REQUEST FOR BID

NATIONAL DEPARTMENT OF HEALTH

BID DETAILS: BOOK 2 OF 2: CONTRACT

BID NUMBER: NDoHF 09/2019-20

CLOSING Date: 22 OCTOBER 2019
   Time: 11:00


BRIEFING SESSION: YES [x] NO

DETAILS OF BIDDER

Organisation/individual: ............................................................................................................................

Contact person: .........................................................................................................................................

Date: .........................................................................................................................................................

Email address: ..........................................................................................................................................

Telephone Number: ..................................................................................................................................

Cellular Number: ........................................................................................................................................

Fax Number: ..............................................................................................................................................

Procurement process administered by National Department of Health
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PART C1: AGREEMENT AND CONTRACT DATA
C1.1: CONTRACT PARTICIPATION GOAL (CPG) DECLARATION

Contract Participation Goals (CPG) Targets

The Contractor shall allow in his pricing for the implementation of the CPG targets in accordance with specification SO included in this document. The Contractor must also allow for the provision of monthly reports to specify their achievements with regards to the CPG targets.

The table below to be completed by Bidder

<table>
<thead>
<tr>
<th>Subset</th>
<th>Main Contract Participation Goal</th>
<th>Subsets of Main Contract Participation Goal</th>
<th>Minimum % (D)</th>
<th>Bidders proposed % (Do)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Targeted Enterprise BBBEE - Subcontractor</td>
<td>SMME / QSE Enterprise (Subcontractor)</td>
<td>25,0%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Targeted Enterprise BEE-Supplier &amp; Manufacturer</td>
<td>SMME / QSE Supplier and Manufacturer</td>
<td>2,0%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Targeted Local Labour</td>
<td>Unskilled, Semi-skilled and Skilled Labour</td>
<td>3,0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total CPG Target</td>
<td>Subsets 1,2 &amp; 3</td>
<td>30,0%</td>
<td></td>
</tr>
</tbody>
</table>

The penalty applied would be calculated and follows:

\[
\text{Penalty} = 0.5 \times \frac{(D - Do) \times N_A}{100}
\]

\(D\) = Minimum CPG Target

\(Do\) = Achieved CPG Target

\(N_A\) = Net amount being the Tender Sum excluding VAT and Preliminary and General Amounts

Declaration

I/We hereby offer to undertake and implement the proposed CPG targets in accordance with the requirements as set out in the BID. We confirm that this proposal will remain binding upon us for the duration of the contract.

Signature of Bidder: _______________________________________________________

Date: _________________________________________________________________

Are you duly authorised to commit the Bidder: YES / NO

Capacity under which this proposal is signed ____________________________________

*Failure on the part of the Bidder to complete and sign this form in accordance with the minimum requirements will invalidate the proposal.*

Copies may be obtained from the Association of South African Quantity Surveyors (011-3154140, 021 4626431), Master Builders Association (011-205-9000; 021 6852625), South African Association of Consulting Engineers (011-4632022) or South African Institute of Architects (011-4860684; 021 424 7128).

**CONTRACT VARIABLES**

**THE SCHEDULE**

The schedule, as referred to in the contract agreement, is fully contained in this contract data section, contains all variables referred to in 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.

<table>
<thead>
<tr>
<th>42.0</th>
<th>PRE-TENDER INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>42.1</td>
<td>CONTRACTING AND OTHER PARTIES</td>
</tr>
<tr>
<td><strong>[1.2]</strong></td>
<td>Employer:</td>
</tr>
<tr>
<td></td>
<td>NATIONAL DEPARTMENT OF HEALTH</td>
</tr>
<tr>
<td></td>
<td>Postal address:</td>
</tr>
<tr>
<td></td>
<td>Private bag X628</td>
</tr>
<tr>
<td></td>
<td>Pretoria</td>
</tr>
<tr>
<td></td>
<td>001</td>
</tr>
<tr>
<td></td>
<td>Tel: 012 312 000</td>
</tr>
<tr>
<td></td>
<td>Physical address:</td>
</tr>
<tr>
<td></td>
<td>Civitas Building, Cnr Andries and Struben Streets, Pretoria</td>
</tr>
</tbody>
</table>
### 42.1.2

<table>
<thead>
<tr>
<th>Principal Agent:</th>
<th>Aurecon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postal address:</td>
<td>P.O. Box 509 George 6530</td>
</tr>
<tr>
<td>Tel:</td>
<td>044 805 5446</td>
</tr>
<tr>
<td>Fax:</td>
<td>086 600 9396</td>
</tr>
</tbody>
</table>

### 42.1.3

<table>
<thead>
<tr>
<th>Agent (1)</th>
<th>Brink Stokes Mkhize</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent’s service:</td>
<td>Architect</td>
</tr>
<tr>
<td>Postal address:</td>
<td>P.O. Box 1691 George 6530</td>
</tr>
<tr>
<td>Tel:</td>
<td>044 874 5054</td>
</tr>
<tr>
<td>Fax:</td>
<td>044 874 7715</td>
</tr>
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</table>

### 42.1.4

<table>
<thead>
<tr>
<th>Agent (2)</th>
<th>Chandler Consulting (Pty) Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent’s service:</td>
<td>Quantity Surveyor</td>
</tr>
<tr>
<td>Postal address:</td>
<td>P.O. Box 2228 George 6530</td>
</tr>
<tr>
<td>Tel:</td>
<td>044 873 5070</td>
</tr>
<tr>
<td>Fax:</td>
<td>-</td>
</tr>
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</table>

### 42.1.5

<table>
<thead>
<tr>
<th>Agent (3)</th>
<th>Aurecon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent’s service:</td>
<td>Civil Engineer</td>
</tr>
<tr>
<td>Postal address:</td>
<td>P.O. Box 509 George 6530</td>
</tr>
<tr>
<td>Tel:</td>
<td>044 805 5446</td>
</tr>
<tr>
<td>Fax:</td>
<td>086 600 9396</td>
</tr>
</tbody>
</table>

### 42.1.6

<table>
<thead>
<tr>
<th>Agent (4)</th>
<th>Aurecon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent’s service:</td>
<td>Structural Engineer</td>
</tr>
<tr>
<td>Postal address:</td>
<td>P.O. Box 509 George 6530</td>
</tr>
<tr>
<td>Tel:</td>
<td>044 805 5446</td>
</tr>
<tr>
<td>Fax:</td>
<td>086 600 9396</td>
</tr>
</tbody>
</table>
42.1.7  
[1.1, 5.2]  
Agent (5)  
BDE Consulting Engineers  
Agent’s service:  
Electrical Engineer  
Postal address:  
73 Meade Street  
George  
6530  
Tel: 044 801 9700  
Fax: 086 566 9263

42.1.8  
[1.1, 5.2]  
Agent (6)  
BDE Consulting Engineers  
Agent’s service:  
Mechanical Engineer  
Postal address:  
73 Meade Street  
George  
6530  
Tel: 044 801 9700  
Fax: 086 566 9263

42.1.9  
[1.1, 5.2]  
Agent (7)  
OHS Inc  
Agent’s service:  
Health & Safety  
Postal address:  
Tel: 082 771 7072  
Fax:

42.2  
CONTRACT DETAILS

42.2.1  
[1.1]  
Works description:  Refer to Part C3: Scope of Work.

42.2.2  
[1.1]  
Site description:  Refer to Part C4: Site Information.

42.2.4  
[41.0]  
Specific options that are applicable to a State organ only  
Where so
1) Interest rate legislation: The interest rate applicable will be 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)

2) Lateral support insurance to be effected by the contractor: Yes ☐ No ☒

3) Payment will be made for materials and goods Yes ☒ No ☐

4) Dispute resolution by litigation Yes ☒ No ☐

5) Extended defects liability period applicable to the following elements: 12 Months on electrical, electronic & mechanical installations

Possession of the site is to be given within ten (10) working days of the contractor providing the employer with the documents as required in terms of 15.1

Period for the commencement of the works after the contractor takes possession of the site: Ten (10) working days.

For the works as a whole:
The date for practical completion shall be N/A from the commencement date and the penalty per calendar day shall be R N/A.

For the works in sections:
The date for practical completion from the commencement date and the penalty per calendar day:

Section 1: Albertinia Clinic 6 Working months from handover date of clinic. Working months is shall:
1. Exclude the period between letter of acceptance and site handover
2. Exclude any annual builders holiday periods if applicable.
3. Include completing the works in sections in order that decanting of patients, staff and equipment can take place.
4. Include standing time of 10 working days between completion of one section and commencement of another section. No extension of time or additional Preliminaries will be paid for these standing times. The contractor may be requested to assist with labour for the decanting processes.
R 1 020,00

Section 2: Riversdale Clinic 6 Working months from handover date of clinic (Working months as stipulated above) R 800,00

Section 3: Riversdale Hospital 12 Working months from site handover date (Working months as stipulated above) R 2 430,00

The overall contract period is 15 working months.

The law applicable to this agreement shall be that of the: Republic of South Africa
### 42.3 INSURANCES

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>42.3.1</td>
<td>Contract works insurance to be effected by the <strong>contractor</strong></td>
</tr>
<tr>
<td>[10.1 #, 10.2 #, 12.1 #]</td>
<td>☑ To the minimum value of the <strong>contract sum</strong> plus 10%</td>
</tr>
<tr>
<td></td>
<td>☐ For the minimum sum of <strong>R N/A (N/A)</strong></td>
</tr>
<tr>
<td>42.3.2</td>
<td>Supplementary insurance is required: <strong>Yes</strong></td>
</tr>
<tr>
<td>[10.1#, 10.2 #, 12.1 #]</td>
<td>To the minimum value of the <strong>contract sum</strong> plus 10%</td>
</tr>
<tr>
<td>42.3.3</td>
<td>Public liability insurance to be effected by the <strong>contractor</strong></td>
</tr>
<tr>
<td>[11.1#, 12.1 #]</td>
<td>☑ For the sum of <strong>R 5 million</strong></td>
</tr>
<tr>
<td></td>
<td>☐ For the sum of <strong>R N/A (N/A)</strong></td>
</tr>
<tr>
<td>42.3.4</td>
<td>Support insurance to be effected by the <strong>contractor</strong></td>
</tr>
<tr>
<td>[11.2#, 12.1 #]</td>
<td>For the sum of <strong>R N/A (N/A)</strong></td>
</tr>
<tr>
<td></td>
<td>With a deductible of <strong>R N/A (N/A)</strong></td>
</tr>
</tbody>
</table>

### 42.4 DOCUMENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>42.4.2</td>
<td>Three (3) copies of the construction documents will be supplied to the <strong>contractor</strong> free of charge</td>
</tr>
<tr>
<td>42.4.5</td>
<td><strong>JBCC</strong> Engineering General Conditions are to be included in the <strong>contract documents</strong>: <strong>No</strong></td>
</tr>
</tbody>
</table>


### 42.4.6

<table>
<thead>
<tr>
<th>[31.5.3]</th>
<th>The <strong>contract value</strong> is to be adjusted using <strong>CPAP</strong> indices:</th>
<th>Yes ☒ No ☐</th>
</tr>
</thead>
</table>

Where **CPAP** is applicable, the **contract sum** will be adjusted in accordance with the **JBCC** Contract Price Adjustment Provisions (CPAP) as set out in the **CPAP** Indices Application Manual as prepared by the **JBCC** Series 2000, code 2118, dated 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 Priced Document.

2. All electrical installations in buildings and power distribution systems shall be adjusted in terms of the index for Work Group 160 Electrical Installation. In case of uninterruptible power supplies, elevators, escalators and hoists, generating sets, motor-alternator sets and intercommunication systems shall be in accordance with Work Group 170.

3. With reference to Work Group 190 a proportion of the value related preliminaries pro rata to the amount of work excluded from adjustment, shall be excluded from Contract Price Adjustment Provisions, if Option A has been selected for the adjustment of preliminaries.

4. Further to clause 3.4.4 of the **CPAP** Indices Application Manual, the listing of additional items for exclusion by bidders, will not be permitted.

5. Where V results in a negative amount after application of the formula in clause 8.3 of the **CPAP** Indices Application Manual the factor of 0.55 shall be substituted by 1.45.

**Alternative Indices:** Not Applicable

### 42.4.7

<table>
<thead>
<tr>
<th>[3.10]</th>
<th>Details of changes made to the provisions of <strong>JBCC</strong> standard documentation</th>
</tr>
</thead>
</table>

**Clause**

1.1 **COMMENCEMENT DATE** – means the date that the **agreement**, made in terms of the Form of Offer and Acceptance, comes into effect.

   "**CONSTRUCTION GUARANTEE**" means a 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 **schedule**.

   **CONSTRUCTION PERIOD** – means the period commencing on the **commencement date** and ending on the date of **practical completion**.

   **CORRUPT PRACTICE** – means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.

   **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 practice 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** – means the interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be the 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).

   "**PRICED DOCUMENT**" means bills of quantities, provisional bills of quantities, schedule of rates or other documents as are appropriate to this agreement.
“PRINCIPAL AGENT” means the person or entity appointed by the employer and named in the schedule. In the event of a principal agent not being appointed, then all the duties and obligations of a principal agent as detailed in the agreement shall be fulfilled by a representative of the employer as named in the schedule.

“SECURITY” means the form of security provided by the employer or contractor, as stated in the schedule, from which the contractor or employer may recover expense or loss.

1.6 Amend by replacing the words “prepaid registered post, telefax or e-mail” with “prepaid registered post or telefax”

1.6.4 No clause

3.2.1 Amend by replacing “14.1” with “14.0”

3.7 Replace with the following clause:

The principal agent shall supply the number of copies of drawings, unpriced bills of quantities/lump sum document and documents as stated in the schedule at no cost to the contractor. The contractor shall keep a copy of all drawings, schedules, unpriced bills of quantities/lump sum document and contract instructions on the site and shall supply and keep a copy of the JBCC Series 2000 Principal Building Agreement and Preliminaries applicable to this contract on the site. The employer, principal agent and agents shall have access to these documents at all times.

3.10 Replace the second reference to “principal agent” with the word “employer”

4.3 No clause

5.1.2 Amend reference to “32.6.1/3” to “32.6.2/3” and include reference to “34.4” and “38.5.8”, in terms of which the employer has retained its authority and has not given a mandate to the principal agent and in terms of which the employer shall sign all documents.

Add the following as 10.5

10.5 Damage to the works

10.5.1 Without in any way limiting the contractor’s obligations in terms of the contract, the contractor shall bear the full risk of damage to and/or destruction of the works by whatever cause during construction of the works and hereby indemnifies and holds harmless the employer against any such damage. The contractor shall take such precautions and security measures and other steps for the protection and security of the works as the contractor may deem necessary.

10.5.2 The contractor shall at all times proceed immediately to remove or dispose of any debris arising from damage to or destruction of the works and to rebuild, restore, replace and/or repair the works.

10.5.3 The employer shall carry the risk of damage to or destruction of the works and materials paid for by the employer that is the result of the excepted risks as set out in 10.6.

10.5.4 Where the employer bears the risk in terms of this contract, the contractor shall, if requested to do so, reinstate any damage or destroyed portions of the works and the costs of such reinstatement shall be measured and valued in terms of 32.0 hereof.

Add the following as 10.6

10.6 Injury to Persons or loss of or damage to Properties

10.6.1 The contractor shall be liable for and hereby indemnifies the employer against any liability, loss, claim or proceeding whether arising in common law or by statute, consequent upon personal injuries to or the death of any person whomsoever arising out of or in the course of or caused by the execution of the works unless due to any act or neglect of any person for whose actions the employer is legally liable.
10.6.2 The contractor shall be liable for and hereby indemnifies the employer against any liability, loss, claim or proceeding consequent upon loss of or damage to any moveable, or immovable or personal property or property contiguous to the site, whether belonging to or under the control of the employer or any other body or person, arising out of or in the course of or by reason of the execution of the works unless due to any act or neglect of any person for whose actions the employer is legally liable.

10.6.3 The contractor shall, upon receiving a contract instruction from the principal agent, cause the same to be made good in a perfect and workmanlike manner at his own cost and in default thereof the employer shall be entitled to cause it to be made good and to recover the cost thereof from the contractor or to deduct the same from amounts due to the contractor.

10.6.4 The contractor shall be responsible for the protection and safety of such portions of the premises placed under his control by the employer for the purpose of executing the works until the issue of the certificate of practical completion.

10.6.5 Where the execution of the works involves the risk of removal of or interference with support to adjoining properties including land or structures or any structures to be altered or added to, the contractor, shall and will remain adequately insured or insured against the death of or injury to persons or damage to such property consequent on such removal or interference with the support until such portion of the works has been completed.

10.6.6 The contractor shall at all times proceed immediately at his own cost to remove or dispose of any debris and to rebuild, restore, replace and/or repair such property and to execute the works.

Add the following as 10.7:

10.7 High risk insurance

In the event of the project being executed in a geological area classified as a “High Risk Area”, that is an area which is subject to highly unstable subsurface conditions that might result in catastrophic ground movement evident by sinkhole or doline formation the following will apply:

10.7.1 Damage to the works

10.7.1.1 The contractor shall, from the commencement date of the works until the date of the certificate of practical completion, bear the full risk of and hereby indemnifies and holds harmless the employer against any damage to and/or destruction of the works consequent upon a catastrophic ground movement as mentioned above. The contractor shall take such precautions and security measures and other steps for the protection of the works as he may deem necessary.

10.7.1.2 When so instructed to do so by the principal agent, the contractor shall proceed immediately to remove and/or dispose of any debris arising from damage to or destruction of the works and to rebuild, restore, replace and/or repair the works, at the contractor’s own costs.
10.7.2 Injury to persons or loss of or damage to property

10.7.2.1 The contractor shall be liable for and hereby indemnifies and holds harmless the employer against any liability, loss, claim or proceeding arising at any time during the period of the contract whether arising in common law or by statute, consequent upon personal injuries to or the death of any person whomsoever resulting from, arising out of or caused by a catastrophic ground movement as mentioned above.

10.7.2.2 The contractor shall be liable for and hereby indemnifies the employer against any and all liability, loss, claim or proceeding consequent upon loss of or damage to any moveable, or immovable or personal property or property contiguous to the site, whether belonging to or under the control of the employer or any other body or person whomsoever arising out of or caused by a catastrophic ground movement, as mentioned above, which occurred during the period of the contract.

10.7.3 It is the responsibility of the contractor to ensure that he has adequate insurance to cover his risk and liability as mentioned in 10.7.1 and 10.7.2. Without limiting the contractor’s obligations in terms of the contract, the contractor shall, within twenty one (21) calendar days of the commencement date but before commencement of the works, submit to the employer proof of such insurance policy, if requested to do so.

10.7.4 The employer shall be entitled to recover any and all losses and/or damages of whatever nature suffered or incurred consequent upon the contractor’s default of his obligations as set out in 10.7.1; 10.7.2 and 10.7.3. Such losses or damages may be recovered from the contractor or by deducting the same from any amounts still due under this contract or under any other contract presently or hereafter existing between the employer and the contractor and for this purpose all these contracts shall be considered one indivisible whole.

14.0 SECURITY

14.1 In respect of contracts with a contract sum up to R1 million, the security to be provided by the contractor to the employer will be a payment reduction of ten per cent (10%) of the value certified in the payment certificate (excluding VAT) up to a maximum of five per cent (5%) of the value of the contract (excluding VAT).

14.1.1 The payment reduction of the value certified in a payment certificate shall be in terms of 31.8(A).

14.1.2 The employer shall be entitled to recover expense and loss from the payment reduction in terms of 33.0 provided that the employer complies with the provisions of 33.4 in which event the employer’s entitlement shall take precedence over his obligations to refund the payment reduction security or portions thereof to the contractor.

14.2 In respect of contracts with a contract sum above R1 million, the contractor shall have the right to select the security to be provided in terms of 14.3, 14.4, 14.5 or 14.6 as stated in the schedule. Such security shall be provided to the employer within twenty-one (21) calendar days from commencement date. Should the contractor fail to select the security to be provided or should the contractor fail to provide the employer with the selected security within twenty-one (21) calendar days from commencement date, the contractor shall be deemed to be in default and the employer may cancel the contract in terms of 36.0.
14.3 Where the security as a cash deposit of ten per cent (10%) of the contract sum (excluding VAT) has been selected:

14.3.1 The contractor shall furnish the employer with a cash deposit equal in value to ten per cent (10%) of the contract sum (excluding VAT) within twenty-one (21) calendar days from commencement date.

14.3.2 Within twenty-one (21) calendar days of the date of practical completion of the works the employer shall reduce the cash deposit to an amount equal to three per cent (3%) of the contract value (excluding VAT), and refund the balance to the contractor.

14.3.3 Within twenty-one (21) calendar days of the date of final completion of the works the employer shall reduce the cash deposit to an amount equal to one per cent (1%) of the contract value (excluding VAT) and refund the balance to the contractor.

14.3.4 On the date of payment of the amount in the final payment certificate, the employer shall refund the remainder of the cash deposit to the contractor.

14.3.5 The employer shall be entitled to recover expense and loss from the cash deposit in terms of 33.0 provided that the employer complies with the provisions of 33.4 in which event the employer’s entitlement shall take precedence over his obligations to refund the cash deposit security or portions thereof to the contractor.

14.3.6 The parties expressly agree that neither the employer nor the contractor shall be entitled to cede the rights to the deposit to any third party.

14.4 Where security as a variable construction guarantee of ten per cent (10%) of the contract sum (excluding VAT) has been selected:

14.4.1 The contractor shall furnish the employer with an acceptable variable construction guarantee equal in value to ten per cent (10%) of the contract sum (excluding VAT) within twenty-one (21) calendar days from commencement date.

14.4.2 The variable construction guarantee shall reduce and expire in terms of the Variable Construction Guarantee form included in the invitation to tender.

14.4.3 The employer shall return the variable construction guarantee to the contractor within fourteen (14) calendar days of it expiring.

14.4.4 Where the employer has a right of recovery against the contractor in terms of 33.0, the employer shall issue a written demand in terms of the variable construction guarantee.

14.5 Where security as a fixed construction guarantee of five per cent (5%) of the contract sum (excluding VAT) and a five per cent (5%) payment reduction of the value certified in the payment certificate (excluding VAT) has been selected:

14.5.1 The contractor shall furnish a fixed construction guarantee to the employer equal in value to five per cent (5%) of the contract sum (excluding VAT).

14.5.2 The fixed construction guarantee shall come into force on the date of issue and shall expire on the date of the last certificate of practical completion.

14.5.3 The employer shall return the fixed construction guarantee to the contractor within fourteen (14) calendar days of it expiring.

14.5.4 The payment reduction of the value certified in a payment certificate shall be in terms of 31.8(B) and 34.8.

14.5.5 Where the employer has a right of recovery against the contractor in terms of 33.0, the employer shall be entitled to issue a written demand in terms of the fixed construction guarantee or may recover from the payment reduction or may do both.
14.6 Where security as a cash deposit of five per cent (5%) of the contract sum (excluding VAT) and a payment reduction of five per cent (5%) of the value certified in the payment certificate (excluding VAT) has been selected:

14.6.1 The contractor shall furnish the employer with a cash deposit equal in value to five per cent (5%) of the contract sum (excluding VAT) within twenty-one (21) calendar days from commencement date.

14.6.2 Within twenty-one (21) calendar days of the date of practical completion of the works the employer shall refund the cash deposit in total to the contractor.

14.6.3 The payment reduction of the value certified in a payment certificate shall be mutatis mutandis in terms of 31.8(B).

14.6.4 Where the employer has a right of recovery against the contractor in terms of 33.0, the employer may issue a written notice in terms of 33.4 or may recover from the payment reduction or may do both.

14.7 Payments made by the guarantor to the employer in terms of the fixed or variable construction guarantee shall not prejudice the rights of the employer or contractor in terms of this agreement.

Replace clauses 15.1, 15.1.1 and 15.1.2 with the following:

15.1 On acceptance of the tender or negotiated amount, the contractor shall submit:

15.1.1 The Priced Document within twenty-one (21) calendar days of commencement date, to the quantity surveyor as identified in the contract data and where such quantity surveyor has not been identified, the principal agent. Such document shall have all items properly priced, extended and cast. Priced items are deemed to include all costs, overheads and profit. The quantity surveyor/principal agent may instruct the contractor to adjust prices which are considered to be imbalanced or unreasonable and to eliminate errors or discrepancies. Such adjustments shall be effected to the approval of the quantity surveyor/principal agent and shall not change the contract sum.

15.1.2 In respect of contracts with a contract sum above R1 million, the security selected in terms of 14.3, 14.4, 14.5 or 14.6, to the employer.

Add 15.1.4 as follows:

15.1.4 An acceptable health and safety plan, required in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), within twenty-one (21) calendar days of commencement date.

15.2.1 Amend to read as follows:

“Give the contractor possession of the site within ten (10) working days of the contractor complying with the terms of 15.1.1, 15.1.2 and 15.1.4”

Add 15.5 and 15.6 as follows:

15.5 Construction programme and “milestone dates”

15.5.1 The contractor shall prepare and submit a detailed programme of the works within fourteen (14) calendar days from the site handover date, to the principal agent and employer, to enable the principal agent and employer to assess the progress of the works. The contractor shall coordinate n/s subcontractors’ and direct contractors’ programmes with his own and implement and modify the programme should any significant deviation take place. Copies of the programme and all supporting documents and all updates shall be issued timeously and at each monthly progress meeting to the principal agent, employer and other relevant parties.

15.5.2 The principal agent shall determine a number of significant “milestones” in the construction progress of the works and the contractor shall provide dates to the employer on which these milestones are to be achieved. Failure to achieve these “milestone dates” may result in the employer cancelling the contract in terms of 36.1.1.

15.6 The circumstances for which the contractor is entitled to a revision of “milestone dates” are delays to “milestone” achievement caused by delays as listed under clauses 29.1.1 to 29.1.6 and 29.2.1 to 29.2.11 and 29.3 that shall be applied mutatis mutandis.
Add 15.7 as follows:

15.7 The **contractor** shall submit a verified “Poverty Alleviation and Job Creation” form at each monthly progress meeting, providing details of the number of employees on site for the preceding month, which shall be inclusive of details for **direct contractors’** and/or **subcontractors’** employees.

17.1.11 Delete both occurrences of the words “and selected”

20.1.3 No clause

21.0 No clause

25.4 Amend by replacing “31.10” with “31.11.2”

26.1.2 Amend by replacing “bills of quantities” with “priced document and contract data”

29.2.5 No clause

31.8 Amend as follows:

### 31.8 Payment reduction according to security selection in terms of 14.0

<table>
<thead>
<tr>
<th>31.8(A)</th>
<th>31.8(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ninety per cent (90%) of such value in interim <strong>payment certificates</strong> issued up to the date of <strong>practical completion</strong>, subject to a maximum reduction of interim <strong>payment certificates</strong> to a value of ninety-five per cent (95%) of the <strong>contract sum</strong>. Once the maximum payment reduction has been reached, the <strong>principal agent</strong> shall determine the appropriate percentage of reduction to maintain the <strong>security</strong> at the maximum payment adjustment level until the percentage of reduction is reduced in terms of 31.8(A).2</td>
<td></td>
</tr>
<tr>
<td>Ninety-five per cent (95%) of such value in interim <strong>payment certificates</strong> issued in terms of 31.4.1 and of the <strong>materials and goods</strong> in terms of 31.4.2 shall be certified in full. The value certified shall be subject to the following percentage adjustments:</td>
<td></td>
</tr>
<tr>
<td>Ninety-seven per cent (97%) of such value in interim <strong>payment certificates</strong> issued on the date of <strong>practical completion</strong> and up to, but excluding, the date of <strong>final completion</strong></td>
<td></td>
</tr>
<tr>
<td>Ninety-nine per cent (99%) of such value in interim <strong>payment certificates</strong> issued on the date of <strong>final completion</strong> and up to but excluding the final <strong>payment certificate</strong> in terms of 34.6</td>
<td></td>
</tr>
<tr>
<td>One hundred per cent (100%) of such value in the final <strong>payment certificate</strong> in terms of 34.6 except where the amount certified is in favour of the <strong>employer</strong>. In such an event the payment reduction shall remain at the adjustment level applicable to the final <strong>payment certificate</strong></td>
<td></td>
</tr>
<tr>
<td>Ninety-five per cent (95%) of such value in interim <strong>payment certificates</strong> issued up to the date of <strong>practical completion</strong></td>
<td></td>
</tr>
<tr>
<td>Ninety-seven per cent (97%) of such value in interim <strong>payment certificates</strong> issued on the date of <strong>practical completion</strong> and up to, but excluding, the date of <strong>final completion</strong></td>
<td></td>
</tr>
<tr>
<td>Ninety-nine per cent (99%) of such value in interim <strong>payment certificates</strong> issued on the date of <strong>final completion</strong> and up to but excluding the final <strong>payment certificate</strong> in terms of 34.6</td>
<td></td>
</tr>
<tr>
<td>One hundred per cent (100%) of such value in the final <strong>payment certificate</strong> in terms of 34.6 except where the amount certified is in favour of the <strong>employer</strong>. In such an event the payment reduction shall remain at the adjustment level applicable to the final <strong>payment certificate</strong></td>
<td></td>
</tr>
</tbody>
</table>
31.12 Delete the following: “Payment shall be subject to the employer giving the contractor a tax invoice for the amount due.”

31.16 / 31.16.3 No clause

32.5.1 / 32.5.4 / 32.5.7 Add the following to the end of each of these clauses:
“…due to no fault of the contractor”

32.6.2 / 32.6.3 / 32.15 Replace “principal agent” with “employer”

33.1.7 / 33.2.4 Delete the following “in terms of 14.5”

33.2.8 Delete the words “or selected”

33.2 Add the following clauses 33.2.9 to 33.2.13:

33.2.9 the contractor’s failure or neglect to commence with the works on the dates prescribed in the contract

33.2.10 the contractor’s failure or neglect to proceed with the works in terms of the contract

33.2.11 the contractor’s failure or neglect for any reason to complete the works in accordance with the contract

33.2.12 the contractor’s refusal or neglect to comply strictly with any of the conditions of contract or any contract instructions and/or orders in writing given in terms of the contract

33.2.13 the contractor’s estate being sequestrated; liquidated or surrendered in terms of the insolvency laws in force within the Republic of South Africa

33.4 replace “in terms of 14.4.5” with “in terms of 14.5 or 14.6”

34.3 / 34.4 Replace “principal agent” with “employer”

34.8 The principal agent shall certify one hundred per cent (100%) of the amount of the final account in the final payment certificate where security in terms of 14.5 or 14.6 has been selected and where payment reduction has been applied

34.13 Replace “seven (7) calendar days” with “twenty one (21) calendar days” and delete the words: “subject to the employer giving the contractor a tax invoice for the amount due”

36.1.3 refuses or neglects to comply strictly with any of the conditions of contract

36.1.4 estate being sequestrated, liquidated or surrendered in terms of the insolvency laws in force within the Republic of South Africa

36.1.5 in the judgement of the employer, has engaged in corrupt or fraudulent practices in competing for or in executing the contract

36.3 Replace “principal agent” with “employer”

36.5.11 Replace “27.2.1” with “27.2”

Add the following clause:

36.7 Notwithstanding any clause to the contrary, on cancellation of this agreement either by the employer or the contractor; or for any reason whatsoever, and the contractor shall on written instruction, discontinue with the works on a date stated and withdraw himself from the site. The contractor shall not be entitled to refuse to withdraw from the works on the grounds of any lien or right of retention or on the grounds of any other right whatsoever

37.3.5 Replace “ninety (90)” with “one hundred and twenty (120)”

37.3.8 Replace “27.2.2” with “27.2”

Add the following clause:
37.5 Notwithstanding any clause to the contrary, on cancellation of this agreement either by the employer or the contractor; or for any reason whatsoever, the contractor shall on written instruction, discontinue with the works on a date stated and withdraw himself from the site. The contractor shall not be entitled to refuse to withdraw from the works on the grounds of any lien or right of retention or on the grounds of any other right whatsoever.

38.5.4 Replace “ninety (90)” with “one hundred and twenty (120)”

38.5.8 Replace “principal agent” with “employer”

38.5.9 Replace “27.2.2” with “27.2”

Add the following clause:

38.7 Notwithstanding any clause to the contrary, on cancellation of this agreement either by the employer or the contractor; or for any reason whatsoever, the contractor shall on written instruction, discontinue with the works on a date stated and withdraw himself from the site. The contractor shall not be entitled to refuse to withdraw from the works on the grounds of any lien or right of retention or on the grounds of any other right whatsoever.

39.3.5 Add the following words at the end thereof: “within one hundred and twenty (120) working days of completion of such a report”

39.3.9 Replace “27.2.1” with “27.2”

40.2.2 Replace “one (1) year” with “three (3) years”

Remove the reference to “no clause” in clause 40.6 and replace with:

40.6 The provision of 40.2 shall not be construed as a waiver of the parties’ entitlement to resolve a dispute by mediation at any time.

40.7.1 Change “ten (10)” to “fifteen (15)” and by the addition of the following to the end thereof:

Whether or not mediation resolves the dispute, the parties shall bear their own costs concerning the mediation and equally share the costs of the mediator and related costs.

NOTIFICATION OF THE REQUIREMENT FOR CONTRACTOR PERFORMANCE REPORT

The principal agent shall issue to the Contractor together with the certificate of practical completion a completed CIDB Contractor Performance Report (See Annex A). Unless the contractor within one week of receiving such report disputes its findings, the report shall deemed to reflect the performance of the contractor.

Disputes relating to the findings of the report shall be dealt with in accordance with the provisions of Clause 40.
42.0 POST-TENDER INFORMATION

**Note:** All information for this section requires consultation with the contractor. The principal agent shall not pre-select any of the alternatives available to the contractor.

42.5 CONTRACT DETAILS

42.5.1 Contractor:

Postal address:
________________________________________
________________________________________
________________________________________

Tel: ____________________________  Fax: ____________________________

TAX / VAT Registration No: ____________________________

Physical address:
________________________________________
________________________________________
________________________________________

42.5.2 The accepted contract sum inclusive of tax is R ____________________________

Amount in words: _____________________________________________________

42.5.3 [31.3] The latest day of the month for the issue of an interim payment certificate: _______________

42.5.4 [32.12] The preliminaries amounts shall be paid in terms of:  

<table>
<thead>
<tr>
<th>Alternative A</th>
<th>Alternative B</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

42.5.5 [32.12] The preliminaries amounts shall be adjusted in terms of:  

<table>
<thead>
<tr>
<th>Alternative A</th>
<th>Alternative B</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
The security to be provided by the contractor:

14.1 The Bidder accepts that in respect of contracts up to R1 million, a payment reduction** of 10% of the value certified in payment certificates (excluding VAT) up to a maximum of 5% of the contract value will be applicable and will be deducted by the Employer in terms of the applicable conditions of contract.

14.2 In respect of contracts above R1 million, the Bidder offers to provide security as indicated below:

14.3 Cash deposit of 10% of the Contract Sum (excluding VAT)

14.4 Variable construction guarantee of 10% of the Contract Sum (excluding VAT) (WCTD-10.3)

14.5 Fixed construction guarantee of 5% of the Contract Sum (excluding VAT) (WCTD-10.1) and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)

14.6 Cash deposit of 5% of the Contract Sum (excluding VAT) and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)

NB. Guarantees submitted must be issued by either an insurance company duly registered in terms of the Short-Term Insurance Act, 1998 (Act 35 of 1998) or by a bank duly registered in terms of the Banks Act, 1990 (Act 94 of 1990) on the pro-forma referred to above. No alterations or amendments of the wording of the pro-forma will be accepted.

The annual building holiday period after the commencement of the construction period:

From: ____________________________ to ____________________________

DOCUMENTS

Priced Document: Yes □ No □ Document marked as: ____________________________

Guarantees: Yes □ No □ Document marked as: ____________________________

Contract drawings: Yes □ No □ Document marked as: ____________________________

Other documents: Yes □ No □ (Attach additional pages if more space is required)
### SIGNATURES OF THE CONTRACTING PARTIES

Thus done and signed at __________________________ on __________________________

<table>
<thead>
<tr>
<th>Name of signatory</th>
<th>for and behalf of the <strong>Employer</strong> who by signature hereof warrants authorisation hereto</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity of signatory</td>
<td>as Witness</td>
</tr>
</tbody>
</table>

Thus done and signed at __________________________ on __________________________

<table>
<thead>
<tr>
<th>Name of signatory</th>
<th>for and behalf of the <strong>Contractor</strong> who by signature hereof warrants authorisation hereto</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity of signatory</td>
<td>as Witness</td>
</tr>
</tbody>
</table>
C1.3: FIXED CONSTRUCTION GUARANTEE
JBCC 2000 PRINCIPAL BUILDING AGREEMENT
(Edition 4.1 of March 2005)

To: National Department of Health
Private Bag X828
PRETORIA
0001

Sir,

FIXED CONSTRUCTION GUARANTEE FOR THE EXECUTION OF A CONTRACT IN TERMS OF JBCC 2000 (4.1 EDITION MARCH 2005)

1 With reference to the contract between ______________________________________________________
(hereinafter referred to as the “contractor”) and the National Department of Health,
(hereinafter referred to as the “employer”), Tender No: NDoHF 09/2019-20, for the NDoHF 09/2019-20: WC 9.D.D: REFURBISHMENTS AND UPGRADES AT ALBERTINA & RIVERSDALE CLINICS AND RIVERSDALE HOSPITAL IN WESTERN CAPE PROVINCE, EDEN DISTRICT MUNICIPALITY (hereinafter referred to as the “contract”)
in the amount of R ____________________________ , (in words ____________________________ )
(hereinafter referred to as the contract sum), I / We, ___________________________________________________________________
in my/our capacity as ________________________________________________________________
and hereby representing _____________________________________________ (hereinafter referred to as the “guarantor”)
advise that the guarantor holds at the employer’s disposal the sum of R ____________________________ ,
(in words __________________________________________________________________________) being five (5) % of the contract sum (excluding VAT), for the due fulfilment of the contract.

2 The guarantor hereby renounces the benefits of the exceptions non numeratae pecunia; non causa debiti; excussionis et divisionis; and all other exceptions which could be pleaded against the enforcement of this guarantee, with the meaning and effect whereof I/we declare myself/ourselves to be conversant, and undertake to pay the employer the amount guaranteed, during the period when the claim is received by the guarantor, on receipt of a written demand from the employer to do so, and which demand the employer may make if the employer has a right of recovery against the contractor in terms of 33.0 of the contract.

3 Subject to the above, but without in any way detracting from the employer’s rights to adopt any of the procedures provided for in the contract, the said demand can be made by the employer, at any stage prior to the expiry of this guarantee.

4 The amount paid by the guarantor in terms of this guarantee may be retained by the employer on condition that upon the issue of the last final payment certificate, the employer shall account to the guarantor showing how this amount has been expended and refund any balance due to the guarantor.

5 The employer shall have the absolute right to arrange his affairs with the contractor in any manner, which the employer deems, fit and the guarantor shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the guarantor. Without derogating from the a foregoing, any compromise, extension
of the construction period, indulgence, release or variation of the contractor’s obligation shall not affect the validity of this guarantee.

6 This undertaking is neither negotiable nor transferable, and

6.1 must be surrendered to the guarantor at the time when the employer accounts to the guarantor in terms of clause 4 above, or

6.2 shall lapse on the date of the last certificate of practical completion; and

6.3 shall not be interpreted as extending the guarantor’s liability to anything more than payment of the amount guaranteed

SIGNED AT __________________________ ON THIS __________________________ DAY OF __________________________ 200__

AS WITNESSES

1. __________________________ __________________________

2. __________________________ __________________________

By and on behalf of

________________________________________

(insert the name and physical address of the guarantor)

NAME: __________________________

CAPACITY: __________________________

(duly authorised thereto by resolution attached marked Annexure A)

DATE: __________________________

A. No alterations and/or additions of the wording of this form will be accepted.

B. The physical address of the guarantor must be clearly indicated and will be regarded as the guarantor’s domicilium citandi et executandi, for all purposes arising from this guarantee.

C. This GUARANTEE must be returned to: __________________________

____________________________________________________________________
C1.4: VARIABLE CONSTRUCTION GUARANTEE
JBCC 2000 PRINCIPAL BUILDING AGREEMENT
(Edition 4.1 of March 2005)

To: National Department of Health
Private Bag X828
PRETORIA
0001

Sir,

VARIABLE CONSTRUCTION GUARANTEE FOR THE EXECUTION OF A CONTRACT IN TERMS OF JBCC 2000 (4.1 EDITION MARCH 2005)

1 With reference to the contract between ________________________________________________________
   ________________________________________ (hereinafter referred to as the “contractor”) and the National
   Department of Health, (hereinafter referred to as the “employer”), Tender No: NDoHF 09/2019-20, for the NDoHF
   RIVERSDALE HOSPITAL IN WESTERN CAPE PROVINCE, EDEN DISTRICT MUNICIPALITY (hereinafter
   referred to as the “contract”) in the amount of R ____________________________________________
   (in words ______________________)
   (hereinafter referred as the contract sum), I / We, _____________________________________________________________________
   in my/our capacity as ________________________________________________________________and hereby
   representing _____________________________________________ (hereinafter referred to as the “guarantor”)
   advise that the guarantor holds at the employer’s disposal the sum of R _______________________________
   (in words ___________________________________________________________________________) being
   ten (10) % of the contract sum (excluding VAT), for the due fulfilment of the contract.

2 I / We advise that the guarantor’s liability in terms of this guarantee shall be reduced as follows:

   2.1 From and including the date on which this guarantee is issued and up to and including the date of payment
       of the amount in the practical completion certificate, the guarantor will be liable in terms of this guarantee
       to the maximum amount of 10% of the contract sum (excluding VAT);

   2.2 From and including the day after the date of the certificate of practical completion and up to and including
       the date of the final completion certificate, the guarantor’s liability will be reduced to 3% of the value of the
       works (excluding VAT);

   2.3 From and including the day after the date of the final completion certificate and up to and including the
       date of settlement of the amount in the final payment certificate, the guarantor’s liability will be reduced to
       1% of the value of the works (excluding VAT);

   2.4 This guarantee shall expire on the date of payment of the amount in the last final payment certificate

3 The guarantor hereby renounces the benefits of the exceptions non numeratae pecunia; non causa debiti;
   excussionis et divisionis; and all other exceptions which could be pleaded against the enforcement of this
   guarantee, with the meaning and effect whereof I/we declare myself/ourselves to be conversant, and undertake to
   pay the employer the amount guaranteed, during the period when the claim is received by the guarantor, on
   receipt of a written demand from the employer to do so, and which demand the employer may make if the
   employer has a right of recovery against the contractor in terms of 33.0 of the contract.
Subject to the above, but without in any way detracting from the employer’s rights to adopt any of the procedures provided for in the contract, the said demand can be made by the employer at any stage prior to the expiry of this guarantee.

The amount paid by the guarantor in terms of this guarantee may be retained by the employer on condition that upon the issue of the last final payment certificate, the employer shall account to the guarantor showing how this amount has been expended and refund any balance due to the guarantor.

The employer shall have the absolute right to arrange his affairs with the contractor in any manner which the employer deems fit and the guarantor shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the guarantor. Without derogating from the foregoing, any compromise, extension of the construction period, indulgence, release or variation of the contractor’s obligation shall not affect the validity of this guarantee.

This undertaking is neither negotiable nor transferable, and

1. must be surrendered to the guarantor at the time when the employer accounts to the guarantor in terms of clause 5 above, or

2. shall lapse in accordance with clause 2.4 above; and

3. shall not be interpreted as extending the guarantor’s liability to anything more than the payment of the amount guaranteed

SIGNED AT ___________________________ ON THIS ___________________________ DAY OF ___________________________ 200__

AS WITNESSES

1. ___________________________ ___________________________

2. ___________________________ ___________________________

By and on behalf of

(insert the name and physical address of the guarantor)

NAME: ___________________________

CAPACITY: ___________________________

(duly authorised thereto by resolution attached marked Annexure A)

DATE: ___________________________

D. No alterations and/or additions of the wording of this form will be accepted.

E. The physical address of the guarantor must be clearly indicated and will be regarded as the guarantor’s domicilium citandi et executandi, for all purposes arising from this guarantee.

F. This GUARANTEE must be returned to: ___________________________ ___________________________
PART C2: PRICING DATA
C2.1: PRICING INSTRUCTIONS

JBCC 2000 PRINCIPAL BUILDING AGREEMENT
(Edition 4.1 of March 2005)

C2.1 Pricing Instructions

1 GENERAL

1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act no. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

1.2 The consultant(s)/project manager must acquaint themselves fully with all relevant matters pertaining to this section in order to enable prospective bidders to price for all eventualities.

2 PRICED DOCUMENT

2.1 The Priced Document, including specialist trades i.e. electrical installation, mechanical installation and civil and structural engineering work, has been drawn up in accordance with the Standard System of Measuring Building Work (as amended) published and issued by the Association of South African Quantity Surveyors (Sixth Edition (Revised)), 1999. The Priced 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, Specifications, Drawings and all other relevant documentation.

2.2 It will be assumed that prices included in the Priced Document are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information on standards)

2.3 The Priced Document is not intended for the ordering of materials. Any ordering of materials, based on the Priced Document, is at the Contractor's risk.

3 VALUE ADDED TAX

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

4 CONTRACT DOCUMENT

4.1 The agreement is based on the JBCC Series 2000 Principal Building Agreement, prepared by the Joint Building Contracts Committee, Edition 4.1, March 2005. The additions, deletions and alterations to the JBCC Principal Building Agreement as well as the contract specific variables are as stated in the Contract Data. Only the headings and clause numbers for which allowance must be made in the Priced Document are recited.

4.2 Preliminary and general requirements are based on the JBCC Series 2000 Preliminaries, prepared by the Joint Building Contracts Committee, May 2005. The additions, deletions and alterations to the various parts of these JBCC Preliminaries as well as the contract specific variables are as stated in the Contract Data in the Scope of
Work. Only the headings and clause numbers for which allowance must be made in the Priced Document are recited.

4.3 The Contract Data and the standard form of contract referenced therein must be studied for the full extent and meaning of each and every clause set out in Section 1 (Preliminary and General) of the Priced Document. Where any item is not relevant to this specific contract, such item is marked N/A (signifying "not applicable").

5 DRAWINGS

5.1 The drawings listed in the Scope of Works, used for the setting up this Priced Document, are kept by the quantity surveyor and can be viewed at any time during office hours up until the completion of the works.

6 QUANTITY SPLITS

6.1 The quantities applicable per facility is reflected below each item in the priced document. The names of the locations are as follows:

Location 21: Albertinia Clinic
Location 22: Riversdale Clinic
Location 23: Riversdale Hospital
**NATIONAL DEPARTMENT OF HEALTH**

**NDoHF 09/2019-20: WC 9.D.D: REFURBISHMENTS AND UPGRADES AT ALBERTINA & RIVERSDALE CLINICS AND RIVERSDALE HOSPITAL IN WESTERN CAPE PROVINCE, EDEN DISTRICT MUNICIPALITY**

**C2.2: PRICED DOCUMENT COMPRISING BILLS OF QUANTITIES**

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- Bill No 3 Concrete Formwork and Reinforcement 88
- Bill No 4 Masonry 92
- Bill No 5 Waterproofing 95
- Bill No 6 Roof Covering 98
- Bill No 7 Carpentry & Joinery 102
- Bill No 8 Ceilings & Partitions 106
- Bill No 9 Floor Coverings 109
- Bill No 10 Ironmongery 114
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<table>
<thead>
<tr>
<th>Bill No</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>RIVERSDALE HOSPITAL NEW HVAC EQUIPMENT</td>
<td>179</td>
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<td>RIVERSDALE HOSPITAL HVAC REPAIR</td>
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<td>RIVERSDALE HOSPITAL HVAC SERVICE</td>
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<td>RIVERSDALE HOSPITAL HVAC TRANSPORT &amp; LABOUR</td>
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<td>RIVERSDALE HOSPITAL FIRE DETECTION NEW EQUIPMENT</td>
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<td>RIVERSWDALE HOSPITAL SIGNS</td>
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<td>14</td>
<td>RIVERSDALE HOSPITAL FIRE EQUIPMENT TRANSPORT &amp; LABOUR</td>
<td>213</td>
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**SUMMARY OF SECTION 4**

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**FINAL TENDER SUMMARY**

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<table>
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<th>Item No</th>
<th>Quantity</th>
<th>Amount</th>
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**SECTION NO. 1: PRELIMINARIES**

**BILL NO. 1**

**PRELIMINARIES**

**MEANING OF TERMS "TENDER / TENDERER"**

Any reference to the words "Tender" or "Tenderer" herein and/or in any other documentation shall be construed to have the same meaning as the words "Bid" or "Bidder".

**PRELIMINARIES**

The JBCC Preliminaries Code 2103, May 2005 edition for use with the JBCC Principal Building Agreement Edition 4.1 Code 2101, March 2005 is taken to be incorporated herein. The tenderer is deemed to have referred to these documents for the full intent and meaning of each clause. These clauses are referred to by number and heading only. Where standard clauses or options are not applicable to the contract such modifications or corrections as are necessary are given under each relevant clause. Where an item is not relevant to this specific contract such item is marked "N/A" signifying "Not Applicable".

**PRICING OF PRELIMINARIES**

Should Option A, as set out in clause B10.3.1 hereinafter be used for the adjustment of preliminaries then each item priced is to be allocated to one or more of the three categories Fixed, Value Related or Time Related and the respective amounts entered in the spaces provided under each item.

Items not priced in these Preliminaries shall be deemed to be included elsewhere in these Bills of Quantities.

**SECTION A: JBCC PRINCIPAL BUILDING AGREEMENT**

**DEFINITIONS**

A

A1.0 DEFINITIONS AND INTERPRETATION

Clause 1.0

Clause 1.1 Definition of "Commencement Date" is added:

-32-
"COMMENCEMENT DATE" means the date that the agreement, made in terms of the Form of Offer and Acceptance, comes into effect

Clause 1.1 Definition of "Construction Guarantee" is amended by replacing it with the following:

"CONSTRUCTION GUARANTEE" means a 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 schedule

Clause 1.1 Definition of "Construction Period" is amended by replacing it with the following:

"CONSTRUCTION PERIOD" means the period commencing on the commencement date and ending on the date of practical completion

Clause 1.1 Definition of "Corrupt Practice" is added:

"CORRUPT PRACTICE" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution

Clause 1.1 Definition of "Fraudulent Practice" is added:

"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 practice 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

Clause 1.1 Definition of "Interest" is amended by replacing it with the following:

"INTEREST" means the interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be the 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)

Clause 1.1 Definition of "Principal Agent" is amended by replacing it with the following:

"PRINCIPAL AGENT" means the person or entity appointed by the employer and named in the schedule. In the event of a principal agent not being appointed, then all the duties and obligations of a principal agent as detailed in the agreement shall be fulfilled by a representative of the employer as named in the schedule

Clause 1.1 Definition of "Security" is amended by replacing it with the following:

"SECURITY" means the form of security provided by the employer or contractor, as stated in the schedule, from which the contractor or employer may recover expense or loss
Clause 1.6 is amended by replacing the words "prepaid registered post, telefax or e-mail" with "prepaid registered post or telefax"

Clause 1.6.4 is amended by replacing it with the following:

No clause

Fixed:_________ Value related:_________ Time related:_________ Item

OBJECTIVE AND PREPARATION

A A2.0 OFFER, ACCEPTANCE AND PERFORMANCE

Clause 2.0

Fixed:_________ Value related:_________ Time related:_________ Item

B A3.0 DOCUMENTS

Clause 3.0

Clause 3.2.1 is amended by replacing "14.1" with "14.0"

Clause 3.7 is amended by the addition of the following:

The contractor shall supply and keep a copy of the JBCC Series 2000 Principal Building Agreement and Preliminaries applicable to this contract on the site, to which the employer, principal agent and agents shall have access at all times

Clause 3.10 is amended by replacing the second reference to "principal agent" with the word "employer"

Fixed:_________ Value related:_________ Time related:_________ Item

C A4.0 DESIGN RESPONSIBILITY

Clause 4.0

Clause 4.3 is amended by replacing it with the following:

No clause

Fixed:_________ Value related:_________ Time related:_________ Item

Carried to Collection R

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
A5.0 EMPLOYER'S AGENTS

Clause 5.0

Clause 5.1.2 is amended to include clauses 32.6.3, 34.3, 34.4 and 38.5.8

Fixed:_________ Value related:___________ Time related:___________ Item

A6.0 SITE REPRESENTATIVE

Clause 6.0

Fixed:_________ Value related:___________ Time related:___________ Item

A7.0 COMPLIANCE WITH REGULATIONS

Clause 7.0

Note: A separate clause has been included in Section C: Specific Preliminaries of the bills of quantities / lump sum document for the contractor to have the opportunity to price for all the requirements of the Occupational Health and Safety Act, Construction Regulations and Health and Safety Specification

Fixed:_________ Value related:___________ Time related:___________ Item

A8.0 WORKS RISK

Clause 8.0

Fixed:_________ Value related:___________ Time related:___________ Item

A9.0 INDEMNITIES

Clause 9.0

Fixed:_________ Value related:___________ Time related:___________ Item

A10.0 WORKS INSURANCES

Clause 10.0

Clause 10.0 is amended by the addition of the following clauses:

Carried to Collection

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
10.5 Damage to the Works

(a) Without in any way limiting the contractor's obligations in terms of the contract, the contractor shall bear the full risk of damage to and/or destruction of the works by whatever cause during construction of the works and hereby indemnifies and holds harmless the employer against any such damage. The contractor shall take such precautions and security measures and other steps for the protection and security of the works as the contractor may deem necessary.

(b) The contractor shall at all times proceed immediately to remove or dispose of any debris arising from damage to or destruction of the works and to rebuild, restore, replace and/or repair the works.

(c) The employer shall carry the risk of damage to or destruction of the works and materials paid for by the employer that is the result of the excepted risks as set out in 10.6.

(d) Where the employer bears the risk in terms of this contract, the contractor shall, if requested to do so, reinstate any damage or destroyed portions of the works and the costs of such reinstatement shall be measured and valued in terms of 32.0 hereof.

