with opening size 150 x 150mm high formed in wall is to be built in 1:3 cement mortar on the concrete bottom. A 115mm thick reinforced concrete Class C cover slab, reinforced as detailed, is to be cast in-situ on removable formwork and is to have two openings formed in same, each suitable either for and fitted with 600 x 450mm x 38 kg cast iron single seal manhole cover and frame, or for the shaft of the inspection chamber built off the cover slab in one, brick walls in 1:3 cement mortar with smooth face bricks internally, finished on top with 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and rebated for and fitted with 600 X 450mm X 38-kg cast iron single seal manhole cover and frame. The bottom and sides of the septic tank are to be finished in 1:3 cement plaster, 19mm thick, with an approved waterproofing compound added, with all internal angles coved to 50mm radius. Inlet and outlet chambers attached at either end of the septic tank shall be size 600 x 450mm internally, of the depth required and each shall be constructed of one brick walls built in 1:3 cement mortar on a concrete Class C bottom 150mm thick, or where extended above the top of the septic tank cover, built off the cover and finished on top with 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and bedded in cement mortar with the exposed surfaces finished smooth in 1:3 cement plaster with angles rounded. The cover slab is to have a rebated opening formed in same suitable for and fitted with a 600 x 450mm x 38 kg cast iron single seal manhole cover and frame. Chambers shall be provided with inspection eye pipes or bends, straight or curved channel sections, benched up to sides of chambers in concrete Class C, finished in 1:3 cement plaster with all angles rounded.

The inlet and outlet of the septic tank shall be formed of cast iron square junction piece with tail-pipe extending 300mm below water level in tank, built in through end walls and jointed to channels in inlet and outlet chambers.

TESTING OF DRAINS, MANHOLES AND INSPECTION CHAMBERS: — All drains, manholes and inspection chambers with the exception of subsoil drains shall be constructed so as to be watertight. No trenches shall be backfilled or pipes encased in concrete until the drains have been tested and approved. Any drains covered by the Contractor prior to testing shall be exposed at the Contractor's expense.

The Contractor shall give at least 24 hours notice of any particular length between manholes ready for testing. The drains shall not be tested until a period of 24 hours, or such other period as may be required, has been allowed for the pipe joints to set. The Contractor shall provide all necessary testing apparatus, expanding plugs, stoppers, water and any other materials and all labour that may be required for carrying out the tests.

The whole of the drainage system shall be tested using one or more of the following tests:-

(a) **Visual test**— Each length of pipe shall be inspected for invert level grade, direction and line. Internal inspection of the bore of the pipes shall be made using mirrors and a powerful source of light. The drains must be free of invert lips and the bases of the pipes must be straight.

(b) **Air test** — All openings in the drain shall be plugged and sealed and all associated traps filled with water and air pumped into the drains until a manometric pressure of 40mm is indicated, after which, without further pumping, the pressure shall not drop below 25mm for a period of at least 30 seconds.
After the entire drainage system has been completed, all plumbing fittings installed and permanently connected up, and traps filled with water, a final air test shall be applied to the whole system.

(c) **Water test**— All openings-in the drain, except the highest one, shall be plugged and sealed and the drain filled with water so that every part of the system is tested under a head of water of not less than 1.5m and not more than 3.5m. After allowing period of 10 minutes for initial absorption, the amount of water it shall be necessary to add to maintain the water level over the next 15 minutes shall not exceed a rate of 25 litres for 100mm diameter pipe and 3,75 litres for 150mm diameter pipe for 100m of drain and an equivalent rate for larger drains. In carrying out the water test, the head of water shall be obtained by providing temporary pipes, fittings, etc. wherever necessary or by such other method as may be approved.

In cases where the maximum head of water, owing to the gradient of the drains, would be exceeded in any section, inspection eyes at suitable intervals may be provided and the drain plugged, in order not to subject the lower portion of the drain to a greater head of water than that required. Drains must be free of air before testing.

(d) **Manhole and Inspection Chamber test** — The inlet and outlet pipe hose shall be plugged and sealed and the inspection chamber filled with water. After allowing the water to stabilise due to absorption, the water level should not fall more than 5mm in 2 hours.

DEFECTS TO BE MADE GOOD: — Should the drain system fail to withstand the above tests, all defects shall be made good and the tests repeated at the Contractor's expense until the whole system is sound and passed to the satisfaction of the Department. In making good, all defective parts shall be cut out and replaced with new. No patching of pipes, joints or connections will be permitted.

SHEET METALWORK: — generally is to be lapped 75mm at ends and 150mm at angles, unless otherwise specified. Rates for sheet metalwork shall include for all labour, cutting and waste, laps, seams, welts, angles, clips, tacks, soldered dots, riveting, soldering, brazing, burning, nailing, dressing and wedging as required. All measurements are net with no allowance being made for laps, seams, welts, angles, clips and tacks or waste in cutting. Where stepped flashings are described as to flat slope, the pitch of the roof to which they apply does not exceed 40 degrees

(a) **Galvanized sheet iron**: — shall be of an approved brand of the thickness specified after galvanising and having a galvanized coating of "Iscor Coating Designation Z450". Corroded or otherwise defective sheets shall not be used. All nailing or screwing shall be done with galvanized nails or screws.

(b) **Sheet aluminium**: — shall be of the thickness and quality specified. All nailing shall be done with aluminium alloy nails and all screwing done with stainless steel screws.

(c) **Sheet copper**: — shall be cold rolled sheet of the thickness and temper specified. Sheet copper for covering flat roofs and for valley and gutter linings, flashings, soakers, etc. shall be of dead-soft temper and for eaves gutters, rainwater pipes and other unsupported or semi self-supported work shall be of half-hard temper. All nailing shall be done with copper or copper alloy nails and all screwing done with brass screws.

(d) **Sheet lead**: — shall be best milled sheet lead of the full mass specified and of equal thickness throughout and must comply with SANS Specification 1178.

LININGS TO VALLEYS: — shall be of the material specified, lapped 200mm at ends and dressed up on to purlins or battens at sides of valleys with edges bent back to form open beads.

LININGS TO SECRET GUTTERS: — at back of chimney stacks and wall abutments and at raking intersections of walls and roofs shall be of the material specified, turned 100mm up vertical surfaces and dressed 250mm up roof slope and on to purlin or batten at edge.

SOAKERS: — to slate covered roofs shall be of galvanized sheet iron or sheet copper of 0.6mm thickness, 450mm wide to closed valleys and 250mm wide to raking intersections of roofs with vertical wall and chimney stack abutments and turned 75mm up vertical surfaces. Soakers shall be 75mm longer than the gauge of the slate roofing.

UNDER-FLASHINGS: — to all iron roofs and where specified to slate or tiled roofs shall be 0.6mm thickness galvanized sheet iron. Flashings to asbestos cement roofs shall be asbestos cement preformed units fitted in accordance with the manufacturer's instructions. Where specified, copper flashings shall be formed from sheet of 0.6mm thickness and aluminium flashings shall be formed from 1200-H4 quality sheet of 0.6mm thickness. Lead flashings, where specified, shall be formed from sheet having a mass of 24 kg/in 2.

COVER FLASHINGS: — shall be either galvanized sheet iron, copper or aluminium, as specified, of 0.6mm thickness fitted over under-flashing, stepped where required on rake and with top edge bent and wedged 25mm deep into joint of brickwork or groove formed in concrete face and flush pointed in 1:3 cement mortar.

FLASHINGS AROUND PIPES THROUGH ROOF COVERINGS

(a) Pipes through preformed sheet steel roofing shall be flashed around with 0.6mm galvanized sheet iron apron pop-riveted to top of roofing wit edges cut and dressed to profile of roofing, soldered all round and with conical sheet iron 'u' stand, riveted and soldered at joint and at base to apron. The top of the conical upstand is to be fixed around the pipe with 25mm x 3mm galvanized mild steel strap wrapped around the pipe and fixed with a galvanized steel gutter bolt.

(b) Pipes through fibre cement roofing shall be flashed around with 24 kg/in 2 lead a on dressed into corrugations, bedded in mastic and bolted to roof sheeting with galvanized steel gutter bolts and with conical lead upstand, wiped on at joint with apron, and secured around pipe with copper wire.

(c) Pipes through slate or tile roofing shall be flashed around with 24 kg/in 2 lead apron dressed to profile of slates or tiles with top edge of lead apron dressed over back edge of slate or tile under overlap of slates or tiles. A conical lead upstand, wiped on at joint with apron, is to be secured around the pipe with copper wire.

(d) Pipes through pre-printed or embossed sheet steel or aluminium roofing shall be flashed around with flexible glass-fibre reinforced waterproofing dressed to profile of roofing, pop-riveted around edges to roofing and dressed up and around pipe. The waterproof is to be finished in a colour to match that of the roofing material.

RAINWATER PIPES

GENERALLY:

Full bore outlets for flat roofs are not allowed. Where flat roofs are specified, it is preferred to have a drain along the edges into a common outlet. Where roof cover is of 'Chromodek' sheets, the preferred guttering is of the same material in the same colour in continuous lengths.

(a) **Unplasticised polyvinyl chloride (UPVC) rainwater pipes and accessories** shall comply with SANS Specification 967 and must be fixed clear of the finished wall face on stock pattern brackets in accordance with the manufacturer's instructions.

(b) **Galvanized mild steel rainwater pipes**, shall be medium quality screwed and socketed normalised welded mild steel pipes, galvanized inside and outside, and shall comply with SANS Specification 62.

Fittings for galvanized mild steel pipes shall comply with SANS Specification 509. The screwed joints must be made with lead paint and hemp or approved thread sealing tape. The pipes must be fixed clear of the finished wall face with galvanized cast iron hinged

holderbats built into walls at not exceeding 2m centres in 1:3 cement mortar.

EAVES GUTTERS

a) **Galvanized sheet iron gutters, rainwater heads; etc.** shall be formed from 0.6mm sheet and must have beaded edges with all laps riveted and soldered. Corners must be reinforced with 0.6mm X 50mm wide galvanized sheet iron strips and must be soldered across the inside of the angles.

Gutters must be laid to even falls on approved galvanized mild steel gutter brackets screwed to roof timbers at approximately 1m centres. Half round pattern gutters shall be bolted to each bracket with 6mm galvanized gutter bolt fitted close to the beaded edge. Rectangular pattern gutters shall be fixed at each bracket with galvanized mild steel long-screw with 1mm thick galvanized sheet iron spacer tube.

(b) **Fibre cement gutters and accessories** shall be of approved manufacture, not less than 6mm thick, with spigot and socket joints made in an approved mastic compound in accordance with the manufacturer's instructions. Gutters must be laid to even falls on approved aluminium alloy or stock asbestos cement brackets screwed to roof timbers at the manufacturer's recommended spacings.

(c) **Unplasticised polyvinyl chloride (UPVC) gutters and accessories** shall comply with SANS Specification 11 and must be laid to falls and fixed on brackets in accordance with the manufacturer's instructions.

SANITARY PLUMBING AND FITTINGS, WASTE, VENTILATION AND ANTI-SIPHON PIPES

(a) **Unplasticised polyvinyl chloride (UPVC) pipes and fittings** shall be of approved manufacture marked with the manufacturer's name and trade name, the nominal bore and the South African Bureau of Standards mark and shall comply with SANS Specification 967. Joints shall be made with injection moulded fittings in accordance with the manufacture's instructions and SANS Code of Practice 0112. The pipes must be fixed clear of the finished wall face with aluminium alloy holderbats fitted with plastic cushion strips with the holderbats fixed to plugs in wall.

(b) **Polypropylene pipes and fittings** shall be of approved manufacture and shall have a mechanical form of jointing. Pipes and fittings are to be fixed and jointed in accordance with the manufacturer's instructions.

(c) **Multilayed pipes** shall be of approved manufacture and shall have a mechanical form of jointing. Pipes and fittings are to be fixed and jointed in accordance with the manufacturer's instructions.

SANITARY FITTINGS: — All sanitary ware must comply with SANS 497 Specifications and be fitted with Ball-O-Cock valves in supply lines.

Wash hand basins shall be of white glazed fireclay or vitreous china of the type and size specified. Basins shall have an integral overflow to non patient treatment facilities and be fitted with 32mm chromium plated waste union with flange and grating, rubber plug on chromium plated brass chain and, where required, tap hole stopper cemented in.

WC pans shall be of white glazed fireclay or vitreous china of the type specified with 'S" or "P" trap with straight or side outlet and shall be fitted with single or double flap plastic seat as required, secured to pan with concealed brass holding down bolts. Pans shall be bedded on the concrete floors in 1:3 cement mortars. Pans in seclusion rooms and other public areas to be 'Gypsy' vandal proof – or other approved.

Glazed ceramic urinals of the bowl or stall type shall be of white glazed fireclay or vitreous china. Bowl urinals shall be fitted with 40mm chromium plated waste union, with flange and

domical grating and with spreader with flush pipe connector. Stall urinals shall be fitted with 75mm chromium plated waste union with flange and hinged domed grating and with spreader with flush pipe connector.

Flushing cisterns shall be as specified, either of white porcelain enamelled cast iron, white glazed fireclay, vitreous china or black plastic complying with SANS Specification 821, each with body and cover. Cisterns shall be a maximum of 11 litre capacity and the flushing apparatus shall be of brass, copper or other corrosion resistant metal, PVC or other approved plastic or of an approved ceramic material. All cistern lids must be able to be **screwed** down. Connections for flush pipe, inlet and overflow pipe must be provided in the body. Cisterns shall be fitted with 15mm brass ball valve with copper, PVC or polystyrene ball and with either chromium plated operating lever handle or galvanized steel pull chain and handle. A galvanized, white enamelled or chromium plated steel or copper flush pipe, of the required length, as specified, is to be jointed to the flush pipe connection on the body of the cistern and in the case of WC pans is to be fixed to the inlet of the pan with an approved patent adaptor. From the overflow connection on each cistern a 22mm copper overflow pipe, bent as required, shall be taken through wall to discharge externally, with ends splay cut and projecting 50mm beyond wall face, or where this is not possible, bent to discharge into WC pan.

Baths shall be enamelled cast iron baths of the type and size specified, holed for and fitted with chromium plated brass overflow union with grating, 40mm chromium plated brass waste union with flange and grating, rubber plug on chromium plated brass chain and fitted with adjustable cast iron feet. The fall along bottom of baths from head ends to outlets must be adequate for complete emptying.

Stainless steel sinks and drainers shall be of the types and sizes specified with exposed surfaces buffed to a satin finish and sound deadened on underside by application of an approved sound deadening coating. Splashbacks with tiling keys shall be provided at back and at ends against walls or as specified. Sink bowls are to be pressed out of single sheets with complete drainage to outlets and each bowl is to be fitted with integral built-in overflow with chromium plated brass grating and 40mm recessed waste outlets with chromium plated brass waste union with grating, rubber plug and chromium plated brass chain. Sink bowls, unless otherwise specified, are to be 450 x 355 x 140mm deep. Drainers are to be pressed out of single sheets and are to have pressed flutes to give complete drainage.

(a) For domestic use — Sinks shall comply with SANS Specification 242 and shall be manufactured from A.I.S.I. Type 430 stainless steel 0.8mm thick for units not exceeding 2,4m long and from stainless steel 1.2mm thick for units exceeding 2,4m Long. -

(b) For hospital use and laboratories — Sinks shall be manufactured from A.I.S.1. Type 304 stainless steel 0.9mm thick for units not exceeding 2.4m long and from stainless steel 1.2mm thick for units exceeding 2.4m long.

Stainless steel wash hand basins and wash troughs shall be of the types and sizes specified complying with SANS Specification 906, with exposed surfaces buffed to a satin finish and sound deadened on underside by application of an approved sound deadening coating. Each basin or wash trough in non patient treatment area's are to be fitted with integral built-in overflow with chromium plated brass grating and 40mm recessed waste outlet with chromium plated brass waste union with grating, rubber plug and chromium plated brass chain.

Stainless steel urinals shall be of the types and sizes specified complying with SANS Specification 924 and shall be manufactured from A.I.S.I. Type 304 stainless steel, 1.2mm thick, buffed to a satin finish and sound deadened at back by application of an approved sound deadening coating. The back and sides of urinals are to be made rigid by means of integral pressed ribs or by bowing. Edges at sides and top are to have plaster key. Tread plates are to be ribbed and the front edges are to be stiffened and bent to form key for floor finish. The trough shall be a minimum of 125mm wide and half round in section with all corners radiused and shall fall to ensure complete drainage to 75mm recessed outlet with

chromium plated domed hinged grating and frame.

RATES FOR SANITARY WARE: — shall include for the supply and fixing of the units as specified and for cleaning, washing and leaving in a satisfactory condition on completion.

BELOW GROUND WATER RETICULATION

Unplasticised polyvinyl chloride (UPVC) piping and fittings shall be of approved manufacture complying with SANS Specification 966. Pipes must be of the class specified and must be marked with the manufacturer's name, trade name or registered trademark, nominal diameter, class reference and the SANS mark. Pipes shall be laid and jointed in accordance with the manufacturer's instructions.

High density polyethylene (HDPE) piping shall be of approved manufacture complying with SANS Specification 533 and shall be of the class specified, laid and jointed in accordance with the manufacturer's instructions. Piping must be jointed with compression fittings with compression rings and coupling nuts.

High Density Polyethylene / Polypropylene / Multilayed piping shall be of approved manufacture, complying with SANS Specification 15875-1-2004 & 2/2003 & 1315, laid and jointed in accordance with the manufacturer's instructions.

Copper piping shall be of approved manufacture complying with SANS Specification 460 and shall be of Class 2. Pipes must be jointed with brass compression fittings with compression rings and coupling nuts complying with SANS Specification 1067 Part I Type 'A'. Copper piping must be bent, where required, with an approved bending machine.

ABOVE GROUND WATER SUPPLIES

Colour Coding Cold Water Supply the exposed piping for this non potable (recycled) water shall be colour banded Brilliant Green (B49) / Yellow Band(H10).
The other exposed piping for potable (drinkable) water shall be colour banded Brilliant Green (B49) / Blue Band(F29)

Galvanized mild steel piping for water supplies shall be medium quality screwed and socketed normalised welded mild steel pipe, galvanized inside and outside, and shall comply with SANS Specification 62.

Fittings to galvanized mild steel piping shall be steel pipe fittings complying with SANS Specification 62 or malleable cast iron fittings complying with SANS Specification 509.

Copper piping shall be of approved manufacture, complying with SANS Specification 460 and shall be of Class 2 – fixed and jointed in accordance with the manufacturer's instructions. Class 2 copper piping must be jointed with brass compression fittings with compression rings and coupling nuts complying with SANS Specification 1067 part I Type 'A'.

Polypropylene / Multilayed Piping shall be of approved manufacture, complying with SANS Specification 1315, laid and jointed in accordance with the manufacturer's instructions. This applies to hot and cold water supply within ceiling spaces also.

Stainless steel piping shall be of approved manufacture, complying with SANS Specification 4127 and shall be A.I.S.I. Type 304 L. Fittings to stainless steel piping not exceeding 50mm nominal bore shall be brass compression fittings with compression rings and coupling nuts.

Piping exceeding 50mm nominal bore shall be welded piping with 1.5mm wall thickness, unless otherwise stated, and of A.I.S.I. Type 316 stainless steel. Joints are to comprise approved A.I.S.I. Type 316 stainless steel pressed collars welded to ends of pipes and fittings with loose galvanized mild steel slip-on flanges complete with galvanized mild steel bolts, nuts and washers, and neoprene gaskets. Fittings must be A.I.S.I. Type 316

stainless steel butt weld fittings.

Phosphoric acid based fluxes must be used for all welded joints which are to be argon arc TIG welded using Type 316 filler rods, with the welds treated with suitable pickling compound.

WATER TAPS AND VALVES: — Water taps, stopcocks, ball-o-cocks and wheel valves shall be of approved manufacture complying with SANS Specification 226.

Ball valves with brass valve and copper or plastic ball float shall be of approved manufacture complying with SANS Specification 1056. Plastic floats when supplied, must comply with SANS Specification 1006.

Full Bore Teflon Seated Ball Valve shall be of approved manufacture complying with SANS Specification 664. Valves shall be clockwise closing with non-rising, cap-fitted spindles and flanked connections and of the class specified.

Pressure reducing valves shall be of approved manufacture complying with SANS Specification 198.

FIXING OF WATER PIPES: — Galvanized mild steel water piping shall be fixed, unless otherwise described, to walls or ceilings with galvanized malleable iron holderbats (school board pattern), built into walls in 1:3 cement mortar. Pipes shall be fixed to timber work with galvanized mild steel pipe clips screwed on.

Copper and stainless steel water piping shall be fixed, unless otherwise described, to walls or ceilings with brass holderbats (school board pattern) built into walls in 1:3 cement mortar. Pipes shall be fixed to timber work with brass or copper pipe clips screwed on.

Polypropylene / Multilayed Piping - shall be fixed to walls according to manufacturers recommendations.

CONCRETE THRUST AND ANCHOR BLOCKS: — shall be of the sizes required and provided where directed to anchor the water pipelines against the thrust due to hydrostatic pressure. Concrete blocks shall be cast against the undisturbed face of the excavation. Backfilling behind the thrust face of the block will not be permitted.

TESTING OF WATER MAINS: — The whole of the water reticulation shall be subjected to a hydraulic test pressure 1.5 times the maximum working pressure of the pipeline. Testing of pipelines may only commence after the installation of all anchor blocks, valves and fittings have been completed. Testing shall be carried out between installed sluice valves whenever possible. Where this is not possible the ends of the pipes shall be sealed with end caps properly held in place with temporary props.

The tests shall be carried out on lengths not exceeding 300 metres.

The pipeline shall be filled from the lowest end in order to expel the air at the upper end through special taps or through service connections, stand pipes, etc. When full the line shall be allowed to stand for 24 hours and any further accumulated air shall be expelled. The full test pressure shall then be applied and maintained for one hour, during which time the line will be examined for any leaks, movement at anchors and other defects.

Any defective work is to be taken out and replaced at the Contractor's expense and the whole retested until found satisfactory.

The Contractor shall provide all necessary testing apparatus, temporary end caps, plugs, stoppers, special taps and any other materials that may be required, and all labour for carrying out the tests.

EXCAVATIONS FOR PIPE TRENCHES: — Excavations for pipe trenches, gulley traps, manholes, inspection chambers, valve, chamber, soakpits and septic tanks shall be to the

depth and gradients shown on the drawings using sight rails and boning rods and shall include for taking precautions against collapse of sides of excavations, staging, pumping and baling to keep the excavations free from water or mud and for filling in and ramming.

The bottoms of pipe trenches are to be excavated to even falls. The barrel of the pipe, except where it is laid on a sand or concrete bed, must rest on solid ground and hand-holds of sufficient size must be cut under pipe joints to enable the jointing and filleting to be properly performed. Any excavations taken out deeper than required shall be made up to the correct grade with well rammed earth. In intermediate or hard rock excavation and where a bedding is not specified, the trench bottom must be excavated 100mm deeper than required for the grade and be backfilled with well rammed earth.

The Contractor is to notify the Department when the trenches are ready for inspection and approval. Any work put in hand before approval has been given shall, if so required, be replaced with new at the Contractor's expense.

Notwithstanding such approval of the trench bottoms, any excavations which become waterlogged or otherwise spoilt after approval, shall be cleaned out and reformed at the Contractor's expense and to the satisfaction of the Department before any piping or sand or concrete beds are laid.

Depths of excavations as approved shall be checked and recorded by a Departmental Official and the Contractor before excavations are filled in.

For the purpose of any measurement, whatever size may have been excavated, excavations are taken as follows: — Trenches not exceeding 0.75mm deep shall be taken 0.5m wider than the internal diameter of the pipe. This width shall be increased by 75mm for each successive depth of 0,75m to a maximum of 1m wider than the internal diameter of the pipe.

BACKFILLING: — No trench shall be backfilled until the Department is satisfied that the works therein have been satisfactorily completed, tested and are ready for backfilling.

The backfilling around and 300mm above the pipe is to be of approved selected material, imported if necessary, free from rock or stone, carefully packed, watered and lightly rammed equally on either side of the pipe and then filled in above this level with suitable material from the excavations, watered and compacted in layers not exceeding 300mm thick with the top 300mm consolidated to dry density of not less than 95% MOD. A.A.S.H.O. density. Topsoil from the excavation is to be set aside and used in the final layer of backfilling.
Any disturbance of or damage to the pipes during backfilling must be made good by the contractor at his own expense.

All spoil from the excavations for trenches, etc. shall be deposited and levelled on site or carted away as directed. Any subsidence or depressions below the level of the adjacent ground shall be filled in, as and when necessary, until the end of the maintenance period.

SIZES OF PIPES: The diameters stated for galvanized mild steel piping, cast iron piping, vitrified clay piping and asbestos cement pressure piping (C.I.D.) are the nominal internal diameters. The diameters stated for all other pipes are nominal external diameters.

In the case of piping and fitting which are manufactured in imperial diameters, the size nearest the metric equivalent must be used.

RATES FOR PIPES: — Rates for all pipes, gutters, channels, etc. are to include for couplings in running lengths, joints, short lengths and cutting and fixing as required. Rates for mild -steel pipes shall include for all plain sockets and nipples. Where fittings have reduced ends or branches the fittings are described as "reduced" and the largest end or branch has been stated. The Contractor may use equal fittings with reducers or bushings if he so desires, but no claim for extras in this connection will be entertained.

Rates for pipes fixed to walls, soffits of slabs, roof timbers, etc. are to include for all

brackets, holderbats, pipe clips and approved extended hangers where pipes are required to be laid to falls and for plugging and screwing or for cutting and pinning or building in tails of holderbats.

Rates for piping are to include for cleaning down at completion, and in addition, the rate for stainless steel pining is to include for polishing exposed piping, all to the approval of the Department.

RATES FOR CHASES, HOLES ETC.: — are to include for making good to approval. The term "hole" is to include for sleeves where required through concrete work.

FIRE EXTINGUISHERS: — Where specified, carbon dioxide gas type fire extinguishers shall be 2.26kg type, complying with SANS Specification 889 and fixed in position on wall brackets screwed to and including 20mm thick chamfered and oiled wrot hardwood backboard, size 450mm x 100mm screwed to plugs in wall.

Where specified, dry powder type fire extinguishers shall be of 10 litre capacity, complying with SANS Specification 810 and fixed as before described on backboard size 1000mm x 200mm.

FIRE HOSE REELS: — shall be non-swinging rotary fire hose reels, complying with SANS Specification 543, with solid side discs and 25mm waterway at bracket incorporating rotary pressure joint to hose connection at hub and fitted with 25mm screwed malleable iron 'Sanders type A' valve with "S" grade diaphragm, connection for supply pipe with the handwheel clearly marked in red with arrows and the words "OPEN", "OOP".

The reel is to be secured to the wall with and including three steel anchor bolts and fitted with 30m length of 20mm internal diameter best quality reinforced red rubber non-kinkable hose with one end fixed to wheel hub connection and the other end fitted with 20mm chromium plated gunmetal adjustable "Centorium" type nozzle with hose threaded through and including chromium plated hose guide, designed to permit the hose to run out in any direction and the nozzle supported on and including chromium plated bracket fixed to wall.

For ease of removal, a union shall be installed between the valve and the reel.

FIRE HYDRANTS: — shall be of the wheel valve pattern with instantaneous coupling outlets, size 63.5mm or 70mm as stated on the drawings. Hydrants fixed in a horizontal position shall have oblique angle outlets and those fixed in a vertical or inclined position shall have right angle outlets. The materials used in the manufacture of the hydrants shall be as laid down for the manufacture of couplings, branch pipes, etc. in SANS Specification 1128, and the various requirements of instantaneous couplings and dimensions for 70mm outlets shall comply with the requirements for Morris instantaneous pattern couplings.
The valve spindle shall have a minimum diameter of 22mm with swivelling clack at one end fitted with first quality dexine or other approved washer, bedded on to a raised seat not less than 6mm wide, and the other end shall be machined to form a square shank of 15mm minimum thickness and a length corresponding with the thickness of the boss of the handwheel, the portion protruding from the boss shall be threaded and fitted with a washer and nut to hold the handwheel firmly in place. Valve inlet shall be male screwed 80mm Whitworth pipe thread, and outlet shall be fitted with approved India-rubber coupling gasket. The internal diameter of the valve body shall be not less than 95mm in the case of 63.5mm outlets or 100mm in the case of 70mm outlets.

The valve hand wheel shall have an overall diameter of 165mm and the rim shall be of oval cross-section and shall have the words "OPEN" and "OOP" together with direction arrows embossed on the face.

All hexagonal faces shall be machined and all exposed surfaces of the valve and the wheel periphery shall be buffed and polished. Parts of the wheel not polished shall be painted two coats bright red high gloss paint.

The completed hydrant valve shall be guaranteed hydraulically tested by the manufacture to a pressure of 35 bar and shall be badged or stamped accordingly with the manufacturer's

name or symbol and the words "TESTED 35 bar".

16. GLAZING

MATERIALS: — Glass shall conform to the requirements of the relevant current British Standards Specification for the respective materials.

Clear glass shall be float quality glass.

Silvered glass mirror to comply with SANS Specification 1236 Class A.

Toughened safety glass 15 to be "Armourplated" float quality safety glass of the thickness specified and as manufactured by Armourplate Safety Glass (Pty) Ltd. or other approved, and glazed to sashes, etc. in strict accordance with the manufacturer's instructions.

All toughened safety glass is to have the manufacturer's name or motif sand-blasted in one corner of each pane

Laminated safety glass is to be float quality normal strength glass, unless otherwise stated, and of the type specified and as manufactured by Shatterprufe Safety Glass Co. (Pty) Ltd., or other approved, and glazed to sashes, etc. in strict accordance with the manufacturer's instructions.

All laminated safety Glass is to have the manufacturer's name or motif sand-blasted in one corner of each pane.

All glass is to be free from imperfections and is to be left in a thoroughly clean condition on completion.

No glazing is permitted in Patient Treatment area's below 1 (one) meter.

GLAZING: — The glazing and fixing of glass in buildings shall be in accordance with SANS Code of practice 0317.

Glass panes shall have adequate glazing clearance between edges of glass and the rebates.

Putty for glazing shall comply with SANS Specification 680 type 1 for glazing in wood and type 2 for glazing in steel. Putty for glazing in natural finished wood shall be tinted to match the colour of the wood. Putty to be mixed with a hardener to allow for painting within +/- 3 days. Putty for glazing in aluminium windows shall be tinted to match the aluminium or anodised aluminium where required.
All rebates, other than those in natural finished hardwoods, are to be primed before glazing. Glass fixed with glazing beads shall be well bedded in back putty in the rebates.

Putty shall be carefully trimmed and cleaned off with front putty worked to within 3mm of the sight lines.

RATES: — Rates for glass generally shall include for preparing the rebates, etc. all putty, sprigs, clips, etc. as required and all cutting.

Rates for toughened and laminated glass shall include in addition for all necessary spacing and setting blocks in accordance with the manufacturer's requirements.

17. PAINTING

MATERIALS: — Proprietary materials where specified are to be of the brand specified or other approved by the Department.

All primers, emulsion paints, enamels, stains, varnishes, etc. are to comply with the relevant SANS Specification.

Paints, etc. shall be suitable for application on the surfaces to which they are being applied and those used externally shall be of exterior quality or suitable for exterior use.

For any particular work the priming coat and subsequent coats of paint are to be executed with paints from the same manufacturer and in accordance with that manufacturer's instructions.

The materials are to be brought to the site in unopened containers and no adulteration will be permitted, except thinners of a quantity and quality directed by the manufacturer.

The Department shall at all times be permitted to take samples for testing purposes from open containers of any brand of paint being used on the work.

All materials, if and when required by the Department, will be subject to tests by the South African Bureau of Standards, and the cost of such tests, should the material under test not meet the requirements of this specification, shall be borne by the Contractor. Fillers and stoppings are to be suitable for use with the material being filled or stopped and to the approval of the Department.

PREPARATORY WORK: — All new and existing surfaces are to be thoroughly dry and are to be cleaned of all dust, dirt, grease, oil, rust, scale, efflorescence, fungus, loose or flaking material, etc. rubbed down, stopped, filled, knotted and sanded smooth as required in accordance with the paint manufacturer's recommendations and to the approval of the Department prior to the application of paint, etc.

Ceilings are to have nail heads, including those to cornices and cover strips, primed and stopped up as necessary and rubbed down smooth.

Asbestos cement shall be primed with an approved alkali resistant primer before the application of subsequent coats which are not, in themselves, alkali resistant.

Iron, steel and other ferrous metals shall be cleaned in accordance with SANS Code of Practice 064 to remove rust, scale, grease, oil, etc. and the surface brought to a bright metallic condition.

Galvanized iron and zinc shall be cleaned in accordance with SANS Code of Practice 062 to remove the manufacturer's temporary protective coating, white rust, etc.

Other non-ferrous metals shall be thoroughly cleaned to remove all milling oils, temporary protective coatings, etc. and the surface abraded with fine water-paper and white spirit.

Woodwork to be painted shall have all knots and resinous areas treated with an approved knotting, the surface shall then be primed and all holes, etc. stopped and rubbed down smooth,

Woodwork to be oiled, stained, varnished, etc. shall be free of all stains, pencil marks and other surface discolorations and all holes, etc. stopped with tinted stopping and rubbed down smooth.

In preparing existing glazed sashes and sash doors, all loose putty is to be removed, the rebates primed and glass re-sprigged and re-puttied as necessary before the painting is commenced.

Previously distempered or lime washed surfaces to receive any other type of paint, are to have the existing distemper or lime wash completely removed by scraping or wire brushing and the surf aces treated with an approved bonding liquid.

Where existing paint film are in good condition any flaking or bared patches are to be properly feathered into the surrounding paint and spot primed as necessary.

Where existing paint films are in poor condition and require to be removed completely, they are to be removed by means of wire brushing, paint remover, burning off, or other approved method. Paint removers shall be free of wax and caustic substances and shall preferably be of water rinseable type. When burning off paint from wood, care must be taken to avoid charring the wood.

The final state of preparatory work to existing decorated surfaces shall in all cases produce in the finished decorated surfaces a condition similar to new work.

The Contractor will be held responsible for the proper and adequate preparation of the surfaces and any work which fails to meet the manufacturer's recommendations must be made good at the Contractor's expense to the satisfaction of the Department.

APPLICATION OF PAINTS, ETC.: — Painting may be carried out by brush, roller or spray as recommended by the manufacturer and to the approval of the Department. All paints, etc. are to be applied in strict accordance with the manufacturer's instructions. Each coat of paint is to be adequately and permanently keyed onto the previous coat or surface and shall be evenly distributed and continuous and shall dry to a smooth film, free from sags, runs or other imperfections. Each coat of paint is to be of a colour distinctive from previous or succeeding coats.

All painting must be done in accordance with a colour scheme which will be provided by the Department, and rates for painting etc. are to include for all cutting in of contrasting colours and masking as required. No distinction has been made where more than one colour of the same material is required on the walls or ceiling of the same room.

Samples of colours for the final coats are to be prepared in all cases to the approval of the Department and all work must be finished to the approved colours.

Backs of wood door and similar frames an the surfaces of other new or prefixed joinery in contact with brickwork, etc. and built in as the work proceeds, shall be primed or sealed before building in to prevent moisture seeping into the wood from the mortar bedding.

Tongued and grooved and rebated edges of boards in batten doors and other such like inaccessible parts of new joinery shall, before assembly, be primed, or where the joinery is to receive a finish other than paint, be given one coat of such other finishing material.

All new external structural timbers shall be primed before the timbers are fixed in position and shall include all surfaces such as backs of fascias and barge boards.

RATES: — Rates for painting, etc. are to include for all preparatory work, and where spraying is employed, are to include or adequately masking all surrounding areas.

Where diameters of pipes are stated these are the nominal internal diameters, and rates for painting pipes are to include for painting the holderbats, hangers, clips, etc. supporting the pipes.