10.6 Injury to Persons or loss of or damage to Properties

(a) The contractor shall be liable for and hereby indemnifies the employer against any liability, loss, claim or proceeding whether arising in common law or by statute, consequent upon personal injuries to or the death of any person whomsoever arising out of or in the course of or caused by the execution of the works unless due to any act or negligence of any person for whose actions the employer is legally liable.

(b) The contractor shall be liable for and hereby indemnifies the employer against any liability, loss, claim or proceeding consequent upon loss of or damage to any moveable or immovable or personal property or property contiguous to the site, whether belonging to or under the control of the employer or any other body or person, arising out of or in the course of or by reason of the execution of the works unless due to any act or negligence of any person for whose actions the employer is legally liable.

(c) The contractor shall, upon receiving a contract instruction from the principal agent, cause the same to be made good in a perfect and workmanlike manner at his own cost and in default thereof the employer shall be entitled to cause it to be made good and to recover the cost thereof from the contractor or to deduct the same from amounts due to the contractor.

(d) The contractor shall be responsible for the protection and safety of such portions of the premises placed under his control by the employer for the purpose of executing the works until the issue of the certificate of practical completion.

Carried to Collection
(e) Where the execution of the works involves the risk of removal of or interference with support to adjoining properties including land or structures or any structures to be altered or added to, the contractor shall obtain adequate insurance and will remain adequately insured or insured to the specific limit stated in the contract against the death of or injury to persons or damage to such property consequent on such removal or interference with the support until such portion of the works has been completed.

(f) The contractor shall at all times proceed immediately at his own cost to remove or dispose of any debris and to rebuild, restore, replace and/or repair such property and to execute the works.

10.7 High risk insurance

In the event of the project being executed in a geological area classified as a "High Risk Area", that is an area which is subject to highly unstable subsurface conditions that might result in catastrophic ground movement evident by sinkhole or doline formation the following will apply:

10.7.1 Damage to the works

The contractor shall, from the commencement date of the works until the date of the certificate of practical completion bear the full risk of and hereby indemnifies and holds harmless the employer against any damage to and/or destruction of the works consequent upon a catastrophic ground movement as mentioned above. The contractor shall take such precautions and security measures and other steps for the protection of the works as he may deem necessary.

When so instructed to do so by the principal agent, the contractor shall proceed immediately to remove and/or dispose of any debris arising from damage to or destruction of the works and to rebuild, restore, replace and/or repair the works, at the contractor's own costs.

10.7.2 Injury to persons or loss of or damage to property

The contractor shall be liable for and hereby indemnifies and holds harmless the employer against any liability, loss, claim or proceeding arising at any time during the period of the contract whether arising in common law or by statute, consequent upon personal injuries to or the death of any person whomsoever resulting from, arising out of, or caused by a catastrophic ground movement as mentioned above.

The contractor shall be liable for and hereby indemnifies the employer against any and all liability, loss, claim or proceeding consequent upon loss of or damage to any moveable or immovable or personal property or property contiguous to the site, whether belonging to or under the control of the employer or any other body or person whomsoever arising out of or caused by a catastrophic ground movement, as mentioned above, which occurred during the period of the contract.

Carried to Collection

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
10.7.3 It is the responsibility of the contractor to ensure that he has adequate insurance to cover his risk and liability as mentioned in 10.7.1 and 10.7.2. Without limiting the contractor's obligations in terms of the contract, the contractor shall, within twenty-one (21) calendar days of the commencement date but before commencement of the works, submit to the employer proof of such insurance policy, if requested to do so.

10.7.4 The employer shall be entitled to recover any and all losses and/or damages of whatever nature suffered or incurred consequent upon the contractor's default of his obligations as set out in 10.7.1; 10.7.2 and 10.7.3. Such losses or damages may be recovered from the contractor or by deducting the same from any amounts still due under this contract or under any other contract presently or hereafter existing between the employer and the contractor and for this purpose all these contracts shall be considered one indivisible whole.

Fixed:_________ Value related:_________ Time related:_________ Item

A

A11.0 LIABILITY INSURANCES

Clause 11.0

Fixed:_________ Value related:_________ Time related:_________ Item

B

A12.0 EFFECTING INSURANCES

Clause 12.0

Fixed:_________ Value related:_________ Time related:_________ Item

C

A13.0 No clause

N/A

D

A14.0 SECURITY

Clause 14.0

Clauses 14.1 - 14.8 are amended by replacing them with the following:

14.1 In respect of contracts with a contract sum up to R1 million, the security to be provided by the contractor to the employer will be a payment reduction of five per cent (5%) of the value certified in the payment certificate (excluding VAT)

14.1.1 The payment reduction of the value certified in a payment certificate shall be mutatis mutandis in terms of 31.8(A)

14.1.2 The employer shall be entitled to recover expense and loss from the payment reduction in terms of 33.0 provided that the employer complies with the provisions of 33.4 in which event the employer's entitlement shall take precedence over his obligations to refund the payment reduction security or portions thereof to the contractor

Carried to Collection R

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
14.2 In respect of contracts with a contract sum above R1 million, the contractor shall have the right to select the security to be provided in terms of 14.3, 14.4, 14.5, 14.6, or 14.7 as stated in the schedule. Such security shall be provided to the employer within twenty-one (21) calendar days from commencement date. Should the contractor fail to select the security to be provided or should the contractor fail to provide the employer with the selected security within twenty-one (21) calendar days from commencement date, the security in terms of 14.7 shall be deemed to have been selected.

14.3 Where security as a cash deposit of ten per cent (10%) of the contract sum (excluding VAT) has been selected:

14.3.1 The contractor shall furnish the employer with a cash deposit equal in value to ten per cent (10%) of the contract sum (excluding VAT) within twenty-one (21) calendar days from commencement date.

14.3.2 Within twenty-one (21) calendar days of the date of practical completion of the works the employer shall reduce the cash deposit to an amount equal to three per cent (3%) of the contract value (excluding VAT), and refund the balance to the contractor.

14.3.3 Within twenty-one (21) calendar days of the date of final completion of the works the employer shall reduce the cash deposit to an amount equal to one per cent (1%) of the contract value (excluding VAT) and refund the balance to the contractor.

14.3.4 On the date of payment of the amount in the final payment certificate, the employer shall refund the remainder of the cash deposit to the contractor.

14.3.5 The employer shall be entitled to recover expense and loss from the cash deposit in terms of 33.0 provided that the employer complies with the provisions of 33.4 in which event the employer’s entitlement shall take precedence over his obligations to refund the cash deposit security or portions thereof to the contractor.

14.3.6 The parties expressly agree that neither the employer nor the contractor shall be entitled to cede the rights to the deposit to any third party.

14.4 Where security as a variable construction guarantee of ten percent (10%) of the contract sum (excluding VAT) has been selected:

14.4.1 The contractor shall furnish the employer with an acceptable variable construction guarantee equal in value to ten per cent (10%) of the contract sum (excluding VAT) within twenty-one (21) calendar days from commencement date.

14.4.2 The variable construction guarantee shall reduce and expire in terms of the Variable Construction Guarantee form included in the invitation to tender.
14.4.3 The **employer** shall return the variable **construction guarantee** to the **contractor** within fourteen (14) calendar days of it expiring.

14.4.4 Where the **employer** has a right of recovery against the **contractor** in terms of 33.0, the **employer** shall issue a written demand in terms of the variable **construction guarantee**

14.5 Where **security** as a fixed **construction guarantee** of five per cent (5%) of the **contract sum** (excluding VAT) and a five per cent (5%) payment reduction of the value certified in the **payment certificate** (excluding VAT) has been selected:

14.5.1 The **contractor** shall furnish a fixed **construction guarantee** to the **employer** equal in value to five per cent (5%) of the **contract sum** (excluding VAT)

14.5.2 The fixed **construction guarantee** shall come into force on the date of issue and shall expire on the date of the last certificate of **practical completion**

14.5.3 The **employer** shall return the fixed **construction guarantee** to the **contractor** within fourteen (14) calendar days of it expiring.

14.5.4 The payment reduction of the value certified in a **payment certificate** shall be in terms of 31.8 (A) and 34.8.

14.5.5 Where the **employer** has a right of recovery against the **contractor** in terms of 33.0, the **employer** shall be entitled to issue a written demand in terms of the fixed **construction guarantee** or may recover from the payment reduction or may do both

14.6 Where **security** as a cash deposit of five per cent (5%) of the **contract sum** (excluding VAT) and a payment reduction of five per cent (5%) of the value certified in the **payment certificate** (excluding VAT) has been selected:

14.6.1 The **contractor** shall furnish the **employer** with a cash deposit equal in value to five per cent (5%) of the **contract sum** (excluding VAT) within twenty-one (21) calendar days from commencement date.

14.6.2 Within twenty-one (21) calendar days of the date of **practical completion** of the works the **employer** shall refund the cash deposit in total to the **contractor**

14.6.3 The payment reduction of the value certified in a **payment certificate** shall be **mutatis mutandi** in terms of 31.8(A)

14.6.4 Where the **employer** has a right of recovery against the **contractor** in terms of 33.0, the **employer** may issue a written notice in terms of 33.4 or may recover from the payment reduction or may do both
14.7 Where security as a payment reduction of ten per cent (10%) of the value certified in the payment certificate (excluding VAT) has been selected:

14.7.1 The payment reduction of the value certified in a payment certificate shall be mutatis mutandis in terms of 31.8(B)

14.7.2 The employer shall be entitled to recover expense and loss from the payment reduction in terms of 33.0 provided that the employer complies with the provisions of 33.4 in which event the employer’s entitlement shall take precedence over his obligations to refund the payment reduction or portions thereof to the contractor

14.8 Payments made by the guarantor to the employer in terms of the fixed or variable construction guarantee shall not prejudice the rights of the employer or contractor in terms of this agreement

14.9 Should the contractor fail to furnish the security in terms of 14.2, the employer, in his sole discretion and without notification to the contractor, is entitled to change the contractor’s selected form of security to that of a ten per cent (10%) payment reduction of the value certified in the payment certificate (excluding VAT), whereafter 14.7 shall be applicable

<table>
<thead>
<tr>
<th>Fixed:</th>
<th>Value related:</th>
<th>Time related:</th>
</tr>
</thead>
</table>

**EXECUTION**

**A15.0** PREPARATION FOR AND EXECUTION OF THE WORKS

Clause 15.0

Clause 15.1.1 is amended by replacing it with:

No clause

Clause 15.1.2 is amended by replacing it with:

The security selected in terms of 14.0

Clause 15.1 is amended by the addition of the following clause:

15.1.4 An acceptable health and safety plan, required in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), within twenty-one (21) calendar days of commencement date

Clause 15.2.1 is amended by replacing it with the following clause:
Give the contractor possession of the site within ten (10) working days of the contractor complying with the terms of 15.1.4

Fixed:__________ Value related:__________ Time related:__________ Item

A  A16.0  ACCESS TO THE WORKS

Clause 16.0

Fixed:__________ Value related:__________ Time related:__________ Item

B  A17.0  CONTRACT INSTRUCTIONS

Clause 17.0

Clause 17.1.11 is amended by deleting the words "and the appointment of nominated and selected subcontractors"

Fixed:__________ Value related:__________ Time related:__________ Item

C  A18.0  SETTING OUT OF THE WORKS

Clause 18.0

Fixed:__________ Value related:__________ Time related:__________ Item

D  A19.0  ASSIGNMENT

Clause 19.0

Fixed:__________ Value related:__________ Time related:__________ Item

E  A20.0  NOMINATED SUBCONTRACTORS

Clause 20.0

Clause 20.1.3 is amended by replacing it with the following:

No clause

Note: See item B9.1 hereinafter for adjustment of attendance on nominated subcontractors executing work allowed for under provisional sums

Fixed:__________ Value related:__________ Time related:__________ Item

Carried to Collection
### A21.0 SELECTED SUBCONTRACTORS

Clause 21.0

Clause 21 is amended by replacing it with:

No clause

Fixed: __________ Value related: __________ Time related: __________

### A22.0 EMPLOYER'S DIRECT CONTRACTORS

Clause 22.0

Fixed: __________ Value related: __________ Time related: __________

### A23.0 CONTRACTOR'S DOMESTIC SUBCONTRACTORS

Clause 23.0

Fixed: __________ Value related: __________ Time related: __________

**COMPLETION**

### A24.0 PRACTICAL COMPLETION

Clause 24.0

Fixed: __________ Value related: __________ Time related: __________

### A25.0 WORKS COMPLETION

Clause 25.0

Fixed: __________ Value related: __________ Time related: __________

### A26.0 FINAL COMPLETION

Clause 26.0

Clause 26.1.2 is amended by inserting "#" next to 26.1.2

Fixed: __________ Value related: __________ Time related: __________

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<td>LATENT DEFECTS LIABILITY PERIOD</td>
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<tr>
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<td>Clause 27.0</td>
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<td>Fixed: __________ Value related: ______ Time related: ______</td>
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<td>A28.0</td>
<td>SECTIONAL COMPLETION</td>
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<td>Clause 28.0</td>
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<td>REVISION OF DATE FOR PRACTICAL COMPLETION</td>
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<td>Clause 29.0</td>
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<td></td>
<td>Clause 29.2.5 is amended by replacing it with:</td>
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<td>A30.0</td>
<td>PENALTY FOR NON-COMPLETION</td>
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<td>Clause 30.0</td>
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<td><strong>PAYMENT</strong></td>
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<td>E</td>
<td>A31.0</td>
<td>INTERIM PAYMENT TO THE CONTRACTOR</td>
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<td>Clause 31.0</td>
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<td>Clause 31.5.2 is amended by replacing &quot;14.7.1&quot; with &quot;14.0&quot;</td>
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<td></td>
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<td>Clause 31.8 is amended by replacing it with the following two alternative clauses:</td>
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<tr>
<td></td>
<td></td>
<td><strong>Alternative A</strong></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>31.8(A) Where a security is selected in terms of 14.1; 14.5 or 14.6, the value of the works in terms of 31.4.1 and materials and goods in terms of 31.4.2 shall be certified in full. The value certified shall be subject to the following percentage adjustments:</td>
<td></td>
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<td></td>
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<td>31.8(A).1 Ninety-five per cent (95%) of such value in interim payment certificates issued up to the date of practical completion</td>
<td></td>
</tr>
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Carried to Collection

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
31.8(A).2 Ninety-seven per cent (97%) of such value in interim payment certificates issued on the date of practical completion and up to but excluding the date of final completion

31.8(A).3 Ninety-nine per cent (99%) of such value in interim payment certificates issued on the date of final completion and up to but excluding the final payment certificate in terms of 34.6

31.8(A).4 One hundred per cent (100%) of such value in the final payment certificate in terms of 34.6 except where the amount certified is in favour of the employer. In such an event the payment reduction shall remain at the adjustment level applicable to the final payment certificate

**Alternative B**

31.8(B) Where security as a payment reduction in terms of 14.7 has been selected, the value of the works in terms of 31.4.1 and materials and goods in terms of 31.4.2 shall be certified in full. The value certified shall be subject to the following percentage adjustments:

31.8(B).1 Ninety per cent (90%) of such value in interim payment certificates issued up to the date of practical completion

31.8(B).2 Ninety-seven per cent (97%) of such value in interim payment certificates issued on the date of practical completion and up to but excluding the date of final completion

31.8(B).3 Ninety-nine per cent (99%) of such value in interim payment certificates issued on the date of final completion and up to but excluding the final payment certificate in terms of 34.6

31.8(B).4 One hundred per cent (100%) of such value in the final payment certificate in terms of 34.6 except where the amount certified is in favour of the employer. In such an event the payment reduction shall remain at the adjustment level applicable to the final payment certificate

Clause 31.12 is amended by deleting the following:

Payment shall be subject to the employer giving the contractor a tax invoice for the amount due

Fixed:___________ Value related:___________ Time related:___________ Item

**A32.0 ADJUSTMENT TO THE CONTRACT VALUE**

Clause 32.0

Clauses 32.5.1, 32.5.4 and 32.5.7 are amended by the addition of the following at the end of the sentence:

"due to no fault of the contractor"

Fixed:___________ Value related:___________ Time related:___________ Item

Carried to Collection

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
A33.0 RECOVERY OF EXPENSE AND LOSS

Clause 33.0

Fixed:__________ Value related:__________ Time related:__________

A34.0 FINAL ACCOUNT AND FINAL PAYMENT

Clause 34.0

Clause 34.1 is amended by removing "#" next to 34.1

Clause 34.2 is amended by inserting "#" next to 34.2

Clause 34.8 is amended by deleting the words "where security as a fixed construction guarantee in terms of 14.4 has been selected or where payment reduction has been applied in terms of 14.7.1"

Clause 34.13 is amended by replacing "seven (7) calendar days" with "twenty-one (21) calendar days" and deleting the words "subject to the employer giving the contractor a tax invoice for the amount due"

Fixed:__________ Value related:__________ Time related:__________

A35.0 PAYMENT TO OTHER PARTIES

Clause 35.0

Fixed:__________ Value related:__________ Time related:__________

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
CANCELLATION

A36.0 CANCELLATION BY EMPLOYER - CONTRACTOR'S DEFAULT

Clause 36.0

Clause 36.1 is amended by the addition of the following clauses:

36.1.3 refuses or neglects to comply strictly with any of the conditions of contract

36.1.4 estate being sequestrated, liquidated or surrendered in terms of the insolvency laws in force within the Republic of South Africa

36.1.5 in the judgement of the employer, has engaged in corrupt or fraudulent practices in competing for or in executing the contract

Clause 36.3 is amended by removing the reference to "No clause" and replacing the words "principal agent" with "employer"

Clause 36.0 is amended by the addition of the following clause:

36.7 Notwithstanding any clause to the contrary, on cancellation of this agreement either by the employer or the contractor, or for any reason whatsoever, the contractor shall on written instruction, discontinue with the works on a date stated and withdraw himself from the site. The contractor shall not be entitled to refuse to withdraw from the works on the grounds of any lien or right of retention or on the grounds of any other right whatsoever

Fixed:__________ Value related:__________ Time related:__________

B A37.0 CANCELLATION BY EMPLOYER - LOSS AND DAMAGE

Clause 37.0

Clause 37.3.5 is amended by replacing "ninety (90)" with "one hundred and twenty (120)"

Clause 37.0 is amended by the addition of the following clause:

37.5 Notwithstanding any clause to the contrary, on cancellation of this agreement either by the employer or the contractor, or for any reason whatsoever, the contractor shall on written instruction, discontinue with the works on a date stated and withdraw himself from the site. The contractor shall not be entitled to refuse to withdraw from the works on the grounds of any lien or right of retention or on the grounds of any other right whatsoever

Fixed:__________ Value related:__________ Time related:__________

Carried to Collection

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
Clause 38.0 is amended by replacing “ninety (90)” with “one hundred and twenty (120)”

Clause 38.0 is amended by the addition of the following clause:

38.7 Notwithstanding any clause to the contrary, on cancellation of this agreement either by the employer or the contractor, or for any reason whatsoever, the contractor shall on written instruction, discontinue with the works on a date stated and withdraw himself from the site. The contractor shall not be entitled to refuse to withdraw from the works on the grounds of any lien or right of retention or on the grounds of any other right whatsoever.

Fixed:__________ Value related:__________ Time related:__________ Item

Clause 39.0 is amended by the addition of the following at the end of the sentence:

"within one hundred and twenty (120) working days of completion of such a report"

Fixed:__________ Value related:__________ Time related:__________ Item

A38.0 CANCELLATION BY CONTRACTOR - EMPLOYER'S DEFAULT

A39.0 CANCELLATION - CESSATION OF THE WORKS

A40.0 DISPUTE SETTLEMENT

DISPUTE

C

C A40.0 DISPUTE SETTLEMENT

Clause 40.0

Clause 40.2.2 is amended by replacing "one (1) year" with "three (3) years"

Clause 40.6 is amended by removing the reference to:

No clause

Clause 40.7.1 is amended by replacing "(10)" with "(15)" and by the addition of the following:

Whether or not mediation resolves the dispute, the parties shall bear their own costs concerning the mediation and equally share the costs of the mediator and related costs.

Fixed:__________ Value related:__________ Time related:__________ Item

DISPUTE

C

C A40.0 DISPUTE SETTLEMENT

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
SUBSTITUTE PROVISIONS

A  A41.0  STATE CLAUSES

Clause 41.0

Fixed:__________ Value related:__________ Time related:__________

CONTRACT VARIABLES

B  A42.0  THE SCHEDULE (NDoH-04)

Clause 42.0

Tenderers are referred to the Contract Data NDoH-04 for variables pertaining to this contract

Fixed:__________ Value related:__________ Time related:__________
SECTION B: JBCC PRELIMINARIES

B1.0 DEFINITIONS AND INTERPRETATION

A B1.1 Definitions and interpretation

See also clause A1.0 of Section A for additional and/or amended definitions which shall apply equally to this Section

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B2.0 DOCUMENTS

B B2.1 Checking of documents

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<tr>
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C B2.2 Provisional bills of quantities

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<tr>
<th>Fixed:</th>
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D B2.3 Availability of construction documentation

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E B2.4 Interests of agents

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<tr>
<th>Fixed:</th>
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F B2.5 Priced documents

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</table>

G B2.6 Tender submission

Clause 2.6 is amended by replacing "JBCC Form of Tender" with "Form of Offer and Acceptance"

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B3.0 THE SITE

In respect of clause 3, Tenderers shall be deemed to have visited the site and made provision in their tender for all site circumstances that may affect their work and rates, as no claims in this respect will be considered.

Carried to Collection R
### PRELIMINARIES

**Bill No. 1**  
**Section No 1: Preliminaries**

**GROUP 2 CLINICS (WC 9.D.D)**

**PROVISIONAL BILLS OF QUANTITIES**

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<thead>
<tr>
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<th>Description</th>
<th>Fixed</th>
<th>Value related</th>
<th>Time related</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td><strong>B3.1</strong> Defined works area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td><strong>B3.2</strong> Geotechnical investigation</td>
<td></td>
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<tr>
<td>C</td>
<td><strong>B3.3</strong> Inspection of the site</td>
<td></td>
<td></td>
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<tr>
<td>D</td>
<td><strong>B3.4</strong> Existing premises occupied</td>
<td></td>
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<tr>
<td>E</td>
<td><strong>B3.5</strong> Previous work - dimensional accuracy</td>
<td></td>
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<tr>
<td>F</td>
<td><strong>B3.6</strong> Previous work - defects</td>
<td></td>
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<tr>
<td>G</td>
<td><strong>B3.7</strong> Services - known</td>
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<tr>
<td>H</td>
<td><strong>B3.8</strong> Services - unknown</td>
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<tr>
<td>I</td>
<td><strong>B3.9</strong> Protection of trees</td>
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<tr>
<td>J</td>
<td><strong>B3.10</strong> Articles of value</td>
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<tr>
<td>K</td>
<td><strong>B3.11</strong> Inspection of adjoining properties</td>
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</tbody>
</table>

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## B4.0 MANAGEMENT OF CONTRACT

### A B4.1 Management of the works

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<th>Item</th>
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### B B4.2 Programme for the works

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### C B4.3 Progress meetings

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### D B4.4 Technical meetings

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<th>Time related:</th>
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### E B4.5 Labour and plant records

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<th>Value related:</th>
<th>Time related:</th>
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</table>

## B5.0 SAMPLES, SHOP DRAWINGS AND MANUFACTURERS' INSTRUCTIONS

### F B5.1 Samples of materials

<table>
<thead>
<tr>
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<th>Item</th>
<th>Fixed:</th>
<th>Value related:</th>
<th>Time related:</th>
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### G B5.2 Workmanship samples

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### H B5.3 Shop drawings

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<th>Item</th>
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### I B5.4 Compliance with manufacturers’ instructions

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<th>Item</th>
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<th>Value related:</th>
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## B6.0 TEMPORARY WORKS AND PLANT

### J B6.1 Deposits and fees

<table>
<thead>
<tr>
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<th>Item</th>
<th>Fixed:</th>
<th>Value related:</th>
<th>Time related:</th>
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Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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<td><strong>Enclosure of the works</strong></td>
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<tr>
<td>B6.3</td>
<td><strong>Advertising</strong></td>
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<tr>
<td>B6.4</td>
<td><strong>Plant, equipment, sheds and offices</strong></td>
<td></td>
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<tr>
<td>B6.5</td>
<td><strong>Main notice board</strong></td>
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<tr>
<td>B6.6</td>
<td><strong>Subcontractors’ notice board</strong></td>
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<tr>
<td>B7.1</td>
<td><strong>Location</strong></td>
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<tr>
<td>B7.2</td>
<td><strong>Water</strong></td>
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<td>B7.3</td>
<td><strong>Electricity</strong></td>
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<tr>
<td>B7.4</td>
<td><strong>Telecommunication facilities</strong></td>
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<td>B7.5</td>
<td><strong>Ablution facilities</strong></td>
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**TEMPORARY SERVICES**

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<tr>
<td>B7.2</td>
<td><strong>Location</strong></td>
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<tr>
<td>B7.3</td>
<td><strong>Water</strong></td>
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<tr>
<td>B7.4</td>
<td><strong>Electricity</strong></td>
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<tr>
<td>B7.5</td>
<td><strong>Ablution facilities</strong></td>
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<tbody>
<tr>
<td>A</td>
<td><strong>B8.0 PRIME COST AMOUNTS</strong></td>
</tr>
<tr>
<td>A1</td>
<td><strong>B8.1 Responsibility for prime cost amounts</strong></td>
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<tr>
<td>B</td>
<td><strong>B9.0 ATTENDANCE ON N/S SUBCONTRACTORS</strong></td>
</tr>
<tr>
<td>B1</td>
<td><strong>B9.1 General attendance</strong></td>
</tr>
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<tr>
<td>C</td>
<td><strong>B9.2 Special attendance</strong></td>
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<td>Fixed:________________ Value related:______________ Time related:____________</td>
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<tr>
<td>D</td>
<td><strong>B9.3 Commissioning - fuel, water and electricity</strong></td>
</tr>
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<tr>
<td>E</td>
<td><strong>B10.0 FINANCIAL ASPECTS</strong></td>
</tr>
<tr>
<td>E1</td>
<td><strong>B10.1 Statutory taxes, duties and levies</strong></td>
</tr>
<tr>
<td></td>
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<tr>
<td>F</td>
<td><strong>B10.2 Payment for preliminaries</strong></td>
</tr>
<tr>
<td></td>
<td>Fixed:________________ Value related:______________ Time related:____________</td>
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<tr>
<td>G</td>
<td><strong>B10.3 Adjustment of preliminaries</strong></td>
</tr>
<tr>
<td></td>
<td>Clauses B10.3.1 and B10.3.2 are amended by replacing &quot;within fifteen (15) working days of taking possession of the site&quot; with &quot;when submitting his priced bills of quantities / lump sum document&quot;</td>
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<td>Fixed:________________ Value related:______________ Time related:____________</td>
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<td>H</td>
<td><strong>B10.4 Payment certificate cash flow</strong></td>
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<tbody>
<tr>
<td>A</td>
<td>Protection of the works</td>
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<tr>
<td>B</td>
<td>Protection / isolation of existing / sectionally occupied works</td>
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<tr>
<td>C</td>
<td>Security of the works</td>
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<tr>
<td>D</td>
<td>Notice before covering work</td>
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<tr>
<td>E</td>
<td>Disturbance</td>
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<tr>
<td>F</td>
<td>Environmental disturbance</td>
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<tr>
<td>G</td>
<td>Works cleaning and clearing</td>
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<tr>
<td>H</td>
<td>Vermin</td>
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<tr>
<td>I</td>
<td>Overhand work</td>
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<td></td>
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</tr>
<tr>
<td>J</td>
<td>Instruction manuals and guarantees</td>
<td></td>
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</tr>
<tr>
<td>K</td>
<td>As built information</td>
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### B11.12 Tenant installations

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### B12.0 SCHEDULE OF VARIABLES

#### B12.1 Schedule of variables

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This schedule contains all variables referred to in 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 these Preliminaries.

Spaces requiring information must be filled in, shown as "not applicable" or deleted and 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.

#### 12.1 PRE-TENDER INFORMATION

12.1.1 **Provisional bills of quantities**

- [2.2] The quantities are provisional: **YES**

12.1.2 **Availability of construction documentation**

- [2.3] Construction documentation is complete: **NO**

12.1.3 **Interests of agents**

- [2.4] Details: **N/A**

---

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
12.1.4 Defined works area
[3.1] Details:
The area of the works to be occupied by the contractor, any restrictions to the area and the limit of access or exit will be defined and pointed out by the architect on the handover of the site.

The contractor will be required to complete the works in sections in order that decanting of patients, staff and equipment can take place. Standing time of maximum 10 working days between completion of one section and commencement of another section is deemed to be included in the overall construction period. No extension of time or additional Preliminaries will be paid for these standing times and the contractor is required to make allowance for these standing times in his Preliminaries. It is envisaged that the work will be completed in 3 sections.

The contractor will be required to assist with labour for the decanting processes and must make allowance therefore in his Preliminaries.

12.1.5 Geotechnical investigation
[3.2] Details:
No site soil investigation report is available at this stage.

12.1.6 Existing premises occupied
[3.4] Specific requirements:
The existing premises will be occupied for the duration of the contract. Due to the nature of the occupancy, the contractor is to perform in such a manner so as to cause the minimum of inconvenience to the occupants and shall take all measures available to him in order to minimise noisy operations.

12.1.7 Previous work - dimensional accuracy
[3.5] Details:
No additional specific requirements.

12.1.8 Previous work - defects
[3.6] Details:
No additional specific requirements.

12.1.9 Services - known
[3.7] Details:
The contractor is to liaise with the Architect, Civil and Electrical Engineer with regard to existing services, servitudes, etc. prior to signing the contract.

12.1.10 Protection of trees
[3.9] Specific requirements:
No additional specific requirements.
12.1.11 **Inspection of adjoining properties**

Specific requirements:
No additional specific requirements

12.1.12 **Enclosure of the works**

Specific requirements:
No additional specific requirements

12.1.13 **Offices**

Specific requirements:
The contractor shall provide, maintain and remove on completion of the works an office for the exclusive use of the principal agent, minimum size 4 x 3 x 3m high internally, suitably insulated and ventilated, provided with electric lighting and fitted with boarded floor, desk, chair, drawing stool, drawing board and lock-up drawers for drawings. The office shall be kept clean and fit for use at all times

12.1.14 **Main notice board**

Specific requirements:
The contractor shall provide, erect where directed, maintain and remove on completion of the works a notice board size 3 x 3m as type Drawing GEN 063, constructed of suitable boarding with flat smooth surface and with edging bead 19mm thick round outer edges and projecting 12mm from face of boarding and rounded on front edge. The board shall be securely fixed to hoarding, where hoarding is provided, or fixed to and including a suitable supporting structure of timber or tubular posts and braces. The board is to be painted ivory white and the bead and 12mm wide dividing lines dark green. All wording shall be inscribed in dark green as per the coat of arms for SA. All wording shall be inscribed in dark green painted sans serif lettering

12.1.15 **Subcontractors’ notice board**

A notice board is required NO

Specific requirements:

12.1.16 **Water**

Option A (by contractor) YES
Option B (by employer - free of charge) NO
Option C (by employer - metered) NO

12.1.17 **Electricity**

Option A (by contractor) YES
Option B (by employer - free of charge) NO
Option C (by employer - metered) NO

Carried to Collection R
12.1.18 **Telecommunications**

- Telephone: YES
- Facsimile: YES
- E-mail: YES

12.1.19 **Ablution facilities**

- Option A (by contractor): YES
- Option B (by employer): NO

12.1.20 **Protection of existing/sectionally occupied works**

- Protection is required: YES

12.1.21 **Special attendance**

- Subcontractor (1) details:

- Subcontractor (2) details:

- Subcontractor (3) details:

- Subcontractor (4) details:

12.1.22 **Protection of the works**

- Specific requirements:

12.1.23 **Disturbance**

- Specific requirements:
  - The contractor shall keep the site, structures, etc well watered during operations to prevent dust and shall provide and erect and remove on completion of the works all necessary temporary dust screens all to the satisfaction of the principal agent

12.1.24 **Environmental disturbance**

- Specific requirements:

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**12.2 POST-TENDER INFORMATION**

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- Carried to Collection: R

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Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
| 12.2.1 | **Payment of preliminaries** |
|        | Option A (prorated) YES/NO |
|        | Option B (calculated) YES/NO |
| 12.2.2 | **Adjustment of preliminaries** |
|        | Option A (three categories) YES/NO |
|        | Option B (detailed breakdown) YES/NO |
| 12.2.3 | **Additional agreed preliminaries items** |
|        | Details: |

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

Carried to Collection
SECTION C: SPECIFIC PRELIMINARIES

Section C contains specific preliminary items which apply to this contract except where N/A (Not Applicable) appears against an item.

A C1.0 CONTRACT DRAWINGS

The drawings issued with the tender documents do not comprise the complete set but serve as a guide only for tendering purposes and for indicating the scope of the work to enable the tenderer to acquaint himself 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 understood by the tenderer he shall, before submitting his tender, obtain clarification in writing from the principal agent.

Fixed: __________ Value related: __________ Time related: __________ Item

B C2.0 GENERAL PREAMBLES

These tender documents contain pages and volumes as indicated in the index of the complete tender documentation.

The items in these tender documents are to read and priced in conjunction with and the descriptions regarded as amplified by The Model Preamble of Trades as recommended and published by the Association of South African Quantity Surveyors, 1999 edition and no claim arising from brevity of description of items fully described in the said Model Preambles for Trades will be entertained.

Fixed: __________ Value related: __________ Time related: __________ Item

C C3.0 TRADE NAMES

Wherever a trade name for any product has been described in the bills of quantities / lump sum document, 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.

If prior written approval for an alternative product is not obtained, the product described shall be deemed to have been tendered for.

Fixed: __________ Value related: __________ Time related: __________ Item

Carried to Collection

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
A C4.0 IMPORTED MATERIALS AND EQUIPMENT

Where imported items are listed in the tender documents, the tenderer shall provide all the information called for, failing which the price of any such item, materials or equipment shall be excluded from currency fluctuations. (refer to Schedule of Imported Materials and Equipment DPW-23(EC) to be completed by tenderer)

Notwithstanding any provisions elsewhere regarding the adjustment of contract prices, the price of any item, material or equipment listed in terms of this clause shall be excluded from the Contract Price Adjustment Provisions (if applicable)

Fixed: __________ Value related: __________ Time related: __________

B C5.0 AUTHORIZATION FOR THE TAKING OF PHOTOGRAPHS

The contractor shall obtain prior authorization from the employer for the making of any sketches or the taking of any photographs of any site, installation, building or civil works belonging to the employer and shall ensure that all personnel, subcontractors and other persons entering the site shall comply with this requirement as well

Fixed: __________ Value related: __________ Time related: __________

C C6.0 OCCUPATIONAL HEALTH AND SAFETY ACT

The contractor shall comply with all the requirements set out in the Construction Regulations, 2014 issued under the Occupational Health and Safety Act, 1993 (Act No 85 of 1993)

It is required of the contractor to thoroughly study the Health and Safety Specification that must be read together with and is deemed to be incorporated under this Section of the bills of quantities / lump sum document

The contractor must take note that compliance with the Occupational Health and Safety Act, Construction Regulations and Health and Safety Specification is compulsory. In the event of partial or total non-compliance, the principal agent, notwithstanding the provisions of clause A31.0 of Section A or any other clause to the contrary, reserves the right to delay issuing any progress payment certificate until the contractor provides satisfactory proof of compliance. The contractor shall not be entitled to any compensation of whatsoever nature, including interest, due to such delay of payment

Provision for pricing of the Occupational Health and Safety Act, Construction Regulations and Health and Safety Specification is made under this clause and it is explicitly pointed out that all requirements of the aforementioned are deemed to be priced hereunder and no additional claims in this regard shall be entertained

Fixed: __________ Value related: __________ Time related: __________

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
A  C6.1  NOTIFICATION OF CONSTRUCTION WORK (Construction Regulation 3)

The Contractor shall, before commencing work, notify the Department of Labour of the intended construction work in terms of Regulation 3. The Contractor shall submit the notification in writing, on the appropriate form, prior to commencement of work.

Fixed: __________  Value related: __________  Time related: __________

B  C6.2  HEALTH AND SAFETY PLAN (Construction Regulation 5.4)

The Contractor shall provide and demonstrate to the Principal Agent a suitable and sufficiently documented health and safety plan based on the Act, Construction Regulations and the health and safety specification, which shall be applied from the date of commencement of and for the duration of the construction work. The Contractor shall ensure that a copy of the health and safety plan is available on request to an employee, inspector, sub contractor or principal agent all in terms of Regulation 5.

Fixed: __________  Value related: __________  Time related: __________

C  C6.3  REGISTRATION WITH THE COMPENSATION FUND (Construction Regulation 5.3 f)

The Contractor shall provide proof of his registration and good standing with the Compensation Fund or a licensed compensation insurer prior to the commencement of work.

Fixed: __________  Value related: __________  Time related: __________

D  C6.4  HEALTH AND SAFETY FILE (Construction Regulation 5.7)

The Contractor shall ensure that a health and safety file, which shall include all documentation required in terms of the health and safety specification, the Act and the Construction Regulations, is opened and kept on site and made available to the Principal Agent or Inspector upon request. Upon completion of the works, the Contractor shall hand over a consolidated health and safety file to the principal agent.

Fixed: __________  Value related: __________  Time related: __________

Carried to Collection: __________
A C6.5 SUPERVISION OF CONSTRUCTION WORK (SAFETY OFFICER) (Construction Regulation 6)

The Contractor shall appoint a full-time competent employee in writing as the construction supervisor, with the duty of supervising the construction work.

The Contractor shall appoint a full-time or part-time construction safety officer in writing to assist in the control of all safety related aspects on the site. Such appointments are required to ensure that at all times the requirements of the Act and Construction Regulations are adhered to. Refer to Regulation 6

Fixed:__________ Value related:__________ Time related:__________

B C6.6 RISK ASSESSMENT AND SAFETY POLICY (Construction Regulation 7)

Before commencing work the Contractor shall cause a risk assessment to be performed by a competent person appointed in writing and the risk assessment shall form part of the health and safety plan. A copy of the risk assessment shall be available on site at all times for inspection.

The Contractor shall at all time carry out the works in a manner to avoid the risk of bodily harm to persons or risk of damage to any property. He shall take all precautions regarding training of employees in any hazards and the related work procedures, health and safety induction training of employees, visitors or any other persons entering the site and provide personal protective equipment to all employees and visitors to site which are necessary and adequate to eliminate any conditions which contribute to the risk of injury to persons or damage to property in terms of Regulation 7

Fixed:__________ Value related:__________ Time related:__________

C C6.7 SIGNIFICANT HAZARD IDENTIFICATION RISK ASSESSMENT PREPARED BY THE DESIGN CONSULTANTS

The contractor shall allow for additional financial provision, if any, to take the necessary precautions regarding the significant hazards and risks identified and assessed by the design consultants

Fixed:__________ Value related:__________ Time related:__________

D C6.8 ADDITIONAL FINANCIAL PROVISION

The Contractor shall allow for additional financial provision, if any, to comply with the requirements of the Occupational Health and Safety Act (Act No 85 of 1993) and the Construction Regulations issued there under which have not been specifically elsewhere provided

Fixed:__________ Value related:__________ Time related:__________

Carried to Collection
A C6.9  FALL PROTECTION PLAN (Construction Regulation 8)

The contractor shall, before commencing any construction work submit a fall protection plan identified all steps to be taken in order to ensure the continued adherence to the fall protection plan and shall include a risk assessment of all work carried out from an relevant position. The fall protection plan shall form part of the health and safety plan and file

Fixed: ________ Value related: ________ Time related: ________

B C6.10  PHYSICAL AND PSYCHOLOGICAL FITNESS (Construction Regulation 8.2(b))

The contractor and sub-contractors shall before commencing any construction work submit proof of his employees that shall carried out work from an elevated position their physical and psychological fitness. And shall be recorded in the health and safety file

Fixed: ________ Value related: ________ Time related: ________

C C6.11  CONSTRUCTION VEHICLES AND MOBILE PLANT (Construction Regulation 21)

The contractor and sub-contractors shall ensure that all operated workers received training and been certified competent to operate such vehicle, and are physical and psychological fit to operate such construction vehicles and mobile plants. And shall be recorded in the health and safety file

Fixed: ________ Value related: ________ Time related: ________

D C6.12  TRAINING (Construction Regulation 8 (c))

The contractor and sub-contractors shall, before commencing any construction work, submit his training program of all his employees. This program shall from part of the health and safety plan

Fixed: ________ Value related: ________ Time related: ________

E C6.13  DEMOLITION WORK (Construction Regulation 12)

The contractor shall, before any demolition work shall carried out, submit all method of demolition to be used. This method shall form part of the health and safety plan and file.

Fixed: ________ Value related: ________ Time related: ________

Carried to Collection

Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### A C6.14 REMOVAL AND DISPOSAL OF ASBESTOS MATERIAL (Asbestos Regulation)

The principle contractor shall appoint a contractor that is registered with the Department of Labour as an AIA. The contractor must allow for:
- NOTIFICATION OF ASBESTOS PROCESSING
- PERSONAL PROTECTIVE EQUIPMENT
- PACKAGING AND TRANSPORT AND STORAGE TO DISPOSAL SITE
- DEMOLITION WORK OF SHEETS
- LABELLING AND INFORMATION

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### B C7.0 HIV/AIDS AWARENESS

It is required of the contractor to thoroughly study the HIV/AIDS Specification (PW 1544) of the Department that must be read together with and is deemed to be incorporated under this Section of the **bills of quantities / lump sum document**. Provision for pricing of HIV/AIDS awareness is made under items C7.1 to C7.5 hereafter and it is explicitly pointed out that all requirements of the aforementioned specification are deemed to be priced hereunder, as the said items represent the only method of measurement and no additional items or extras to the contract in this regard shall be entertained.

The contractor must take note that compliance with the HIV/AIDS Specification is compulsory. In the event of partial or total non-compliance, the **principal agent**, notwithstanding the provisions of clause A 31.0 of Section A or any other clause to the contrary, reserves the right to delay issuing any progress payment certificate until the contractor provides satisfactory proof of compliance. The contractor shall not be entitled to any compensation of whatsoever nature, including interest, due to such delay of payment.

#### C7.1 AWARENESS CHAMPION

Selection, appointment, briefing and making available of an Awareness Champion including provision of all relevant services, all in accordance with the HIV/AIDS Specification

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#### C7.2 AWARENESS WORKSHOPS

Selection and appointment of a competent Service Provider approved by the **principal agent**, provision of a Service Provider Workshop Plan and a suitable venue, conducting of awareness workshops by means of traditional and/or modern multi-media techniques, including follow-up courses, making available all tuition material and performing assessment procedures, all in accordance with the HIV/AIDS Specification

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- Carried to Collection
C7.3 POSTERS, BOOKLETS, VIDEOS, ETC.

Provision, displaying, maintaining and replacing when necessary of four plastic laminated posters, booklets and educational videos, etc. for the duration of the construction period, all in accordance with the HIV/AIDS Specification

Fixed: ___________ Value related: ___________ Time related: ___________

C7.4 ACCESS TO CONDOMS

Provision and maintenance of condom dispensers fixed in position, including male and female condoms, replenishing male and female condoms on a daily basis as required for the duration of the construction period, all in accordance with the HIV/AIDS Specification

Fixed: ___________ Value related: ___________ Time related: ___________

C7.5 MONITORING

Monitoring HIV/AIDS awareness of workers, providing the principal agent with access to information including making available all reports, thoroughly completed and reflecting the correct information, for the duration of the construction period and close out, all in accordance with the HIV/AIDS Specification

Fixed: ___________ Value related: ___________ Time related: ___________

A C8.0 CONTRACT PARTICIPATION GOAL REQUIREMENTS

B C8.1 Registering Emerging Contractors on CIDB data register

The unit of measurement shall be the number of new Contractors registered at the CIDB. The tender rate shall include remuneration for facilitating the Contractor in completing application forms and payment of registration fees.

Fixed: ___________ Value related: ___________ Time related: ___________

C C8.2 Obtaining a higher designated grading for Subcontractors

The unit of measurement shall be the number of Contractors successfully obtaining a higher CIDB designation after completion of the work.

Fixed: ___________ Value related: ___________ Time related: ___________
A  C8.3  Formal training of Subcontractors

The unit of measurement shall be the number of subcontractors identified for formal training courses.

Fixed:__________ Value related:__________ Time related:__________  Item

B  C8.4  Remuneration of CLO

Allow the budgetary amount of R36 000.00 (Thirty Six Thousand Rand) NET for the payment of the CLO to be used as directed by the Principal Agent and deducted in whole or in part if not required.

The Contractor will submit a monthly invoice for the remuneration of the CLO for the required Contract period.  Item  36 000.00

C  C8.5  Transport Cost for CLO (If applicable)

The unit of measurement shall be the cost per km based on the total km travelled during the month for the CLO from his home to the Construction site.

Fixed:__________ Value related:__________ Time related:__________

D  C8.6  PAYMENT FOR EMPLOYMENT AND TRAINING OF LOCAL UNSKILLED WORKERS

E  C8.6.1  Orientation and Life Skills development training for local unskilled workers for an average of 10 days per worker

Fixed:__________ Value related:__________ Time related:__________  Item

F  C8.6.2  Technical skills training for local unskilled for an average of 20 days per worker

The tendered sum shall include full compensation for identification of pre-qualification criteria and training needs, staff assessment and evaluation prior to training, all technical research, development and compilation of an accredited training course and course material, and all other actions necessary for commencement of official training sessions in accordance with the specification. The tendered sum shall also include full compensation for the compilation of a draft syllabus and for incorporation of all the Engineer’s comments and corrective requirements.

Fixed:__________ Value related:__________ Time related:__________  Item

G  C8.7  IMPLEMENTATION OF CONTRACT PARTICIPATION GOALS

H  C8.7.1  Allow for the provision of monthly reports

Fixed:__________ Value related:__________ Time related:__________  Item
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<tr>
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Allow the budgetary amount of R30 000.00 (Thirty Thousand Rand) NET for establishment of a facilities and infrastructure breakdown maintenance call centre to be used as directed by the Principal Agent and deducted in whole or in part if not required.

Item: 30 000.00
## PRELIMINARIES

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Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
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PROVISIONAL BILLS OF QUANTITIES
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Section No 1: Preliminaries
Bill No. 1
PRELIMINARIES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

Carried to Final Summary R
## SECTION NO. 2: BUILDERS WORK

### BILL NO 1

#### ALTERATIONS (PROVISIONAL)

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: Unless otherwise stated herein, all items in this bill shall be deemed to fall into Work Group No 102 for Haylett formula purposes

<table>
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<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
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### SUPPLEMENTARY PREAMBLES

#### OLD MATERIAL IS TO BECOME THE PROPERTY OF THE CONTRACTOR

Old materials from alterations, except where described to be re-used or handed over, become the property of the contractor who must allow credit for same in the Final Summary

### OLD MATERIAL TO BE CARTED AWAY

Old material from the alterations, except where described to be re-used or handed over, as well as all rubbish, etc must be regularly carted from the site and not be allowed to accumulate on or around the site

### OLD MATERIAL NOT TO BE RE-USED

None of the old materials are to be used for new work except where specifically described being set aside for re-use

### HANDING OVER OF MATERIALS

Where certain materials or articles from demolitions or articles are described as to be handed over by the Contractor to the Regional Representative or Representative/Agent, such materials or articles shall be properly stored by the contractor, until handing over thereof.

The contractor must obtain an official receipt listing the materials or articles and dates of handing over. If the contractor fails to submit the receipt when requested, it shall be deemed that the materials or articles are still in his possession and he will be held liable to the Department for the full replacement value thereof, which amount will be deducted from any monies due to the contractor

---

Carried to Collection

Section No 2: Builders Work
Bill No. 1
ALTERATIONS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
CREDIT FOR OLD MATERIAL

In pricing, credits for old materials shall not be offset against the charge so as to result in a net figure in the Amount column but shall be set out in detail in the space provided in these Bills of Quantities.

The Employer reserves the right to retain any of the old materials at the price shown in the list of credits or, if no credit is shown in that list, at no charge to the Employer.

PROTECTION OF EXISTING WORK

In taking down and removing existing work the utmost care shall be observed to avoid any structural or other damage to the remaining portions of the building. The contractor shall cover up and protect from injury all work not removed and shall make good at his own expense any damage that may occur.

Provide and erect all casings and protections for and cover up all existing fittings, doors, windows, joinery work, walls, floors, etc not disturbed during the alterations and clear away and make good on completion.

Provide, erect and remove when directed all temporary roof coverings, tarpaulins, dust and weatherproof screens and barriers that may be necessary as protection against inclement weather or other damage, to the satisfaction of the Representative/Agent.

DEMOLITION

Provide, erect and remove when directed all incidental shoring, needling, strutting, etc that may be necessary while carrying out any portion of the Works to ensure stability of the premises with suitable and substantial timber and other materials. Prices for all items of demolition to form openings shall include for the provision of such support.

Prices for the demolition of any portion of the structure shall include for its demolition complete with all surfaces finishes such as plaster, screeds, etc, all attached items of joinery such as skirtings, shelving, cupboards, etc and all reinforcement, conduit, pipes, lintels, etc built into that portion of the structure.

REMOVAL OF DOORS, WINDOWS AND SANITARY FITTINGS

Prices for the removal of doors and frames shall include for the removal of fanlights, ironmongery, architraves and other associated trim.

Carried to Collection

Section No 2: Builders Work
Bill No. 1
ALTERATIONS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
Prices for the removal of windows shall include for the removal of glass, louvers, burglar bars attached to the windows, curtain rails, pelmets and louvers.

Prices for the removal of sanitary fittings shall include for the removal of copper service pipes, exposed waste pipes, taps, traps, brackets and cisterns.

**ASBESTOS CEMENT**

Prices for the removal and disposal of all asbestos cement products shall include to be done in accordance with the precautionary guidelines as per the Occupational Health & Safety Act and Health & Safety Specification.

-------------------------------

**REMOVAL OF EXISTING WORK**

**Breaking up and removing**

A  40mm Thick bituminous premix road surfacing  
   m² 837  
   21 : 0  22 : 0  23 : 837

B  100mm Thick unreinforced concrete surface beds, paving, etc  
   m² 4  
   21 : 0  22 : 0  23 : 4

C  Precast concrete barrier kerbs  
   m 83  
   21 : 0  22 : 0  23 : 83

D  Precast concrete stormwater channel  
   m 20  
   21 : 0  22 : 0  23 : 20

**Breaking down and removing brickwork etc.**

E  Half brick wall  
   m² 93  
   21 : 86  22 : 0  23 : 7

F  One brick wall  
   m² 67  
   21 : 0  22 : 0  23 : 67

G  280mm Hollow walls of two half brick skins  
   m² 19  
   21 : 0  22 : 0  23 : 19

**Taking out and removing doors, windows, etc. from brickwork to be demolished**

H  Timber single door and frame not exceeding 2.5m²  
   No 7  
   21 : 7  22 : 0  23 : 0

Carried to Collection

Section No 2: Builders Work
Bill No. 1
ALTERATIONS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
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<tr>
<th>Description</th>
<th>No</th>
<th>Quantity</th>
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<td><strong>Taking out and removing doors, windows, etc, including thresholds, sills, etc (building up openings and making good finishes elsewhere)</strong></td>
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<tr>
<td>A Glazed steel window not exceeding 2.5m²</td>
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<tr>
<td>No. Glazed steel window exceeding 2.5m²</td>
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<td>21 : 0 22 : 34 23 : 2</td>
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<tr>
<td><strong>Taking out and removing doors, windows, etc, including thresholds, sills, etc and building up openings in brick walls, including making good cement plaster on both sides (making good paintwork elsewhere)</strong></td>
<td></td>
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</tr>
<tr>
<td>B Timber single door and frame 813 x 2 032mm high overall from half brick wall</td>
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<td>No. Timber single door and frame 813 x 2 032mm high overall from half brick wall</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>21 : 1 22 : 0 23 : 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Timber double door and frame 1 626 x 2 032mm high overall from 280mm hollow brick wall</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>No. Timber single door and frame 813 x 2 032mm high overall from half brick wall</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>21 : 0 22 : 0 23 : 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D Glazed steel window 0.6 x 0.9m high from one brick wall</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>No. Glazed steel window 0.6 x 0.9m high from one brick wall</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>21 : 0 22 : 0 23 : 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Taking out doors, windows, etc, including thresholds, sills, etc, setting aside for re-use and later refixing in similar new position</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Timber single door and frame 813 x 2 032m high overall, including setting up and building in frame in current position to open in opposite direction.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>No. Timber single door and frame 813 x 2 032m high overall, including setting up and building in frame in current position to open in opposite direction.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>21 : 0 22 : 0 23 : 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Taking down and removing roofs, floors, panelling, ceilings, partitions, etc</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Lean-to roof approximately 6 x 1.5 x 1.5m high overall, of timber trusses and purlins, corrugated sheet steel covering, ceilings and cornices, eaves soffit covering, fascias, barge boards, gutters and rainwater pipes</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>No. Lean-to roof approximately 6 x 1.5 x 1.5m high overall, of timber trusses and purlins, corrugated sheet steel covering, ceilings and cornices, eaves soffit covering, fascias, barge boards, gutters and rainwater pipes</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>21 : 0 22 : 0 23 : 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G Gypsum coved cornice</td>
<td></td>
<td>49</td>
</tr>
<tr>
<td>No. Gypsum coved cornice</td>
<td></td>
<td>49</td>
</tr>
<tr>
<td>21 : 0 22 : 0 23 : 49</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Taking out and removing sundry joinery work, fittings, etc</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H Timber floor cupboards</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>No. Timber floor cupboards</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>21 : 0 22 : 0 23 : 13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Carried to Collection**

Section No 2: Builders Work
Bill No. 1
ALTERATIONS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Timber shelving on and including wall brackets</td>
<td>m</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Taking up and removing wood block floor coverings, vinyl floor coverings,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>carpets, etc and preparing screeds for new floor coverings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Vinyl tile floor covering and prepare for new porcelain tile floor</td>
<td>m²</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>covering (porcelain tiles elsewhere)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Vinyl skirting to vinyl tile floors</td>
<td>m</td>
<td>595</td>
</tr>
<tr>
<td></td>
<td>Hacking up/off and removing ceramic tiles including removing mortar bed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>or adhesive from concrete or brickwork and preparing surfaces for new</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>screed, plaster, tile finish, etc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Tiles to floors</td>
<td>m²</td>
<td>16</td>
</tr>
<tr>
<td>E</td>
<td>Tiles to walls</td>
<td>m²</td>
<td>88</td>
</tr>
<tr>
<td>F</td>
<td>Vitreous china wash hand basin with pillar taps, including short lengths of</td>
<td>No</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>piping, etc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Vitreous china WC pan with cistern</td>
<td>No</td>
<td>6</td>
</tr>
<tr>
<td>H</td>
<td>Built-in bath including breaking up and removing brick surrounds and concrete</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>base</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** The prices entered for removal of sanitary fittings, etc hereunder will be deemed to allow for the removal of all exposed piping reticulation related to each fitting. No further separate payment will be considered for the removal of additional pipework.

<table>
<thead>
<tr>
<th>F</th>
<th>Vitreous china wash hand basin with pillar taps, including short lengths of piping, etc</th>
<th>No</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21:0 22:0 23:6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Vitreous china WC pan with cistern</td>
<td>No</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>21:0 22:0 23:6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Built-in bath including breaking up and removing brick surrounds and concrete base</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>21:0 22:0 23:3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Carried to Collection**

Section No 2: Builders Work
Bill No. 1
ALTERATIONS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### A
Stainless steel sink 2 300mm long

<table>
<thead>
<tr>
<th>No</th>
<th>21:0</th>
<th>22:0</th>
<th>23:3</th>
</tr>
</thead>
</table>

### B
Vitreous china wall hung urinal with flush valve

<table>
<thead>
<tr>
<th>No</th>
<th>21:0</th>
<th>22:0</th>
<th>23:1</th>
</tr>
</thead>
</table>

### C
Shower taps and shower head

<table>
<thead>
<tr>
<th>No</th>
<th>21:0</th>
<th>22:0</th>
<th>23:5</th>
</tr>
</thead>
</table>

### CUTTING THROUGH FLOORS AND CEILINGS

#### Cutting through

### D
100mm Thick unreinforced concrete surface bed for 800mm wide concrete wall footings and making good concrete on both sides of new 230 brick walls

<table>
<thead>
<tr>
<th>No</th>
<th>21:22</th>
<th>22:0</th>
<th>23:25</th>
</tr>
</thead>
</table>

### OPENINGS THROUGH EXISTING WALLS ETC

#### Altering openings

### E
Altering opening in one brick wall where 3 100 x 2 100mm high garage door removed to form opening for new double door and frame 1 626 x 2 032mm high overall by building up opening on one side, making good cement plaster on one sides and into reveals and with 20 MPa concrete threshold with steel trowelled finish (new door and frame and making good paintwork elsewhere)

<table>
<thead>
<tr>
<th>No</th>
<th>21:0</th>
<th>22:1</th>
<th>23:0</th>
</tr>
</thead>
</table>

### F
Altering opening in one brick wall where 1.24 x 1.53m high timber window removed to form opening for new single door and frame 813 x 2 032mm high overall by breaking out brickwork on bottom and sides, making good cement plaster on one sides and into reveals and with 20 MPa concrete threshold with steel trowelled finish (new door and frame and making good paintwork elsewhere)

<table>
<thead>
<tr>
<th>No</th>
<th>21:0</th>
<th>22:0</th>
<th>23:2</th>
</tr>
</thead>
</table>

**Breaking out for and forming openings through brick walls for new doors and frames, including prestressed concrete lintels, making good cement plaster on both sides and into reveals and with 20 MPa concrete thresholds with steel trowelled finish (new doors and frames and making good paintwork elsewhere)**

### G
Opening for door with timber frame 813 x 2 032m high overall through half brick wall

<table>
<thead>
<tr>
<th>No</th>
<th>21:0</th>
<th>22:0</th>
<th>23:8</th>
</tr>
</thead>
</table>

---

Carried to Collection

Section No 2: Builders Work
Bill No. 1
ALTERATIONS

**GROUP 2 CLINICS (WC 9.D.D)**

**PROVISIONAL BILLS OF QUANTITIES**
### A
Opening for door with timber frame 813 x 2032m high overall through one brick wall

- No: 2
- Dimensions: 21:0 22:0 23:2

### B
Opening for door with timber frame 1640 x 2032m high overall through 280mm hollow brick wall

- No: 2
- Dimensions: 21:0 22:0 23:2

### C
Opening for window 1200 x 1200mm high through 230mm brick wall

- No: 1
- Dimensions: 21:0 22:0 23:1

### D
Opening for window 1200 x 1500mm high through 230mm brick wall

- No: 1
- Dimensions: 21:0 22:0 23:1

### BUDGET ALLOWANCE

E
Allow the budgetary amount of R25 000.00 (Twenty Five Thousand Rand) NET for sundry alteration work to be used as directed by the Principal Agent and deducted in whole or in part if not required

- Item: 25 000.00

---

**Section No 2: Builders Work**
Bill No. 1
ALTERATIONS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

---

Carried to Collection

- R
Bill No. 1

ALTERATIONS

COLLECTION

Total Brought Forward from Page No.

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<th>Amount</th>
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<tr>
<td>73</td>
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<td>74</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td></td>
</tr>
<tr>
<td>77</td>
<td></td>
</tr>
<tr>
<td>78</td>
<td></td>
</tr>
</tbody>
</table>

Carried to Summary

Section No 2: Builders Work
Bill No. 1
ALTERATIONS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### BILL NO 2

**EARTHWORKS**

**NOTE:** Tenderers are advised to study the Model Preambles for Trades before pricing this bill

**NOTE:** Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 104 for Haylett Formula purposes.

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
</table>

**SUPPLEMENTARY PREAMBLES**

**Nature of the ground**

The nature of the ground is assumed to be silty clay, therefore "earth"

**Working space**

No formwork or working space has been measured to the sides of concrete wall footings and column bases and no formwork or additional backfilling necessary due to over-excavations will be measured. Backfilling to such over-excavations areas must be compacted to the same degree and in the same manner as the backfilling to the remainder of such excavation.

Working space for formwork to sides of all concrete, except columns, has been measured only where the concrete face is less than 750mm from the face of the measured excavation.

Working space for formwork to sides of columns has been measured for the width of the column face only where both:

- the top off column bases is more than 1,5m below the commencing level of the excavations and
- the column face is less than 500mm from the face of the measured excavations.

No claim will be considered for any working space for formwork to concrete other than as above described or for working space beyond the sides of trench excavations for the building of brick or block walls.

---

**Carried to Collection**

Section No 2: Builders Work  
Bill No. 2  
EARTHWORKS  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
**Carting away of excavated material**

Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site.

-------------------

**EXCAVATION, FILLING, ETC**

**Excavation in earth not exceeding 2m deep**

<table>
<thead>
<tr>
<th></th>
<th>Trenches</th>
<th></th>
<th>m³</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Trenches inside existing buildings</td>
<td></td>
<td>m³</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Holes</td>
<td></td>
<td>m³</td>
<td>0.3</td>
</tr>
<tr>
<td>C</td>
<td>Thickening under surface beds etc</td>
<td></td>
<td>m³</td>
<td>1</td>
</tr>
</tbody>
</table>

**Extra over trench and hole excavations in earth for excavation in**

<table>
<thead>
<tr>
<th></th>
<th>Soft rock.</th>
<th>m³</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Hard rock.</td>
<td>m³</td>
<td>5</td>
</tr>
</tbody>
</table>

**Extra over all excavations for carting away**

| G | Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor | m³  | 54 |

**Risk of collapse of excavations**

| H | Sides of trench and hole excavations not exceeding 1.5m deep | m²  | 134|

**Keeping excavations free of water**

| I | Keeping excavations free of water | Item |
|   | 21 : 45 | 22 : 0 | 23 : 89 |
|   | 21 : 0.00 | 22 : 0.00 | 23 : 1.00 |

Carried to Collection

Section No 2: Builders Work
Bill No. 2
EARTHWORKS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### Earth filling supplied by the contractor compacted to 95% Mod AASHTO density

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Under floors, steps, pavings, etc</td>
<td>m³</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 6</td>
</tr>
<tr>
<td>B</td>
<td>Backfilling to trenches, holes, etc</td>
<td>m³</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 9</td>
</tr>
</tbody>
</table>

### Compaction of surfaces

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Compaction of ground surface under floors etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 90% Mod AASHTO density</td>
<td>m²</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 15</td>
</tr>
</tbody>
</table>

### Prescribed density tests on filling

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>&quot;Modified AASHTO Density&quot; test</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0</td>
</tr>
<tr>
<td>E</td>
<td>Field density tests</td>
<td>No</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0</td>
</tr>
</tbody>
</table>

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**Carried to Collection R**

Section No 2: Builders Work
Bill No. 2
EARTHWORKS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

-82-
Bill No. 2

EARTHWORKS

COLLECTION

<table>
<thead>
<tr>
<th>Page No</th>
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</thead>
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<td>81</td>
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<tr>
<td>82</td>
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</tr>
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</table>

Total Brought Forward from Page No.

Section No 2: Builders Work
Bill No. 2
EARTHWORKS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
</table>

### BILL NO 3

**CONCRETE, FORMWORK AND REINFORCEMENT**

**NOTE:** Tenderers are advised to study the Model Preambles for Trades before pricing this bill

**NOTE:** Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 110 for Haylett Formula purposes.

---

**SUPPLEMENTARY PREAMBLES**

**Cost of tests**

The costs of making, storing and testing of concrete test cubes as required under Clause 7 "Tests" of SABS 1200 G shall include the cost of providing cube moulds necessary for submitting reports on the tests to the Architect. The testing shall be undertaken by an independent firm or institution nominated by the contractor to the approval of the Architect. (Test cubes are measured separately)

**Formwork**

Descriptions of formwork shall be deemed to include use and waste only (except where described as "left in" or "permanent"), for fitting together in the required forms, wedging, plumbing and fixing to true angles and surfaces as necessary to ensure easy release during stripping and for re-conditioning as necessary before re-use.

The vertical strutting shall be carried down to such construction as is sufficiently strong to afford the required support without damage and shall remain in position until the newly constructed work is able to support itself.

Formwork to soffits of solid slabs etc shall be deemed to be to slabs not exceeding 250mm thick unless otherwise described.

Formwork to soffits of slabs, beams, etc shall be deemed to be propped up exceeding 1,5m and not exceeding 3,5m high unless otherwise described.

---

**Carried to Collection**

Section No 2: Builders Work
Bill No. 3
CONCRETE, FORMWORK AND REINFORCEMENT
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
Formwork to sides of bases, pile caps, ground beams, etc will only be measured where it is prescribed by the engineer for design reasons. Formwork necessitated by irregularity or collapse of excavated faces will not be measured and the cost thereof shall be deemed to be included in the allowance for taking the risk of collapse of the sides of the excavations, provision for which is made in "Earthworks"

Concrete

Prices for concrete in strip footings and filling to cavity of hollow walls are to include for working around steel reinforcing bars where applicable

<table>
<thead>
<tr>
<th>UNREINFORCED CONCRETE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>25MPa/19mm concrete</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Filling to cavity of hollow walls</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>21 : 0</td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Steps, urinal steps, cupboard platforms, etc</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>21 : 0.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>25MPa/19mm concrete</td>
<td></td>
</tr>
<tr>
<td>C Strip footings</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>21 : 6</td>
</tr>
<tr>
<td>D Bases</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>21 : 0.0</td>
</tr>
<tr>
<td>E Surface beds on waterproofing</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>21 : 3</td>
</tr>
<tr>
<td>F Ramps</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>21 : 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REINFORCED CONCRETE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>25MPa/19mm concrete</td>
<td></td>
</tr>
<tr>
<td>G Isolated beams</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>21 : 0</td>
</tr>
</tbody>
</table>

Carried to Collection | R |

Section No 2: Builders Work
Bill No. 3
CONCRETE, FORMWORK AND REINFORCEMENT
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
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<tr>
<th></th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Columns in foundations</td>
<td>m³</td>
<td>0.4</td>
</tr>
<tr>
<td>B</td>
<td>Columns</td>
<td>m³</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>CONCRETE SUNDRIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30MPa non-shrink grout</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bedding approximately 15mm thick under 310 x 310mm base plate including chamfered edges all round</td>
<td>No</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td><strong>Finishing top surfaces of concrete smooth with a steel trowel</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surface beds, slabs, etc to falls</td>
<td>m²</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td><strong>Finishing top surfaces of concrete to an evenly ribbed non-slip surface</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surface beds, slabs, etc</td>
<td>m²</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>TEST BLOCKS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Making and testing 150 x 150 x 150mm concrete strength test cube</td>
<td>No</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>FORMWORK</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>ROUGH FORMWORK (DEGREE OF ACCURACY III)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rough formwork to sides</td>
<td>m²</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Rectangular columns in foundations</td>
<td>m²</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Rectangular columns</td>
<td>m²</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Isolated beams</td>
<td>m²</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Edges, risers, ends and reveals not exceeding 300mm high or wide</td>
<td>m</td>
<td></td>
</tr>
</tbody>
</table>

**Carried to Collection**
### Rough formwork to soffits

<table>
<thead>
<tr>
<th>A</th>
<th>Isolated beams</th>
<th>m²</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 0</td>
<td>22 : 0</td>
<td>23 : 6</td>
</tr>
</tbody>
</table>

### MOVEMENT JOINTS ETC

**Movement joints with "Jointex" between vertical concrete and brick surfaces**

<table>
<thead>
<tr>
<th>B</th>
<th>10mm Joints not exceeding 300mm high</th>
<th>m</th>
<th>44</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 16</td>
<td>22 : 0</td>
<td>23 : 28</td>
</tr>
</tbody>
</table>

### REINFORCEMENT

**Mild steel reinforcement to structural concrete work**

<table>
<thead>
<tr>
<th>C</th>
<th>10mm Diameter bars</th>
<th>t</th>
<th>0.01</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 0.00</td>
<td>22 : 0.00</td>
<td>23 : 0.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>8mm Diameter bars</th>
<th>t</th>
<th>0.03</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 0.01</td>
<td>22 : 0.00</td>
<td>23 : 0.03</td>
</tr>
</tbody>
</table>

**High tensile steel reinforcement to structural concrete work**

<table>
<thead>
<tr>
<th>E</th>
<th>20mm Diameter bars</th>
<th>t</th>
<th>0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 0.01</td>
<td>22 : 0.00</td>
<td>23 : 0.04</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F</th>
<th>16mm Diameter bars</th>
<th>t</th>
<th>0.58</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 0.11</td>
<td>22 : 0.00</td>
<td>23 : 0.47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G</th>
<th>12mm Diameter bars</th>
<th>t</th>
<th>0.55</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 0.10</td>
<td>22 : 0.00</td>
<td>23 : 0.44</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H</th>
<th>10mm Diameter bars</th>
<th>t</th>
<th>0.31</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 0.06</td>
<td>22 : 0.00</td>
<td>23 : 0.25</td>
</tr>
</tbody>
</table>

**Fabric reinforcement**

<table>
<thead>
<tr>
<th>I</th>
<th>Ref 193 fabric reinforcement in concrete surface beds, slabs, etc</th>
<th>m²</th>
<th>82</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 22</td>
<td>22 : 0</td>
<td>23 : 60</td>
</tr>
</tbody>
</table>

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Carried to Collection

Section No 2: Builders Work
Bill No. 3
CONCRETE, FORMWORK AND REINFORCEMENT
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

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<table>
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<tr>
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<tr>
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<td>85</td>
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<td>86</td>
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<td>87</td>
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Total Brought Forward from Page No.

Carried to Summary

Section No 2: Builders Work
Bill No. 3
CONCRETE, FORMWORK AND REINFORCEMENT
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 116 for Haylett Formula purposes.

SUPPLEMENTARY PREAMBLES

BRICKWORK

Sizes in descriptions

Where sizes in descriptions are given in brick units, "one brick" shall represent the length and "half brick" the width of a brick

Hollow walls etc

Descriptions of hollow walls shall be deemed to include leaving every fifth perpend of the bottom course of the external skin open as a weep hole

Wall ties for brickwork

Wall ties shall be polypropylene "Permaties" complying with BS 76377. Ties for hollow walls shall be of sufficient length to allow not less than 75mm of each end to be built into the brickwork. Ties are to be spaced at intervals of not more than 1m in the horizontal direction and not more than 400mm staggered in the vertical direction except at openings, vertical joints or ends of walls where they are to be placed vertically above each other
### Brickwork of NFX clay bricks (14Mpa nominal compressive strength) in Class II mortar

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Units</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>One brick walls in foundations</td>
<td>m²</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 24 22 : 0 23 : 27</td>
</tr>
<tr>
<td>B</td>
<td>280mm Hollow wall of two half brick skins, including polypropylene ties in foundations</td>
<td>m²</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0 22 : 0 23 : 16</td>
</tr>
</tbody>
</table>

### SUPERSTRUCTURE

#### Brickwork of NFX clay bricks (14Mpa nominal compressive strength) in Class II mortar

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Units</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Half brick walls</td>
<td>m²</td>
<td>137</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 55 22 : 0 23 : 82</td>
</tr>
<tr>
<td>D</td>
<td>Half brick wall in beamfilling</td>
<td>m²</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0 22 : 0 23 : 5</td>
</tr>
<tr>
<td>E</td>
<td>One brick walls</td>
<td>m²</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0 22 : 0 23 : 16</td>
</tr>
<tr>
<td>F</td>
<td>280mm Hollow walls of two half brick skins, including polypropylene ties</td>
<td>m²</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0 22 : 0 23 : 50</td>
</tr>
</tbody>
</table>

### BRICKWORK SUNDRIES

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Units</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Splayed mortar fillet one course high in 50mm cavity</td>
<td>m</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0 22 : 0 23 : 18</td>
</tr>
<tr>
<td>H</td>
<td>Closing 50mm cavity of hollow wall vertically with brickwork half brick wide</td>
<td>m</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0 22 : 0 23 : 16</td>
</tr>
<tr>
<td>I</td>
<td>Closing 50mm cavity of hollow wall horizontally with two courses of brickwork</td>
<td>m</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0 22 : 0 23 : 18</td>
</tr>
</tbody>
</table>

### Brickwork reinforcement

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Units</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>75mm Wide brickwork reinforcement built in horizontally</td>
<td>m</td>
<td>927</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 130 22 : 0 23 : 797</td>
</tr>
<tr>
<td>K</td>
<td>230mm Wide brickwork reinforcement built in horizontally</td>
<td>m</td>
<td>636</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 284 22 : 0 23 : 353</td>
</tr>
</tbody>
</table>

### Carried to Collection

R
<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Fab-con&quot; pre-stressed fabricated lintels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 100 x 70mm Lintels in lengths not exceeding 3m</td>
<td>52</td>
<td>m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 8</td>
<td>22 : 2</td>
<td>23 : 43</td>
</tr>
<tr>
<td>B 150 x 70mm Lintels in lengths not exceeding 3m</td>
<td>9</td>
<td>m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0</td>
<td>22 : 0</td>
<td>23 : 9</td>
</tr>
<tr>
<td>C 230 x 70mm Lintels in lengths not exceeding 3m</td>
<td>10</td>
<td>m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0</td>
<td>22 : 0</td>
<td>23 : 10</td>
</tr>
<tr>
<td>Galvanised hoop iron cramps, ties, etc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 30 x 1.6mm Cramp 500mm long with one end fixed to wood and other end built into brickwork</td>
<td>162</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 6</td>
<td>22 : 12</td>
<td>23 : 144</td>
</tr>
<tr>
<td>E 30 x 1.6mm Roof tie 1.5m long with one end built into brickwork and other end fixed to timber</td>
<td>24</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0</td>
<td>22 : 0</td>
<td>23 : 24</td>
</tr>
</tbody>
</table>

Carried to Collection

Section No 2: Builders Work
Bill No. 4
MASONRY
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Bill No.</th>
<th>MASONRY</th>
<th>COLLECTION</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Page No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>91</td>
</tr>
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</table>

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Section No 2: Builders Work
Bill No. 4
MASONRY
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### BILL NO 5

**WATERPROOFING**

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 120 for Haylett Formula purposes.

---

**SUPPLEMENTARY PREAMBLES**

**Waterproofing**

Waterproofing of roofs, basements, etc shall be laid under a ten year guarantee. Waterproofing to roofs shall be laid to even falls to outlets etc with necessary ridges, hips and valleys. Descriptions of sheet or membrane waterproofing shall be deemed to include additional labour to turn-ups and turn-downs

---

**DAMPPROOFING OF WALLS AND FLOORS**

- **ONE LAYER OF 375 MICRON "CONSOI PLASTICS BRIKGRIIP DPC" EMBOSSED DAMP PROOF COURSE**
  - **A**: In walls
    - \[m^2\] 36
    - 
    - 21 : 8  
    - 22 : 2  
    - 23 : 27

- **ONE LAYER OF 250 MICRON "CONSOI PLASTICS GUNPLAS USB GREEN" WATERPROOF SHEETING SEALED AT LAPS WITH "GUNPLAS PRESSURE SENSITIVE TAPE"**
  - **B**: Under surface beds
    - \[m^2\] 75
    - 
    - 21 : 15  
    - 22 : 0  
    - 23 : 60

- **FIVE COAT "ACRYLASTIC" FIBRE REINFORCED HEAVY DUTY MAINTENANCE FREE ACRYLIC WATERPROOFING**
  - **C**: Headwall flashing strip 150mm girth, including sealing top edge into groove with mastic
    - \[m\] 31
    - 
    - 21 : 3  
    - 22 : 7  
    - 23 : 21

---

Carried to Collection

Section No 2: Builders Work
Bill No. 5
WATERPROOFING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Side wall flashing strip 150mm girth, including sealing top edge into groove with mastic</td>
<td>m</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Between timber frames and walls</td>
<td>m</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Between timber thresholds and surface beds</td>
<td>m</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>10 x 10mm In vertical expansion joints, including raking out expansion joint filler as necessary</td>
<td>m</td>
<td>44</td>
</tr>
</tbody>
</table>

**Carried to Collection**

Section No 2: Builders Work
Bill No. 5
WATERPROOFING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
Bill No. 5

WATERPROOFING

COLLECTION

<table>
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Section No 2: Builders Work
Bill No. 5
WATERPROOFING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

Carried to Summary

R
BILL NO 6

ROOF COVERINGS, ETC

NOTE:  Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE:  All items in this section shall be deemed to fall into Work Group No. 124 for Haylett Formula purposes.

--------------------------------------

0.53mm Corrugated 10.5 profile Clean COLORBOND AZ150 G550 or similar approved sheeting

A  Roof covering with pitches not exceeding 25 degrees  m²  185

B  Ridge cappings 462mm girth once bent including Serrated Closers and Poly-Closers to both sides  m  6
    21 : 0  22 : 0  23 : 6

C  Hip cappings 462mm girth once bent including Serrated Closers and Poly-Closers to both sides  m  20
    21 : 0  22 : 0  23 : 20

D  Headwall Flash 308mm girth once bent including Serrated Closers and Poly-Closers  m  31
    21 : 3  22 : 7  23 : 21

E  Sidewall Flash 308mm girth once bent.  m  19
    21 : 0  22 : 0  23 : 19

F  Counter Flash 185mm girth twice bent including forming and sealing top edge into groove in brickwork with polysulphide sealant  m  50
    21 : 3  22 : 7  23 : 40

G  Gable Trim (Barge Flashing) 462mm girth once bent  m  15
    21 : 9  22 : 7  23 : 0

ROOF AND WALL INSULATION

Carried to Collection

Section No 2: Builders Work
Bill No. 6
ROOF COVERINGS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>“White Alucushion” on PVC coated straining wire</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A Insulation laid taut over purlins (at approximately 1200mm centres) and fixed concurrent with roof covering</td>
<td>m²</td>
<td>185</td>
</tr>
</tbody>
</table>

Carried to Collection

Section No 2: Builders Work
Bill No. 6
ROOF COVERINGS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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<tr>
<td>ROOF COVERINGS</td>
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<td>97</td>
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Section No 2: Builders Work
Bill No. 6
ROOF COVERINGS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
BILL NO 7

CARPENTRY AND JOINERY

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 126 for Haylett Formula purposes.

SUPPLEMENTARY PREAMBLES

Particle board

Particle board shall comply with the following specifications:

a) SABS 1300 Particle board: exterior and flooring type

b) SABS 1301 Particle board: interior type

Meranti

All meranti shall be selected meranti and shall be free of "sap" wood

Joinery

Descriptions of frames shall be deemed to include frames, transomes, mullions, rails, etc

Descriptions of hardwood joinery shall be deemed to include pelleting of bolt holes

Fixing

Items described as "nailed" shall be deemed to be fixed with hardened steel nails or shot pins to brickwork or concrete

Decorative laminate finish

Laminate finish shall be glued under pressure. Edge strips shall be butt jointed at junctions with adjacent similar finish

ROOFS, ETC

Carried to Collection

Section No 2: Builders Work
Bill No.  7
CARPENTRY AND JOINERY
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wrought TBTO treated grade 5 South African Pine</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 38 x 114mm Wall plates</td>
<td>m</td>
<td>18</td>
</tr>
<tr>
<td>B 38 x 38mm Battens at eaves</td>
<td>m</td>
<td>30</td>
</tr>
<tr>
<td>C 50 x 76mm Purlins</td>
<td>m</td>
<td>132</td>
</tr>
<tr>
<td>D Allow the budgetary amount of R35 000.00 (Thirty Five Thousand Rand) NET for timber roof construction to be used as directed by the Principal Agent and deducted in whole or in part if not required</td>
<td>Item</td>
<td>35 000.00</td>
</tr>
<tr>
<td><strong>EAVES, VERGES, ETC.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Pressed fibre-cement boards</td>
<td>m</td>
<td>88</td>
</tr>
<tr>
<td><strong>DOORS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid core medium duty flush doors with hardboard facing on both sides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F 44mm Door size 813 x 2 032mm high</td>
<td>No</td>
<td>27</td>
</tr>
<tr>
<td>G 44mm Door size 900 x 2 032mm high</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>H 44mm Door size 1 400 x 2 032mm high</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>I 44mm One and a half leaf door size 1 219 x 2 032mm high</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>&quot;Solid Doors&quot; or similar approved horizontal wide groove double sided hardwood door code 12E 0180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J 44mm Door size 813 x 2 032mm high</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>K 44mm Double door size 1 511 x 2 032mm high</td>
<td>No</td>
<td>1</td>
</tr>
</tbody>
</table>

Carried to Collection

Section No 2: Builders Work
Bill No. 7
CARPENTRY AND JOINERY
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>FRAMED FRAMES ETC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wrought meranti</strong></td>
</tr>
<tr>
<td>A 70 x 90mm Frame with one labour for 813 x 2 032mm high door</td>
</tr>
<tr>
<td>21 : 0 22 : 0 23 : 24</td>
</tr>
<tr>
<td>B 70 x 90mm Frame with one labour for 1 511 x 2 032mm high door</td>
</tr>
<tr>
<td>21 : 0 22 : 1 23 : 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FITTINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Allow the budgetary amount of R529 000.00 (Five Hundred and Twenty Nine Thousand Rand) NET for joinery fittings to be used as directed by the Principal Agent and deducted in whole or in part if not required</td>
</tr>
<tr>
<td>21 : 0.00 22 : 0.00 23 : 1.00</td>
</tr>
</tbody>
</table>

| Item | 529 000.00 |

Carried to Collection

Section No 2: Builders Work
Bill No. 7
CARPENTRY AND JOINERY
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Page No</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>99</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
<tr>
<td>101</td>
<td></td>
</tr>
</tbody>
</table>

**Carried to Summary**

Section No 2: Builders Work  
Bill No. 7  
CARPENTRY AND JOINERY  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
BIL NO 8

CEILINGS, PARTITIONS AND ACCESS FLOORING

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: All items in this section shall be deemed to fall into Work Group No. 129 for Haylett Formula purposes.

SUPPLEMENTARY PREAMBLES

Descriptions

Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete

Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 600mm centres, and where described as "bolted" the bolts have been given elsewhere

Bulkheads

Bulkheads are those areas of the ceiling which are at a level differing from the general ceiling in a particular room or area and which generally occur along the perimeter of the room or area. Their purpose is either to conceal services or to create an architectural feature by changing levels.

Bulkheads will only be measured as such when they conform with the above description and when the horizontal or vertical dimensions do not exceed 1.2m. Should these dimensions be more than 1.2m then the horizontal or vertical ceilings will be included in the general ceiling measurements.

CEILING TIMBERS, BEADS, INSULATION, ETC

Sawn softwood

A 38 x 38mm Branders m 210

21 : 47  22 : 0  23 : 163

NAILED UP CEILINGS

Carried to Collection

Section No 2: Builders Work
Bill No. 8
CEILINGS AND PARTITIONING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### Part A

**6.4mm Gypsum plasterboard with H-profile PVC jointing strips**

- Ceilings including 38 x 38mm sawn softwood brandering at 400mm centres
  - m²: 52
  - 21:5 22:0 23:47

### Part B

**6mm Fibre cement plain ceiling boards with H-profile PVC jointing strips**

- Ceilings including 38 x 38mm sawn softwood brandering at 400mm centres
  - m²: 102
  - 21:0 22:0 23:102

### Part C

**CORNICES, ETC**

**Polystyrene**

- 25 x 50mm Twice rebated cornices, including sealing joints with painters’ mate
  - m: 210
  - 21:47 22:0 23:163

### Part D

**INSULATION**

"Isotherm" thermal insulation

- 135mm "Isotherm" thermal isolation blanket closely fitted and laid on top of brandering between roof timbers etc
  - m²: 52
  - 21:5 22:0 23:47

### Part E

**PRE-FABRICATED WALL PANELS**

- 40mm Thick 'Kwickspace' or similar approved wall panels comprising two 0.5mm thick rigidised pre-painted Chromadek galvanised sheeting with solid foam core in between sheets and secured on vertical edges between and to steel hollow section columns with and including 38 x 38 x 3mm galvanised & painted angle section sub frame as per details on architects drawings G439/W02b

- 1500 x 2050mm High panel
  - No: 2
  - 21:2 22:0 23:0

### Part F

- 2000 x 2050mm High panel
  - No: 1
  - 21:1 22:0 23:0

---

**PARTITIONS, ETC.**

Carried to Collection

---

Section No 2: Builders Work
Bill No. 8
CEILINGS AND PARTITIONING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
SUPPLEMENTARY PREAMBLES

Drywall partitioning shall comprise steel studding formed of 90mm aluminium top track and 64mm aluminium bottom track with vertical studs at maximum 600mm centres, friction fitted or pop-riveted to the top and bottom tracks with similar additional vertical studs as necessary at abutments, ends, etc and covered as described with 12.5mm plasterboard screwed to studding with “Drywall” screws at maximum 220mm centres. Boards are to be butt jointed and finished with “Rhino” tape and “Ready mix D” jointing compound all in accordance with the manufacturer’s instructions. Intersections and abutments are measured separately and descriptions shall be deemed to include any additional studs, corner beads, jointing compound, tape, etc.

Partitioning walls to be DONN reference DW/6/96 and all corners and joints are to be constructed to DONN reference DW/14/96.

Unless otherwise described rates for partitions shall be deemed to include for standard flat section aluminium skirtings on both sides.

Wall paper and/or paint and varnish finishes are measured elsewhere.

**Drywall steel stud partitioning with 12.5mm plasterboard on both sides**

A Partitioning 2.8m high with bottom track plugged and top track fixed to suspended ceiling tees.  

<table>
<thead>
<tr>
<th>21 : 0</th>
<th>22 : 0</th>
<th>23 : 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Doors**

B Extra over partition for 40mm semi-solid laminated flush door 813 x 2032mm high with veneer finish on both sides and hardwood edge strips to vertical edges hung to and including 70 x 95mm rebated meranti door frame including additional studding, trimming, etc. (ironmongery elsewhere)  

<table>
<thead>
<tr>
<th>21 : 0</th>
<th>22 : 0</th>
<th>23 : 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C Extra over partition for 40mm solid flush double door 1600 x 2032mm high with veneer finish on both sides and hardwood edge strips to vertical edges hung to and including 70 x 95mm rebated meranti door frame including additional studding, trimming, etc. (ironmongery elsewhere)  

<table>
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<tr>
<th>21 : 0</th>
<th>22 : 0</th>
<th>23 : 1</th>
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<tbody>
<tr>
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<th>Amount</th>
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<td>104</td>
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Carried to Summary

Section No 2: Builders Work
Bill No. 8
CEILINGS AND PARTITIONING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
## BILL NO 9

**FLOOR COVERINGS, PLASTIC LININGS, ETC**

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 130 for Haylett Formula purposes.

---

### FLOOR COVERINGS

2mm Thick homogeneous rotary pressed and continuously calendared fully flexible vinyl sheet flooring (with a vinyl content of approx 50%) with welded joints fixed in accordance with manufacturers specifications to screeded floors. The flooring shall incorporate a chemically cross linked Polyurethane coating and must meet ISO 14001 & 9001 standards with BBA certification, supplied with a written 15-year performance guarantee. Rate to include final stripping and sealing of floors as per manufacturers requirements

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>m²</td>
<td>775</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 88</td>
<td>22 : 0</td>
<td>23 : 687</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>m</td>
<td>714</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 72</td>
<td>22 : 0</td>
<td>23 : 642</td>
<td></td>
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</table>

### SKIRTINGS, NOSINGS, ETC

"Polyflor" or similar approved

<table>
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<tr>
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<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>C</td>
<td>m</td>
<td>714</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 72</td>
<td>22 : 0</td>
<td>23 : 642</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>m</td>
<td>714</td>
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<td></td>
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<tr>
<td></td>
<td>21 : 72</td>
<td>22 : 0</td>
<td>23 : 642</td>
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</tbody>
</table>

### SUNDRIES

Carried to Collection

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Section No 2: Builders Work
Bill No. 9
FLOOR COVERINGS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>A</th>
<th>Minimum 3mm thick on existing floors</th>
<th>m²</th>
<th>45</th>
</tr>
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<tbody>
<tr>
<td></td>
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</table>

“Servoplan Ki1” or similar approved self levelling screed as per manufacturers specification

Section No 2: Builders Work
Bill No. 9
FLOOR COVERINGS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

Carried to Collection
Bill No. 9

FLOOR COVERINGS

**COLLECTION**

<table>
<thead>
<tr>
<th>Page No</th>
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<tbody>
<tr>
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<td>108</td>
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Total Brought Forward from Page No.

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Section No 2: Builders Work
Bill No. 9
FLOOR COVERINGS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
BILL NO 10

IRONMONGERY

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 132 for Haylett Formula purposes.

SUPPLEMENTARY PREAMBLES

Finishes to ironmongery

Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list:
- BS  Satin bronze lacquered
- CH  Chromium plated
- SC  Satin chromium plated
- SE  Silver enamelled
- GE  Grey enamelled
- AS  Anodised silver
- AB  Anodised bronze
- AG  Anodised gold
- ABL Anodised black
- PB  Polished brass
- PL  Polished and lacquered
- PT  Epoxy coated
- SD  Sanded

HINGES, BOLTS, ETC

"Union" or similar approved

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No</td>
<td>72</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21:3</td>
<td>22:12</td>
<td>23:57</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>No</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21:2</td>
<td>22:4</td>
<td>23:0</td>
<td></td>
</tr>
</tbody>
</table>

CATCHES, CABIN HOOKS, ETC

Carried to Collection R
**“QS”**

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>QS4449 Cabin hook, including 70 x 70 x 20mm chamfered meranti block painted</td>
<td>2</td>
</tr>
</tbody>
</table>

**LOCKS**

**“Union” or similar approved**

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Euro profile mortice sash lock code L-2209-78-SS</td>
<td>34</td>
</tr>
<tr>
<td>C</td>
<td>Euro profile double cylinder code 2X18-SC</td>
<td>34</td>
</tr>
<tr>
<td>D</td>
<td>Bathroom lock code 2226-78SS</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>Rebate set code 2900SS</td>
<td>4</td>
</tr>
</tbody>
</table>

**HANDLES**

**“Union” or similar approved**

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Stainless steel lever handle set on 45 x 150mm euro profile backplate code 6145-05SS</td>
<td>33</td>
</tr>
<tr>
<td>G</td>
<td>350mm Back to back pull handle set code 5213BBSS</td>
<td>3</td>
</tr>
</tbody>
</table>

**SLIDING GEAR**

**“Henderson” or similar approved**

<table>
<thead>
<tr>
<th>No</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>“Husky 100” sliding gear set for single door with track 2 800mm long, including brackets for side fixing, hangers, rollers, guides, stops, etc</td>
<td>1</td>
</tr>
</tbody>
</table>

**PUSH PLATES AND KICK PLATES**

Carried to Collection

Section No 2: Builders Work
Bill No. 10
IRONMONGERY
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
**BATHROOM FITTINGS**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>No</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.6mm Thick type 304 satin finish stainless steel plates fixed to timber doors with 20mm x 8mm thick stainless steel half round head screws, 25mm from edge of plate all round at 200mm centres</td>
<td>813 x 300mm High pushplate</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 2</td>
<td>22 : 0</td>
</tr>
<tr>
<td>B</td>
<td>813 x 300mm High kickplate</td>
<td>813 x 300mm High kickplate</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 12</td>
<td>22 : 0</td>
</tr>
<tr>
<td>C</td>
<td>&quot;Rodan Range (RODX672)&quot; or similar approved wall mounted double toilet roll holder with spindle system</td>
<td>No 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 1</td>
<td>22 : 0</td>
</tr>
<tr>
<td>D</td>
<td>&quot;Rodan Range (RODX619)&quot; or similar approved wall mounted soap dispenser</td>
<td>No 17</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 6</td>
<td>22 : 0</td>
</tr>
<tr>
<td>E</td>
<td>&quot;Serenaseat&quot; powder coated aluminium shower seat with Bamboo seat and backrest, size 457 wide x 400mm deep fixed to shower walls in accordance with manufacturers recommendations</td>
<td>No 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 0</td>
<td>22 : 0</td>
</tr>
<tr>
<td>F</td>
<td>32mm &quot;Ref SR2&quot; grade 304 satin polished stainless steel cistern rail,</td>
<td>No 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fixed with stainless steel fixing screws and plastic wall plugs supplied</td>
<td>21 : 1</td>
<td>22 : 0</td>
</tr>
<tr>
<td>G</td>
<td>32mm &quot;Ref DL3&quot; grade 304 satin polished stainless steel dogleg rail with three flanges, fixed with stainless steel fixing screws and plastic wall plugs supplied</td>
<td>No 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 1</td>
<td>22 : 0</td>
</tr>
<tr>
<td>H</td>
<td>Shadowline cubicle curtain rail fixed to suspended ceiling</td>
<td>m 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 9</td>
<td>22 : 0</td>
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**PELMENTS AND CURTAIN TRACKS**

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<thead>
<tr>
<th></th>
<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Shadowline cubicle curtain rail fixed to suspended ceiling</td>
<td>m 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 9</td>
</tr>
</tbody>
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**Carried to Collection**

Section No 2: Builders Work
Bill No. 10
IRONMONGERY
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### SHELVES ETC

"Shelco" proprietary type steel shelving with standard powder coated finish

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>&quot;Ref FT8&quot; double slot wall band 2 400mm long, plugged</td>
<td>No 7</td>
</tr>
<tr>
<td>B</td>
<td>Shelf bracket for 365mm shelf</td>
<td>No 73</td>
</tr>
<tr>
<td>C</td>
<td>914 x 365mm Shelf</td>
<td>No 36</td>
</tr>
</tbody>
</table>

"Shelco" free standing proprietary type steel shelving units with standard powder coated finish, including heavy duty uprights, open base foot pieces, shelf brackets, shelves, spacers, top rails and top finishing plates

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Double shelving unit 4 690 x 445 x 2 200mm high in 5 bays with 6 uprights, each bay 914mm wide with 7 rows of 914 x 365mm shelves on both sides</td>
<td>No 2</td>
</tr>
</tbody>
</table>

### SUNDRIES

10mm Diameter steel dowel 75mm long in and including mortice in timber and brickwork or concrete

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>10mm Diameter steel dowel 75mm long in and including mortice in timber and brickwork or concrete</td>
<td>No 2</td>
</tr>
</tbody>
</table>

"Union" or similar approved

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Floor mounted doorstop code 87001SS</td>
<td>No 35</td>
</tr>
</tbody>
</table>

### BUDGET ALLOWANCE

Allow the budgetary amount of R5 000.00 (Five Thousand Rand) NET for signage to Albertina clinic be used as directed by the Principal Agent and deducted in whole or in part if not required

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Allow the budgetary amount of R5 000.00 (Five Thousand Rand) NET for signage to Albertina clinic be used as directed by the Principal Agent and deducted in whole or in part if not required</td>
<td>Item 5 000.00</td>
</tr>
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</table>

Allow the budgetary amount of R5 000.00 (Five Thousand Rand) NET for signage to Riversdale clinic be used as directed by the Principal Agent and deducted in whole or in part if not required

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Allow the budgetary amount of R5 000.00 (Five Thousand Rand) NET for signage to Riversdale clinic be used as directed by the Principal Agent and deducted in whole or in part if not required</td>
<td>Item 5 000.00</td>
</tr>
</tbody>
</table>

Allow the budgetary amount of R50 000.00 (Fifty Thousand Rand) NET for signage to Riversdale Hospital be used as directed by the Principal Agent and deducted in whole or in part if not required

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>I</td>
<td>Allow the budgetary amount of R50 000.00 (Fifty Thousand Rand) NET for signage to Riversdale Hospital be used as directed by the Principal Agent and deducted in whole or in part if not required</td>
<td>Item 50 000.00</td>
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<td>Amount</td>
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<td>113</td>
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</table>

**Ironmongery**

Section No 2: Builders Work
Bill No. 10
IRONMONGERY
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item No</th>
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<td><strong>BILL NO 11</strong></td>
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<tr>
<td></td>
<td><strong>STRUCTURAL STEELWORK</strong></td>
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<td>NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill</td>
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<td>NOTE: Unless otherwise stated herein, all items in this bill shall be deemed to fall into Work Group No 134 for Haylett formula purposes</td>
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<td></td>
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<tr>
<td></td>
<td>Descriptions of bolts shall be deemed to include nuts and washers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Descriptions of L-shaped and U-shaped anchor bolts shall be deemed to include bending, threading, nuts and washers and embedding in concrete</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td><strong>GALVANISED STEEL COLUMNS AND BEAMS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Welded columns in single lengths with flat base, cap, bearer and connection plates, bolted to concrete</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>75 x 75 x 4mm Galvanized square hollow section columns</td>
<td>t</td>
<td>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.13  22 : 0.05  23 : 0.00</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td><strong>Welded beams in single lengths with flat bearer and connection plates, bolted to steel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>75 x 75 x 4mm Galvanized square hollow section beams</td>
<td>t</td>
<td>0.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.12  22 : 0.00  23 : 0.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>GALVANISED STEEL PURLINS, GIRTS, BRACING, ETC.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Purlins and girts, bolted to steel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>75 x 50 x 20 x 2.5mm Thick cold-formed lipped channel purlins</td>
<td>t</td>
<td>0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.06  22 : 0.00  23 : 0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>BOLTS, FASTENERS, ETC</strong></td>
<td></td>
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<tr>
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Section No 2: Builders Work  
Bill No. 11  
STRUCTURAL STEEL  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th><strong>Bolts to columns, beams, etc</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> High tensile bolts (class 8.8)</td>
</tr>
<tr>
<td>21 : 0.06</td>
</tr>
<tr>
<td><strong>B</strong> M12 Chemical anchors 125mm girth</td>
</tr>
<tr>
<td>21 : 20</td>
</tr>
</tbody>
</table>

**Carried to Collection**

Section No 2: Builders Work  
Bill No. 11  
STRUCTURAL STEEL  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
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Total Brought Forward from Page No.

Carried to Summary

Section No 2: Builders Work
Bill No. 11
STRUCTURAL STEEL
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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<td>BILL NO 12</td>
<td>METALWORK</td>
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</table>

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 136 for Haylett Formula purposes.

SUPPLEMENTARY PREAMBLES

Descriptions

Descriptions of bolts shall be deemed to include nuts and washers

Descriptions of expansion and chemical expansion bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete

The effective fixing length of expansion and chemical expansion bolts is the thickness of material being fixed to the masonry surface

Metalwork described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described

---

GALVANISED STEEL BALUSTRADES

"Maclock Systems" or similar approved ball type welded and bolted balustrades to walkways

A Raking balustrades 1 000mm high of 34mm diameter x 2.5mm thick continuous pipe top and bottom rails and 43mm diameter x 2.5mm thick stanchions at average 1 400mm centres bolted to concrete

   21 : 0  22 : 0  23 : 1

B Extra over for end closure to raking balustrade

   21 : 0  22 : 0  23 : 2

---

GALVANISED PRESSED STEEL DOOR FRAMES

Carried to Collection

Section No 2: Builders Work
Bill No. 12
METALWORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
1.6mm Thick double rebated frame suitable for half brick walls with 1.5 pairs of 100mm steel hinges per door leaf and striking plate

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Frame for door 813 x 2 032mm high</td>
<td>No 3</td>
</tr>
<tr>
<td></td>
<td>21 : 3</td>
<td>22 : 0</td>
</tr>
<tr>
<td></td>
<td>23 : 0</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Frame for door 900 x 2 032mm high and fixed fanlight 310mm high</td>
<td>No 1</td>
</tr>
<tr>
<td></td>
<td>21 : 1</td>
<td>22 : 0</td>
</tr>
<tr>
<td></td>
<td>23 : 0</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Frame for door 1 219 x 2 032mm high and fixed fanlight 305mm high</td>
<td>No 1</td>
</tr>
<tr>
<td></td>
<td>21 : 1</td>
<td>22 : 0</td>
</tr>
<tr>
<td></td>
<td>23 : 0</td>
<td></td>
</tr>
</tbody>
</table>

**GATES, SCREENS, ETC**

Welded screens and gates to sputum booth

D  Single gate 975 x 2 050mm high of 38 x 76 x 3mm hollow section frame with 76 x 3mm flat bar welded on to take and filled in with Powdercoated "Clearview" or similar approved fence panel bolted to flat bar with dome headed bolts and fitted with a pair of suitable hinges welded to post and with hasp and staple welded on as per details on architects drawing G439/W02b

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 1</td>
<td>22 : 0</td>
</tr>
<tr>
<td></td>
<td>23 : 0</td>
<td></td>
</tr>
</tbody>
</table>

E  Viewing panel 975 x 2 050mm high of Powdercoated "Clearview" or similar approved fence panel secured between 38 x 38 x 3mm galvanised angle section subframe and with 38 x 3mm flat bar bolted together with dome headed bolts and the whole bolted to inside of 75 x 75mm square hollow section columns. (columns elsewhere) as per details on architects drawing G439/W02b

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 1</td>
<td>22 : 0</td>
</tr>
<tr>
<td></td>
<td>23 : 0</td>
<td></td>
</tr>
</tbody>
</table>

**ALUMINIUM ROLLER SHUTTERS ETC**

"Roll-up serranda" series 500 powder coated mild steel push-up 75mm x 1.0mm thick endlocked slatted curtain roller shutter for opening as specified with no overhead box, standard bottom rail, 75mm wide guides, mild steel t-bar with rubber seal, powder coated mild steel ancillary components including 4.5mm thick end plates, guide rails, slide bolt, fixed to brick jambs and concrete lintel

F  Manual push-up slatted roller shutter for 1 000 x 1 100mm high opening

<table>
<thead>
<tr>
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<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 1</td>
<td>22 : 0</td>
</tr>
<tr>
<td></td>
<td>23 : 0</td>
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</table>

**DARK BRONZE ANODISED ALUMINIUM LOUVRE UNITS**

Carried to Collection

Section No 2: Builders Work
Bill No. 12
METALWORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
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<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Louvre unit for 300 x 300mm high opening including vermin proof screen</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Allow the budgetary amount of R335 000.00 (Three Hundred and Thirty Five Thousand Rand) FOR burglar proofing to be used as directed by the Principal Agent and deducted in whole or in part if not required</td>
<td>1</td>
<td>335 000.00</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Allow the budgetary amount of R15 000.00 (Fifteen Thousand Rand) FOR dust screen to ambulance drop off to be used as directed by the Principal Agent and deducted in whole or in part if not required</td>
<td>1</td>
<td>15 000.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Allow the budgetary amount of R244 000.00 (Two Hundred and Forty Four Thousand Rand) FOR aluminium windows &amp; doors to be used as directed by the Principal Agent and deducted in whole or in part if not required</td>
<td>1</td>
<td>244 000.00</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Allow the budgetary amount of R 9 000.00 (Nine Thousand Rand) FOR steel roof structure to Albertina clinic to be used as directed by the Principal Agent and deducted in whole or in part if not required</td>
<td>1</td>
<td>8 800.00</td>
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</tr>
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**BUDGETARY ALLOWANCES**

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<th>Cost</th>
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Section No 2: Builders Work
Bill No. 12
METALWORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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Carried to Summary

Section No 2: Builders Work
Bill No. 12
METALWORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

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<td><strong>BILL NO 13</strong></td>
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<tr>
<td><strong>PLASTERING</strong></td>
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<tr>
<td>NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill</td>
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<td>NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 142 for Haylett Formula purposes.</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>SCREEDS</strong></td>
<td>Screeds wood floated, on concrete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>30mm Thick screeds</td>
<td>m²</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 6</td>
<td>22 : 0</td>
<td>23 : 39</td>
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<tr>
<td><strong>INTERNAL PLASTER</strong></td>
<td>Cement plaster steel trowelled, on brickwork</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>On walls</td>
<td>m²</td>
<td>331</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 111</td>
<td>22 : 0</td>
<td>23 : 221</td>
</tr>
<tr>
<td>C</td>
<td>On narrow widths</td>
<td>m²</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 : 0</td>
<td>22 : 0</td>
<td>23 : 8</td>
</tr>
<tr>
<td><strong>EXTERNAL PLASTER</strong></td>
<td>Cement plaster wood floated, on brickwork</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>On walls in foundations</td>
<td>m²</td>
<td>18</td>
<td></td>
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<tr>
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<td>21 : 2</td>
<td>22 : 0</td>
<td>23 : 16</td>
</tr>
<tr>
<td>E</td>
<td>On walls</td>
<td>m²</td>
<td>71</td>
<td></td>
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<td></td>
<td>21 : 0</td>
<td>22 : 0</td>
<td>23 : 71</td>
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<tr>
<td>F</td>
<td>On narrow widths</td>
<td>m²</td>
<td>4</td>
<td></td>
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<td>21 : 0</td>
<td>22 : 0</td>
<td>23 : 4</td>
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<tr>
<td>G</td>
<td>On sloping top, edge and projecting soffit of sills 335mm girth</td>
<td>m</td>
<td>4</td>
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<td>21 : 0</td>
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Section No 2: Builders Work  
Bill No. 13  
PLASTERING  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
### CORNER PROTECTORS, DIVIDING STRIPS, ETC

<table>
<thead>
<tr>
<th>A</th>
<th>3 x 32mm Flat section galvanised mild steel water bar embedded in floor finish</th>
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<td></td>
<td>21 : 1</td>
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<td></td>
<td>m</td>
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### BILL NO 14

**TILING**

**NOTE:** Tenderers are advised to study the Model Preambles for Trades before pricing this bill.

**NOTE:** Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 144 for Haylett Formula purposes.

---

**SUPPLEMENTARY PREAMBLES**

**Descriptions**

Unless described as "fixed with adhesive to plaster (plaster elsewhere)" descriptions of tiling on brick or concrete walls, columns, etc shall be deemed to include 1:4 cement plaster backing and descriptions of tiling on concrete floors, etc shall be deemed to include 1:3 plaster bedding.

---

### WALL TILING

- **300 x 600 x 10mm Full body white gloss porcelain tiles fixed with suitable adhesive to manufacturers recommendations to bedding (bedding elsewhere) and flush pointed with white epoxy grout**

<table>
<thead>
<tr>
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<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
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<tr>
<td>A</td>
<td>m²</td>
<td>223</td>
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<td>21 : 121</td>
<td>22 : 0</td>
<td>23 : 101</td>
</tr>
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</table>

### FLOOR TILING

- **300 x 300 x 10mm Porcelain tiles (PC Sum R250,00/m² excluding VAT, delivered to site) fixed with suitable adhesive to manufacturers recommendations to bedding (bedding elsewhere) and flush pointed with tinted waterproof jointing compound**

<table>
<thead>
<tr>
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<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>B</td>
<td>m²</td>
<td>151</td>
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<td></td>
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<td>21 : 151</td>
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<td>23 : 0</td>
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Section No 2: Builders Work
Bill No. 14
TILING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>A</th>
<th>145mm High cut tile skirting</th>
<th>m</th>
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Section No 2: Builders Work
Bill No. 14
TILING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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<td>126</td>
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# BILL NO 15

## PLUMBING AND DRAINAGE

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

<table>
<thead>
<tr>
<th>SUPPLEMENTARY PREAMBLES</th>
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</thead>
<tbody>
<tr>
<td><strong>uPVC pipes and fittings</strong></td>
</tr>
<tr>
<td>Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings</td>
</tr>
<tr>
<td>Soil, waste and vent pipes and fittings shall be solvent weld jointed</td>
</tr>
<tr>
<td><strong>Copper pipes</strong></td>
</tr>
<tr>
<td>Pipes shall be hard drawn and half-hard pipes of the class stated. Class 0 (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 &quot;Cobra Watertech&quot; type. Capillary solder fittings shall comply with ISO 2016. Only compression fittings shall be used in walls or in ground</td>
</tr>
<tr>
<td><strong>Reducing fittings</strong></td>
</tr>
<tr>
<td>Where fittings have reducing ends or branches they are described as &quot;reducing&quot;. In the case of pipes with diameters not exceeding 60mm only 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</td>
</tr>
<tr>
<td><strong>Exposed concrete surfaces</strong></td>
</tr>
<tr>
<td>Exposed surfaces of concrete stormwater channels, cover slabs, inspection eye marker slabs, gully tops, cleaning eye tops, catch pits, inspection chambers, etc shall be finished smooth with plaster</td>
</tr>
</tbody>
</table>

---

Section No 2: Builders Work
Bill No. 15
PLUMBING AND DRAINAGE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

---

Carried to Collection

R


**Excavations**

No claim for rock excavation will be entertained unless the contractor has timeously notified the quantity surveyor thereof prior to backfilling.