Rates are to include for providing all necessary dust sheets, covers, etc. taking all necessary precautions to prevent marking the surfaces of joinery, walls, floors, glass, electrical fittings, etc. All surfaces disfigured or otherwise damaged shall be completely renovated or replaced as necessary to the approval of the Department at the Contractor's own expense.

18. ROADWORK

The Contractor is referred to the preambles for "Earthworks" with particular reference to the full description, intent and meaning of the classification for excavations and the preambles for "Concrete, Formwork and Reinforcement"

The construction of the roads is to be carried out by an approved Specialist Sub-Contractor in accordance with the following specifications and all to the approval of the Department.

SUB-GRADE: — All materials placed in the sub-grade layer which is defined as being the 150mm thick layer immediately below the sub-base or the base course (where no sub-base is specified), shall conform to the following specification: —

(a) Minimum C.B.R. at 93% Mod. A.A.S.H.O. density = 10 %

(b) Maximum C.B.R. Swell = 1.5 %

(c) Maximum Plasticity Index if:
more than 30% passes the 2mm sieve = 12
less than 30% passes the 2mm sieve = 16

The sub-grade layer in cut areas shall be treated in place either to achieve a uniform standard of compaction or to break up undesirable formations of hard rock.

In the case of materials other than hard rock, treatment in place shall consist of scarifying or otherwise loosening to a depth of 150mm and re-compacting to a density of 93 % Mod. A.A.S.H.O. where directed, with the material stabilised in place before compacting.

In hard rock, treatment in place shall consist of thoroughly loosening to a depth of 450mm by rip in or blasting and then sized by rolling or knapping until the maximum dimension of any spall shall be not more than 300mm.

Compaction of the rock in the sub-grade shall be achieved by spreading and sorting by bulldozer to a reasonable uniform thickness with sufficient fine material added to fill the voids and bind the surface.

Compaction shall be achieved by means of a vibratory roller until the Department is satisfied that the mass is sufficiently dense, to provide a stable sub-grade layer.

Density tests shall be carried out at the minimum rate of one test per every 500m^2 of sub-grade area or not more than 50m apart but not less than four tests for smaller areas and shall assess the full layer thickness. The costs of such control tests shall be included in the Contractor's rate for sub-grade treatment. The Department may; at its discretion, arrange for independent check tests to be performed, but the costs of the tests in this instance will be borne by the Administration.

Processing of the material will be measured under the relevant items. An approved total weed killer shall be applied during the formation of the sub-grade. The rate of application shall be in accordance with the manufacturer's specification.

Rates shall include for the supply, delivery, spreading and stabilisation with lime, if required, and compacting and shaping to correct lines and levels.

The lime and method of mixing and watering shall be as described in the specification for stabilisation.

SUB-BASE: — All material placed in the sub-base layer, which is defined as being that layer of 150mm thickness immediately below the base course layer, shall conform to the following specification: —

	Unstabilised	Stabilised
Minimum C.B.R. at 95 % Mod. A.A.S.H.O. density	70%	50%
Minimum C.B.R. Swell	0, 5%	0, 5%

Maximum Plasticity Index	10	10
Minimum Liquid Limit	35%	35%
Maximum size of aggregate	63mm	63mm
Material passing the No. 75 micrometer sieve shall not exceed	25 %	
Minimum relative compaction in place	95 % Mod. A.A.S.H.O.	

Combined coarse and fine sand density fractions shall exceed 35 % of the soil mortar

Unless otherwise specified, the responsibility for obtaining material that conforms to the above specification rests with the Contractor who will be required to perform his own tests to prove compliance, and to submit samples to the Department before the material is delivered on site. Further control tests will be required by the Department during the placing and compaction of the material, the locations of which will be selected at random.

Should the Contractor wish to use material from the site excavations, he shall first obtain the approval of the Department. His rates shall in this case include for the selection and stockpiling.

Density tests shall be carried out at the minimum rate as specified for the sub-grade layer.

The layer shall be finished off to present a uniform texture and tightly bonded surface.

Rates shall include for the supply, delivery, spreading and stabilisation with lime, if required, and compacting and shaping to correct lines and levels.

The lime and method of mixing and watering shall be as described in the specification for stabilisation.

The finished surface shall be within 20mm of the design level. The finished width shall not be less than the design width. The average of five thickness tests at the rate of one test for every 200m^2 of surface shall not be less than 150mm and at any point not less than 130mm.

The surface finish when measured under a 3m straight edge shall have no slacks or bumps greater than 5mm.

The cost of the density control tests shall be included in the Contractor's rate for sub-base construction. The Department, at his discretion, may arrange for independent check tests to be conducted, and the costs in these instances will be borne by the Administration.

STABILISATION: — The stabilisation agent shall be slaked lime of the calcium type conforming to the requirements of SANS Specification 824.

The rate of application shall conform to the design rate and all materials to be stabilised shall be approved by the Department before processing.

The material shall be spread in a uniformly thick loose layer over the full area and thoroughly dried by scarifying or blading with a grader to ensure exposure to the air of all particles and to ensure thorough mixing to obtain a uniform grading of the material.
When the material has been approved as being ready for stabilising it shall be lightly rolled to facilitate the spreading of the lime. The lime shall be evenly applied to the surface, preferably by mechanical spreader, at the specified rate and thoroughly mixed by rotavator or disc harrow until a uniform integrated mixture of uniform colour is obtained over the full depth of the layer.

Before mixing is commenced, the Contractor shall satisfy the Department that the lime has been applied at the specified rate.

Immediately after the lime has been mixed in, water shall be added in small increments by suitable watering equipment and mixed into the layer until the required water content has been obtained which shall not exceed the Mod. A.A.S.H.O. optimum plus 2%:

The efficiency of the spreading and mixing shall be measured by Lime Determination Test according to A.S.T.M.D. Test Number 3155/1973 or the California Test Method No. 338-B July 1996. Only where the result from every 15 tests at locations selected by the Department indicate that more than 90 % of the layer has a time content exceeding 60 % of the nominal lime content will the work be accepted, provided that the coefficient of variation shall not be greater than 25%.

The test positions shall be spaced at one for every 100m^2 of surface area, but shall not be spaced, greater than 20m apart

BASE COURSE: — When the sub-grade has been prepared and approved, the base course, consisting of one of the following, shall be formed to the compacted thickness specified.

Crusher Run Base Course
Crusher-run base course shall be fresh dolerite, hard blue tillite, quartzite, fresh granite, fresh basalt or other stone which meets the following specifications.

TABLE F: CRUSHER RUN BASE COURSE: STONE SPECIFICATIONS

Sieve Size	% Passing
37.5mm	100
26.5mm	82 - 95
19.1mm	70 - 85
13.2mm	58 - 75
4.75mm	34 - 55
Sieve Size	**% Passing**
2.00mm	22 - 40
0.425mm	10 - 25
0.075mm	5 - 12

Minimum C.B.R. @ 98% Mod. A.A.S.H.O. density		80%
Maximum C.B.R. Swell		0, 5 %
Maximum Liquid Limit		25
Maximum Plasticity Index		4
Maximum Linear Shrinkage	2	
Minimum Sand Equivalent Value		30
Maximum Flakiness Index	35	

The soundness of the aggregate shall be such that after 5 cycles using Magnesium

Sulphate it shall not show a loss of more than 15% by weight.
The maximum Aggregate Crushing Value should not exceed 30.
The moisture content used for field compaction shall not exceed the Mod. A.A.S.H.O. optimum plus 2 %.

Natural Ground Base Course

Natural ground base course shall be approved stone which meets either of the following specifications.

Natural Gravel (Unstabilised)	
Minimum C.B.R. at 98% Mod. A.A.S.H.O.	80 %
Minimum C.B.R. Swell	0.5 %
Group Index value	0
Maximum Plasticity Index	4
Maximum Liquid Limit	35
Maximum Linear Shrinkage	2
Minimum Sand Equivalent Value	30
Maximum size of particle	53mm

Material passing No. 75 micrometer sieve shall not exceed 25 %

The combined coarse sand and coarse/fine sand fraction shall not exceed 35 % of the soil mortar

Natural Gravel (Stabilised with Lime)

Lime must comply with SANS Specification 824 Minimum C. B .R.			
at 98% Mod. A.A.S.H.O. density,	160	140	120
provided that the minimum C.B.R. before stabilising, at 95 % Mod. A.A.S.H.O. density	30	45	60
Maximum C.B.R. S well			0, 5%
Maximum Plasticity Index	4		
Maximum particle size	2/3 layer thickness		
Maximum percentage passing No. 75 micrometer sieve	25		
Grading Modules	1, 5		

The responsibility for obtaining suitable base course material complying with the above rests with the Contractor, unless otherwise specified, and the provisions for sub-base material in regard to tests, etc. to prove compliance with the specification shall apply to the base course.

During construction, the base course shall be evenly distributed over the sub-grade. The stone shall then be rolled with a 4 to 5 tonne roller or equal unless otherwise instructed. After a few passes of the roller the surface shall be checked for shape camber and levels and all depressions filled in. Rolling and trimming shall continue until the surface is true to required levels and falls.

Minimum density in place after compaction shall be 98% Mod. A.A.S.H.O. density.

CHIP AND SPRAY SURFACING

Binders

One of the following may be used: —
M.C. 3000 Bitumen to SANS Specification 308 (150/200 Pen.)
M.C. 800 Bitumen to SANS Specification 308 (150/200 Pen.)

RTH 45 / 50 Tar to SANS Specification 748 Spray-grade 60% emulsion where approved or specified by the Department. If emulsion is used then the specified application rates shall be increased to give the required net bitumen content.

Cover Aggregate

All Cover aggregate used in the surface treatment shall be washed 13.2mm nominal sized crusher stone in accordance with SANS Specification 647.

Aggregate Crushing Value shall not exceed 15.

Binder shall be applied after the prime coat has dried completely and all tackiness has vanished.

The binder is to be applied by means of a distributor at a rate of 1.1 litre/m2 followed immediately afterwards by the spreading of a cover aggregate of 13.2mm stone at the rate of $125m^2$ / m^3. The aggregate is to be spread by means of an approved chip spreader; band spreading will only be permitted in those areas inaccessible to the spreader. The aggregate is to be rolled immediately with two passes of a pneumatic tyred roller. When the binder has set the surface shall be drag-broomed twice in each direction and then rolled again with four passes of the roller during the heat of the day or until the aggregate is firmly keyed into a tight surface.

DOUBLE SEAL COAT WITH BLACK TOP SURFACING: — The prime and first seal coat shall be applied as previously specified.

After the first seal coat has been drag-broomed and rolled as previously described, the binder shall be applied to the surface at a rate of 0.8 litre/in 2 followed immediately by the spreading of 6.7mm stone chips at the rate of $150m^2/m^3$. This stone aggregate shall then be drag-broomed and rolled as previously described.

A seal spray having a net bitumen content of 0.7 litre/in^2 shall then be applied to the surface when this coat has dried completely, and shall be rolled to firmly bed any loose aggregate.

If the surface is to be opened early to traffic, it shall be covered very lightly with sand or crusher dust distributed evenly with a hessian drag and back rolled with wet wheels before opening to traffic.

SLURRY SEAL SURFACING: — The aggregate for slurry seal shall conform to the following grading: —

Sieve Size (mm)	Percentage Passing
4, 75	100
2, 36	90—100
1, 18	65—95
0, 600	42—72
0, 300	23—48
0,150	10—27
0, 075	5—12

Slurry sand shall be crusher sand with a minimum sand equivalent of 35.

Binder — Stable grade emulsion (60%)
Anionic to SANS Specification 309
Cationic to SANS Specification 548

Consistency of the slurry shall consist of 90% crusher sand, cement filler not less than 1% and net binder content of not less than 9% by weight. Water to be added as required. As a guide, approximately 300 litres of emulsion and 160 litres of water are required per cubic metre of slurry.

The slurry shall be machine mixed and wherever possible applied by means of a spreader box. The rate of application shall be $170m^2/m^3$. The slurry shall be of a creamy, homogeneous mixture, free of lumps, and if the mixture shows signs of breaking before application to the surface it shall be discarded.

After the first seal has been approved by the Department, but before the application of the slurry, a fog spray comprising of a solution of 1 part emulsion to 3 parts water shall be applied at a rate of 0.8 litre/m^2 to cover the aggregate. The application of the slurry may commence when the fog spray has been applied to assist with the spread of the slurry and to smooth out squeegee marks the slurry shall, immediately after being applied and before it has broken, be smoothed by a damp hessian drag either attached to the spreader box or pulled over by hand.

After the slurry has set it shall be covered by two passes of a pneumatic-tyred roller during the heat of the day.

The permissible variation in the application of the slurry shall not vary from the specified rate by more than 10%.

PREMIX TARMACADAM SURFACING

Prime Coat
When the base course is complete and dry it shall be cleaned of all loose material and be given a prime coat of one of the following primers: —
M.C. cut-back bitumen.
Tar Primer R.T.H. 3/P.
Emulsion Primer (60%).

The rate of application of the primer shall be within the range 0.65—1.0 litre/m^2, the actual rate to be determined by test and observation on site. Where emulsion primer is used, the application rate shall be increased to give the required nett bitumen content.

Hand spraying shall be used only in those areas inaccessible to mechanical distributors. Before spraying is commenced, the surface shall be lightly watered to settle dust.

Single Coat Premix Tarmacadam
When the prime coat has dried the single coat premix wearing course, of the compacted thickness specified, shall be constructed.

The wearing course shall be Type A (Hot Mix), unless otherwise specified or approved by the Department, and shall conform to the following specification: —

TABLE G: SINGLE COAT PRE-MIX WEARING COURSE: SPECIFICATIONS

	Screen Size mm	A Hot Mix	B Hot Mix	C (Kerbs)

Aggregate Grading Per Cent Passing	26.5 19.0 13.2 9.5 6.7 4.75 2.36 1.18 0.6 0.3 0.15 0.075	100 100 80 - 100 70 - 90 - 50 - 70 35 - 50 27 - 40 19 - 30 13 - 23 8 - 16 4 - 10	- - 100 80 - 95 60 - 75 45 - 60 28 - 42 18 - 30 7 - 20 2 - 10 0 - 5 0 - 4	- - - 100 90 - 100 65 - 75 52 - 62 50 - 60 45 - 55 30 - 40 9 - 19 4 - 8
Grade Binder		60 / 70	Emulsion	60 / 70
Nominal Nett Binder Content		5.5 % +/- 0.38	4.75 % +/- 0.3	5.5 % +/- 0.3

Penetration grades to comply with SANS Specification 307.

Cut-back bitumen to comply with SANS Specification 308.

Maximum heating temperature of bitumen 170^{0}C.

Delivery temperature at the paver for hot mixes 130—160°C.

For every 500m^2 of area paved the Contractor shall produce an extraction test result from a sample taken during laying operations showing grading and bitumen content of the premix carpet. The test as specified or any further tests to prove compliance with the specification shall be at the Contractor's expense.

In order that the stone and binder shall be properly mixed, this operation must be carried out in a pug-mill mixer or by hand with shovels and wheelbarrows or on metal plates, in which case the binder must be added in the correct proportions in small quantities. Mixing shall continue until the aggregate is uniformly coated with the binder. Bituminous surfacing shall not be carried out in rainy weather nor when atmospheric shade temperature is below 10^{0}C. Immediately after mixing, the surfacing materials must be spread and rolled on the same day. Spreading shall be done evenly over the base to ensure a consolidated thickness as specified and shall be performed by means of a mechanical spreader or by a drag spreader, or by hand, using rakes and screeds.

Where hand spreading is used, the premix must not be dumped on the base, but taken from the boards on barrows by shovel and then evenly distributed over the base. Hand raking must be reduced to a minimum to avoid segregation of aggregate. Rolling shall commence as soon as the binder has set sufficiently and, unless otherwise instructed, this shall be done with a 4 to 5 tonne roller or equal.

Places inaccessible to a roller may be compacted by means of 12kg tampers. The surface shall be rolled true to line and level without slacks or irregularities.

After three days the rolling shall be repeated during the hottest part of the day and a light application of fines may be added during the final rolling.

Premix Tarmacadam Kerb

Premix kerbs are to be Type C as specified above and constructed to give the following compacted size: —

Width at top	125mm
Width at base	230mm

Height 150mm

PRE-CAST CONCRETE PAVING BLOCKS: — shall be of the type, class and thickness specified, of approved colour and shall comply with SANS Specification 1058. Paving blocks which fail to meet these requirements must immediately be removed from the site and replaced at the Contractor's expense to the satisfaction of the Department.

Paving blocks shall be one of the following types as specified: —
Type S-A: — allows geometrical interlock between all vertical faces of adjacent blocks,
Type S-B: — allows geometrical interlock between some vertical faces of adjacent blocks.
Type S-C: — allows no geometrical interlock between vertical faces at adjacent blocks.

Paving blocks shall be one of the following classes as specified: —
Class 25: — average compression strength of at least 25 MPa.
Class 35: — average compression strength of at least 35 MPa.

Paving blocks are to be laid to approved patterns as specified and in accordance with the relevant clauses (excluding Clause 8) of SANS Specification 1200 MJ on and including a sand bed of the compacted thickness specified. After laying, the paving blocks are to be compacted by means of a vibrating plate compactor with the joints filled in, after compaction, by sweeping in jointing sand.

Sand for bedding shall conform to the following grading: —

Sieve size (mm)	Percentage Passing
9, 52	100
4, 75	95-100
2, 36	80-100
1, 18	50-85
0, 60	25-60
0, 30	10-30
0, 15	5-15
0,075	0-10

Sand for jointing shall pass a 1.18mm sieve and shall contain 10-50% of material that passes a 0,075mm sieve.

Spaces constituting less than 25% of a full block unit and of 25mm minimum dimension at perimeter edges of pavings against kerbs, buildings, inspection chambers, etc. are to be filled with Class B concrete trowelled to a smooth even surface to match paving blocks.

Rates for paving block pavings are to include for all straight cutting and waste, all half blocks at straight edges, filling with concrete as described, fitting, protecting from injury and cleaning down at completion.

KERBS

Generally

The kerbs are to be laid before the base course is commenced to the lines and positions as shown on the drawings. The Contractor is to allow sufficient time for the mortar bedding and joints to set and is to take all necessary precautions to maintain the line of the kerbs especially while rolling the base course and surfacing, as no claims in this connection will be considered.

Rates for kerbs are to include for necessary excavation, well consolidated bottom under kerbs and for filling and ramming to secure the kerbs in position.

Pre-cast Concrete Kerbs

Pre-cast concrete mountable kerbs as SANS Fig8 are to be of concrete Class 20 (20 MPa) and of the sizes described in the items, cast generally in 1m lengths, and finished smooth off the mould on top edge and both sides, with angles rounded, and rates are to include for all necessary formwork and moulds. The kerbs are to be bedded on and including a mat of

1:3 cement mortar, and the abutting ends of the kerbs are to be fully jointed in a similar mortar and pointed with a keyed-in joint on top edge and exposed sides.

Brick on edge kerbs
Brick on edge kerbs are to be of extra hard burnt bricks of the colour specified. The kerbs are to project 10mm above the finished tarmacadam level and are to be bedded on a mat of 1:4 cement mortar, and the abutting ends of bricks are to be fully jointed in a similar mortar and pointed with a keyed-in joint on top and exposed sides.

19. FENCING AND GATES

GENERALLY: — The Department shall be responsible for the initial location and exposure of all necessary boundary beacons and their indication to the Contractor at the site handover. The Contractor shall be responsible for subsequently ensuring that these beacons remain undisturbed and that the fencing is correctly aligned between boundary beacons. Should, during setting out of the further boundary beacons be uncovered or located and reasonable doubt arise regarding the correct alignment of fencing, then the Contractor shall be responsible for immediately notifying the Department, in writing, of such doubt, in order that the setting out may be checked and rectified, if necessary.

All bushes, trees, old fencing, rocks, debris, long grass and other obstructions shall be removed from the fencing line to produce a clear even strip 500mm wide on either side.

Trees, rocks or other items of horticultural or archaeological interest that are not to be removed will be indicated by the Department.

Straining Posts: - shall be erected at ends, corners and intermediately at not exceeding 30m centres with standards or intermediate posts erected between posts at not exceeding 3m centres.
Where fences are erected directly over boundaries, corner beacons shall be preserved by splaying the corner by planting two straining posts, each with one stay, 1 m from the beacon peg.
Security fences (i.e. fences with projecting overhangs if specified) shall be sited 350 mm back from the boundary line so that the end of the overhang is exactly on the boundary line.

SECURITY FENCING:

2.3m High security fencing shall consist of: -

1) Straining and Intermediate Posts (2.9mtr long).
2) Stays (2.6mtr long).
3) Welded mesh fencing (1.8mtr high).
4) Razor wire.
5) Concrete ground beam.
6) Tubular steel gate posts (when specified).

Straining and corner posts shall be 150mm ø x 3mm wall thickness steel tubing, in lengths as specified, with upper end capped and 3mm thick x 300mm x 300mm footplate welded to base. The whole shall be **hot dipped galvanized**. 80mm diameter stays x 3mm wall thickness shall be secured to posts with galvanised bolts. Straining posts to be positioned at maximum 30mtr c/c. Bottom of posts bedded in concrete to be painted with bitumen paint prior to erection. Where holes have to be drilled on site, drilling shall be cold galvanized before corrosion sets in.

Intermediate posts shall be 2.9mtr long x 100mm x 100mm square pre-stressed, precast concrete posts with top end splayed, spaced at maximum 3mtr apart. Stays for posts shall be prestressed reinforced concrete members of 75mm x 75mm x 2.6mtr long, splayed at the top end, with a 10mm ø x 50mm long galvanized steel pin attached to fit into a drilled hole in the upright and bonded to posts with approved epoxy.

Fence shall comprise of galvanized rectangular welded mesh fencing 1,80mtr high x 3.15mm ø x 25mm x 50mm rectangles fixed to 8 gauge or 3.15mm diameter – as

specified - hardened galvanized steel straining wires x 5, spaced vertically at 450mm ¢. Welded mesh shall be secured to straining wires with 2mm ø galvanized tying wire spaced at a maximum of 250mm between ties. Fencing overlap to be a minimum of 150mm.

Straining wires shall be fixed to posts with doubled strands of 2mm ø galvanized tying wire, pulled tight around posts and wound tightly around the straining wires.

Coils of 500mm ø galvanized flat wrap razor wire shall be fixed vertically above the welded mesh to a height of 450mm above the top of the welded mesh. Razor wire shall be supported on and fixed to three strands of galvanized double strand barbed wire. Barbed wire shall be fixed to the posts in the same manner as the straining wires.

Razor wire shall be fixed to the barbed wire at every intersection and laced to the concrete posts with galvanized tying wire.

A 250mm wide x 150mm minimum depth concrete ground beam of 15mpa strength shall be excavated for and cast along the entire length of the fence. Shuttering for the ground beam sides shall be provided as required. Finished level of the ground beam shall be 50mm above final ground level at the highest point, finished in a straight line both vertically and horizontally. 75mm of the welded mesh fencing and the bottom straining wire shall be embedded in this ground beam to secure the lower fence line. The top of the concrete beam shall be shaped to allow water to run off the top of the beam to prevent water collecting and standing on top of the beam.

At any change in direction of the fence line, two 150mm ø x 3mm wall thickness straining posts shall be erected with bottom ends embedded in a common concrete base with each post stayed separately.

Concrete bases for posts shall be Class B (1:3:5-19mm stone) size 400 x 400 x 500mm deep, unless otherwise specified, with tops of bases 100mm below ground level.

When required, gateposts shall be supplied in steel tubing complying with CKS 82, 150mm ø x 5mm wall thickness, in lengths as specified, with upper end capped with 1.6mm thick pressed mild steel domed cap welded on and 3mm thick x 300mm x 300mm footplate welded to base. Gateposts are to be drilled and fitted with mild steel ferrules welded into position to receive 20 mm ø mild steel hinges. Threaded 12 mm ø studs or approved stay collars are to be fixed on to the posts to locate and secure the top ends of stays. The whole shall be hot dipped galvanized. Where holes for the threading and fixing of straining wires are required, holes shall be drilled on site and cold galvanized on completion.
Stays shall have the top end flattened, bent as required, holed 12 mm ø for bolting to post and the whole hot dip galvanized.

Mild steel tubing for gate components shall comply with SANS Specification 657 Part 1. The diameters specified are the nominal external diameter of the tubing.

Straining wire: - shall be as specified, or either Type 1 galvanized wire of 3,15 mm diameter or Type 2 PVC coated galvanised wire with 3, 15 mm diameter core wire PVC coated to an overall diameter of 3,95 mm. Stainless steel straining wire when specified shall be 2,50 mm diameter A.I.S.I. Type 304 stainless steel, strained between posts and tied to same at terminal ends by turning each wire twice around the post and tying off by twisting it a minimum of three turns around the strained wire.

Binding or Tying wire: - shall be as specified, either Type 1 galvanised wire of 2 mm diameter or Type 2 PVC coated galvanised wire with 2 mm diameter core wire PVC coated to an overall diameter of 2, 80 mm.

Galvanized barbed fencing wire: - shall consist of two strands of 1, 60 mm diameter high tensile steel wire twisted together with barbs at 125 mm centres and each row of barbed wire shall be strained between posts and tied to same at ends by turning each wire around the post and tying off by twisting it a minimum of three turns around the strained wire.

Galvanising: - shall comply with SANS Specification 763 and all items of posts, stays, gate

framing, etc., described as galvanised shall be hot dipped galvanised after fabrication with Class A galvanising with all internal and external surfaces fully coated.

GATES: — Generally single gates and double gates shall be of the sizes stated and formed with mild steel tubular framing all round, covered with chain link wire mesh of the type specified laced to framing. Tubular framing to gates shall be mitred and welded at corners and, at all other intersections, the tubular framing shall be scribed and welded together with all welds ground smooth.

Preferred gate hinges are Bullet Type or through pin type hinges.

Where gates are to be hung on precast concrete posts, hinges shall be fixed to and including mild steel clamps, each formed of two 50 x 5 mm mild steel plates 200 mm long, twice holed for and bolted on opposite sides of post with two 10 mm ø x 140 mm galvanized mild steel hex-head bolts and with each plate holed to receive 20 mm ø gate hinge.

Each single gate and one leaf of each double gate shall be fitted with gate latch formed of 25 x 6 mm mild steel bracket, 550 mm girth, twice bent to U-shape with centre section 150 mm high and with ends scribed and welded to tubular stile of gate. A locking bar formed of 25 x 6 mm mild steel plate, 100 mm long, twice holed 13 mm diameter for shackle of padlock and for pad bolt, shall be welded to inside of bracket. The sliding pad bolt shall be formed of 12 mm ø mild steel rod, 220 mm long, with 25 x 6 mm mild steel flat bar 60 mm long welded on at one end and holed 13 mm diameter for shackle of padlock. The stile of the gate and the locking post or locking stile of the double gate shall be holed for and fitted with mild steel ferrule welded in to receive pad bolt. In addition, fittings to each leaf of double gate shall comprise 50 x 6 mm mild steel locking bar, 80 mm long, holed 20 mm ø for shackle of padlock and welded to locking stile of gate and drop bolt formed of 16 mm diameter mild steel rod, 575 mm girth, once bent to L-shape, fitted through and including 20 mm internal diameter mild steel sleeve welded to gate at bottom corner, with 12 mm diameter mild steel peg stay 25 mm long welded on to gate frame.

A concrete gate stop block size 230 x 230 x 230 mm deep with two 20 mm internal diameter mild steel sockets, each 75 mm long, cast into top shall be embedded in the road surface between each pair of double gates in the closed position. A similar gate stop block but with one socket shall be embedded in the road surface to each leaf of double gate in the open position.

Each single or double gate shall be fitted with an approved 51 mm brass padlock with hardened steel shackle and two keys.

Gates for 1, 20 m high fencing

Single gates shall be size 1,00 x 1,20 m high, each hung on hinges as stated above and formed of 32 mm diameter x 2 mm wall thickness mild steel tubular framing all round. Each gate shall be fitted with locking pad bolt with brass padlock.

Double gates shall be in two equal leaves with each leaf size 2.25 x 1, 20 m high, hung on hinges as stated above, formed of 38 mm diameter x 2 mm wall thickness mild steel tubular framing all round with two 38 mm diameter x 2 mm wall thickness mild steel tubular braces welded on between bottom corners and centre of top rail of each leaf. Each pair of double gates shall be fitted with locking pad-bolt, locking bars with brass padlock, drop bolts and concrete gate stop blocks as specified above.

Gates for 1, 50 m high fencing

Single gates shall be size 1, 00 x 1, 50 m high as described for gates for 1, 20 m high fencing but with each stile of gate extended 330 mm above top rail and braced between top rail and top of extension arm with 32 mm diameter x 2 mm wall thickness mild steel diagonal brace welded on and hung on hinges as stated above. Two rows of galvanised barbed wire, spaced 150 mm apart, shall be strained and tied to the extension arms.

Double gates shall be in two equal leaves with each leaf size 2, 25 x 1.50 m high with each hung on hinges as stated above, all as described for double gates for 1, 20 m high fencing but with each stile of each leaf extended 3 mm above top rail and braced between top rail and top of extension arm with 38 mm diameter x 2 mm wall thickness mild steel diagonal brace welded on. A vertical extension arm 330 mm high - formed of 38 mm diameter x 2 mm wall thickness mild steel tube - shall be welded on above centre of top rail. Two rows of galvanised barbed wire, spaced 150 mm apart, shall be strained and tied to extension arms.

Gates for 3, 00 m high fencing

Single gates shall be size 1,00 x 1,50 m high, hung on hinges as stated above and formed of 38 mm diameter x 2 mm wall thickness mild steel tubular framing all round with 38 mm diameter x 2 mm wall thickness mild steel horizontal centre rail. Each gate shall be fitted with locking pad bolt with brass padlock.

Chain link wire mesh fencing shall be carried over and above the top of the gate as previously described for fencing.

Double gates shall be in two equal leaves with each leaf size 2, 25.x 3, 00 m high, each hung each hung on hinges as stated above, and formed of 51 mm diameter x 2 mm wall thickness mild steel tubular framing all round with two 51 mm diameter x 2 mm wall thickness mild steel tubular braces welded on between bottom corners and centre of top rail of each leaf. Each pair of double gates shall be fitted with locking pad bolt, locking bars with brass padlock, drop bolts and gate stop blocks.

Gates for 1, 8 m high security fencing:

Single gates shall be size 1,00 x 1,80 m high, hung on hinges as stated above and formed of 38 mm diameter x 2 mm wall thickness mild steel tubular framing all round with 38 mm diameter x 2 mm wall thickness mild steel horizontal centre rail. Each gate shall be fitted with locking pad bolt with brass padlock.

Single gates shall be hung on mild steel tubular gate posts with cranked overhang when specified and the galvanised barbed wire overhang shall be carried over above the gate as previously described.

Double gates shall be in two equal leaves with each leaf size 2, 25 x 1, 80 m high, each hung on hinges as stated above and formed of 51 mm diameter x 2 mm wall thickness mild steel tubular framing all round with two 51 mm diameter x 2 mm wall thickness mild steel tubular braces welded on between bottom corners and centre of top rail of each leaf. The stiles of each gate shall be extended 450 mm high above the top rail and braced between top rail and top of extension arm with 51 mm diameter x 2 mm wall thickness mild steel diagonal brace welded on. A vertical extension arm 450 mm high formed of 51 mm diameter x 2 mm wall thickness mild steel tube shall be welded on above centre of top rail. Three rows of galvanised barbed wire, spaced 150 mm apart, shall be strained and tied to extension arm. Each pair of double gates shall be fitted with locking pad bolt, locking bars with brass padlock, drop bolts and gate stop blocks.

Double gates shall be hung on posts without cranked overhang but with the posts extended 450 mm high above top of chain link wire mesh fencing to receive continuation of barbed wire and razor wire.

Gates for 2, 40 m high security fencing

Single gates shall be of size 1, 00 x 2, 00 m high, all as described for gates for 1, 80 m high security fencing.

Chain link wire mesh fencing shall be carried over above the top of the gate to an overall height of 2, 40 m with the razor wire carried across between the gateposts.

Double sates shall be in two equal leaves, with each leaf 2, 25 x 2, 40 m high, all as described for double gates in 1, 80 m high security fencing.

Double gates shall be hung on posts without cranked overhang but with the posts extended 450 mm high above top of chain link wire mesh fencing to receive continuation of razor wire.

SUBMISSIONS FOR PREFABRICATED TIMBER ROOF TRUSSES

Letter Ref. TR 1

I / We hereby undertake to be responsible for the design of the total timber roof construction and will satisfy myself / ourselves that the fabrication and erection is in accordance with my / our design.

Project: _____

_____

Part(s):

_____

_____

NAME OF FIRM:

_____

SIGNATURE: _____ QUALIFICATION:

_____

DATE: _____

Letter Ref. TR 2

I / We am/are satisfied that the fabrication and erection of the total roof construction has been completed in conformity with my / our design.

Project: _____

_____

Part(s):

_____

_____

NAME OF FIRM:

_____

SIGNATURE: _____ QUALIFICATION:

_____

DATE: _____

SUPPLEMENTARY PREAMBLES

The following Supplementary Preambles are to be read in conjunction with the "Standard Preambles to all Trades" included here before and are to apply to this Contract.

Where these "Supplementary Preambles" are at variance with the "Standard Preambles to all Trades" referred to above, such variances are to take precedence and are to apply to this Contract.

1. ALTERATIONS

All Notes, Preambles, etc. applicable for the various trades in the Bills of Quantities, will apply equally to the trades in this Bill.
Tenderers are advised to visit the site and satisfy themselves as to the nature and extent of the work to be done, and also to examine the condition of the existing building.

Tenderers are advised that all materials from the pulling down (except where described to be re-used or handed over to the Department) will become the property of the Contractor, and all these materials, together with all rubbish and debris, must be immediately carted away, and the site left clean and unencumbered. Materials, etc. which are described to be handed over to the Department are to be carefully dismantled where necessary, and neatly stacked where directed on site. Items described as removed shall be removed from site.

Credit for the value of the materials from the pulling down may be allowed for on the Final Summary page.

Prior to the removal of any timbers from the site, they are to be inspected by the Government Entomologist as laid down in Section 32 of the Government Forest and Veld Conservation Act of 1941 (Act 13 of 1941) as amended. If any of the timbers are infested with wood destroying agencies, they are to be disposed of in the manner prescribed by the Government Entomologist.

The Contractor is to give ample notice to the Department and Local Authorities regarding any disconnections necessary prior to the removal or interruption of electric light or telephone cables, water and sanitary services, etc.

Tenderers are advised that adjacent sections of this building will be occupied during the building operations, and the Contractor is required to carry out the work with as little noise, dust and disturbance as possible. Undisturbed access is to be given to patients, staff and visitors.

The Contractor is advised to check all dimensions affecting the existing building as he will be held solely responsible for all new work being of the correct size. All sizes stated are approximate and under no circumstances will claims be entertained should actual sizes of existing items on site vary marginally from the sizes stated in this document.

The Contractor will be held solely responsible for any damage to persons, property, and equipment and for the safety of the structure throughout the whole of the Contract, and must make good at his own expense any damage that may occur.

The Contractor must obey the instructions of the Department in carrying out any portion of the work which in his opinion requires expediting, and the Contractor shall give priority to such work as and when directed.

In taking down and removing existing work, the utmost care is to be observed to avoid any structural or other damage to the remaining portions of the building. The Contractor must also protect all work not removed, such as walls, floors, doors, windows or joinery, loose and fixed fittings and electrical equipment, appliances, etc. from damage during the progress on the works and provide all necessary materials in so doing.

Special care is to be taken not to interfere with any electric light, bell, power or telephone wires and fittings that may be encountered on site. New work to the existing electrical, air-conditioning, gas and telephone installations, etc. is included elsewhere in this document.