“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 the manufacturer's instructions.

Where no manufacturer's instructions exist pipes shall be laid in accordance with Clauses 5.1 and 5.2 of each of the following:

- SANS 1200 L: Medium-pressure pipelines
- LD: Sewers
- LE: Stormwater drainage

Pipe trenches etc shall be backfilled in accordance with Clauses 3, 5.5, 5.6, 5.7 and 7 of SANS 1200 DB: Earthworks (Pipe trenches)

Pipes shall be bedded in accordance with Clauses 3.1 to 3.4.1, 5.1 to 5.3 and 7 of SANS 1200 LB: Bedding (Pipes).

Unless otherwise described bedding of rigid pipes shall be Class B bedding.

**Flush pans**

Flush pans shall have straight or side outlets and “P” or “S” traps as necessary.

**Stainless steel basins, sinks, wash troughs, urinals, etc**

Units shall have standard aprons on all exposed edges and tiling keys against walls where applicable.

**Waste unions**

Descriptions of waste unions shall be deemed to include rubber or vulcanite plugs and chains fixed to fittings.

--------------------------------------

NOTE: All items in this section shall be deemed to fall into Work Group No. 146 for Haylett Formula purposes.

**SOIL DRAINAGE**

A

Allow the budgetary amount of R20 000.00 (Twenty Thousand Rand) NET for sewer installation to be used as directed by the Architect and deducted in whole or in part if not required

Item 20 000.00

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Section No 2: Builders Work
Bill No. 15
PLUMBING AND DRAINAGE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
**Allow the budgetary amount of [R 35,000.00 (Thirty Five Thousand Rand)] for manholes to be used as directed by the Architect and deducted in whole or in part if not required**

### RAINWATER DISPOSAL

**"Watertite" aluminium pre-painted white**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>125 x 85mm Ogee eaves gutters</td>
<td>m</td>
<td>70</td>
</tr>
<tr>
<td>B</td>
<td>Extra over eaves gutter for stopped end</td>
<td>No</td>
<td>10</td>
</tr>
<tr>
<td>C</td>
<td>Extra over eaves gutter for angle.</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>Extra over eaves gutter for outlet for 75 x 75mm pipe.</td>
<td>No</td>
<td>12</td>
</tr>
<tr>
<td>E</td>
<td>75 x 75mm Rainwater pipes</td>
<td>m</td>
<td>74</td>
</tr>
<tr>
<td>F</td>
<td>Extra over rainwater pipe for bend</td>
<td>No</td>
<td>36</td>
</tr>
</tbody>
</table>

**NOTE:** All items in this section shall be deemed to fall into Work Group No. 148 for Haylett Formula purposes.

### SANITARY FITTINGS

**"Franke"**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>&quot;Nouveau&quot; stainless steel grade 304 (18/10) single bowl drop-on sink size 800 x 460mm (code NVN611) set in joinery fitting, including sealing all round sink with silicon sealant</td>
<td>No</td>
<td>5</td>
</tr>
<tr>
<td>I</td>
<td>&quot;Nouveau&quot; stainless steel grade 304 (18/10) double bowl drop-in sink size 160 x 460mm (code NVN621) set in joinery fitting, including sealing all round sink with silicon sealant</td>
<td>No</td>
<td>3</td>
</tr>
</tbody>
</table>

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**Carried to Collection**

Section No 2: Builders Work  
Bill No. 15  
PLUMBING AND DRAINAGE  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Product</th>
<th>Specification</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Franke model CH Slop Hopper 540 x 540 mm manufactured from grade 304 (18/10) stainless steel 1,2 mm thick with a 100 mm high integral splash back to the rear and both sides. The cone has an integral flushing rim and a 110 mm waste outlet for pan connector (pan connector elsewhere), the inlet is fitted with a 38 x 250 mm long vertical flush pipe for a standard flush valve (flush valve elsewhere). Unit fitted with a hinged bucket grid manufactured from 10 mm diameter grade 304 (18/10) stainless steel round bar complete with two 40 x 40 mm square stainless steel wall mounting gallows brackets. Unit fixed to wall 600 mm from the top of the front apron to the finish floor level with 4 off anchor bolts</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>&quot;Sola&quot; 510 x 400mm white medical wash hand basin (code 703700) including 32mm chrome plated standing overflow tube, bolted to wall including silicone sealant between basin and finished wall surface for secure and neat finish</td>
<td>22</td>
</tr>
<tr>
<td>C</td>
<td>White wall mounted urinal (code 5461B003-5330)</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>Ambassador white wall hung WC pan code TA5008A with blue diamond composite timber white seat and flap</td>
<td>4</td>
</tr>
<tr>
<td>E</td>
<td>1750 x 750mm High &quot;President&quot; bath colour white with handles</td>
<td>3</td>
</tr>
<tr>
<td>F</td>
<td>317 40mm CP Bath waste with 309 anti-theft plug and spindle</td>
<td>3</td>
</tr>
<tr>
<td>G</td>
<td>310 CP heavy sink waste with 309 anti-theft plug and spindle</td>
<td>18</td>
</tr>
</tbody>
</table>

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Section No 2: Builders Work
Bill No. 15
PLUMBING AND DRAINAGE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### TRAPS ETC

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Code</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>40mm &quot;P&quot; or &quot;S&quot; trap</td>
<td>No 1</td>
<td>21 : 1 22 : 0 23 : 0</td>
</tr>
<tr>
<td></td>
<td><strong>&quot;Cobra Watertech&quot;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>32 x 40mm 345/40 CP Bottle trap</td>
<td>No 17</td>
<td>21 : 6 22 : 0 23 : 11</td>
</tr>
<tr>
<td>C</td>
<td>40mm 365/40 CP Bottle trap</td>
<td>No 2</td>
<td>21 : 0 22 : 0 23 : 2</td>
</tr>
<tr>
<td></td>
<td><strong>&quot;Franke&quot; or similar approved</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Spazi F/1 single bowl plumbing kit code 301151</td>
<td>No 4</td>
<td>21 : 2 22 : 0 23 : 2</td>
</tr>
<tr>
<td>E</td>
<td>Spazi F/2 double bowl plumbing kit code 301251</td>
<td>No 3</td>
<td>21 : 1 22 : 0 23 : 2</td>
</tr>
<tr>
<td>F</td>
<td>90mm 'Blister' basket strainer waste and plug with overflow</td>
<td>No 10</td>
<td>21 : 4 22 : 0 23 : 6</td>
</tr>
<tr>
<td></td>
<td><strong>&quot;Kessel&quot;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>75mm Shower trap with 100 x 100mm giro stainless steel grating</td>
<td>No 5</td>
<td>21 : 0 22 : 0 23 : 5</td>
</tr>
<tr>
<td></td>
<td><strong>&quot;Rofo Engineering&quot;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Ro200V(H)NW100 stainless steel 304 floor drain</td>
<td>No 1</td>
<td>21 : 1 22 : 0 23 : 0</td>
</tr>
</tbody>
</table>

### TAPS, VALVES, ETC

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Code</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>15mm Ballostop regulating valve</td>
<td>No 14</td>
<td>21 : 6 22 : 0 23 : 8</td>
</tr>
<tr>
<td>J</td>
<td>15mm 232/350 CP angle regulating valve with 350mm long service connection</td>
<td>No 34</td>
<td>21 : 12 22 : 0 23 : 22</td>
</tr>
</tbody>
</table>

Carried to Collection

Section No 2: Builders Work
Bill No. 15
PLUMBING AND DRAINAGE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>&quot;Stella&quot; 3314ST-15 square type pillar tap with streamline outlet and flanged backnut.</td>
<td>No 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Medical elbow action square type pillar tap code 505-21</td>
<td>No 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>15mm Wall mounted elbow action mixer with swan neck swivel spout outlet code 515/055-21 manufactured in accordance with SANS 226:2004 Type 2 (BS5412), supplied with neoprene cartridges and not ceramic</td>
<td>No 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>35mm Diameter FM 1.000 flush valve</td>
<td>No 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Flushmaster code FJ6000 flushvalve with FJT5.5 urinal tailpipe</td>
<td>No 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>&quot;Metris E2&quot; single lever concealed shower / bath mixer (code 31965.000)</td>
<td>No 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>&quot;Croma 100&quot; shower set Vario with adjustable hand shower on 65cm rail, with soap dish (code 27772.000)</td>
<td>No 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> All items in this section shall be deemed to fall into Work Group No. 146 for Haylett Formula purposes.</td>
<td></td>
</tr>
</tbody>
</table>

**SANITARY PLUMBING**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>uPVC pipes</td>
<td>m 368</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>40mm Pipes</td>
<td>m 138</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>110mm Pipes</td>
<td>m 85</td>
</tr>
</tbody>
</table>

**PLUMBING AND DRAINAGE**

Section No 2: Builders Work
Bill No. 15

**GROUP 2 CLINICS (WC 9.D.D)**

**PROVISIONAL BILLS OF QUANTITIES**

<table>
<thead>
<tr>
<th></th>
<th>Carried to Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>A</td>
<td>40mm Bend</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>40mm Junction</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>40mm Adaptor coupling</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>40mm Access bend</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>40mm Access junction</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>50mm Bend</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>50mm Junction</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>50 x 40mm Reducer</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>110mm Bend</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>110mm Reducer</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>110mm Junction</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>110mm Double reducing junction</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>110mm Access bend</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>110mm Access junction</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>110mm Access reducing junction</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection

Section No 2: Builders Work
Bill No. 15
PLUMBING AND DRAINAGE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>QTY</th>
<th>Price (x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>110mm Pan connector</td>
<td></td>
<td>21 : 1 22 : 0 23 : 10</td>
</tr>
<tr>
<td>B</td>
<td>110mm Bend with anti-syphon horn</td>
<td>No 5</td>
<td>21 : 1 22 : 0 23 : 4</td>
</tr>
<tr>
<td>C</td>
<td>110mm &quot;GI Two-way&quot; vent valve</td>
<td>No 5</td>
<td>21 : 1 22 : 0 23 : 4</td>
</tr>
<tr>
<td></td>
<td>Testing</td>
<td>Item</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Testing waste pipe system</td>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 1.00</td>
</tr>
<tr>
<td></td>
<td>WATER SUPPLIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Pestan PPR80 PN16&quot; or similar approved pipes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>16mm Pipes</td>
<td>m 368</td>
<td>21 : 88 22 : 0 23 : 280</td>
</tr>
<tr>
<td>F</td>
<td>20mm Pipes</td>
<td>m 552</td>
<td>21 : 132 22 : 0 23 : 420</td>
</tr>
<tr>
<td>G</td>
<td>26mm Pipes</td>
<td>m 46</td>
<td>21 : 11 22 : 0 23 : 35</td>
</tr>
<tr>
<td></td>
<td>Extra over &quot;Pestan&quot; pipes for fittings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>16mm Fittings</td>
<td>No 460</td>
<td>21 : 110 22 : 0 23 : 350</td>
</tr>
<tr>
<td>I</td>
<td>20mm Fittings</td>
<td>No 230</td>
<td>21 : 55 22 : 0 23 : 175</td>
</tr>
<tr>
<td>J</td>
<td>26mm Fittings</td>
<td>No 23</td>
<td>21 : 6 22 : 0 23 : 18</td>
</tr>
<tr>
<td></td>
<td>Testing</td>
<td>Item</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Testing water pipe system</td>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 1.00</td>
</tr>
</tbody>
</table>

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Section No 2: Builders Work
Bill No. 15
PLUMBING AND DRAINAGE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
PLUMBING AND DRAINAGE

<table>
<thead>
<tr>
<th>Page No</th>
<th>Amount</th>
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<tr>
<td>128</td>
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<td>129</td>
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<td>135</td>
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</tbody>
</table>

Total Brought Forward from Page No.

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Section No 2: Builders Work
Bill No. 15
PLUMBING AND DRAINAGE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
**BILL NO 16**

**GLAZING**

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: Unless otherwise stated herein, all items in this bill shall be deemed to fall into Work Group No 150 for Haylett formula purposes

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
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<tbody>
<tr>
<td>A</td>
<td>m²</td>
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</tr>
</tbody>
</table>

**GLAZING TO STEEL WITH PUTTY**

6mm "Shaterprufe" normal strength clear laminated safety glass

<table>
<thead>
<tr>
<th>A</th>
<th>Panes exceeding 0,1m² and not exceeding 0,5m²</th>
<th>m²</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 1 22 : 0 23 : 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MIRRORS**

6mm Clear Glass fibre washed back polished mirror with polished edges, holed for and fixed with chromium plated dome capped mirror screws with rubber buffers to plugs in brickwork or concrete

<table>
<thead>
<tr>
<th>B</th>
<th>Mirror 450 x 600mm high with 4 screws</th>
<th>No</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21 : 5 22 : 0 23 : 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Section No 2: Builders Work
Bill No. 16
GLAZING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

-137-
**BILL NO 17**

**PAINTWORK**

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 152 for Haylett Formula purposes.

**COLOURS**

Unless otherwise described all paintwork shall be deemed to have a colour value in excess of 7 on the Munsell system in accordance with SANS 1091

---

**PAINTWORK, ETC TO NEW WORK**

**ON FLOATED PLASTER**

One coat DULUX TRADE ECOSURE PLASTER PRIMER and two coats DULUX STERISHIELD DIAMOND MATT or similar approved paint

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>m²</td>
<td>355</td>
<td></td>
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</tr>
<tr>
<td>B</td>
<td>m²</td>
<td>98</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 2</td>
<td>22 : 1</td>
<td>23 : 95</td>
<td></td>
</tr>
</tbody>
</table>

**ON PLASTER BOARD**

One coat DULUX TRADE ALKALI RESISTANT PLASTER PRIMER and apply two coats DULUX WEATHERGUARD ULTRASMOOTH or similar approved paint

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>m²</td>
<td>153</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 5</td>
<td>22 : 0</td>
<td>23 : 149</td>
<td></td>
</tr>
</tbody>
</table>

**ON FIBRE CEMENT**

Carried to Collection  

Section No 2: Builders Work  
Bill No. 17  
PAINTWORK  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
### Tender No: NDoHF 09/2019-20: WC 9.D.D

#### One coat DULUX TRADE ECOSURE PLASTER PRIMER and two coats DULUX TRADE 65 MATT PVA or similar approved paint

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>On fascias and barge boards</td>
<td>30</td>
<td>m²</td>
</tr>
<tr>
<td></td>
<td>Clean off with galvanised iron cleaner GIC1 in conjunction with scotch Brite pad (green) to water break free surface, one coat GIP1 galvanised iron primer and two coats VLO velvaglo satin enamel paint on galvanised steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>On door frames</td>
<td>4</td>
<td>m²</td>
</tr>
<tr>
<td></td>
<td>Clean off with galvanised iron cleaner GIC1 in conjunction with scotch Brite pad (green) to water break free surface, one coat GIP1 galvanised iron primer and two coats VLO velvaglo satin enamel paint on galvanised steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Columns and beams</td>
<td>23</td>
<td>m²</td>
</tr>
</tbody>
</table>

#### ON METAL

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>On backs of frames, linings, etc not exceeding 300mm wide</td>
<td>146</td>
<td>m</td>
</tr>
</tbody>
</table>

#### ON WOOD

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>On doors</td>
<td>226</td>
<td>m²</td>
</tr>
<tr>
<td>F</td>
<td>On door frames, architraves, etc</td>
<td>35</td>
<td>m²</td>
</tr>
<tr>
<td>G</td>
<td>On exposed roof timbers at eaves</td>
<td>12</td>
<td>m²</td>
</tr>
</tbody>
</table>

### PAINTWORK ETC TO PREVIOUSLY PAINTED WORK

**Carried to Collection**

Section No 2: Builders Work
Bill No. 17
PAINTWORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
PREPARATORY WORK TO EXISTING WORK

PREVIOUSLY PAINTED SURFACES

Previously painted surfaces in sound condition:
Remove loose and flaking paint back to a sound substrate and a firm edge by scraping and sanding. Spot prime bare areas with appropriate primer. Clean down with POLYCELL SUGAR SOAP solution to remove all contaminants and chalked material. Rise with clean water to remove all traces of sugar soap. Alternatively, clean with high pressure water jet. Sand glossy enamel surfaces to a matt finish and apply new paint.

Previously painted surfaces in poor condition:
Completely remove paint by most appropriate means e.g. scraping, coarse sanding or stripping with STRIPCLEAN SUPER PAINT STRIPPER (PR 17) or POLYCELL POLYSTRIPPA. Wash thoroughly with POLYCELL SUGAR SOAP. Rinse well with fresh water to remove all traces of the cleaning agents and debris. Ensure substrate is sound, not powdery or friable, prior to coating.

Previously limewashed or distempered surfaces:
Remove all limewash by wirebrushing, sandpapering, etc. until plaster is visible. Remove distemper completely with POLYCELL POLYPEEL and rinse off thoroughly with water. Allow to dry and apply one coat of BONDING LIQUID (CVI. 14) N.B. Must be overcoated within 72 hours.

Filling:
Fill all imperfections with POLYCELL MENDALL 90 and spot prime filled areas PROFESSIONAL PLASTER PRIMER (PP 700).

Previously painted metal surfaces
Surfaces shall be thoroughly rubbed and cleaned down. Blistered or peeling paint shall be completely removed down to bare metal.

Previously painted wood surfaces
Surfaces shall be thoroughly cleaned down. Blistered or peeling paint shall be completely removed and cracks and crevices shall be primed, filled with suitable filler and finished smooth.

ON CONCRETE

Carried to Collection
Prepare and spot prime bare and repaired areas with suitable primer thinned 5 parts primer to 1 part mineral turpentine and apply two coats nuroof acrylic roof paint or similar approved paint

<table>
<thead>
<tr>
<th>Area</th>
<th>Surface Area (m²)</th>
<th>Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>A  On concrete roof tiles</td>
<td>701</td>
<td>21 : 701 22 : 0 23 : 0</td>
</tr>
<tr>
<td><strong>ON FLOATED PLASTER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B  On internal walls</td>
<td>13 637</td>
<td>21 : 1216 22 : 3349 23 : 9071</td>
</tr>
<tr>
<td>One coat DULUX TRADE ECOSURE PLASTER PRIMER (patching) and two coats DULUX STERISHIELD DIAMOND MATT or similar approved paint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One coat DULUX TRADE ALKALI RESISTANT PLASTER PRIMER (patching) and two coats DULUX TRADE 65 MATT PVA or similar approved paint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D  On external walls</td>
<td>2 951</td>
<td>21 : 0 22 : 1206 23 : 1745</td>
</tr>
<tr>
<td><strong>ON FIBRE CEMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E  Fascias and barge boards</td>
<td>11</td>
<td>21 : 11 22 : 0 23 : 0</td>
</tr>
<tr>
<td>F  On gutters, including caulk joints</td>
<td>576</td>
<td>21 : 33 22 : 0 23 : 542</td>
</tr>
<tr>
<td><strong>ON METAL</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection

Section No 2: Builders Work
Bill No. 17
PAINTWORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>m²</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Corrugated roofs and apply one coat water based galvanised iron primer and two coats UV-resistant water based alkyd roof paint, on steel</td>
<td>5,966</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clean off with galvanised iron cleaner GIC1 in conjunction with scotch Brite pad (green) to water break free surface, one coat GIP1 galvansied iron primer and two coats VLO velvaglo satin enamel pain on galvanised steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>On windows</td>
<td>162</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Timber wall panels</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>On interior and exterior doors</td>
<td>1,726</td>
<td></td>
</tr>
</tbody>
</table>

**ON WOOD**

Three coats DULUX WOODGARD INTERIOR/EXTERIOR TIMBAVARNISH or similar approved paint

Section No 2: Builders Work
Bill No. 17
PAINTWORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

Carried to Collection

R
<table>
<thead>
<tr>
<th>Page No</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>138</td>
<td></td>
</tr>
<tr>
<td>139</td>
<td></td>
</tr>
<tr>
<td>140</td>
<td></td>
</tr>
<tr>
<td>141</td>
<td></td>
</tr>
<tr>
<td>142</td>
<td></td>
</tr>
</tbody>
</table>

**PAINTWORK**

**COLLECTION**

Total Brought Forward from Page No.

---

Section No 2: Builders Work
Bill No. 17
PAINTWORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

Carried to Summary
### BILL NO 18

**EXTERNAL WORK**

NOTE: Tenderers are advised to study the Model Preambles for Trades before pricing this bill

--------------------------------------------------------------

**SITE PREPARATION**

NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 104 for Haylett Formula purposes.

**EARTHWORKS**

**REMOVAL OF TREES ETC**

Cutting down and removing, grubbing up roots and filling in holes

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Tree exceeding 200mm and not exceeding 500mm girth</td>
<td>No</td>
<td>1</td>
<td>21 : 0 22 : 0 23 : 1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Tree exceeding 1 000mm and not exceeding 1 500mm girth</td>
<td>No</td>
<td>1</td>
<td>21 : 0 22 : 0 23 : 1</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Tree exceeding 1 500mm and not exceeding 2 000mm girth</td>
<td>No</td>
<td>1</td>
<td>21 : 0 22 : 0 23 : 1</td>
<td></td>
</tr>
</tbody>
</table>

**BULK EXCAVATION, FILLING, ETC**

Open face excavation in earth over sloping site

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Open face excavation</td>
<td>m³</td>
<td>105</td>
<td>21 : 0 22 : 0 23 : 105</td>
<td></td>
</tr>
</tbody>
</table>

**Extra over all excavations for carting away**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor</td>
<td>m³</td>
<td>105</td>
<td>21 : 0 22 : 0 23 : 105</td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection

Section No 2: Builders Work
Bill No. 18
EXTERNAL WORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
Granular G7 earth filling supplied by the contractor compacted to 95% Mod AASHTO density

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Volume</th>
<th>Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Over site to form platforms</td>
<td>m³</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Allow the budgetary amount of R40 000.00 (Forty Thousand Rand) NET for stormwater drainage to Riversdale Ambulance drop-off to be used as directed by the Architect and deducted in whole or in part if not required</td>
<td>Item</td>
<td>40 000.00</td>
<td></td>
</tr>
</tbody>
</table>

**STORMWATER DRAINAGE**

ROADWORK, PARKING AREAS AND PAVING

NOTE: All items below shall be deemed to fall into Work Group No 154 for Haylett formula purposes

**SUPPLEMENTARY PREAMBLES**

Testing of material and filling

Descriptions of earth filling, compaction, etc shall be deemed to include for all necessary testing required in accordance with the SABS 1200 series

**EXCAVATION, FILLING, ETC**

Earth filling supplied by the contractor under paving, parking areas, roadways, etc

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Volume</th>
<th>Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Filling of G7 material in accordance with SANS 1200 DM, compacted to 93% Mod AASHTO density</td>
<td>m³</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Sub-base course of G5 material in accordance with SANS 1200 DM, compacted to 95% Mod AASHTO density</td>
<td>m³</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Base course of G4 material in accordance with SANS 1200 DM, compacted to 98% Mod AASHTO density</td>
<td>m³</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection

Section No 2: Builders Work
Bill No. 18
EXTERNAL WORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
## Compaction of surfaces

<table>
<thead>
<tr>
<th>Description</th>
<th>m²</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compaction of ground surfaces under floors etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 90% Mod AASHTO density</td>
<td>800</td>
<td></td>
</tr>
</tbody>
</table>

## ROADWORK, ETC

### Bituminous premix road surfacing

<table>
<thead>
<tr>
<th>Description</th>
<th>m²</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>40mm Thick to parking areas, roadways, etc including bitumin spray to base course</td>
<td>800</td>
<td></td>
</tr>
</tbody>
</table>

### Precast concrete finished smooth on exposed surfaces, including bedding, jointing and pointing

<table>
<thead>
<tr>
<th>Description</th>
<th>m</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 x 300mm High kerbs (SANS 927 fig 3) with 150 x 150 x 300mm unreinforced concrete haunching at back of each joint, including excavation, backfilling, etc</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

### Paintwork

<table>
<thead>
<tr>
<th>Description</th>
<th>m</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare and apply one coat white reflective road marking paint on bituminous road surfacing, precast concrete paving blocks, etc</td>
<td>69</td>
<td></td>
</tr>
</tbody>
</table>

---

**Carried to Collection**

Section No 2: Builders Work  
Bill No. 18  
EXTERNAL WORK  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Page No</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>144</td>
<td></td>
</tr>
<tr>
<td>145</td>
<td></td>
</tr>
<tr>
<td>146</td>
<td></td>
</tr>
</tbody>
</table>

Total Brought Forward from Page No. 147.

Section No 2: Builders Work
Bill No. 18
EXTERNAL WORK
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Bill No</th>
<th>Description</th>
<th>Page No</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>ALTERATIONS</td>
<td>79</td>
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</tr>
<tr>
<td>2</td>
<td>EARTHWORKS</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>CONCRETE, FORMWORK AND REINFORCEMENT</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>MASONRY</td>
<td>92</td>
<td></td>
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<tr>
<td>5</td>
<td>WATERPROOFING</td>
<td>95</td>
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</tr>
<tr>
<td>6</td>
<td>ROOF COVERINGS</td>
<td>98</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>CARPENTRY AND JOINERY</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>CEILINGS AND PARTITIONING</td>
<td>106</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>FLOOR COVERINGS</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>IRONMONGERY</td>
<td>114</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>STRUCTURAL STEEL</td>
<td>117</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>METALWORK</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>PLASTERING</td>
<td>124</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>TILING</td>
<td>127</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>PLUMBING AND DRAINAGE</td>
<td>136</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>GLAZING</td>
<td>137</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>PAINTWORK</td>
<td>143</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>EXTERNAL WORK</td>
<td>147</td>
<td></td>
</tr>
</tbody>
</table>

Carried to Final Summary

Section No 2: Builders Work
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
SECTION NO. 3: ELECTRICAL INSTALLATION

BILL NO 1

PREAMBLES

NOTE: Unless otherwise stated herein, all items in this Bill shall be deemed to fall into Work Group No. 160 for Haylett Formula purposes.

PROJECT AND GENERAL SPECIFICATIONS

The project and general specifications applicable to the electrical work are issued as separate documents which form part of the tender documentation. No specific reference in the descriptions in these bills of quantities is made to particular clauses in these specifications. Tenderers are however to acquaint themselves fully and read the descriptions closely with the applicable clauses in these specifications for the full intent and meaning of each description.

THE GENERAL TECHNICAL SPECIFICATIONS (PART A, C & ADDENDUM A) IS APPLICABLE TO ALL WORK AS SET OUT IN THIS SECTION INCLUSIVE OF BILLS NO 1 TO 8

SUPPLEMENTARY PREAMBLES

The contractor who is to carry out the electrical work shall be a Registered Electrical Contractor of experienced specialists to be employed as a domestic subcontractor to the main contractor.

Prices:

Unless otherwise stated, the description of each item shall be deemed to include manufacturing, conveying and delivering, unloading, storing, unpacking, hoisting, setting, fitting and fixing in position, cutting, waste, patterns, templates, plant, temporary works, return of packings, establishment charges, profit and other obligations arising out of the conditions of contract.

Items described as "fixed" shall be deemed to include for fixing to all types of surfaces, in chases or casting in or building into walls, etc., and prices are to include for the above.

No allowance has been made in the measurement of conductors for additional lengths at connection points and prices for the measured conductors shall be deemed to include therefor.

Carried to Collection

Section 3: Electrical Installation
Bill No. 1
PREAMBLES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
Prices for conduits shall include for fixing to all types of surfaces, in chases including chasing and making good, casting in or building into brickwork etc.

All chasing including filling the chase to within 1mm of the final wall finish must be done by the electrical subcontractor and rates must allow for this.

Unless otherwise described, all work in this trade is to be carried out in/to existing buildings.
<table>
<thead>
<tr>
<th>Bill No. 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PREAMBLES</td>
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</tr>
<tr>
<td>COLLECTION</td>
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<tr>
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<td>Pag No. 149</td>
<td>$150</td>
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</tbody>
</table>

Carried to Summary

Section 3: Electrical Installation
Bill No. 1
PREAMBLES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### BILL NO 2

#### SMALL POWER

**ASSEMBLIES / DISTRIBUTION BOARDS**

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A

Allow the budgetary amount of R10 000.00 (Ten Thousand Rand) NET for the upgrade of distribution boards at Albertinia Clinic to be used as directed by the Principal Agent and deducted in whole or in part if not required

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>21 : 1.00</td>
<td>22 : 0.00</td>
<td>23 : 0.00</td>
</tr>
</tbody>
</table>

B

Allow the budgetary amount of R10 000.00 (Ten Thousand Rand) NET for the upgrade of distribution boards at Riversdale Clinic to be used as directed by the Principal Agent and deducted in whole or in part if not required

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>21 : 0.00</td>
<td>22 : 1.00</td>
<td>23 : 0.00</td>
</tr>
</tbody>
</table>

C

Allow the budgetary amount of R75 000.00 (Seventy Five Thousand Rand) NET for the upgrade of distribution boards at Riversdale Hospital to be used as directed by the Principal Agent and deducted in whole or in part if not required

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>21 : 0.00</td>
<td>22 : 0.00</td>
<td>23 : 1.00</td>
</tr>
</tbody>
</table>

D

Allow the budgetary amount of R20 000.00 (Twenty Thousand Rand) NET for FAN MCC at Riversdale Hospital to be used as directed by the Principal Agent and deducted in whole or in part if not required

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>21 : 0.00</td>
<td>22 : 0.00</td>
<td>23 : 1.00</td>
</tr>
</tbody>
</table>

E

Allow the budgetary amount of R60 000.00 (Sixty Thousand Rand) NET for Theatre UPS's at Riversdale Hospital to be used as directed by the Principal Agent and deducted in whole or in part if not required

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>21 : 0.00</td>
<td>22 : 0.00</td>
<td>23 : 1.00</td>
</tr>
</tbody>
</table>

#### SWITCHGEAR

Equipment such as isolators, circuit breakers, earth leakage units, transformers, switches, surge protectors and measuring instruments

Mounting of equipment shall be suitable for Dual mount DIN and Mini Rail

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td></td>
<td>21 : 0.00</td>
<td>22 : 0.00</td>
<td>23 : 1.00</td>
</tr>
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<td>Description</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>----</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Single pole 5 to 10 Amp</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 4.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Single pole 15 to 30 Amp</td>
<td>35.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 35.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Single pole 35 to 63 Amp</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 4.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Tripple pole 25 to 63 Amp</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 4.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Double pole isolator 63 Amp</td>
<td>6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 6.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Triple pole isolator 100 Amp</td>
<td>2.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 2.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Single phase unit without overload protection</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 4.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Single phase unit with overload protection</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00 22 : 0.00 23 : 1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SMALL POWER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CONDUITS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Rigid Conduit</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rigid PVC conduit including bends, draw boxes with covers, saddles,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>couplings, ends etc., fixed for any installation method whether</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>chased into brickwork, cast in concrete, built in, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>20mm Diameter conduit</td>
<td>4564.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 1584.00 22 : 700.00 23 : 2280.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection

Section 3: Electrical Installation
Bill No. 2
SMALL POWER
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### OUTLET BOXES

Outlet boxes and cover plates for all switchgear to suit any number, size or type of entries, fixed onto conduit including locknuts, bushes, etc. fixed for any installation method whether chased into brickwork, cast in concrete, built in, etc. All outlet boxes shall be earthed.

#### GALVANISED CONDUIT OUTLET BOXES

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Rate 1</th>
<th>Rate 2</th>
<th>Rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>60mm dia round outlet box</td>
<td>76.00</td>
<td>70.00</td>
<td>152.00</td>
</tr>
<tr>
<td>B</td>
<td>60mm cover plate</td>
<td>76.00</td>
<td>70.00</td>
<td>152.00</td>
</tr>
<tr>
<td>C</td>
<td>100 x 50 x 50mm outlet box</td>
<td>28.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

#### CONDUCTORS

600 / 1000V PVC insulated stranded copper conductor drawn into conduit including terminations and connections

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Rate 1</th>
<th>Rate 2</th>
<th>Rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>2.5mm² Conductor</td>
<td>4932.00</td>
<td>2100.00</td>
<td>7380.00</td>
</tr>
</tbody>
</table>

#### SWITCHGEAR SMALL POWER

Switchgear such as switched socket outlets and isolators, etc. complete with cover plates fixed to flush outlet boxes equal to Crabtree Range

#### SOCKET OUTLETS

Rates for switches, socket outlets, etc. are to include for screwing to outlet boxes, connecting up and cover plates

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Rate 1</th>
<th>Rate 2</th>
<th>Rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>16A 100mm x 100mm Combo single three-pin switched socket and 2-pin with E switched (Euro) slimline outlet (white)</td>
<td>8.00</td>
<td>2.00</td>
<td>5.00</td>
</tr>
<tr>
<td>F</td>
<td>Flush 20A Double pole isolator</td>
<td>20.00</td>
<td>0.00</td>
<td>17.00</td>
</tr>
<tr>
<td>G</td>
<td>Extra over for surface isolator</td>
<td>20.00</td>
<td>0.00</td>
<td>17.00</td>
</tr>
</tbody>
</table>

Carried to Collection

Section 3: Electrical Installation
Bill No. 2
SMALL POWER
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### RETICULATION MANAGEMENT

#### POWER SKIRTING/TRUNKING

<table>
<thead>
<tr>
<th>Description</th>
<th>No.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Two compartment galvanised steel power skirting including covers, end caps, splices, joining, drilling, bends, angles, tee pieces, etc.</td>
<td>m</td>
<td>24.00</td>
</tr>
<tr>
<td>D 16A Three-pin normal switched socket outlet to fit power skirting</td>
<td>No</td>
<td>14.00</td>
</tr>
<tr>
<td>E 16A Three-pin dedicated switched socket outlet to fit power skirting</td>
<td>No</td>
<td>14.00</td>
</tr>
<tr>
<td>F Switch Module</td>
<td>No</td>
<td>14.00</td>
</tr>
<tr>
<td>G Euro 2 pin plus Earth Slimline socket</td>
<td>No</td>
<td>14.00</td>
</tr>
</tbody>
</table>

**Bill No. 2**

Section 3: Electrical Installation

Bill No. 2

SMALL POWER

GROUP 2 CLINICS (WC 9.D.D)

PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Page No</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>152</td>
<td></td>
</tr>
<tr>
<td>153</td>
<td></td>
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<tr>
<td>154</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td></td>
</tr>
</tbody>
</table>

Bill No. 2

SMALL POWER

COLLECTION

Total Brought Forward from Page No.

Carried to Summary

Section 3: Electrical Installation
Bill No. 2
SMALL POWER
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20mm Diameter conduit</td>
<td>m</td>
<td>2550.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 1620.00  22 : 120.00  23 : 810.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>No</td>
<td></td>
<td>38.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60mm dia round outlet box including cover</td>
<td>No</td>
<td>38.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 14.00  22 : 0.00  23 : 24.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>No</td>
<td></td>
<td>28.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100 x 100 x 50mm outlet box</td>
<td>No</td>
<td>28.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 28.00  22 : 0.00  23 : 0.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>m</td>
<td></td>
<td>7650.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5mm² Conductor</td>
<td>m</td>
<td>7650.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 4960.00  22 : 360.00  23 : 2430.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>m</td>
<td></td>
<td>2550.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5mm² Conductor</td>
<td>m</td>
<td>2550.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 1620.00  22 : 120.00  23 : 810.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>No</td>
<td></td>
<td>14.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20A Single-lever one-way switch EX</td>
<td>No</td>
<td>14.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 7.00  22 : 2.00  23 : 5.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>No</td>
<td></td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20A Single-lever one-way switch W/P EX</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00  22 : 0.00  23 : 2.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>No</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20A Three-lever one-way switch EX</td>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 : 0.00  22 : 0.00  23 : 1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Switchgear Lighting**

Switchgear complete with cover plates, yokes, modules, etc. fixed to outlet box and conduit.

- **F** 20A Single-lever one-way switch EX
- **G** 20A Single-lever one-way switch W/P EX
- **H** 20A Three-lever one-way switch EX

Carried to Collection: R
A 20A Photo-electric daylight-sensitive switch - 15A rated photocell fitted inside a waterproof bulkhead type fitting with opal acrylic lens. Photocell equal to Spectrum QS with time and MOV integrated | No | 15.00

21 : 3.00  22 : 2.00  23 : 10.00

**LUMINAires**

Luminaire supplied and fitted to structure or ceilings including lamps, tubes, connections & connectors, brackets, etc.

Rates for light fittings are to include for hanging, fixing and connecting and for lamp holders and fluorescent tubes and lamps of the type and wattage described

All LED fittings should be Zhaga compliant and bear the logo. Min Efficacy should be 120 Lm/W and LEDs a minimum of L70F10 rating

B Type F1 - 1.5m Open channel fluorescent luminaire with 2X58W cool white lamps and electronic control gear. Must bear the SABS black label. Equal to LASCON R1TA 258 ELB-230V-0.8MM –PWD NEW WIRING | No | 55.00

21 : 43.00  22 : 2.00  23 : 10.00

**Extra over for LED Tubes:**

C Phillips MAS LED tube 1500 HO 20W840 T8 | No | 43.00

21 : 43.00  22 : 0.00  23 : 0.00

D Type B EX - 20W LED Bulkhead. Equal to Beka series 21 | No | 45.00

21 : 21.00  22 : 0.00  23 : 24.00

E Adapter plate for Type B surface entry above luminaire | No | 45.00

21 : 21.00  22 : 0.00  23 : 24.00

F Type R - Non-Maintained Emergency LED Exit Sign complete with control gear and 3 hr backup equal to Cosine SABS Exit Sign NEW WIRING | No | 25.00

21 : 4.00  22 : 4.00  23 : 17.00

G Adapter plate for back entry for above luminaire | No | 25.00

21 : 4.00  22 : 4.00  23 : 17.00

H Type D - 10W LED Downlight Equal to Lighting Innovations DAS-10W-53-WHT-4K | No | 6.00

21 : 0.00  22 : 0.00  23 : 6.00

**Carried to Collection**

**Section 3: Electrical Installation**

**Bill No. 3**

**LIGHTING RETICULATION**

**GROUP 2 CLINICS (WC 9.D.D)**

**PROVISIONAL BILLS OF QUANTITIES**
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Type T1 - Post-top mounted powder coated luminaire complete with die cast aluminium spigot base, lamp compartment with integral control gear and top cover, fitted with 55W LED. Must bear the SANS 60598 - 1 safety mark. Replace existing post top. Equal to Beka Star</td>
<td>No 20.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 0.00</td>
<td>22 : 0.00</td>
</tr>
<tr>
<td>B</td>
<td>Lamps equal to Osram/Philips</td>
<td>No 6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rectangle Bulkhead CFL PL-EL 11W CFL</td>
<td></td>
<td>21 : 2.00</td>
<td>22 : 2.00</td>
</tr>
<tr>
<td>C</td>
<td>Round Bulkhead Square 2D 16W CFL</td>
<td>No 6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21 : 2.00</td>
<td>22 : 2.00</td>
</tr>
<tr>
<td>D</td>
<td>Phillips HF LED Substitute for EM controlgear</td>
<td>No 240.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MAS LEDTube 1500 20W840 T8</td>
<td></td>
<td>21 : 20.00</td>
<td>22 : 20.00</td>
</tr>
</tbody>
</table>

**LAMPS**

**GROUP 2 CLINICS (WC 9.D.D)**

**PROVISIONAL BILLS OF QUANTITIES**
<table>
<thead>
<tr>
<th>Page No</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>157</td>
<td></td>
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<td>158</td>
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<tr>
<td>159</td>
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Carried to Summary

Section 3: Electrical Installation
Bill No. 3
LIGHTING RETICULATION
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item No</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>25mm² Bare stranded copper</td>
<td>m</td>
<td>90.00</td>
</tr>
<tr>
<td></td>
<td>21 : 30.00</td>
<td>22 : 30.00</td>
<td>23 : 30.00</td>
</tr>
<tr>
<td></td>
<td><strong>Copper earth electrode driven into ground with top 600mm below ground level including driving caps, clamps and couplings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Steel core reinforced copper spike (rod) 3.6m x 16mm diameter and brass coupling with driving cap driven into ground</td>
<td>No</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>21 : 1.00</td>
<td>22 : 1.00</td>
<td>23 : 1.00</td>
</tr>
<tr>
<td>C</td>
<td>Terminating lug, cadmium plated bolt, nut and washer for connecting 25mm² copper conductor</td>
<td>No</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>21 : 1.00</td>
<td>22 : 1.00</td>
<td>23 : 1.00</td>
</tr>
<tr>
<td>D</td>
<td>Earthing and bonding</td>
<td>No</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>21 : 1.00</td>
<td>22 : 1.00</td>
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</table>

**Carried to Summary**

Section 3: Electrical Installation
Bill No. 4
EARTHING AND GENERAL
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
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<td>No</td>
<td>21 : 1.00</td>
<td>22 : 1.00</td>
<td>23 : 1.00</td>
</tr>
</tbody>
</table>

**BILL NO 5**

**TESTING AND COMMISSIONING**

A. Allow for testing, balancing and commissioning the complete electrical installation

B. Allow for providing as-built drawings

C. Allow for providing electronic copy of record/maintenance/instruction manuals

D. Allow for Certificate of Compliance in terms of the Occupational and Health Safety Act 1993

E. The complete installation shall be tested in accordance with Wiring Code SANS 10142 and shall be allowed for under this item. Tests shall be carried out after site handover. Should any part of the installation fail the test, a detailed report shall be forwarded to the Engineer. A certificate of compliance shall be completed for the entire installation indicating the current condition of the installation as per the test report. (Allow per site)

Carried to Summary

Section 3: Electrical Installation
Bill No. 5
TESTING AND COMMISSIONING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
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<th>Rate</th>
<th>Amount</th>
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<td><strong>Overtime / Saturdays</strong></td>
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**Carried to Collection**

Section 3: Electrical Installation
Bill No. 6
LABOUR RATES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>A</td>
<td>Elconop-1</td>
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<tr>
<td></td>
<td>21:00 - 22:00</td>
<td>Rate Only</td>
</tr>
<tr>
<td>B</td>
<td>Electrical Assistant</td>
<td>Hrs</td>
</tr>
<tr>
<td></td>
<td>21:00 - 22:00</td>
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<tr>
<td>C</td>
<td>General Worker</td>
<td>Hrs</td>
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**Sundays / Public Holidays**

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<tr>
<td>D</td>
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<td>E</td>
<td>Electrician</td>
<td>Hrs</td>
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<td>Electrical Assistant</td>
<td>Hrs</td>
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</tr>
<tr>
<td>J</td>
<td>General Worker</td>
<td>Hrs</td>
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**Transport and Equipment**

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<td>K</td>
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<td>km</td>
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<td>21:00 - 22:00</td>
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</tr>
<tr>
<td>L</td>
<td>10 tonne truck</td>
<td>km</td>
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<td></td>
<td>21:00 - 22:00</td>
<td>Rate Only</td>
</tr>
<tr>
<td>M</td>
<td>10 tonne mobile</td>
<td>Hrs</td>
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<td>N</td>
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**Carried to Collection**

Section 3: Electrical Installation
Bill No. 6
LABOUR RATES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

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<td>23:00</td>
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Carried to Collection

Section 3: Electrical Installation
Bill No. 6
LABOUR RATES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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Total Brought Forward from Page No.

Carried to Summary

Section 3: Electrical Installation
Bill No. 6
LABOUR RATES
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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<td>1</td>
<td>PREAMBLES</td>
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<td>SMALL POWER</td>
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<td>3</td>
<td>LIGHTING RETICULATION</td>
<td>160</td>
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<td>4</td>
<td>EARTHING AND GENERAL</td>
<td>161</td>
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<td>5</td>
<td>TESTING AND COMMISSIONING</td>
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Section 3: Electrical Installation

GROUP 2 CLINICS (WC 9.D.D)

PROVISIONAL BILLS OF QUANTITIES
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<td><strong>SECTION NO. 4: MECHANICAL INSTALLATION</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>BILL NO 1</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>ALBERTINIA CLINIC: MECHANICAL SERVICES</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Fire Related equipment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Hose Reel - new, fixed on back plate, mounted on wall and provide updated</td>
<td>No</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>service stickers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Fire Extinguishers - new 9kg CO2 extinguishers and provide updated service</td>
<td>No</td>
<td>3.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>stickers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Service hose reels</td>
<td>No</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Service fire extinguishers</td>
<td>No</td>
<td>3.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Air Conditioning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Supply and install new high wall split heat pump - 3.5kW cooling - inverter</td>
<td>No</td>
<td>1.00</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>type. Pipe length +/-6m. Include weatherproof isolator at condenser.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Service existing split units:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Clean filters</td>
<td>No</td>
<td>6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Check for gas leaks/gas charge, and report back</td>
<td>No</td>
<td>6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Check fan motors all running and report back</td>
<td>No</td>
<td>6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Check mounting brackets and body work for rust and report back.</td>
<td>No</td>
<td>6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Ventilation Equipment</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>FA1 (Fresh air supply): (duct mounted)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Duty- 2500m³/hr @ 120Pa</td>
<td>No</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Fan box complete with 2 x 500x500 washable filter and mesh screen.</td>
<td>No</td>
<td>1.00</td>
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Carried to Collection R

Section 4: Mechanical Installation
Bill No. 1
ALBERTINIA CLINIC MECHANICAL
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Galv. Ducting un-insulated, mounted in ceiling space - 500x400mm</td>
<td>m</td>
<td>16.00</td>
</tr>
<tr>
<td>B</td>
<td>Flex duct 300mmØ</td>
<td>m</td>
<td>6.00</td>
</tr>
<tr>
<td>C</td>
<td>Ceiling diffusers, 300mmØ neck size, white.</td>
<td>No</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td><strong>EF1 (Extract air): duct mounted.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Duty- 1200m³/hr @ 120Pa</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>E</td>
<td>Fan box complete with weather cowl and mesh screen.</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>F</td>
<td>Galv. Ducting un-insulated, mounted in ceiling space - 500x400mm</td>
<td>m</td>
<td>10.00</td>
</tr>
<tr>
<td>G</td>
<td>Flex duct 300mmØ</td>
<td>m</td>
<td>6.00</td>
</tr>
<tr>
<td>H</td>
<td>Ceiling grills- 400x400 c/w 300mm spigot</td>
<td>No</td>
<td>3.00</td>
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<tr>
<td></td>
<td><strong>EF2 (Extract air): window/wall mounted. Expell Air type or equal.</strong></td>
<td></td>
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</tr>
<tr>
<td>I</td>
<td>Extract fans- duty 750m³/hr, complete with safety grid on the inside</td>
<td>No</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td>and weather louvers on outside.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Allow to cut window to fit fans - alternative allow for making holes in walls, +/- 250mmØ</td>
<td>No</td>
<td>5.00</td>
</tr>
<tr>
<td>K</td>
<td>Allow for supply and fit local isolator at fans. (Power supply to isolator by others.)</td>
<td>No</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td><strong>EF3 to EF 5 (Extract air): window/wall mounted. Expell Air type or equal.</strong></td>
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<td></td>
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<tr>
<td>L</td>
<td>Extract fans- duty 300m³/hr, complete with safety grid on the inside</td>
<td>No</td>
<td>3.00</td>
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<tr>
<td></td>
<td>and weather louvers on outside.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Allow to cut window to fit fans - alternative allow for making holes in walls, +/- 250mmØ</td>
<td>No</td>
<td>3.00</td>
</tr>
<tr>
<td>N</td>
<td>Allow for supply and fit local isolator at fans. (Power supply to isolator by others.)</td>
<td>No</td>
<td>3.00</td>
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**Carried to Collection**

Section 4: Mechanical Installation  
Bill No. 1  
ALBERTINIA CLINIC MECHANICAL  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
<table>
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<th>Description</th>
<th>Quantity</th>
<th>Rate</th>
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<td></td>
<td><strong>FA2 (Fresh air supply): window/wall mounted. Expell Air type or equal.</strong></td>
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<tr>
<td>A</td>
<td>Extract fans- duty 750m³/h, complete with safety grid on the inside and weather louvers on outside.</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>B</td>
<td>Allow to cut window to fit fans - alternative allow for making holes in walls, +/- 250mmØ</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>C</td>
<td>Allow for supply and fit local isolator at fans. (Power supply to isolator by others.)</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td><strong>FA3 to FA8 (Fresh air supply): window/wall mounted. Expell Air type or equal.</strong></td>
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<tr>
<td>D</td>
<td>Extract fans- duty 750m³/h, complete with safety grid on the inside and weather louvers on outside.</td>
<td>No</td>
<td>6.00</td>
</tr>
<tr>
<td>E</td>
<td>Allow to cut window to fit fans - alternative allow for making holes in walls, +/- 250mmØ</td>
<td>No</td>
<td>6.00</td>
</tr>
<tr>
<td>F</td>
<td>Allow for supply and fit local isolator at fans. (Power supply to isolator by others.)</td>
<td>No</td>
<td>6.00</td>
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<tr>
<td></td>
<td><strong>Door louvers - double sided - natural aluminium, mounted in wooden doors 300mm from bottom</strong></td>
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<tr>
<td>G</td>
<td>300 x 300</td>
<td>No</td>
<td>11.00</td>
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<tr>
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<td><strong>UN-IDENTIFIED EQUIPMENT</strong></td>
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<tr>
<td>H</td>
<td>Provisional amount for un-identified equipment to be serviced or to be provided. The unit prices as per above shall be applicable. Alternatively quotes shall be obtained and shall be approved by the Engineer before ordering</td>
<td>Item</td>
<td>8 000.00</td>
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</table>

- Carried to Collection -

Section 4: Mechanical Installation
Bill No. 1
ALBERTINIA CLINIC MECHANICAL
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

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<table>
<thead>
<tr>
<th>Page No</th>
<th>Amount</th>
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<tbody>
<tr>
<td>168</td>
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<tr>
<td>169</td>
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<td>170</td>
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Carried to Summary

Section 4: Mechanical Installation
Bill No. 1
ALBERTINIA CLINIC MECHANICAL
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
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<tbody>
<tr>
<td>BILL NO 2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>RIVERSDAL CLINIC: MECHANICAL SERVICES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fire Related equipment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>New Hose Reel- fixed on back plate, mounted on wall and provide updated service stickers</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>New Fire Extinguishers-4.5 kg CO2 extinguishers and provide updated service stickers</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Service hose reels</td>
<td>No</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Service fire extinguishers</td>
<td>No</td>
<td>9.00</td>
<td></td>
</tr>
<tr>
<td><strong>Air Conditioning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Supply and install new high wall split heat pump - 3.5kW cooling - inverter type. Pipe length +/-6m. Include weatherproof isolator at condenser.</td>
<td>No</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Supply and install new cassette split heat pump - 10kW cooling - inverter type. Pipe length +/-10m. Include weatherproof isolator at condenser.</td>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td><strong>Service existing split units:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Clean filters</td>
<td>No</td>
<td>32.00</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Check for gas leaks/gas charge, and report back</td>
<td>No</td>
<td>32.00</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Check fan motors all running and report back</td>
<td>No</td>
<td>32.00</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Check mounting brackets and body work for rust and report back.</td>
<td>No</td>
<td>32.00</td>
<td></td>
</tr>
<tr>
<td><strong>Ventilation Equipment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Duty- 1750m³/hr @ 120Pa</td>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection R

Section 4: Mechanical Installation
Bill No. 2
RIVERSDALE CLINIC MECHANICAL
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Fan box complete with 1 x 500x500 washable filter and mesh screen.</td>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Galv. Ducting un-insulated, mounted in ceiling space - 500x300mm</td>
<td>m</td>
<td>52.00</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Flex duct 300mmØ</td>
<td>m</td>
<td>9.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Ceiling diffusers, 300mmØ neck size, white.</td>
<td>No</td>
<td>9.00</td>
<td></td>
</tr>
</tbody>
</table>

**Service existing (wall or window mounted) FA 2 to FA 14:**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Remove fan from mountings, clean motor and blades thoroughly, oil bearings where possible, re-mount to brackets, check electrical connection to comply with SANS</td>
<td>No</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

**Service existing (wall or window mounted) EF to EF 8**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Remove fan from mountings, clean motor and blades thoroughly, oil bearings where possible, re-mount to brackets, check electrical connection to comply with SANS</td>
<td>No</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

**NEW: Window/wall fans - Expelair or equil.**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Extract / fresh air fans- duty 300m³/h, complete with safety grid on the inside and weather louvers on outside.</td>
<td>No</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Allow to cut window to fit fans - alternative allow for making holes in walls, +/- 250mmØ</td>
<td>No</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Allow for supply and fit local isolator at fans. (Power supply to isolator by others.)</td>
<td>No</td>
<td>5.00</td>
<td></td>
</tr>
</tbody>
</table>

**Door louvers - double sided - natural aluminium, mounted in wooden doors 300mm from bottom**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>300 x 300</td>
<td>No</td>
<td>12.00</td>
<td></td>
</tr>
</tbody>
</table>

**UN-IDENTIFIED EQUIPMENT**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Provisional amount for un-identified equipment to be serviced or to be provided. The unit prices as per above shall be applicable. Alternatively quotes shall be obtained and shall be approved by the Engineer before ordering</td>
<td>Item</td>
<td></td>
<td>12 000.00</td>
</tr>
</tbody>
</table>

**Carried to Collection**

Section 4: Mechanical Installation
Bill No. 2
RIVERSDALE CLINIC MECHANICAL
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Page No</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>172</td>
<td></td>
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<tr>
<td>173</td>
<td></td>
</tr>
</tbody>
</table>

Carried to Summary

Section 4: Mechanical Installation
Bill No. 2
RIVERSDALE CLINIC MECHANICAL
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
The supply and installation of new equipment, spares and other items. (Refer Technical Specification: Part 2.3.3.6 Sub section 2)

Unit prices for all new equipment installed under this contract will include a compulsory guarantee for a period of 12 months from date of practical completion. Installations to fit in with existing infrastructure.

**New Air Conditioning Equipment**

**New split units:-**

<table>
<thead>
<tr>
<th>Item No</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No</td>
<td>2.00</td>
</tr>
<tr>
<td>B</td>
<td>No</td>
<td>2.00</td>
</tr>
<tr>
<td>C</td>
<td>No</td>
<td>2.00</td>
</tr>
</tbody>
</table>

**New Cassette units**

Supply and install new cassette unit including labour, wiring, wall brackets, 25m piping, pipe insulation, refrigerant charge, test and commissioning. (Transport to site included)

<table>
<thead>
<tr>
<th>Item No</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>E</td>
<td>No</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Compressor replacements in units, including burn-out kit, vacuum, re-fill oil and refrigerant**

<table>
<thead>
<tr>
<th>Item No</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>No</td>
<td>2.00</td>
</tr>
<tr>
<td>G</td>
<td>No</td>
<td>2.00</td>
</tr>
<tr>
<td>H</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>Description</td>
<td>Unit</td>
<td>Quantity</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Extract Air Fans - general:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wall mounted, including opening in wall, 2 pole isolator, 25m x 2.5mm² x 3 core surfix cable, making good plaster and paint. GX models or equal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A Fan duty 250m³/hr @ free air</td>
<td></td>
<td>10.00</td>
</tr>
<tr>
<td>B Fan duty 500m³/hr @ free air</td>
<td></td>
<td>4.00</td>
</tr>
<tr>
<td><strong>Fresh Air Fans - general:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wall mounted, including opening in wall, 2 pole isolator, 25m x 2.5mm² x 3 core surfix cable, making good plaster and paint. GX models or equal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Fan duty 250m³/hr @ free air</td>
<td></td>
<td>33.00</td>
</tr>
<tr>
<td>D Fan duty 500m³/hr @ free air</td>
<td></td>
<td>3.00</td>
</tr>
<tr>
<td><strong>Fresh air systems - General Wards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ducting: mounted in ceiling void c/w hangers &amp; brackets at 2.0m censers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E 400 x 400mm Galvanized - external insulated</td>
<td>m</td>
<td>30.00</td>
</tr>
<tr>
<td>F 200mmØ Galv ducting- external insulated</td>
<td>m</td>
<td>10.00</td>
</tr>
<tr>
<td>G 150mmØ flex ducting - external insulated, strapping incl.</td>
<td>m</td>
<td>20.00</td>
</tr>
<tr>
<td>H 150mmØ ceiling jets with twin adjustable shut-off blades</td>
<td></td>
<td>20.00</td>
</tr>
<tr>
<td>I Fan cowls, c/w fan box, 500x1000 filter box, 2 x 500x500 filters, s/steel vermin proof wire mesh</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Fans: Fresh air supply</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J Fresh air fans: VSD controlled , duct mounted, duty 0.36m³/sec @ 120Pa</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Fans: extract - to provide negative pressure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K VSD controlled, roof top mounted, 0.40m³/sec @ 50 Pa</td>
<td></td>
<td>2.00</td>
</tr>
</tbody>
</table>

Carried to Collection
A Synchronize VSD's of supply air fans and extract neg. pressure fans. Extract fans to always deliver 5% less air than fresh air fans. No 2.00

**New Make-air supply system- corridor**

B Provide new fresh air make-up fan, duct mounted. Fan duty 1.45m³/s @ 120Pa. VSD control included. No 1.00

C Fan cowl, c/w fan box, 500x1000 filter box, 2 x 500x500 washable pleated filters, s/steel vermin proof wire mesh No 1.00

D Galv Duct- 350x350mm un-insulated- in ceiling m 25.00

E Flex Duct - 250mmØ un-insulated Ø m 8.00

F Spigots- 250mm, fixed to duct No 8.00

G 250mmØ adjustable ceiling diffusers No 8.00

**Electrical works**

H 4mm² x 3 core Surfix cable fixed to trusses in ceiling void m 100.00

I Terminations to equipment, complete No 50.00

J Weather proof isolators, 16A-220V-4 pole, mounted next to fans No 10.00

K Provisional amount for additional switch gear in DB’s required Item 15 000.00

**PVC Trunking**

L Moulded Trunking for refrigerant lines with lids: Straight lengths (per meter) m 10.00

M Elbows & bends.(90º) No 10.00

N T-Sections. No 6.00

O End Caps. No 6.00

**Theatre Central Plant Chiller**

P Discharge, recover and dispose refrigerant as per SANS and OHS Regulations. Item

---

**Carried to Collection**

Section 4: Mechanical Installation
Bill No. 3
RIVERSDALE HOSPITAL NEW HVAC EQUIPMENT
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
A  Drain, recover and dispose sump oil as per SANS and OHS Regulations.  

B  Dismantle chiller, pumps, cooling tower and ancillary equipment and hand over to Maintenance Manager  

C  Supply, deliver and install the following new air cooled heat pump chiller - inverter type:  
   § Nominal 30kW, Max 36kW.  
   § Min. capacity 25%, max capacity 120%.  
   § Water - brazed plate heat exchanger.  
   § Nominal water flow – 71L/min.  
   § Refrigerant 410A.  
   § Water leaving 6°C. DT 6°C.  
   § Chill water pump included in unit.  
   § Chiller equal or similar to EWAQ-050-BAWP  

D  Allow for temporary connections as specified in the detail C2.1 clause 1.4.1A.  

E  Provisional amount for repairs to chill water pipe lines insulation and flow control valves.  

F  Provisional amount and upgrading of the chiller control panel and control system.  

G  Commission chiller to full operation. (Provisional)  

H  Provisional amount to upgrade the existing Theatre AHU to match the SANS requirement.  

Un-Identified Units  

I  Amount for un-identified new installations. The unit prices as per above shall be applicable. Alternative quotes will be obtained, profit will be added as per Bill 4.  

Carried to Collection  

Section 4: Mechanical Installation  
Bill No. 3  
RIVERSDALE HOSPITAL NEW HVAC EQUIPMENT  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Page No</th>
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<td>176</td>
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<td>177</td>
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<td>178</td>
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</table>

**Carried to Summary**

Section 4: Mechanical Installation
Bill No. 3
RIVERSDALE HOSPITAL NEW HVAC EQUIPMENT
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No</td>
<td>9,000 BTU Unit</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>No</td>
<td>12,000 BTU Unit</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>m</td>
<td>1/2&quot; + 1/4&quot; Piping pair.</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>m</td>
<td>5/8&quot; + 3/8&quot; Piping pair.</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>kg</td>
<td>To be used in R22 Refrigerant systems</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>kg</td>
<td>To be used in R410A Refrigerant systems</td>
<td>5.00</td>
<td></td>
</tr>
</tbody>
</table>

The supply and installation of replacement equipment, spares and other items listed below shall be as per the Technical Specification: Part 2.3.3.6 Sub section 2.

Unit prices for all new equipment installed under this clause "Repairs" will include a compulsory guarantee for a period of 3 months from date of practical completion. Installations to fit in with existing infrastructure.

**Replacement of compressors in units.**

Remove existing compressor, make good to accept new compressor. Supply and install new compressor including labour, nitrogen purging, refrigerant, oil, wiring, test and commissioning.

**Consumables typical to replacement of units.**

Copper piping in pairs (suction and liquid lines) including insulation, per meter:

- C: 1/2" + 1/4" Piping pair. (m) 10.00
- D: 5/8" + 3/8" Piping pair. (m) 10.00

Refrigerant per kg.

- E: To be used in R22 Refrigerant systems (kg) 5.00
- F: To be used in R410A Refrigerant systems (kg) 5.00

Carried to Collection

Section 4: Mechanical Installation
Bill No. 4
RIVERSDALE HOSPITAL HVAC REPAIR
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Straight lengths (per meter)</td>
<td>m</td>
<td>5.00</td>
</tr>
<tr>
<td>B</td>
<td>Elbows &amp; bends (90°)</td>
<td>m</td>
<td>4.00</td>
</tr>
<tr>
<td>C</td>
<td>T-Sections</td>
<td>No</td>
<td>2.00</td>
</tr>
<tr>
<td>D</td>
<td>End Caps</td>
<td>No</td>
<td>2.00</td>
</tr>
<tr>
<td>E</td>
<td>Filters to be used in split units. Average price for sizes 12000BTU to 18000BTU</td>
<td>No</td>
<td>40.00</td>
</tr>
<tr>
<td>F</td>
<td>Filters to be used in Cassette units. Average price for 15000BTU to 36000BTU.</td>
<td>No</td>
<td>6.00</td>
</tr>
<tr>
<td>G</td>
<td>Filters, 500x500x50 washable pleated filters</td>
<td>No</td>
<td>20.00</td>
</tr>
<tr>
<td>H</td>
<td>HEPA filters H13 - retention 99.75%</td>
<td>No</td>
<td>16.00</td>
</tr>
<tr>
<td>I</td>
<td>To be used in ¼” lines.</td>
<td>No</td>
<td>5.00</td>
</tr>
<tr>
<td>J</td>
<td>To be used in ⅜” lines.</td>
<td>No</td>
<td>5.00</td>
</tr>
<tr>
<td>K</td>
<td>To be used in ⅝” lines.</td>
<td>No</td>
<td>5.00</td>
</tr>
<tr>
<td>L</td>
<td>To be used in ⅞” lines.</td>
<td>No</td>
<td>5.00</td>
</tr>
<tr>
<td>M</td>
<td>Dial thermometer: Ø100</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>N</td>
<td>To be used in R134 Refrigerant systems</td>
<td>kg</td>
<td>2.00</td>
</tr>
<tr>
<td>O</td>
<td>To be used in R404 Refrigerant systems</td>
<td>kg</td>
<td>2.00</td>
</tr>
</tbody>
</table>

**Carried to Collection: R**

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Section 4: Mechanical Installation
Bill No. 4
RIVERSDALE HOSPITAL HVAC REPAIR
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burn-out kits</td>
<td>A To be used in ⅜&quot; lines.</td>
<td>No</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B To be used in ¼&quot; lines.</td>
<td>No</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C To be used in ¾&quot; lines.</td>
<td>No</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>Armaflex pipe insulation per meter</td>
<td>D To be used on ¾&quot; lines. (½&quot; wall)</td>
<td>m</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E To be used on ½&quot; lines. (½&quot; wall)</td>
<td>m</td>
<td>15.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F To be used on ¾&quot; lines. (¾&quot; wall)</td>
<td>m</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G To be used on ¾&quot; lines. (¾&quot; wall)</td>
<td>m</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>H To be used on ½&quot; lines. (¾&quot; wall)</td>
<td>m</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I To be used on ¾&quot; lines. (¾&quot; wall)</td>
<td>m</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>J Blower coil Defrost Heaters elements - 500W</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>K Freezer room door seal heating elements</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L Evaporator Fan - blower coils</td>
<td>No</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>Water Heating Systems</td>
<td>M Wash coils with detergent. Price per heat pump</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N Check gas charge, oil leaks, condenser fan operations, report</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>malfunction. Price per heat pump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial geysers (Electrical)</td>
<td>O Replace faulty elements - 2kW hard water- connect up.</td>
<td>No</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P Replace thermostats. Connect up. Set point to be 50°C</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection

Section 4: Mechanical Installation
Bill No. 4
RIVERSDALE HOSPITAL HVAC REPAIR
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Provisional amount for upgrading work in control panels and insulation on pipe work</td>
<td>8,000.00</td>
</tr>
<tr>
<td>B</td>
<td>Amount for un-identified units. The unit prices as per above shall be applicable. The contractor will report on units not stipulated in the Schedules as part of the survey during the first service module.</td>
<td>25,000.00</td>
</tr>
<tr>
<td>Page No</td>
<td>Amount</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>181</td>
<td></td>
<td></td>
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<tr>
<td>182</td>
<td></td>
<td></td>
</tr>
<tr>
<td>183</td>
<td></td>
<td></td>
</tr>
</tbody>
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Total Brought Forward from Page No.

Carried to Summary

Section 4: Mechanical Installation
Bill No. 4
RIVERSDALE HOSPITAL HVAC REPAIR
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### BILL NO 5

**RIVERSDALE HOSPITAL: SCHEDULED SERVICING OF EQUIPMENT - HVAC & REFRIGERATION**

Prices shall include all items as per the service schedules stipulated in the Technical Specification Part 2.3.4.3.3

Consumables will be included in the item prices for Bi-Monthly and Annually services.

Transport for Bi-Monthly and Annually services will be included in unit prices

**Item prices to include all accommodation, allowances etc.**

**Room Air Conditioning.**

**Split Units (36 off)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Minor- Bi-Monthly</td>
<td>No</td>
<td></td>
<td>180.00</td>
</tr>
<tr>
<td>B</td>
<td>Main- Yearly x 2</td>
<td>No</td>
<td></td>
<td>36.00</td>
</tr>
</tbody>
</table>

**Cassette type split units (2 off)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Minor- Bi-Monthly</td>
<td>No</td>
<td></td>
<td>10.00</td>
</tr>
<tr>
<td>D</td>
<td>Main- Yearly x 2</td>
<td>No</td>
<td></td>
<td>2.00</td>
</tr>
</tbody>
</table>

**Central AC Plants.**

**Air Cooled Chillers (1 off)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Minor- Bi-Monthly</td>
<td>No</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>F</td>
<td>Main- Yearly x 2</td>
<td>No</td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Air Cooled Package unit (1 off)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Minor- Bi-Monthly</td>
<td>No</td>
<td></td>
<td>5.00</td>
</tr>
</tbody>
</table>

**Carried to Collection**

-185-
<table>
<thead>
<tr>
<th>A</th>
<th>Main- Yearly x 2</th>
<th>No</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Minor- Bi-Monthly</td>
<td>No</td>
<td>5.00</td>
</tr>
<tr>
<td>C</td>
<td>Main- Yearly</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Ventilation Fans</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Minor- Quarterly</td>
<td>No</td>
<td>48.00</td>
</tr>
<tr>
<td><strong>Duct Mounted (2 off - filter cleaning)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Minor- Quarterly</td>
<td>No</td>
<td>8.00</td>
</tr>
<tr>
<td><strong>Diffusers and grilles (100 off)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Yearly</td>
<td>No</td>
<td>20.00</td>
</tr>
<tr>
<td><strong>Refrigeration.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note timing and scope of works as stipulated in the Technical specification.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Bi-monthly</td>
<td>No</td>
<td>5.00</td>
</tr>
<tr>
<td>H</td>
<td>Annual</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Mortuary units (2 off)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Bi-monthly</td>
<td>No</td>
<td>20.00</td>
</tr>
<tr>
<td><strong>Heating Equipment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Bi-monthly</td>
<td>No</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Carried to Collection

Section 4: Mechanical Installation
Bill No. 5
RIVERSDALE HOSITAL HVAC SERVICE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Annually</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td><strong>Heat pump (2 off)</strong></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Bi-monthly</td>
<td>No</td>
</tr>
<tr>
<td>C</td>
<td>Annually</td>
<td>No</td>
</tr>
<tr>
<td>D</td>
<td><strong>Un-identified Units</strong></td>
<td></td>
</tr>
</tbody>
</table>

**D** Amount for un-identified units. The unit prices as per above shall be applicable. The contractor will report on units not stipulated in the Schedules as part of the survey during the first service module.

<table>
<thead>
<tr>
<th>Item</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20 000.00</td>
</tr>
</tbody>
</table>

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Carried to Collection

Section 4: Mechanical Installation
Bill No. 5
RIVERSDALE HOSITAL HVAC SERVICE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
Bill No. 5

RIVERSDALE HOSPITAL HVAC SERVICE

**COLLECTION**

<table>
<thead>
<tr>
<th>Page No</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>185</td>
<td></td>
</tr>
<tr>
<td>186</td>
<td></td>
</tr>
<tr>
<td>187</td>
<td></td>
</tr>
</tbody>
</table>

Total Brought Forward from Page No.

Carried to Summary

Section 4: Mechanical Installation

RIVERSDALE HOSPITAL HVAC SERVICE

GROUP 2 CLINICS (WC 9.D.D)

PROVISIONAL BILLS OF QUANTITIES
## BILL NO 6

**RIVERSDALE HOSPITAL: TRANSPORT AND LABOUR - HVAC & REFRIGERATION**

### TRANSPORT COSTS

Transport costs for the Upgrading and Repairs Contract only, excluding the transport costs required for the 12 months maintenance period. (transport for maintenance must be included in Bill 4 item prices.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>km</td>
<td>400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MATERIAL COSTS

- Expected amount to be used for minor repairs not scheduled as items in Bills 2, 3 & 4.

<table>
<thead>
<tr>
<th>Item</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Item</td>
<td>30 000.00</td>
</tr>
</tbody>
</table>

### LABOUR COSTS

Labour costs for installations and breakdowns will include for all overhead and statutory rates required by law.

<table>
<thead>
<tr>
<th>Item</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Hrs</td>
<td>40.00</td>
</tr>
<tr>
<td>E</td>
<td>Hrs</td>
<td>40.00</td>
</tr>
<tr>
<td>F</td>
<td>Hrs</td>
<td>25.00</td>
</tr>
<tr>
<td>G</td>
<td>Hrs</td>
<td>25.00</td>
</tr>
</tbody>
</table>

---

**Carried to Summary**

Section 4: Mechanical Installation

Bill No. 6

RIVERSDALE HOSPITAL HVAC TRANSPORT & LABOUR

GROUP 2 CLINICS (WC 9.D.D)

PROVISIONAL BILLS OF QUANTITIES
The supply and installation of new fire detection equipment, spares and other items listed here below shall be as per the Technical Specification: (Part 2.3.3.4 Sub section 2)

All prices to include the removal of old unit, supply, install and all related travel unless otherwise pointed out. Installations to fit in with existing infrastructure.

New Equipment (supply and install)

A New optical Smoke detector  No 15.00
B New heat detector  No 2.00
C New Sounder  No 2.00
D New Strobe light  No 2.00
E Galvanized conduit in ceiling space or fixed to walls.  m 10.00
F Galvanized draw boxes: 4 way c/w lid.  No 2.00
G Cabling (PH 30 grade wiring)  m 20.00
H Connect and address newly installed detectors and "fire exit doors" to control panel and identify accordingly.  No 15.00

Information notices.

I Remove all current block plans and replace with corrected new plans .(Refer to Part C2.1.4.2)  No 4.00
J Remove all current "Operating Instructions" and replace with corrected new instructions .(Refer to Part C2.1.4.3)  No 4.00
### System communications

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Item</th>
<th>Quantity</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Provide alarm link from main control panel to local Fire Department Control room. (Provisional amount)</td>
<td>Item</td>
<td>5 000.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Provide facility to automatically switch off central air conditioning unit in Casualty department when fire is detected. Installation to include relays, wire ways, wiring and connections to make it functional and be zone specific as applicable.</td>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Provide facility to automatically switch off central air conditioning unit in Theatres department when fire is detected. Installation to include relays, wire ways, wiring and connections to make it functional and be zone specific as applicable.</td>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Provide facility to automatically switch off central ventilation unit in The Wards when fire is detected. Installation to include relays, wire ways, wiring and connections to make it functional and be zone specific as applicable.</td>
<td>No</td>
<td>4.00</td>
<td></td>
</tr>
</tbody>
</table>

### UN-IDENTIFIED EQUIPMENT

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Item</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Provisional amount for un-identified fire detection equipment. The unit prices as per above shall be applicable. The contractor will report on equipment not stipulated in the Schedules as part of the survey during the first service module</td>
<td>Item</td>
<td>10 000.00</td>
</tr>
<tr>
<td>Bill No. 7</td>
<td>RIVERSDALE HOSPITAL FIRE DETECTION NEW EQUIPMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COLLECTION</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total Brought Forward from Page No.</td>
<td>Page No</td>
<td>Amount</td>
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</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>190</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>191</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
BILL NO 8

RIVERSDALE HOSPITAL: SERVICING OF FIRE DETECTION EQUIPMENT.

The supply and installation of new fire detection equipment, spares and other items listed below shall be as per the Technical Specification: (Part 2.3.3.4 Sub section 2)

All prices to include the removal of old unit, supply, install and all related travel unless otherwise pointed out. Installations to fit in with existing infrastructure.

"First Service”.

The repair and rectification of existing installation.

<table>
<thead>
<tr>
<th>Item No</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Replace all control panel batteries with new.</td>
<td>No</td>
<td>2.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Smoke-test all Smoke Detectors.</td>
<td>No</td>
<td>140.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Heat-test all Heat Detectors.</td>
<td>No</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Test sounder / strobe light</td>
<td>No</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Inspect and test control/repeater panel for correct operation, check all hot spots, wiring connections and electronic devices.</td>
<td>No</td>
<td>2.00</td>
<td>Item</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Successful tenderer will assess the cost to make the system fully functional, and quote. (Provisional Amount)</td>
<td>Item</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Final Service of entire installation at the end of the 12 month contract period.**

<table>
<thead>
<tr>
<th>Item No</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Service of all Smoke Detectors.</td>
<td>No</td>
<td>140.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Service of all Heat Detectors.</td>
<td>No</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Service of sounder / strobe light</td>
<td>No</td>
<td>4.00</td>
<td>Item</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Service and test control/repeater panel.</td>
<td>No</td>
<td>2.00</td>
<td>Item</td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection

Section 4: Mechanical Installation
Bill No. 8
RIVERSDALE HOSPITAL FIRE DETECTION SERVICE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>A</th>
<th>Service and test communication system to Fire Brigade.</th>
<th>No</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Provisional amount for un-identified fire detection equipment. The unit prices as per above shall be applicable. The contractor will report on equipment not stipulated in the Schedules as part of the survey during the first service module.</td>
<td>Item</td>
<td>10 000.00</td>
</tr>
</tbody>
</table>

**UN-IDENTIFIED EQUIPMENT**

Carried to Collection

Section 4: Mechanical Installation  
Bill No. 8  
RIVERSDALE HOSPITAL FIRE DETECTION SERVICE  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
Bill No. 8

RIVERSDALE HOSPITAL FIRE DETECTION SERVICE

<table>
<thead>
<tr>
<th>Page No</th>
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</thead>
<tbody>
<tr>
<td>193</td>
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<tr>
<td>194</td>
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</tr>
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Total Brought Forward from Page No.

Section 4: Mechanical Installation
Bill No. 8
RIVERSDALE HOSPITAL FIRE DETECTION SERVICE
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

Carried to Summary

R
<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>BILL NO 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIVERSDALE HOSPITAL: TRANSPORT AND LABOUR FOR FIRE DETECTION.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The supply and installation of new fire detection equipment, spares and other items listed here below shall be as per the Technical Specification: (Part 2.3.3.4 Sub section 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This provision is for unforeseen breakdowns and repairs outside normal working hours and after completion of contract for the remainder of the 12 month period. Excluding all work related to latent defects, equipment under guarantee and work during normal construction activities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Transport costs are for a Vehicle with a load of (1) Ton. Inclusive of traveling time for a technician and (1) assistant. (Provisional)</td>
<td>km</td>
<td>400.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Expected amount to be used for minor repairs not scheduled as items in Bills 2 &amp; 3.</td>
<td>Item</td>
<td>5 000.00</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Profit (R5,000.00 x %profit + =Amount.)</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATERIAL COSTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Technician normal time</td>
<td>Hrs</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Assistant normal time</td>
<td>Hrs</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Technician Overtime</td>
<td>Hrs</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Assistant overtime</td>
<td>Hrs</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>O&amp;M documents of all new or replaced equipment (4 sets).</td>
<td>Sets</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>LABOUR COSTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Carried to Summary</td>
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<td>Section 4: Mechanical Installation</td>
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<tr>
<td>Bill No. 9</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>RIVERSDALE HOSPITAL FIRE DETECTION TRANSPORT &amp; LABOUR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROUP 2 CLINICS (WC 9.D.D)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>PROVISIONAL BILLS OF QUANTITIES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**BILL NO 10**

**RIVERSDALE HOSPITAL: NEW EQUIPMENT - FIRE PROTECTION.**

The supply and installation of new fire protection equipment, spares and other items listed here below shall be as per the Technical Specification: (See Part 2.3.3.1 Sub section 2).

All prices to include supply, install and all related travel unless otherwise pointed out. Installations to fit in with existing infrastructure.

**New Equipment**

**Hand Held CO2 Units (All units in wards and corridors)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2 kg CO2 unit</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>5 kg CO2 unit</td>
<td>No</td>
<td>7</td>
</tr>
</tbody>
</table>

**Hose Reels**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Hose Reel complete with pressure guage</td>
<td>No</td>
<td>1</td>
</tr>
</tbody>
</table>

**Fire Hydrants:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Fire Hydrant complete with 900mm pedestal</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>Hydrant hose cabinet: PVC with hinged lockable door.</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>30m x 65mm Hydrant hose: flat lay. Complete with couplings and a nozzle.</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>G</td>
<td>Hydrant hose nozzle.</td>
<td>No</td>
<td>1</td>
</tr>
</tbody>
</table>

**New Bulk water storage - Fire-Fighting**

Supply, erection and installation of a ground level 50KL water storage tank, pressure pumps, footings, power supply and water connections (refer to Project Specification Clause 2.3.3.3 Sub-Section 2 (G))
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Code</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Supply 50kL Hot Dipped Galv. Panels storage tank</td>
<td>No</td>
<td></td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Deliver to site</td>
<td>Item</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Assemble on site to completion</td>
<td>Item</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Soil platform compacted as per detail specification</td>
<td>Item</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Concrete plinths as per tank manufacturer spec.</td>
<td>Item</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pump technical specification**

- The Pumps shall be of the Multi-pump set type and shall include (but not limited to) the following:
  - 1 x set of 3 x boost-smart helix type – suitable for water
  - Maximum flow 1200 L/min @ 30m head per set
  - Minimum flow @ 90L/m @ 30m head per set
  - Motor current each – 4kW – 400V – 3 phase – 2900 rpm
  - IP 55 protection
  - Manifold, header, VSD drive, over current protection, pressure transducers, shut-off valves etc. ready for connection to water supply lines.
  - Full detail of offer including pump curves to be submitted before ordering.

| F   | Supply Multi-stage 3-in-1 pump set combination, complete with VSD drives, control panel, manifolds, valves, transducers - refer to detail specification | Sets |       | 2.00      |             |        |
| G   | Install pump sets, connect up to water supply lines ready for full operation. | No   |       | 2.00      |             |        |
| H   | 16mmx4core PVCA cable laid in ground, including 4 x cable terminations      | m    |       | 80.00     |             |        |
| I   | Excavations and backfill, compacted to original soil conditions - 400mm x 600mm - price per running meter | m    |       | 80.00     |             |        |
| J   | All control mechanisms, including water level controls, control wiring etc. to full operation | Item |       |           |             |        |
| K   | Provisional amount for upgrading electrical connection at nearest supply point | Item |       |           | 6 000.00   |        |
| L   | Provisional amount for final water line connections                          | Item |       |           | 15 000.00  |        |

**Carried to Collection**

Section 4: Mechanical Installation
Bill No. 10
RIVERSDALE HOSPITAL NEW FIRE EQUIPMENT
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
**UN-IDENTIFIED EQUIPMENT**

A  Provisional amount for un-identified fire protection equipment. The unit prices as per above shall be applicable. The contractor will report on equipment not stipulated in the Schedules as part of the survey during the first service module.

| Item | 8 000.00 |

Carried to Collection

Section 4: Mechanical Installation
Bill No. 10
RIVERSDALE HOSPITAL NEW FIRE EQUIPMENT
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
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<th>Amount</th>
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<td>198</td>
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<tr>
<td>199</td>
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Carried to Summary

Section 4: Mechanical Installation
Bill No. 10
RIVERSDALE HOSPITAL NEW FIRE EQUIPMENT
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
## BILL NO 11

### RIVERSDALE HOSPITAL: MATERIAL AND REPAIRS TO EXISTING EQUIPMENT - FIRE PROTECTION.

The supply and installation of, fire protection equipment that is to be replaced, spares and other items listed here below shall be as per the (Technical Specification: Part 2.3.3.1 Sub section 2).

Replacement of items & spare parts for hand held units, and mounting of hand held units.

All prices to include the removal of old unit, supply, install and all related travel unless otherwise pointed out. Installations to fit in with existing infrastructure.

#### Hand Held CO2 Units

<table>
<thead>
<tr>
<th>Item No</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2 kg CO2 unit</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>5 kg CO2 unit</td>
<td>No</td>
<td>5.00</td>
<td></td>
</tr>
</tbody>
</table>

#### Other spares

<table>
<thead>
<tr>
<th>Item No</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Backing board.</td>
<td>No</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Hanging Bracket.</td>
<td>No</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Neck ring. (CETA accredited)</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Safety pin.</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>CO2 Hose &amp; Horn.</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>CO2 Horn.</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Units pressure test. (for DCP, CO2, Foam or Water units)</td>
<td>No</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Nitrogen charge per unit.</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Supply and install SANS approved CO2 per kg</td>
<td>kg</td>
<td>5.00</td>
<td></td>
</tr>
</tbody>
</table>

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**Carried to Collection**

Section 4: Mechanical Installation
Bill No. 11
RIVERSDALE HOSPITAL FIRE EQUIPMENT REPAIRS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES

-201-
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Cabinet key</td>
<td>No 5.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>CO2 Head assembly</td>
<td>No 2.00</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Break glass unit</td>
<td>No 5.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Repaint (spray) of DPC / CO2 units</td>
<td>m² 5.00</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Instruction label</td>
<td>No 5.00</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Service sticker</td>
<td>No 5.00</td>
<td></td>
</tr>
</tbody>
</table>

**Replacement of items & spare parts for Hose Reels, and mounting of Hose Reels:**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Hose reel cabinet: PVC with hinged lockable door.</td>
<td>No 1.00</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Hose reel Nylon Cover</td>
<td>No 1.00</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>30 m 28 mm diam Fire hose</td>
<td>No 2.00</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Hose reel frames</td>
<td>No 2.00</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Hose reel waterway. (Brass)</td>
<td>No 2.00</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Hose reel nozzle (aluminium)</td>
<td>No 2.00</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Hose reel nozzle (pvc)</td>
<td>No 2.00</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Hose clamp.</td>
<td>No 2.00</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>Hose Reel Stop cock</td>
<td>No 2.00</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Hose Reel Draw shackle</td>
<td>No 2.00</td>
<td></td>
</tr>
</tbody>
</table>

**Replacement of items & spare parts for Fire Hydrants:**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>Hydrant hose cabinet: PVC with hinged lockable door.</td>
<td>No 2.00</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>30m x 65mm Hydrant hose: flat lay. Complete with couplings.</td>
<td>No 4.00</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>45m x 65mm Hydrant hose: flat lay. Complete with couplings.</td>
<td>No 4.00</td>
<td></td>
</tr>
</tbody>
</table>

**Carried to Collection**
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Hydrant Head: 65mm outlet.</td>
<td>No</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>B</td>
<td>Branch pipe: 65mm. (straight thro)</td>
<td>No</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>C</td>
<td>Hydrant T-spanner.</td>
<td>No</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>D</td>
<td>Pressure test of fire hydrant at highest point</td>
<td>No</td>
<td></td>
<td>3.00</td>
</tr>
<tr>
<td>E</td>
<td>Re cast Concrete pedestal. (thrust block)</td>
<td>No</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>F</td>
<td>Paint Hydrant, &amp; Pedestal.</td>
<td>No</td>
<td></td>
<td>12.00</td>
</tr>
<tr>
<td>G</td>
<td>65mm Lip seal.</td>
<td>No</td>
<td></td>
<td>4.00</td>
</tr>
<tr>
<td>H</td>
<td>Hydrant hand wheels</td>
<td>No</td>
<td></td>
<td>4.00</td>
</tr>
<tr>
<td>I</td>
<td>Clack washers</td>
<td>No</td>
<td></td>
<td>11.00</td>
</tr>
<tr>
<td>J</td>
<td>Instruction label</td>
<td>No</td>
<td></td>
<td>11.00</td>
</tr>
</tbody>
</table>

All prices to include supply and install unless otherwise pointed out.

Stop Valve, threaded brass.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>25mm stop valve complete</td>
<td>No</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>L</td>
<td>32mm stop valve complete</td>
<td>No</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>M</td>
<td>40mm stop valve complete</td>
<td>No</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>N</td>
<td>50mm stop valve complete</td>
<td>No</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>O</td>
<td>100mm stop valve complete</td>
<td>No</td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

Cut lengths of pipe work: price per meter length, threaded both ends as required - Galvanized.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>25mm</td>
<td>m</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>Q</td>
<td>32mm</td>
<td>m</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>R</td>
<td>40mm</td>
<td>m</td>
<td></td>
<td>5.00</td>
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Carried to Collection

Section 4: Mechanical Installation
Bill No. 11
RIVERSDALE HOSPITAL FIRE EQUIPMENT REPAIRS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
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<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>50mm</td>
<td>m</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>B</td>
<td>25mm T sections</td>
<td>No</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>C</td>
<td>25mm Elbows</td>
<td>No</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>D</td>
<td>25mm sockets</td>
<td>No</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>E</td>
<td>25mm Union</td>
<td>No</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>F</td>
<td>32mm T sections</td>
<td>No</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>G</td>
<td>32mm Elbows</td>
<td>No</td>
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<td>1.00</td>
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<td>H</td>
<td>32mm sockets</td>
<td>No</td>
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<td>1.00</td>
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<tr>
<td>I</td>
<td>32mm Union</td>
<td>No</td>
<td></td>
<td>1.00</td>
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<tr>
<td>J</td>
<td>40mm T sections</td>
<td>No</td>
<td></td>
<td>1.00</td>
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<td>K</td>
<td>40mm Elbows</td>
<td>No</td>
<td></td>
<td>1.00</td>
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<tr>
<td>L</td>
<td>40mm sockets</td>
<td>No</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>M</td>
<td>40mm Union</td>
<td>No</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>N</td>
<td>25mm to 40mm</td>
<td>No</td>
<td></td>
<td>4.00</td>
</tr>
<tr>
<td>O</td>
<td>Painting of replaced pipes - including de-rusting, preparation, primer and 2 x final coats Signal Red. Price per meter length of pipe.</td>
<td>m</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>25mm</td>
<td>m</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>Q</td>
<td>32mm</td>
<td>m</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>R</td>
<td>40mm</td>
<td>m</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>S</td>
<td>50mm</td>
<td>m</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>Item</td>
<td>Provisional amount for un-identified fire protection equipment. The unit prices as per above shall be applicable. The contractor will report on equipment not stipulated in the Schedules as part of the survey during the first service module</td>
<td>5 000.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Page No</td>
<td>Amount</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>201</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>202</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>203</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>204</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>205</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Carried to Summary

Section 4: Mechanical Installation
Bill No. 11
RIVERSDALE HOSPITAL FIRE EQUIPMENT REPAIRS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>4.5 kg DCP unit</td>
<td>No</td>
<td>6.00</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>5 kg CO2 unit</td>
<td>No</td>
<td>20.00</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>9 kg CO2 unit</td>
<td>No</td>
<td>2.00</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>Reel</td>
<td>No</td>
<td>16.00</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>30 m 28 mm diam Fire hose</td>
<td>No</td>
<td>16.00</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>63 mm diam hydrant connection</td>
<td>No</td>
<td>6.00</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>63 mm diam hydrant Booster connection</td>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>Hydrant Hose (45 m 65 mm diam Fire hose)</td>
<td>No</td>
<td>6.00</td>
</tr>
<tr>
<td>I</td>
<td></td>
<td>Pressure test of fire hydrant at highest point</td>
<td>No</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Hand Held DCP Units**

**Hand Held CO2 Units**

**Hose Reels**

**Hydrants**

**Pressure Testing**

---

**RIVERSDALE HOSPITAL: SCHEDULED SERVICING OF EQUIPMENT - FIRE PROTECTION.**

**SERVICING OF EQUIPMENT**

Supply rates for servicing of fire protection equipment shall be as per the Technical Specification: (Part 2.3.3.1 Sub section 2.) Sum given in the bill below shall be inclusive of all labour, travelling, supplies, materials and equipment required to complete the service.

---

**Carried to Collection**

Section 4: Mechanical Installation
Bill No. 12
RIVERSDALE HOSPITAL FIRE EQUIPMENT SERVICING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
## UN-IDENTIFIED EQUIPMENT

A Provisional amount for un-identified fire protection equipment. The unit prices as per above shall be applicable. The contractor will report on equipment not stipulated in the Schedules as part of the survey during the first service, as per the Technical Specification

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 000.00</td>
</tr>
</tbody>
</table>

Carried to Collection

Section 4: Mechanical Installation
Bill No. 12
RIVERSDALE HOSPITAL FIRE EQUIPMENT SERVICING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
RIVERSDALE HOSPITAL FIRE EQUIPMENT SERVICING

COLLECTION

Bill No. 12

Amount

Page No

Total Brought Forward from Page No.

207

208

Carried to Summary

Section 4: Mechanical Installation
Bill No. 12
RIVERSDALE HOSPITAL FIRE EQUIPMENT SERVICING
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
## BILL NO 13

**RIVERSDALE HOSPITAL: SYMBOLIC SIGNS.**

**SYMBOLIC SIGNS**

All prices to include the removal of old unit, supply, install and all related travel unless otherwise pointed out. Installations to fit in with existing infrastructure.

**ABS (Acrylonitrile Butadiene Styrene)**

The supply and installation of new SYMBOLIC SIGNS listed here below shall be as per the Technical Specification: Part 2.1 Sub section 3.2.

**Information Signs: ABS**

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>150 x 150 mm</td>
<td>No</td>
<td>15.00</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>190 x 190 mm</td>
<td>No</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>290 x 290 mm</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>440 x 440 mm</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
</tbody>
</table>

**Aluminium Framed, Wall Mount Bracketed, ABS 150 mm Signs: Double Sided**

Supply and install the following:

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>2 compartment unit.</td>
<td>No</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3 compartment unit.</td>
<td>No</td>
<td>4.00</td>
<td></td>
</tr>
</tbody>
</table>

**Aluminium Framed, Wall Mount Bracketed, 190 mm ABS Signs: Double Sided**

<table>
<thead>
<tr>
<th>Item No</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>2 compartment unit.</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>3 compartment unit.</td>
<td>No</td>
<td>2.00</td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection

Section 4: Mechanical Installation
Bill No. 13
RIVERSDALE HOSPITAL SIGNS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Aluminium Framed, Chain Hanging, Ceiling Units - 190 mm ABS Signs: Double Sided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply and install the following:</td>
</tr>
<tr>
<td>A  2 compartment unit. No 4.00</td>
</tr>
<tr>
<td>B  3 compartment unit. No 4.00</td>
</tr>
</tbody>
</table>

**Warning Signs: Photo luminescent type.**

Supply and install the following signs at emergency exits:

| C  190 x 190 mm No 6.00                                      |

<table>
<thead>
<tr>
<th>Aluminium Framed Wall Mounted Brackets 190 mm ABS PVC Signs: Double Sided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply and install the following:</td>
</tr>
<tr>
<td>D  2 compartment unit. No 2.00</td>
</tr>
<tr>
<td>E  3 compartment unit. No 2.00</td>
</tr>
<tr>
<td>F  4 compartment unit. No 2.00</td>
</tr>
</tbody>
</table>

**Key Boxes/Break Glass Unit**

| G  Supply and install new unit. No 5.00                        |
| H  Replacement break glass panel No 5.00                      |

**UN-IDENTIFIED SYMBOLIC SIGNS**

I Provisional amount for un-identified symbolic signs. The unit prices as per above shall be applicable. The contractor will report on equipment not stipulated in the Schedules as per Part 2.3.4.2 as part of the survey during the first service module.

| Item | 1 500.00 |

---

**Carried to Collection**

Section 4: Mechanical Installation
Bill No. 13
RIVERSWDALE HOSPITAL SIGNS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
<table>
<thead>
<tr>
<th>Bill No. 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIVERSWDALE HOSPITAL SIGNS</td>
</tr>
<tr>
<td>COLLECTION</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Brought Forward from Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>210</td>
</tr>
<tr>
<td>211</td>
</tr>
</tbody>
</table>

Carried to Summary

Section 4: Mechanical Installation
Bill No. 13
RIVERSWDALE HOSPITAL SIGNS
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### BILL NO 14

**RIVERSDALE HOSPITAL: TRANSPORT AND LABOUR FOR FIRE PROTECTION.**

This provision is for unforeseen breakdowns and repairs outside normal working hours and after completion of contract for the remainder of the 12 month period. Excluding all work related to latent defects, equipment under guarantee and work during normal construction activities.

#### TRANSPORT COSTS

<table>
<thead>
<tr>
<th>Item No</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Transport costs are for a Vehicle with a load of (1) Ton. Inclusive of travelling time for a technician and (1) assistant. (Provisional)</td>
<td>km</td>
<td></td>
<td>200.00</td>
<td></td>
</tr>
</tbody>
</table>

#### MATERIAL COSTS

<table>
<thead>
<tr>
<th>Item No</th>
<th>Description</th>
<th>Unit</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Expected amount to be used for minor repairs not scheduled as items in Bills 2, 3 &amp; 4.</td>
<td>Item</td>
<td>500.00</td>
</tr>
<tr>
<td>C</td>
<td>Profit (i.e. R500.00 x %profit + =Amount.)</td>
<td>%</td>
<td></td>
</tr>
</tbody>
</table>

#### LABOUR COSTS

**Labour costs for installations and breakdowns will include for all overhead and statutory rates required by law. (Hours for travelling measured under "Transport")**

<table>
<thead>
<tr>
<th>Item No</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Technician normal time (Provisional)</td>
<td>Hrs</td>
<td>20.00</td>
</tr>
<tr>
<td>E</td>
<td>Assistant normal time (Provisional)</td>
<td>Hrs</td>
<td>20.00</td>
</tr>
<tr>
<td>F</td>
<td>Technician Overtime (Provisional)</td>
<td>Hrs</td>
<td>10.00</td>
</tr>
<tr>
<td>G</td>
<td>Assistant overtime (Provisional)</td>
<td>Hrs</td>
<td>10.00</td>
</tr>
<tr>
<td>H</td>
<td>O&amp;M Manuals complete with all relevant information</td>
<td>Sets</td>
<td>4.00</td>
</tr>
</tbody>
</table>

---

Section 4: Mechanical Installation
Bill No. 14
RIVERSDALE HOSPITAL FIRE EQUIPMENT TRANSPORT & LABOUR
GROUP 2 CLINICS (WC 9.D.D)
PROVISIONAL BILLS OF QUANTITIES
### SECTION SUMMARY

<table>
<thead>
<tr>
<th>Bill No</th>
<th>Description</th>
<th>Page No</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>ALBERTINIA CLINIC MECHANICAL</td>
<td></td>
<td>171</td>
</tr>
<tr>
<td>2</td>
<td>RIVERSDALE CLINIC MECHANICAL</td>
<td></td>
<td>174</td>
</tr>
<tr>
<td>3</td>
<td>RIVERSDALE HOSPITAL NEW HVAC EQUIPMENT</td>
<td></td>
<td>179</td>
</tr>
<tr>
<td>4</td>
<td>RIVERSDALE HOSPITAL HVAC REPAIR</td>
<td></td>
<td>184</td>
</tr>
<tr>
<td>5</td>
<td>RIVERSDALE HOSPITAL HVAC SERVICE</td>
<td></td>
<td>188</td>
</tr>
<tr>
<td>6</td>
<td>RIVERSDALE HOSPITAL HVAC TRANSPORT &amp; LABOUR</td>
<td></td>
<td>189</td>
</tr>
<tr>
<td>7</td>
<td>RIVERSDALE HOSPITAL FIRE DETECTION NEW EQUIPMENT</td>
<td></td>
<td>192</td>
</tr>
<tr>
<td>8</td>
<td>RIVERSDALE HOSPITAL FIRE DETECTION SERVICE</td>
<td></td>
<td>195</td>
</tr>
<tr>
<td>9</td>
<td>RIVERSDALE HOSPITAL FIRE DETECTION TRANSPORT &amp; LABOUR</td>
<td></td>
<td>196</td>
</tr>
<tr>
<td>10</td>
<td>RIVERSDALE HOSPITAL NEW FIRE EQUIPMENT</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>11</td>
<td>RIVERSDALE HOSPITAL FIRE EQUIPMENT REPAIRS</td>
<td></td>
<td>206</td>
</tr>
<tr>
<td>12</td>
<td>RIVERSDALE HOSPITAL FIRE EQUIPMENT SERVICING</td>
<td></td>
<td>209</td>
</tr>
<tr>
<td>13</td>
<td>RIVERSDALE HOSPITAL SIGNS</td>
<td></td>
<td>212</td>
</tr>
<tr>
<td>14</td>
<td>RIVERSDALE HOSPITAL FIRE EQUIPMENT TRANSPORT &amp; LABOUR</td>
<td></td>
<td>213</td>
</tr>
</tbody>
</table>

Section 4: Mechanical Installation  
GROUP 2 CLINICS (WC 9.D.D)  
PROVISIONAL BILLS OF QUANTITIES
NATIONAL DEPARTMENT OF HEALTH  


C2.3: FINAL TENDER SUMMARY

The complete set of tender documents is as set out in summary handed out with the tender documentation and amounts must be carried from the summaries in the Bills of Quantities – PART C2.2 to this Final Tender Summary

<table>
<thead>
<tr>
<th>SECTION</th>
<th>DESCRIPTION</th>
<th>TENDER AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PRELIMINARIES</td>
<td>R……………….</td>
</tr>
<tr>
<td>2</td>
<td>BUILDERS WORK</td>
<td>R……………….</td>
</tr>
<tr>
<td>3</td>
<td>ELECTRICAL INSTALLATION</td>
<td>R……………….</td>
</tr>
<tr>
<td>4</td>
<td>MECHANICAL INSTALLATION</td>
<td>R……………….</td>
</tr>
</tbody>
</table>

SUB TOTAL

Provide the amount of R 1 200 000,00 (One Million and Two Hundred Thousand Rand) for Contingencies, etc. to be spent in whole or in part or be deducted in its entirety at the discretion of the Agent/Representative

R 1 200 000,00

Provide the amount of R 440 000,00 (Four Hundred and Forty Thousand Rand) for escalation to be adjusted and calculated to actual amount in terms of the JBCC CPAP provisions

R 440 000,00

PLUS 15% VAT

R………………. 

TOTAL

R………………. 

TOTAL CARRIED TO FORM OF OFFER AND ACCEPTANCE IN BOOK 1
PART C3: SCOPE OF WORK
C3.1: DESCRIPTION OF THE WORKS

C3.1.1 Employer’s objectives
Backlog maintenance, Refurbishment and Upgrades at Albertinia Clinic, Riversdale Clinic and Riversdale Hospital

C3.1.2 Overview of the works
Decanting of the different areas will be done by the hospital and the access to the different areas to be given to the contractor at any given time will be as discussed and agreed between the hospital, principal agent and contractor at the time of site handover.

No claims will be entertained by the contractor for standing time during decanting between phases and duration of 10 working days is to be allowed.

Albertinia Clinic
1. New Sputum Booth - Build new sputum booth
2. Internal Alterations - Create universal access bathroom; Reconfigure internal layout to create prep / fracture room, treatment and records room; change doors to be fire compliant; enlarge waiting area; create new sub-wait area in courtyard; enclose main entrance; new flooring; Private counselling room and dispensary alterations
3. General - Repaint existing facility internally and externally
4. Electrical & Mechanical - HVAC, electrical & fire compliance

Riversdale Clinic
1. Timber Windows Replacement - Replace timber windows with new aluminium windows
2. Burglar Proofing to Windows - Provide burglar proofing to existing ground floor windows
3. Pharmacy Compliance - Additional shelving and new canopy over receiving bay
4. Physio Gymnasium - Remove roll-up garage door and install new double door; New canopy over door
5. New Door - Add a new door between clinic wings as a second exit
6. General - Repaint existing facility internally and externally
7. Electrical & Mechanical - HVAC, electrical & fire compliance

Riversdale Hospital
1. Public Toilets - Upgrade public toilets at main entrance
2. Emergency Centre Ambulance Drop-off entrance - Add covered ambulance drop-off roof structure including; New drywalls and waiting and triage area; Internal finishes
3. **Emergency Centre** - Add resuscitation room; Add covered ambulance drop-off; New drywalls and waiting and triage area; Internal finishes

4. **Out Patients** - Internal alterations

5. **Female ward** - Create new store; Universal access bathrooms finishes to be upgraded

6. **Male ward** - Create store rooms; bathrooms, sluice & kitchen upgrades

7. **Maternity ward** - Convert milk kitchen to OPS manager’s office & store

8. **Staff restrooms / Kiosk** - Repair floor

9. **X-Rays** - Create new waiting area and store room at X-rays

10. **Main Theatre** - Repair floor

11. **Burglar Proofing to Windows** - Provide burglar proofing to existing ground floor windows

12. **Partially Open Link** - Lean-to roof in courtyard between theatre and store rooms (old passage)

13. **General** - Repaint existing facility internally and externally

14. **Electrical & Mechanical** - HVAC, electrical & fire compliance

### C3.1.3 Extent of the works
The works comprise mainly but is not limited to the removal of existing and installation of new internal finishes and services

### C3.1.4 Location of the works
**Address:**

Albertinia Clinic, Albertinia, Langeberg, Eden, Western Cape

Riversdale Clinic, Riversdale, Langeberg, Eden, Western Cape

Riversdale Hospital, Riversdale, Langeberg, Eden, Western Cape

### C3.1.5 Temporary works
N/A
C3.2: LIST OF DRAWINGS

The following drawings are applicable to the contract:

Drawings are attached at the back of this tender document

**Architectural Drawings:**

<table>
<thead>
<tr>
<th>DRAWING NO</th>
<th>DRAWING DESCRIPTION</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>ALBERTINIA CLINIC DRAWINGS</strong></td>
<td></td>
</tr>
<tr>
<td>G439/W01d</td>
<td>Proposed New &amp; Existing Floor Plans</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W02b</td>
<td>Construction Details</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W03d</td>
<td>Window &amp; Door Schedule</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W04d</td>
<td>Construction Details</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W05d</td>
<td>Construction Details</td>
<td>A1</td>
</tr>
<tr>
<td></td>
<td><strong>RIVERSDALE CLINIC DRAWINGS</strong></td>
<td></td>
</tr>
<tr>
<td>G439/W02b</td>
<td>Floor Plan</td>
<td>A1</td>
</tr>
<tr>
<td></td>
<td><strong>RIVERSDALE HOSPITAL DRAWINGS</strong></td>
<td></td>
</tr>
<tr>
<td>G439/W01</td>
<td>Floor Plans</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W03b</td>
<td>Ground Floor Plan</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W04-2</td>
<td>Pharmacy Floorplan Option #1</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W04-3</td>
<td>Pharmacy Floorplan Option #1</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W06</td>
<td>First Floor Plan</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W07</td>
<td>Ground Floor Plan Room Data Sheets</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W08</td>
<td>Ground &amp; First Floor Plan Room Data Sheets</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W09</td>
<td>Ground Floor Room Data Sheets</td>
<td>A1</td>
</tr>
</tbody>
</table>

**Mechanical Engineers Drawings:**

<table>
<thead>
<tr>
<th>DRAWING NO</th>
<th>DRAWING DESCRIPTION</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>G439/W01c/M1</td>
<td>Albertina Clinic Mechanical Services</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W02b/M</td>
<td>Riversdal Clinic Mechanical Services</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W03b/M1</td>
<td>Riversdal Hospital Air Conditioning &amp; Ventilation</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W03b/F1</td>
<td>Riversdal Hospital Fire Equipment and Detection</td>
<td>A1</td>
</tr>
<tr>
<td>G439/W06/M</td>
<td>Riversdal Hospital Air Conditioning &amp; Ventilation</td>
<td>A1</td>
</tr>
</tbody>
</table>
C3.3: PRO FORMAS

C3.3.1 Forms required during contract administration

The following pages contain pro formas of forms that the contractor is required to fill in and submit during contract administration. These pro formas are for information only and are not to be filled in or regarded as returnable documents.

C3.3.2 Pro Formas included

- Poverty Alleviation & Job Creation Report
# Overall Project New Worker Schedule

**Project Name:**

**Contract No:** ___________________  **Month of Report:** ______________________  **Sheet No:** ________________

**Contractors Name:** ____________________________________________________

**Total value of Contract /Project:**

Names of all **NEW Workers** employed this month are to be entered in the table below:

<table>
<thead>
<tr>
<th>Name of Worker</th>
<th>Identity Number</th>
<th>Age of Worker</th>
<th>Nr of Labour Days</th>
<th>Daily Wage Rate</th>
<th>Nr of Training Days</th>
<th>PDI</th>
<th>Woman</th>
<th>Disabled</th>
<th>Local</th>
<th>Education Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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**Totals from Previous Sheet:**

**Totals for This Sheet:**

**Totals Carried Forward to Next Sheet:**

**Completed By:**

**Name:** ___________________________________________  **Signature:** ____________________________

**Capacity:** _________________________________________  **Date:** ______________________
PART C4: SITE INFORMATION
NATIONAL DEPARTMENT OF HEALTH

NDoHF 09/2019-20: WC 9.D.D: REFURBISHMENTS AND UPGRADES AT ALBERTINA & RIVERSDALE CLINICS AND RIVERSDALE HOSPITAL IN WESTERN CAPE PROVINCE, EDEN DISTRICT MUNICIPALITY

C4.1: SITE INFORMATION

Albertinia Clinic is situated in Church Street, Albertinia
Riversdale Clinic is situated in Hospital Street, Riversdale
Riversdale Hospital is situated in Hospital Street, Riversdale
PART C5: HEALTH AND SAFETY SPECIFICATION

A copy of the Health & Safety specification is included in Part C6 - Annexes
PART C6: ANNEXURES
ANNEXURE A: HEALTH & SAFETY SPECIFICATION
Project Health and Safety Specification

In terms of OHS ACT 85 of 1993 and Construction Regulations 2014


For

NATIONAL DEPARTMENT OF HEALTH
PROJECT HEALTH AND SAFETY SPECIFICATION

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1. Purpose

1. The purpose of this document is to provide health and safety information about specific project risks known by the Client, Designer and Client Agent. These risks are applicable to this project and may not necessarily be common knowledge to the Contractor. The Contractor must take this information into account and ensure that their tenders include adequate resources to deal with the matters detailed in this document. Compliance must be ensured by the Contractor and Appointed Sub-Contractors to all relevant legislation. Safeguarding of employees, sub-contractors and other persons affected by the construction activities must be ensured.

2. Reference should be made to the following documentation in conjunction with this safety specification (including existing surveys, drawings and reports):
   
   (a) Engineers Drawings
   (b) Designers Input
   (c) Tender Documents

3. Due to potentially dangerous operations being undertaken in construction, there is a possibility of incidents and accident which may lead to injuries or fatalities. In many instances non compliances to the Occupational Health and Safety Act (OHS Act) has resulted in severe consequences for the parties involved. The Project Client is determined to ensure the highest health and safety standards throughout the Contract.