The Contractor must take the exigencies of the Hospital Service into consideration. Liaison is to be carried out through the offices of the Regional Engineer, with referrals to the Director: Physical Facilities Management for a final decision. No instructions may be received by the Contractor from the Hospital Authorities and all instructions are to be given by the Chief Department in writing before they are put in hand.

2. CONCRETE, FORM WORK AND REINFORCEMENT

Cement is to comply with:

SANS ENV 197 (1 to 2)
SANS ENV 413 (1 to 2)
SANS ENV 196 (1 to 7)
SANS ENV 196 (21)

as applicable, and replaces the following SANS Specifications in the Standard Preambles:

SANS 471 Portland cement (ordinary, rapid hardening and sulphate resisting)
SANS 626 Portland blast furnace cement.
SANS 831 Portland cement 15 (ordinary and rapid hardening)

3. MASONRY

Masonry is to comply with SANS Code of Practice 0249 and 0164 as applicable.

4. ROOF COVERINGS, ETC.

The installation of roof coverings and side claddings is to comply with SANS Code of Practice 0237 as applicable.

5. CARPENTRY AND JOINERY

Note:

All timber must be treated in terms of SANS Code of Practice 05 for GYMNOSPERMAE including all SA Pine species and ANGIOSPERMAE including all Eucalyptus species but excluding laminated timber.

It is now a compulsory requirement to use only treated timber in buildings. The treatment shall comply with SANS 457, 753, 754 or 1288 as relevant.

Reference must also be made to the appropriate Standard Preambles and SANS requirements for items not covered by these joinery preambles, etc. i.e. ironmongery, aluminium, glazing, paintwork, etc.

Where items are described as "plugged and screwed", they are to include for plugging and screwing to new or existing brickwork or concrete, with heads of screws sunk and pelleted.

Sawn softwood timber: General, Stress Graded, Industrial, Brandering and Battens is to comply with SANS 1783 Parts 1 to 4 as applicable.

All hardwood is to be dark red Meranti, even in grain and colour selected for "Standard and Better" quality, from Malaysia, with a minimum density of 550 kg per cubic metre at moisture content of 12%, and is to comply with SANS 1099 as applicable.

Hardboard is, unless otherwise described; to be 3mm un-tempered hardboard for floor units and 6mm tempered hardboard for wall units.

Melamine faced moisture resistant V313 chipboard can be used when specified.

Materials generally are to comply with the following specifications and requirements as applicable:

TABLE H: CARPENTRY AND JOINERY: SANS SPECIFICATIONS

MATERIAL	SANS SPECIFICATION	GRADE OR CLASS
Softwood structural timber	1783	Parts 1, 2, 3, 4
Softwood engineering timber	1783	Parts 1, 2, 3, 4
Softwood studs for timber frames in building	1783	Parts 1, 2, 3, 4
Softwood brandering and battens	1783	Parts 1, 2, 3, 4
Softwood joinery timber	1783	Parts 1, 2, 3, 4
Softwood flooring boards	629	Flooring Grade
Hardwood joinery timber	1099	Heavy flooring board
Hardwood strip flooring	281	Knotty grade
Wooden ceiling and panelling boards	1039	As specified
Laminated timber (glulam)	1460	As specified
Gypsum, plasterboard	266	As specified
Wood fibreboard	540	As specified
Wood wool panels (cement bonded)	637	As specified
Fibre cement sheets: profiled and flat	685	As specified
Fibre cement boards	803	As specified
Plywood and composite board Particle Board: Highly Moisture resistant exterior and flooring type Interior Type	929 EN 312 EN 312	 Parts 1 to 7
Decorative laminates	SANS ISO 4586 and SANS 1405	High Pressure
Decorative Melamine Faced Boards	1763	
Wooden Doors (flush)	545	
Materials for thermal insulation of buildings	1381	As applicable
Mild steel nails	820	
Metal screws for wood	1171	
Creosote	538	As specified
Timber roof trusses	0243	SANS Code of Practice

6. CEILINGS AND PARTITIONS

Refer to Joinery Fittings regarding specifications and requirements of materials.

7. IRONMONGERY

Materials

i) Locks are to comply with SANS 4 as applicable
ii) Door closers are to comply with SANS 1510 as applicable
iii) Symbolic safety signs are to comply with SANS 1186 as applicable

All ironmongery, unless otherwise described, is fixed to timber.

Sheet steel furniture to comply with SANS 757 as applicable

8. METALWORK

Rates are to include for cutting to lengths, splay cut ends, shaping, holing, tapping, threading, forging, turning, fitting, assembling, welding, filing smooth, preparation, priming coats, hoisting, temporary bracing and fixing in position.

Towel rails are to be tubular Satin Chrome mild steel to diameters - minimum 19mm - and lengths as specified in matched Satin Chrome end pieces. End pieces to be either flat or bracket type - according to requirements, application and specification - plugged and screwed into walls with Chromed Brass screws.

Electro-plating is to comply with SANS ISO 1456 as applicable.

Curtain tracks to be "Forwin" Hospital Curtain Tracks as "Kirton" (Pty) Ltd. - or other approved -, including 15 wheeled runners per metre, hangers, brackets, stopped ends, etc. Hangers are to be suspended from roof timbers or concrete slab over – **not off the ceiling grid**. Allowance is to be made for necessary bends and curving as per plan supplied. Curtains to be provided as (Chintz fabric (#155CZ) woven with 100% polyester yarn)

SHELVING FOR PHARMACIES: - Shall be epoxy coated steel shelving, either fixed to epoxy coated wall bands or free standing units as specified.

SHELVING FOR CSSD STERILE STORE: - Shall be slatted grade 304 stainless steel wall bands or free standing units as specified.

Aluminium Windows and Doors

NOTE:

Glazed aluminium alloy windows and sliding doors for external use are to comply with SANS 1651 as applicable.

All items must conform to and carry the Certification Seal of the AAAMSA and no items which are not so certified will be accepted on site.

The work is to be cleated and framed.

All visible surfaces are to have a 25 micron anodised finish as specified.

Anodised coatings on aluminium are to comply with SANS 999 as applicable.

Rates are to include for setting up and building in as well as for isolation material between the aluminium surfaces and adjacent surfaces of a differing material.

All visible surfaces are to be covered with a temporary protective tape, later to be removed.

Float glass for glazing is to comply with SANS CKS 55 and SANS 952 as applicable.

Safety and security glazing materials for buildings is to comply with SANS 1263(1) unless otherwise described. All panes are to be marked so as to be visible. Laminated safety glass is to carry a written five year guarantee.

Windows and doors are to be watertight.

Silicon pointing to windows and doors is covered elsewhere.

9. PLASTERING

Rates for new plaster, screeds, etc. to existing surfaces are to include for all preparatory work and forming a key.

Removal of paint and/or varnish as well as the roughening of the existing face brick surfaces both externally and internally to receive new plaster has been measured separately.

Plaster and screeds, etc. in patches is generally of an isolated nature and to existing surfaces. Portion of the work may be in narrow widths.
Where alterations are to be done to the existing structure, the new plaster, etc. has been measured to a point 300mm beyond the line of the alteration on the existing structure.

10. TILING

Ceramic Wall and Floor Tiles are to comply with SANS 1449 as applicable.

11. PLUMBING AND DRAINAGE

Water Supply and Drainage for Buildings is to comply with SANS Code of Practice 0252 as applicable.

Water Supply and Distribution System Components is to comply with SANS 1808 as applicable.

Electrical Water Heater:

Storage Heaters to comply with SANS 151.
Instantaneous Heaters to comply with SANS 1356 and IEC 335 (2-35).

12. GLAZING

Glass is to comply with SANS Specification 952.

Glass for glazing is to comply with SANS Specification CKS 55.

Safety and security materials are to comply with SANS Specification 1263 as specified.

Laminated safety glass is to carry a written five year guarantee.

ANNEXURE 2:
GENERAL ELECTRICAL SPECIFICATIONS

GENERAL ELECTRICAL SPECIFICATION

(ALL IN CONTRACTS)

1. CONDUIT AND CONDUIT ACCESSORIES

1.1 Conduit

Conduit shall be of steel galvanised internally and externally, either solid drawn, or welded and not less than 20 mm diameter, with all rough edges removed. All tube ends removed. All tube ends are to be reamed. With screwed conduit one threaded end is to be fitted with a coupling and the other end is to be protected against damage.

UPVC conduit may only be used if permitted by the Head : Works and only in those areas which he may specify. In this case this conduit shall be according to SABS 950.

Conduit accessories, which are secured to the conduit by means of lugs, screws or setscrews, are not acceptable.

General requirements of conduiting to SABS IEC 60614 (1).

Metal conduits shall be fully in accordance with SABS 1065 PART I.

1.2 Conduit Accessories

All conduit accessories shall be galvanised both internally and externally and comply with SABS 1065 – PART II.

All screwed conduit fittings shall be of malleable cast iron.

Where fittings are fitted with covers, the covers shall be of galvanised pressed steel secured with brass screws.

1.3 Flexible Conduit

Flexible conduit shall be of the plastic covered metal type complete with brass connectors to the approval of the Head : Works.

2. INSTALLATION OF CONDUIT

2.1 General

Except where cables are specified for certain circuits, the installation(s) shall be tubed throughout in steel conduit. Split conduit is not permitted. All conduits shall, wherever possible, or unless otherwise specified or agreed, be concealed in the structural work.

Except where agreed or otherwise specified or indicated on the drawings, all conduit to points shall run via the ceiling and floor slabs or roof space. In damp situations and where exposed to the weather, the conduits shall be so installed as to avoid, as far as possible, the condensation of moisture within them. All running joints are to be painted with an approved metal primer.

Mechanical and Electrical continuity must be maintained throughout the installation. Each length of conduit and every conduit fitting must be inspected for defects and all sharp edges or burrs must be removed before it is installed. All joints are to be tightly fitted together.

Running joints with long threads, where used, are to be fitted with a lock nut and the running thread shall not be longer in length than a coupling and lock unit.

In conduits smaller than 32 mm elbows and normal bends are not to be used but conduits are to be set to the required angles.

Flexible connections between conduit and appliance or other equipment shall be by means of flexible tubing (see Par 1.3).

No wiring shall be drawn into conduits until the conduits have been installed.

Where more than one socket outlet is connected on a circuit, the conduit shall be looped from the one outlet box to the following outlet box.

All switch-boxes, socket outlet boxes and any other purpose made metal box including distribution board trays shall be suitable treated against corrosion before installation with "Rustodian" or other approved metal primer.

All conduits shall be securely fixed into chases, and all flush switch and socket outlet boxes must be firmly embedded in cement mortar.

The Contractor shall make himself familiar with the positions of all fittings, such as blackboards, pinning boards, cupboards, shelving, worktops, etc, before commencing the conduit installation. The position of switches and socket outlets as indicated on the drawings are approximate only. The Contractor must verify that the final position of these will not be covered by the installation of the fittings referred to above, or come midway between the junction of any dados and upper wall finishes.

No extras will be entertained for moving switches or socket outlets as a result of the Contractor's failure to verify the final positions of the fittings or type of wall finish.

2.2 In Roof Spaces

The conduit in roof spaces shall be installed parallel or at right angles to the roof truss members and shall be secured at centers not exceeding 1,2 m by means of galvanised saddles nailed to the timbers with galvanised clout nails. Crampets will not be allowed.

Crossing of conduits is to be avoided wherever possible. Where unavoidable, one conduit must be neatly set over the other. Where a number of conduits have to run back to the distribution board or switchboard, they shall run parallel to the distribution board or switchboard, and at saddle distance to each other wherever possible.

Conduit runs from distribution boards shall terminate in fabricated sheet steel draw boxes installed in the roof above the distribution boards. Each draw box shall be fabricated from 1,6 mm galvanised sheet steel with welded corners and suitably treated against corrosion with "Rustodian" or other approved primer and finished in aluminium paint.

Each draw box is to be fitted with slip-on lid with a 13 mm skirt. The box shall be 75 mm deep, shall be rectangular in shape and the size of conduits entering or leaving the box. Conduits shall be fixed to the box by means of couplings and brass male bushes or lock nuts and brass bush-nuts.

Conduit droppers shall be neatly cut into timber wall plates and set to face the right direction. All sets must be uniform. Conduits may be set at angles only where droppers or ceiling points are within 230 mm of roof members.

No conduits are to be run over the top of gangplanks or trapdoors.

Draw-in boxes with metal covers shall be provided where required and shall be installed near the gangplanks, if any. All inspection conduit fittings in open roof spaces shall face upwards to facilitate wiring and to permit easy inspection. Three-way conduit boxes shall be used for tee-off purposed in open roof spaces. Inspection tees are not to be used except where otherwise agreed or specified.

All conduits extended into a roof space with a roof clearance of more than 900 mm shall be set onto the beam and extended into the roof for a distance where there is sufficient clearance. Under flat roofs or where there is less than 900 mm clearance, the conduit shall be installed as specified for tubing in concrete slabs, right angle bends should be kept to a minimum and the shortest route taken.

Where false ceilings occur they shall be tubed as called for in the detailed specification. Conduits in restricted spaces and run as for concrete slabs must however, be installed in a neat and orderly manner.

Conduits to ceiling points for all types of fittings must be firmly supported and shall terminate in a back entry conduit box. The conduit box shall be taken through to the face of the ceiling and finish flush. Where the ceiling brandering interferes with the installation of the ceiling point specified, the Contractor must trim the brandering to allow the conduit box to be taken through to the face of the ceiling as specified. Luminaires must be bonded to the conduit box by means of metal threaded screws.

2.3 In Concrete Slabs

In order not to delay building operations, the Contractor must ensure that all conduits and conduit fittings, which are to be cast in concrete, are laid in good time. The Contractor shall have a competent Electrical Artisan standing by during casting of concrete, etc, to ensure that the conduit boxes are not damaged during casting of concrete.

Draw boxes, expansion joints boxes and round conduit boxes are to be provided where necessary.

Deep type conduit boxes shall be used for side entering conduits and normal shallow boxes may be used for back entry conduits. No elbows, bends or sharp sets will be allowed in concrete slabs except in cases of conduits of 40 mm diameter or when larger sweeping bends will be permitted.

Common drawn and/or inspection boxes shall be used where there is more than one circuit involved. They shall be installed in lavatories, storerooms, or other inconspicuous places. Covers shall be of hardboard neatly finished to match the finished ceiling or wall surface, and shall be fitted parallel to the wall or ceiling.

All boxes, etc. are to be securely fixed to the shuttering to prevent displacement when concrete is cast. All conduits must be laid off the deck, supported and secured at regular intervals and installed as close as possible to the neutral axis of concrete beams and slabs.

Expansion joints shall be shown on layout drawings and shall consist of a metal box in which one conduit is fixed and the other capable of movement with the building's expansion and contraction. Earth continuity of these joints shall be maintained by means of stranded copper conductors bonded to the conduits in the box as shown on the drawing.

Earth conductors and clamps buried in concrete are not permitted.

Conduits must be spaced sufficiently apart to allow for proper concreting. All joints shall be painted with an approved metal primer after completion of the tubing installation, prior to the concreting. All exposed parts of the conduit installation shall be suitably, protected against corrosion at the discretion of the Head : Works.

Before any concrete slab is cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

2.4 Surface Work

All conduit must be plumbed and leveled and only straight lengths shall be used.

In cases where doorframes are out of plumb, or fittings, beams etc, are out of level, the conduit shall be run parallel with the doorframes, fittings, beams etc.

No threads shall be visible when the conduit installation is complete, except on running couplings.

Running couplings shall only be used where unavoidable and shall be fitted with a sliced coupling as a lock nut.

No inspection or normal bends are to be used on surface work, except with the approval of the Works Inspector and where conduits of 32 mm diameter or larger are used. Conduits shall be set uniformly and inspection couplings shall be used where necessary.

Fittings, tees, boxes, couplings, etc, are to be cut into the surface to allow the conduit to fit flush against the surface or alternatively spacer bar saddles may be used. Conduit is to be bedded into any irregularities to avoid gaps between the surface and the conduit.

Double sets, where used, shall be parallel with no twists and shall be as short as possible. All conduits, which terminate at metal trays, boxes, industrial switches and plugs shall do so by means of couplings and male bushes. No couplings will be permitted in droppers of lengths less than 3.6 m.

Where crossings of conduits is unavoidable, purpose made metal boxes shall be used. The length of the box is to be 8 times the diameter of the largest conduit, the width one and half times the sum of the diameter of al the conduits, and the depth one and half times the diameter of the largest conduit with a minimum depth of 50 mm. The box shall be fitted with a neatly fitting cover and the finish shall be in keeping with the general layout.

Where a number of conduits are to be installed in parallel they shall be evenly spaced and grouped under one purpose made saddle. Conduit spacing shall not exceed 10 mm. The purpose made saddle shall be made of 25 x 2 mm galvanised steel strip or other approved material, formed to suit the curvature of the various conduits and shall be drilled and fixed by means of screws between. Saddles shall be spaced at intervals not exceeding 1.8 m, except for conduit droppers, which shall be saddled centrally between ceiling and accessory box. All saddles are to be secured to the wall by means of black japan or brass rounded head screws. Distribution boards, draw boxes, industrial switches and plugs, etc, shall be neatly recessed into the surface of plastered walls to avoid double sets or alternatively spacer bar saddles may be used. On face brick walls the conduit shall be tightly set into the switch or plug.

In situations where there are not ceilings, the conduits are to be run along the wall plates and tie beams.

No wiring is to be carried out until the tubing has been inspected and approved.

Where spacer bar saddles are used, these shall be installed at centers of 1 m for horizontal and 1.5 m for vertical runs.

All conduits shall be painted with an approved enamel paint to match the background colour.

2.5 Future Extensions

In roof spaces with a minimum clearance of 900 mm, switch and plug drips for future use are to be set 300 mm in the correct direction and shall be threaded and fitted with plugged couplings. Where the roof over a slab is to be removed for future expansions, conduits for future use are to terminate 40 mm above tie beams and shall be threaded and fitted with plugged couplings.

Where future extensions are to be below slabs, all switch, socket outlet and other conduit droppers are to terminate 130 mm below slabs or beams with conduit ends threaded and fitted with plugged couplings.

Where provision is made for future extensions to a concrete slab, all conduits required for future use are to project 130 mm from the slab. Conduit projections are to be painted with an approved anti-corrosive paint and must be fitted with plugged couplings.

All switch, plug and other outlet boxes required for future use shall be fitted with approved blank cover plates.

Unused lighting outlet boxes are to be fitted with round hardboard or plastic covers with brass cover screws, which shall fit flat on the finished ceiling.

2.6 Fixing of Conduits

Conduits shall be fixed to switch and socket outlet boxes by means of couplings and brass male bushes or lock nuts and brass bush nuts. Couplings and male bushes to be used on all surface work.

2.7 **Chases and Building Work**

Except where otherwise specified conduits, switch boxes, plug boxes and distribution boards are to be built into the brick walls by the Contractor. It will, however, remain the responsibility of the Contractor to ensure that the above-mentioned boxes and distribution boards are correctly built in and are firmly bedded and cemented into the walls, plumb and square.

The Contractor shall, unless otherwise specified, do all necessary chasing and cutting of bricks. All electrical materials (e.g. conduits up to 40 mm for UG cables, conduits, conduit boxes, distribution boards etc) must be supplied by the Contractor who must arrange to have these on site, and positioned when required for the building work. A competent Electrical Artisan must be in attendance and ensure that the conduits etc are correctly installed and positioned.

The Contractor is to ensure that tubing installed in chases is securely nailed and covered by a layer of 5:1 mixture of coarse sand and cement, finished flush with brickwork and that switch and plug boxes finish flush with the finished wall surface.

The Contractor is to ensue that below distribution boards connected by means of underground cables, a 230 mm wide by 115 mm deep cavity in the wall from the cable pipe to the distribution board is to be provided by the Contractor, or alternatively, cable sleeves as specified.

3. PLUGGING OF WALLS

Only approved plastic plugs shall be used to secure conduit or equipment up to 5kg mass. The use of round-headed screws only will be permitted.

Heavier equipment shall be secured by means of approved expansion bolts.

Wood plugs and any plugs in the joints in brick walls are not permitted.

4. FIXING TO CONCRETE CEILINGS

Ceilings mounted equipment other than luminaires shall be secured to concrete ceilings by means of expansion bolts, shot bolts or "Robot" tools bolts or as expressly specified for the service.

5. WIRING

5.1 PVC Insulated Single Core Medium Voltage Conductor

The conductor is to be of high conductivity copper wire insulated with Polyvinyl Chloride. The cable shall be finished in the required colours and shall be in accordance with SABS 1507 and 1574.

Circuit wiring shall be of the Loop-in system and no wiring joints in the conduit or conduit fittings will be permitted. Not more than two conductors of a kind will be allowed at any outlet point. the end strands of cables, whether single or looped which have to be connected to terminals of switched, plugs, lamp-holders, fittings and distribution boards, etc, are to be tightly twisted together. Cutting away of wire strands of any cable will not be allowed. Only one circuit in any one conduit will be permitted unless otherwise specified.

Conductor sizes shall be as follows except where otherwise specified:

Lighting circuits	1,5 mm²	
Bells circuits	1,5 mm²	
Clock circuits	1,5 mm²	
Incinerator circuits	2,5 mm²	
Ironing circuits	2,5 mm²	with 2,5 mm² insulated earth wire
Plug circuits	4,0 mm²	with 2,5 mm² insulated earth wire
Geyser circuits	4,0 mm²	with 2,5 mm² insulated earth wire
Heater circuits	4,0 mm²	with 2,5 mm² insulated earth wire
Stove	10 mm²	with 6,0 mm² insulated earth wire
Motor circuits		
Up to 4kW single phase	4,0 mm²	with 2,5 mm² insulated earth wire
Up to 11kW three phase	4,0 mm²	with 2,5 mm² insulated earth wire

To avoid deformation of PVC insulated cables at temperatures in excess of 57° C, they shall not be brought directly on to the terminals of appliances such as electric heaters, or any other electrical appliances or apparatus (including luminaires) which have a temperature in excess of 57° C. They shall terminate in a suitable terminal box as near to the appliance or fittings as possible and connect up from thereon, with heat resistant conductor.

6. MOUNTING AND POSITIONING OF LUMINAIRES

Luminaires and installation to comply with SABS 1464 Parts 1 to 22 and IEC 598-1 and IEC 60598 as applicable.

The contractor shall, in the case of board and acoustic tile ceilings (i.e. as opposed to concrete slabs), ensure that the luminaires are symmetrically positioned with regard to the ceiling pattern.

The layout of the luminaires as indicated on the drawings shall be adhered to as far as possible. The exact positions must be confirmed on site with the Head : Works.

Except where otherwise specified, pendant luminaires are to be mounted with the bottom of the fittings 2,5 m above finished floor level, mounted on either metal discs or wood blocks.

Under no circumstances shall cover strips be cut to accommodate wood blocks. Wood blocks must be neatly slotted to fit over cover strips and are to be secured by a minimum of two screws, which shall penetrate at least 25 mm into solid wood. Ceiling cover strips shall be neatly cut to accommodate fluorescent luminaires.

Where ceilings are raked, all incandescent luminaires are to be mounted on shaped leveling wood blocks securely fixed to the ceiling. Batten holders shall be secured to woodblocks by suitable brass screws. Fluorescent luminaires are to be mounted direct on raked ceiling without leveling blocks.

Fluorescent luminaires to be mounted on concrete ceilings shall be screwed to the outlet boxes and additionally supported by means of 50 x 6 mm expansion bolts. The bolts are to be ¾ of the length of luminaires apart.

Where a number of luminaires are installed end to end, outlet points must be provided after every second luminaire unless otherwise indicated on the drawing.

The luminaires are to be joined together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

The luminaires are to be jointed together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

Incandescent luminaires are to be screwed directly to outlet boxes in concrete slabs and in board ceilings. In board ceilings the conduit box and the conduit shall be secured to the timberwork of the ceiling in such a manner that it shall support any incandescent luminaire, which is designed to be fixed to a normal conduit box.

Fluorescent luminaires shall be secured to board ceilings by means of the conduit box and 6 mm bolts passing through the boards and brandering.

7. BATTEN HOLDERS

B.C. batten holders shall be of brass or moulded plastic reinforced type complete with shade ring. The batten holders shall comply with SABS IEC 60238 and SABS IEC 61184. All lamp holders are to have brass terminals with screw type connection.

8. LAMP HOLDERS

Edison screw lamp holders	:	SABS IEC 60238
Bayonet lamp holders	:	SABS IEC 61184
Lamp holders for tubular fluorescent lamps	:	SABS IEC 60400

B.C. screwed lamp holders shall be of brass 20 mm E.T. complete with shade ring and shall comply with SABS IEC 60238 and SABS IEC 61184 with screw type connection terminals.

9. SWITCHES AND SOCKET OUTLETS

Switches SABS IEC 60669 as applicable and socket outlets SABS IEC 60884 as applicable shall be of the most modern manufacture and bear the SABS mark.

Flush switch and plug cover plates shall, unless otherwise specified, be of anodized aluminium of thickness not less than 0,9 mm, satin or other approved finish as directed and otherwise to be fully in accordance with SABS IEC 1084 for cover plates and SABS 1085 for wall boxes.

10. POSITIONS OF SWITCHES AND SOCKET OUTLETS

Except where otherwise specified, lighting switches and socket outlets are to be installed 1,4 m above finished floor level.

All mounting heights specified are to be measured from finished floor level to the bottom of the outlet box.

Where the lower portion of the wall consists of face brickwork and the upper portion of plastered finish, switches and socket outlets are to be mounted in the plastered surface, provided that the lower edge of the plasterwork does not exceed a height of 1,5 m above finished floor level in which case the switches or socket outlets are to be installed in the face brick dado.

Where socket outlet and switch boxes have been installed with fixing lugs below finished wall surface, only approved distance pieces required to compensate for the recess shall be used. The lengths of distance pieces are not to exceed 15 mm.

Unless otherwise approved, light switches adjacent to doors are to be installed at the lock side of the door. Where the lock position is not indicated on the drawings, its position shall be ascertained before the switch box is installed. Switches are to be installed 150 mm from the reveal, or centrally if there is a fitting near the door.

All switch and socket outlet boxes shall be installed plumb, and built into the wall with a 1:1 mixture of cement and sand.

Industrial type switches and socket outlets shall be neatly recessed into the surface of plastered walls to avoid sets or alternatively spacer bar saddles may be used.

Deep type boxes may be used where switches or socket outlets are back to back, but where one side only is to be utilized at the time and the other is for future use, the side for future use shall be suitably covered with a metal cover plate.

11. LOW TENSION SWITCHBOARDS

Low Voltage switch gear and control gear to comply with SABS 1473 and SABS IEC 60947 and SABS 60349.

Where switchboards are to be installed in switch rooms or switch cupboards, the Contractor must ensure that the boards are manufactured to suit the dimensions of the rooms or cupboards.

Low tension switchboards shall be specified in detail for each service, but shall generally conform to the following:

They are to be of strong and rigid construction, with suitable angle, channel or folded steel framework. They are to be flush fronted and totally enclosed with sheet steel panels suitably formed at the edges and reinforced to prevent distortion. Unless otherwise directed, all front panels must be at least 2 mm thick and all other panels at least 1.6 mm thick. Panels are to be secured to the framework with studs and chromium plated dome nuts (self-tapping and similar screws are not permitted).

Switches, etc, are to be mounted on metal frames within the boards to give flush front panels. Equipment of normally surface mounted types such as energy meters, time switches and contractors, are to be mounted on inner metal trays behind hinged front panels. In the case of supply authority meters the hinged front panels must have transparent inserts.

All metal work of the boards must be thoroughly degreased, primed with PA 10 self etching primer and finished with one coat of undercoat and two coats of electrical orange high gloss enamel, unless otherwise specified.

All accessible current carrying parts, bus-bars, connecting strips, collector bars, etc, are to be adequately insulated in phase colours and suitably braced to withstand projected fault currents.

Connecting strips and collector bars must be of sufficient cross sectional area to carry full rated current of the switches served, irrespective of the fuse of trip rating.

The complete distribution board including bus-bars must be suitably constructed to withstand fault currents specified.

Connections to bus-bars are to be made by means of lugs suitably bolted and locked with high tensile bolts and connections to lugs must be effected by means of a crimping tools.

Incoming and outgoing bus-bar studs, where required, must be suitably insulated where they pass through panels of the board, and firmly supported within the board.

Where applicable, incoming and outgoing collector bars for cables in parallel must so arrange that the multiple cable ends can be connected to the bars with reasonably short tails which do not have to cross.
Cable supports must be placed at suitable heights having regard to the bending radius of the cables concerned and convenience in making off.

Wall-mounting and floor-standing back to wall type boards must be provided with full easy access to all equipment and wiring without any necessity of disconnecting or removing of any of the equipment mounted in the board.

Clear visible indication of all switch positions must be provided and the switches must be clearly labeled as directed by the Head : Works.

The details of construction proposed, and the Head : Works must approve all equipment of switchboards: Works before manufacture is commenced.

12. DISTRIBUTION BOARDS

12.1 Approval

The Head : Works must approve the details of construction proposed and all equipment within distribution boards: Works before manufacture is commenced.

12.2 Flush Mounting Distribution Boards

These shall be generally manufactured in accordance with SABS 1765. The board shall consist of two panels fitted side by side with common bonding tray and attached to a common architrave. One panel shall accommodate all single phase MCB's and the second panel shall accommodate the main isolator, main bus-bars and the triple pole MCB's. Chassis shall be of rigid channel section rust proofed steel with clip-on trays for the single pole MCB's. The main isolator is to be mounted at the bottom of the second panel with the triple pole circuit breakers above.

12.3 Surface Mounting Distribution Boards

These shall be generally manufactured in accordance with SABS 1765, with two panels as for flush boards.

12.4 **Single Phase Distribution Boards**

Single Phased boards shall be generally constructed as three phase boards except they shall have a single panel. Single phase boards shall be mounted with the bottom of the architrave 1,5 m above finished floor level unless specifically directed otherwise.

12.5 **Distribution Board – In Roof Spaces**

Where distribution boards are installed below a roof space, a minimum of 2 x 20 mm and 1 x 25 mm spare conduits are to be run from the distribution board into the roof space.

13. **METER BOXES**

The meter box shall be mounted with the top 1,7 m above finished ground level. Surface mounted meter boxes shall be secured by at least 4 x 10 mm expansion bolts.

Service cables entering the meter box shall be protected by means of a suitably sized galvanised pipe extended 450 mm below the ground surface and securely saddled to the wall and bonded to the meter box.

14. **CONNECTIONS TO OUTLETS**

14.1 **General**

Where connectors are used to connect to the wiring of luminaires and other appliances, the connectors shall comply with SABS Specification 1239.

14.2 **Connection to Stoves**

14.2.1 **General**

The connection to an electric stove, unless otherwise specified shall consist of 2 x 10 mm^2 conductors and a 6 mm^2 insulated earth wire in 25 mm conduit. The stove shall be controlled by a 60 Amp micro gap switch of approved make and the connection shall be by means of a 45 Amp 3 pin stove plug of the "Cape Town" type. Cable ends, which are to be connected to the stove, shall be equipment with suitable soldered or crimped lugs. The connection between the stove plug and stove shall be by means of flexible conduit.

Except for high school domestic science unit kitchens (see Clause 14.2.2), the conduit shall be chased into the wall and fitted with a switchbox for housing the micro gap switch and a 25 mm circular conduit box over which the stove plug will be mounted. The stove plug shall be fitted with an adaptor plate and shall be screwed directly to the conduit box by means of round head metal screws. The plug outlet shall face downward.

The stove plug and switch shall be mounted 430 mm and 1,4 m respectively above finished floor level unless otherwise specified or indicated on the drawings.

14.2.2 **Stove Connections in High School Domestic Science Unit Kitchens**

Connections to stoves in High School Domestic Science Unit Kitchens, where the stoves are situated in front of a fitting, shall be generally as specified in Clause 14.2.1 except that the 25 mm diameter conduit shall be run in the floor slab, from the distribution board to a position to the right of the stove. A pedestal, which is complete with a 45 Amp 3 pin "Cape Town" type cooker plug, mounted on the back, shall be fitted over the conduit and securely bolted to the floor by means of expansion bolts. The plug circuit, which passes through the pedestal, is to be on a separate circuit.

14.3 **Connections to Hot-water Cylinders**

The connections to hot-water cylinders not exceeding 3kW loading shall consist of 2 x 4 mm² PVC conductors and 1 x 2,5 mm² earth wire in a 20 mm diameter conduit from the distribution board. The conduits shall be chased in the wall and shall terminate at the side of the cylinder in a box over which is to be mounted a double pole isolator with pilot light.

The final connection between the isolator and cylinder shall be by means of silicone heat resistant conductors in 20 mm diameter flexible conduit.

Connections to roof mounted hot-water cylinders shall generally be as specified above with an isolator with pilot light mounted adjacent.

14.4 **Connections to Power Points**

Connections to electric motors and fixed apparatus to vibration shall, unless otherwise specified or indicated on the drawings, have final connections consisting of conduit and flexible tubing or reinforced hose in accordance with Clause 1.3 of this specification and PVC cables and earth wire of the required size.

An isolator shall protect all fixed apparatus and where necessary a starter fitted with a no-volt coil and overload protection adjacent to such apparatus.

Power points for connection of fixed apparatus to be installed by others, shall terminate in an approved type wall mounted switch unless otherwise specified.

The minimum conductor size for all power points shall be 4 mm² unless otherwise specified.

14.5 **Underground Service Connection**

This clause refers to underground service connections not provided by the Supply Authority.

The service cable and earth wire to be connected at the supply point in accordance with Clause 15.8 of this specification, and unless otherwise specified, shall be aid 600 mm below ground level throughout and otherwise fully in accordance with Clause 15 and all applicable sub-clauses thereof. Cable entries to meter boxes shall be in accordance with Clause 13 and other entries shall be by pipe or duct as directed.

14.6 Connections to Outbuildings

Connections to outbuildings shall be made by means of underground cable only, laid in accordance with Clause 15 and all applicable sub-clauses.

Where the cable is run from the roof space of the main building, it shall be enclosed in suitably sized galvanised pipe built into the wall or run surface as directed. Surface run pipes shall be securely saddled at 1,8 m centers. Where the cable connects to the conduit in the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space with fixings at regular intervals, and down to the main board. At the outbuildings, the cable shall be enclosed in a suitably sized galvanised sleeve pipe built into the wall or run surface and terminated in the distribution board tray.

14.7 Connection and Mounting of Cable Fed Street/Site Lighting

Street/site lights shall in all cases, except where otherwise specified, be fed by underground cable. Unless otherwise directed, a suitable terminal board shall be provided in the base of the lighting pole for the connection of the incoming and outgoing cables, the feeds from the terminal board to the fitting shall be as specified.

"Surfix" cable and compression glands shall be installed between terminal board and cross arm/bracket mounted luminaires. The terminal board shall also accommodate a miniature circuit-breaker in the phase connection to the fitting. Poles intended for mounting directly in ground are to be provided with a 300 x 300 mm base plate.

15. UNDERGROUND CABLES

1000 volt PVC SWA and 110 Volt PILCA cable and accessories shall be in accordance with the relevant SABS specifications to SABS 1507.

The storage, transportation, handling and laying of underground cables shall be according to the manufacturer's requirements and the Contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operation. All cable pipes and ducts entering buildings are to be sealed against the ingress of vermin, water, etc.

15.1 Trenching

Cables, unless otherwise specifically directed, shall be laid at a depth of 600 mm below ground level. Trenches shall not be less than 300 mm wide for one to three cables, and the width shall be increased where more than three cables are to be laid together so that the cables may be placed at least 75 mm throughout the run.

The Contractor shall take all necessary precautions to prevent trenching work being in any way a hazard to the public and to safeguard all structures, roads, sewer works, or other property from risk of subsidence and damage.

15.2 **Cable Joints**

Joints in underground cable runs will not be permitted unless unavoidable and at the discretion of the Head : Works. Where cable joints are unavoidable, the cable jointer is to work efficiently and cleanly and so that each end of the cables to be joined may have a minimum of 0,9 m of slack disposed in a loop without stress. Back-filling under joints must be firmly tamped to prevent any subsequent settling.