4. To ensure this The Project Client / Client Agent has prepared and published this document. This document should be used as a guideline for minimum levels of awareness and guidance for health and safety requirements for this Contract. The responsibility for adhering to these requirements rests with the Contractors.

5. Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health and safety of his employees. OHS Act Section 8 (1)

6. Compliance with the OHS Act and Regulations will not be limited to this specification and the definitions contained in this document.

7. Tenderers are expected to be conversant with the requirements and effect of health and safety legislation, in particular the Construction Regulations, 2014, and the Occupational Health and Safety Act, 85 of 1993. Provision must be made in the tender submission to comply with all legal requirements. Adequate provision must be made for the cost of Health and Safety.

8. The Contractor’s personnel will be responsible for the implementation all necessary legislative requirements. Document control and record systems associated with the legislation must be kept by the Contractor.

9. This document should be used to assist the Contractor towards achieving compliance with the OHS Act 85 of 1993.

10. The Specification will be implemented during construction of the works for Projects Client /Client Agent has control over.

11. The Project Client is committed to ensure compliance to all the relevant legislation regarding Occupational Health and Safety is maintained and no accident occurs.
12. This document must be used as a means of measuring performance of all parties entering into a contract with the project Client or Contractor in Occupational Health and Safety Standards.

13. The Project Client does not accept any liability which may result from the Contractor failing to comply with the Document; the Contractor remains responsible for achieving the required performance levels.

14. This document forms part of the Contract, and Contractors are required to make it part of their Contracts with Sub-Contractors and Suppliers.

15. **The successful Contractor will ensure that a Safety Plan complying with all the relevant legal requirements and this document is compiled and approved by the Client/Client Agent before commencement of Construction.**

### 1.1 PROJECT DIRECTORY

<table>
<thead>
<tr>
<th>EMPLOYER</th>
<th>Principal Agent:</th>
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<tbody>
<tr>
<td><strong>National Department Of Health</strong></td>
<td><strong>Aurecon</strong></td>
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<tr>
<td>Private bag X828</td>
<td>Civil Engineer - Structural Engineer</td>
</tr>
<tr>
<td>Pretoria 001</td>
<td>P.O. Box 509</td>
</tr>
<tr>
<td>Tel: 012 312 000</td>
<td>George 6530</td>
</tr>
<tr>
<td><strong>Agent (1)</strong></td>
<td><strong>Brink Stokes Mkhize</strong></td>
</tr>
<tr>
<td><strong>Agent's service:</strong> Architect</td>
<td>P.O. Box 1691</td>
</tr>
<tr>
<td>Tel: 044 805 5446</td>
<td>George 6530</td>
</tr>
<tr>
<td><strong>Agent (2)</strong></td>
<td><strong>Chandler Consulting (Pty) Ltd</strong></td>
</tr>
<tr>
<td><strong>Agent's service:</strong> Quantity Surveyor</td>
<td>P.O. Box 2228</td>
</tr>
<tr>
<td>Tel: 044 874 5054</td>
<td>George 6530</td>
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<tr>
<td><strong>Agent (3)</strong></td>
<td><strong>BDE Consulting Engineers</strong></td>
</tr>
<tr>
<td><strong>Agent’s service:</strong> Electrical Engineer - Mechanical Engineer</td>
<td>Postal address: 73 Meade Street</td>
</tr>
<tr>
<td>Tel: 044 801 9700</td>
<td>George 6530</td>
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1.2 PROJECT DETAILS

Description of Work

Albertinia Clinic

1. New Sputum Booth - Build new sputum booth
2. Internal Alterations - Create universal access bathroom; Reconfigure internal layout to create prep /fracture room, treatment and records room; change doors to be fire compliant; enlarge waiting area; create new sub-wait area in courtyard; enclose main entrance; new flooring; Private counselling room and dispensary alterations
3. General - Repaint existing facility internally and externally
4. Electrical & Mechanical - HVAC, electrical & fire compliance

Riversdale Clinic

1. Timber Windows Replacement - Replace timber windows with new aluminium windows
2. Burglar Proofing to Windows - Provide burglar proofing to existing ground floor windows
3. Pharmacy Compliance - Additional shelving and new canopy over receiving bay
4. Physio Gymnasium - Remove roll-up garage door and install new double door; New canopy over door
5. New Door - Add a new door between clinic wings as a second exit
6. General - Repaint existing facility internally and externally
7. Electrical & Mechanical - HVAC, electrical & fire compliance

Riversdale Hospital

1. Public Toilets - Upgrade public toilets at main entrance
2. Emergency Centre Ambulance Drop-off entrance - Add covered ambulance drop-off roof structure including; New drywalls and waiting and triage area; Internal finishes
3. Emergency Centre - Add resuscitation room; Add covered ambulance drop-off; New drywalls and waiting and triage area; Internal finishes
4. Out Patients - Internal alterations
5. Female ward - Create new store; Universal access bathrooms finishes to be upgraded
6. Male ward - Create store rooms; bathrooms, sluice & kitchen upgrades
7. Maternity ward - Convert milk kitchen to OPS manager’s office & store
8. Staff restrooms / Kiosk - Repair floor
9. X-Rays - Create new waiting area and store room at X-rays
10. Main Theatre - Repair floor
11. Burglar Proofing to Windows - Provide burglar proofing to existing ground floor windows
12. Partially Open Link - Lean-to roof in courtyard between theatre and store rooms (old passage)
13. General - Repaint existing facility internally and externally
14. Electrical & Mechanical - HVAC, electrical & fire compliance
1.3 EXISTING ENVIRONMENT

Environment where construction work will be conducted Albertinia Clinic - Albertinia Langeberg, Eden Western Cape Riversdale Clinic - Riversdale Langeberg Eden Western Cape, Riversdale Hospital - Riversdale Langeberg Eden Western Cape. The works will be conducted while Hospital/Clinic are operational creating the hazard of members of the public and patients in hospital being affected by construction works. Hospital employees and visitors’ vehicles will be parked on the premises during construction work and employees, patients as well as visitors will be moving around on the premises during the works being performed. The contractor will be required to take this into consideration when drafting their risk assessment and planning their works on the premises.

Hazards particular to this project Baseline Risk Assessment

1.4 BASELINE RISK ASSESSMENT

Significant Risks and Hazards identified by the Client/Designer/Client Agent.

- Using local labour to perform work, (unskilled labour)
- Movement of Members of Public on premises.
- Use of Construction Plant and Equipment.
- Noise and Dust that may affect patients, employees and visitors in the hospital.
- Cement mixing
- Tiling and floor work
- Brick work
- Excavations.
- Painting work
- Working at height.
- Roof work
- Use of scaffolding
- Hot work (Welding, grinding & cutting)
- General Construction.
- Removal of Asbestos.
- Fire.
- Hand tools
- Hazardous Substances
- Manual Handling of General Items
- Electrical work
- Environmental
- Waste management

NOTE:
Please refer to end of Safety Specification for minimum control measures required to address these risks.

The following materials and substances have, or may have, to be used in the works or is present and are identified as potentially posing special health and / or safety hazards during the project. Appropriate measures will need to be specified for their control:

- Asbestos (If found on site)
- Petrol
- Diesel
- Hydraulic Oil
- Cement
- Paint
- Turpentine
- Silicone

The following Project Client safety rules and/or requirements are to be observed:

**Safety Rules**

1. Always wear the correct PPE when working on site
2. Inspect your tools daily before use, never use defective equipment
3. Report all incidents to safety representatives, supervision and safety officer before the end of the work shift
4. Ensure all work areas are clearly identified with correct safety warning signs
5. Ensure work areas are barricaded correctly to prevent unauthorised entry
6. All workers must always be supervised by a competent appointed supervisor
7. Do not enter areas you are not allowed to be in.
8. If you did not attend the induction training, you are not allowed to work on site
9. Always hook up when performing work on heights
10. Do not work on scaffold that has not been approved as safe (Green tagged)

**Labour Records**

At the end of each week the contractor will provide a written record, in schedule form reflecting the number and description of tradesmen and labourers employed by him and all his sub-contractors on the works each day. The contractor will also submit on a monthly basis a safety report reflecting total employees on site, total hours worked LTI (Lost time injury) frequency rate, NDI (Non disabling injury) frequency rate, amount of PTO’s conducted for the month

**Plant Records**

At the end of each week the contractor will provide a written record, in schedule form reflecting the number, type and capacity of all plant, excluding hand tools, currently used on the works.

**GENERAL PROJECT INFORMATION**

The purpose of this section is to provide general health and safety information about construction risks which are applicable to the construction industry as a whole. The Contractor must take all information in this section into account and ensure that their tenders include adequate resources to deal with the matters detailed below. All relevant risks must be dealt with in compliance with legislation

2. **STANDARD OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION**

2.1. **Scope**

1. This Section covers the requirements for eliminating and mitigating incidents and within the Contract. The scope addresses minimum legal compliance, hazard and risk management, promotion of a health and safety culture amongst all parties involved in the project and those affected by the activities taking place.

2. Contractors employed by The Project Client / Project Agent must ensure that the provisions of the specifications are applied both on the site and all off site activities relating to this project.

3. The Contractor must enforce the provisions of these Specifications amongst all subcontractors and suppliers for the project.
2.2 Interpretation

2.2.1 Application

1. The Occupational Health and Safety Specification contains clauses that are applicable to building / construction and impose pro-active controls associated with activities that impact on human health and safety as it relates to plant and machinery. Compliance to the requirements of the Act is in addition to the requirements of the Occupational Health and Safety Specification and form part of the Contractor’s responsibility. The Client / Client Agent will monitor that the Contractors compliance with the requirements of the OHS Act.

2.2.2 Definitions

For the purpose of this Occupational Health and Safety Specification following the definitions, hereunder will apply:

"client" means any person for whom construction work is being performed;

"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 to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification 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 Act and with the applicable regulations made under the Act;

"construction manager" 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 Work (as defined in the Construction Regulations, 2014) 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 and, 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;

"contractor" means an employer who performs construction work;

"designer" means

(a) a competent person who

(i) prepares a design;

(ii) checks and approves a design;

(iii) arranges for a person at work under his or her control to prepare a design, including an employee of that person where he or she is the employer; or
(iv) designs temporary work, including its components;
(b) an architect or engineer contributing to, or having overall responsibility for a design;
(c) a building services engineer designing details for fixed plant;
(d) a surveyor specifying articles or drawing up specifications;
(e) a contractor carrying out design work as part of a design and building project; or
an interior designer, shop-fitter or landscape architect;

"fall arrest equipment" means equipment used to arrest a person in a fall, including personal equipment, a body harness, lanyards, deceleration devices, lifelines or similar equipment;

"fall prevention equipment" means equipment used to prevent persons from falling from a fall risk position, including personal equipment, a body harness, lanyards, lifelines or physical equipment such as guardrails, screens, barricades, anchorages or similar equipment;

"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;

"fall risk" means any potential exposure to falling either from, off or into;

Hazard identification
Means the identification and documenting of existing or expected hazards to health and safety of persons which are normally associated with the type of construction work being executed or to be executed;

"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;

Risk assessment
Means a program to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove or control such hazard

Site
Means the area in the possession of the Contractor for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the Contractor;

The Act
Means, unless the context indicates otherwise, the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and Regulations promulgated there under.

Hazard
Means a source of or exposure to danger which may cause injury or damage to persons or property;
"medical certificate of fitness" means a certificate contemplated in Construction regulation 7(8);

"principal contractor" means an employer appointed by the client to perform construction work;

Risk
Means the probability or likelihood that a hazard can result in injury or damage.

2.2 General Health and Safety Provisions

2.3.1 Notification of Intention to Commence Construction Work

1. A contractor who intends to carry out any construction work other than work contemplated in regulation 3(1), must at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 if the intended construction work will—

(a) include excavation work;
(b) include working at a height where there is risk of falling;
(c) include the demolition of a structure; or
(d) include the use of explosives to perform construction work.

2. A contractor who intends to carry out construction work that involves construction of a single storey dwelling for a client who is going to reside in such dwelling upon completion, must at least 7 days before that work

2.3.2 Application for construction work permit (Construction regulations 3)

(1) A client who intends to have construction work carried out, must at least 30 days before that work is to be carried out apply to the provincial director in writing for a construction work permit to perform construction work if the intended construction work will—

(a) exceed 365 days;
(b) will involve more than 3600 person days of construction work; or
(c) the works contract is of a value equal to or exceeding forty million rand or Construction Industry Development Board (CIDB) grading level 7.

(2) An application contemplated in subregulation (1) must be done in a form similar to Annexure 1.

(3) The provincial director must issue a construction work permit in writing to perform construction work contemplated in subregulation (1) within 30 days of receiving the construction work permit application and must assign a site specific number for each construction site.

(4) A site specific number contemplated in subregulation (3) must be conspicuously displayed at the main entrance to the site for which that number is assigned.

(5) A construction work permit contemplated in this regulation may be granted only if—

(a) the fully completed documents contemplated in regulation 5(1)(a) and (b) have been submitted; and
(b) proof in writing has been submitted—
(i) that the client complies with regulation 5(5)
(ii) with regard to the registration and good standing of the principal contractor as contemplated in regulation 5(1)(b); and
(iii) that regulation 5(1)(c), (d), (e), (g) and (h) has been complied with.

(6) A client must ensure that the principal contractor keeps a copy of the construction work permit contemplated in subregulation (1) in the occupational health and safety file for inspection by an inspector, the client, the client's authorised agent, or an employee.

(7) No construction work contemplated in subregulation (1) may be commenced or carried out before the construction work permit and number contemplated in subregulation (3) have been issued and assigned.

(8) A site specific number contemplated in subregulation (3) is not transferrable.

This project will require a Construction work permit due to the 15 month construction period.

2.3.3 Assignment of Contractor’s Responsible Persons to Supervise Health & Safety on Site

2.3.2.1 Construction Manager

1. A principal contractor must in writing appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.

2. Where the construction manager has not appointed assistant construction managers as contemplated in Construction Regulation 8(2) or, in the opinion of an inspector, a sufficient number of such assistant construction managers have not been appointed, that inspector must direct the construction manager in writing to appoint the number of assistant construction managers indicated by the inspector, and those assistant construction managers must be regarded as having been appointed under Construction Regulation 8(2).

3. No construction manager appointed under Construction Regulation 8(1) may manage any construction work on or in any construction site other than the site in respect of which he or she has been appointed.

4. A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

2.3.2.2 Assistant Construction Manager

1. A principal contractor must upon having considered the size of the project, in writing appoint one or more assistant construction managers for different sections thereof: Provided that the designation of any such person does not relieve the construction manager of any personal accountability for failing in his or her management duties in terms of this regulation.

2.3.2.3 Construction Safety Officer

1. A contractor must, after consultation with the client and having considered the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, appoint a full-time or part-time construction health and safety officer in writing to assist in the control of all health and safety related aspects on the site: Provided that, where the question arises as to whether a
construction health and safety officer is necessary, the decision of an inspector is decisive.

2. No contractor may appoint a construction health and safety officer to assist in the control of health and safety related aspects on the site unless he or she is reasonably satisfied that the construction health and safety officer that he or she intends to appoint is registered with a statutory body approved by the Chief Inspector and has necessary competencies and resources to assist the contractor.

2.3.2.4 Construction Supervisor

1. A contractor must, upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor contemplated in Construction Regulation 8(7) and every such employee has, to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: Provided that the designation of any such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties in terms of this regulation.

2. Where the contractor has not appointed an employee as contemplated in Construction Regulation 8(8), or, in the opinion of an inspector, a sufficient number of such employees have not been appointed, that inspector must instruct the employer to appoint the number of employees indicated by the inspector, and those employees must be regarded as having been appointed under Construction Regulation 8(8).

3. No construction supervisor appointed under Construction Regulation 8(7) may supervise any construction work on or in any construction site other than the site in respect of which he or she has been appointed: Provided that if a sufficient number of competent employees have been appropriately designated under Construction Regulation 8(7) on all the relevant construction sites, the appointed construction supervisor may supervise more than one site.

The Contractor will submit proof of supervisory appointments and any relevant appointments in writing (as stipulated by the OHS Act), prior to commencement of work

2.3.4 Competency for Contractor’s Responsible Persons

1. The Contractor’s responsible persons will be competent in health and safety and will have undergone Health and Safety Management Courses (Legal liability, HIRA, Construction Regulations 2014, Incident Investigation, Supervisory Safety course)

2.3.4 Compensation of Occupational Injuries and Diseases Act 130 of 1993 (COIDACT)

1. The Contractor will submit a letter of good standing with the Compensation Insurer to The Project Client / Client Agent, within 10 working days from receipt of the Letter of Acceptance from The Project Client / Client Agent prior to commencing work on site.

2.3.5 Occupational Health and Safety Policy

1. The Contractor will submit a Health and Safety Policy with the Tender, signed by the Chief Executive Officer.
2.3.6 Health and Safety Organogram

1. The Contractor will submit an organogram to the Client/Client Agent, outlining the Health and Safety Site Team as required and as related to the relevant appointments by the OHS Act. Contact details must be added to the Organogram for each appointee.

2.3.7 Risk Assessment for construction work

1. A contractor must, before the commencement of any construction work and during such construction work, have risk assessments performed by a competent person appointed in writing, which risk assessments form part of the health and safety plan to be applied on the site, and must include—
   (a) the identification of the risks and hazards to which persons may be exposed to;
   (b) an analysis and evaluation of the risks and hazards identified based on a documented method;
   (c) a documented plan and applicable safe work procedures to mitigate, reduce or control the risks and hazards that have been identified;
   (d) a monitoring plan; and
   (e) a review plan.

2. A contractor must ensure that as far as is reasonably practicable, ergonomic related hazards are analyzed, evaluated and addressed in a risk assessment.

3. A contractor must ensure that all employees under his or her control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures and or control measures before any work commences, and thereafter at the times determined in the risk assessment monitoring and review plan of the relevant site.

4. A principal contractor must ensure that all contractors are informed regarding any hazard that is stipulated in the risk assessment before any work commences, and thereafter at the times that may be determined in the risk assessment monitoring and review plan of the relevant site.

5. A contractor must consult with the health and safety committee or, if no health and safety committee exists, with a representative trade union or representative group of employees, on the monitoring and review of the risk assessments of the relevant site.

6. A contractor must ensure that copies of the risk assessments of the relevant site are available on site for inspection by an inspector, the client, the client’s agent, any contractor, any employee, a representative trade union, a health and safety representative or any member of the health and safety committee.

7. A contractor must review the relevant risk assessment—
   (a) where changes are effected to the design and or construction that result in a change to the risk profile; or
   (b) when an incident has occurred.

Issue Based Risk Assessment

1. As circumstances and needs arise, separate risk assessment will need to be conducted. An additional risk assessment will need to be conducted when for example:
   (a) A new operation introduced onto site
   (b) A system for work is changed
   (c) After an accident or a ‘near miss has occurred
Continuous Risk Assessment

1. This should take place continually, as it forms an integral part of day-to-day management.

2. It should be conducted by frontline supervisors on site and it is essential that formal training is provided to enable the said personnel to be efficient in conducting said assessment. The Contractor must ensure that the Risk Assessment identifies the hazards present in work activities on site. This must be followed by an evaluation of the risks involved taking into account those precautions already being taken.

2.3.8 Health and Safety Representative(s)

1. The Contractor will ensure that a Health and Safety Representative(s) are /is elected for every 20 employees on site and trained to carry out his / her functions. The appointment must be in writing. The Health and Safety Representative will carry out regular inspection, keep records and report to the supervisor to take appropriate action. He / She will attend Health and Safety Committee Meetings. The Health and Safety Representative will be part of the team that will investigate incidents, accidents & non-conformances.

2.3.9 Health and Safety Committee

1. The Contractor will ensure that monthly health and safety meetings are held when two or more safety reps have been elected, minutes must be kept on record. Meetings must be organized and chaired by the Contractor’s Responsible Person. The Contractor will ensure that the Health and Safety Representative(s) is/are invited to attend the meeting as observer. Copies of the minutes must be made available to the Client/ Client Agent or Inspector.

2.3.10 Inductions

1. The Contractor will ensure that all employees under his / her control have gone through health and safety induction before commencement on site. The Contractor will keep a copy of the attendance register of all his / her employees who attended the induction as well as the induction manual used during the induction process.

2.3.11 Medical certificates of fitness

1. 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 registered occupational health practitioner in the form of Annexure 3 of Construction Regulation 2014. Any employees identified as having medical restrictions must be placed on register and restrictions monitored.

2.3.12 Awareness

1. The Contractor will conduct, periodic toolbox talks, preferably twice a week or before any hazardous work takes place. The talks will cover the relevant hazards and risks associated with the work conducted, daily, activity and an attendance register must be kept and signed by all attendees. A record of the content of the topic will be kept on the site health a safety file.

2.3.13 Competency

1. After the Contractor has identified the training to be conducted, based on the Hazard Identification Risk Assessment (HIRA); findings will be noted on a training matrix. The contractor will send the relevant persons on appropriate courses and keep certificates of training for reference.
2.3.14 General Record Keeping

1. The contractor will keep and maintain Health and Safety records to demonstrate compliance with the Occupational Health and Safety Specification and the Act. The contractor will ensure that all records of incidents, spot fines, training etc. are kept on site. All documents will be available for inspection by The Project Client / Client Agent or Inspectors.

2.3.15 General Inspection, Monitoring and Reporting

1. The Contractor will carry out daily inspections and investigate all incidents and report to The Project Client / Client Agent. The contractor will be required to keep records of all inspections and investigations which were undertaken and any other inspections and investigations by person’s authorised to do so.

2.3.16 Internal Audits

1. The contractor’s responsible person will conduct monthly Health and Safety Audits to ensure compliance with the OHS Act and Occupational Health and Safety Specification. Records of audits must be kept, and non-conformance reported, investigated and corrective action must be taken to prevent re-occurrence.

2.3.17 External Audits

1. The Project Client / Client Agent will conduct health and safety audits to ensure compliance with the Occupational Health and Safety Specification and any relevant Health & Safety Legislation. All documentation held by the Contractor will be available for inspection.

2. Audits and Inspections may be conducted on an ad hock basis without informing the Contractor.

2.3.18 Emergency Procedures

1. The Contractor will submit a detailed Emergency Procedure for approval by The Project Client / Client Agent prior to commencement on site. The procedure will detail the response plan including the following key personnel:
   (a) List of key personnel,
   (b) Details of emergency services,
   (c) Actions or steps to be taken in the event of the emergency; and
   (d) Information on hazardous materials / situations, including each material’s hazardous potential impact or risk on the environment or human and measures to be taken in the event of an accident.

2. Emergency procedures will include, but will not be limited to, fire, spills, accidents to employees, use of hazardous substances, etc. The Contractor will advise The Project Client / Client Agent in writing of any on site emergencies, together with a record of action taken, within 24 hours of the emergency occurring. A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc.) must be maintained and available to site personnel.

2.3.19 First Aid Box and First Aid Equipment

1. The Contractor will appoint in writing a First Aider(s). The appointed First Aider(s) are to be sent for accredited first aid training before starting on site, or must be in possession of a valid certificate of which copies are to be kept on site. The Contractors will provide, on site, First Aid Boxes, adequately stocked at all time, and ensure that the First Aid Box is accessible and fully controlled by a qualified First Aider. In addition, the location of these boxes must
be indicated by means of Health and Safety Signage. The name of the First Aider as well as a picture and contact number must be displayed on site.

2.3.20 Accident / Incident Reporting and Investigation

1. The Contractor will in addition to the prescribed requirements of the OHS Act investigate, record and report all reportable incidents. The investigations will be conducted by a qualified person or persons who have sufficient knowledge to carry out an investigation. In the case of a serious injury, meaning one in which a loss of man-hours are experienced exceeding 7 days, an independent investigator must be appointed by the Contractor. The contractor will be required to provide a procedure describing processes that will be followed in the event of an incident this will include near misses, first aid cases, medical treatment cases, lost time injury & fatalities. The procedure must also include a process flow in the event of an incident.

2.3.21 Hazards and Potential Situations Communication

1. The Contractor will immediately notify other Contractors or Sub-contractors of any hazardous or potentially hazardous situations, which may arise during performance of the activities.

2.3.22 Personal Protective Equipment (PPE) and Clothing

1. The Contractor will make provision and keep adequate quantities of SABS approved PPE or clothing on site at all times. These will be analysed by means of the Risk Assessment.

2. The Contractor will clearly outline procedures to be taken when PPE or clothing is:
   (a) Lost or Stolen
   (b) Worn Out or Damaged
   (c) When and where it must be worn or used

3. Proof of PPE issued to employees must be available on file as well as proof of PPE inspections conducted.

2.3.23 Occupational Health and Safety Signage

1. The Contractor will provide adequate OHS signage on site in line with **SANS 1186-1:2015 Symbolic safety signs**. OHS signage will include, but will not be limited to, Construction area, authorised entry only, danger signs, Hard Hat / Helmet Area; Safety Shoes to be worn on site; Dust Masks to be worn in areas where there might be exposure to excessive dust; Ear Plugs / Muffs to be worn where there might be exposure over 85 dBA; Gloves; Safety Goggles; Safety Harness, etc. The Contractor will be responsible to determine what signage will be required and to maintain the quality and replacement of signage.

2.3.24 Consolidated Health and Safety File

1. The Contractor will in accordance with Construction Regulation 7(1)e, hand a consolidated health and safety file to the client on completion of construction work, this must include records of drawings and designs as well as significant information regarding the construction of the completed structure.

2.3.25 Permits

1. The Contractor will issue a permit for all hazardous or dangerous activities to be carried out during construction. The following is a list of hazardous activities which need a permit:
   (a) Working in Confined Space;
   (b) Use of a Hazardous Chemical Substance, e.g. Asbestos, Lead;
2.3.26 Sub-contractors

1. The Contractor will ensure that all Sub-contractors under his / her control are complying with the Occupational Health and Safety Specification, requirements by the Act, and any relevant legislation which may relate to the activities directly or indirectly. The contractor will on request provide proof to the Client or Client representative that subcontractor safety plans were reviewed and approved.

2.4 Occupational Safety

2.4.1 Excavations, Shoring, Dewatering or Drainage and Tunnelling

1. A contractor must -
   (a) ensure that all excavation work is carried out under the supervision of a competent person who has been appointed in writing for that purpose; and
   (b) evaluate, as far as is reasonably practicable, the stability of the ground before excavation work begins.

2. A contractor who performs excavation work –
   (a) must take reasonable and sufficient steps in order to prevent, as far as is reasonably practicable, any person from being buried or trapped by a fall or dislodgement of material in an excavation;
   (b) may not require or permit any person to work in an excavation which has not been adequately shored or braced: Provided that shoring and bracing may not be necessary where -
      i. the sides of the excavation are sloped to at least the maximum angle of repose measured relative to the horizontal plane; or
      ii. such an excavation is in stable material: Provided that -
         (a) permission has been given in writing by the appointed competent person contemplated in Construction Regulation 13(1) upon evaluation by him or her of the site conditions; and
         (b) where any uncertainty pertaining to the stability of the soil still exists, the decision from a professional engineer or a professional technologist competent in excavations is decisive and such a decision must be noted in writing and signed by both the competent person contemplated in Construction Regulation 13(1) and the professional engineer or technologist, as the case may be;
   (c) must take steps to ensure that the shoring or bracing contemplated in paragraph (b) is designed and constructed in a manner that renders it strong enough to support the sides of the excavation in question;
   (d) must ensure that no load, material, plant or equipment is placed or moved near the edge of any excavation where it may cause its collapse and consequently endangers the safety of any person, unless precautions such as the provision of sufficient and suitable shoring or bracing are taken to prevent the sides from collapsing;
   (e) must ensure that where the stability of an adjoining building, structure or road is likely to be affected by the making of an excavation, steps are taken to ensure the stability of such building, structure or road and the safety of persons;
   (f) must cause convenient and safe means of access to be provided to every excavation in which persons are required to work, and such access may not be further than six meters from the point where any worker within the excavation is working;
   (g) must ascertain, as far as is reasonably practicable, the location and nature of electricity, water, gas or other similar services which may in any way be affected by
the work to be performed, and must before the commencement of excavation work that may affect any such service, take the steps that are necessary to render the circumstances safe for all persons involved;

(h) must ensure that every excavation, including all bracing and shoring, is inspected -
   i. daily, prior to the commencement of each shift;
   ii. after every blasting operation;
   iii. after an unexpected fall of ground;
   iv. after damage to supports; and
   v. after rain,

by the competent person contemplated in Construction Regulation 13(1), in order to ensure the safety of the excavation and of persons, and those results must be recorded in a register kept on site and made available on request to an inspector, the client, the client's agent, any other contractor or any employee;

(i) must cause every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered, to be -
   i. adequately protected by a barrier or fence of at least one metre in height and as close to the excavation as is practicable; and
   ii. provided with warning illuminates or any other clearly visible boundary indicators at night or when visibility is poor,

or have resort to any other suitable and sufficient precautionary measure where subparagraphs (i) and (ii) are not practicable;

(j) must ensure that all precautionary measures stipulated for confined spaces as determined in the General Safety Regulations, 2003, are complied with by any person entering any excavation;

(k) must, where the excavation work involves the use of explosives, appoint a competent person in the use of explosives for excavation, and must ensure that a method statement is developed by that person in accordance with the applicable explosives legislation; and

(l) must cause warning signs to be positioned next to an excavation within which or where persons are working or carrying out inspections or tests.

(m) No person may enter a tunnel, which has a height dimension of less than 800 millimetres.

2.4.2 Temporary Works

1. A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.

2. A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.

3. A contractor must ensure that –

   (a) all temporary works structures are adequately erected, supported, braced and maintained by a competent person so that they are capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads are imposed onto the structure that the structure is not designed to withstand;
   
   (b) all temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted;
   
   (c) detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee;
   
   (d) all persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely;
(e) all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used;
(f) all temporary works structures are inspected by a competent person immediately before, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure has been removed and the results have been recorded in a register and made available on site;
(g) no person may cast concrete, until authorization in writing has been given by the competent person contemplated in paragraph (a);
(h) if, after erection, any temporary works structure is found to be damaged or weakened to such a degree that its integrity is affected, it is safely removed or reinforced immediately;
(i) adequate precautionary measures are taken in order to -
   ii. secure any deck panels against displacement; and
   iii. prevent any person from slipping on temporary works due to the application of release agents;

4. No contractor may use a temporary works design and drawings for any work other than its intended purpose.

2.4.3 Stacking of Materials

1. A contractor must, in addition to compliance with the provisions for the stacking of articles in the General Safety Regulations, 2003, ensure that –

   (a) a competent person is appointed in writing with the duty of supervising all stacking and storage on a construction site;
   (b) adequate storage areas are provided;
   (c) there are demarcated storage areas; and
   (d) storage areas are kept neat and under control.

2.4.4 Housekeeping and General Safeguarding on Construction Sites

1. A contractor must, in addition to compliance with the Environmental Regulations for Workplaces, 1987, promulgated by Government Notice No. R. 2281 of 16 October 1987, ensure that suitable housekeeping is continuously implemented on each construction site, including –
(a) the proper storage of materials and equipment;
(b) the removal of scrap, waste and debris at appropriate intervals;
(c) ensuring that materials required for use, are not placed on the site so as to obstruct means of access to and egress from workplaces and passageways;
(d) ensuring that materials which are no longer required for use, do not accumulate on and are removed from the site at appropriate intervals;
(e) ensuring that waste and debris are not disposed of from a high place with a chute, unless the chute complies with the requirements set out in regulation 14(6);
(f) ensuring that construction sites in built-up areas adjacent to a public way are suitably and sufficiently fenced off and provided with controlled access points to prevent the entry of unauthorized persons; and
(g) ensuring that a catch platform or net is erected above an entrance or passageway or above a place where persons work or pass under, or fencing off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe in the case of danger or possibility of persons being struck by falling objects.

2.4.5 **Hazardous Chemical Substances (HCS)**

1. In addition to the requirements in the HCS Regulations, the principal contractor must provide proof in the Health and Safety Plan that:

   (a) Material Safety Data Sheets (MSDS’s) of the relevant materials / hazardous chemical substances are available prior to use by the contractor. Mention should be made how the principal contractor is going to act according to special/unique requirements made in the relevant MSDS’s. All MSDS’s will be available for inspection by the agent at all times.
   
   (b) Exposure monitoring is done according to OESSM and by an Approved Inspection Authority (AIA) and that the medical surveillance programme is based on the outcomes of the exposure monitoring.
   
   (c) How the relevant HCS’s are being/going to be controlled by referring to:
      
      i. Limiting the amount of HCS
      ii. Limiting the number of employees
      iii. Limiting the period of exposure
      iv. Substituting the HCS
      v. Using engineering controls
      vi. Using appropriate written work procedures
   
   (e) The correct PPE is being used.
   
   (f) HCS are stored and transported according to SABS 072 and 0228.
   
   (g) Training with regards to these regulations was given.

2. The H&S plan should make reference to the disposal of hazardous waste on classified sites and the location thereof (where applicable).

3. The First Aider must be made aware of the MSDS and how to treat HCS incidents appropriately.

4. **All personnel that may get into contact with effluent must be inoculated against all possible medical conditions associated with the contact of effluent.**

2.4.6 **Noise Induced Hearing Loss**

1. Where noise is identified as a hazard the requirements of the NIHL regulations must be complied with and the following must be included / referred to in the Health and Safety Plan. The Contractor must be able to:
(a) Proof of training with regards to these regulations.
(b) That monitoring carried out by an AIA and done according to SABS 083.
(c) Medical surveillance programme is established and maintained for the necessary employees.
(d) Control of noise by means of:
   i. Engineering methods considered
   ii. Admin control considered
   iii. Personal protective equipment considered/decided on
   iv. Describe how records are going to be kept for 40 years.

2.4.7 Construction Plant

"Construction Plant" encompasses all types of plant including but not limiting to, cranes, piling frames, boring machines, and excavators, draglines, dewatering equipment and road vehicles with or without lifting equipment.

1. A contractor must ensure that all construction vehicles and mobile plant -
   (a) are of an acceptable design and construction;
   (b) are maintained in a good working order;
   (c) are used in accordance with their design and the intention for which they were designed, having due regard to safety and health;
   (d) are operated by a person who -
      i. has received appropriate training, is certified competent and in possession of proof of competency and is authorised in writing to operate those construction vehicles and mobile plant;
      ii. has a medical certificate of fitness to operate those construction vehicles and mobile plant, issued by an occupational health practitioner in the form of Annexure 3 of Construction Regulation 2014
   (e) have safe and suitable means of access and egress;
   (f) are properly organized and controlled in any work situation by providing adequate signalling or other control arrangements to guard against the dangers relating to the movement of vehicles and plant, in order to ensure their continued safe operation;
   (g) are prevented from falling into excavations, water or any other area lower than the working surface by installing adequate edge protection, which may include guardrails and crash barriers;
   (h) are fitted with structures designed to protect the operator from falling material or from being crushed should the vehicle or mobile plant overturn;
   (i) are equipped with an acoustic warning device which can be activated by the operator;
   (j) are equipped with an automatic acoustic reversing alarm; and
   (k) are inspected by the authorised operator or driver on a daily basis using a relevant checklist prior to use and that the findings of such inspection are recorded in a register kept in the construction vehicle or mobile plant.

2. A contractor must ensure that -
   (a) no person rides or is required or permitted to ride on a construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose;
   (b) every construction site is organized in such a way that, as far as is reasonably practicable, pedestrians and vehicles can move safely and without risks to health;
   (c) the traffic routes are suitable for the persons, construction vehicles or mobile plant using them, are sufficient in number, in suitable positions and of sufficient size;
   (d) every traffic route is, where necessary, indicated by suitable signs;
(e) all construction vehicles and mobile plant left unattended at night, adjacent to a public road in normal use or adjacent to construction areas where work is in progress, have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, in order to identify the location of the vehicles or plant;

(f) all construction vehicles or mobile plant when not in use, have buckets, booms or similar appendages, fully lowered or blocked, controls in a neutral position, motors stopped, wheels chocked, brakes set and ignition secured;

(g) whenever visibility conditions warrant additional lighting, all mobile plant are equipped with at least two headlights and two taillights when in operation;

(h) tools, material and equipment are secured and separated by means of a physical barrier in order to prevent movement when transported in the same compartment with employees;

(i) vehicles used to transport employees have seats firmly secured and adequate for the number of employees to be carried; and

(j) all construction vehicles or mobile plant travelling, working or operating on public roads comply with the requirements of the National Road Traffic Act, 1996.

2.4.8 Pressure Vessels Including Gas Cylinders

1. The Contractor will comply with Pressure Equipment regulations, including:

(a) Providing competency and awareness training to the operators;

(b) Providing PPE or clothing;

(c) Providing and maintain appropriate signage in areas Pressure equipment are used;

(d) Inspect equipment regularly and keep records of inspections;

(e) Providing appropriate fire fighting equipment (Fire Extinguishers).

2.4.9 Fire Extinguishers and Fire Fighting Equipment

1. The Contractor will provide adequate, regularly serviced fire extinguishers located at strategic points on site. The Contractor will keep spare serviced portable fire extinguishers. The Contractor will have adequate persons trained or competent to use the Fire Fighting Equipment. Safety signage will be posted; indicating locations of fire extinguishers.

2.4.10 Hired Plant and Machinery

1. The contractor will ensure that any hired plant and machinery brought to site is safe for use. The necessary requirements as stipulated by the OHS Act as well as those that are stipulated by this Occupational Health and Safety Specification, will apply. Health and Safety Induction is to be conducted with any hire plant or machinery operators and attendance of appropriate toolbox talks ensured. All operators of hired plant or machinery must be in possession of valid operator’s certificates and medical certificates of fitness, as per requirement by the OHS Act.

2.4.11 Lifting Machinery and Tackle, Material Hoist and Cranes

1. A contractor must ensure that every material hoist and its tower have been constructed in accordance with the generally accepted technical standards and are strong enough and free from defects.

2. A contractor must ensure that the tower of every material hoist is -

(a) erected on firm foundations and secured to the structure or braced by steel wire guy ropes, and extends to a distance above the highest landing to allow a clear and unobstructed space of at least 900 millimetres for over travel;
(b) enclosed on all sides at the bottom, and at all floors where persons are at risk of being struck by moving parts of the hoist, except on the side or sides giving access to the material hoist, with walls or other effective means to a height of at least 2100 millimetres from the ground or floor level; and
(c) provided with a door or gate at least 2100 millimetres in height at each landing, and that door or gate must be kept closed except when the platform is at rest at such a landing.

3. A contractor must cause -
   (a) the platform of every material hoist to be designed in a manner that it safely contains the loads being conveyed and that the combined mass of the platform and the load does not exceed the designed lifting capacity of the hoist;
   (b) the hoisting rope of every material hoist which has a remote winch to be effectively protected from damage by any external cause to the portion of the hoisting rope between the winch and the tower of the hoist; and
   (c) every material hoist to be provided with an efficient brake capable of holding the platform with its maximum load in any position when power is not being supplied to the hoisting machinery.

4. No contractor may require or permit trucks, barrows or material to be conveyed on the platform of a material hoist and no person may so convey trucks, barrows or material unless those articles are secured or contained in a manner that displacement thereof cannot take place during movement.

5. A contractor must cause a notice, indicating the maximum mass load which may be carried at any one time and the prohibition of persons from riding on the platform of the material hoist, to be affixed around the base of the tower and at each landing.

6. A contractor of a material hoist may not require or permit any person to operate a hoist, unless the person is competent in the operation of that hoist.

7. No contractor may require or permit any person to ride on a material hoist.

8. A contractor must ensure that every material hoist -
   (a) is inspected on daily basis by a competent person appointed in writing by the contractor and such competent person must have the experience pertaining to the erection and maintenance of material hoists or similar machinery;
   (b) inspection contemplated in paragraph (a), includes the determination of the serviceability of the entire material hoist, including guides, ropes and their connections, drums, sheaves or pulleys and all safety devices;
   (c) inspection results are entered and signed in a record book by a competent person, which book must be kept on the premises for that purpose;
   (d) is properly maintained and the maintenance records in this regard are kept on site.

9. A contractor must, in addition to compliance with the Driven Machinery Regulations, 1988 ensure that where tower cranes are used -
   (a) they are designed and erected under the supervision of a competent person;
   (b) a relevant risk assessment and method statement are developed and applied;
   (c) the effects of wind forces on the crane are taken into consideration and that a wind speed device is fitted that provides the operator with an audible warning when the wind speed exceeds the design engineer’s specification;
   (d) the bases for the tower cranes and tracks for rail-mounted tower cranes are firm, level and secured;
   (e) the tower crane operators are competent to carry out the work safely; and
   (f) the tower crane operators have a medical certificate of fitness to work in such an environment, issued by an occupational health practitioner in the form of Annexure 3 of Construction Regulation 2014.
2.4.12 Bulk Mixing Plant

1. A contractor must ensure that the operation of a bulk mixing plant is supervised by a competent person who has been appointed in writing and is –
   (a) aware of all the dangers involved in the operation thereof; and
   (b) conversant with the precautionary measures to be taken in the interest of health and safety.

2. No person supervising or operating a bulk mixing plant may authorize any other person to operate the plant, unless that person is competent to operate a bulk mixing plant.

3. A contractor must ensure that the placement and erection of a bulk mixing plant complies with the requirements set out by the manufacturer and that such plant is erected as designed.

4. A contractor must ensure that all devices to start and stop a bulk mixing plant are provided and that those devices are -
   (a) placed in an easily accessible position; and
   (b) constructed in a manner to prevent accidental starting.

5. A contractor must ensure that the machinery and plant selected is suitable for the mixing task and that all dangerous moving parts of a mixer are placed beyond the reach of persons by means of doors, covers or other similar means.

6. No person may remove or modify any guard or safety equipment relating to a bulk mixing plant, unless authorized to do so by the appointed person contemplated in Construction Regulation 20(1).

7. A contractor must ensure that all precautionary measures stipulated for confined spaces as determined in the General Safety Regulations, 2003, are complied with when entering any silo.

8. A contractor must ensure that a record is kept of all repairs or maintenance to a bulk mixing plant and that the record is available on site to an inspector, the client, the client's agent or any employee.

2.4.13 General Machinery

1. The Contractor will comply with the Driven Machinery Regulations, which include inspecting machinery regularly, appointing a competent person to inspect and ensure maintenance, issuing PPE or clothing and training those that use machinery and enforce compliance.

2.4.14 Portable Electrical Tools / Explosive Power Tools

   (a) before construction commences and during the progress thereof, adequate steps are taken to ascertain the presence of and guard against danger to workers from any electrical cable or apparatus which is under, over or on the site;
   (b) all parts of electrical installations and machinery are of adequate strength to withstand the working conditions on construction sites;
   (c) the control of all temporary electrical installations on the construction site is designated to a competent person who has been appointed in writing for that purpose;
(d) all temporary electrical installations used by the contractor are inspected at least once a week by a competent person and the inspection findings are recorded in a register kept on the construction site; and

(e) all electrical machinery is inspected by the authorized operator or user on a daily basis using a relevant checklist prior to use and the inspection findings are recorded in a register kept on the construction site.

2.4.15 High Voltage Electrical Equipment

1. The Contractor will ensure that, where the work is under, on or near high-voltage electrical equipment the Electrical Regulations, together with safety instructions (Regulations of the Owner of the Equipment) are complied with.

2. Such equipment includes:
   - Eskom and the Local Authority equipment
   - The Contractor’s own power supply; and
   - Electrical equipment being installed but not yet taken over from a Contractor by The Project Client / Client Agent.

2.4.16 Public Health and Safety

1. The Contractor will ensure that each person working on or visiting a site, and the surrounding community, will be made aware of the dangers likely to arise from on-site activities and the precautions to be observed to avoid or minimize those dangers. Appropriate health and safety signage will be posted at all times. No visitor will be allowed on site without permission of the Construction Supervisor or his/her Assistant. All visitors must complete a register, which should include the name, reason for visit and contact detail of said person.

2. Both the Project Client / Client Agent and the Contractor have a duty in terms of the OHS Act to do all that is reasonably practicable to prevent members of the public and others being affected by the construction processes to be aware and put preventative measure in place. The public or visitors will go through a brief 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. All visitors must complete a register, which should include the name, reason for visit and contact detail of said person.

2.4.17 Night Work

1. The Contractor will not undertake any night work without prior arrangement and a written permit from The Project Client / Client Agent. The Contractor will ensure that adequate lighting is provided for all night work and failure to do so will result in work being stopped.

2.4.18 Facilities for Safekeeping and Eating Area (Mess Room) for workers

1. There will be a temporary structure to serve as a mess room or eating area.

2.4.19 Fall Protection

1. A contractor must:
   (a) designate a competent person to be responsible for the preparation of a fall protection plan;
   (b) ensure that the fall protection plan contemplated in paragraph (a) is implemented, amended where and when necessary and maintained as required; and
   (c) take steps to ensure continued adherence to the fall protection plan.
2. A fall protection plan contemplated in Construction Regulation 10(1), must include:
   (a) a risk assessment of all work carried out from a fall risk position and the procedures and methods used to address all the risks identified per location;
   (b) the processes for the evaluation of the employees' medical fitness necessary to work at a fall risk position and the records thereof;
   (c) a programme for the training of employees working from a fall risk position and the records thereof;
   (d) the procedure addressing the inspection, testing and maintenance of all fall protection equipment; and
   (e) a rescue plan detailing the necessary procedure, personnel and suitable equipment required to affect a rescue of a person in the event of a fall incident to ensure that the rescue procedure is implemented immediately following the incident.

3. A contractor must ensure that a construction manager appointed under regulation 8(1) is in possession of the most recently updated version of the fall protection plan.

4. A contractor must ensure that:
   (a) all unprotected openings in floors, edges, slabs, hatchways and stairways are adequately guarded, fenced or barricaded or that similar means are used to safeguard any person from falling through such openings;
   (b) no person is required to work in a fall risk position, unless such work is performed safely as contemplated in Construction Regulation 10(2);
   (c) fall prevention and fall arrest equipment are:
      i. approved as suitable and of sufficient strength for the purpose for which they are being used, having regard to the work being carried out and the load, including any person, they are intended to bear; and
      ii. securely attached to a structure or plant, and the structure or plant and the means of attachment thereto are suitable and of sufficient strength and stability for the purpose of safely supporting the equipment and any person who could fall; and
   (d) fall arrest equipment is used only where it is not reasonably practicable to use fall prevention equipment.

5. Where roof work is being performed on a construction site, the contractor must ensure that, in addition to the requirements set out in Construction Regulation 10(2) and (4), it is indicated in the fall protection plan that:
   (a) the roof work has been properly planned;
   (b) the roof erectors are competent to carry out the work;
   (c) no employee is permitted to work on roofs during inclement weather conditions or if any conditions are hazardous to the health and safety of the employee;
   (d) all covers to openings and fragile material are of sufficient strength to withstand any imposed loads;
   (e) suitable and sufficient platforms, coverings or other similar means of support have been provided to be used in such a way that the weight of any person passing across or working on or from fragile material is supported; and
   (f) suitable and sufficient guard-rails, barriers and toe-boards or other similar means of protection prevent, as far as is reasonably practicable, the fall of any person, material or equipment.

2.4.20 Structures

1. A contractor must ensure that:
   (a) all reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work;
2. An owner of a structure must ensure that -
   (a) inspections of that structure are carried out periodically by competent persons in
       order to render the structure safe for continued use;
   (b) that the inspections contemplated in paragraph (a) are carried out at least once
       every six months for the first two years and thereafter yearly;
   (c) the structure is maintained in such a manner that it remains safe for continued use;
   (d) the records of inspections and maintenance are kept and made available on request
       to an inspector.

2.4.21 Scaffolding

1. A contractor must appoint a competent person in writing who must ensure that all
   scaffolding work operations are carried out under his or her supervision and that all scaffold
   erectors, team leaders and inspectors are competent to carry out their work.

2. (A contractor using access scaffolding must ensure that such scaffolding, when in use,
   complies with the safety standards incorporated for this purpose into these Regulations under
   section 44 of the Act as well as SANS 10085-1:2004

2.4.22 Suspended Platforms

1. A contractor must appoint a competent person in writing who must ensure that all
   suspended platforms work operations are carried out under his or her supervision and that all suspended platform erectors, operators and inspectors are competent to carry out their work.

2. No contractor may use or permit the use of a suspended platform, unless -
   (a) the design, stability and construction thereof comply with the safety standards
       incorporated for this purpose into these Regulations under section 44 of the Act;
   (b) he or she is in possession of a certificate of system design issued by a professional
       engineer, certificated engineer or a professional technologist for the use of the
       suspended platform system; and
   (c) he or she is, before the commencement of the work, in possession of an operational
       compliance plan developed by a competent person based on the certificate of system
       design contemplated
   (d) in subparagraph (b) and applicable to the environment in which the system is being
       used, which operational compliance plan must include proof of the -
       i. appointment of the competent person contemplated in Construction
          Regulation 17 (1);
       ii. (ii) competency of erectors, operators and inspectors;
       iii. (iii) operational design calculations, which must comply with the requirements
            of the system design certificate;
       iv. (iv) performance test results;
       v. (v) sketches indicating the completed system with the operational loading
           capacity of the platform;
       vi. (vi) procedures for and records of inspections having been carried out; and
       vii. (vii) procedures for and records of maintenance work having been carried out.

3. A contractor making use of a suspended platform system must submit a copy of the
   certificate of system design contemplated in Construction Regulation 17 (2)(b), including a
   copy of the operational design calculations contemplated in Construction Regulation 17
2(c)(iii), sketches and test results, to the provincial director before commencement of the use of the system and must further indicate the intended type of work that the system will be used for.

4. A contractor must submit a copy of the certificate of system design in the manner contemplated in Construction Regulation 17 (3) for every new project.

5. A contractor must ensure that the outriggers of each suspended platform -
   (a) are constructed of material of adequate strength and have a safety factor of at least four in relation to the load it is to carry; and
   (b) have suspension points provided with stop devices or other effective devices at the outer ends to prevent the displacement of ropes.

6. A contractor must ensure that -
   (a) the parts of the building or structure on which the outriggers of a suspended platform are supported, are checked by means of calculations to ensure that the required safety factor is adhered to without risk of damage to the building or structure;
   (b) the suspension wire rope and the safety wire rope are separately connected to the outrigger;
   (c) each person on a suspended platform is provided with and wears a body harness as a fall prevention device, which must at all times be attached to the suspended platform;
   (d) the hand or power driven machinery to be used for the lifting or lowering of the working platform of a suspended platform is constructed and maintained in such a manner that an uncontrolled movement of the working platform cannot occur;
   (e) the machinery referred to in paragraph (d) is so situated that it is easily accessible for inspection;
   (f) the rope connections to the outriggers are vertically above the connections to the working platform; and
   (g) when the working platform is suspended by two ropes only, the connections of the ropes to the working platform are of a height above the level of the working platform to ensure the stability of the working platform.

7. A contractor must ensure that a suspended platform -
   (a) is suspended as near as possible to the structure to which work is being done to prevent as far as is reasonably practicable horizontal movement away from the face of the structure;
   (b) is fitted with anchorage points to which workers must attach the lanyard of the safety harness worn and used by the worker, and such anchorage connections must have sufficient strength to withstand any potential load applied to it; and
   (c) is fitted with a conspicuous notice easily understandable by all workers working with the suspended platform, showing -
      i. the maximum mass load;
      ii. (ii) the maximum number of persons; and
      iii. (iii) the maximum total mass load, including load and persons, which the suspended platform can carry.

8. A contractor must cause -
   (a) the whole installation and all working parts of a suspended platform to be thoroughly examined by a competent person in accordance with the manufacturer's specification;
   (b) the whole installation to be subjected to a performance test as determined by the standard to which the suspended platform was manufactured;
   (c) the performance test contemplated in paragraph (b) to be done by a competent person appointed in writing, with the knowledge and experience of erection and maintenance of suspended platforms or similar machinery, and who must determine the serviceability of the structures, ropes, machinery and safety devices before they are used, every time suspended platforms are erected; and
(d) the performance test contemplated in paragraph (b) of the whole installation of the suspended platform to be subjected to a load equal to that prescribed by the manufacturer or, in the absence of such load, to a load of 110 per cent of the rated mass load, at intervals not exceeding 12 months and in such a manner that every part of the installation is stressed accordingly.

9. A contractor must, in addition to Construction Regulation 17 (8), cause every hoisting rope, hook or other load-attaching device which forms part of the suspended platform to be thoroughly examined in accordance with the manufacturer's specification by the competent person contemplated in Construction Regulation 17 (8) before they are used every time they are assembled, and, in cases of continuous use, at intervals not exceeding three months.

10. A contractor must ensure that the suspended platform supervisor contemplated in Construction Regulation 17 (1), or the suspended platform inspector contemplated in Construction Regulation 17 (8)(c), carries out a daily inspection of all the equipment prior to use, including establishing whether –
   (a) all connection bolts are secure;
   (b) all safety devices are functioning;
   (c) all safety devices are not tampered with or vandalized;
   (d) the total maximum mass load of the platform is not exceeded;
   (e) the occupants in the suspended platform are using body harnesses which have been properly attached;
   (f) there are no visible signs of damage to the equipment; and
   (g) all reported operating problems have been attended to.

11. A contractor must ensure that all inspection and performance test records are kept on the construction site at all times and made available to an inspector, the client, the client's agent or any employee upon request.

12. A contractor must ensure that all employees required to work or to be supported on a suspended platform are -
   (a) medically fit to work safely in a fall risk position or such similar environment by being in possession of a medical certificate of fitness;
   (b) competent in conducting work related to suspended platforms safely;
   (c) trained or received training, which includes at least -
      i. how to access and egress the suspended platform safely;
      ii. how to correctly operate the controls and safety devices of the equipment;
      iii. information on the dangers related to the misuse of safety devices; and
      iv. information on the procedures to be followed in the case of -
         (aa) an emergency;
         (bb) the malfunctioning of equipment; and
         (cc) the discovery of a suspected defect in the equipment; and
      v. instructions on the proper use of body harnesses.