15.3 **Bedding**

In trenches made in intermediate, hard rock, or boulder material, the cables shall be laid on a 75 mm thick bed of earth and be covered with a 150 mm layer of earth before the trench is filled in. The Contractor to supply all earth required for trench filling.

15.4 **Laying**

Cables shall be removed from the cable drum in such a way that no twisting, tension or mechanical damage is caused, and must be adequately supported at short intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts, to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after the drawing in of the cables.

15.5 **Back Filling**

Back filling after bedding (see Clause 15.3) is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150 mm. The surface is to be made good a required.

Back filling of cable trenches must not be commenced until after the cable trenches and laid cable(s) have been inspected by the Head : Works. Where a Contractor fails to observe this requirement he may, at the discretion of the Head : Works, be required to re-open such cable trenches for inspection at his own expense.

15.6 **Protection of Cables**

Where so directed by the Head : Works, concrete or other warning covers shall be placed over cables above the top bedding layer. Cable pipes when directed are to be installed at road and other crossings.

15.7 **Marking of Cables**

Cable marking tape is to be supplied by the Contractor and is to be laid 150 mm below ground over a cable run and as may be directed by the Head : Works to give early indication of underground cable runs.

15.8 **Joints and Termination of Cables**

Joints in underground cables and terminations shall be made by means of "Scotch Cast" or other approved epoxy-resin pressure type jointing kits. Low tension PVC cables are to be made off with sealing glands and materials designed for this purpose, which must be of approved make.

15.9 **Sealing of Paper Insulated Cable Ends**

Where cables are cut and not immediately made off, the ends must be sealed without delay. If cables are cut and the ends not immediately made off or sealed, the cable may be rejected and the Contractor will be required to replace it at his own expense.

15.10 **Earth Wires**

Except where specifically directed otherwise, earth continuity conductors are to be run with all underground cables constituting part of a low tension distribution system. Such earth continuity conductors shall be bare copper wire of a cross sectional area in accordance with the Code of Practice 0142 but shall not be less than 4 mm² nor more than 70 mm². The earth continuity conductor is to be bonded to the cable armouring, and to the lead sheath if any, at each termination, as well as to the local earth bard. The earth wire must be secured to the cable at 1,8 m centers.

15.11 **Opening Up of Existing Cables**

Where it is necessary to expose existing buried cables for any purpose, or to excavate in the vicinity of existing buried cables, pipes, etc, every care is to be exercised and only labourers experienced in such work, and duly warned by the Contractor, shall be employed thereon.

15.12 **Definitions for Classifying of Excavation**

(a) Soft Excavation – shall be excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0,10kW per millimeter of tinned-bucket width, without the assistance of pneumatic tools such as paving breakers, or that can be efficiently loaded without prior ripping or stockpiling by a rubber tyred front-end loader approximately 15T mass and a flywheel power of approximately 100kW.

(b) Intermediate Excavation – shall be excavation in material that requires a back-acting excavator of flywheel power exceeding 0,10kW per millimeter of tinned-bucket width and the assistance of pneumatic tools prior to removal by equipment equivalent to that specified in (a) above.

(c) Hard Rock Excavation – shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting prior to removal.

(d) Class A Boulder Excavation – shall be excavation in materials containing more than 40% by volume of boulders of sizes between 0,03 cubic meter and 20 cubic meter in a matrix of softer material or smaller boulders.

Note: (1) Excavation of solid boulders or lumps of size exceeding 20 cubic meter will be classified as hard rock excavation.

(2) Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock intermediate excavation according to the nature of the material.

(e) Class B Boulder Excavation – shall be excavation of boulders only in a material containing 40% or less by volume of boulders of size between 0,03 cubic meter and 20 cubic meter in a matrix of softer material or smaller boulders.

Note: Those boulders that required individual drilling and blasting in order to be loaded by a back-acting excavator as specified in (a) above, or by a track type front-end loader, will each be separately classed as Class B Boulder Excavation.

16. EARTHING

16.1 Main Earthing

The type of main earthing shall be as required by the Supply Authority, if other than the Head : Works and in any case as directed by the Head : Works who may require additional earthing to meet test standards.

Where required, an earth mat is to be provided, the minimum size, unless otherwise specified, being constructed from copper straps 950 x 25 x 3 mm at 230 mm centers and braced at all intersections. Alternatively or additionally earth rods or trench earths may be required, as the Head : Works may direct, and installed according to his instructions.

All earth electrodes and connections thereto must be approved "in-situ" by the Head : Works before back-filling.

The electrical installation shall not be earthed by means of the lightning arrester earth electrode, if such is included in the installation, but may be bonded thereto.

16.2 Earthing in Installations

The installation shall be effectively earthed in accordance with the relevant sections of the Code of Practice 0142 and the requirements of the Supply Authority.

All hot and cold water and waste pipes are to be effectively bonded by means of 12 x 1,5 mm solid copper tape (perforated tape or wire will not be permitted), clamped by means of brass bolts and nuts. Bonding tapes exceeding 75 mm in length must be fixed to the wall by means of No. 6 x 20 mm brass screws and plastic plugs not exceeding 150 mm centers. Main earth copper tapes where installed less than 2,5 m from ground level, must be run in 20 mm diameter conduit securely saddled to the wall.

Gutters and down pipes are to be bonded by means of 6 mm round headed brass bolts, with nuts and washers. Self-tapping screws are not permitted.

Connections from the earth bar or terminal on the main board must be made to a visible cold water main, the incoming service conductor, if any, and the earth mat or plate (where such is required) by means of either 12 x 1,5 mm solid copper tape or bare 25 mm^2 copper wire, or such larger conductor as the Head : Works may direct. From each distribution board separate earth conductors are to be taken to the main earth bar or terminal on the main board. Each conductor shall consist to stranded copper conductors drawn into the conduit together with the distribution board feeders. The size of the earth conductors to be in accordance with the requirements of the Code of Practice 0142 or as specified.

Earthing clips shall be made of not less than 0,9 mm thick copper strips not less than 12 mm wide. They are to be complete with 25 x 7,7 mm brass bolts, washers and nuts and must be constructed so that the clips will fit firmly to the conduit without any additional packing.

Adjustable earth clips are not permitted.

17. EXISTING BUILDINGS

17.1 Occupied Buildings

Where work is to be carried out in occupied buildings the Contractor must arrange to carry out the installation with as little interruption to services and discomfort to the occupants as possible.

17.2 Temporary Connections

Temporary connections shall be provided where necessary for continuity of services, and as directed by the Head : Works. The contractor must ensure that such connections are both electrically safe and free from physical hazard.

17.3 Old Materials

Unless otherwise specified all existing materials removed by the Contractor shall remain the property of the Head : Works and are to be handed to the Head : Works.

17.4 Making Good

Any damage which may be done to the plaster work, floors, ceilings, wood and paint work, furniture and other equipment in the building, etc, during the progress of the electrical installation shall be repaired and made good by the Contractor to the satisfaction of the Head : Works.

18. COMPLETION

18.1 Balancing of Load

The Contractor is required to balance the load as equally as possible over multi-phase supplies.

18.2 Tests

The installation shall be tested by the Contractor as the service progresses or as required by the Head : Works and upon completion, for earth continuity and insulation. The final test before the taking over of the installation shall be made in the presence of the Head : Works.

The mandatory "Certificate of Compliance" shall be issued by the Contractor to the Supply Authority, with a copy to the Head : Works prior to first delivery being taken.

18.3 **Labelling**

All circuits and apparatus on switchboards shall be suitably correctly labeled by means of engraved plastic labels (white lettering on black), which are to be either bolted or screwed to the equipment panel, or fitted in channeling provided below the switch gear.

Sub-circuits are to be numbered and a legend detailing the circuits is to be framed and fitted to the door of the distribution board.

All other equipment is to be individually labeled to indicate the function.

All switchboards are to be fitted with a label on which the designation of the board is clearly indicated.

A separate engraved label depicting the origin and cable/conductor size shall be fixed below the main switch.

18.4 **Finishes**

Covers for all boxes, expansion boxes, etc, shall be finished to match the paint work of the ceiling or wall surface or as specified.

18.5 **Site Drawing**

On all completed new work or where specifically called for in the Tender Document, the Contractor shall, on completion of the works, submit to the Head : Works, a marked up site plan indicating the exact underground cable reticulation.

19. **POWER DUCTING FOR SCHOOL SCIENCE LABORATORIES**

The ducting shall be "Ductline 3" supplied by Messrs. Lascon Lighting, 102 Malbourne Road, P.O. Box 2479, Durban 4000: Telephone 031-2075081 or other approved.

20. **SPEAKER AND MICROPHONE OUTLETS**

Speaker and microphone outlets are to conform to the following details:

1. Speaker outlet – To have one flat and one round pin.
2. Microphone outlet – To have one round pin only.

Both female and male parts to be supplied and installed by the Contractor.

21. **BELLS AND BUZZERS**

21.1 **Bells**

Bells for schools and hostels shall be 220 Volt AC or 24 Volt DC as specified for the service. They are to be of robust construction encased in a sturdy cast metal weather-proof case. They are to operate on the frequency of the supply. They shall have an adjustable stabilizing spring, gold-silver contact points and 150 mm gongs.

21.2 **Doorbells, Buzzers and Bell Transformers**

These will be as specified for each service.

21.3 **Bell Pushes**

Except where otherwise specified, bell pushes shall be of the flush type suitable for mounting in a standard 100 x 50 mm box. They shall be clearly marked as a bell push and shall be fitted with satin finished anodized aluminium cover plates.

22. SIGNAL TIMERS

22.1 Primary Schools

The timer shall be designed to automatically signal the start and finish of school periods by the switching of a bell circuit and is to comply with the following specification:

1. The mechanism may be synchronous motor or quartz movement driven with a 24 hour dial or digital time read-out suitable for operation on a 220V 50Hz supply and is to be provided with a spring or battery reserve of a least 24 (twenty four) hours.

2. The unit is preferably to have minute to minute timing for a 24 (twenty four) hour period although 5 (five) minute intervals are acceptable, and is to be provided with Weekend lockout. Signal periods shall be adjustable from 5 – 45 seconds.

3. The unit shall be housed in a metal or plastic case with detachable front cover suitable for wall mounting.

4. Timers with punch tape programming are not acceptable.

22.2 High Schools and Colleges

Timers for these institutions shall generally be as for Primary Schools but are to have at least 3 (three) separate programmes and be fitted with three push buttons for independent manual operations for testing of each programme, plus an on/off switch for each programme, which does not affect the running of the clock.

23. CLOCKS

Electric clocks shall be of the quartz electronic battery operated type, with a dial of 250 mm diameter. The dial shall be white, with distinctive minute markings and chapters shall be black Arabic figures. Time adjustment shall be simple. Where mains operated electronic clocks are specified, these shall be of the synchronous self starting type, suitable for a 200 – 250 V 50 Hz AC supply

24. TIME SWITCHES

The time switch shall consist of a single pole switch with silver to silver or other approved contacts operated by a quartz movement with a 24 hour reserve.

A suitable 24 hour, night and day dial, with hour indicator and two adjustable strikers, one OFF and one ON must be provided. The whole mechanism is to be totally enclosed in a dust proof case.

The current rating shall be required and the switch is to be suitable for operation on 220 volt 50 Hertz AC supply. Time switches used for under floor heating are to be fitted with weekend cut-out.

25. **MOULDED CASE CIRCUIT BREAKERS (INCLUDING MINIATURE)**

Circuit breakers shall be of the size and type as directed and specified for the service. They shall comply with SABS Specification 156 and SABS IEC 60947-2.

26. **SWITCHES: ON-LOAD FAULT MAKING (CIRCUIT BREAKER TYPE) WITHOUT TRIPS**

The switches shall be triple pole, hand operated, panel mounting air break type, having continuous current rating as specified and suitable for operation of 380 – 440 Volt 50 Hz AC system.

The contacts are to be of silver alloy and the switch mechanism shall be of the quick-make, quick-break type.

27. **SWITCHBOARD EQUIPMENT**

Switchboard equipment such as switches, circuit breakers, etc, shall be as directed and specified in the detail specification for the service.

Circuit breaker equipment of SABS IEC 60934.

28. **FUSE-SWITCH UNITS (WITH HRC FUSES)**

The fuse-switch unit is to be of the double pole, or triple pole or triple pole with neutral link type, and of the required current rating, as specified for the service and must be in accordance with BS EN 60947-3.

The fuse links must be fully isolated when the switch is in the open position, and interlocks must be provided to prevent the switch being operated with the cover open.

The fuse links shall comply with SABS Specification 172 and SABS IEC 60269-1 to 4.

29. **BUS-BAR COPPER**

Bus-bar copper must be fully in accordance with Tables A1 and A2 of SABS 1473-2 and SABS IEC 60439-2.

30. **SPECIFICATION COMPLIANCE**

The complete installation shall comply with the requirements of this specification. Should any differences or contradictions exist between this Specification and the detailed requirements for a specific installation, then the detailed requirements shall take precedence.

ANNEXURE 3:
LIGHTNING PROTECTION SPECIFICATIONS

LIGHTNING PROTECTION INSTALLATION

GENERAL SPECIFICATION

1. SATISFACTORY INSTALLATION

The whole of the installation shall be carried out in accordance with:

(a) The latest S.A.B.S. Code of Practice for the Protection of Structures against Lightning - S.A.B.S. 03 ; SABS IEC 61024 (1) , 61024 (1 -1); SABS IEC 61312 (1) ; SABS IEC 61662 & NRS 042.

(b) The KwaZulu-Natal Department of Works General Electrical Specification.

(c) The Municipal By-Laws and any other special requirements as deemed necessary by the Local Supply Authority.

(d) Local Fire Regulations.

2. S.A.B.S. APPROVED DRAWINGS

SABS Approved drawings are not required for this project.

3. TEST ON COMPLETION

Upon completion of the lightning protection system, the following tests shall be witnessed by an appointed representative of the Employer. The results shall be recorded on suitable test certificates which must be signed by both the Contractor and the Employers representative. A sketch must be included on each test certificate indicating the positions of each earth electrode in relation to some permanent reference point. It must also indicate the positions at which tests were carried out, the type of test and the results of these tests.

3.1 Earth Resistance Test

The Earth Resistance Test shall involve measuring the resistance to earth of each rod-type electrode, or group of rod-type electrodes, or trench earth which would normally be connected to one down-conductor or earth terminal. This test must be made with the electrodes completely disconnected from any part of the structure or lightning protection system.

3.2 Electrical Continuity Tests

(a) **External Down-Conductors**

Electrical continuity between the lower ends of external down-conductors which must all be disconnected from the earthing system during the test shall not exceed 1 (one) ohm.

(b) **Metallic Services**

Electrical continuity between any metallic structures of services (e.g. rainwater pipes) which form an integral part of the lightning protection system shall not exceed 1 (one) ohm. These tests should be carried out with all other components of the lightning protection system disconnected from the component being tested.

4. DESCRIPTION OF MATERIAL

4.1 Air Terminals and Down-conductors

All conductors must be in accordance with the requirements of BSS 1474 or American Standards Specification 6063. All aluminium conductors shall have a cross-section area of not less than 30 mm² (domestic dwelling only) or 50 mm² for all other applications. The dimensions of flat section conductors to be 20 mm x 3 mm. Where conductors are mounted in stand-off guides, the cross-section area of the conductor must be not less than 70 mm² to give adequate mechanical strength.

4.2 Conductor Guides

The conductor must be mounted in aluminium alloy guides conforming with the material specification given in 4.1 above. The guides must allow for free longitudinal movement of the conductor to cater for expansion and contraction of the system caused by temperature variation. The minimum thickness of any part of the guide shall not be less than 3 mm. The guides must be securely attached to the structure using two stainless steel screws and plugs, the use of plated screws is not permitted.

The conductor system shall be supported in guides so that an air gap exists at all times between the aluminium and the surface of the structure, the guides being seated upon plastic or other similar insulating material. Should conductors be installed directly upon the surface of concrete or cement plaster, an insulating strip is to be installed over its whole length to prevent contact between the two surfaces. Guides shall be installed to support the conductor at intervals not exceeding 1,2 metres horizontally or 1,5 metres vertically.

N.B.: No part of an aluminium conductor system must be allowed to come into direct contact with concrete or cement plaster as this may cause the aluminium to corrode.

4.3 Expansion Loops

Where conductors are installed horizontally without deviation from a straight line over long distances, expansion loops must be provided at distances not exceeding 30 metres. These expansion loops must have a cross-sectional area which is at least equal to that of the conductor.

4.4 Protection of Down-conductors

Where external down-conductors are installed in areas which are readily accessible to the public, the lower ends of the conductors shall be enclosed in a semi-rigid insulating material. In the case of a circular section conductor this shall comprise a 2 metre length of 20 mm diameter P.V.C. conduit. This conduit shall be securely attached to the wall by means of galvanized steel saddles fixed with stainless steel screws and plugs, spaced at intervals not exceeding 1 m. Where a flat section conductor is used this shall be covered by a similar length of 25 mm P.V.C. conduit. The lower end of the conduit shall be positioned as close as practicable to ground level, i.e. immediately above an aluminium to copper joint. The ends of the conduit shall not be sealed.

4.5 Earthing Electrodes

Earthing electrodes must consist of either copper-clad steel rods not less than 12 mm in diameter and having a minimum copper thickness of 0,20 mm driven into the ground, or a 50 mm² (35 mm² for domestic dwellings) bare copper conductor buried in a trench, or a combination thereof. Where copper clad steel electrodes are used they must have a suitable bond between the steel core and copper exterior to prevent moisture ingress between the two metals. Where it is necessary to extend earth rods, an electrolytically compatible corrosion resistant, coupling device, which prevents ingress or moisture into the joint shall be used. The copper conductor below the down-conductor joint shall be covered by a semi-rigid P.V.C. conduit for a distance of approximately 200 mm above ground and 400 mm below ground.

4.6 Joints Above Ground

Circular section aluminium conductors shall be jointed by aluminium ferrules or lugs which are securely crimped into place. Aluminium lugs must be bolted together using 10 mm diameter aluminium bolts and washers. The material specification for these components must conform with that laid down in paragraph 4.1. Alternatively heavily tinned copper lugs and ferrules may be used. The lugs should be joined together by means of 10 mm diameter copper, brass or bronze bolts and washers. Care should be taken to inhibit corrosion where dissimilar metals are used by thoroughly cleaning the surfaces of the metal before assembly and subsequently sealing the joint with an inert tenacious compound or tape.

Flat section aluminium conductors shall be joined by double riveting, using aluminium rivets which comply with the material specification laid down in 4.1. Alternatively 2 x 6 mm diameter stainless steel bolts, nuts and washers may be used. Fold over type bends will not be permitted.

Down-conductors are to be terminated approximately 200 mm above finished ground level. Circular section aluminium is to be jointed to a 50 mm^2 (35 mm^2 in the case of domestic dwellings) stranded copper conductor by securely crimping in place two heavily tinned lugs and bolting these together using 10 mm diameter copper, brass or bronze nuts, bolts and washers.

N.B. : Under no circumstances shall aluminium conductors be buried in the ground.

4.7 Joints Below Ground

A joint in the stranded copper conductor which forms part of the earthing system must be made by using a crimped copper ferrule clamping (not lugs) using two copper line taps of suitable dimensions, or exothermic welding. The copper earth conductor must be joined to an earth rod by either clamping, using a standard earth rod clamp or copper line tap or by exothermic welding. Joints which are made between dissimilar metals (i.e. copper conductor to galvanized steel water main), must be thoroughly cleaned before assembly. They shall be rendered watertight using waterproof adhesive tape on a suitable compound for a minimum distance of 200 mm in all directions from the joint.

4.8 Bonds

Where it is necessary to bond the aluminium conductor to any other metallic surface, this must be done by bolting or riveting. When attaching aluminium to a dissimilar metal the joints are to be thoroughly cleaned and sealed to prevent corrosion.

5. GENERAL INSTALLATION PROCEDURE

5.1 Air Terminals for Non-metallic Pitched Roofs

Aluminium conductors are to be installed along all ridges of roofs and projections such as dormer windows, etc., terminating at the ends with conductors running downwards over the surface of the roof and the eaves. Non-metallic chimneys must be protected by means of a finial of sufficient length to cover the chimney within a 45° angle struck downwards from its point. Alternatively it should have a conductor installed in the form of a closed loop upon the upper surface. The conductors are to follow the outer contour of the stack and must be bonded at a convenient point to the nearest component of the air terminal system.

N.B. : This bond may run in a horizontal or downward direction, but under no circumstances must any part of it run above horizontal.

Conductors may be dead-ended (i.e. have one end free and unbonded), providing that the length of such a conductor does not exceed 10 metres and that the unbonded end is either at the same level or higher than the bonded end. This technique may be used where ridge conductors are installed over dormer windows, etc.

In all cases where metallic gutters have been installed along the eaves of a pitched roof, these must be bonded to the air terminal system. Where metallic gutters do not exist, however, a conductor must be installed over the surface of the roof at eaves level to which the remainder of the air terminal system is to be bonded, with the following exceptions :

(a) Where the maximum distance from the ground level to the eaves of the building is less than 4 metres and the pitch of the roof is more than 1 in 2 (27° from the horizontal).

(b) Where the maximum distances from ground level to the eaves is less then 7 metres and the pitch of the roof is more than 1 in 1,5 (34° from the horizontal).

(c) Where the distance from the ground level to the eaves is more than 7 metres and the pitch of the roof is more than 1 in 1 (i.e. the included angle at the apex of the roof is less than 90°).

Under these circumstances eaves conductors need not be installed.

Any non-metallic objects which protrude above the general roof lines, such as Cape Dutch gable ends, must be protected as described above with a suitable air terminal system. Any metallic objects which protrude above the general roof line, such as hot water expansion pipes must be bonded as directly as possible to the nearest eaves conductor, gutter or other part of the lightning system.

N.B. : These bonding conductors must run in a horizontal or preferably a downward direction, from the vent pipe, etc., to the lightning protection system.

5.2 Air Terminals for Metallic Pitched Roofs

Buildings with roofs covered with electrically continuous metal sheets do not require separate air terminals but must be earthed via down conductors generally as described in 5.6 and 5.7. Any non-metallic objects projecting above the general roof line must be separately protected as described in 5.1 and bonded to the metal roof covering.

5.3 Air Terminals for Non-metallic flat or Mono-pitched Roofs

For flat or mono pitched roofs of non-metallic construction the air terminal system must consist of aluminium alloy conductors installed around the outer perimeter of each section of the roof structure. These conductors must be installed on top of parapet walls if these exist. Lift motor rooms, tank rooms, penthouses, etc., which protrude above the general roof line must have air terminal conductors installed around the outer perimeter of each roof slab or parapet wall. Any metallic objects which protrude above the roof line, such as expansion pipes, signs, flag poles, handrails, etc., must be bonded directly to the nearest component of the lightning protection system as described in 5.1.

N.B. : It is not permissible for the ends of conductors to be bonded directly to the perimeter air terminal system if the latter is installed upon a parapet wall having a height exceeding 500 mm above roof slab level. In these circumstances the conductors are to be bonded directly to the down conductors.

5.4 Air Terminals for Metallic flat or Mono Pitched Roofs

Metallic flat or mono pitched roofs do not require separate air terminal conductors, providing that there is electrical continuity between the metallic roofing sheets, (see 5.2). A metallic roof surrounded by a non-metallic parapet wall shall have conductors installed at the top of the parapet wall and these must be bonded to the metallic roof at intervals not exceeding 20 metres. If the parapet wall is clad with metal over its upper surface or a handrail is installed which affords good electrical continuity, separate air terminal conductors need not be installed. Under these circumstances the metal handrail or cladding must be bonded to the metal roof covering at intervals not exceeding 20 metres.

All non-metallic covering such as slates, tiles, asbestos cement sheeting, etc., supported by a steel structure being electrically continuous throughout may be treated as being of a complete metal construction. In these circumstances no separate air terminal system need be installed providing the steel roof structure is bonded to earth at intervals given in 5.5.

5.5 Down Conductors for Non-metallic Structures

Down conductors must be installed at regular intervals around structures and to run as directly as possible between the air terminal and earthing system. They must, where practicable, be positioned at the external corners of the structure. The maximum separating distance between down conductors around the perimeter of the structure must not exceed 30 metres. In the case of very tall buildings having a slender base (i.e. chimney stacks, water towers, etc.), a minimum of two down conductors must be installed.

The lower ends of down conductors are to be terminated and bonded to the earthing system approximately 200 mm above finished ground level. Under no circumstances must aluminium conductors be buried underground. Test joints must be provided between the down conductors and earthing system. Down conductors must run vertically between the air terminal and earthing systems. Where this is impracticable, their course may be deviated to run at any angle up to and including horizontal.

Where it is necessary to run conductors horizontally over the upper surface of a structural protrusion, such as an exposed concrete slab, the conductor may run down vertically over the edge of the slab and return to the main structure, so that the distance between the upper and lower conductors exceeds one third of the length of the horizontal run. Looped down conductors are not permitted. Down conductors must not run over the underside of large overhangs which are less than 6 metres above ground level, or other areas where people are likely to be present during a thunderstorm.

External or internal metallic rainwater pipes may be used as down conductors providing these are of substantial section and are jointed by screwing one length into another or welding. Thin gauge galvanized steel pipes whose sections are held together by friction, rivets or screws must not form part of a lightning protection system.

5.6 Down conductors for reinforced concrete framed structures

The steel reinforcement of this type of structure may be used in place of down conductors. Where the reinforcing system is used, the air terminal system must be bonded to it at a maximum of 30 metre intervals using steel clamps. This bond may be achieved by clamping, with a steel clamp, a steel conductor to a selected reinforcing bar, the opposite end of this conductor must terminate at a corrosion resistant metallic terminal such as Grade 316 stainless steel.

The reinforcing system of prefabricated concrete buildings must not be used unless special provision is made for bonding the various prefabricated sections together.

The terminals should be mounted flush with the face of the concrete. An aluminium alloy bond must then be taken from the air terminal system and be connected to the stainless steel terminal by means of a heavily tinned crimp lug for circular section aluminium, or a suitable bi-metallic joint in the case of flat section aluminium. A similar system must be used to bond the reinforcing system at ground level to the earthing system at points directly below the air terminal bonds. Here copper conductors must be used as the external bonding material.

Under no circumstances must copper, or other non-ferrous material be allowed to come into contact with steel reinforcing bars, as this may cause severe corrosion and subsequent structural damage. The lightning protection system must not be bonded to any part of the structure which is electrically isolated from the remainder of the building, i.e. cantilevered sections. In these circumstances, or where it is otherwise impracticable to use the reinforcing system, external down conductors must be installed as described in 5.5.

5.7 Down conductors for steel framed structures

Where the framework of a building is constructed of structural steel columns, these may be used in place of down conductors providing the separating distance between them does not exceed 30 metres. The upper ends of the columns must be bonded to the air terminal systems and the lower ends to the earthing system.

5.8 Earthing by means of vertically installed rod type electrodes

Rod-type electrodes must be driven into the ground at a position directly below each down connector. The maximum earthing resistance of each electrode or number of electrodes bonded to any one down conductor shall not exceed N X 30 ohms, where N equals the total number of down conductors which are bonded to a common air terminal system, or 200 ohms whichever is the lower value.

The minimum horizontal separating distance between rod-type electrodes bonded together must not be less than their installed depth. The upper ends of installed rod-type electrodes are to be terminated approximately 500 mm below finished surface level. A 50 mm^2 copper bonding conductor must be installed to run between each earthing electrode system and the lower ends of the adjacent down conductors. A joint is to be made between each of these bonding conductors and the down conductors at a position approximately 200 mm above finished ground level. These bonding conductors must be installed in P.V.C. conduit securely affixed to the wall (see 3.4). The length of this P.V.C. conduit must be approximately 600 mm and must be installed so that approximately 200 mm protrudes above ground level, the remainder being buried into the soil.

5.9 Earthing by means of metallic water mains

Where two or three down conductors are installed the water mains may serve as an earth terminal for one of these. Where three of more down conductors are installed the water mains may serve as an earth terminal for two of these. Regardless of whether the water mains are used as an earth terminal or not, the incoming metal water pipe must be bonded to the lightning protection earthing system underground.

5.10 Earthing by means of trench type electrodes

Where the soil conditions prevent the satisfactory installation of rod-type electrodes, a trench earth system must be installed. This method is to comprise a 50 mm^2 stranded copper conductor installed horizontally into a trench at a depth of 500 mm below finished ground level. The conductor is to follow the general outline of the structure to be protected and be installed 1 metre away from the outside walls. Where the building stands on rocky ground, the trench earth may be attached to the lower part of the wall in areas where rock protrudes through the soil. The conductor must, however, be buried wherever possible as described above.

Each down conductor must be bonded to the trench earth system as directly as possible by means of a copper conductor.

Trench earth systems must have a maximum earth resistance of 30 ohms. An isolated length of trench earth mat must be bonded to the down conductor system in such a way as to reduce the length of dead-ends to the minimum.

Should trench earths be installed beneath pathways where people are likely to be present during a thunderstorm, a plastic, bitumastic or ceramic pipe must be installed having a length similar to the width of the pathway and the trench earth conductor run inside it.

N.B. : The maximum useful length of a dead-ended trench earth is 80 metres.

ANNEXURE 4:

SPECIFICATION FOR ELECTRICAL INSTALLATION AND WORK INSTRUCTIONS

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR

SPECIFICATION FOR ELECTRICAL INSTALLATION

1. GENERAL

The Electrical Contractor must be an Installation Electrician and registered with the Labour Department. The Electrical Contractor must have at least a CIDB Grade 3 EP rating.

Any work done on telephone and data installations, shall be carried out by contractors registered with SITA.

2. SCOPE

This Electrical Contract comprises the supply, delivery, installation, replacement and commissioning of the Electrical installation, as described in this specification, applicable drawings and bill of quantities.

The installation & replacement includes the following:

- Deviate or re-route electrical trunking around the water line at the walkways.
- Add sufficient power supply to new water pumps and fire pumps.

Works shall comprise of the following:

- Upgrade Mini-Sub-10 from 100kVA to 200kVA.
- Replacement / upgrade of Main DB-1 N/ESS
- Installation of new 200kVA Generator and Bulk Fuel Tank.
- Replace / upgrade the street lighting.
- New Lightning Protection

3. REGULATIONS, FACTORIES ACT AND BY-LAWS

- The Machinery and Occupational Safety Act No. 85 of 1993 as amended.
- The Local Government Ordinance 1939 (Ordinance 17 of 1939), as amended and the municipal by-laws and any special requirements of the Local Supply Authority;
- The local Fire Office Regulations.
- The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977;
- The Post Office Act 1958 (act 44 of 1958);

- SANS 1 0142-1 "Code of Practice for the Wiring of Premises part 1" as amended, hereafter called the "Wiring Code".
- SANS 10142-2, The wiring of premises, Part 2: Medium-voltage installations 1kV ac not exceeding 22kVac and up to and including 3MVA installed capacity;
- SANS 10114-1, Interior lighting, Part 1: Artificial lighting of interiors;
- SANS 10389-1, Exterior lighting, Part 1: Artificial lighting of exterior areas for work and safety;
- SANS 10313, Protection against lightning- Physical; damage to structure and life hazard;
- SANS 10292: Earthing of low-voltage (LV) distribution systems.
- SANS 10131:2004: Above Ground Storage Tanks for petroleum products.
- Department of Public Works Standard Specifications.
- KZN Department of Health Policy Document 2013
- IUSS

4. NOTICES AND FEES

The Contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority. The fee charged by the Supply Authority for connection of the installation to the supply mains, will be arranged and paid by the Department.

5. QUALITY OF MATERIALS

Only materials of first-class quality shall be used and all materials shall be subject to the approval of the Department: Head.

Wherever applicable material is to comply with the relevant South African National Standards Specifications, or to British Standard Specifications, where no SANS Specifications exist.

Materials, wherever possible, must be of South African manufacture.

6. SITE

The Tenderers must, before submitting their tenders, acquaint themselves with the local conditions, accessibility of the sites, soil conditions, availability of labour and labour conditions, transport, off-loading, store and custody conditions for materials and equipment necessary for the completion of the total contract. No claim based on ignorance in this regard shall be considered.

7. EXTENT OF THE WORK

The Hospital is a live facility and operating. Areas may not be switched off randomly, but prior permission must be granted by the hospital.

Works shall be planned and programmed in accordance with the Implementation Plan. The Contractor will only work in the areas that are described for in the Specification, Implementation plan, Bill of Quantities and drawings or as otherwise instructed by the Engineer.

The Tenderer's attention is drawn to the fact that he must include in his tender price for all equipment, material, labour and additional costs, in order to carry out the installation in its entirety and to complete it in accordance with this Specification and applicable drawings and to the satisfaction of the Department.

8. POWER SUPPLY

Eskom is the supply authority in this area.

9. "AS BUILT" DRAWINGS

The contractor shall prepare the "as-built" paper prints in strict accordance with this specification. These drawings shall be kept in the site office. These "AS BUILT" drawings shall be handed over to the Engineer at First Hand-over. Retention money normally due before commencement of the maintenance period will not be released until "AS BUILT" drawings have been prepared to the satisfaction of the Engineer and the Department Head or his Representative.

On completion the Consulting Engineer must provide the Department with one complete set of as built drawings. These drawings must show the exact installation as finally completed.

10. SUPERVISION

Work must under all circumstances be supervised by a qualified and experienced representative of the Contractor who must be the holder of an electrical installation certificate. The representative must be authorised by the Contractor and must be able to receive instructions on behalf of the Contractor.

11. CERTIFICATE OF COMPLIANCE BY AN ACCREDITED PERSON

On completion of the electrical installation the contractor shall complete the Certificate of Compliance for the electrical installation in the form of Annexure 1 as described in the Occupational Health and Safety Act No. 85 of 1993, as amended, and obtainable from the Electrical Contracting Board of South Africa. This form must be handed to the Engineer at first handover.

REGISTRATION AS ELECTRICAL CONTRACTOR

Only CONTRACTORS registered with the Electrical Contracting Board of South Africa in accordance with Regulations 5 of the Occupational Health and Safety Act will be accepted and permitted to do work under this CONTRACT. The requirements of Regulation 5(2) will be strictly enforced by the EMPLOYER and is repeated for convenience purposes:

"5(2) The Electrical Contracting Board of South Africa shall, free of charge, register as an electrical contractor and enter in a register kept for that purpose the name of any person who applies therefore in terms of sub-regulation (1) and who-

(a) has a fixed address and has a telephone listed in his name; and

(b) employs an accredited person on a full-time basis, or is himself an accredited person."

An "accredited person" is defined in the Regulations as "...a person registered in terms of regulation 0 of the Act) as an electrical tester for single phase, an installation electrician or a master installation electrician, as the case may be". If, for any reason whatsoever, the CONTRACTOR fails to comply with these statutory requirements during the CONTRACT, the EMPLOYER shall terminate the services of the CONTRACTOR in accordance with Clause 56 of the CONDITIONS OF CONTRACT.

12. ELECTRICAL EQUIPMENT

All fittings, material and equipment and component parts thereof are to be in accordance with the Specification and must have the approval of the Department: Head. In addition, all equipment shall be designed, manufactured and tested in accordance with the relevant South African National Standards Specification, or otherwise, the relevant British Standard Specification.

All material and equipment must be suitable for the supply voltage 400/230 V and the necessary precautions shall be taken against corrosion, i.e. exposed metal shall be anti-rust treated to approval and all metalwork to be galvanised or painted.

13. CABLES

13.1 GENERAL

Supply, install and connect all the low voltage cables as shown on the drawings.

All Low Voltage cables shall be PVC SWA PVC ECC Type unless otherwise specified.

13.2 INSTALLATION

(a) **Testing**

All low voltage cables must be tested on Site, in the presence of the Department: Head or his representative. All test results must be submitted to the Department.