13. A contractor must ensure that where the outriggers of a suspended platform are to be moved, only persons trained and under the supervision of the competent person effect such move, within the limitation stipulated in the operational compliance plan contemplated in Construction Regulation 17 (2)(c), and that the supervisor must carry out an inspection and record the result thereof prior to re-use of the suspended platform.

14. A contractor must ensure that the suspended platform is properly isolated after use at the end of each working day in such a manner that no part of the suspended platform presents a danger to any person thereafter.
2.4.23 Explosive actuated fastening devices

1. No contractor may use or permit any person to use an explosive actuated fastening device, unless -
   (a) the user is provided with and uses suitable protective equipment;
   (b) the user is trained in the operation, maintenance and use of such a device;
   (c) the explosive actuated fastening device is provided with a protective guard around the muzzle end, which effectively confines any flying fragments or particles; and
   (d) the firing mechanism is so designed that the explosive actuated fastening device, will not function unless -
      i. it is held against the surface with a force of at least twice its weight; and
      ii. the angle of inclination of the barrel to the work surface is not more than 15 degrees from a right angle.

2. A contractor must ensure that -
   (a) only cartridges suited for the relevant explosive actuated fastening device, and the work to be performed, are used;
   (b) an explosive actuated fastening device is cleaned and examined daily before use and as often as may be necessary for its safe operation by a competent person who has been appointed for that purpose;
   (c) the safety devices of an explosive actuated fastening device are in good working order prior to use;
   (d) when not in use, an explosive actuated fastening device and its cartridges are locked up in a safe place, which is inaccessible to unauthorized persons;
   (e) an explosive actuated fastening device is not stored in a loaded condition;
   (f) a warning notice is displayed in a conspicuous manner in the immediate vicinity wherever an explosive actuated fastening device is used; and
   (g) the issuing and collection of cartridges and nails or studs of an explosive actuated fastening device are -
      i. controlled and done in writing by a person having been appointed in writing for that purpose; and
      ii. recorded in a register by a competent person and that the recipient has accordingly signed for the receipt thereof as well as the returning of any spent and unspent cartridges.

2.4.24 Demolition and Asbestos removal

1. A contractor must appoint a competent person in writing to supervise and control all demolition work on site.

2. A contractor must ensure that before any demolition work is carried out, and in order to ascertain the method of demolition to be used, a detailed structural engineering survey of the structure to be demolished is carried out by a competent person and that a method statement on the procedure to be followed in demolishing the structure is developed by that person.

3. During a demolition, the competent person contemplated in subregulation (1) must check the structural integrity of the structure at intervals determined in the method statement contemplated in subregulation (2), in order to avoid any premature collapses.

4. A contractor who performs demolition work must -
   (a) with regard to a structure being demolished, take steps to ensure that -
      (i) no floor, roof or other part of the structure is overloaded with debris or material in a manner which would render it unsafe;
      (ii) all reasonably practicable precautions are taken to avoid the danger of the structure collapsing when any part of the framing of a framed or partly framed building is removed, or when reinforced concrete is cut; and
(iii) precautions are taken in the form of adequate shoring or other means that may be necessary to prevent the accidental collapse of any part of the structure or adjoining structure;

(b) ensure that no person works under overhanging material or a structure which has not been adequately supported, shored or braced;

(c) ensure that any support, shoring or bracing contemplated in paragraph (b), is designed and constructed so that it is strong enough to support the overhanging material;

(d) where the stability of an adjoining building, structure or road is likely to be affected by demolition work on a structure, take steps to ensure the stability of such structure or road and the safety of persons;

(e) ascertain as far as is reasonably practicable the location and nature of electricity, water, gas or other similar services which may in any way be affected by the work to be performed, and must before the commencement of demolition work that may affect any such service, take the steps that are necessary to render circumstances safe for all persons involved;

(f) cause every stairwell used and every floor where work is being performed in a building being demolished, to be adequately illuminated by either natural or artificial means;

(g) cause convenient and safe means of access to be provided to every part of the demolition site in which persons are required to work; and

(h) erect a catch platform or net above an entrance or passageway or above a place where persons work or pass under, or fence off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe where there is a danger or possibility of persons being struck by falling objects.

5. A contractor must ensure that no material is dropped to any point, which falls outside the exterior walls of the structure, unless the area is effectively protected.

6. No person may dispose of waste and debris from a high place by a chute unless the chute -
   (a) is adequately constructed and rigidly fastened;
   (b) if inclined at an angle of more than 45 degrees to the horizontal, is enclosed on its four sides;
   (c) if of the open type, is inclined at an angle of less than 45 degrees to the horizontal;
   (d) where necessary, is fitted with a gate at the bottom end to control the flow of material; and
   (e) discharges into a container or an enclosed area surrounded by barriers.

7. A contractor must ensure that every chute used to dispose of rubble is designed in such a manner that rubble does not free-fall and that the chute is strong enough to withstand the force of the debris travelling along the chute.

8. A contractor must ensure that no equipment is used on floors or working surfaces, unless such floors or surfaces are of sufficient strength to support the imposed loads.

9. Where a risk assessment indicates the presence of asbestos, a contractor must ensure that all asbestos related work is conducted in accordance with the Asbestos Regulations, 2001, promulgated by Government Notice No. R. 155 of 10 February 2002.

10. Where a risk assessment indicates the presence of lead, a contractor must ensure that all lead related work is conducted in accordance with the Lead Regulations, 2001, promulgated by Government Notice No. R.236 of 28 February 2002.

11. Where the demolition work involves the use of explosives, a method statement must be developed in accordance with the applicable explosives legislation, by an appointed person who is competent in the use of explosives for demolition work and all persons involved in
the demolition works must adhere to demolition procedures issued by the appointed person.

12. A contractor must ensure that all waste and debris are as soon as reasonably practicable removed and disposed of from the site in accordance with the applicable legislation.

2.5 **Occupational Health**

1. Exposure of workers to occupational health hazards and risks are very common in any work environment, especially in construction. The occupational hazards and risks may enter the body in three ways:
   (a) Inhalation e.g. cement dust;
   (b) Ingestion through swallowing;
   (c) Absorption through the skin (pores) e.g. painting or use of thinners.

2. All contractors are to ensure that where employees are exposed to airborne contaminants, pre-employment medicals should be conducted to ensure fitness to work under such conditions.

3. All contractors will be responsible for the full cost of medical treatment that his staff may require; the contractor is therefore required to ensure that all his personnel are medically fit.

4. All Contractors should ensure that Occupational Hygiene surveys are conducted as per the Occupational Health and Safety Act to ensure employees is not exposed to hazards. Risk Assessments should identify areas where surveys are to be conducted.
## OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION REQUIREMENTS FOR CONSTRUCTION

### ANNEXURE A

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification of Intention to Commence Construction / Building work</td>
<td>To be completed and logged with the Department of Labour To be submitted 30 days before commencement of construction work</td>
<td>Before commencement on site</td>
</tr>
<tr>
<td>Assignment of Responsible Person to Manage Building Work</td>
<td>All relevant appointments as per OHS Act</td>
<td>Before commencement on site</td>
</tr>
<tr>
<td>Assignment of Responsible Person to Supervise Building Work</td>
<td>All relevant appointments as per OHS Act</td>
<td>Before commencement on site</td>
</tr>
<tr>
<td>Medical Certificates of Fitness for all personnel on site</td>
<td>As per specifications and OHS Act</td>
<td>Before commencement on site</td>
</tr>
<tr>
<td>Competency for Responsible Persons</td>
<td>As per specifications and OHS Act</td>
<td>Before commencement on site</td>
</tr>
<tr>
<td>Compensation of Occupational Injuries and Diseases Act (COIDA) 130 of 1993</td>
<td>COIDA Requirement</td>
<td>Before commencement on site and during construction period</td>
</tr>
<tr>
<td>Occupational Health and Safety Policy</td>
<td>Contractor’s Responsibility</td>
<td>At tender stage</td>
</tr>
<tr>
<td>Health and Safety Organogram.</td>
<td>Contractor’s Responsibility</td>
<td>Before commencement on site</td>
</tr>
<tr>
<td>Health &amp; Safety Representative</td>
<td>Section 17 OHS Act</td>
<td>Submit as soon as there are more than 20 employees on site</td>
</tr>
</tbody>
</table>
Assignment of Contractor’s Responsible Persons

**ANNEXURE B**

The contractor **will** make the following appointments where applicable but are not limited to:

<table>
<thead>
<tr>
<th>Role</th>
<th>CR Code</th>
<th>Additional Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>OHS 16(2) Competent Person for OHS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Manager CR 8(1) * CV &amp; Certificates Safety courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assistant Construction Manager CR 8(2) * CV &amp; Certificates Safety courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Safety Officer - CR 8(5) * CV &amp; Certificates Safety courses – SACPCMP proof of registration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Work Supervisor - CR 8(7) * CV &amp; Certificates Safety courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Work Assistant Supervisor - CR 8(8) * CV &amp; Certificates Safety courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk Assessor - CR 9(1) * Competency required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Protection Planner – CR 10(1) * Competency certificate required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excavation Supervisor – CR 13(1)(a) Proof of experience/competency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scaffold Supervisor – CR 16(1) * Competency certificate required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk Mixing Plant Supervisor - CR 20(1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Vehicle &amp; Mobile Plant Operator - CR23(1)(d) * Competency certificate – copy of driver’s license</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housekeeping Supervisor – CR 27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stacking &amp; Storage Supervisor - CR 28(a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Equipment Inspector - CR 29(h) * Proof of competency required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health and Safety Representative - OHS 17(1) (where applicable) Proof election ballots and training provided by company</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employers Nominee to H&amp;S Committee - OHS 19 (where applicable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Coordinator - ER 9 * Proof of competency required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Aider/s - GSR 3 * competency certificate required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous Chemical Substance Supervisor - HCS Regulations</td>
<td></td>
<td></td>
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<tr>
<td>Lifting Gear Inspector - DMR 18 * Competency certificate required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifting Machine Inspector - DMR 18 * Competency certificate required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incident / Accident Investigator - GAR 9(2) * Competency certificate required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsible Person for Machinery - GMR 2(1) Proof of experience/competency</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### OTHER Occupational Health and Safety Specification REQUIREMENTS

**ANNEXURE C**

The contractor will comply and not be limited to the following requirements:

<table>
<thead>
<tr>
<th>What</th>
<th>When</th>
<th>Output</th>
<th>Reference information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness training</td>
<td>Weekly and before hazardous work is carried out</td>
<td>Attendance Register</td>
<td></td>
</tr>
<tr>
<td>Health and Safety Committee Meetings</td>
<td>Monthly</td>
<td>Minutes signed by the employer (Contractor)</td>
<td></td>
</tr>
<tr>
<td>Health and Safety Reports</td>
<td>Monthly</td>
<td>Report covering:</td>
<td>Incident reporting and investigation for The Project Client / Client Agent &amp; Contractor form</td>
</tr>
<tr>
<td>General Inspections</td>
<td>As per Occupational Health and Safety Specification and OHS Act</td>
<td>Report on Occupational Health and Safety Specification and OHS Act compliance:</td>
<td></td>
</tr>
<tr>
<td>General Inspections</td>
<td>Monthly</td>
<td>Covering:</td>
<td></td>
</tr>
<tr>
<td>Record keeping</td>
<td>Ongoing</td>
<td>Covering:</td>
<td></td>
</tr>
<tr>
<td>Permits</td>
<td>Before commencement with certain activities</td>
<td>As stipulated by the Occupational Health and Safety Specification and the OHS Act / Construction Regulations</td>
<td></td>
</tr>
</tbody>
</table>
**ANNEXURE C**

Basic documents needed for Construction work permit application; optional documents may be requested depending on Department of Labour communications.

<table>
<thead>
<tr>
<th>No</th>
<th>Aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Annexure 1 - <em>(TO BE COMPLETED AND SIGNED BY BOTH CLIENT AND PRINCIPAL CONTRACTOR)</em></td>
</tr>
<tr>
<td>2</td>
<td>Principal Contractor’s Health and Safety Plan CR 5(1)(m)</td>
</tr>
<tr>
<td>3</td>
<td>Appointed Principal Contractor’s Letter for Good Standing as per CR 5(1)(j)</td>
</tr>
<tr>
<td>4</td>
<td>Principal Contractor made adequate provision for the cost of health and safety measures (Bill of Quantities) CR 5(1)(g)</td>
</tr>
</tbody>
</table>
| 5  | Proof of Principal Contractor’s competency and resources to carry out the construction work safely CR 5(1)(h)  
   - Schedule of activities  
   - Appointment Letter for Construction Manager, CV Certificates and List of projects  
   - Appointment Letter for Construction Supervisor & Assistant Construction Supervisor – CV & Certificates  
   - Appointment letter for Construction Safety manager . (CV/ Competency/ list of projects)  
   - Proof of SACPCMP Registration  
   - Appointment letter for CHSO (CV / competency/ List of projects) Proof of SACPCMP Registration |
| 6  | Company Profile and CIBD grading |
| 7  | List of similar works done by the Principal Contractor for the past 3-5 years |
| 8  | Temporary work designer appointment |

**Proof of recipient of specification**

**Designer: Aurecon**  
**Person receiving specification:** ________________________________

**Date:** ____________________  
**Signature:** ________________________________
ANNEXURE B: CONTRACT PARTICIPATION GOAL REQUIREMENTS
### ADDITIONAL SPECIFICATION

**CONTRACT PARTICIPATION GOAL REQUIREMENTS**

**CONTENTS**

SO 01 SCOPE
SO 02 CONTRACTUAL OPPORTUNITIES FOR POTENTIALLY EMERGING CONTRACTORS
SO 03 IDENTIFYING SCOPE OF WORK FOR SUBCONTRACTORS, SUPPLIERS AND LABOUR TO ACHIEVE PARTICIPATION TARGETS
SO 04 RESPONSIBILITY OF THE PRINCIPAL CONTRACTOR
SO 05 DEVELOPMENT OF EMERGING CONTRACTORS
SO 06 MONITORING OF COMPLIANCE FOR DEVELOPMENT OF EMERGING CONTRACTORS
SO 07 PRINCIPAL CONTRACTOR’S PRICING STRATEGY
SO 08 TERMS OF REFERENCE FOR COMMUNITY LIAISON OFFICER (CLO)
SO 09 TRAINING OF WORKERS
SO 10 MEASUREMENT AND PAYMENT

**SO 01 SCOPE**

This project and contracts also aims to create work opportunities for emerging contractors and to provide a platform for sustainable growth in experience and capacity.

The contractual opportunities will be structured in such a way as to address and overcome specific constraints that prevent growth in the emerging sector, such as for example:

- Lack of experience
- Lack of managerial skill and limited marketing ability
- Access to capital and credit
- Insufficient cash flow management
- Insufficient site and labour supervision.

In addition, provision will be made for on-site training by an established Contractor, in order to improve business skills and to develop the trade skills of the Emerging Contractor’s operatives.

**SO 02 CONTRACTUAL OPPORTUNITIES FOR POTENTIALLY EMERGING CONTRACTORS**

It is foreseen that Contracts will be in the value categories that represent Contractors with a CIDB designation grading of 6 and higher.

To manage the technical and financial risk for the Client, Contractors with the applicable grading will have the opportunity to tender for these contracts in line with the CIDB regulations. These Contractors will be the Principal Contractors responsible to employ Potentially Emerging local Sub-Contractors of lesser CIDB grading designations, for portions of the scope of work which will be identified, and measured for each Contract.

Potentially Emerging subcontractors or suppliers shall be identified as an Entity whose business is at least 51% Black Owned.

In addition, work opportunities will also be created for person / persons who are not registered on the CIDB Contractors Register, with aspirations of becoming registered contractors.

Potential Emerging Contractors and Suppliers will be identified by the Contractor at 28 days after the Tender has been awarded in order to ensure participation from all interested parties in the local community.

The Contractor and subcontractors will employ and utilise local labour within a 10 km radius from the sites of construction. Local specialised and general labour will be used for skilled and unskilled work, placing responsibility on the Contractors to provide the required on-site training to achieve a competent work force.
SO 03 IDENTIFYING SCOPE OF WORK FOR SUBCONTRACTORS, SUPPLIERS AND LABOUR TO ACHIEVE PARTICIPATION TARGETS

The tenderer's tender price will determine the sum of the Participation goal based as a percentage of the total actual repair cost as shown in the summary pages of the Bill of Quantities stated as a compulsory minimum of 30% of the value of work done.

Each Contract will consist of:

- Building structural
- Civil infrastructure
- Mechanical equipment
- Electrical infrastructure and equipment.

Depending on the extent and value of the Scope of Work, the tenderer will identify certain portions of the work in the Bill of Quantities, to be sub-contracted, identify work for skilled and general labour, as well as the utilisation of local suppliers.

The Contractor will be required to ensure a minimum Contract Participation Goal as indicated in the Bill of Quantities.

The Contract Participation Goal can be obtained by means of:

- Local Sub-Contractors
- Local Suppliers
- Skilled labour
- General Labour

SO 04 RESPONSIBILITY OF THE PRINCIPAL CONTRACTOR

The Contractor will be guided by the Project Specification and Schedule of Quantities, in order to determine his tender tariffs and price structure for the identified work earmarked for a Sub-Contractor.

During the tender stage the Contractor shall identify specific local Potentially Emerging subcontractors whose business is registered within the particular province. These subcontractors can be selected by the Contractor but the Client may also have the opportunity to indicate a list of local subcontractors that must be afforded the opportunity to provide the Contractor with rates for the identified work.

The subcontractor will price the appropriate schedule of quantities for the identified work groups. The Principal Contractor shall familiarise himself with the submitted tender rates from the subcontractor. He must ensure that the rates are market related and will guide the subcontractor to understand the cost structures of the different individual rates.

The Contractor will be responsible for the quality of work, which will be a result of his effort of training and mentoring.

In a situation where the appointed Sub-Contractor fails to complete the work or to comply with the specification, the main Contractor will be responsible to step in and complete or rectify all work.

SO 05 DEVELOPMENT OF EMERGING CONTRACTORS

In the case where the Contractor must appoint an un-designated subcontractor, if so required by the Client provision will be made in the Schedule of Quantities (Preliminary and General) for the Contractor to:

a) Register the Sub-Contractor as a Grade 1, within the appropriate discipline
b) Bear the cost of such registration
c) Assist in the administrative requirements for registration of the Sub-Contractor.
SO 05.01 For an un-designated Contractor:
- The Contractor shall be responsible for registering the Contractor
- Development of the capability and capacity of the newly established Contractor, through joint participation in repair activities
- Supply of materials
- Assist in the employment of workers
- On the job training and manage of quality of work
- Assist the Contractor with obtaining tools and material.

SO 05.02 For Contractors with a grading 2 and 3, the Main Contractor will be responsible for:
- Development of the capability and capacity of the sub-contractor by ensuring quality control on an daily basis
- Assistance in procuring material and equipment
- Assistance in the appointment of labour and supervision
- Assistance in compiling a programme of work and management of resources.

SO 05.03 For Contractors with a grading 3 and 4, the Main Contractor will be responsible for:
- Assistance in servicing and maintaining equipment guiders in managing labour and payment
- Assistance in managing cash flow
- Controlling quality and ensure work in accordance with specification
- Ensuring that a contractual programme is compiled and adhered to.

SO 06 MONITORING OF COMPLIANCE FOR DEVELOPMENT OF EMERGING CONTRACTORS

SO 06.01 Monitoring Scorecard for evaluation of Emerging subcontractors by the PSP
During construction, the appointed Professional Service Provider (PSP) will be responsible to monitor the Principal Contractors guidance of the Sub-Contractors to comply to the requirements.

The scorecard has been developed and form part of Specification SO for the Utilisation, training and guidance of Sub-Contractor

In the event where any of the Sub-Contractors has failed to proceed with the Works in accordance with the approved programme, the PSP will proceed to implement the general Condition of Contract Clause 5.7.1 and 9.2 if required.

If it happens that the Contract with a Sub-Contractor is cancelled, the Main Contractor may be instructed to appoint an alternative Sub-Contractor to complete the work.

SO 07 PRINCIPAL CONTRACTOR’S PRICING STRATEGY

SO 07.01 Tender Rates
The Contractor will be guided by the Project Specification and Schedule of Quantities, in order to determine his tender rates and price structure for the identified work earmarked for a emerging subcontractor.

The specific portion of work earmarked for a specific designation graded Contractor will be priced by the subcontractor. As indicated above the Principal Contractor will assist the emerging subcontractor to submit rates that is relevant to the scope of work and market related to enable the principal contractor to submit a competitive tender.

The Contract Participation Goal will require the Contractor to allocate certain Scope of Work for:
• Sub-Contractors (within the particular province)
• Local Suppliers (within the particular province)
• Skilled labour (within a maximum 10 km radius)
• General labour (within a maximum 10 km radius)

The Contractor will be required to comply to the minimum Contract Participation Goal as indicated in the Bill of Quantities.

The Contractor will be responsible for the quality of work, which will be a result of his effort of training and mentoring.

SO 07.02 Compliance with the Contract

(i) The contractor shall enter into written contractual agreements with all the emerging and CIDB graded subcontractors Local Suppliers, skilled labourers and general labourers cited in the Contract Data as well as provisional and general items and in compliance to obtain the required CPG compliance and shall, as soon as is practicable, furnish the employer's representative with copies of such agreements and the written acceptances thereof. The contract to be performed by the Sub-Contractor shall thereafter neither be reduced in scope, nor terminated without the prior written approval of the Project Manager, which shall not be unreasonably withheld or delayed.

Substitutions

(i) In the event that, through no fault of the Contractor, a contracted subcontractor is found to be unable to perform, or to perform on time due to any of the following;

• Unable to produce acceptable work;
• Unwilling to perform work required; or
• Not fit to perform the service then

The contractor shall notify the Project Manager of the apparent necessity to reduce or terminate such a subcontractor’s Contract, citing the reasons therefore.

(ii) In the event that the employer approves the contractor's request to be relieved of his obligation to make use of an alternative enterprise, the contractor shall either provide a substitute subcontractor to take over the contract, or engage a subcontractor on another Portion of the contract so as to secure the required conclusion of the works.

(iii) The contractor may only terminate contracts with contracted subcontractor's and enter into agreements with substitute enterprises for the purpose of ensuring the completion of the works, with the Project Manager's approval, which shall not be unreasonably withheld.

SO 07.03 Claims procedure

The Contractor shall prepare and attach to his claim for payment, in a form approved by the Project Manager, the following:

• A brief report which describes the commercially useful functions performed by the Sub-Contractor in the performance of the contract, both over the interim period and on a cumulative basis;
• A schedule reflecting the estimated total value of the contracts, the cumulative value of the contracts and the value of supplies provided or work and services performed (or both) over the period for which payment is claimed in respect of each and every targeted enterprise performing commercially useful functions;
• A schedule which lists the names, identity numbers, gender, trade/occupation, period of employment, employment number and the like, as directed by the employer's representative, together with the respective wage rates and allowances payable in respect of targeted labour, including the monetary value of wages and allowances paid both on a cumulative basis and over the period for which payment is claimed; and
• A schedule of wages and allowances paid to all employees, indicating the status of such employees, where the contractor fulfils his contract obligations by virtue of his status as the Principal Contractor.
Should random inspections conducted by the PSP’s on targeted enterprise activities indicate that such enterprises are not performing in accordance with the requirements, the contractor shall provide, separate weekly resource returns and any other relevant information in respect of such enterprises in a format approved by the Project Manager.

The Contractor shall, upon completion of each individual subcontractor’s contract, issue a completion certificate and certify the amount paid to such subcontractor’s. He shall submit the certificates, counter-certified by the relevant subcontractor’s, to the PSP’s for record-keeping purposes.

In a situation where the appointed subcontractor fails to complete the work or to comply with the specification, the main Contractor will be responsible to step in and complete or rectify all work.

In the case where the Contractor must appoint an un-designated subcontractor, provision will be made in the Schedule of Quantities (Preliminary and General) for the Contractor to:

a) Register the Sub-Contractor as a Grade 1, within the appropriate discipline
b) Bear the cost of such registration
c) Assist in the administrative requirements for registration of the Sub-Contractor.

These cost items will form part of the schedule of quantities for the identified Scope of Work.

**SO 08 TERMS OF REFERENCE FOR COMMUNITY LIAISON OFFICER (CLO)**

**SO 08.01 Introduction**

The terms of reference provide a framework for which the Community Liaison Officer (CLO) would operate within the context of the related projects.

The CLO must be a respected member of the community and the method of appointment should be transparent and agreed with the Project Steering Committee (PSC).

**SO 08.02 Scope of Work**

The CLO will be responsible for the following responsibilities:

- Be available on site daily between the hours agreed on by the Contractor, the Employer and the Engineer from time to time;
- Assist social facilitator (if appointed) in convening of workshops.
- Disseminate information to the Professional Service Providers (PSP).
- Determine, in consultation with the Contractor, the needs of the temporary Labourers for relevant skills Training. He is responsible for the identification of suitable trainees and shall attend one of each of the training sessions;
- Communicate with the Contractor and the Engineer to determine the labour requirements with regard to the numbers and skills;
- Assist in maintaining good labour relations, and when applicable partake in Labourer grievance and dispute procedures,
- Assist in and facilitate the recruitment of suitable temporary labour and the establishment of the Labour Register;
- Attend all meetings in which the Local Community and/or Labourers are present or are required to be represented;
- Inform temporary Labourers of their conditions of temporary employment, and inform temporary Labourers as early as possible when their period of employment will be terminated;
- Articulate policies to Labourers
Communicate labour requirements.

Attend Induction training programmes for workers and induct labourers.

Verify labour records and ensure all engaged qualify as per EPWP code and prepare EPWP reports for issuing to Department of Public Works.

Investigate and report all labour dispute matters to the PSC, advice site agent on resolution. Attend all disciplinary proceedings and ensure procedures are adhered to and hearing are fair and sanctions reasonable.

Organise and assist the contractor in explaining to all workers the labour-based construction model.

Ensure labourers understand their task and the principles behind task work.

Ensure labourers are informed of their conditions of temporal employment.

Attend all site meetings and briefings for work procedures.

Keep written record of interviews and community liaison which should be summarized and included in the monthly progress reports.

Collect monthly welfare reports and submit to social facilitators.

Ensure that Contractor’s workers are paid what is due to them in time.

**SO 08.03 Remuneration for CLO**

The Contractor, the Engineer and the Employer shall determine the remuneration of the Liaison Officer jointly. A Prime Cost Sum is provided in the Schedule of Quantities to cover the remuneration of the Liaison Officer.

The Liaison Officer shall only be employed and paid for the period in which the duties of a Liaison Officer are required as agreed on by the Engineer and the Contractor.

**SO 08.04 Transport of Liaison Officer (If Applicable)**

The Contractor shall provide transport for the Liaison Officer as agreed upon by the Employer, the Engineer and the Contractor.

**SO 09 TRAINING OF WORKERS**

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.

Three types of training are applicable, namely

- Life skills;
- Technical Skills training including First Aid & Health and Safety training
- On the job training

Training will be implemented by CETA accredited training instructors / facilitators.

- Workers shall be employed on the projects for a minimum period of 12 months.
- Workers shall be employed on projects in the vicinity of their homes. The same arrangements applicable for other workers regarding accommodation, subsistence and travel shall be applicable to EPWP workers.
(a) 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.

(b) Where not allowed for in the Bill of Quantities, the cost of the formal training of targeted labour, will be funded by the provincial office of the Department of Labour. This training should take place as close to the project site as practically possible. The contractor, must access this training by informing the relevant provincial 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 must be furnished with a copy of this request.

(c) The contractor shall be responsible for scheduling the training of workers and shall take all reasonable steps to ensure that each beneficiary is provided with a minimum of six (6) days of formal training if he/she is employed for 3 months or less and a minimum of ten (10) days if he/she is employed for 4 months or more.

(d) The contractor shall do nothing to dissuade targeted labour from participating in the above mentioned training programmes.

(e) 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 (d) above.

(f) Proof of compliance with the requirements of (a) to (e) must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

**SO 10 SANCTIONS**

Add the following:

The Contractor will be assessed on a quarterly basis in the event that the Contractor fails to substantiate that any failure to achieve the Individual Contract Participation Goals (CPG_E, CPG_ES, CPG_EW, CPG_EL, CPG_S, CPG_SS, CPG_SW, CPG_SL, CPG_L) relating to the granting of a preference was due to quantitative underruns, the elimination of items, or any other reason beyond the Contractor’s control which may be acceptable to the Employer, the Contractor shall pay to the Employer penalties (P) in an amount determined in accordance with the following formula:

\[
P = 0.50 \times \left( \frac{D - Do}{100} \right) \times N_A
\]

where \( D = \) tendered Contract Participation Goal (CPG_E, CPG_ES, CPG_EW, CPG_EL, CPG_S, CPG_SS, CPG_SW, CPG_SL, CPG_L) percentage.

Do = the Contract Participation Goal (CPG_E, CPG_ES, CPG_EW, CPG_EL, CPG_S, CPG_SS, CPG_SW, CPG_SL, CPG_L) which the Employer’s Representative, based on the credits passed, certifies as being achieved upon completion of the Contract.

\( N_A \) = Net Amount, being Tender Sum excluding VAT, contingencies, escalation, provisional sums and prime cost items.

\( P \) = Rand value of penalty payable.
SO 11 MEASUREMENT AND PAYMENT

SO 11.01 Registering Emerging Contractors on CIDB data register …………………..Unit: Number

The unit of measurement shall be the number of new Contractors registered at the CIDB. The tender rate shall include remuneration for facilitating the Contractor in completing application forms and payment of registration fees.

SO 11.02 Obtaining a higher designated grading for Subcontractors………………..Unit: Number

The unit of measurement shall be the number of Contractors successfully obtaining a higher CIDB designation after completion of the work.

SO 11.03 Formal training of Subcontractors ……………………………………………..Unit: PC Sum

The unit of measurement shall be the number of subcontractors identified for formal training courses.

SO 11.04 Remuneration of CLO………………………………………………………………..Unit: PC Sum

An amount has been allowed for the payment of the CLO. The Contractor will submit a monthly invoice for the remuneration of the CLO for the required Contract period.

SO 11.05 Transport Cost for CLO …………………………………………………………..Unit: Km (If applicable)

The unit of measurement shall be the cost per km based on the total km travelled during the month for the CLO from his home to the Construction sites.

SO 11.06 PAYMENT FOR EMPLOYMENT AND TRAINING OF LOCAL UNSKILLED WORKERS

SO 11.06.01 Orientation and Life Skills development training for local unskilled workers for an average of 10 days per worker………………………………………………………………..Unit: worker / days

SO 11.06.02 Technical skills training for local unskilled for an average of 20 days per worker………………………………………………………………..Unit: worker / days

The tendered sum shall include full compensation for identification of pre-qualification criteria and training needs, staff assessment and evaluation prior to training, all technical research, development and compilation of an accredited training course and course material, and all other actions necessary for commencement of official training sessions in accordance with the specification.

The tendered sum shall also include full compensation for the compilation of a draft syllabus and for incorporation of all the Engineer’s comments and corrective requirements.

SO 11.07 IMPLEMENTATION OF CONTRACT PARTICIPATION GOALS

SO 11.07.01 Allow for the provision of monthly reports ………………………………Unit: months
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PROVINCIAL ADMINISTRATION
WESTERN CAPE

GENERAL TECHNICAL
SPECIFICATION
FOR
ELECTRICAL INSTALLATION:

PART A:
GENERAL
AND
LOW VOLTAGE (400 V) INSTALLATION:

Specification No.

Revision: October 1999
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1. INTRODUCTION

This PART A: shall be read together with the following parts of the GENERAL TECHNICAL
SPECIFICATION: ELECTRICAL INSTALLATION:

PART B: HIGH VOLTAGE SWITCHGEAR, TRANSFORMERS, MINI
SUBSTATIONS, OVERHEAD LINES AND BUNDLE CONDUCTORS: when
referred to in the Project Specification.

PART C: HOSPITAL INSTITUTIONS: when referred to in the Project
Specification.

This General Technical Specification will form part of the contract documents, but will only
be issued on request.

2. DEFINITIONS

Engineer:

Engineer shall mean the Chief Engineer (E and F) of the Provincial Administration
or his duly appointed representative.

Sub Contractor:

Sub Contractor shall mean that person, firm or company who shall be nominated
as Sub Contractor to carry out the sub contract works as specified.

"Approved", "Approval", "Suitable", "Equal", "Necessary" and Required"

These words shall mean, approved in the opinion of the Engineer, in writing.

All materials or equipment so described shall be submitted to the Engineer, at his
request, for his approval.

3. ACCEPTABILITY

All material, plant equipment, accessories and fittings installed or used in the execution of
the Contract shall except where otherwise specified or specifically exempted by the
Engineer in writing, be new and shall comply with:

The Specification,

The Code of Practice for the Wiring of Premises as issued by the South African
Bureau of Standards, as amended, S.A.B.S. 0142,

The appropriate South African Bureau of Standards Specifications,

The appropriate British Standard, where no S.A.B.S. specifications exists.


The requirements of the Local Electricity Supply Authority.

The Local Fire Regulations, and
4. STANDARD AND SAMPLES

Samples of all items of equipment used and the relevant S.A.B.S. test reports or certificates shall be submitted to the Engineer on his request before installation is commenced.

All such samples may be retained until completion of the Contract. All such samples shall have securely attached thereto labels designating the Contract by name and number (if any), the name of the Contractor and any further relevant information.

5. EVERYTHING NECESSARY

The installation shall include everything necessary whether specified in detail or not and shall be carried out in the best possible way to ensure a complete and first class installation to the approval of the Engineer.

6. UNIFORMITY

All items of the same type of equipment shall where at all possible - be of the same make and type for each item throughout the installation, to ensure interchange ability and ease of maintenance.

7. RADIO, TELEVISION, COMPUTER AND COMPUTER SYSTEM INTERFERENCE

The Contractor shall allow for interference suppression components where required, to ensure that the electrical installation shall not cause interference to radio, television, staff location, computer and computer systems.

All necessary steps are to be taken to comply with the regulations concerning interference.

8. DELIVERY

The Contractor must co-ordinate the delivery dates for all items of equipment supplied by him to allow adequate time for installation, commissioning and testing prior to contract completion.

To this end, the Contractor must ensure that shop drawings are presented to the Engineer for approval timeously, and a programme of submission of such drawings must be approved by the Engineer within three months of the acceptance of the tender.

Documentary proof is to be supplied of the placing of all orders for equipment having a protracted delivery period. No substitution of specified items will be allowed due to the late placing of orders, and no delay claims in this regard will be entertained.
9. **METHODS OF FIXING**

The size of bolts or screws shall be the largest permitted by diameter of the hole in the apparatus concerned and are to be of adequate length. When fixing any item of equipment, all bolt or screw holes provided therein shall be used and the fixing in each hole is to be secure.

In all cases, bolts shall be secured by means of a washer on either side of the items being bolted followed by a lock washer and nut.

9.1. **LIGHT WEIGHT EQUIPMENT:**

All light weight fixing to brick or concrete shall be made with steel screws and approved plugs. Holes of the requisite size for the plug which shall suit the screw used, are to be neatly drilled in the concrete or brickwork (not in the joints between bricks) to a depth excluding plaster or soft wall finish, equal to at least the length of the plug to be used. The plug length shall be such that when the screw is in place all the threaded length is in the plug. Fixing to timber shall be made with greased brass wood screws. For fixing to hollow tiles, etc., screw anchor type fixing shall be used, fitted as above as far as possible.

Fixing to soft or hard fibre boards, etc., which are inaccessible to the back shall be made with sheradised self tapping screws of appropriate size or with springs or gravity toggles.

9.2. **HEAVY EQUIPMENT**

All heavy weight fixing to brick or concrete shall be by means of mild steel bolts of appropriate size of the grouted bolt type or by one of the various types of suitable expanding bolt fixings. After erection of equipment all exposed metalwork of fixing shall be treated with two coats of paint to match the finish of the equipment.

10. **PROTECTIVE PAINTING**

The paintwork of all equipment and plant which is damaged during the course of erection and prior to acceptance by the Engineers, must be satisfactorily made good by the Contractor at his own expense.

11. **CONTRACTOR'S STAFF**

The work shall be done by, or at all times be under the personal supervision of an installation electrician appointed in writing by the Contractor as the Responsible Person, in terms of the requirements of the Machinery and Occupational Safety Act. This person shall be available during working hours, and shall be experienced in projects of the size of the service specified.

The Engineer may, if he deems fit, require that the Contractor removes or causes to be removed an employee of his from the specified premises by virtue of that person's incapability, appearance or any such reason which in the opinion of the Engineer, is valid.

At all times while on the specified premises, all artisan and labourer members of the Contractor's staff shall wear clothing adequately marked with the Contractor's name or acceptable identification.
12. **ELECTRICAL WORK ASSOCIATED WITH MECHANICAL SERVICES**

The electrical work associated with mechanical services will be the responsibility of the Mechanical Contractor.

The relevant requirements of this specification shall apply.

13. **SCHEDULES OF EQUIPMENT**

A complete list of fittings and other equipment intended for use on this Contract is to be submitted with the tender. This list shall contain manufacturers’ names, catalogue numbers, etc. Where any item offered is not to specification, prior approval in writing shall be obtained before this can be offered.

Should any item supplied not comply with the specification, an alternative which meets the specification is to be provided at no additional cost to the contract.

14. **VOLTAGE RATINGS**

The voltage ratings of appliances, etc., installed by the Contractor, shall comply with the nominal declared voltage of the respective Supply Authority.

15. **INTERRUPTED POWER SUPPLY**

If the electrical work consists of additions and alterations to, or renovations of an existing electrical installation, the tenderer shall arrange his work in such a manner that a minimum interruption of electrical power to the institution, or part thereof, will occur.

The power supply may only be interrupted if such an interruption has been arranged in good time with the head of the relevant institution and the Engineer.

16. **SUPPLY AUTHORITIES SERVICE CONNECTION**

Unless otherwise specified, the electrical service connection will be arranged with the relevant Supply Authority and paid for by the Department. The Contractor shall give all notices as required by the Supply Authority.

17. **CABLES**

17.1. **CABLE LENGTHS**

Cable lengths where scheduled are for tendering purposes only, any variation between scheduled and actual lengths will be allowed for at schedule rates.

It is essential that the actual cable lengths required shall be checked on site before orders are placed, as no joints will be permitted. (Except where lengths exceed the drum length.)
17.2. 11 KV (NOMINAL) CABLES

17.2.1. Cross linked Polyethylene Insulated SWA and: Copper cored cables, (XLPE) Cables:

These shall be three core cables having stranded copper conductors. The conductors shall be insulated by cross linked polyethylene and the cores are to have an extruded semi conductive polyethylene core screen. The cores shall be laid up with interstitial fillers.

The cable is to have the following:

- A taped binder between the interstitial fillers, the three stranded copper earth wires situated above the interstitial fillers.
- A taped metallic screen and shall be PVC bedded.
- SWA and shall be PVC served.
- Rating suitably for use in a nominal 11 kV earthed reticulation system.

17.2.2. Paper insulated Cables

Paper insulated cables shall be in accordance with S.A.B.S 97 of 1991.

The cable construction shall be impregnated paper insulated/lead sheathed/fibrous helical bedding/double steel tape or galvanised steel wire armoured/fibrous helical serving or outer PVC sheath.

The conductors shall be of high conductivity annealed stranded copper that may be shaped or circular, but the cross-sectional area of each conductor shall not be less than that specified.

The conductor insulation shall consist of impregnated paper tapes, either pre-impregnated or mass-impregnated with a non-draining type of compound.

The bedding shall consist of a bitumen impregnated fibrous material and the sheath shall be lead alloy E The serving shall consist of bitumen impregnated fibrous material. Abbreviation for this type is PEST. Alternatively the cable may be sheathed with watertight extruded black PVC to eliminate electrolytic corrosion of the cable. Abbreviation for this type is PEST.

Armouring shall consist of double steel tape or galvanised steel wire. It should be noted that a cable with wire armour has a much higher fault rating than a cable with tape armour and that in vertical installations only wire armour shall be used.

The cable insulation shall be suitable for the supply voltage specified and the cable must be suitable for a system with an earthed neutral.
Cable shall be manufactured and supplied in one length to the lengths specified unless these lengths exceed a standard drum length, in which case a ruling shall be obtained from the Engineer.

Unless cables are made to order only cables from fresh stocks shall be supplied.

17.2.3. **Cable terminations and joints with cold shrink or heat shrink materials**

17.2.3.1. **General**

The complete kit shall be packed in a container that is marked for the type of cable insulation and construction as well as the voltage range for which the materials are suitable.

An illustrated set of instructions for the installation of the materials shall accompany every kit.

Cable joints and terminations shall be made off in accordance with the cable and termination kit manufacturer’s recommendations.

The joints and terminations shall make minimal, if any, use of insulating or stress relieving tapes. The use of electrical stress control and insulating tubing that is shrunk onto the termination or joint, is preferred above other methods.

The shrinkable and other materials used for the terminations and joints shall be of a high quality and shall retain their electrical and mechanical properties without deterioration.

17.2.3.2. **Termination**

Where a cross-over of conductors is required a purpose made spacer for the conductors shall be installed.

In the case of XLPE terminations connect the three internal ECC conductors to the armouring and earth.

Terminations shall be made of a material that gives lasting protection against UV radiation.

The cores of all cables terminated outdoors and the cores of 3,3 kV and higher voltage cables terminated indoors, shall be completely covered with a shrunk-on protective layer against surface tracking, UV radiation and weathering.

Outdoor terminations shall be designed to prevent flashover under wet or contaminated conditions. This shall be achieved with shrunk-on insulating spacers and rain sheds.

17.2.3.3. **Joints**

The electrical continuity of all the conductors, screens and armouring shall not be impaired by the joints and the earth continuity shall be accomplished within the joints, i.e. no external earth continuity conductor that will be subject to corrosion, is
acceptable. The joints shall be completely covered by a watertight sheath to prevent corrosion.

In the case of joints in cables with an outer PVC anti-electrolysis sheath, the joints shall be subject to the same electrical insulation test as the outer sheath of the cable.

Joints in XLPE cables shall be achieved by means of jointing kits supplied by the cable manufacturer.

17.2.4. Sealing of Ends

Where cables are cut and not immediately made off, the ends shall be sealed without delay to prevent the ingress of moisture and air etc.

17.3. 600 V / 1000 V CABLES AND TERMINATIONS

600 V / 1000 V cables shall be to S.A.B.S. 1507 of 1990.

17.3.1. PVC SWA PVC Power Cable.

The conductors are to be of high conductivity copper insulated with one layer of PVC.

The colour of the cores shall be as follows:

- Twin core: one red, and one black.
- Three core: one red, one white and one blue.
- Four core: one red, one white, one blue and one black.

The cores are to be twisted together, bedded, sheeted with PVC (preferably black) armoured with a layer of galvanised steel wire, bedded and served with PVC (preferably black).

All insulation shall be for general service 660 V / 1000 V grade.

17.3.2. PVC SWA PVC Power Cable Glands

These glands shall be of the adjustable type and shall be suitable for PVC SWA general purpose 660/1000 volt cable.

Gland for use indoors and sheltered from the weather elements shall be made of nickel plated brass, comprising the following:

- cone nut
- barrel with captive cone which can swivel
- adjustable nipple
- lock nut
- screw-on earth tag with 50 % cross-section of the maximum conductor size and max cross section of
70 sq mm

- cable entrance side of barrel shall have a purpose made groove to accept a shroud
- shroud made of non-deteriorating neoprene or synthetic rubber shroud which is resistant to water oil and sunlight and which shall fit tightly around cable and gland.

These glands shall be CCG Cable Glands type BW or equivalent.

Glands for external use shall be as for those for indoor use, with the additional feature of a compression gland providing a positive mechanical seal on the cable to prevent the ingress of dust and moisture.

These glands for external use shall be CCG Cable Glands type CW or equivalent.

17.3.3. Power Cable Terminations

Power cable terminations, connections and joints shall be facilitated by means of the use of a portable hydraulic compression tool with preset automatic tamperproof hydraulic unloading bypass valve, the entire equipment being either bought from, hired, or approved by the Cable Manufacturer.

Approved lugs or ferrules shall be crimped to the cable cores in all cases. No other method of termination or joint shall be allowed.

Where aluminium and copper or brass are in intimate contact and especially where the joint so formed is current carrying, "Densal" jointing paste or other approved paste or treatment shall be used.

17.3.4. M.I.M.S. Cables

M.I.M.S. cable shall be mineral insulated copper sheathed cable equal to Pyrotenax or other approved make of not less than 600 V / 1000 V grade.

Cable shall be properly dried out and seals shall be made cold with installation and connecting up in accordance with manufacturer’s instructions.

All seals shall be subjected to insulation tests. Not less than one month after sealing, every seal shall give a reading of infinity on a 500 volt megger.

Where M.I.M.S. cable passes through a wall or reinforced concrete floor slab it shall be run in heavy duty PVC tubing through such wall or slab.
17.4. LAYING OF CABLES

17.4.1. Handling

The storage, transportation, handling and laying of cables shall be according to first class practice, and the Contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operations.

Twisted, kinked or cables damaged in any way will be rejected.

Cables shall be removed from the 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.

Cables shall not be bent through a radius smaller than that recommended by the manufacturer.

The ends of such pipes and ducts shall be sealed to approval of the Engineer after the drawing in of the cables.

17.4.2. Trenching:

17.4.2.1. Definitions of ground types

Earth shall mean ground that can be removed by hand tools and shall include loose ground, clay made up ground, loose or soft shale, loose "ouklip" and any stones less than 75 mm diameter.

Soft rock shall mean rock that can be loosened by pick or crowbar and includes hard shale, compact "ouklip", stone of similar hardness and stones exceeding 75 mm in diameter but not exceeding 0.03 m³ in volume.

Hard rock shall mean granite, quartzitic sandstone, solid shale, slate and rock of similar or greater hardness and boulders exceeding 0.03 m³ in volume. The decision as to what is "soft rock" or "hard rock" shall be at the sole discretion of the Engineer.

17.4.2.2. Excavations

**The excavation of cable trenches shall be carried out as specified in the Project Specification.

The bottom and sides of the trench shall be free from any protruding objects which could cause damage to the cable.

Any change in level shall be made to give an easy grade.

**Cables, unless otherwise specified in the Project Specification, shall be laid at a depth of at least 750 mm for LV cables and 1000 mm for HV cables below final finished ground level.
Trenches shall not be less than 300 mm wide for one or two cables, and the width shall be increased where more than two cables are to be laid together so that the cables may be placed at least 300 mm apart throughout the run.

Where the nature of the ground does not permit the excavation of cable trenches to the specified depth, the matter shall be referred to the Engineer for a ruling.

17.4.2.3. **Precautions**

The Contractor must take all necessary precautions to prevent trenching work being in any way a hazard to any person and to safeguard all structures, roads, railways, sewers, works or other property from any risk of subsidence and damage.

The Contractor is to check his levels on the site plan prior to commencement of trenching to ensure that all depths are to final finished levels, and is to ensure that cables and trenches do not interfere in any way with other services. Any such problem is to be brought to the immediate attention of the Engineer.

17.4.3. **Joint Holes**

Where cable joints are required to be made in the course of an underground run, a joint hole shall be excavated of sufficient size to enable the cable joiner to work efficiently and cleanly and so that each end of the cables to be joined may have a minimum of 1000 mm of slack disposed in a loop without stress.

Backfilling under joints must be compacted firmly to prevent any subsequent settling.

17.4.4. **Bedding**

In all trenches a layer of at least 75 mm of clean sand shall be laid below the cable followed by a layer of at least 100 mm clean bedding, lightly compacted, laid above the cable.

17.4.5. **Cable Trench Intermediate Cover**

All cables shall be protected by 300 mm wide continuous, bright orange PVC danger tape laid on top of the upper layer of bedding 250 mm above the cable and marked with a skull and cross bones and the words "DANGER", "GEVAAR", "INGOZI".

17.4.6. **Backfilling**

Backfilling after bedding and laying of the PVC danger tape is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be compacted after the addition of every 150 mm.

The surface is to be made good as required.
Backfilling may not commence until the entire trench has been inspected and measured, where necessary, and the route recorded by the Engineer.

17.4.7. **Cable Markers: (For cables buried in Trenches):**

Cement or concrete or other approved cable markers shall be provided at points of entry into buildings, at road crossings, at changes of direction and at intervals not exceeding 30 000 mm.

Cable joints shall also be marked.

Cement or concrete cable markers shall be of a high strength mixture of cement or concrete formed into a truncated pyramid at least 450 mm high, 150 mm x 150 mm at the top and 250 mm x 250 mm at the bottom.

The cable markers shall be installed in the centre of the cable trench, with the top of the cable marker being 100 mm above the final finished ground level.

A brass or stainless steel indicator plate shall either be cast into the top of the marker, or shall otherwise be secured thereto to approval, and shall have the following inscription indelibly and permanently inscribed thereon: 'ELECTRIC CABLE' and cable direction arrow as well as reference numbers of each cable laid in that trench.

Should a cable joint be located beneath the marker, the word 'JOINT' in brackets shall follow the cable data inscription.

From the underside of the cable marker a 900 mm long nylon rope of 10 mm diameter shall be installed with the other end secured to the cable.

17.4.8. **Cable Labels**

Individual cables shall be provided with approved labels manufactured from non-metallic sheet at least 1 mm thick x 10 mm wide and fixed to the cables to the approval of the Engineer.

Labels shall be stamped or embossed with the cable number.

All cables in a particular run shall be labelled in the same vicinity.

Labels shall be fixed in the following positions along a cable run:

17.4.8.1. **Internal**

At approx. 200 mm below cable glands where cables leave or enter a switchboard or switch, etc.

At change of direction points.

Within 750 mm from all junction points.

At either side of a barrier.
17.4.8.2. **External**

At approx. 200 mm below cable glands at switchboards and at either side of sleeves.

17.4.9. **Cable Schedule**

Information shall be provided to the Engineer to enable him to draw up a cable schedule reflecting the following “as built” information:

- cable identity number
- start location
- end location
- cable type
- cable size
- route length
- associated earth continuity conductor.

17.4.10. **Cable Sleeves**

**Cable sleeves shall be high density Polyethylene pipes of not less than 100 mm diameter or as specified in the Project Specification.**

**At least 2 spare pipes, or as many as specified in the Project Specification shall be provided on new work and shall be complete with a galvanised steel draw wire.**

Sleeves entering buildings shall be sealed at both ends after installation of cables.

During the course of construction and until final sealing, cable sleeves shall be kept clean and free of debris by means of temporary plugs. Final sealing shall consist of a weak cement mixture.

17.4.11. **Opening up of Existing Cable Trenches**

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. In the vicinity of existing services mechanical excavation equipment is not allowed.

17.4.12. **Cables on cable racks**

Cables shall be laid in single layers on racks with spaces between cables as specified by the cable manufacturers.

17.5. **CABLE ROUTES AND SECURING**

Where cables are run on wall surfaces they shall be protected for the full length by galvanised conduit or other approved means securely saddled to the walls and secured by brass round head screws.
In roof spaces, unless otherwise specified cables shall be saddled to wooden battens or other approved means installed by the electrical contractor.

In passages used by the public, all cables are to be neatly concealed where practicable. Where concealment is not practicable the cables must be neatly laid, and the outer sheath is to blend with the decor where at all possible.

Where applicable, all cables are to be neatly fixed to trusses, cable trays, etc., with suitable approved cable clamps/cleats; or "INSULOID" or other approved plastic fixing straps spaced not more than 5 000 mm on horizontal runs and not more than 1 000 mm on vertical runs.

Cables crossing voids must be suitably supported in an approved manner, and be protected against damage.

17.6. TESTS

On completion tests shall be carried out on site in the presence of the Engineer and test results shall be properly recorded and submitted in triplicate:

On each completed section of laid and jointed cable, the insulation resistance shall be tested to approval with an approved "Megger" type instrument of not less than 1000 Volts for HV and 500 Volts for LV cables.

On each completed section of laid and jointed HV cable a high voltage pressure test shall be carried out. The test shall be performed as specified in S.A.B.S. 97 of 1970 as amended.

17.7. PVC INSULATED WIRING

Except where otherwise specified the entire installation shall be wired with PVC insulated annealed copper wiring, drawn into the conduit or laid into cable trunking. Earthed concentric wiring shall not be accepted.

Unless otherwise specified no wiring of less than 1,5 mm$^2$ shall be used for lighting and power mains voltage circuits. Circuits shall be wired in cables of not less than the following sizes:

<table>
<thead>
<tr>
<th>Circuit Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting</td>
<td>1,5 mm$^2$</td>
</tr>
<tr>
<td>Clocks</td>
<td>1,5 mm$^2$</td>
</tr>
<tr>
<td>16 Amp Socket Outlets with 20 Amp protection</td>
<td>2,5 mm$^2$</td>
</tr>
<tr>
<td>16 Amp Socket Outlets with 30 Amp protection</td>
<td>4 mm$^2$</td>
</tr>
</tbody>
</table>

and generally:

<table>
<thead>
<tr>
<th>Circuit Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single phase circuits protected by up to 20 Amp MCB</td>
<td>2,5 mm$^2$</td>
</tr>
<tr>
<td>Single phase circuits protected by up to 35 Amp MCB</td>
<td>6,0 mm$^2$</td>
</tr>
<tr>
<td>Three phase circuits protected by up to 10 Amp MCB</td>
<td>1,5 mm$^2$</td>
</tr>
<tr>
<td>Three phase circuits protected by up to 25 Amp MCB</td>
<td>4,0 mm$^2$</td>
</tr>
</tbody>
</table>
Three phase circuits protected by up to 30 Amp MCB 4,0 mm²

More than one circuit may be run in a conduit provided the number of conductors does not exceed the limits laid down. (See S.A.B.S. 0142 clause 4.2.2 (f))

Conductors shall not be drawn into conduit until the complete conduit run has been installed and swabbed out clean and dry and the building has so far advanced that there is no likelihood of the ingress of dirt or moisture. All conductors must be totally contained within conduit or cable trunking, or within metal enclosed equipment or apparatus.

All wiring shall be looped from point to point.

There shall be no joints in cabling or wiring.

Not more than two conductors shall be looped together in any one terminal of an outlet point.

There shall be no cutting away or nicking of conductor strands.

Terminations to be crimped lugs or ferrules for all wiring of 6 mm² or more.

Note:

A proper crimping tool and lugs for the particular size and type of conductor shall be used.