On each completed section of the laid cable, the insulation resistance shall be tested to approval with an approved "Megger" type instrument of not less than 500 V for low voltage cables.

(b) **Depth of Trenches**

All low voltage cable trenches must be 750 mm deep. The cable must be installed on top of 150 mm layer of sifted soil.

(c) **Marking Tape**

Yellow PVC marking tape, 150 mm wide, must be supplied and installed 200 mm above all cables. The wording "Electric Cable Below - Caution" and "Elektriese Kabel Hieronder - Gevaar" must be provided on the marking tape.

(d) **Cable Lengths**

Tenderers must base their tender price on the preliminary lengths specified in the Bills of Quantities. After installation the exact lengths shall be determined on Site. Adjustments to the contract price shall then be calculated using tariffs in the Bills of Quantities.

It shall be the responsibility of the Electrical Contractor to establish the correct lengths of cable on Site, before placing an order. The Contractor shall not be reimbursed for any surplus cable.

(e) **Cable Laying**

Cables must be removed from the drums in such a manner that the cable is not subjected to mechanical damage, twisting or tension exceeding that stipulated by the cable manufacturer.

The laying of cables shall not commence until the trenches have been inspected and approved. The cables must be adequately supported at intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after drawing in of the cables.

13.3 CABLE SLEEVES

Sleeves must be supplied and installed as indicated on the drawings and in accordance with SANS 1200 LC. There must be sleeves to all the distribution boards from the outside of the buildings.

13.4 CABLE MARKERS

Cable markers must be provided on all cable runs at 50 m intervals on straight runs and at all bends. The position of cable markers must be confirmed on Site.

Cable markers must be as indicated on the typical cable route marker details drawing No. ST/A5.

The cable markers must protrude 25 mm above ground level.

13.5 JOINTS

Joints in cable runs shall not be allowed unless specified or authorised by the Department: Head or his representative.

Where cable joints are to be made, a joint hole must be excavated of sufficient size to enable the cable jointer to work efficiently and unimpeded.

Each cable end must be left in a loop of 0,9 m to prevent any tension on the joint.

During backfilling the section supporting the joint must be compacted to the extent that no movement will take place after the trenches have been backfilled.

All joints in underground cables and terminations shall be made either by means of compound filled boxes according to the best-established practice by competent cable jointers using first class materials, or by means of approved epoxy-resin pressure type jointing kits, such as "Scotchcast". Epoxy-resin joints must be made entirely in accordance with the manufacturer's instructions and with materials stipulated in such instructions.

Where cables are cut and not immediately made off, the ends are to be sealed without delay.

13.6 CABLE TRENCHES

Tenderers must base their tariffs for cable trenches in soil, soft rock and hard rock on the quantities given in the Bills of Quantities. The actual quantities shall be determined on Site. Adjustments to the contract price shall be calculated using the tariffs in the Bills of Quantities, after completion of the installation.

Soil: shall mean hand pickable soil and includes loose gravel, clay, backfilled soil, loose or soft shale, loose ouklip and boulders less than 75 mm diameter;

Soft rock: shall mean rock which is hand pickable including hard shale, compact ouklip and boulders exceeding 75 mm in diameter to 0,03 cubic metres volume; and

Hard rock: shall mean granite, quartz sandstone, slate and stone of similar hardness as well as rocks exceeding 0,03 cubic metre volume.

No guarantee can be given that explosives will not be necessary for excavations. However, should explosives be necessary and the Contractor receives permission to use explosives, the Contractor shall remain responsible for all work done with the explosives and shall comply with all conditions, regulations, requirements, etc. imposed by the governing bodies.

Mechanical excavators may be used for trenching operations provided that they are not used in close proximity to other plant, services or other installations likely to be damaged by the use of such machinery. The use of mechanical excavators shall be subject to the approval of the Department: Head or his representative.

Should excavations be done in close proximity of existing services extreme care must be taken. Only labourers with experience of these conditions may be utilised.

The bottom and sides of trenches must be of smooth contour, and shall have no sharp dips or rises which may cause tensile forces in the cable during backfilling.

Backfilling of trenches may commence after the trenches have been approved and shall be compacted in layers of 150 mm. Sufficient allowance must be made for final settlement. For the first layer of 150 mm, sifted soil of which 75 mm must be below and 75 mm must be above the cable, must be used. Where no suitable soil is available on Site, the Contractor shall import fill from elsewhere and make all the necessary arrangements to do so.

The Contractor shall be responsible to take the necessary precautions where excavations may be dangerous. (Refer to the Machinery and Occupational Safety Act 1983, Reg. D16) The Contractor must ensure that all buildings, sewers, etc., are protected against cave-in.

The cable trenches shall be excavated as indicated on the cable trench detail drawing ST/A2.

Payment will be made on a cubic excavation rate based on the basis of the given maximum dimensions or the actual dimensions, whichever is the lesser. The only exception shall be in cases of additional excavations caused by obstructions such as water pipes, drains, large rocks,

etc., in which case the length of the additional excavation must be agreed upon on Site by the Department: Head or his representative.

13.7 CABLE SCHEDULE

CABLE SCHEDULE					
	FROM	TO	CABLE	BARE COPPER EARTH	VOLTAGE GRADE
1	RMU 10	New MINI-Sub 10	1x25mm^2 x 3-Core Paper insulated steel tape armoured and served copper cable	-	11kV
2	New MINI-sub 10	Main DB-1/N	1x150mm^2 x 4-Core PVC/PVC/SWA/PVC/ECC Copper	-	400V
3	Main DB-1/N	New Generator	1x150mm^2 x 4-Core PVC/PVC/SWA/PVC/ECC Copper		400V
4	New Generator	Main DB-1/ESS	1x150mm^2 x 4-Core PVC/PVC/SWA/PVC/ECC Copper		400V
5	Main DB-1/ESS	DB-FP/ESS	1x70mm^2 x 4-Core PVC/PVC/SWA/PVC/ECC Copper		400V
6	DB-FP/ESS	DB-WP/ESS	1x6mm^2 x 4-Core PVC/PVC/SWA/PVC/ECC Copper		400V
7	Main DB-1/ESS	New street lighting	1x16mm^2 x 2-Core PVC/PVC/SWA/PVC/ECC Copper	16mm^2	230V
8	DB-FP/ESS	Area Lighting	1x10mm^2 x 2-Core PVC/PVC/SWA/PVC/ECC Copper	16mm^2	230V

14. DISTRIBUTION BOARDS

14.1 GENERAL

All equipment as listed below must be installed in the boards. Surge arrestors must be installed in each of the electrical distribution boards. There must be 20% spare capacity in the boards. The centre of the boards must be installed at 1700 mm above finished floor level.

For approval of drawings see paragraph 16. The manufacturing of the distribution boards is described below.

14.2 INSTALLATION

The distribution boards must be placed in such a way that the Builder can build them into the walls, where applicable. Special provision must be made that the distribution board tray is not damaged while being built in.

The distribution boards must be placed in the position shown on the drawings.

All distribution boards must be installed level.

A neutral bar associated with each bank of moulded case circuit breakers must be positioned below each bank of moulded case circuit breakers and must be wired in the same sequence as the moulded case circuit breakers. Not more than one conductor per connector will be accepted.

Only hydraulic-magnetic operated moulded case circuit breakers must be used if the new micro ranges are not used.

Excluding the metering kiosk, 6 kA circuit breakers will be accepted in distribution boards unless otherwise indicated on the drawings.

The minimum conductor size between lightning arrestors and earth shall be 4 mm^2.

Busbar stubs must be provided where more than one conductor terminates on equipment.

Circuits which are removed from distribution boards must be marked "SPARE" on the distribution boards.

Labels indicating the supply point and size of the supply cable must be provided on each distribution board.

Where switchboards are positioned behind doors of building structure i.e. built-in cupboards, a suitable approved electrical danger sign as well as the applicable distribution boards designate label must be supplied and fitted in a suitable position on the outside top section of one of the entrance doors at each such location.

14.3 Moisture and Vermin

All switch boards shall be rendered moisture-proof and vermin-proof and shall be adequately ventilated.

14.4 Load Balance

The load shall be balanced as equally as possible across multi-phase supplies.

14.5 CONSTRUCTION OF FLUSH-MOUNTED SWITCHBOARDS

14.5.1 Standard

Flush-mounted switchboards shall comply fully with SANS 1180, Part I.

14.5.2 Expanded Metal

Where switchboards are to be built into 115 mm thick walls, expanded metal shall be spot-welded to the rear of the bonding trays. The expanded metal shall protrude at least 75 mm on each tray side to prevent plaster from cracking.

14.5.3 Knock-outs

Knock-outs shall be provided in the top and bottom ends of each switchboard tray to allow for the installation of conduits for the specified and future circuits. Knock-outs shall be provided for an equal number of 20 mm and 25 mm diameter conduits.

14.5.4 Panel

Front panels shall have machine-punched slots for housing the specified and future flush-mounted switchgear. The distance between the inside of the closed doors and the panel shall not be less than 20 mm. No equipment may be mounted on the panel unless the panel is permanently hinged to the switchboard frame.

14.5.5 Fixing of Front Panels

The front panel shall be secured to the architrave frame by means of captive fasteners similar to "DZUS" or "CAMLOC". Alternatively, the panel may be secured to the architrave frame by means of two pins at the bottom and a latch or lock at the top of the panel. Self-tapping screws will not be allowed.

14.5.6 Door Handles and Catches

Switchboard doors shall be equipped with handles and catches. Locks shall only be provided when specified. In all cases where lockable doors are higher or wider than 450 mm, handles consisting of a pushbutton-and-handle combination with spring-loaded catch, or rotary handle-and-catch combination shall be installed. Switchboard doors smaller than 450 mm in height and width may be equipped with spring-loaded flush-mounted ring type latches. Square key operated catches are not acceptable unless specified.

14.6 CONSTRUCTION OF SURFACE-MOUNTED SWITCHBOARDS

14.6.1 Standard

Surface-mounted switchboards shall comply with SANS 1180, Part II.

14.6.2 Switchboard Tray

Surface-mounted switchboards shall be equipped with a 1,6 mm minimum sheet steel reinforced tray, suitably braced and stiffened to carry the chassis, door and equipment. Lugs, to secure the switchboard to a vertical surface, shall be provided.

14.6.3 Construction

All joints shall be welded or securely bolted. The tray shall be square and neatly finished without protrusions. The front tray sides shall be rounded with an edge of at least 20 mm to accommodate flush doors.

14.6.4 Chassis

A sheet steel chassis for the mounting of equipment shall be bolted to the tray.

14.6.5 Front Panel and Door

The front panel and door shall comply with the above. Doors shall fit flush in the tray when closed.

14.7 MOUNTING OF EQUIPMENT

The mounting of equipment shall comply with SANS 1180, where applicable. Equipment to be mounted on the chassis shall be mounted by bolts, washers and nuts or by bolts screwed into tapped holes in the chassis plate.

In the latter case the minimum thickness of the chassis plate shall be 2,5 mm. The latter method shall not be used where boards will be subject to vibration or mechanical shocks. Self-tapping screws will not be accepted.

15. DRAWINGS

15.1 DRAWINGS FOR APPROVAL

A set of three prints of the shop drawings of the distribution boards shall be submitted to the Engineer for approval before the distribution board is manufactured. The following information shall be presented:

(a) Schematic and wiring diagrams of the distribution boards.

(b) A complete layout of the arrangement of the distribution boards showing all equipment dimensions and construction details. The positions and methods of fixing of busbars shall be shown.

(c) All labelling information on a separate sheet.

(d) The makes, catalogue numbers and capacities of all equipment.

The approval of drawing shall not relieve the Contractor of his responsibility to the Client to supply the distribution boards according to the requirements of this Specification.

15.2 FINAL DRAWINGS

A complete set of "record" drawings of the distribution boards shall be submitted to the Engineer within two weeks after delivery.

15.3 COMPLETION

The supply contract shall be regarded as incomplete until all drawings have been handed to the Engineer.

15.4 TELKOM MAIN DISTRIBUTION BOARD

Supply and install a flush mounted distribution board which complies with the requirements of Telkom. Provisional board size 600 x 600 with backing boards and doors.

The board must be installed in the position indicated on the drawing and shall be linked to the existing PABX infrastructure by means of a 75 mm PVC sleeve. A draw wire shall be provided.

16. COMPLETION

The supply contract shall be regarded as incomplete until all as built drawings have been handed to the Department.

17. CONDUIT AND ACCESSORIES

Unless other methods of installation are specified for certain circuits, the installation shall be in conduit throughout. No open wiring in roof spaces or elsewhere will be permitted.

The conduit and conduit accessories shall comply fully with the applicable SANS Specifications as set out below and the conduit shall bear the mark of approval of the South African National Standards.

(a) Screwed metallic conduit and accessories: SANS 162

(b) Plain-end metallic conduit and accessories: SANS 1007

(c) Non-metallic conduit: SANS 950

The installation shall be in PVC conduit. All conduit shall be concealed in the building work where possible.

Should for some reason it not be possible to conceal conduit in the building work and conduit must be surface-mounted, only black enamelled conduit may be used and only galvanised conduit may be used in open areas.

The conduit shall be supported and fixed with saddles with a maximum spacing of 1 m, even in roof spaces. (Refer to SANS 10142). The Contractor shall supply and install ALL ADDITIONAL SUPPORTING TIMBERS REQUIRED.

The conduit is to be clear of moisture and debris before wiring is commenced.

Chasing must be limited to the absolute minimum. No chasing by hammer and chisel will be accepted. Slots for conduits must be cut where necessary.

17.1 CONDUIT IN ROOF SPACES

In roof spaces, the conduit shall be installed in such a manner as to allow for all wiring to be executed from below the ceilings.

Conduit in roof spaces shall be installed parallel or at right angles to the roof members and shall be secured at intervals not exceeding 1,0 m by means of saddles screwed to the roof timbers.

Nails or cramps will not be allowed.

17.2 CONDUIT IN CONCRETE SLABS

In order not to delay building operations, the Contractor must ensure that all conduits and other electrical equipment, which are to be cast in the concrete columns and slabs, are installed in good time.

The Contractor shall have a representative in attendance at all times when the casting of concrete takes place.

Draw boxes, expansion joint boxes and round conduit boxes are to be provided where necessary. See Typical detail of Conduit Expansion Joint cast in concrete drawing No. ST/A7.

Before any concrete slab is cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

17.3 PRESSED STEEL SWITCH BOXES

All switch boxes are to be manufactured from heavy gauge sheet metal and should be galvanised. The boxes are to be fitted with the necessary number of lugs to suit the number of switch units for which the box is intended.

Lugs are to be drilled and tapped at 82 mm centres suitable for fixing either flush switch or standard flush plug units. Fixing screws must be provided.

The dimensions of the single gang boxes are to be approximately 50 mm wide by 50 mm deep by 100 mm long, with one knock-out at each end and at the back and at least two knock-outs in each side.

The dimensions of double gang boxes are to be approximately 50mm deep by 100 mm long by 100 mm wide, with two knock-outs in each end and at least two knock-outs in the back and in each side.

The boxes must comply with SANS 518 of 1959.

All knock-outs are to be 20 mm in diameter, suitable for 20 mm electrical conduit.

18. WIRING

Wiring shall be carried out in conduit throughout. Only one circuit per conduit will be permitted.

No wiring shall be drawn into conduit until the conduit installation has been completed. All conduit to be clear of moisture and debris before wiring is commenced.

Switch socket circuits shall be wired by means of 4 mm^2 phase conductors and a 2,5 mm^2 earth conductor in 20 mm diameter conduit unless otherwise indicated.

Wiring for lighting circuits is to be carried out with 2,5 mm^2 conductors with 2,5 mm^2 earth conductors. In all other instances the number and size of cables drawn into any conduit shall be as specified or shown on the drawings. Sizes and numbers of cables not specified, must be determined in accordance with the Standard Regulations.

THE LOOP-IN SYSTEM SHALL BE FOLLOWED THROUGHOUT AND NO JOINTS OF ANY DESCRIPTION WILL BE PERMITTED

The phase and earth wiring shall be done in PVC insulated 600/1000 V grade cables to SANS 150.

Where cable ends connect onto switches, fittings, etc., the end strands must be neatly and tightly twisted together and firmly secured. Cutting away of wire strands of any cable will not be allowed.

Where earth conductors end onto switches, fittings, etc, the two end strands must be neatly and tightly twisted together and then firmly secured by a ferule. A single conductor must be secure at the other end of the ferrule. The single conductor must be connected to the switches, fitting, etc.

19. SWITCHES AND SOCKET OUTLETS

19.1 LIGHT OUTLETS AND SWITCHES

Light switches must be "LUMEX" CLIPSAL type or Crabtree Classic Range or other approved. Light switches shall be flush or surface mounted as indicated in the schedule of material and installed 1400 mm above furnished floor level.

Provide lighting outlets throughout the building as schedules and shown on the drawing.

Additional wood brandering shall be provided for the fixing of surface light fittings. No butterfly clips are acceptable.

19.2 SWITCHED SOCKET OUTLETS

Socket outlets shall be installed in the positions indicated on the drawings. Socket outlets must be the "Lumex" Clipsal type or Crabtree type or Crabtree Classic Range or other approved.

Socket outlets in plaster or face brick walls shall be flush-mounted in 100 mm x 100 mm x 50 mm deep pressed metal boxes, with cover plates similar to those for switches or surface mounted as indicated in the schedule of materials. Only socket outlets from the same manufacturer will be accepted.

Switched socket circuits shall be protected by means of earth leakage units as detailed.

Socket outlets shall be mounted at a height of 300 mm above finished floor level unless otherwise indicated on the drawings.

The socket outlet in the Computer Room must be installed at the back of the desk into a 100 x 50 industrial box.

20. LUMINAIRES

Supply, install and connect all luminaires complete with the specified or appropriate lamps.

Each lighting outlet is indicated with an appropriate symbol, which identifies the type of luminaires to be installed on each outlet. See schedule below.

All fluorescent lamps shall comply with the SANS 1041 as revised and shall have a colour rendering of at least 80 and a colour temperature of 4000K (cool white).

20.1 SCHEDULE OF LUMINAIRES

SYMBOL **DESCRIPTION**

Type A2: NEW STREET LIGHT, IP66, 6995lm NOMINAL, 55W, 3000K, 20kV/20kA SURGE ARRESTOR TO BEKA LEDlume-MINI XP, OR OTHER APPROVED, MOUNTED TO 8m MOUNTING HEIGHT GLASS RE-INFORCED POLE AND CONNECTED VIA UNDERGROUND CABLES.

Type B1: SURFACE MOUNTED IP66 DUST, MOISTURE AND CORROSION PROOF LED LUMINAIRE WITH 5910Lm OUTPUT, 4000K, RA85, STAINLESS STEEL

DIFFUSER CLIPS AND 5-YEAR GUARANTEE TO LIGHTING INNOVATIONS / DUNA OR OTHER APPROVED.

Type C1: SURFACE MOUNTED IP65 ROUND BULKHEAD LED LUMINAIRE WITH OPAL DIFFUSER, DIE CAST ALUMINIUM BASE, 1470Lm, 4000K TO BEKA 31 OR OTHER APPROVED.

21. PHOTO CELL

The area lighting must be switched by either a contactor mounted in the distribution board which is controlled by a photo cell or direct by the photo cell. The photo cell must be mounted as indicated on the drawings in such a manner that the luminaries will not affect the operation of the photo cell.

The photo cell must be linked with the distribution board by 3 x 1,5 mm^2 PVC conductors drawn in conduit in the roof space.

The photo cell must comply with the following:

(i) Area lights must be switched ON when the illumination dropped to 50 lux.

(ii) Area lights must be switched OF when the illumination raised to 90 lux.

(iii) It must be weatherproof and must have a built-in time delay of approximately 40 seconds.

(iv) Built-in protection against voltage surges must be provided.

(v) The photo cell must be mounted in an empty Lascon B10 (or other approved) bulkhead type luminaire, with an aluminium base.

(vi) A sample of the proposed photo cell must be submitted to the Department for approval.

(vii) 16 A rating must be provided.

All UPS units must have rotary type bypass systems, which must bypass both the input and output of the UPS, remote alarm and be protected by curve 1 circuit breaker.

22. EARTHING ELECTRODES

22.1 GENERAL

This section covers uncoated, coated and metal clad circular rod electrodes intended to provide an earth in soil for electrical and lightning arrestor systems.

22.2 CATEGORY AND TYPE

Only the following type of earthy rods shall be used:

1 (a) - Solid copper

(b) - Solid stainless steel

2 (a) - Solid steel with bonded copper protection

(b) - Solid steel with plated copper protection

(c) - Solid steel with a shrunk-on copper jacket

3 - Solid steel with a shrunk-on stainless steel jacket

4 - Galvanised steel

Bare aluminium is not acceptable as an electrode material.

All rods shall be solid and of circular cross section with lengths as specified in Paragraph 22.

The nominal diameter of the earthing rods shall not be less than 16 mm unless the rods are specified for placing in pre-drilled holes, in which event the minimum nominal diameter shall not be less than 12 mm.

22.3 COUPLINGS AND CONDUCTOR CLAMPS

Earthing electrodes shall be provided with (n-1) couplings, where n = number of rods supplied.

Rods designed for coupling by means of external sleeves shall be provided with an adequate quantity of hydrocarbon or silicon grease to be applied to the coupling before the joint is made.

Rods designed for coupling by means of internal pins or splines shall be provided with tin-walled tubes and hydrocarbon or silicon grease to seal the joint.

The material of the clamps shall be electrolytically compatible with the rod and conductor materials.

Where brazed or welded connections are specified, the supplier of the rods shall stipulate at least two types of metals which are compatible with the rod and conductor materials.

An adequate number of driving caps of bolts shall be supplied with the rods to protect the ends of the earthing rods whilst being driven into **hard soil**.

22.4 EARTH CLAMPS

Earth clamps shall consist of copper strips at least 1,2 mm thick and not less than 12 mm wide secured with a brass bolt, nut and washer and shall be so constructed that the clamp will fit firmly to the conduit without any additional packing.

23. EARTHING OF INSTALLATIONS

The type of main earthing must be as required by the supply authority, if other than the Department: Head or his representative, who may require additional earthing to meet the test standards.

Installations shall be effectively earthed in accordance with the "Standard Regulations" and to the requirements of the supply authority, as well as the Department: Head, who may require additional earthing to meet test standards. Earthing must comply to SANS 10142.

All hot and cold water as well as waste pipes must be effectively bonded by 12,5 x 1,6 mm solid or perforated copper tape (not wire) clamped by means of brass bolts and nuts. The tape is to be fixed to walls by means of roundhead brass screws at intervals not exceeding 150 mm.

The earth connection from the main earth bar in the main board must be made to the cold water main and the incoming service earth conductor by means of 16 mm^2 stranded (not solid) bare

copper earth wire or such conductor as the Department's Representative may direct. Where applicable all steel roof sheeting as well as steel walkways and stairs shall be suitably earthed.

Furthermore, an earth electrode (earth spike) of at least 1,5 m long must be provided and driven into the ground at the centre of each gable-end wall of each individual block. This earth electrodes shall be installed at least 1 m from the building's perimeter and shall clear all aprons and water channels. These earth spikes must be driven into the ground to at least 300 mm below ground level and only after final bonding and tests have been carried out must proper backfilling and compacting of same be executed.

In each instance these earth spikes must be interconnected by means of a 16 mm^2 stranded bare copper earth conductor which must be installed in the inside of the ridging of the roof structure encased in 20 mm flush conduits installed in the gable walls. This earth conductor must be bonded to the roof sheeting at intervals not exceeding 5 m, ensuring that roof sheeting on both sides of the ridging are properly bonded.

The overall earth resistance at the main distribution board shall not exceed 1 ohm. The Contractor shall assess the soil and site conditions at the time of tendering and allow for this to enable him to perform the proper earthing and bonding of all installations.

24. TESTING AND INSPECTION

The Contractor shall test the entire installation in conjunction with and to the satisfaction of the Supply Authority and in the presence of the Department: Head or his representative. The Contractor shall make all arrangements for testing and inspection, the costs thereof being included in the Tender Price.

All 220 V socket outlets shall be tested for polarity and sensitivity of the earth leakage protection equipment shall be tested by means of an approved instrument.

Each length of cable shall be tested for insulation and polarity by means of a 1 000 Volt megger designed for that purpose. In the case of underground cables this shall be done before backfilling. In additional, the earth-loop impedance of each main and sub-main feed shall be measured. The earth resistances shall be tested by means of an approved instrument.

If there is no power on the day of the test, the Contractor shall supply a 3 kW, 230 V generating plant for testing purposes.

"DANGER" notices shall be display at the remote ends of cables under test.

The Engineer reserves the right to witness all tests. The Contractor shall advise the Engineer in writing of all results and furnish copies of all certificates.

Load balancing shall be undertaken by the Contractor in conjunction with the Engineer. Where conductors are altered to achieve satisfactory results, they shall be re-laced by the Contractor.

The Contractor shall provide all the necessary instruments for the proper testing of the complete installation. If there is reason to doubt the accuracy of such instruments, the Contractor shall take the necessary action to prove their accuracy.

If the results of the first delivery tests are favourable and the installation is found in order, there will be no charge for the test. If the test is found unfavourable a levy of R200,00 will be charged to the Contractor for each subsequent test in the form of a variation order omitting such costs from his contract price.

The Contractor shall ensure that the installation is complete in every respect and that there are no major defects prior to notifying the Engineer (in writing) for a first delivery inspection

The Engineer will accept zero minor defects during the final inspection. Should this number of defects be exceeded at the final inspection then the Engineer will terminate that inspection and request that an additional final inspection be arranged by the Contractor.

25. LIGHTNING PROTECTION

The installation shall be to the requirements of SANS 10313 and SANS 10142-1. In all distribution boards surge protection devices shall be installed.

This installation includes for the carrying out of the required soil survey on site, the issuing of the test report, the design of the required system (if required) in accordance with SANS, the supply and installation of the design for system, the carrying out of the SANS prescribed test after completion of the installation and the issue of a compliance certificate.

26. GUARANTEE PERIOD

Notwithstanding any other regulations, all named items of the installation shall be guaranteed against latent defects for a period of twelve (12) months from the date of the first delivery.

27. LABELLING OF DISTRIBUTION BOARDS SWITCH SOCKET OUTLETS, ISOLATORS, LIGHT SWITCHES AND DISTRIBUTION BOARDS AND LIGHT FITTINGS

All circuits and apparatus on switchboards shall be suitably and correctly labelled by means of engraved plastic labels (white lettering on black), lettering shall be 3 mm in height, which are to be either bolted or screwed to the equipment panel, or fitted in channelling provided below the switchgear as described in the KZN Department of Health Policy specification.

Sub-circuits are to be numbered and a legend card detailing the circuits is to be framed and fitted to the door of the distribution board.

All other equipment is to be individually labelled to indicate the function in accordance with the SABS Code of Practice 0142-1 Clause 4.5 and all associated sub-clauses.

All switchboards are to be fitted with PVC engraved label on which the name, designation of the board, size of cable, fault level rating and phase rotation is clearly indicated and fixed below the main switch. The lettering shall be 3 mm in height and shall be generally black on white or otherwise stated depending on the function of the DB White on Red for Essential supply or White on Blue for UPS supply).

i.e.

DB Name: DB 4
Fed from: DB 2
Size of cable: 16 mm x 4 C
Fault Level :5 kA
Phase Rotation: Clockwise

All switchboards are to be fitted with PVC engraved labels on which the name is clearly indicated and fixed with self-tapping screws to the outside of the board in a central position above any equipment installed.

The lettering shall be 8 mm in height and shall be generally black on white or otherwise indicated depending on the function of the DB (White on Red for Essential supply or White on Blue for UPS supply).

Example

A plug circuit on DBA having 4 x switched socket outlets shall be labelled as follows on the switch socket outlet cover: DBA/P1/1, DBA/P1/2, DBA/P1/3 and DBA/P1/4.

A light circuit o DBA having 12 lights shall be labelled as follows: DBA/L1 o the light switch cover plate and DBA/L1/1 – 12on each of the different light fittings or next to the light fitting.

All cables shall be fitted with separate PVC engraved labels depicting the size of the cable. The label shall be fitted to the cable using suitable cable ties and shall be located directly below the shroud of the cable gland.

28. RE-ROUTING OF TRUNKING.

The existing water line, which runs in the walkways, bends around the trunking. The water line will be straightened and the trunking must be constructed to bend around and below the water line instead. At each DB in the walkways, there are two sets of 2-channel trunking to be re-constructed.

Data and telephone wiring shall be re-routed by SITA registered contractors.

Works shall be planned and programmed according to the Implementation plan.

29. STANDBY DIESEL GENERATOR & Bulk Fuel Tank

See enclosed Standby Generator specifications

30. MINIATURE SUBSTATION

See enclosed miniature substation specifications

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR
SPECIFICATION FOR STANDBY DIESEL GENERATOR

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SECTION 1 – GENERAL

1. Intent of Document

The specification is intended to cover the complete installation of the generator plant and all associated equipment. The minimum equipment requirements are outlined, but do not cover all the details of design and construction. Such details are recognised as being the exclusive responsibility of the contractor.

In all cases where a device or part of the equipment is referred to in the singular, it is intended that such reference shall apply to as many devices as are required to complete the installation.

2. Standards and Codes

All work and equipment shall be in accordance with the requirements of BS5514 and shall comply with the Occupational Health and Safety Act, No 85 of 1993 and current regulations of all other codes applicable to this work.

South African manufactured equipment shall be preferred. Only engines and alternators with full local Original Equipment Manufactured backup will be accepted.

Tenderers must provide assurance that replacements for equipment, switchgear and instruments, are readily available from stock held in South Africa.

3. Regulations

The installation shall be erected and tested in accordance with the following Acts and regulations:

a) The latest issue of SANS 10142: "Code of Practice for the Wiring of Premises",

b) The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended,

c) The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority,

d) The Fire Brigade services Act 1993 Act 99 of 1987 as amended,

e) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as emended,

f) The Post Office Act 1958 (Act 44 of 1958) as amended,

g) The Electricity Act 1984 (Act 41 of 1984) as amended and

h) The Regulations of the local Gas Board where applicable.

i) SANS 10131:2004 "Above-ground storage tank for petroleum products"

4. Scope of Work

The scope of works consists of the following:

4.1 The supply, delivery, installation, testing and commissioning of the new standby generator and bulk fuel tank, suitable for the hospital environment.

5 Co-ordination

The Contractor shall co-ordinate his program with the all the different services. His installation rates shall include for such "first fixing: of plant as may be required, and for returning at a later stage to complete the installation when the other Contractor's has completed their operations, were necessary.

Delays due to lack of co-ordination between the Contractors shall not form a basis for claims be the Contractor of this Contract.

The contractor shall arrange for the power outages with the hospital and coordinate the program with the hospital.

6 Test Certificates and Inspections

The following tests are to be carried out:

(a) At the supplier's premises, before the generating set will be delivered to site Representatives of the Department may be present during the test to satisfy them that the generating set complies with the specification and delivers the specified output. The test must be carried out in accordance with BSS 5514, Part 2 and 3. The Department & the Engineer must be timeously advised of the date for the test.

(b) After completion of the works and before first delivery is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory working thereof. During this period the installation will be inspected and the contractor shall make good, to the satisfaction of the Representative/Agent, any defects which may arise.

(c) The Contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installation at completion.

(d) Test reports of both tests as specified under (a) and (b) are to be submitted to the Department.

7 Guarantee and Maintenance

The Contractor shall guarantee the complete plant for a period of twelfth months after the first delivery has taken place or Works Completion in the case of JBCC conditions of contract.

If during this period the plant is not in working order, or not working satisfactorily owing to faulty material, design or workmanship, the Contractor will be notified and immediate steps shall be taken by him to rectify the defects and/or replace the affected parts on site at his own expense.

The Contractor shall maintain the plant in good working condition for the full twelfth month period to the final delivery of the installation. However, should the Contractor fail to hand over the plant in good working order on the expiry of the specified twelfth months, the Contractor shall be responsible for further monthly maintenance until final delivery is taken.

During this period the contractor will undertake to arrange that the plant be inspected at least once per month by a qualified member of his staff who shall: -

(a) Report to the Maintenance Manager, keeping the maintenance records, and enter into a log book the date of the visit, the tests carried out, the adjustments made, and any further details that may be required.

(b) Grease and oil moving parts, where necessary.

(c) Check the air filter and, when necessary, clean the filter and replace filter oil.

(d) Check the lubricating oil and top-up when necessary.

(e) After the plant has run one oil change for the number of hours stipulated by the manufacturers, drain the sump and refill with fresh lubricating oil. The reading of the hour meter on the switchboard will be taken to establish the number of hours run by the plant.

Under this heading only the cost of the actual oil used, shall be charged as an extra on the monthly account.

(f) Clean the lubricating oil filter and/or replace the filter element at intervals recommended by the engine manufacturer, the cost of a new filter element to be charged as an extra on the monthly account.

(g) Check and when necessary adjust the valve settings and the fuel injection equipment.

(h) Check the battery and top-up the electrolyte when necessary.

(i) Test-run the plant for 0,5 hours and check the automatic starting with simulated faults on the mains, the proper working of all parts, including the electrical gear the protective devices with fault indicators, the changeover equipment and the battery charger. Make the necessary adjustments.

(j) Report to the Department and to the Contractor on any parts that become unserviceable through fair wear and tear, or damaged by causes beyond the control of the Contractor.

The Contractor on receiving the report, shall immediately submit a detailed quotation for the repair or replacement of such parts to the Department.

(k) Advise the Department when it has become necessary to de-carbonise the engine and submit a quotation for this service.

(l) Top up the water of the radiator, if applicable.

(m) Clean the plant and its components.

8 Materials and Workmanship

(a) The work throughout shall be executed to the highest standards and to the entire satisfaction of the Representative/Agent who shall interpret the meaning of the Contract Document and shall have the authority to reject any work and materials, which, in his judgement, are not in full accordance therewith. All condemned material and workmanship shall be replaced or rectified as directed and approved by the Engineer. Rectification of any defective work shall be for the contractor's account.

(b) All work shall be executed in a first-class manner by qualified tradesman.

(c) The Contractor shall warrant that the materials and workmanship shall be of the highest grade, that the equipment shall be installed in a practical and first-class manner in accordance with the best practices and ready and complete for full operation. It is specifically intended that all material or labour which is usually provided as part of such equipment as is called for and which is necessary for its proper completion and operation shall be provided without additional cost whether or not shown or described in the Contract Document.

(d) The Contractor shall thoroughly acquaint himself with the work involved and shall verify on site all measurements necessary for proper installation work. The Contractor shall also be prepared to promptly furnish any information relating to his own work as may be necessary for the proper installation work and shall co-operate with and co-ordinate the work of others as may be applicable.

(e) All components and their respective adjustment, which do not form part of the equipment installation work but influence the optimum and safe operation of the equipment shall be considered to form part of and shall be included in the Contractor's scope of works.

(f) All control equipment and serviceable items shall be installed and positioned such that they will be accessible and maintainable.

(g) The Contractor shall make sure that all safety regulations and measures are applied and enforced during the installation and guarantee periods to ensure the safety of the public and the User Client.

(h) The Contractor is to include for all scaffolding required to complete the work required.

9 Imported Content

This equipment will not be subject to fluctuations in the rate of exchange.

However, should the Contractor choose to be protected against fluctuations in the rate of exchange on imported equipment, the following conditions will apply:

a) The Materials Offered Ex-Import (Annexure A), which forms part of this tender document, must be completed by the Contractor.

b) Any fluctuations in the rate of exchange will be for the account of the Government and shall be calculated from a date seven (7) days prior to the date of the Contractor's tender to a date seven (7) days after receipt by the Contractor's bank of the negotiable bill of lading or the exporter's invoice, provided this latter date is not later than 30 days after the date of payment. Thereafter, fluctuations in the rate of exchange shall not be for the account of the Government.

10 Brochures

Detailed brochures of all equipment offered shall be presented together with the tender documents.

11 Submittals

The following information must accompany the tender documents

(a) Full particulars, performance curves and illustrations of the equipment offered, must be submitted with the Tender.

(b) The design of the control system to comply with the requirements for automatic starting, stopping, interlocking and isolation as specified.

(c) Curves furnished by the engine makers, showing the output of the engine offered against the speed, for both intermittent and continuous operation as well as fuel consumption curves when the engine is used for electric generation.

(d) The completed schedules of equipment.

The successful Tenderer must, as soon as possible after receipt of the order, submit detailed drawings and wiring diagrams of the plant and the switchgear. One diagram shall be contained in a metal pouch on the side of the switchboard.

SECTION 2 – EQUIPMENT REQUIREMENTS

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SECTION 2 - EQUIPMENT REQUIREMENTS

1. Engine

1.1 General

The engine must comply with the requirements as laid down in BS 5514 and must be of the atomised injection, compression ignition type, running at a speed not exceeding 1500 r.p.m. The engine must be amply **rated** for the required electrical output of the set, when running under the site conditions. The starting period for either manual or automatic switching-on until the taking over by the generating set, in one step, of a load equal to the **specified** site electrical output, shall not exceed 15 seconds. This must be guaranteed by the Tenderer.

Turbo-charged engines will only be accepted if the Tenderer submits a written guarantee that the engine can deliver full load within the specified starting period.

1.2 Rating

The set shall be capable of delivering the specified output continuously under the site conditions, without overheating. The engine shall be capable of delivering an output of 110 % of the specified output (i.e. 220kW at unity power factor) for one hour in any period of 12 hours consecutive running in accordance with BS 5514.

1.3 De-Rating

The engine must be de-rated for the site conditions as set in the Technical Specification, Section 3 of this document.

The de-rating of the engine for site conditions shall be strictly in accordance with BS 5514 of 1977 as amended to date. Any other methods of de-rating must have the approval of the Department and must be motivated in detail. Such de-rating must be guaranteed in writing and proved by the successful Tenderer at the site test.

1.4 Starting and Stopping

The engine shall be fitted with an electric starter motor and be easily started from cold, without the use of any special ignition devices under summer as well as winter conditions.

Tenderers must state what arrangements are provided to ensure easy starting in cold weather. Full details of this equipment must be submitted. In the case of water-cooled engines, any electrical heaters shall be thermostatically controlled. The electrical circuit for such heaters shall be taken from the control panel and must be protected by a suitable circuit breaker.

1.5 Starter Battery

The set must be supplied with a fully charged lead-acid type battery, complete with necessary electrolyte. The battery must have sufficient capacity to provide the starting torque stipulated by the engine makers. The battery capacity shall not be less than 120 Ah and shall be capable of providing three consecutive start attempts from cold and thereafter a fourth attempt under manual control of not less than 20 seconds duration each. The battery must be of the heavy duty "low maintenance" type, housed in a suitable battery box.

1.6 Cooling

The engine may be either of the air or water-cooled type. In the case of water-cooling, a built-on heavy duty, tropical type pressurised radiator must be fitted. Only stand-by sets that are water cooled shall have electric heaters.

For either method of cooling, protection must be provided against running at excessive temperatures. The operation of this protective device must give a visual and audible indication on the switchboard on the switchboard. Water-cooled engines shall in addition be fitted with a low water cut-out switch, installed in the radiator, to switch the set off in the event of a loss of coolant. The protection shall operate in the same way as the other cut-outs (e.g. low oil pressure). Air ducts required for the cooling of the engine shall form part of the contract. The air shall be supplied from the cooling fan cowling/radiator face to air outlet louvers in the plant room wall.

1.7 Lubrication

Lubrication of the main bearings and other important moving parts shall be by a forced feed system. An automatic low oil pressure cut-out must be fitted, operating the stop solenoid on the engine and giving a visible and audible indication on the switchboard.

1.8 Fuel Pump

The fuel injection equipment shall be suitable for operation with the commercial brands of diesel fuel normally available in South Africa.

1.9 Fuel Base Tank

The fuel base tank shall be incorporated and built into the generator unit. The tank shall have sufficient capacity for standby sets to run the engine on full load for a period of 12 hours.

A water trap is fitted in the fuel pipeline from the tank to the engine.

The tank shall be fitted with a suitable filter, a full height gauge glass, "low fuel level" alarm, giving an audible and visible signal on the switchboard as well as a low-low fuel level cut-out.

An electrically operated pump with sufficient length of oil resistant hose to reach 5m beyond the door shall be supplied as part of the offer, to enable the fuel tank of each set to be filled from 200 litre drums. The pipe connections shall be of the push lock type.

The base tank shall be interconnected with a bulk fuel tank adjacent to the generator.

The interconnection fuel piping shall consist suitable UV rated fuel piping and the connection to vibrating components shall be in flexible tubing with armoured covering.

An engraved label shall be installed in a conspicuous area on the generator control panel that indicates the following:

- Base tank capacity.
- Bulk tank capacity.

- Full load litres per hour consumption.

1.10 Bulk Fuel Tank

The tank construction and features shall comply with SANS 10131:2004 and approved by Newcastle Local Authority and Fire Chief. It shall carry the SABS approved mark.

The day tank shall automatically fill from the bulk tank by electric pumping which is controlled by a level switch system.

1.11 Governor

The speed of the engine shall be controlled by a governor in accordance with class A2 of BS 5514 of 1977 if not otherwise specified in the Technical Specification.

The permanent speed variation between no load and full load shall not exceed 4,5% of the normal engine speed and the temporary speed variation shall not exceed 10% External facilities must be provided on the engine, to adjust the normal speed setting by ± 5% at all loads zero and rated load.

1.12 Flywheel

A suitable flywheel must be fitted, so that lights fed from the set will be free from any visible flicker.

The cyclic irregularity of the set must be within the limit laid down in BS 5514 of 1977.

1.13 Exhaust Silencer

It is essential to keep the noise level as low as possible. An effective exhaust silencing system of the residential type must be provided.

The exhaust pipe shall be installed in such a way that the expulsed exhaust fumes will not cause discomfort to the public. The exhaust pipe must be flexibly connected to the engine to take up vibrations transmitted from the engine, which may cause breakage. The exhaust piping and silencer shall be lagged to reduce the heat and noise transmission into the plant room and shall be protected against the ingress of driving rain at 45° to the horizontal. The exhaust pipe must extend 0,5m above the roof gutters. It must be secured by flanges both sides of the wall at the point of exit. These flanges must be clamped to the wall with bolts through the wall.

1.14 Accessories

The engine must be supplied complete with all accessories, air and oil filters, 3 instruction manuals, spare parts lists, the first fill of all lubricating oils, fuel, etc.

2. Alternator

2.1 General

The alternator shall be of the self excited brush less type, with enclosed ventilated drip proof housing and must be capable of supplying the specified

output continuously with a temperature rise not exceeding the limits laid down in BS 5000 for rotor and stator windings.

The alternator shall be capable of delivering an output of 110% of the specified output (i.e. 220kW at unity power factor, for one hour in any period of 12 hours consecutive running.

Both windings must be fully impregnated for tropical climate and must have an oil resisting finishing varnish.

2.2 Regulation

The alternator must preferably be self-regulated without the utilisation of solid-state elements. The inherent voltage regulation must not exceed plus or minus 5% of the nominal voltage specified, at all loads with the power factor between unity and 0,8 lagging and within the driving speed variations of 4,5% between no-load and full load.

2.3 Performance

The excitation system shall be designed to promote rapid voltage recovery following the sudden application of the load. The voltage shall recover to within 5% of the steady state within 300 mili-seconds following the application of full load and the transient voltage dip shall not exceed 18%.

2.4 Coupling

The engine and alternator must be directly coupled by means of a high-quality flexible coupling, equal and similar to the "HOLSET" type.

3. Switchboard

3.1 General

A switchboard must be supplied and installed to incorporate the equipment for the control and protection of the generating set and battery charging.

The switchboard must conform to the specification as set out in the following paragraphs.

3.2 Construction

The switchboard shall be incorporated and built into the generator unit, fabricated from steel panels, carried on and-substantial angle iron framework.

The board shall be flush fronted and all equipment to be mounted behind the front plate, on suitable supports.

All equipment, connections and terminals shall be easily accessible from the front. The front panels may be either hinged or removable and fixed with studs and chromium-plated cap nuts. Self-tapping screws shall not be used in the construction of the board.

All pushbuttons, pilot lights, control switches, instrument and control fuses, shall be mounted on hinged panels with the control wires in flexible looms.

The steelwork of the boards must be thoroughly de-rusted, primed with zinc chromate and finished with two coats of signal red quality enamel, or a baked powder epoxy coating.

Suitably rated terminals must be provided for all main circuits and the control and protection circuits. Where cable lugs are sued, these shall be crimped onto the cable strands. Screw terminals shall be of the type to prevent spreading of cable strands. All terminals shall be clearly marked.

For the control wiring; each wire shall be fitted with a cable or wire marker of approved type, and numbering of these markers must be shown on the wiring diagram on the switchboard. Control wiring shall be run in PVC trunking. The trunking shall be properly fixed to the switchboard steelwork. Adhesives shall not be acceptable for the fixing of trunking or looms.

The automatic control and protection equipment shall be mounted on a separate easily replaceable small panel with printed circuits. The equipment shall mainly be the "solid state" type. After mounting the equipment on the panel, the rear of this panel shall be sealed with epoxy-resin. However, other proven control systems may also be considered, but must be described in detail at tender stage.

All equipment on the switchboard, such as contactors, isolators, busbars, etc., shall have ample current carrying capacity to handle at least 110% of the alternator full load current.

3.3 Protection and Alarm Devices

All switchboards shall be equipped with protection and alarm devices as described below.

A circuit breaker and an adjustable current limiting protection relay must be installed for the protection of the alternator. The protection relay shall be of the type with inverse time characteristics. The relay shall activate a contactor to isolate the alternator and stop the engine.

Protection must be provided for overload, high engine temperature, low lubricating oil pressure, over speed, start-failure, and low water level.

Individual relays with reset pushed are required, to give a visible signal and stop the engine when any of the protective devices operate. In the case of manual operation of standby sets, it shall not be possible to restart the engine.

The indicators and re-set pushes must be marked in both official languages respectively.

"OVERLOAD"	"OORLAS"
"TEMPERATURE HIGH"	"TEMPERATUUR HOOG"
"OIL PRESSURE LOW"	"OLIEDRUK LAAG"
"OVER-SPEED"	"OORSPOED"
"START FAILURE"	"AANSITFOUT"
"LOW WATER LEVEL"	"LAE WATERVLAK"

In addition, two relays with reset pushes must be fitted giving and audible and visible signal when:

(a) The fuel level in the service tank is low. The reset push of this relay must be marked "FUEL LOW" - "BRANDSTOF LAAG".

In addition, a low-low level sensor must be provided. At this level, the engine must stop to prevent air entering the fuel system.

(b) The battery charger failed. The reset push of this relay must be marked "CHARGER FAIL" - "BATTERYLAAIER FOUTIEF".

This is also applicable to the engine driven generator/alternator.

All relays must operate an audible alarm. A pushbutton must be installed in the alarm circuit to stop the audible signal, but the fault indicating light on the control panel must remain lit until the fault has been rectified.

An on/off switch is not acceptable. After the alarm has been stopped, it must be re-set automatically, ready for a further alarm.

The hooter / siren must be of the continuous duty and low consumption type. Both hooter / siren and protection circuits must operate from the battery.

Potential free contacts from the alarm relay must be brought down to terminals for remote indication of alarm conditions.

A test pushbutton must be provided to test all indicators lamps.

3.4 Manual Starting

Each switchboard shall be equipped with two pushbuttons marked "START" and "STOP" for manual starting and stopping of the set.

3.5 Battery Starting Equipment

Each switchboard shall be equipped with battery charging equipment.

The charger shall operate automatically in accordance with the state of the battery and shall generally consist of an air-cooled transformer, a full wave solid state rectifier, and the necessary automatic control equipment of the constant voltage system.

The charger must be fed from the mains. An engine driven alternator must also be provided for charging the battery while the set is operational. Failure of this alternator must also activate the battery charger failure circuit.

3.6 Switchboard Instruments

Each generating set shall have a switchboard equipped as follows:

(a) One analogue flush mounted, square dial voltmeter, reading the alternator voltage, scaled as follows:

(i) 0-300V for single phase generators.
(ii) 0-500V for three phase generators. In this case a six position and off selector switch must be installed for reading all phase and phase to neutral voltages.

(b) An analogue flush mounted square dial combination maximum demand and instantaneous ampere meter for each phase, with resettable pointer

suitably scaled 20% higher than the alternator rating. A red arc stripe above scale markings from 0-20A and a red radial line through the scale at full-load current shall be provided. These instruments shall be supplied complete with the necessary current transformer.

(c) One flush square dial vibrating type frequency meter, indicating the alternator frequency.

(d) A six-digit running hour meter with digital counter, reading the number of hours the plant has been operating. The smallest figure on this meter must read $^1/_{10}$ hour.

(e) Fuses or m.c.b.'s for the potential voltage circuits of the meters.

(f) One flush square dial ampere meter suitably scaled for the battery charging current.

(g) One flush square dial voltmeter with a spring-loaded pushbutton or switch for the battery voltage.

3.7 Marking

All labels, markings or instructions on the switchgear shall be in both official languages.

3.8 Earthing

An earth bar must be fitted in the switchboard, to which all non-current carrying metal parts shall be bonded.

The neutral point of the alternator must be solidly connected this bar by means of a removable link labelled "EARTH" "AARD". Suitable terminals must be provided on the earth bar for connection of up to three earth conductors.

3.9 Operation Selector Switch

A four-position selector switch must be provided on the switchboard marked "AUTO", "MANUAL", "TEST" and "OFF" - "AUTO", "HANDBEHEER" "TOETS" and "AF".

With the selector on "AUTO", the set shall automatically start and stop, according to the mains supply being available or not.

With the selector on "TEST", it shall only be possible to start and stop the set with the pushbuttons, but the running set shall not be switched to the load.

With the selector on "MANUAL", the set must take the load when started with the pushbutton, but it must not be possible to switch the set on to the mains, or the mains onto the running set.

With the selector on "OFF", the set shall be completely disconnected from the automatic controls, for cleaning and maintenance of the engine.

3.10 Automatic Change-over System

A fully automatic change-over system must be provided to isolate the mains supply and connect the standby set to the outgoing feeder in case of a mains failure and reverse this procedure on return of the mains.

3.11 By-pass Switch and Main Isolator

The switchboard shall be equipped with an on-load isolator to isolate the mains and a manually operated on-load by-pass switch, which shall either connect the incoming mains to the automatic control gear or directly to the outgoing feeder. In the latter position the automatic control gear, including the main contactors, shall be isolated for maintenance purposes. It shall not be possible to start the engine except with the selector switch in the "TEST" position.

It is required that this by-pass switch and mains isolator be mounted away from the automatic control gear, in a separate compartment either on the side or in the lower portion of the switchboard cubicle, and that the switches operated from the front of the compartment.

3.12 Start Delay

Starting shall be automatic in event of a mains failure. A 0-15 second adjustable start delay timer shall be provided to prevent start-up on power trips or very short interruptions.

3.13 Stop Delay

A stop delay with timer is required for the set, to keep the set on load for an adjustable period of one to sixty seconds after the return of the mains supply, before changing back to the supply. An additional timer shall keep the set running for a further adjustable cooling period of 5 to 10 minutes at no-load before stopping.

4. Installation

Except for the supply of the incoming mains cable and outgoing feeder cables, the tenderer must allow for the complete installation and wiring of the plant in running order, including the connection of the incoming cable and outgoing feeder cables.

The connecting of the cable and control cabling to the generator and the control terminals in the LV board remains the responsibility of the tenderer.

5. Warning Notices

Notices, in both official languages, must be installed in the plant rooms.

The contents of these notices are summarised below.

(a) Unauthorised entry prohibited.

(b) Unauthorised handing of equipment prohibited.

(c) Procedure in case of electric shock.

(d) Procedure in case of fire.

The successful tenderer must consult the Occupational Health and Safety Act 83 of 1993 and get approval of the wording from the Department's representative, prior to ordering the notices.

Lettering must be black on a yellow background.

Notices (a) must be installed outside next to the entrance of the plant room and (b-d) inside the plant room.

In the plant room, a clearly legible and indelible warning notice must be mounted in a conspicuous position.

The motive shall be made of a non-corrodible and non-deteriorating material, preferable plastic, and must read as follows:

DANGER: This engine will start without notice. Turn selector switch on control board to "OFF" before working on the plant.

GEVAAR: Hierdie masjien sal sonder waarskuwing begin loop. Draai keuseskakelaar op beheerpaneel na "AF" voordat aan die masjien gewerk word.

6. Generator Type and Construction

The generator type shall be the enclosed outdoor unit type, built on a common chassis with on board Automatic Mains Failure (AMF) panel, base fuel tank and complete exhaust system. The canopy shall be fully acoustically insulated as specified and weather proof. The canopy shall be manufactured from 1.6mm sheet metal. Pad llockable hinged doors shall allow access for maintenance purposes. Louvers shall be positioned at both ends to suit the sets cooling and combustion air flows. The inside of the canopy shall be cladded in acoustic "Quash" material to further attenuate the noise. The canopy shall be prime painted with an etching primer before being finished off with two coats of enamel paint.

The engine and alternator of the set shall be built together on a common frame, which must be mounted on a skid base on anti-vibration mountings. The set must be placed direct on the concrete slab. A drip tray must be fitted under the engine. The tray must be large enough to catch a drip from any part of the engine.

The frame must be of the 'DUPLEX' type.

7. Exhaust system

The exhaust system shall be incorporated complete with attenuation.

8. Operation

The set is required to supply all the essential loads connected to the distribution board.

The set shall be fully automatic i.e. it shall start when any one phase of the main supply fails or get switched and shall shut down when the normal supply is

re-established. In addition, it shall be possible to manually start and stop the set by means of pushbuttons on the switchboard.

The automatic control shall make provision for three consecutive starting attempts. Thereafter the set must be switched off, and the start failure relay on the switchboard must give a visible and audible indication of the fault.

To prevent the alternator being electrically connected to the mains supply when the mains supply is on and vice versa, a safe and fail proof system of suitably interlocked contactors shall be supplied and fitted to the changeover switchboard.

SECTION 3 – TECHNICAL SPECIFICATION

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SECTION 3 – TECHNICAL SPECIFICATION

1. General

Supply, deliver, install, commission, test and maintain a standby generating set at Madadeni Hospital, Madadeni, KwaZulu Natal.

This installation must comply fully with all the sections and drawings of this document. This technical specification is supplementary to the Equipment Requirements, Section 2, and must be read together where they are at variance the Technical Specification shall apply.

The generator set must be installed and positioned on the concrete plinths as shown on the drawings.

The bulk fuel tank shall be installed and positioned on the concrete slabs with bund walls next to the generator as shown on the drawings.

2. Site Information and Conditions

2.1 Location

The site is at Madadeni Hospital.

2.2 Site Conditions

The following site conditions will be applicable and equipment shall be suitably rated to develop their assigned rating and duty at these conditions.

a)	Height above sea level	: 1300 meter
b)	Maximum ambient temperature	: 43°C
c)	Minimum temperature	: -5°C
d)	Maximum ambient humidity at lowest temperature	: ..... %

3. Output and Voltage

After the de-rating factors for the engine and generator due to site conditions have been taken into account, the set must have a site output and voltage as follows: -

No load voltage	:	400/230 Volt
Apparent Power	:	200 kVA
Power at 0,8 power factor		164 kW
Frequency	:	50Hz
Fault Level	:	10kA

The generating set is required to supply all the essential loads connected from the distribution board in the particular area of the hospital. Such load types shall include the following:

Discharge lighting
Fluorescent lighting
LED Street lighting
Heaters & plugs
Split type Air-conditioner units (auto re-start type)
Domestic water pump.
Fire pressure pump (45kW).

Particular care shall be taken to successfully supply the fire pump at any time or state of loading of the generator.

4. **Switchboard/Control Panel Unit**

All switch- and control gear shall be rated for a fault current level of 10kA.

The switchboard/control panel unit shall be incorporated and built into the generator unit.

5. **Cables**

The contractor shall supply and install all the cables specified and all the connections & terminations associated with the complete generating set installation.

The following cables shall be supplied, installed and terminated at the Switchboard. Adequate provision shall be made for the termination of these cables at the Switchboard:

Supplied from	To	Cable (PVC/PVC/SWA/ECC/PVC)
Main DB-1/N	Generator AMF panel	1x150mm^2 x 4 Core
Generator AMF Panel	Main DB-1/Ess	1x150mm^2 x 4 Core

6. **Engine**

A sump drainpipe must be fitted with a shut-off valve placed in a convenient position outside the base frame to facilitate drainage.

Recommended oil types must be indicated on the engine, or base frames, by means of suitable labels.

All engine instruments shall have clear markings on the faceplates, indicating the normal operating zone(s), maximum and minimum allowable values/limits and danger zone(s).

The flywheel shall be covered by approved hoods.

7. **Alternator**

The Alternator shall be of the low harmonic type.

8. **Load Acceptance**

The generator set shall be capable of accepting 75% of the specified site electrical output (i.e. 150kW at unity power factor) 10 seconds after the starter motor is energised and the remaining 25%, 5 seconds thereafter, i.e. 100% load acceptance shall not exceed 15 seconds.

The generator must be able to accept the starting load of the Fire pumps.

9. **Alarms**

The successful tenderer must pay particular attention to the requirements of the alarms as described in the Equipment Requirements, Section 2.

One alarm hooter and red light shall be supplied and installed high on the front side of the canopy.

The hooter shall consist of an electronic unit similar and equal to a "Klaxon" - type SY2/725 hooter with a continuously rated output and 110 db at a distance of 2 metres and shall be IP55 weatherproof rated.

The warning light shall consist of a 40W flashing red light, which shall be mounted on a galvanised steel frame together with the hooter.

The hooter and light shall be switched on or off simultaneously after initiation or cancellation of an alarm condition. The supply and installation of the wiring between the control board and the alarm unit forms part of this contract.

The successful tenderer must ensure that the hooter control circuit resets automatically after cancellation due to a low fuel condition or battery charger failure, but the visible fault indication must remain, i.e. should the operator continue to run the set, the hooter must sound, should any other condition develop.

A remote alarm panel shall be supplied and installed by the contractor in the Maintenance Manager's office. This shall be of surface mounting, enamelled sheet metal (colour to approval), minimum depth construction, and shall incorporate a flashing red pilot alarm light, adjustable electronic sounder, and a silence push button. The silence button shall not switch off the pilot light - this shall only be switched off when the alarm is reset at the Generator Panel.

A 2,5mm² x 4-core PVC SWA PVC cable will be supplied, installed and terminated between the Generator Panel and the Maintenance Manager's office. The Contractor shall connect this cable at both ends and shall supply and install all switch gear relays, etc. to ensure satisfactory operation of the Remote Alarm Panel.

10. Remote Control Generator Switch

A Remote-Control Generator "ON/OFF/AUTO" switch will be supplied and installed in the Maintenance Manager's office, and a 2,5mm² x 4-core PVC SWA PVC cable shall be supplied and installed between the Maintenance Manager's office and the Generator Panel.

The contractor shall connect this cable at both ends, and shall supply and install all switch gear, relays, etc. to ensure satisfactory operation of the remote-control switch.

11. Fuel Drip Tray

A drip tray approximately 100mm deep shall be mounted below the fuel tank and must be large enough to collect any fuel that drips from the tank accessories. The drip tray shall be manufactured from black mild steel. The thickness of the drip tray sheet steel shall not be less than 2mm.

12. Completion Time

The Generator Set is required to be commissioned in conjunction with the main contract.

13. Acoustic insulation

The genset shall overall be acoustically insulated and comply with the local municipal by-laws and the hospital environment. The acoustic insulation shall attenuate the noise to a maximum of 65 dBA, measured at 5 meters away from the genset.

14. Inform

The successful tenderer shall inform the Engineer when the set is ready for installation.

15. Fuel Tank

The service tank (base tank) shall be incorporated and built onto the frame of the generator unit. The tank shall have sufficient capacity for the generating set to run the engine on full load for a period of 12 hours.

16. Bulk Fuel Tank

The contractor shall supply and install an above-ground, 3000 litre bulk tank, compliant and equipped to SANS 10131:2004, adjacent to the generator as shown on the drawings. The tank shall be a low mounted type with 1m above the ground to the underside of the tank.

The bulk tank shall be positioned on the re-enforced concrete slab as shown on the drawings.

Approved UV resistant type fuel pipe shall be installed between the tank and the generator's base tank. The base tank shall be automatically filled from the bulk tank via suitable level controls.

A lockable isolating valve shall be installed at the bulk tank's outlet, as well at the generators base tank inlet.

17. Fire protection

Fire protection equipment shall be installed in accordance with SANS 10131.

18. Works implementation and power outages.

The contractor shall program the works according to the implementation plan and minimize the duration of the power outage.

SPECIFICATION FOR THE SUPPLY DELIVERY AN INSTALLATION OF AN EMERGENCY GENERATOR SET

SECTION 4 – SCHEDULES OF TECHNICAL INFORMATION

GENERAL

Tenderers must complete the following schedule of information and are to submit with their Tender comprehensive literature on the equipment offered including countries of origin. FAILURE TO COMPLETE AND SIGN THIS SCHEDULE IN ITS ENTIRITY SHALL LEAD TO DISQUALIFICATION OF THE BID.

DIESEL ENGINE

a) Make and Model .....

b) Type (two or four stroke).....

c) Performance Parameters

i) Rated output at sea level: Prime Power: .....kVA / kW.

Standby Power.....kVA / kW.

ii) Rated output at .....metres above sea level (Altitude of hospital/Institution)

Prime Power .....kVA / kW.

Standby Power.....kVA / kW.

iii) Ambient air temperatures at .....metres above sea level (Altitude of hospital/Institution)

Minimum °C.....

Maximum ° C.....

d) Governed speed .....RPM

e) Number of cylinder .....

f) Diameter of cylinders .....mm

g) Stroke of piston .....mm

h) Piston speed .....m/minute

i) Type of air cleaner .....

j) Type of lubricating oil filter .....

k) Make and type of injection system .....

l) Type and number of fuel filters .....

m) Manufacture and type of turbo-charger
.....

n) Manufacturer and type of governor
.....

o) Max cyclic variations .....

p) Speed variation for sudden release or application of load:

i) Temporary .....

ii)Permanent .....

q) 100% Rated full load may be applied seconds after initiation of starting sequence
.....

r) Specific fuel consumption at full load. Litres/ HR (submit curves)
.....

s) Air quantity required for engine cooling .....cu.m/min.

t) Cross sectional area of radiator air discharge outlet required
.....

STARTING BATTERY

a) Manufacturer .....

b) Type .....

c) Capacity.....

d) Voltage.....

ALTERNATOR

a) Make .....

b) Type .....

c) Type of bearings
.....

d) Method of lubrication
.....

e) Rated load at 0.8 power factor at 400 / 230 volt 50Hz 3 Phase

i) Continuous rating .....kVA.....Amps.....
f) Efficiency of alternator at full load
.....

g) Output voltage within governed speed range at: i) No load .....Volts

ii) 50%load .....Volts

iii) 100% load .....Volts

iv) 110% load .....Volts

h) Method of voltage regulation .....

CONTROL CUBICLE

a) Manufacturer .....
.....

b) Dimensions of control cubicle: Length..... .....mm
Width ....mm
Height .....mm

c) Type of control equipment .....

d) Type, make and rating of 4 pole by pass switch .....

e) Type, make and rating of 4 pole motorised change-over switch .....

f) Rupturing capacity at rated voltage of main circuit .....K.A.

g) Method of tripping employed in main circuit breaker .....

h) Range of load setting of main circuit breaker
.....

i) Electrical and mechanical interlock provided: YES..... NO..... TYPE .....

VOLTMETER – COMPULSORY INSTALLATION

a) Make and type .....

b) Dial dimensions .....

c) B.S.S. accuracy .....

MAXIMUM DEMAND AMMETERS - COMPULSORY INSTALLATION

a) Make and type .....

b) Dial dimensions .....

c) Time lag .....

d) B.S.S. accuracy .....

FREQUENCY METER - COMPULSORY INSTALLATION
Commented [SV1

a) Make and type .....

b) Dial dimensions .....
c) B.S.S. accuracy .....

FUEL TANK

Base tank size .....

Bulk tank size .....

Bulk tank manufacturer and model number .....

Approval with Newcastle Local Authority and Fire Chief.....

EXHAUST

Exhaust material .....

Exhaust material, silencer and outlet pipe ....

MASS OF PLANT .....kg

OVERALL DIMENSIONS OF PLANT

Length .....

Height .....

Width .....

TYPE AND RATING OF EQUIPMENT TO BE USED FOR LOAD TESTS

.....

COMPANY NAME AND ADDRESS OF BULK TANK INSTALLATION

.....

.....

IS THE TENDERER A DIESEL GENERATOR SET MANUFACTURER WITH LOCAL MANUFACTURING AND BACKUP FACILITIES .....YES / NO.....
IS THE TENDER 100% TO SPECIFICATION .....YES / NO.....

If the answer is NO, provide reasons for the deviation from the specification.

_____

_____

_____

_____

_____

DATE..... SIGNATURE OF TENDERER.....

COMPANY STAMP

SCHEDULE OF IMPORTED MATERIALS AND EQUIPMENT TO BE COMPLETED BY TENDERER

The Contractor shall list imported items, materials and/or equipment which shall be excluded from the Contact Price Adjustment Provisions and shall be adjusted in terms of currency fluctuations only. Copies of the supplier's quotations for the items, materials or equipment (not higher than the Contract rate as listed below) should be lodged with the Representative/Agent of the Department of Public works within 60 (sixty) days from the date of acceptance of the tenders. No adjustment of the contractor's profit, local VAT amount, discount, mark-up, handling costs, etc. shall be allowed.

ITEMS	MATERIAL / EQUIPMENT	RAND (R) EXCLUDING VAT
1		
2		
3		
4		
5		
6		

FORMULA:

The net amount to be added to or deducted from the contract sum:

$$A = V \times \frac{Z}{Y}$$

A = the amount (R) of adjustment

V = the net amount (R) (Supplier's Quotation) of the imported item (Material or Equipment)

Y = exchange rate at the closing date of tender submission

Z = exchange rate on the date of payment

PARTICULAR SPECIFICATION

MINIATURE SUBSTATION

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR

SPECIFICATION FOR MINIATURE SUBSTATIONS

PARTICULAR SPECIFICATION

PA.1 **SCOPE**

This section provides for the supply, delivery, installation, connection and commissioning of a 200kVA mini substation.

PA.2 **STANDARDS**

PA.3 The installation shall comply with SANS 10142-2:2018 as amended and all referred standards as applicable:

The specification describes in detail the requirements for miniature substations and is supplementary to the relevant requirements of SABS 1029 and SABS 1030.

PA.4 **MATERIALS**

The substation shall be manufactured of sheet-metal with welded joints. The unit shall be vermin-proof. The substation shall be of the following finish:

a) Sheet-metal of minimum wall thickness of 2,0 mm shall be used for the manufacture of the enclosure or 3CR12 where specified.

b) Welding materials shall be of the same quality or better as the base metal.

c) After machining and before painting, all fat and grease shall be removed by using a suitable solvent.

d) The surfaces shall be treated and painted according to SABS 780 clause 3.25 with final colour as per specification.

Alternative finishes and colours will be considered provided a full description of the process accompanies the tender.

PA.5 **CONSTRUCTION EQUIPMENT**

PA.5.1 **HIGH VOLTAGE COMPARTMENT**

Access to the high voltage compartment shall be through doors on all three sides.

PA.5.1.1 **High Voltage Switchgear**

The equipment shall consist of a vacuum technology ring main unit with a fused switch protecting the transformer.

The ring main unit shall be rated for 350 MVA, 400 A load break/fault make capacity or higher, while the fused switch shall be suitable for 350 MVA at 11 kV with a continuous current rating of 85 A. The unit shall comply with specification BEBS S16 of 1968.

The operation of the three switches shall be similar except for the trip facility on the fused unit.

Ring Main Isolators

a) Switching : Lockable ON/OFF/EARTH positions

b) Mechanism : Spring operated hand control

The removable operating handle shall be used in separate positions for ON/OFF or OFF/EARTH switching. Access to these positions shall be controlled by spring operated lockable covers.

c) Interlocking : The unit shall be interlocked as follows:

i) in the ON position to render the EARTH position inactive;

ii) in the EARTH position until the TEST cover is locked;

d) Current transformers: Nil

e) Fault indication : Nil

f) Cable end box : Two end boxes with solid brass connecting terminals, complete with compound and suitable for the cables in accordance with the project specification

PA.5.1.2 **Fused Switch**

a) Purpose : Transformer supply

b) Identification : Transformer with kVA capacity as specified

c) Tripping : Any blown fuse shall trip all three phases

d) Interlocking

i) to allow replacement of a fuse in the OFF position only;

ii) automatic lock out of the ON/OFF positions until a blown fuse has been replaced;

e) Switching : Lockable ON/OFF/EARTH positions

f) Mechanism : Hand controlled with ON/OFF/EARTH mechanism interlocking and tripping as per (c) and (d) above. When operating from OFF to ON the switch shall fully engage under fault switching whereafter the fuse shall be completely blown before the switch trips and isolates

g) Fuses : HRC fuses shall be fitted in compliance with the manufacturer's recommendation for the protection of the transformer specified

PA.5.2 **TRANSFORMER**

The following applies to the transformer to be fitted to the unit:

a) Specification : Shall carry the mark in accordance with SABS 780/1966

b) Type : Free air above 200 kVA. Hermetically sealed for 200 kVA and smaller

c)	Primary voltage	:	11kV
d)	No-load secondary voltage	:	400V
e)	Phases and frequency	:	3 ph- 50 Hz
f)	Vector Group	:	Dyn 11
g)	HV tappings	:	0 % ± 2,5 % ± 5 %
h)	Tap setting	:	External no-load selector
i)	LV neutral	:	For solid earthing
j)	Efficiency	:	Low loss type
k)	Oil level indicator	:	Included
l)	Cooling	:	ONAN

PA.5.3 **LOW VOLTAGE COMPARTMENT**

This compartment shall be capable of accommodating the following equipment. Circuit breaker and current transformer ratings shall be in accordance with the project specification.

Item		**Description**
Main circuit breaker	:	300Amp Triple pole, 10kA moulded case with thermal overload and magnetic instantaneous protection, with adjustable settings.
INSTRUMENTS	:	Three current transformers with three analogue, resettable maximum demand type ammeters.
	:	1 x 0-500volt voltmeter complete with seven position selector switch and 4 A fused protection.

PA.5.4 **IDENTIFICATION**

Labels of black trafalite engraved with white letters shall be fitted to suitable frames. The labels shall be as described below.

Item	**Equipment**	**Title**	**Letter Size**
(i)	Transformer breaker	MAIN CIRCUIT BREAKER	12 mm
(ii)	3 x ammeters	R, W, B	6 mm
	0 - 500 voltmeter	VOLTAGE	6 mm
	Selector switch	VOLTAGE SELECTOR SWITCH	6 mm
	3 x 4 A fuses	R, W, B	6 mm

(iii) **SPARE FUSES**

Two spare fuses of each size and type shall be provided with the substation.

PA.5.5 **EARTHING**

A continuous copper bar measuring 25 x 6 mm shall be fitted to run from the HV compartment through the transformer section to the LV compartment.

PA.5.6 **SUBSTATION ANCILLARIES**

The following ancillaries shall be provided and installed:

i) Danger signs type WS7 to SABS 1186/1978 manufactured from sheet aluminium of 150 x 150 mm size. Mounting shall be in clearly visible positions on the front and back of the substation.

ii) All control handles and operating cranks shall be mounted in a safe firm position in the respective compartments.

iii) A plastic envelope with single line diagrams and operating instructions shall be provided in each compartment in a safe position.

iv) The gland plate in the low voltage compartment shall be manufactured of 4 mm thick hot dipped galvanised mild steel plate.

The appropriate number and sizes of holes shall be provided to accommodate the cables as specified. All holes shall be pre-drilled prior to galvanising.

v) Substation name shall be fitted in a prominent position with letter size not less than 30 mm.

PA.5.7 **LOCKS**

All doors shall be fitted with HA1 type locks.

Locks shall be of the 40 mm type with hardened brass hasps and corrosion resistant mechanisms. The locks shall be keyed to a reserved number to be provided by the owners.

PA.6 **INSTALLATION**

PA.6.1 **GENERAL**

Substations shall be erected generally in the positions indicated on the drawings. The exact positioning shall be determined on site by the Engineer or his representative after consideration of other services.

PA.6.2 **MOUNTING**

A concrete plinth with measurements as per the drawing on PA.8 shall be cast in such a manner that a 75 mm skirt is obtained with respect to the substation base. The plinth shall protrude 150 mm above ground.

The concrete shall be of a 1:3:5 mix and the plinth shall be neatly finished. A hardening period of at least seven (7) days must be allowed for.

After installation of all cables and compacting of the backfill, the plinth must extend on both ends with a brick-built wall 114 mm wide and form at least 200 mm below ground level on a small foundation.

Alternative plinth structures will be considered provided a full description and detailed drawing accompany the tender.

PA.6.3 **CONNECTIONS**

HV cables shall be rising through the plinth opening from below into the HV compartment where they shall be made off onto the end boxes.

LV cables shall similarly rise from below and shall be mounted in cable glands. Lugs shall be used for connection to equipment.

PA.6.4 **EARTHING**

The main trench earth shall consist of three 20 m lengths of 70 sq.mm bare stranded copper conductor installed radially with a separation of 120 degrees. Lugs shall be sweated onto the earth conductors and connected to the substation earth bar using brass bolts and nuts.

A 70 sq.mm bare stranded copper conductor shall be installed at a depth of 450 mm in a ring 1 m from the substation to serve as a potential earth. Termination of the two ends on the substation earth bar shall be as for the main earth.

All earth conductors shall rise through the plinth opening as for cables. Internally the HV switchgear, cable boxes, transformer tank, transformer neutral, LV framework, HV and LV enclosures shall be separately connected to the earth bar using 70 sq.mm bare stranded copper conductor with sweated lugs and brass bolts and nuts.

PA.7 **TOLERANCES**

Not applicable.

PA.8 **TESTS**

The following tests shall be performed and witnessed by the Engineer or his representative before the substation is energised and commissioned.

i) Checking of primary and secondary circuits against wiring diagrams.

ii) Megger testing of primary and secondary wiring including for protection and metering equipment.

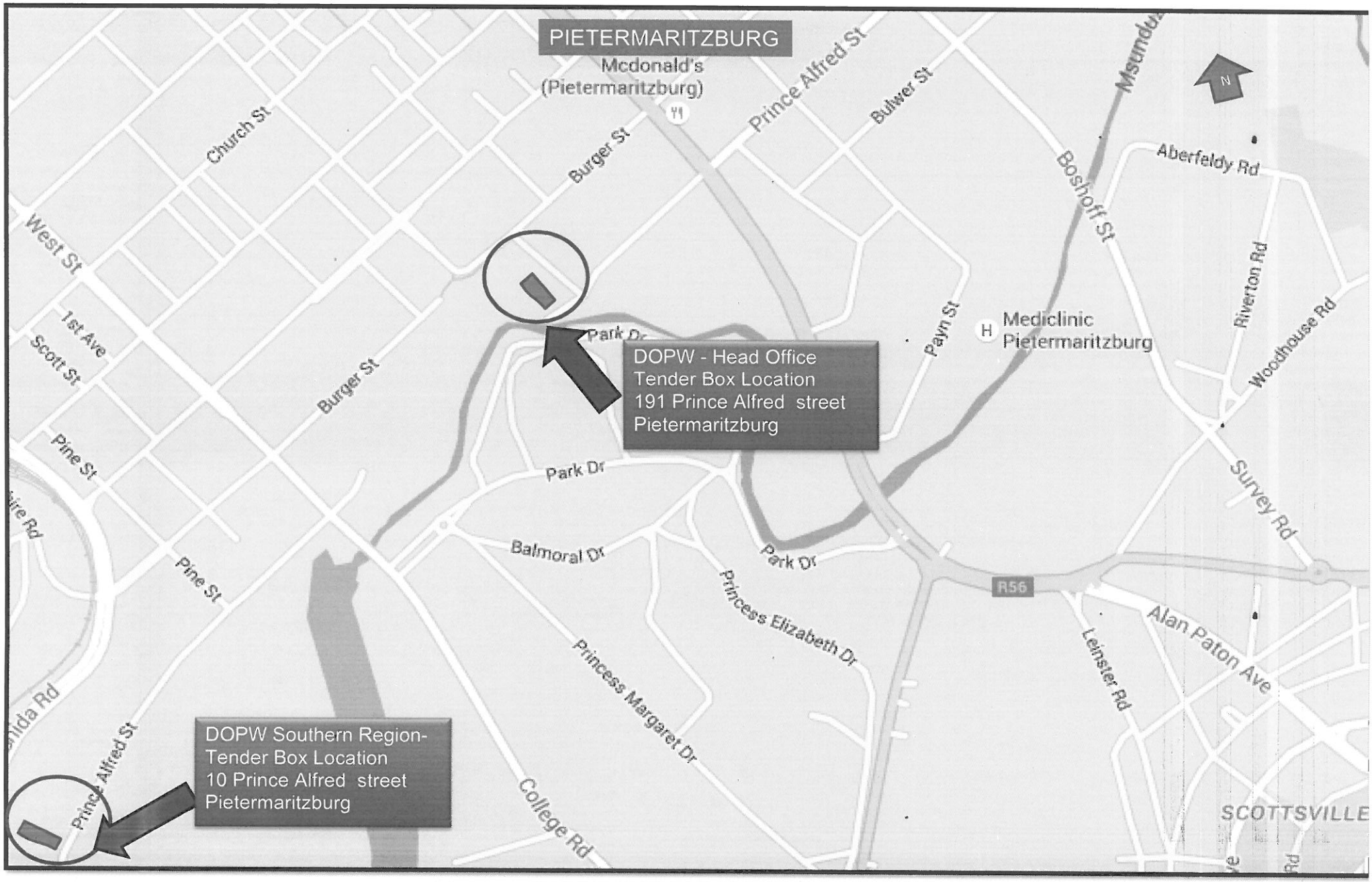
The original copy of the manufacturer's factory test certificate shall be submitted to the Engineer.

PA.9 **MEASURING AND PAYMENT**

In accordance with the bill of materials as measured on site.

ANNEXURE 5:

MAP OF BID SUBMISSION LOCATION


PIETERMARITZBURG
Mcdonald's
(Pietermaritzburg)
Church St
Burger St
Prince Alfred St
Bulwer St
Msunduzi
Aberfeldy Rd
Boshoff St
West St
1st Ave
Scott St
Burger St
Payn St
Mediclinic
Pietermaritzburg
Riverton Rd
Woodhouse Rd
DOPW - Head Office
Tender Box Location
191 Prince Alfred street
Pietermaritzburg
Pine St
Park Dr
Survey Rd
Balmoral Dr
Park Dr
Pine St
R56
Princess Elizabeth Dr
Alan Paton Ave
Leinster Rd
Princess Margaret Dr
DOPW Southern Region-
Tender Box Location
10 Prince Alfred street
Pietermaritzburg
Prince Alfred St
College Rd
SCOTTSVILLE
N

ANNEXURE 6:

JOINT VENTURE AGREEMENT

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Annexure 5

Joint Venture Agreement

(March 2004)

(First Edition of CIDB document 1017)

1. **PREAMBLE**

This agreement is made and entered into by and between

_____

_____

_____

of the first part and

_____

_____

_____

of the second part and

_____

_____

_____

of the third part.

(allow for additional parties as necessary).

Whereas the foregoing parties have resolved to form a Joint Venture under the title of

_____

_____

_____

for the exclusive purposes of securing and/or executing the Contract to be awarded by

(name of Employer)

to the KZN Department of Public Works in respect of the following project:

for *(brief description of Contract)*

MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT

Now it is hereby agreed as follows :

2. DEFINITIONS AND INTERPRETATION

2.1 Definitions

The following words and expressions shall have the meanings indicated, except where the context otherwise requires. Defined terms and words are, in general, signified in the text of the Agreement by the use of capital initial letters, but the absence of such letters does not necessarily signify that a term, or word, is not defined.

'Agreement' means the agreement between the Members of the Joint Venture and includes this model form of agreement together with the Preamble, Specific Provisions, if any, Schedules 'A', 'B' and 'C' and any relevant Documents prepared prior to the signing of the Agreement and appended thereto.

'Contract' means the contract with the Employer for the supply of the Deliverables, for the purposes of securing and executing which, the Joint Venture has been formed.

'Deliverables' means the works and/or services, equipment, materials, goods, etc. to be furnished by the Joint Venture to the Employer in terms of the Contract.

'Document' means any written, drawn, typed, printed, or photographic material, which relates to the Agreement.

'Employer' means the person, or body, which is to award the Contract and will employ the Joint Venture if it is awarded the Contract.

'Joint Venture' means the joint venture formed by the Members in accordance with the Agreement.

'Management Committee' means the body established in terms of the Agreement to manage all aspects of the work of the Joint Venture in securing and executing the Contract and in meeting the provisions for the Agreement.

'Member' means a person, or body which, being a party to the Agreement, is a member of the Joint Venture.

'Member's Interest' means the proportion expressed as a percentage, which the total monetary value of all resources provided and contributions made by a Member towards the execution by the Joint Venture of the Contract bears to the total of such values by all Members and, unless otherwise indicated in the Agreement, represents the extent to which the Member participates in the fortunes of the Joint Venture.

'Representative' means the person representing a Member on the Management Committee.

'Schedules' means Schedules 'A', 'B' and 'C' which set out general, financial and other information relating to the Members and the obligations, duties, rights, risks and benefits arising from their participation in the Joint Venture.

'Specific Provisions' means the variations, if any, required to this standard form of agreement for the specific purposes of the Agreement.

2.2 Interpretation

Unless inconsistent with the context, an expression in the Agreement which denotes:

- any gender shall include the other genders
- a natural person shall include a juristic person and vice versa
- the singular shall include the plural and vice versa

2.3 Headings

The headings to clauses of the Agreement shall not be considered part thereof, nor shall the words they contain be taken into account in the interpretation of any clause.

2.4 Law

The Agreement shall be construed in accordance with and governed by the laws of the Republic of South Africa and the English language versions shall prevail.

2.5 Language

English shall be exclusively used by the Members in the preparation of Documents unless otherwise indicated.

2.6 Conflict between Agreement and Contract

Should any provision of the Agreement be in conflict with the terms of the Contract, the Agreement shall be amended to the approval of the Management Committee so as to eliminate the conflict.

3. JOINT VENTURE GENERAL

3.1 Establishment and Purpose

The Joint Venture established by the Members in terms of the Agreement is an unincorporated association with the exclusive purposes of securing and executing the Contract for the benefit of the Members.

3.2 Termination

The operation of the Joint Venture and the validity of the Agreement shall terminate if and when it becomes evident that the Joint Venture will not be awarded the Contract, or, if the Joint Venture secures the Contract, when all obligations and rights of the Joint Venture and the Members in connection with the Contract and the Agreement have ceased and/or been satisfactorily discharged.

Unless otherwise decided by the Management Committee, the Agreement shall not terminate if a Member changes its name, or is taken over by, or merged with, another body.

This agreement will terminate when any one of the Members resigns, are liquidated or opts out of this agreement and the Joint Venture will be in breach of contract with the Employer and their contract could be cancelled.

3.3 Exclusivity

Unless otherwise agreed by the Management Committee, or provided for in the Contract no Member shall engage in any activity related to the Contract other than as a Member of the Joint Venture and Members shall ensure that their subsidiaries and other bodies over which they have control comply with this requirement.

3.4 Participation of Members

Except as may otherwise be stipulated in the Agreement, each Member shall be responsible for all costs incurred by it prior to the date of inception of the Agreement.

Subsequent to the date of inception of the Agreement, each Member shall, participate in the operations, risks, responsibilities and fortunes of the Joint Venture including, inter alia, the provision of funding, sureties, guarantees, insurances, human and other resources and participation in profits and losses to the extents indicated in the Schedules. Participation in any aspect not covered in the Schedules shall, if an agreement cannot be reached between the Members, be to the same extents as indicated by the Members Interests.

3.5 Management

The affairs of the Joint Venture shall be directed and controlled by the Management Committee, as set out in Section 4 hereof.

3.6 Confidentiality

All matters relating to the Agreement and the Contract shall be treated by the Members as confidential and no such matter shall be disclosed to any third party without the prior written approval of the Management Committee.

No Member shall be party to the dissemination of publicity relating to the Contract, or the Agreement, without the prior written approval of the Management Committee and the Employer.

3.7 Assignment

No Member shall cede, assign, or in any other way make over any of its rights, or obligations, under the Agreement without the prior written consent of the Management Committee.

3.8 Subcontracting

No Member shall subcontract any obligation, work or duty for which it is, itself, responsible in terms of the Agreement without the prior written consent of the Management Committee.

3.9 Variations to Agreement

No variation, modification, or waiver of any part of the Agreement shall be of any force, or effect, unless unanimously agreed by the Members and reduced to writing.

3.10 Liability

Each Member warrants that it will indemnify the other Members against all legal liabilities arising out of, or in connection with the performance of its obligations under the Agreement.

It is acknowledged by the Members that they may be held jointly and severally liable in respect of claims against the Joint Venture by the Employer or third parties.

4. MANAGEMENT OF JOINT VENTURE

4.1 General

The affairs of the Joint Venture shall be directed, controlled and managed by the Management Committee, which, within the terms of the Agreement and the Contract, shall have full authority to bind the Members in all matters relating to the affairs of the Joint Venture.

Communication between the Joint Venture and the Employer, or third parties, relating to the Contract shall be conducted exclusively by the Management Committee, or by such person as it may delegate to perform this function.

The Management Committee shall have the power to appoint a project manager and/or such other persons as it may see fit to appoint for the purpose of executing the Contract and may delegate such of its powers, responsibilities and duties as it may consider necessary, or desirable, to persons or bodies appointed or seconded for this purpose.

Such administrative functions as are necessary to ensure the effective operation of the Management Committee shall be performed by its chairman.

4.2 Management Committee

4.2.1 *Composition*

The Management Committee shall, unless otherwise agreed by all the Members, consist of one Representative of each Member and each Member shall be obliged, at all times, to maintain a Representative on the Management Committee.

Each member shall, not later than three working days after the signing of the Agreement, appoint its Representative and notify the other Members of the name and contact details of the Representative. Such Representative shall have the power to bind the Member that he represents in all matters relating to the execution of the Contract and the performance of the Agreement.

A Member shall be entitled, after giving the other Members not less than three working days written notice of his intention to do so, appoint, remove and/or replace, an alternate who shall, at any meeting of the Management Committee from which the Representative whom he represents is absent, be vested with all rights and powers and subjected to all the obligations of the absent Representative.

The chairman of the Management Committee shall be the Representative of the Member which has the largest Member's Interest. If two, or more, Members have the same, largest Member's Interest, the chairmanship shall rotate between the Representatives of such Members at three monthly intervals, the order of rotation to be determined by ballot.

Notwithstanding the foregoing, the chairmanship of the Management Committee may be determined, or changed, at any time by unanimous decision of the Management Committee.

No remuneration shall be paid by the Joint Venture to Representatives or their alternates for serving on the Management

4.2.2 *Meetings*

Meetings of the Management Committee shall take place at such times and places as the Management Committee may determine, provided that the chairman shall convene a meeting of the Management Committee to be held not later than ten working days after he has been requested, in writing, by a Member to do so. Not less than five working days written notice of any meeting of the Management Committee shall be given to all Representatives and their alternates.

The Management Committee may permit, or invite, persons other than Representatives or alternates to attend any of its meetings, but such persons shall not have voting rights.

4.2.3 *Decisions*

Each Representative shall have one vote on the Management Committee and where, in terms of this clause, a casting vote is required, this shall be exercised by the chairman.

All decisions of the Management Committee shall, desirably, be unanimous. Accordingly, if unanimity cannot, initially, be achieved in regard to a decision, the meeting at which that decision is sought shall be adjourned for a period of 48 hours to enable Representatives to consult with their principals. If, on resumption of the adjourned meeting, unanimity can still not be achieved, the decision, provided it is not one requiring unanimity of the Members, shall be taken by majority vote and, in the event of a tie, the chairman shall exercise a casting vote.

A Member not satisfied with a majority decision of the Management Committee may declare a dispute, to be dealt with in terms of Clause 8 hereof, but the majority decision shall, nevertheless, be implemented with immediate effect.

Decisions of the Management Committee, whether taken at a meeting, or otherwise, shall be recorded in written minutes, which shall be distributed by the chairman to reach the Representatives not later than five working days after those decisions were taken. Such minutes shall be deemed to have been affirmed by the Representatives unless written notice of dissent is received by the chairman not later than three working days after receipt of the minutes by the Representative.

4.2.4 Powers and duties

The functions, responsibilities and powers of the Management Committee shall include, inter alia, those listed below:

4.2.4.1 Formulating overall policy in regard to the achievement of the objectives of the Joint Venture.

4.2.4.2 Managing the day to day affairs of the Joint Venture.

4.2.4.3 Monitoring, directing and co-ordinating the activities of the Members to ensure that the objectives of the Joint Venture are achieved and that the obligations and responsibilities of the individual Members are met.

4.2.4.4 Monitoring and controlling the financial affairs of the Joint Venture and ensuring that proper books of account and financial records relating to affairs of the Joint Venture are maintained in an approved form and submitted to the Management Committee for approval at regular intervals, which shall not be longer than one month.

4.2.4.5 Determining the necessity for and the details of any changes in the duties and responsibilities of Members provided that any resulting changes in Members' Interests shall be unanimously approved by the Members.

4.2.4.6 Determining the terms and conditions of employment of personnel and the emoluments applicable to staff seconded to the Joint Venture by the Members.

4.2.4.7 Controlling and approving the appointment of all subcontractors.

4.2.4.8 Procuring, after the completion of the Contract and the release of all bonds, guarantees and sureties given in respect of the performances of the Joint Venture and the Members, the preparation and auditing of a final set of accounts, on the basis of which the final profits, or losses, attributable to the individual Members shall be determined and any necessary adjustments effected.

5 RESOURCES OF JOINT VENTURE

The resources to be utilised by the Joint Venture in securing and executing the Contract shall, insofar as these are to be provided directly by the Members, be as set out in the Schedules and may, from time to time, be amended by decision of the Management Committee, provided that the Member's Interests are not, except with the unanimous approval of the Members, affected thereby.

Similarly, specific areas of responsibility of the Members for the performance of work and the provision of facilities shall be as set out in the Schedules and may, from time to time, be amended by decision of the Management Committee, provided that the Members' Interest are not, except with the unanimous approval of the Members, affected thereby.

5.1 Schedule 'A' (General)

Schedule 'A' shall contain general information relating to the Joint Venture including, inter alia, the following :

1. The Employer's name and address.
2. A brief description of the Contract and the Deliverables.
3. The name, physical address, communications addresses and domicilium citandi et executandi of each Member and of the Joint Venture.
4. The Members' Interests.
5. A statement indicating whether, or not, Specific Provisions apply to the Agreement.
6. A schedule of insurance policies which must be taken out by the Joint Venture and by the individual Members.
7. A Schedule of sureties, indemnities and guarantees that must be furnished by the Joint Venture and by the individual Members.
8. Details of the persons, who, in the event of failure by the Members to reach agreement on the appointments of mediator and arbitrator, will nominate appointees to these positions in terms of Clauses 8.2 and 8.3.

5.2 Schedule 'B' (Financial)

Schedule 'B' shall contain information regarding the financial affairs of the Joint Venture including, inter alia, the following :

1. The working capital required by the Joint Venture and the extent to which and manner whereby this will be provided and/or guaranteed by the individual Members from time to time.
2. The banking accounts that are to be opened in the name of the Joint Venture and the manner in which these are to be operated.
3. The rates of interest that will be applicable to amounts by which Members are in debit, or credit, to the Joint Venture.
4. The names of the auditors and others, if any, who will provide auditing and accounting services to the Joint Venture.
5. The intervals at which interim financial accounts and forecasts will be prepared for approval by the Management Committee.
6. Insofar as not covered in Schedule 'C', the basis on which contributions of various types by the Members towards the work of the Joint Venture in securing, executing, managing and satisfactorily completing the Contract, will be valued.
7. The basis on which profits and/or surplus cash will, if available from time to time, be distributed to Members.
8. The basis upon which losses, if any, are to be apportioned to Members.

5.3 Schedule 'C' (Contributions by Members)

Schedule 'C' shall set out the contributions of various types, other than cash, that will be made by the individual Members towards the work and obligations of the Joint Venture and shall, as far as possible, indicate the monetary values to be placed on such contributions, which may include, inter alia, the following :

1. Staff seconded to the Joint Venture.
2. Work carried out and services provided to, or on behalf of, the Joint Venture.
3. Plant, equipment, facilities etc. made available for use by the Joint Venture.
4. Materials and goods supplied to, or on behalf of, the Joint Venture.
5. Licences, sureties, guarantees and indemnities furnished to, or on behalf of, the Joint Venture.
6. Joint Venture Disclosure form required for the Contract.

6. BREACH OF AGREEMENT

If a Member breaches any material provision of the Agreement, or delays or fails to fulfil its obligations in whole, or in part, and does not remedy the situation within fourteen calendar days of receipt of notice from the Management Committee, or another Member, to do so, the other Members shall have the right, without prejudice to any other rights arising from the default, to summarily terminate the Agreement and re-assign the defaulting Member's rights and obligations in the Joint Venture as they see fit and withhold any moneys due to the defaulting member by the Joint Venture.

Each Member shall indemnify the other Members against all losses, costs and claims which may arise against them in the event of the Agreement being terminated as a result of breach of the Agreement by the said Member.

7. INSOLVENCY OF MEMBER

Should a Member be placed in liquidation, or under judicial management, whether provisionally or finally, or propose any compromise with its creditors, the other Members shall be entitled to proceed in terms of Clause 6, as if the Member had breached the Agreement.

8. DISPUTES

8.1 Settlement

The Members shall negotiate in good faith and make every effort to settle any dispute, or claim, that may arise out of, or relate to, the Agreement.

If agreement cannot be reached, an aggrieved Member shall, if he intends to proceed further in terms of Clause 8.2 hereof, advise all other Members in writing that negotiations have failed and that he intends to refer the matter to mediation in terms of Clause 8.2.

8.2 Mediation

Not earlier than ten working days after having advised the other Members, in terms of Clause 8.1, that negotiations in regard to a dispute have failed, an aggrieved Member may require that the dispute be referred, without legal representation, to mediation by a single mediator.

The mediator shall be selected by agreement between the Members, or, failing such agreement, by the person named for this purpose in Schedule 'A'. The costs of the mediation shall be borne equally by all Members.

The mediator shall convene a hearing of the Members and may hold separate discussions with any Member and shall assist the Members in reaching a mutually acceptable settlement of their differences through means of reconciliation, interpretation, clarification, suggestion and advice. The Members shall record such agreement in writing and thereafter they shall be bound by such agreement.

The mediator is authorised to end the mediation process whenever in his opinion further efforts at mediation would not contribute to a resolution of the dispute between the Members.

8.3 Arbitration

Where a dispute or claim is not resolved by mediation, it shall be referred to arbitration by a single arbitrator to be selected by agreement between the Members or, failing agreement, to be nominated by the person named for this purpose in Schedule 'A'.

The Member requiring referral to arbitration shall notify the other Members, in writing, thereof, not later than thirty calendar days after the mediator has expressed his opinion, failing which the mediator's opinion shall be deemed to have been accepted by all Members and shall be put into effect.

Arbitration shall be conducted in accordance with the provisions of the Arbitration Act No. 42 of 1965, as amended, and in accordance with such procedure as may be agreed by the Members or, failing such agreement, in accordance with the rules for the Conduct of Arbitrations published by the Association of Arbitrators and current at the date that the arbitrator is appointed.

The decisions of the arbitrator shall be final and binding on the Members, shall be carried into immediate effect and, if necessary, be made an order of any court of competent jurisdiction.

9. DOMICILIUM

The Members choose domicilium citandi et executandi for all purposes of and in connection with the Agreement as stated in Schedule 'A'. A Member shall be entitled to change his domicilium from time to time, but such change shall be effective only on receipt of written notice of the change by all other Members.

Member No. 1

Thus done and signed at _____ this _____ day of _____ 20___

For and on behalf of _____ *[Company]*

by *[name]* _____ who warrants his authority to do so.

_____

As witnesses 1. _____ As witnesses 2. _____

Member No. 2

Thus done and signed at _____ this _____ day of _____ 20___

For and on behalf of _____ *[Company]*

by *[name]* _____ who warrants his authority to do so.

_____

As witnesses 1. _____ As witnesses 2. _____

Member No. 3

Thus done and signed at _____ this _____ day of _____ 20___

For and on behalf of _____ *[Company]*

by *[name]* _____ who warrants his authority to do so.

_____

As witnesses 1. _____ As witnesses 2. _____

[Allow for additional parties as necessary].

ANNEXURE 7:

HEALTH AND SAFETY BILLS OF QUANTITIES

Annexure 7

HEALTH AND SAFETY IMPLEMENTATION COSTING

Contractor to give a breakdown of his Health and Safety costs on this sheet.

ITEM	DESCRIPTION*	UNIT	QUAN-TITY	MONTHS (Indicative)	RATE	AMOUNT
			(a)		(b)	(a) x (b)
1	**MEDICALS**					
1.1	Pre-employment medical	Nr.	-			
1.2	Re-medicals - yearly	Nr.	-			
	TOTAL					
2	**PERSONAL PROTECTIVE EQUIPMENT**					
2.1	Overalls	Nr.				
2.2	Hard Hats	Nr.				
2.3	Safety boots/shoes	Nr.				
2.4	Gloves	Nr.				
2.5	Gumboots steel toe cap	Nr.				
2.6	Safety glasses	Nr.				
2.7	Reflector Bibs	Nr.				
2.8	Barricading Material	M				
2.9	Dust masks	Box 20				
	TOTAL					
3	**FIRE FIGHTING**					
3.1	Fire extinguishers - 4.5Kg	Nr.				
3.2	Surveys - Annual Service	Nr.				
	TOTAL					
4	**HEALTH AND SAFETY PERSONNEL**					
4.1	Safety Manager	Nr.				
4.2	Safety Officer	Nr.				
4.3	Construction Phase Safety, Health, Environmental and Waste Management Plan	Nr.				
	TOTAL					
5	**FACILITIES**					
5.1	Provision of ablution facilities	Nr.				
5.2	Service and maintenance of ablution facilities	Nr.				
5.3	Provision of eating areas	Nr.				
5.4	Cleaning of Lay down and other storage areas	Nr.				
5.5	Wash hand basin	Nr.				
5.6	Hot and Cold running water	Nr.				
5.7	Degreasing & Toilet soap	Nr.				
	TOTAL					

6	**FALL PREVENTION / PROTECTION**						
6.1	Safety harnesses with double lanyards	Nr.					
6.2	Safety harnesses with Scaffold hooks	Nr.					
6.3	Lifelines and vertical fall arrest systems	Nr.					
6.4	Scaffolding – material, erection and inspection (Estimate for project)	Nr.					
6.5	Temporary hand railing material and kick flats	Nr.					
6.6	Chin Straps	Nr.					
	TOTAL						
7	**FIRST AID**						
7.1	Replenishment of boxes and other supplies	Nr					
	TOTAL						
8	**TRAINING**						
8.1	SHE Representative	Nr.					
8.2	First Aid Level 1	Nr.					
8.3	Fire Fighting	Nr.					
	TOTAL						
9	**SIGNAGE**						
9.1	All Signage as required by Law, regulatory, warning and information	Nr.					
9.2	Posters for awareness	Nr.					
	TOTAL						
10	**ELECTRICAL**						
10.1	Replacement of Locks required for lockouts	Nr.					
10.2	Replacement of tags	Nr.					
10.3	Replacement for Permit books	Nr.					
10.4	Replacement of Callipers	Nr.					
	TOTAL						
11	**OTHERS (Project Specific)**						
11.1		Nr.					
	TOTAL						
	GRAND TOTAL TO BE CARRIED TO THE PRELIMINARIES AND GENERAL IN BILL OF QUANTITIES						

ANNEXURE 8:

BUILDERS LIEN AGREEMENT

Annexure 8

WAIVER OF CONTRACTOR'S LIEN

DEFINITIONS

Contractor: _____

Employer: Head: Public Works (KZN Department of Public Works: Province of KwaZulu-Natal)

Agreement: GCC FOR CONSTRUCTION WORKS - SECOND EDITION 2010

Works (description): **MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**

Site: Region: Midland Region, Newcastle District Municipality: Amajuba Local Municipality

AGREEMENT

The Contractor waives, in favour of the Employer, any lien or right of retention that is or may be held in respect of the Works to be executed on the Site

Thus done and signed at _____ on _____
[Date]

_____
Name of signatory

_____
Capacity of signatory

_____
As witness

_____
For and on behalf of the contractor who by signature hereof warrants authorisation hereto

ANNEXURE 9:

EPWP EMPLOYMENT CONTRACT

Annexure 10

(Insert Your Company Logo)

(This shall serve as the cover page on employment contracts for local labour)

EMPLOYMENT AGREEMENT

BETWEEN

[CONTRACTOR NAME].....

AND

[WORKER NAME].....

1. PARTIES

The Parties to this Agreement are -

1.1. Contractor: _____

herein represented by: _____

duly authorised thereto

And

1.2. Mr / Me: _____
[worker's name]

2. DEFINITIONS AND INTERPRETATION

2.1. In this Agreement and any Annexure thereto, unless inconsistent with or otherwise indicated by the context-

"Agreement"	means the contents of this Agreement.
"Company"	means the company that employs the worker
"Department"	means the Department of Public Works
"Worker"	is a person that performs a specific or necessary task or who completes tasks in a certain way
"EPWP"	The Expanded Public Works Programme is a government programme aimed at the alleviation of poverty and unemployment. The programme ensures the full engagement on Labour Intensive Methods of Construction (LIC) to contractors for skills development. The EPWP focuses at reducing unemployment by increasing economic growth by means of improving skills levels through education and training and improving the enabling environment for the industry to flourish.

3. PURPOSE

The purpose of this agreement is to:-

Ensure that the agreement is binding to both the Worker and the Employer.

4. TERMS AND CONDITIONS

- The worker will have no entitlement to the benefits of a full time employee, namely;

  _____

  _____

- The worker should not have the expectation that this contract will be renewed or extended.
- The worker will be subject to all laws, rules, policies, codes and procedures applicable to the;

  _____

- The worker must meet the standards and requirements of the contractor
- The worker must render his/her services during normal working hours of minimum of forty to fifty five hours in any week; which comprise of an eight-hour working day in a five-day week.

5. REMUNERATION

The worker will receive compensation to the amount of R_____00 which must be paid by the 25th or on the last day of each month.

6. ROLES AND RESPONSIBILITIES

6.1 Employer / Worker

- Work for _____ in terms of the period as specified in the employment agreement contract.
- Be available for and participate in all learning and work experience required by the company.
- Comply with workplace policies and procedures.
- Complete any attendance or any written assessment tools supplied by the contractor to record relevant workplace experience.
- Demonstrate willingness to grow and learn through work experience.

Provide the following documentation to the employer,

- Certified identity document not longer than 3 months
- ID size photos
- Sign employment contract

6.2 Employer

- Employ the worker for a period specified in the agreement.
- Provide the worker with appropriate work based experience in the work environment.
- Facilitate payments of wages / stipends.
- Keep accurate records of workers.
- Where a worker/ learner is disabled, the employer will have to provide in the additional needs e.g. special materials, learning aids and in some cases physical or professional support (such aids remain the property of the employer).
- Keep up to date records of learning and discuss progress with the intern on a regular basis.
- Apply fair disciplinary, grievance and dispute resolution procedures to the worker.
- Prepare an orientation/ induction course to introduce worker/ learner to the workplace and specific workplace requirements.
- Ensure the daily attendance register is signed by the worker.

7. DURATION.

This agreement commences on: _____

and

expires on: _____

8. BREACH.

If either party commits any breach of the terms of this contract (and fails to rectify it within 30 days of receipt of a written notice calling it to do so, then) the other party shall be entitled to terminate the contract or to claim specific performance without prejudice to any of its other legal rights, including its rights to claim damages.

9. CONDITIONS OF EMPLOYMENT

9.1. Meal Breaks

9.1.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

9.1.2 An employer and worker may agree on longer meal breaks.

9.1.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

9.1.4 A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

9.2. Special Conditions for Security Guards (Only applicable to security Guards)

9.2.1 A security guard may work up to 55 hours per week and up to eleven hours per day.

9.2.2 A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

9.3. Weekly Rest Period

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

9.4. Work on Sundays and Public Holidays

9.4.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.

9.4.2 Work on Sundays is paid at the ordinary rate of pay.

9.4.3 A task-rated worker who works on a public holiday must be paid;

(a) the worker's daily task rate, if the worker works for less than four hours;

(b) double the worker's daily task rate, if the worker works for more than four hours.

9.4.4 A time-rated worker who works on a public holiday must be paid

(a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;

(b) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

9,5 Sick leave

9.5.1 Only workers who work more than 24 hours per month have the right to claim sick-pay in terms of this clause.

9.5.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract.

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

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

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

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

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

9.5.8 Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is

(a) absent from work for more than two consecutive days; or

(b) absent from work on more than two occasions in any eight-week period.

9.5.9 A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.

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

9.6. Maternity Leave

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

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

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

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

9.6.5 A worker may begin maternity leave as follows;

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

(b) on an earlier date

(i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or

(ii) if agreed to between employer and worker; or

(c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

10,6 A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.

9.7. Family responsibility leave

9.7.1 Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances;

(a) when the employee's child is born;

(b) when the employee's child is sick;

(c) in the event of a death of

(i) the employee's spouse or life partner;

(ii) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

9.8. Keeping Records

9.8.1 Every employer must keep a written record on site for the duration of the project and three (3) year after completion records should consists of at least the following;

(a) the worker's name and position;

(b) copy of an acceptable worker identification

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

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

(e) payments made to each worker in a form of Proof of Payment, Payroll registers and the acknowledgement of payment receipt signed by the worker.

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

9.9. Payment

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

9.9.2 A worker may not be paid less than the Ministerial Determination wage rate.

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

9.9.4 An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

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

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

9.9.7 Payment in cash or by cheque must take place

(a) at the workplace or at a place agreed to by the worker;

(b) during the worker's working hours or within fifteen minutes of the start or finish of work;

(c) in a sealed envelope which becomes the property of the worker.

9.9.8 An employer must give a worker the following information in writing

(a) the period for which payment is made;

(b) the numbers of tasks completed or hours worked;

(c) the worker's earnings;

(d) any money deducted from the payment;

(e) the actual amount paid to the worker.

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

9.9.10 If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

9.10. Inclement weather

If no work has begun on site, and if an employee has reported for work, the employee will be paid for four hours. Should work be stopped after the first four hours, the employee will be paid for the hours worked. Where the employer has given employees notice on the previous working day that no work will be available due to inclement weather, then no payment will be made.

9.11. Deductions

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

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

9.11.3 An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement of Law; court order or arbitration

9.11.4 It is the responsibility of the employers to arrange for all persons employed on a Project to be covered in terms of the Unemployment Insurance Fund Contributions Act, 2002 (Act No. 4 of 2002)

9.11.5 An employer may not require or allow a worker to

(a) repay any payment except an overpayment previously made by the employer by mistake;

(b) state that the worker received a greater amount of money than the employer actually paid to the worker; or

(c) pay the employer or any other person for having been employed.

9.12. Health and Safety

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

9.12.2 A worker must;

(a) work in a way that does not endanger his/her health and safety or that of any other person;

(b) obey any health and safety instruction;

(c) use any personal protective equipment or clothing issued by the employer;

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

9.13. Compensation for Injuries and Diseases

9.13.1 It is the responsibility of the employers to arrange for all persons employed on a Project to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993 as amended by COIDA Act 61, 1997.

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

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

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

9.14. Termination

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

9.14.2 A worker will not receive severance pay on termination.

9.14.3 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.

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

9.14.5 A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available.

Notice procedure is as follows;

- One week if employed for four weeks or less
- Two weeks if employed for more than four weeks but not more than a year
- Four weeks of employed for one (1) year or more

9.15. Certificate of Service

9.15.1 On termination of employment, a worker is entitled to a certificate stating;

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

9.16. DOMICILE

The address to which notices and all legal documents may be delivered or served are as follows:

Employee Details

Name & Surname: _____

ID No: _____

Residential Address: _____

_____

Contact No: _____

Date of Employment: _____

To be supervised by: **Main Contractor:** ☐
or Sub Contractor: ☐

Category of employment: **Skilled:** ☐
Semi-skilled: ☐
Unskilled: ☐

For Skilled & Semi-skilled state the trade: _____

Period of employment: Fixed for until when your services are still required on site

I confirm that I have been inducted and fully understand the condition of my appointment.

Employee Signature: _____ **Witness by SGB/CLO:** _____

Signature by Witness: _____

Employer Details

Name & Surname: _____
Designation: _____
Contact No: _____ **Signature:** _____

ANNEXURE 10:

EPWP PRELIMINARIES

PAGE NO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1		**BILL NO. 1**				
1		**EMPLOYMENT AND TRAINING OF LABOUR ON THE EPWP BENEFICIARY INFRASTRUCTURE PROJECTS**				
1		**PREAMBLES**				
1		Tenderers are advised to study the Additional Specification SL: Employment and training of Labour on the Expanded Public Works Programme (EPWP) Infrastructure Projects as bound elsewhere in the Bills of Quantities and then price this Bill accordingly				
1		**EMPLOYMENT OF EPWP BENEFICIARY**				
1	1	Employment of EPWP benefitiary (30 Youth) (water Supply)	Item	1		
1		The unit of measurement shall be the number of EPWP beneficiary at the statutory labour rates of R 160/day multiplied by the period employed in months and the rate tendered shall include full compensation for all costs associated with the employment of EPWP beneficiary and for complying with the conditions of contract. The cost for training shall be excluded from this item. This item is based on 6 months appointment for EPWP beneficiary				
2		**PROVISION OF EPWP DESIGNED OVERALLS TO YOUTH WORKERS**				
2	2	Supply EPWP designed overalls to EPWP beneficiary - 30	Item	1		
2	3	Profit and attendance on Items 1 - 2 (ref. SL 11.05.02)	%	7.5		
2		**PROVISION OF SMALL TOOLS FOR EPWP BENEFICIARY**				
2	4	Supply of small tools to EPWP beneficiary. Specification to be supplied by the EPWP-NYS Serviced Provider for the respective trade for 30 Workers	Item	1		
2	5	Profit and attendance (ref. SL 11.06.02)	%	7.5		
2		**APPOINTMENT OF YOUTH TEAM LEADERS**				
2	6	Appointment of EPWP beneficiary Team Leaders for the duration of the contract (ref. SL 11.07)	Item	1		
2	7	Liaison with Service Provider (ref. SL 11.08)	Hrs	N/A		
2	8	Profit and attendance on Items 6 & 7	%	7.5		
		FINAL TOTAL CARRIED TO PRELIMINARY AND GENERAL IN BILL OF QUANTITIES				

ANNEXURE 11:

EPWP SCOPE OF WORKS

SCOPE OF WORKS IN RESPECT OF WORK RELATING TO THE EXTENDEND PUBLIC WORKS PROGRAMME (EPWP)

Project title:	**MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**		
Project Code:	**WIMS No. 078856**	EPWP NO:	**N/A**

Introductory notes:

1. The works, or parts of the works will be constructed using labour-intensive methods only in terms of this specification. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters **LI** are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.
2. Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.

DESCRIPTION OF THE WORKS

Employer's objectives

The employer's objectives are to deliver public infrastructure using labour-intensive methods in accordance with EPWP Guidelines.

Labour-intensive works

Labour-intensive works comprise the activities described in the Labour-Intensive Specification. Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of the scope of work.

LABOUR-INTENSIVE COMPETENCIES OF SUPERVISORY AND MANAGEMENT STAFF

Contractors shall only engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/ Supervisors at NQF level 4 "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/ Manager at NQF level 5 "Manage Labour-Intensive Construction Processes" or equivalent QCTO qualifications (See Appendix C). at NQF outlined in Table 1. (See GUIDELINES FOR THE IMPLEMENTATION OF LABOUR-INTENSIVE INFRASTRUCTURE PROJECTS UNDER THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP) -THIRD EDITION 2015)

Emerging contractors shall have personally completed, or be registered on a skills programme for the NQF level 2 unit standard. All other site supervisory staff in the employ of emerging contractors must have completed, or be registered on a skills programme for the NQF level 2 unit standards or NQF level 4 unit standards. Table 1: Skills programme for supervisory and management staff.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour-Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	

Personnel	NQF level	Unit standard titles	Skills programme description
Foreman/supervisor	4	Implement Labour-Intensive Construction Systems and Techniques	This unit standard must be completed, and
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Water an Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	
Site Agent /Manager (i.e. the contractor's most senior representative that is resident on the site)	5	Manage Labour-Intensive Construction Processes	Skills Programme against this single unit standard
Details of these skills programmes may be obtained from the CETA ETQA manager (e-mail :gerard@ceta.co.za , tel: 011-265 5900)			

EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR-INTENSIVE WORKS

1.1 Requirements for the sourcing and engagement of labour.

1.1.1 Unskilled and semi-skilled labour required for the execution of all labour-intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.

1.1.2 The rate of pay set for the SPWP per task or per day will be an acceptable rate determined by the Department of Labour.

1.1.3 Tasks established by the contractor must be such that:

a) the average worker completes 5 tasks per week in 40 hours or less; and
b) the weakest worker completes 5 tasks per week in 55 hours or less.

1.1.4 The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 1.1.3.

1.1.5 The Contractor shall, through all available community structures, inform the local community of the labour-intensive

a) where the head of the household has less than a primary school education;
b) that have less than one full time person earning an income;
c) where subsistence-agriculture is the source of income.
d) that who are not in receipt of any social security pension income

1.1.6 The Contractor shall endeavour to ensure that the expenditure on the employment of unskilled and semi-skilled workers is in the following proportions:

a) 55% women;
b) 55% youth who are between the ages of 18 and 35; and
c) 2% on persons with disabilities.

1.2 Specific provisions pertaining to SANS 1914-5

1.2.1 Definitions

Targeted labour: Unemployed persons who are employed as local labour on the project.

1.2.2 Contract participation goals

1.2.2.1 There is no specified contract participation goal for the contract. The contract participation goal shall be measured in the performance of the contract to enable the employment provided to targeted labour to be quantified.

1.2.2.2 The wages and allowances used to calculate the contract participation goal shall, with respect to both time-rated and task rated workers, comprise all wages paid and any training allowance paid in respect of agreed training programmes.

1.2.3 Terms and conditions for the engagement of targeted labour
Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

1.2.4 Terms and conditions for the engagement of targeted labour
Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

1.2.5 Variations to SANS 1914-5

1.2.5.1 The definition for net amount shall be amended as follows:
Financial value of the contract upon completion, exclusive of any value added tax or sales tax which the law requires the employer to pay the contractor.

1.2.5.2 The schedule referred to in 5.2 shall in addition reflect the status of targeted labour as women, youth and persons with disabilities and the number of days of formal training provided to targeted labour.

1.3 Training of targeted labour

1.3.1 The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.

1.3.2 The cost of the formal training of targeted labour, will be funded by the local office of the Department of Labour. This training will take place as close to the project site as practically possible. The contractor must access this training by informing the relevant regional office of the Department of Labour in writing, within 14 days of being awarded the contract, of the likely number of persons that will undergo training and when such training is required. The Employer and the Department of Public Works (Fax: 012 3258625/ EPWP Unit, Private Bag X65, Pretoria 0001) must be furnished with a copy of this request.

1.3.3 The contractor shall do nothing to dissuade targeted labour from participating in training programmes and shall take all reasonable steps to ensure that each beneficiary is provided with two days of formal training for every 22 days worked.

1.3.4 An allowance equal to 100% of the task rate or daily rate shall be paid by the contractor to workers who attend formal training, in terms of the above.

1.3.5 Proof of compliance with the above requirements must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

GENERIC LABOUR-INTENSIVE SPECIFICATION

1 Scope

This specification establishes general requirements for activities which are to be executed by hand involving the following:

a) trenches having a depth of less than 1.5 metres
b) storm water drainage
c) low-volume roads and sidewalks

2 Precedence

Where this specification is in conflict with any other standard or specification referred to in the Scope of Works to this Contract, the requirements of this specification shall prevail.

3 Hand excavateable material

Hand excavateable material is material:

a) Granular materials:

i) whose consistency when profiled may in terms of table 1 be classified as very loose, loose, medium dense, or dense; or

ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;

b) Cohesive materials:

i) whose consistency when profiled may in terms of table 1 be classified as very soft, soft, firm, stiff and stiff / very stiff; or

ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100mm;

Note: 1) A boulder, a cobble and gravel is material with a particle size greater than 200mm, between 60 and 200mm.

2) A dynamic cone penetrometer is an instrument used to measure the in-situ shear resistance of a soil comprising a drop weight of approximately 10 kg which falls through a height of 400mm and drives a cone having a maximum diameter of 20mm (cone angle of. 60 degrees with respect to the horizontal) into the material being used.

Table 2: Consistency of materials when profiled

GRANULAR MATERIALS		COHESIVE MATERIALS	
CONSISTENCY	**DESCRIPTION**	**CONSISTENCY**	**DESCRIPTION**
Very loose	Crumbles very easily when scraped with a geological pick.	Very soft	Geological pick head can easily be pushed in as far as the shaft of the handle.
Loose	Small resistance to penetration by sharp end of a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30-40 mm; can be moulded by fingers with some pressure.
Medium dense	Considerable resistance to penetration by sharp end of a geological pick.	Firm	Indented by thumb with effort; sharp end of geological pick can be pushed in upto 10 mm; very difficult to mould with fingers; can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of a geological pick; requires many blows for excavation.	stiff	Can be indented by thumb-nail; slight indentation produced by pushing geological pick point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumb-nail' with difficulty; slight indentation produced by blow of a geological pick point.

4 Trench excavation

All hand excavateable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

5 Compaction of backfilling to trenches (areas not subject to traffic)

Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100mm. Each layer shall be compacted using hand stampers

a) to 90% Proctor density;

b) such that in excess of 5 blows of a dynamic cone penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10mm and contains no isolated boulders, or

c) such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

6 Excavation

All hand excavateable material including topsoil classified as hand excavateable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The excavation of any material which presents the possibility of danger or injury to workers shall not be excavated by hand.

7 Clearing and grubbing

Grass and small bushes shall be cleared by hand.

8 Shaping

All shaping shall be undertaken by hand.

9 Loading

All loading shall be done by hand, regardless of the method of haulage.

10 Haul

Excavation material shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

11 Offloading

All material, however transported, is to be off-loaded by hand, unless tipper-trucks are utilised for haulage.

12 Spreading

All material shall be spread by hand.

13 Compaction

Small areas may be compacted by hand provided that the specified compaction is achieved.

14 Grassing

All grassing shall be undertaking by sprigging, sodding, or seeding by hand.

15 Stone pitching and rubble concrete masonry

All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must be collected, loaded, off loaded and placed by hand.

Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m.

Grout shall be mixed and placed by hand.

16 Manufactured Elements

Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320kg. In addition, the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper handhold on them.

ANNEXURE 12:

ATTENDANCE REGISTER- INFRASTRUCTURE AND OTHER PROJECTS

KWAZULU-NATAL DEPARTMENT OF PUBLIC WORKS

EXPANDED PUBLIC WORKS PROGRAMME

The Attendance Register for on-site Workers

Reporting month: _____ Cell No: _____

Surname: _____ First Name: _____

Project Name: **MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**

Project Code: **WIMS No. 078856** Tender No **ZNTL 05094W**

IDENTITY NUMBER:

Day	Date	Time In	Signature	Time Out	Signature	Report On Any Formal Training Provided In The Reporting Month
WEEK 1						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 2						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 3						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 4						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 5						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
Total Days worked						

BUSINESS PLAN

Reference No	
Profile ID	
Project Name	
Project Details	
Project Name	
Project Reference Number	
Project description	
Project Start Date	
Project End Date	
Estimated Budget	
Project Location	
Province	
District/Metro Municipality	
Local Municipality/Metro Region	
Latitude (in decimal format)	
Longitude (in decimal format)	
Public Body Details	
Public body sphere	
Reporting public body that is the project owner (and will report on the project)	
Implementing public body type	
Public body that will implement the project	
IDP reference number allocated to the project	
EPWP Details	
EPWP Sector	
EPWP Program	
EPWP Sub programme	
Budget Amount	
April 2014/March 2015	
April 2015/March 2016	
Total Budget Amount	
Wages	
UIF	
COIDA	
Training	
Administration	
Equipment and materials	
Other	
Describe other	
Outputs and Training	
Output	
Despription	
Target Quantity	
Number of persons to be trained	
Contact person	
Title	
Initials	
First Name	
Surname	
Email	
Tel (Office)	
Fax Number	
Cell Number	
Physical Address 1	
Physical Address 2	
Physical Address 3	
Physical Address 4	
Postal Address 1	
Postal Address 2	
Postal Address 3	
Postal Address 4	

ANNEXURE 13:

EPWP DATA COLLECTION TOOL

KZN PUBLIC WORKS

Monthly Data collection for LOCAL Labour

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

EXPANDED PUBLIC WORKS PROGRAMME

Name of Contractor: _____ Project Code: **WIMS No. 078856** Project location name (area):_____

Name of Project: **MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**

Reporting month:_____ Project location (Ward No.):_____

Beneficiary Details																	Experience/Literacy				Location Details				Household Details		
No	First Name	Initial	Surname	ID number	D.O.B	Gender F/M	Disability Y/N	Start Date on the current month	End Date on the current month	Total days worked	Job description	Registered on UIF (Y/N)	Registered with COIDA (Y/N)	Are you receiving any Gov grant? (Y/N)	1st Language	Other Language 1	Other Language 2	Education Level (See Codes below)	Highest Level of Education	Address	Ward No.	Cell No.	Nationality	No. of people in Household	No. of Dependants in Household	No. of Children attending school
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										

- Education Levels – use the codes (1,2,3) on the excel spreadsheet
  - **(1)** Unknown **(3)** Grade 1-3 (Sub A – Std 1)
  - **(2)** No Schoc **(4)** Grade 4 (Std 2) ABET 1

(5) Grade 5-6 (Std 3-4) ABET 2 **(7)** Grade 9 (Std 7) ABET 4 **(9)** Grade 12 (Std 10)
(6) Grade 7-8 (Std 5-6) ABET 3 **(8)** Grade 10-11 (Std 8-9) **(10)** Post Matric

Contractor sign:_____
Designation:_____
Date:_____
Contact no:_____

DPW Official/Consultant sign:_____
Designation:_____
Date:_____
Contact no:_____

EPWP Official sign:_____
Designation:_____
Date:_____
Contact no:_____

KZN PUBLIC WORKS

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

EXPANDED PUBLIC WORKS PROGRAMME

Worker payment capture form for LOCAL Labour

Name of Contractor: _____ Project Code: **WIMS No. 078856**

Name of Project: **MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**

_____ Reporting month: _____

Payment Upload

No.	First Name	Initials	Surname	Identity No.	D.O.B	Job Description	Daily Wage Rate	Total Paid Days	Total Amount Paid	Total days Worked Days
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Contractor sign:_____
Designation:_____
Date:_____
Contact no:_____

DPW Official/Consultant sign:_____
Designation:_____
Date:_____
Contact no:_____

EPWP Official sign:_____
Designation:_____
Date:_____
Contact no:_____

KZN PUBLIC WORKS

Worker Training capture form for LOCAL Labour

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

EXPANDED PUBLIC WORKS PROGRAMME

Name of Contractor: _____

Name of Project: **MADADENI HOSPITAL: REPLACEMENT OF RESERVOIR TANK - COMPLETION CONTRACT**

Project Code: **WIMS No. 078856**

Reporting month: _____

Training

No	Name	Surname	ID No.	Job description	Course Name	Was training Accredited or Non - accredited by a relevant SETA	Start date on current month	End date on current month	Training Days Paid	Training Days Not Paid	Total Number of Training Days	Cost per trainee	Is training complete or on - going	Name of Training Provider
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														

Contractor sign: _____

Designation: _____

Date: _____

Contact no: _____

DPW Official/Consultant sign: _____

Designation: _____

Date: _____

Contact no: _____

EPWP Official sign: _____

Designation: _____

Date: _____

Contact no: _____

ANNEXURE 14:

PROJECT IMPLEMENTATION PLAN

MADADENI HOSPITAL REPLACEMENT OF RESERVOIR
IMPLEMENTATION PLAN: ELECTRICAL Rev 1
All tasks in each Stage to be completed before the next stage can commence.

STAGE 1

No	TASK	ACTIVITY REQUIRED	AREA AFFECTED	TEMPORARY SERVICE	TIME
1	**Re-route trunking around water pipes:** ***(STAGE 1-6)***	Switch off and Isolate DB. With DB cover plates removed, Identify and mark / tag all affected cables and circuits from the relevant DB N/ESS and trunking. Identify and mark / tag all affected telephone and data cables from the relevant trunking by SITA registered contractor. Place back DB cover plates. Switch back on.	All wards and buildings in both of the North / South Passages, which are supplied from the relevant DB. In most cases the DB supplies several sub-DB's	No Temporary power required.	2hrs Local Power Outage per DB. Complete all DB's for Stage 1. Generator not required to run.
2	**Upgrade MINI-SUB 10:** ***(STAGE 1-5)***	Detect & locate the existing under-ground MV Cables in this area. Workshop drawings, factory test & approvals.	The MINI-SUB 10 Area. Ample free space is available. Disturbance or disruptions to the hospital is unlikely.	No	N/A
3	**Replacement / Upgrade of Main DB-1 N/ESS** ***(STAGE 1-7)***	Supply by Old MINI-SUB. Switch off & Isolate the ESSENTIAL supply from the main Essential panel in the plantroom. Switch off and Isolate NORMAL power to the DB from the old MINI-SUB 10. With cover plates removed, identify and mark / tag all cables and circuits connecting to Main DB-1 N/ESS. Place back cover plates. Switch back on the NORMAL supply from old MINI-SUB 10. Switch back on the ESSENTIAL Supply from the plantroom.	Entire Psychiatric area, HR, Assembly hall, Passage Lighting, Area Lighting, Street lighting and existing reservoir pump, which are supplied from this DB.	Yes - Restriction or security fencing is required for Psychiatric patients who freely roam the DB area. No Temporary power required.	1-2hrs Local Power Outage Old Generator not required to run.
4	**Generator and Fuel Tank Installation** ***(STAGE 1-7)***	Detect & locate the existing under-ground MV Cables in this area. Workshop drawings, Factory tests and approvals.	Ample free space is available behind Philani Ward. Disturbance or disruptions to the hospital is possible.	No	N/A

STAGE 1					
No	**TASK**	**ACTIVITY REQUIRED**	**AREA AFFECTED**	**TEMPORARY SERVICE**	**TIME**
5	**Replace / Upgrade Street lights** ***(STAGE 1-7)***	Old Street lights running from old Main DB-1, old MINI-SUB and old Generator. Samples and approvals. Excavate new cable trenches where possible. Install sleeves at road crossing.	Road side	No Temporary power required. Pipejack or temporary detour for traffic.	1-2hrs Power Outage to old street lighting, due to Identification works done on Main DB-1. 2 Days required for road crossing. Generator not required to run.
6	**New Fire Pump House** ***(STAGE 1-5)***	Detect & locate the existing under-ground MV Cables and other services in this area. Construct New water tank concrete bases (*by Civil Eng* .). Electrical Samples and approvals.	The existing underground MV-Cable must be re-routed to accommodate the new water tank development. **The Doctors' Houses will be affected.** The development is likely to encounter the MV-network.	Allow for the installation and connection of a temporary generator at the Houses' MINI-SUB. Excavate new trench from the re-routing point back to the Ring Main Unit (RMU-9). Switch off the MV-leg to the Houses. Join the cable and connect back to the RMU-9. Switch back on. Open the old MV-Cable trench from the RMU-9 up to the re-routing point to remove the redundant cable.	**For the temporary Generator at the Houses:** 3hrs Power outage to Houses for modification on LV-section at the Houses' MINI-SUB and connection to temporary generator. 1hr Power outage to the houses for the removal of the generator on completion.
7	**Existing Pump House Renovation** ***(STAGE 1-7)***	Old pumps running from old control panel via old street lighting, Old Main DB-1, Old MINI-SUB and old Generator. Electrical Samples and approvals.	Water pumps.	No temporary power required.	1-2hrs Power Outage to water pumps, due to Identification works done on Main DB-1. Generator not required to run.
END OF STAGE 1					

MADADENI HOSPITAL REPLACEMENT OF RESERVOIR
IMPLEMENTATION PLAN: ELECTRICAL

STAGE 2					
No	TASK	ACTIVITY REQUIRED	AREA AFFECTED	TEMPORARY SERVICE	TIME
1	**Re-route trunking around water pipes:**	Switch off and Isolate the relevant DB N/ESS. Disconnect all of those affected cables and circuits, including telephone and data. Pull them out of the trunking up to the point of re-routing. Connect back all those cables and circuits to the DB via temporary support underneath the water pipe. Install cable and wire joints where applicable. Switch back on.	All wards and buildings in both of the North / South Passages, which are supplied from the relevant DB. In most cases the DB supplies several sub DB's	Temporary cable support such as cable ties, rope or steel wire. No Temporary power required.	2 - 4hrs local power outage for each DB. Each DB can be done one at a time. Complete all DB'S for Stage 2. Generator not required to run.
2	**Upgrade MINI-SUB 10**	Construct new concrete base next to the old MINI-SUB. Install new earthmat.	Entire Psychiatric area, HR, Assembly hall, Passage Lighting, Area Lighting, Street lighting and existing reservoir pump, which are supplied from this DB.	Yes - Restriction or security fencing is required for Psychiatric patients who freely roam the DB area.	*(By Civil Eng.)*
3	**Replacement / Upgrade of Main-DB 1 N/ESS**	Supply by Old MINI-SUB. Workshop drawings & approvals.	N/A	Yes - Restriction or security fencing is required for Psychiatric patients who freely roam the DB area.	N/A
4	**Generator and Fuel Tank Installation**	Construct concrete bases. Install cable sleeves.	N/A	No	*(By Civil Engineer)*
5	**Replace / Upgrade Street lights**	Old Street lights running from old Main DB-1, old MINI-SUB and old generator. Install new poles. Install light fittings.	Road side	No	N/A
6	**New Fire Pump House**	New water tank concrete bases to cure (by *Civil Eng*). General Electrical Installation: First fix.	N/A	No	N/A

STAGE 2					
No	TASK	ACTIVITY REQUIRED	AREA AFFECTED	TEMPORARY SERVICE	TIME
7	Existing Pump House Renovation	Old pumps running from old control panel via old street lighting, old main DB-1, old MINI-SUB and old generator. First Fix: New routing of conduits and trays, as required.	N/A	No	N/A
END OF STAGE 2					

MADADENI HOSPITAL REPLACEMENT OF RESERVOIR
IMPLEMENTATION PLAN: ELECTRICAL

STAGE 3					
No	TASK	ACTIVITY REQUIRED	AREA AFFECTED	TEMPORARY SERVICE	TIME
1	Re-route trunking around water pipes:	Cut and remove the redundant trunking to the point of re-routing.	Both North / South Passages	Public Safety Measures	2hrs per DB. Complete all DB's for Stage 3
2	Upgrade MINI-SUB 10	Concrete base to cure (*by Civil Eng.*).	N/A	No	N/A
3	Replacement / Upgrade of Main-DB 1 N/ESS	Switch off & Isolate the ESSENTIAL supply from the main Essential panel in the plantroom. Switch off and Isolate the NORMAL power supply from the old MINI-SUB 10. Disconnect and pull out all incoming and outgoing cables and circuits. Remove old DB and install new DB. Place back and re-connect all incoming and outgoing cables and circuits. Install cable joints where applicable. Switch back on the NORMAL supply from old MINI-SUB 10. Switch back on the ESSENTIAL Supply from the plantroom.	Entire Psychiatric area, HR, Assembly hall, Passage Lighting, Area Lighting, Street lighting and existing reservoir pump, which are supplied from this DB.	Yes - Restriction or security fencing is required for Psychiatric patients who freely roam the DB area. Temporarily connect back the old generator supply.	6-8hrs Local Power outage. Old Generator not required to run.
4	Generator and Fuel Tank Installation	Concrete bases to cure.	N/A	No	*(By Civil Eng.)*
5	Replace / Upgrade Street lights	Old Street lights running from old MINI-SUB.	N/A	No temporary power required.	6-8hrs Power outage, due to Main DB-1 N/ESS replacement.
6	New Fire Pump House	New water tanks erection to new concrete bases (*by Civil Eng*). General Electrical Installation: Second fix. LV-Cable trench excavation.	N/A	No	N/A
7	Existing Pump House Renovation	Old pumps running from old control panel via old street lighting and old MINI-SUB. Second fix: Wiring. LV-Cable trench excavation.	Water pumps.	Temporary power required.	6-8hrs Power outage due to Main DB-1 N/ESS replacement.
END OF STAGE 3					

MADADENI HOSPITAL REPLACEMENT OF RESERVOIR
IMPLEMENTATION PLAN: ELECTRICAL

STAGE 4					
No	**TASK**	**ACTIVITY REQUIRED**	**AREA AFFECTED**	**TEMPORARY SERVICE**	**TIME**
1	**Re-route trunking around water pipes:**	Isolate and drain off water line. Cut out the water pipe loop by approved method. Join in the straight pipe section by approved method. Turn back on water supply. Pressure test and debug.	Both North / South Passages	Public Safety Measures	*(By Civil Eng.)*
2	**Upgrade MINI-SUB 10**	Install & mount new MINI-SUB to new concrete base. Switch off & Isolate Old MINI-SUB from RMU. Connect new earthmat. Disconnect MV-Cable from RMU. Install new MV-cable connection from the RMU to the new MINI-SUB. Disconnect & remove LV-Cable between the LV-Section and New Main DB-1/N. Install new LV-Cable connection between the new MINI-SUB and new Main DB-1/N. Switch back on from RMU.	Entire Psychiatric area, HR, Assembly hall, Passage Lighting, Area Lighting, Street lighting and existing reservoir pump, which are supplied from this DB.	No	6-8 Hrs Local Power Outage. Old Generator is required to run and supply the essential section.
3	**Replacement / Upgrade of Main-DB 1 N/ESS**	None		Yes - Restriction or security fencing is required for Psychiatric patients who freely roam the DB area. Old generator shall run to supply the essential section.	6-8 Hrs Local Power Outage Due to MINI-SUB 10 upgrade.
4	**Generator and Fuel Tank Installation**	Excavate cable trenches.	N/A	No	2-days
5	**Replace / Upgrade Street lights**	Old Street lights running from new Main DB-1. Install under-ground Cables and connections between new Main DB-1/ESS and each pole.	Road side	No temporary supply required. Old generator shall run to supply the essential section.	6-8 Hrs Power Outage due to MINI-SUB 10 replacement.

STAGE 4					
No	TASK	ACTIVITY REQUIRED	AREA AFFECTED	TEMPORARY SERVICE	TIME
6	New Fire Pump House	New water tanks ready (*by Civil Eng*). General Electrical Installation: Third fix and DB. LV-Cable installation and connections between Fire pump house and New Main DB-1/ESS . Pump and control installation (*by Civil Eng.*).	N/A	No	N/A
7	Existing Pump House Renovation	Old Pumps Running from old Control Panel via old street lighting and New Main DB-1. New control Panel installation - off-line only and no supply yet. Third fix and new DB.	Water pumps.	No temporary power required. Old generator shall run to supply essential section.	6-8 Hrs Power Outage due to MINI-SUB 10 replacement.
END OF STAGE 4					

MADADENI HOSPITAL REPLACEMENT OF RESERVOIR
IMPLEMENTATION PLAN: ELECTRICAL

STAGE 5					
No	**TASK**	**ACTIVITY REQUIRED**	**AREA AFFECTED**	**TEMPORARY SERVICE**	**TIME**
1	**Re-route trunking around water pipes:**	Mount and join up the new trunking below the water pipe. Lay back into the new trunking the re-routed cables, circuits, telephone and data.	Both North / South Passages	Public Safety Measures	3hrs per DB. Complete all DB's for Stage 5
2	**Upgrade MINI-SUB 10**	Test & Certify Remove off site old MINI-SUB	N/A	No	N/A
3	**Replacement / Upgrade of Main-DB 1 N/ESS**	None	N/A	No	N/A
4	**Generator and Fuel Tank Installation**	Install & mount Generator and Fuel Tank to new concrete bases. Install new earthmat.	N/A	No	2 days
5	**Replace / Upgrade Street lights**	Old Street lights running from new Main DB-1, new MINI-SUB and old Generator.	N/A	No	N/A
6	**New Fire Pump House**	Switch on from new Main DB-1/ESS. Test & Certify. New Water tanks commissioning (*by Civil Eng.*).	N/A	No	N/A
7	**Existing Pump House Renovation**	Old Pumps Running from old Control Panel via old street lighting, New Main DB-1, new MINI-SUB and old generator. LV-Cable installation and connections between Existing Pump House and new Fire Pump House. New control panel supply connections from new DB. Switch on new DB from New Fire pump house.	N/A	No	N/A
END OF STAGE 5					

MADADENI HOSPITAL REPLACEMENT OF RESERVOIR
IMPLEMENTATION PLAN: ELECTRICAL

STAGE 6					
No	**TASK**	**ACTIVITY REQUIRED**	**AREA AFFECTED**	**TEMPORARY SERVICE**	**TIME**
1	**Re-route trunking around water pipes:**	Test and Certify DB's	Both North / South Passages	Public Safety Measures	3hrs per DB. Complete all DB's for Stage 5
2	**Upgrade MINI-SUB 10**	None	N/A	No	N/A
3	**Replacement / Upgrade of Main-DB 1 N/ESS**	Disconnect old Generator supply. Connect new generator cables.	Entire Psychiatric area, HR, Assembly hall, Passage Lighting, Area Lighting, Street lighting and existing reservoir pump, which are supplied from this DB.	Yes - Restriction or security fencing is required for Psychiatric patients who freely roam the DB area.	3hrs Local Power Outage.
4	**Generator and Fuel Tank Installation**	Construct security Fence. Install Fire Protection. Install Cables and connections between New Main DB-1 and new Generator.	N/A	No	N/A
5	**Replace / Upgrade Street lights**	Switch off & Isolate old street lighting from new Main DB-1/ESS. Switch on new street lighting from new Main DB-1/ESS.	N/A	No temporary power required.	3hrs Power Outage due to Generator cable connections at New Main DB-1 N/ESS.
6	**New Fire Pump House**	None	N/A	No	3hrs Power Outage due to Generator cable connections at New Main DB-1 N/ESS.
7	**Existing Pump House Renovation**	None	N/A	No temporary power required.	3hrs Power Outage due to Generator cable connections at New Main DB-1 N/ESS.
END OF STAGE 6					

MADADENI HOSPITAL REPLACEMENT OF RESERVOIR
IMPLEMENTATION PLAN: ELECTRICAL

STAGE 7					
No	**TASK**	**ACTIVITY REQUIRED**	**AREA AFFECTED**	**TEMPORARY SERVICE**	**TIME**
1	Re-route trunking around water pipes:	None	N/A	No	N/A
2	**Upgrade MINI-SUB 10**	None	N/A	No	N/A
3	**Replacement / Upgrade of Main-DB 1 N/ESS**	Remove redundant change-over cubical. Test & Certify	N/A	Yes - Restriction or security fencing is required for Psychiatric patients who freely roam the DB area.	1-2hrs
4	**Generator and Fuel Tank Installation**	Test & Certify First fill of Diesel	N/A	No	N/A
5	**Replace / Upgrade Street lights**	Disconnect & remove redundant street lights. Disconnect & remove redundant bundle conductors. Remove redundant timber poles. Test & Certify.	N/A	No	N/A
6	**New Fire Pump House**	None	N/A	No	N/A
7	**Existing Pump House Renovation**	Switch off and Isolate Old Control panel from from New Main DB-1/ESS. Remove old pumps and old control panel *(by Civil Eng)*. New Pump installation and connections to new control panel (by Civil Eng). Pump Commissioning *(by Civil Eng)* Test & Certify	N/A	No	N/A
END OF STAGE 7: WORKS COMPLETED					

1. IMPLEMENTATION PLAN

STAGE 1			
Task	**Area Affected**	**Temporary Service**	**Time**
			Task Time
1. Commence with water testing of installed underground pipelines, where sufficiently complete to do so.	• N/A	• N/A	
2. Should water testing indicate a leak, alternative testing such as gas detection to be used to identify likely leak position.	• N/A	• N/A	
3. On completion of pipeline testing, work to complete all reticulations to commence. Excavate trenches and lay new fire water pipelines, construct new hydrants, hose reels and connecting pipework to new fire main. 4.	• N/A	• N/A	
5. Construct concrete base and erect new sectional steel water tank	• N/A	• N/A	
6. Excavate trenches and lay new bulk supply and water reticulation pipelines. This task can be done by EPWP personal. Offtakes and connection points to be provided where connections to existing infrastructure will be made.	• N/A	• N/A	
7. Pressure test all newly installed pipelines	• N/A	• N/A	
8. Complete installation of fire pumps and commission.	• N/A	• N/A	

STAGE 2			
Task	**Area Affected**	**Temporary Service**	**Time**
			Task Time
1. On completion of all pressure testing and when approval is given, connect and charge new bulk supply line.	• N/A	• N/A	• N/A
2. Install and commission new pumps up to the elevated tank, with a connection allowing for the bypassing of the 1000 kℓ existing concrete reservoir directly into the pumps up to the elevated tank	• N/A	• N/A	• N/A
3. Charge new domestic and fire pipework with supply from elevated tank and ground fire tank.	• N/A	• N/A	• N/A
4. Incrementally switch over all offtakes and connection points during short shutdowns, keeping both old and new networks operational. Repairs to pipelines or replacement of existing valves or fittings and the blanking off of all fire hydrants can be done at the same time.	• All patients Wards • OPD & casualty • ICU •	• The contractor to provide water containers with a tap 3 or 4 per affected ward and a person to regularly check and fill water in the toilet cisterns.	• 6 hours
	• Theatre • X- Ray • Kitchen • Laundry • Stores	• Work to be done after hours/ at night when the facility is not in use.	6 hours
	• Staff houses • Nurses' home. •	• Communicate disruptions in advance to the occupants allowing them to plan accordingly. •	6 hours

STAGE 3			
Task	**Area Affected**	**Temporary Service**	**Time**
			Task Time
1. Shut off and scour the existing ground level water reservoir and complete all refurbishment work.	• N/A	• N/A	• N/A
2. Recommission the existing ground level water reservoir. Incorporate the ground level tank into the new reticulation as per design.	• N/A	• N/A	• N/A
3. Once all the offtakes and connection points have been moved over to the new system, the old system can be decommissioned and removed. The existing water tower can then be demolished	• N/A	• N/A	• N/A