Where conductors terminate in a terminal block or strip which is not of the clamping type provided with a cable protector, a suitable ferrule shall be crimped onto the conductor.

Where wiring enters switchboards, control panels, etc., the cables of each circuit shall be neatly and carefully bunched together and shall be installed within purpose made P.V.C trunking.

Identification colours of all PVC wiring shall be as follows:

For single phase wiring:

Red for the phase conductor
Black for the neutral conductor.

For three phase wiring:

Phase 1 Red conductor
Phase 2 White conductor
Phase 3 Blue conductor
Neutral Black conductor.

Earth conductors:

Green/Yellow.

The phase neutral and earth wiring of each circuit run in trunking shall be bound with approved PVC strapping at intervals of 4 m with additional straps at bends.

Circuit wiring and the associated earth continuity conductor shall be identified on its run as follows:
At each end or termination with approved number tape.

In trunking at 4,000 mm intervals and where the circuit enters or leaves the trunk and at intersections, by means of purpose made ferrules and PVC strapping.

The identity shall indicate the normal or alternative supply and the circuit numbers.

The circuit numbers shall be the number associated with the protective device way number in the distribution board. Three phase circuits shall take on the central way number of the protective device.

18. DISTRIBUTION BOARDS

18.1. MAIN BOARD

18.1.1. General

**Main boards shall be of the extensible cubicle type with flush mounted circuit breakers, fuse switches and other equipment as specified in the Project Specification.**

**Unless specified otherwise in the Project Specification, the switchboard shall be designed to withstand a fault level of 35 kA.**

Boards shall be of robust manufacture consisting, in general, of a rectangular tube frame, covered by sheet steel panels of at least 2 mm thickness, in a series of standard modules. Removable panels shall be formed from folded rigid sheet steel of at least 2 mm thickness and be self-supporting, and shall be secured to the boards by means of pins at the bottom, and square key catches at the top.

**Reference shall be made to the Chief Engineer’s Reference Drawings as detailed in the Project Specification.**

**Each modular section is to be self-contained and sealed off from each other by means of a metal barrier with facilities for extension of the horizontal busbars and earth bar, as specified in the Project Specification. Joints between panels shall be sealed against water ingress by means of a silicon strip on the top.**

Boards, unless otherwise specified, are to be suitable for front access only. Rear panels are, however, to be removable in two equal sections. Pressed louvre sections where detailed are to be fitted internally with mesh to preserve vermin proofing.

18.1.2. Basic Form of Modular Section

Each module is to basically comprise the following:-

**Overall width:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Incoming section</td>
<td>600 mm</td>
</tr>
<tr>
<td>Outgoing section</td>
<td>600 mm</td>
</tr>
</tbody>
</table>
Bus section 1000 mm
Changeover section 1200 mm
Overall depth 700 mm
Overall height 2000 mm
comprising the following:

Plinth height: 75 mm

**Lower section height:** nominally 1365 mm for mounting switchgear.
(Refer to the relevant drawings as per the Project Specification.)

The upper section height: nominally 560 mm for mounting metering and control equipment and behind this the main horizontal busbars. (Refer to detail drawings as per the Project Specification.)

Where the upper section is to be used for metering and control equipment it shall be sealed off from the power section as described in the Metering and Control Section below.

18.1.3. Incoming panels

Where a modular section is to contain an incoming main switch, such as an air circuit breaker, the following features shall be provided:-

A substantial unpainted horizontal galvanised metal gland plate mounted in the lower accessible section, for the making off of the incoming cable. If single core cables are to be used, wooden cleats to which these can be clamped are to be provided. The cables are to be connected to the bottom of the main switch.

The main switch as specified mounted in the lower section across the full width of the module, with busbar connections to the main busbars from the top of the main switch.

These rising busbars are to be provided with easily removable links to facilitate the installation of up to three C.T.’s per phase and are to be long enough to accommodate direct mounted fuses for voltmeter circuit.

The busbar and metering section is to be as specified in the sub clause detailing “Metering and Control Section”

18.1.4. Outgoing Switch Panels

These shall be fitted with energy limiting circuit breakers to limit the "let through" current to a maximum of 5 kA.

The lower sections of these shall house up to 8 switches mounted towards the left hand side of the panel. The right hand portion is to provide access for making off of cables.
On the extreme right hand side of the module, a rising length of steel P4000 ducting is to be provided sloping such that the bottom is closer to the front of the panel and the top closer to the back. This is to be fixed top and bottom to horizontal sections of P4000 duct welded between vertical frame members, and is to be located hard up against the side panel.

A neutral vertical busbar matching the phase busbar shall be installed to facilitate termination of outgoing neutrals locally at the glanding position. The vertical busbars shall be aligned with their short edge towards the front of the panel so as to provide the facility of easy connections and the visibility of both the connecting nut and bolt.

A 3 mm thick copper earth strip, of the same width as the P4000 rising duct, is to be fixed to it. This bar is to have 8 x 6 mm bolts and locknuts fitted, one opposite each outgoing switch position, to facilitate proper earthing of outgoing cable glands. The earth bar is also to be bonded to the main earth bar of the board.

Opposite each outgoing switch position, a steel 2 mm thick unpainted, galvanised glanding off piece is to be bolted to the rising P4000 duct, to facilitate the making off of outgoing cables.

Outgoing switches shall be connected to vertically mounted busbars, 50 mm x 6 mm, via PVC insulated solid / stranded copper connections.

The busbar and metering section is to be as specified in the sub clause detailing "Metering and Control Section"

Where M.C.B.'s are specified they shall be typically of 160 amp maximum rating but it shall be possible to install 250 amp units where specified.

18.1.5. Bus Section Switch Panels

The bus section switch shall be four (4) pole to match the incoming switches of the switchboard.

The bus section switch is to be mounted towards the left hand half of the panel. A removable section of riser busbar is to be provided on the right hand side of the panel to facilitate C.T. installation.

The busbar and metering section is to be as specified in the sub clause detailing "Metering and Control Section"

18.1.6. Change over Switch Panel

**This panel shall either be 1 000 mm or 1 200 mm wide as detailed in the Project Specification. It shall be provided with left hand side access (from front) through a removable panel fixed by using two pins at the bottom and two square key catches at the top.

The busbar and metering section is to be as specified in the sub clause detailing "Metering and Control Section". The metering section shall house the necessary change over controls and indicator lights and shall be fitted with centre opening doors.
The lower section shall contain either motorised air disconnectors mounted above each other in a 1200 mm wide panel or horizontally mounted 800 amp, or less, moulded case disconnectors in 1000 mm wide panels. All the above mentioned items shall be four (4) pole and shall be mechanically and electrically interlocked.

Where 800 amp (max), horizontally mounted moulded case disconnectors, one moulded case circuit breaker and one moulded case disconnector shall be mounted below the moulded case disconnectors for protection of the normal and alternative incoming supplies respectively.

18.1.7. **Busbars**

**The busbars shall be of 18 kA 800 amp minimum copper rating or as specified in the Project Specification, with rectangular cross-section maintained throughout, including where holes are drilled through.**

The busbars shall be firmly supported on insulating material. Insulators shall be spaced not more than 600 mm apart.

All joints in the busbars shall have the common flat areas tinned or plated and shall be firmly bolted together with high tensile steel bolts, nuts and locking washers. These high tensile steel bolts and nuts shall be tightened by means of a torque wrench to the manufacturers specification.

Connections to outgoing switches shall be copper and shall be firmly bolted to the busbars.

Connections shall where necessary be braced to prevent warping when fault currents are passing through the bars. The busbars shall be capable of sustaining fault currents as specified above.

Busbars shall be epoxy powder coated to an insulation level of 2 kV and colour coded to indicate the phases and shall be enclosed in a vented chamber.

Where the busbars would penetrate a side panel in the event of panel extension, a separately removable section of the side panel is to be provided. This is to fit over four nuts fixed to the main plate such that removal of the bolts from the outside is possible without the captive nuts being lost.

A metal shroud is to be fixed above the busbars so that these are inaccessible from above. This shroud is to be removable through the top of the panel.

All exposed 220 volt terminals shall be shrouded against accidental contact.
18.1.8. Terminals for Auxiliaries

**Two 30 A terminals per outgoing circuit are to be provided to facilitate connection of any auxiliary indication or control wiring. The terminals are to conform to the requirements as specified in the Project Specification. Auxiliary wiring is to be neatly loomed and laced or run in purpose-made PVC ducting.**

18.1.9. Metering and Control Sections

The metering and control section of each module is to be accessed via a door fixed with two hinges, manufactured of brass or die cast aluminium which shall be of the "T" hinge, proud mount type, and two square key catches.

If equipment is mounted on the door a metal enclosure shall be bolted to the panel frame so as to separate the metering compartment from the rest of the panel.

If equipment is mounted to the metal enclosure then this enclosure shall be hinged to the panel, using hinges manufactured of brass or die cast aluminium which shall be of the "T" hinge, proud mount type, so as to provide access to the busbar section without disconnecting secondary wiring.

When no instrumentation is required to be fitted, the fixing plate may be omitted, provided that the busbar shroud is extended over the metering section.

The voltage wiring in this section shall have less than 5 kA fault level by protection from busbar mounted fuses. All control wiring shall be neatly run in PVC wireways and strapped loom where crossing hinged metal work.

18.1.10. Earth Bars

An earth bar of at least a cross sectional area sized as specified by the S.A.B.S.0142 Code of Practice for the Wiring of Premises shall be provided and shall run the full length of the board, bonding all sections together.

Each incoming cable gland shall be bonded to the earth bar in an approved manner.

The rising earth bar for each outgoing switch panel is to be bonded to the earth bar in an approved manner.

18.1.11. Labelling

All outgoing switches are to be clearly labelled to indicate the sub-distribution board they are feeding. The board itself shall also be clearly labelled, and, as stated above, all internal wiring and cabling is to be clearly labelled.

18.2. DISTRIBUTION BOARDS
18.2.1. General

**These boards shall generally be surface mounting, or floor-standing boards, front access only, without doors unless otherwise specified in the Project Specification, and containing an incoming triple pole disconnector, and a number of outgoing triple pole circuit breakers, with facilities for remote monitoring and control of these where specified in the Project Specification.

18.2.2. Construction

The boards are to be constructed of galvanised sheet steel of minimum 1.6 mm thickness, suitably braced and supported with rectangular tubular sections and finished in epoxy powder coat over a suitable primer.

A 75 mm mounting plinth is to be provided.

The front escutcheon plates of the board are to be provided with cut-outs for the operating toggles of the switchgear and each plate is to be secured by means of two knurled chromed coin slot screws, of minimum 10 mm diameter and 2 mm slot depth, at the top, and two locating pins at the bottom. Two chromed lifting handles per plate are required.

An unpainted galvanised gland plate is to be provided at the top and bottom of the board to allow for the glanding off of cables.

18.2.3. Switchgear and Busbars

The main incoming disconnector is to be placed towards the bottom of the board, with adequate provision being made to bring in cable tails, even if the incoming cable enters at the top of the board. A neutral link in the form of a withdrawable fuse with solid link, is to be provided for the main incoming neutral.

The busbars are to be copper and heat shrink insulated except at terminal positions. All cable connections shall be made off on studs on the busbars using lugs. The studs shall be formed using bolts drilled and tapped into the busbar and fixed using a lock nut. The neutral bar is to be sited on the opposite side of the board, to facilitate connection to outgoing cables.

Mounting heights of main switches, measured from the connection terminals to the boards tray are to be as follows:

Feeders with a nominal size less than 35 mm$^2$ 200 mm

Feeders with a nominal size greater than 35 mm$^2$ 300 mm

Switchgear is to be mounted on brackets to allow the operating handles to protrude through the escutcheon plate.

An earth bar is to be sited in an accessible position at the top and
bottom of the board, and the earth conductors run with each cable, as well as the integral earths of the captive cone cable glands are to be made off to this. Each earth connection shall be made off onto a separate way on the earth bar.

All conductors, including earth, are to be clearly identified and labelled.

The main incoming neutral link shall be shall comprise a purpose made tinned copper link bolted at each end and removable only by means of a tool.

18.2.4. Labelling

All outgoing switches are to be clearly labelled to indicate the sub-distribution board they are feeding. The board itself shall also be clearly labelled, and, as stated above, all internal wiring and cabling is to be clearly labelled.

18.2.5. Terminals for Auxiliaries

**Two 30 A terminals per outgoing circuit are to be provided to facilitate connection of any auxiliary indication or control wiring. The terminals are to conform to the requirements as specified in the Project Specification. Auxiliary wiring is to be neatly loomed and laced or run in purpose-made PVC ducting.

18.3. SUB DISTRIBUTION BOARDS

18.3.1. General

**Board shall be wall mounted unless otherwise specified in the Project Specification.

**Surface mounted boards shall basically consist of a sheet metal bonding tray, chassis to hold the distribution equipment and an escutcheon plate to cover the circuit breakers with only switch handles or toggles protruding. Doors shall be fitted where specified in the Project Specification.

Flush mounted boards shall basically consist of a sheet metal bonding tray and architrave frame with chassis for distribution equipment and an escutcheon plate to cover the circuit breakers with only switch handles or toggles protruding.

Sizes of distribution boards required for a service are to be selected from the S.A.B.S. standard sizes such as to permit installation of all equipment specified with the required clearances as called for under the clause “Clearances” below and are to be a combination of any two of the following overall horizontal and vertical dimensions of the architrave frame:

HORIZONTAL (mm): 400, 600, 800, 900, 1000, 1200

VERTICAL (mm): 900, 1000, 1200 mm.
** Sub-distribution Boards shall be physically sized to accommodate 100 % spare way capacity for circuit breakers, unless detailed otherwise in the Project Specification.

18.3.2. Bonding trays

Wall trays shall be of galvanised sheet steel and shall be robustly constructed of material with minimum thickness of 1,6 mm. The tray shall be fitted with threaded studs to carry the architrave and chassis and slotted PVC cable rack on either side. Lids shall be provided for the racks, which shall be of a minimum dimension of 25 mm x 25 mm but shall be increased to suit the number of outgoing circuits. These racks shall be solely for the electrician’s use to enable him to install the cables for outgoing circuits in a neat fashion.

An earth bar shall be provided at the bottom of the board in a position that will not be obstructed by equipment or wiring once the interior of the board has been fitted.

Trays shall be of sufficient width to accommodate all conduits in not more than two rows, entry normally being from above, and shall allow adequate space for all wiring. Knock-outs shall not normally be provided, other than as detailed on the drawings.

18.3.3. Chassis

Chassis shall be robustly constructed and of adequate size to carry the specified distribution equipment.

On surface mounted boards chassis shall be fixed directly to the bonding tray.

On flush boards chassis shall be fixed to the architrave frame.

Boards including neutral bars and busbars, shall allow for the accommodation of spare circuits as shown on the drawings. Dummies shall be provided for spare miniature circuit breakers. Any other front panel cut-out shall be neatly blanked off.

Tenderers shall take note of the cable sizes given on the drawings, and shall allow sufficient room for satisfactory termination of the cables in the respective boards.
18.3.4. Architrave

The architrave shall be of rigid and robust construction and shall be designed to trim the boards, carry the equipment chassis and carry the doors. Architraves for flush boards shall be adjustable to ensure that the board is attached plumb.

A label giving the identifying letter/number of the board shall be fixed to the top edge of the architrave.

18.3.5. Escutcheon Plate

Escutcheon plates shall be fitted to all boards to prevent accidental contact with the live section of the board. The plates shall have folded edges and suitable cut-outs to permit operating toggles to project through. The plates shall be held in place by two captive, coin slot, chrome screws of minimum diameter 10 mm, and 2 mm minimum slot depth at the top and two locating pins at the bottom. Plates secured by a multiplicity of screws will not be accepted. Chrome lift off knobs shall be provided. Labels shall be fitted clearly identifying each MCB with the circuit number, this number reflecting the physical way position in the board.

18.3.6. Doors

The doors shall have folded edges and shall be rigid. Where boards exceed 600 mm in width, double doors shall be provided in which case the left hand door must be fitted with slide bolts top and bottom inside the door. The door shall be designed to fit flush into the architrave and when open permit unimpeded removal of the escutcheon plate. Single leaf door shall be hinged on the left hand side. Pedestal type door hinges are to be provided. The doors shall be fitted with chrome handles with or without locks and positive door catches.

A pocket with a clear perspex front shall be fitted to the inside of the door to accommodate the legend. This pocket shall be large enough to accommodate a size A4 sheet.

18.3.7. Material and Finish

Trays, architraves, chassis, escutcheon plates, doors, etc. shall be constructed from galvanised sheet steel of at least 1.6 mm thickness. All of the above shall be finished in baked enamel or powder coat spray finish, 0.06 mm thick. Hammertone finish will not be accepted. Escutcheon plates of "Alternative" supply boards and sections of boards are to be finished in orange. All other boards are to be painted as specified.

18.3.8. Busbars, Internal Wiring Terminals

Busbars shall be of the brass clamp-on type or as for distribution boards.

Internal wiring shall be in phase colours, neatly arranged and clipped
with plastic buckle clips or hard nylon "loom formers". Extensions to busbars for spare circuit breakers shall be taped up. Plastic trunking with lids is to be provided for the internal wiring by the board supplier. All internal conductors are to be labelled or numbered at both ends.

Outgoing circuits will be terminated directly on to the appropriate circuit breaker or terminal and shall be labelled with a circuit identifying number.

The main incoming neutral link shall be shall comprise a purpose made tinned copper link bolted at each end and removable only by means of a tool.

18.3.9. **Labels**

All labels shall be permanent, and be of white black, white plastic laminate engraved type and securely fixed by means of metal thread screws and nuts.

All distribution boards shall be labelled with their distinguishing letters. Boards in cupboards shall be labelled on the architrave above doors.

All fuse-switches, circuit breakers, and other apparatus on switch or distribution boards shall be labelled as indicated on the drawings. Circuits shall be numbered consecutively and detailed on legends framed behind clear perspex, fixed to the boards or adjacent to the boards.

The incoming disconnector or circuit breaker on each board shall be labelled "Main Switch", in accordance with statutory requirements.

18.3.10. **Clearances**

Equipment on distribution boards may be installed abutting. Undue cramping of equipment and wiring is to, however, be avoided, and the following clearances must be maintained:

- Clearance of not less than 70 mm in all planes between the equipment and the inside edge of the architrave on one side of each panel only.

- Clearance of not less than 70 mm between the equipment nearest to the top and bottom of each panel and the inside edge of the architrave.

- Clearance of not less than 70 mm between rows of equipment (measured between terminals).

When distribution boards are supplied with main busbars, a minimum clearance of 25 mm must be maintained between any projection of the busbars and front panel.

- Clearance of not less than 75 mm between neutral busbar and any equipment on the panel and 75 mm clearance between neutral busbar and architrave.

The earth bar may be installed with top edge in a horizontal line...
with circuit breaker carriers near bottom edge of wall tray.

Clearance of not less than 40 mm between panel and inside of door(s).

Clearance of not less than 50 mm in the vertical plane between neutral bar for earth leakage relay and equipment and 50 mm clearance between this bar and inside edge of architrave frame.

Clearance of 25 mm in the vertical plane only between bell transformer and other equipment and/or inside edge of architrave frame.

18.4. DISTRIBUTION AND METER CUBICLES

18.4.1. Cubicle Constructions

**Cubicles are to be of suitable size to accommodate all equipment as listed and specified in the Project Specification.

**Two ventilation slots or louvres manufactured of steel, fitted with copper gauze wire inside are to be provided in front and rear, or sides of all cubicles. Doors are to open, through 180° and be provided with rigidly constructed padlock latches and brackets to accommodate night latches, as well as an approved "Danger Notice" consisting of either vitreous enamelled steel or cast aluminium with raised and polished letters against red background on the outside. Single doors are not to exceed a width of 750 mm. Openings in doors for night latches are to be blanked off by means of chromium plated brass discs. Rear access to panel(s) in cubicle is to be provided by means of either doors or removable panels as detailed in the Project Specification.

**All hinges are to be manufactured of brass or die cast aluminium and shall be of the "T hinge proud mount or flush mount" type as specified in the Project Specification. Handles are to be of the lockable 3 point with steel lever type.

**The Contractor is to provide the concrete base as specified in the Project Specification.

The interior and exterior paint finish, as well as that of the panels on which switchgear is to be mounted, are to be of high quality and suitable for outdoor use on all cubicles. The finishing process is to comprise the following:

Two coats of zinc chromate primer.

Two coats of high gloss enamel, applied by brush or sprayed.

The total thickness of the dry paint shall be 0.1 mm minimum and care is to be taken that all edges are properly covered.
18.4.2. Panels

All equipment, with the exception of meters, in the cubicle is to be flush-mounted behind one panel. This panel is to be fixed using two pins and two captive screwdriver slot fasteners.

18.4.3. Busbars

A solid copper busbar is to be provided for each phase and neutral, mounted on suitable coloured ceramic or equal insulators. Insulators shall be marked in accordance with colours of phases, i.e., red, yellow, blue and black for neutral.

The busbars shall be mounted in the top section of the cubicle just below the roof.

**Busbars must be easily accessible and unless otherwise specified dimensions of busbars are to be 6 mm x 25 mm x 300 mm long. A minimum of 50 mm spacing between busbars must be maintained.**

18.4.4. Earth Bar

Install in each cubicle a 6 mm x 25 mm x 230 mm solid copper earth bar with 8 x 8 mm diameter brass bolts, complete with brass washers, spring washers and nuts. The earth bar is to be tapped and heads of bolts are to be soldered to the busbars at the rear.

18.4.5. Cable Termination Brackets

Adjustable steel bracket of approved type is to be provided inside the cubicle for the mounting of paper cable end boxes and/or PVC cable glands, as required.

18.4.6. Alternative Offers

Tenderers may offer cubicles of glass fibre reinforced plastic construction instead of material as specified. Full details, consisting of informative drawings indicating size, construction and material used, must however, be submitted for approval prior to manufacture of the cubicle.

Tenderers shall offer cubicles which are in accordance with the requirements of the Supply Authority.

18.4.7. Earthing

See the clause on "Earthing" below.
18.5. DISTRIBUTION BOARD EQUIPMENT

18.5.1. Switchgear:

The low voltage switchgear shall be as specified in above in cause "Switchgear and Busbars.

18.5.2. Instruments:

18.5.2.1. Ammeters:

Combined Maximum Demand and Indicating type.

Instruments must be suitable for flush mounting with square dials of approximately 96 x 96 mm and are to comprise of moving iron ammeters showing the instantaneous current value, combined with maximum demand ammeters employing bimetallic devices which will indicate the mean current value on the basis of a 15 minute period, and which are fitted with a residual pointer to indicate the maximum mean current reached during any period between manual resetting. The bimetallic system must incorporate ambient temperature compensation. All three indications are to be given on concentric scales.

It should be noted that small instruments with window cut-out scales are not acceptable.

The accuracy of the moving iron ammeters and maximum demand ammeters must not be less than 1.5% and 3% respectively.

The meters shall be used in conjunction with current transformers with 5 Amp secondary windings.

18.5.2.2. Current Transformers

Current transformers are to be of the ring type with an opening to suit the dimensions of the conductors or busbars.

Current transformers for metering purposes are to be of the "CM" accuracy class and of the T10 Class for protection purposes. The rating is to be as specified in the detailed specification.

Current transformers are to be of the bar primary or wound primary type as specified and capable of withstanding the system fault current for 1 second or as specified.

Current transformers must have an output to suit the load but shall not be less than 5 VA. The accuracy shall be Class 1 and the transformers shall be suitable for voltages of up to 600 V 50 Hz or otherwise, as specified.

18.5.2.3. Voltmeters

Voltmeters are to be of the moving iron flush pattern type, to be 96 mm square and to be suitable for vertical switchboard mounting.
Studs are to be provided for back of panel connections, with insulating shrouds.

Voltmeters must be suitable for operation on a 50 Hz system and be calibrated from 0-500 V, or otherwise as specified.

Voltmeters must have industrial grade accuracy as specified.

18.5.2.4. Voltmeter Selector Switches

Selector switches shall be suitable for use in conjunction with a voltmeter, and for vertical switchboard panel mounting with studs for back of panel connections.

Back-up fuses shall be bolted to the bus-bars, rated to reduce the fault level of secondary wiring to the meter cubicle to less than 5 kA.

These switches shall have “OFF” and six metering positions and provide readings between neutral and each of the three phases as well as between phases.

Contacts are to be of silver alloy, and the latching mechanisms must ensure positive accurate positioning of the knob in relation to the face plate markings.

18.5.2.5. Voltmeter Fuses

These fuses shall be H.R.C. cartridge type mounted in holders suitable for busbar and panel mounting.

The cartridges are to be for nominal current rating of 1 Amp at 380 Volt 50 Hz, or otherwise as specified.

18.5.2.6. Test Block For Metering Circuits

On Main Distribution Boards the wiring to voltage and current metering shall be connected via a GEC Type PK Test Block so as to facilitate simple remote measurement of the three phase voltages and neutral and the three current transformer secondary currents. These blocks are to clearly labelled to indicate measured parameters.

18.5.3. Equipment

18.5.3.1. Busbar Insulators

All busbar insulators shall be of white glazed porcelain suitable for voltages up to 600 V.

The insulators with U-clamps shall be approximately 75 mm in diameter by 70 mm high and are to be carried by a 12 mm galvanised iron spindle, with 12 mm thread and fitted with a hexagonal nut.

The top of the insulator is to be fitted with a U-type holder with clamping bolt, suitable for taking busbars up to 16 mm thickness edgewise.
The insulators with bolts shall be approximately 75 mm in diameter by 75 mm high and shall have flats on each end drilled and tapped 10 mm Whitworth thread. Two 10 mm x 25 mm long bolts must be supplied with each insulator.

Subject to approval, suitable glass-filled polyester insulators or suitable non-hygroscopic and non-tracking insulating separator boards may be used.

18.5.3.2. Terminals

Terminals are to be suitable for mounting to standard DIN mounting rails.

They are to be constructed of heat stabilised, flame resistant plastic and are to be arc self-extinguishing.

Contacts are to comprise high conductivity tinned copper.

Terminals shall be of the cage-clamp sprung or the screwed plate clamping type.

It shall be possible to jumper together groups of contacts by means of push-in type jumper contacts in the terminal block centre, without the need to cut or break out sections of the block centre.

18.5.3.3. Pilot Lights

** Unless specified otherwise in the Project Specification, all pilot lights shall be 230 volt cluster type light emitting diodes housed behind a nominally 22.5 mm diameter reflectors and shall give an indication clearly visible in normal daylight.

Pilot lights operating at 50 volts dc or less shall be of the light emitting diode type.

18.5.3.4. Test Blocks

Wiring to voltage and current metering shall be connected via a GEC Chamberlain and Hookham Type PK Test Block so as to facilitate simple remote measurement of the three phase voltages and neutral and the three current transformer secondary currents. These blocks are to clearly labelled to indicate measured parameters.

18.6. LABELS

Engraved white black white plastic laminate labels are to be used, except in the case of the main and emergency supply circuit breakers, where red white red plastic laminate labels are to be used. Labels are to be fixed to panels by means of 3 mm chromium plated bolts and nuts and channelling.
18.7. DIAGRAMS

All boards shall be provided with "as installed" schematic diagrams indicating:–

Where their supply(ies) come from;

All circuits that they supply, and the identifying number and size of the outgoing cables;

Their own internal wiring with circuit numbers, terminal numbers, voltages, and wiring colours used;

Circuit description;

Component legends and circuit diagrams

Suitable neat legends of minimum A 4 sheet size shall be provided mounted inside doors or wall frames.

Where circuit diagrams are required these shall be suitable for mounting with the legends.

One permanent copy is to be framed and fixed to the board, or on a wall close by, and covered by a glass or clear perspex sheet, or other approved.

18.8. LAYOUT DRAWINGS, APPROVAL AND INSPECTIONS

Prior to manufacture all proposed layout drawings shall be submitted to the Engineer for approval.

18.9. EARTH BARS

Connections to tinned copper earth bars shall be made onto studs formed by a bolt drilled and tapped into the busbar and fixed with a lock nut. The conductor connections to the stud shall take the form of a crimped lug captured by a lock washer and nut.

19. CONTROL PANELS

19.1. GENERAL

Layout drawings and working drawings of the panels are to be submitted to the Engineer for approval prior to manufacture.

** Unless specified otherwise in the Project Specification, the switchboard shall be designed to withstand a fault level of 35 kA.

19.2. COMPONENT ARRANGEMENT

The power and control component and wiring are to be separate.

Components are to be replaceable from front access only without dismantling the panel framework.
All components and their terminals, mounting fuse and plug-in unit are to be specifically identified and labelled.

19.3. CABLING AND Wiring

All cabling and wiring less than or equal to 4 mm$^2$ are to be connected via terminals.

Wiring is to be run in PVC-"Comb" trunking and neatly strapped with purpose made straps where it is not practical to run in the trunking.

Each wire is to be uniquely identified by ferrules at each end.

Power and control wiring are to be run in separate trunking.

**Where specified in the Project Specification wiring is to be arranged such that where contacts are controlling a device in logical sequence that the intermediate connections between contacts are brought out to terminals for the purpose of testing.

**The wiring is to be extensible to terminals when specified in the Project Specification for connection remote supervisory and control system.

Where wiring is connected to a hinged door, it is to be run in a loom via terminals on the fixed framework for simple disconnection.

The wiring layout is to facilitate complete rewiring without dismantling the panel framework.

Exposed wiring terminations carrying 220 volt or above shall be shrouded against accidental human touch.

19.4. TERMINALS

Terminals for less than 30 amp rating are to be non combustible, screw-clamp type individually insulated and suitable for mounting on DIN rail and attaching auxiliary devices such as bridging bars and links, fuses, indicator and isolation which facilities are to be provided if specified further.

**Terminals are to be uniquely identified by number or letter as specified in the Project Specification.

Terminals are to be rated for the applicable fault level and current rating specified.

19.5. INSTRUMENTATION AND PROTECTION

Instrumentation and protection equipment is to be mounted so as not to expose the operator to the power wiring for routine setting adjustment and fuse replacement.

These components are to be replaceable without dismantling the framework of the panel.

Current transformers are to be removable from purpose made links in the busbars or primary conductors.
Fault reduction on metering wire is to be done via fuses bolted to the power busbars.

19.6. **INDICATORS, PUSH BUTTONS AND SELECTOR SWITCHES**

** Unless specified otherwise in the Project Specification, all pilot lights shall be 230 volt cluster type light emitting diodes housed behind a nominally 22.5 mm diameter reflectors and shall give an indication clearly visible in normal daylight.

Pilot lights operating at 50 volts dc or less shall be of the light emitting diode type.

The lenses are to be suitable for fitting various colours and symbols as specified further. Indicators Push buttons and switches are to be of the same manufacture and match each other throughout. These units are not to be mounted on unhinged removable access panel sections.

19.7. **LABELLING**

Each access panel to control units is to be labelled as to its function or to give a unique identity to control diagrams. The identity of the Panel is to be labelled.

19.8. **EARTHING**

Earthing is to be done as per clause on "Earthing" below.

19.9. **WIRING DIAGRAMS AND SCHEMATIC DIAGRAMS**

The following are to be supplied to the engineers approval prior to testing and commissioning:

- Wiring diagram uniquely detailing the physical wiring arrangement in the panel.

- Schematic wiring diagram uniquely defining the wiring and connections in the panel in a format which facilitates easy logical performance of the controls to be assessed.

- Schedule of each component and description of its identity and operating function, as well as its replacement part numbers.

- Schedule of protection and control setting characteristics and setting values.

- Narrative of control diagram functions.

- 2 sets of operating and maintenance manuals.

19.10. **TESTING AND COMMISSIONING:**

The Contractor is to test the correct performance of the control panel and to document a test and commissioning procedure that will uniquely demonstrate the correct setting and operation of each component of the control panel and arrange for this demonstration to be witnessed by the engineer and to meet his approval.
19.11. PHYSICAL CONSTRUCTION

19.11.1. Floor Mounted Panels

Floor mounted construction shall be suitable for front access only for maintenance and extension purposes with panel dimensions shall not exceeding 2 000 mm high, 400 mm deep and multiples of 400 mm wide (typically 3 x 400 mm).

**Unless detailed otherwise in the Project Specification, controllers requiring increased depth, the panel dimensions shall not exceed 2 000 mm high, 700 mm deep and 600 mm or 1 200 mm wide with front access for maintenance and extension purposes.**

Doors and removable covers shall be as for LV distribution boards. Switchboard except for sealing sealed against gaskets.

The cubicles shall be linked with horizontal busbars with PVC insulated cable droppers to each controller.

Each starter rated at 1 kW or more shall be accommodated in a separate metal enclosure with its associated controls.

Provision is to be made to run control busbars and wiring horizontally linking the cubicles at the top and bottom.

Cable access with glanding facilities are to be provided for top or bottom entry. Provision is to be made in the glanding facility for individual glanding plate pieces for each cable, each piece being mechanically bolted to the cubicle framework adjacent to the earthing bar.

19.11.2. Wall Mounted Panels

These panels are to be constructed as for electrical sub-distribution boards.

All removable covers and doors are to be fitted with gaskets and covers are to be fitted with two pins and coin slot screws.

Panels shall be suitable for equipment with a fault current less than or equal to 5 kA.

Overall width of the panel is to be 600 mm.

Cable, trunking or conduit access is to be provided at top and bottom.

The Main Disconnector and neutral link are to be located at the bottom right hand section of the panel.

Busbars are to be provided for power distribution to protective devices.

Provide mounting facility for wiring schematics and documentation. This is to be a pocket to contain A4-size documentation format.
20. LOW VOLTAGE (400 VOLT) POWER FACTOR CORRECTION

20.1. CUBICLES

Except where otherwise specified, the cubicles shall be of the floor mounting type, suitable for installation over a cable trench, with cable access from below. Cubicles shall be constructed in accordance with the specification for distribution boards. Checker plating, if any, over cable trenches shall be neatly slotted to permit cable entry and installation.

Capacitors shall be installed in the lower section of the cubicle, which shall be constructed such as to allow for natural cooling by means of vermin proof steel louvres in the top and bottom section of the cubicle.

20.1.1. Controller

A micro processor based reactive power controller with basic requirements as follows:

- Supply voltage 220 V or 380 V
- Digital display
- Push button control of functions
- Power factor indication
- Not less than six steps of control
- Switching delay between two program steps shall be adjustable up to 60 seconds
- Lock time safety time between connection and re-connection of the same capacitor shall be not less than 150 seconds
- Output relay contacts shall be suitable for 7,5 A at 250 V

20.1.2. Capacitors

**Capacitors shall be rated as specified in the Project Specification. Capacitors shall be installed in the cubicle such as to permit easy connections, removal and inspection. Each capacitor container shall be provided with a robust earth terminal, earthed to the cubicle earth bar by means of 16mm$^2$ annealed copper earth wire.**

A discharge resistance network shall be provided for each capacitor, to ensure effective discharge within one minute after switch off, and means shall be provided to prevent the main switch being switched "ON" or "OFF" under load.

20.1.3. Wiring

Wiring between capacitor contactors and capacitors shall consist of PVC insulated armoured cable. All control wiring shall be effectively
numbered and connected to wiring terminal strips, to facilitate connections.

A complete wiring diagram shall be provided and displayed behind a suitable clear acrylic plastic sheet on the inside of the cubicle door.

20.1.4. **Gland Plates**

Rigid gland plates shall be installed for all cable terminations inside the cubicle. The gland plate for the termination of the supply cables shall be installed in the bottom section of the cubicle. All gland plates shall be sufficiently rigid to avoid deformation by the mass of the cables.

20.1.5. **Current Transformers**

Except where otherwise specified in the detailed specification, current transformers shall be of the 5 LA class C type and shall comply with BSS.3983. All CT's shall be clearly and indelibly marked "POWER FACTOR RELAY CT" and "POWER FACTOR INDICATOR CT".

20.1.6. **Labelling**

All equipment facing outside and equipment installed inside the cubicle shall be clearly labelled, indicating function and sequence of switching of equipment.

21. **LOW VOLTAGE SWITCHGEAR**

21.1. **METAL CLAD AIR CIRCUIT BREAKER WITHDRAWABLE TYPE**

The circuit breaker shall be withdrawable and shall be a self contained unit of the dead front type, with the necessary mechanical interlocks to prevent:

Access to "Live" terminals when the breaker is withdrawn.

The withdrawal or insertion of the unit, when the breaker is in the closed position.

Thermal overload releases are to be provided which are to be adjustable over the trip range as specified below.

In addition instantaneous magnetic short circuit trips are to be fitted, which must be adjustable above or below the normal setting.

To obtain grading between the main incoming circuit breaker and the switchgear on the outgoing circuits under fault conditions, the circuit breaker shall be provided with an adjustable time lag on the magnetic releases.

The air circuit breaker shall be provided with:-

A mechanical hand charged, stored energy, spring operated closing mechanism of the trip free pattern. Where motorised breakers are specified, an electrically driven geared mechanism is to be provided in
addition.

A manually operated mechanical trip suitably protected to prevent inadvertent tripping.

A positively driven mechanical indicating device to indicate whether the circuit breaker is "open" or "closed". This indication shall be clearly visible with the breaker in position.

An indication, in the form of a fleeting contact, which can be accessed from marked terminals, of the breaker having tripped on thermal trip, i.e. on overload.

Facilities for locking the breaker in the open or earthed position.

Facilities for interlocking with other switches such as bus couplers and change over devices.

Provision must exist for the addition, if required, of a source side under voltage lockout.

To prevent extension type operating handles from being removed or lost, the handles must be fixed to the circuit breaker on completion of the installation. Fixing of the handles may be effected by means of locking screws or pins.

Switches are to be suitable for maintenance, testing, repair and replacement from the front of the switch panel, and are to be accommodated in the standard panel as detailed.

A description and illustration of the circuit breaker, trip curves and a copy of the test certificate of breaking capacity must be submitted.

21.2. COMBINATION FUSE SWITCHES

Fuse switches are to be of the triple pole type.

The fuse cartridges must be suitable for a 415 V 50 Hz system.

The "ON" and "OFF" positions must be clearly marked.

The fuse links must be fully isolated when the switch is in the "OFF" position, and interlocks must be provided to prevent the cover being opened when the switch is closed and to prevent the switch being operated with the cover open.

NOTE:

Fuse gear comprising H.R.C. fuse cartridges carried on the cover, the cover also forming the operating lever, is regarded as a fuse isolator and is not acceptable.

Switches are to be suitable for mounting in the standard switch panel, and accessible from the front of the panel for maintenance testing, replacement and equipping of additional ways.

21.3. MOULDED CASE ENERGY LIMITING CIRCUIT BREAKERS

These breakers shall be of the fault current limiting type, rated for up to 150 kA
fault. Fault limitation is to be achieved using a combination of magnetic principles, including cross connection of fixed contacts, and both repulsion and attraction circuits activated under fault conditions. A separate current limiting compartment is to be provided, with a gas producing insert to smother arcs as well as arc shoots.

The performance of these breakers up to 150 amps shall be guaranteed to protect 5 kA zero switching MCB’s on the down stream side of a 500 kVA, 4.5% impedance 11000/400 volt transformer, independent of cable or busbar impedance.

The units shall be suitable for vertical or horizontal mounting.

21.4. MINIATURE DISCONNECTOR

Miniature disconnector shall be micro-gap type manually operated air break switches suitable for flush mounting. Where individually mounted they shall be in galvanised steel boxes with dished cover plates finished to match switch cover plates.

All disconnectors shall be on load units.

The terminals shall preferably be of the bolt and nut type to accept cable lugs, using washers and lock washers on each termination. Only where this is not possible, will the pressure type terminal where the conductors are inserted into the terminal and held in position by a pinching screw which covers the full width of the aperture, be accepted.

21.5. MINIATURE CIRCUIT BREAKERS (M.C.B.'S)

Miniature circuit breakers shall be of the hermetically sealed magnetic and thermal trip types, or hydraulic-magnetic with inverse time relay characteristics on low overloads and high speed tripping on short circuit faults. The switch action shall trip-free.

The rupturing capacity shall be a minimum of 5000 Amps unless otherwise specified. Terminals on the breakers shall preferably be of the bolt and nut type to accept cable lugs. Only where this is not possible, will the pressure type terminal where the conductors are inserted into the terminal and held in position by a pinching screw which covers the full width of the aperture, be accepted.

21.6. EARTH LEAKAGE RELAY AND BREAKERS

This relay shall be fully sealed, dust and moisture proof. Construction shall also be such as to render the unit completely tamperproof.

The principle of operation shall be core balance and nominal sensitivity shall be 30 mA.

The relay shall be used in conjunction with a suitable double or triple pole disconnector or circuit breaker with shunt trip as specified especially recommended or approved by the relay manufacturer for the purpose.

Alternately the relay and circuit breaker may be a complete unit.
21.7. CONTACTORS MOTOR STARTERS

Contactors shall be of adequate rating to carry at least 1.2 times the current specified at a 0.85 Power Factor, and shall be capable of interrupting fault currents as specified elsewhere.

The contactors shall have 230 volt or 400 Volt continuously rated coils and shall be suitable for remote control.

The contactor shall hold in reliably even if the coil voltage drops to 70% of its rated value.

The armature operation shall be silent.

The main contacts shall be silver or equivalent faced.

The construction shall be totally enclosed, damp and dustproof.

The insulation between sets of contacts shall be capable of withstanding 400 Volts A.C.

The operating coil circuit shall be protected by an H.R.C. control fuse or circuit breaker as specified on the distribution board, or on the contactor itself, and be sized to suit the coil capacity.

All motor starters shall have thermal overload protection on each of the three phases, with positive protection against single phasing and no-volt release mechanism.

Where two contactors are mechanically interlocked it shall not be possible to close both contactors at the same time.

The contactors shall be of approved manufacture.

22. WIREWAYS

22.1. CONDUIT AND CONDUIT FITTINGS

22.1.1. General

Conduit shall be heavy gauge welded screwed steel conduit and shall be either galvanised or enamelled except where installations are undertaken within 50 km from the sea, when only galvanised conduit and fittings shall be used. No conduit smaller than 20 mm and of wall thickness less than 1.2 mm shall be used.

Fittings shall be of galvanised or enamelled pressed steel and brass bushes. Fittings shall be galvanised where galvanised conduit is specified. If enamel conduit is specified for the installation, galvanised conduit and fittings may be used in lieu of enamelled, and shall nevertheless be used in the following situations:

Where conduit runs are permitted in ground floor slabs.

Where conduit is run exposed on wall surfaces or rises free from floors.
In damp situations.

Where exposed to the weather

Where conduit rising from floor level and forming "U" traps are permitted.

22.1.2. Outlet Boxes and Conduit Accessories

The dimensions of wall outlet boxes for switches and socket outlets shall be to the S.A.B.S. specification and the dimension of special purpose boxes shall be a specified or appropriate to their purpose.

Outlet boxes at lighting points, etc., shall be standard 50 mm dia. circular boxes.

Junction boxes shall be hot dipped galvanised steel or other approved.

Draw-in boxes shall be malleable iron or other approved, circular for conduits up to 20 mm diameter, and rectangular or square for conduits larger than 20 mm diameter. All boxes shall have substantial lids secured by brass, round or cheese headed, screws.

Boxes shall be galvanised where galvanised conduit is specified and may be installed as follows:-

22.1.2.1. In roof spaces

50 mm Round Shallow Boxes Inspection Couplings
Wiring Trays

22.1.2.2. In Concrete Slabs

50 mm Round Deep Boxes
Wiring Trays

22.1.2.3. Surface

50 mm Round Shallow Boxes
Inspection Couplings
Back Entry Elbows
Wiring Trays

22.1.2.4. Wiring trays

Where 3 or more inspection couplings or draw boxes are required in close proximity to each other in a conduit bank, a single wiring tray should be installed in place thereof.

22.1.3. Installation of Conduit

Except where otherwise specified all conduit shall be concealed by laying in concrete, chasing in walls or running in roof spaces.

The Contractor shall arrange to have all conduits, switchboards, etc., ready in good time in order not to delay the building contract.
Drops to wall outlets shall be where possible from ceiling level unless otherwise approved.

Draw-in boxes in the roof space shall be in easily accessible positions.

Draw-in boxes elsewhere shall be in approved positions.

No conduit run shall have more than two $90^\circ$ bends or the angular equivalent, between draw points.

Any 50 mm round draw boxes in ceilings and walls shall have flat metal covers fitted to the boxes together with biscuit rings, if necessary, and secured with round head brass screws, before painting.

Purpose made steel cover plates on flush draw-in boxes shall overlap boxes by approximately 15 mm on all sides and shall blend with the surrounding finishes.

In accessible roof spaces conduit runs shall be installed along or at right angles to the direction of roof trusses.

Conduits which run parallel to ceiling joints and to tie beams shall be fixed on the top of such timbers.

In accessible roof spaces conduit runs shall, where possible, be grouped together and shall be kept at saddle distance apart and fixed with saddles and 25 mm clout nails at reasonable spacing (not exceeding 2 000 mm).

In surface installations, conduit shall be supported on spacer saddles to allow approximately 3 mm clearance behind the conduit and shall be fixed at spacing not exceeding 2 000 mm.

Except for surface installations outlet boxes for ceiling fittings shall finish flush with the underside of the ceiling.

**Conduits, boxes, fittings or any other electrical equipment shall be adequately fixed to walls, slabs, beams or columns as specified in the Project Specification.**

The routes of conduits shall be arranged to avoid trapdoors or low level pockets.

Under no circumstances shall conduit boxes be installed where access cannot be obtained after completion of the building.

All joints shall normally be metal to metal and shall be screwed home, with lock nuts where necessary.

Running joints shall be avoided where possible but where used shall be fitted with lock nuts.

The conduit installation shall be watertight and shall be mechanically and electrically continuous.

During construction precautions shall be taken against the ingress of moisture and dirt and open ends shall be plugged with sockets and
metal plugs or sockets and conduit fishtails.

Before any wiring is installed, all conduits shall be swabbed dry internally.

All conduit joints particularly where screw threads protrude and also where galvanising or enamel has been damaged, shall be painted with approved anti-corrosive paint. Where these touched up sections are visible to the public eye, they shall, additionally, be painted with two coats of aluminium paint in the case of galvanised conduit or black enamel paint where black conduit is used.

Bending of surface conduits shall be carried out on a bending machine. Where parallel conduits are off-set or bent the radii of the bends shall be from a common point so that the distance between the conduits is constant throughout the run. In this connection only the smallest radius bend need be made on a machine.

Conduit shall be installed as far as possible in straight lines, with easy sets or bends, and where practicable, shall be drained.

In concrete slabs hand made easy sets or bends may be made. Otherwise bends and sets shall be made cold with a bending machine.

All bends and sets shall be free of indentation or distortion, i.e. the conduit diameter shall not be reduced.

Excess holes in junction boxes, cable trunking, outlet boxes, switchgear, etc., shall be blanked off by means of stopping plugs or other approved means.

Unless otherwise approved manufactured bends, elbows and "T" pieces shall not be used, and where allowed shall be of the inspection type.

Circular boxes shall be used where tee joints are required.

Sheradized steel or brass or similar approved screws shall be used on conduit fittings.

Unless approved no conduit shall be laid in any ground floor slab.

Where conduit rises free from a floor it shall be supported against bending.

The inside of all conduit shall be cleaned free of burrs and sharp edges. Open ends shall be fitted with brass bushes.

Where conduit enters boards, trays, trunking, etc. locknuts shall be used inside and outside with female bushes inside. Where conduit enters outlet boxes, couplings and male bushes may be used.

Wiring trays shall be installed in the roof space directly above distribution boards to facilitate the conduit installation. Such trays shall be constructed of minimum 1.6 mm sheet steel with detachable covers and shall be galvanised. The length of the trays should be at least equivalent to the width of the board below. The width shall be sufficient to accommodate conduits entering from the sides plus spares at saddle distance apart but not less than 300 mm. They shall
be not less than 75 mm deep with multiple conduit entries including spare 20 mm and 25 mm wide entry knockouts or blanked-off entries. They shall be rigidly supported and installed so that conduits shall enter without offsets.

At least two spare 20 mm and two spare 25 mm conduits shall be installed between each distribution board and its roof wiring tray.

Conduit laid in concrete shall be laid above the reinforcing bars and securely tied to the bars and shall terminate in long spout deep circular malleable iron boxes, or other approved, for lighting points. Conduits in Theatres and Intensive care units shall not be fixed to reinforcing steel.

Conduit chased in brick walls shall be secured at reasonable spacing (not exceeding 1 800 mm) by means of 75 mm nails.

All conduits shall be kept at least 150 mm clear of and if possible below gas, flue, steam or hot water pipes, or any other pipe, the contents of which would damage the conduit or cabling. The positions of all conduit outlets for boxes such as light points, switch points, socket outlets, power outlets, fans, silent call outlets, telephones, etc. shall be verified on site with the detail drawings.

Any discrepancies observed on site between the Engineer's drawings and the Architect's detail drawings shall be drawn to the attention of the Engineer for his decision.

Outlets to fixed equipment such as sterilizers, laundry machines, kitchen equipment, etc. shall terminate in one way outlet boxes approximately 450 mm above floor level, unless otherwise specified.

All conduit runs crossing expansion joints shall make special provision by having outlet boxes or trays in approved positions on one side of the expansion joints. Conduit crossing the expansion joint to the box shall enter into the box freely and without being secured thereto but with a close fit. Other conduits entering the box shall be secured in the usual way.

Each conduit entering freely into the box shall be earthed with a clip wired to a bolted and properly secured earth connection on the box, and in addition an earth wire shall be run in each conduit and connected between outlets on each side of the joint.

22.1.4. Alternative Conduit Systems

** The tenderer may offer as an alternative to the conventional threaded conduit system specified above, or to the system specified in the Project Specification, a patent lock-in system such as the Bosal Africa "Locfit", "Tapertite" or equivalent, provided the system complies with the following:

For other installations an alternative to the conventional threaded conduit system specified above, tenderers may offer a patented lock-in system such as the Bosal Afrika "locfit", "Tapertite" or Plastic or otherwise specified provided the system complies with the following:-

The system shall be installed in accordance with the recommendations of the manufacturer.
The type of system offered must be acceptable to the Engineer.

22.1.5. Flexible Conduit

Only metallic flexible conduit shall be used.

Metal flexible conduit shall be "Kopex", or other approved, covered overall with a P.V.C. sheath.

Each length shall be kept as short as possible and shall be complete at each end with duralumin male gland and conduit coupling having a fixed earth connection and appropriate length of earth wire between.

22.2. STEEL TRUNKING AND DUCTING (WIRING)

Trunking shall be constructed from at least 1.6 mm galvanised sheet steel, of approximately 3 000 mm in length.

The trunking shall be turned in, to form a lip at both edges.

Where trunking forms part of a finished ceiling the cover plates shall be snap in P.V.C. to an approved colour. Elsewhere cover plates shall be galvanised sheet steel of the spring loaded snap in type. Self tapping screw fixing "biscuit tin" lids will not be allowed.

All bends, tees, intersections, endcaps and other accessories shall be works fabricated and finished by the trunking manufacturer.

Accessories shall be of similar construction and finish to the trunking.

Bends, tees and intersections shall be of the gusset type.

Intersections which have holes cut in the base of one trunking to allow the passage of cables into the other, shall have a protective P.V.C. beading round the edge of the hole.

The trunking must be mechanically and electrically continuous throughout.

Trunking which is installed vertically shall be fitted with pin racks at not more than 1000 mm centres.

Where trunking faces downwards, suitable cable retaining straps shall be fitted at not more than 500 mm centres, to prevent the cable from falling out when the cover plates are removed.

Lids shall be retained to trunking using 150 mm treasury tags (2 per 1500 mm length) to facilitate effective lid removal and replacing when wiring.

Trunking shall be fixed to walls by No. 12 x 30 mm long round head screws and "Fisher" plugs at not more than 1000 mm intervals with additional fixing at bends and intersections.

Trunking shall be supported by substantial brackets where required at not more than 2000 mm centres with additional supports at bends and intersections.

Brackets shall match the trunking finish where in the public eye.
All conductors in a circuit shall be taped together at not more than 2000 mm intervals so as to effectively separate circuits and to maintain neatness as much as is possible.

Lengths of trunking shall be coupled together by means of steel fish plates.

Earth continuity shall be ensured by means of a green P.V.C insulated earth continuity conductor being run the full length of the trunking and connected as detailed in the “Earthing” clause.

When installing trunking, the Contractor shall ensure that the following requirements are strictly adhered to:-

- When trunking is cut, filed or drilled the connections shall be given one coat of anti-corrosive paint, and where in the public eye one finishing coat to match the trunking finish.
- Where conduits enter trunking, the connection shall be made with two locknuts and a female brass bush. Where conduits leave the trunking they shall be labelled by means of ferrules attached with purpose made strapping. The label shall identify the circuit number within the conduit.
- Care must be taken to ensure that all steel and brass particles, etc. are removed from the trunking prior to the installation of cables.
- Where trunking passes through holes in the building structure, a fixed portion of the trunking cover plate shall be fitted to the trunking before installation and shall be arranged to project at least 50 mm beyond the finished surface of the building structure.
- Cable joints shall not be permitted within the trunking.
- Where the trunking passes through fire walls or floors, Bestobel Salamander GB 1713-011 packing shall be employed to a distance of 50 mm on either side of the building fabric to effect a fire barrier.

22.3. ALUMINIUM DUCTING (AND HOLLOW SKIRTING)

The requirements for Aluminium Ducting are the same as for Steel Ducting where applicable.

**Aluminium ducting shall consist of an aluminium extrusion of cross-section as shown on the drawings and described in Project Specification.

Ducting and cover plates shall be anodised to grade B where required.

The ducting must be installed as shown on the drawings, and the Contractor shall allow for drilling and tapping all necessary holes for fixing locking screws, socket outlets, light switches, fuse holders, etc.

In order to hold lids in place, suitable approved high density neoprene round section shall be provided to fit into insert section of the lids.

Where lids contain an outlet device the lids shall be fixed to the trunking by means of a course thread self-cutting screw.

Lengths of ducting shall be coupled together by means of aluminium fish plates or
spring pins.

Units terminating a trunking run shall be fitted with blanking off covers which shall be readily removable to permit extension of the run.

The Contractor shall take accurate measurements for the ducting on site and shall submit drawings to the Engineer for approval before the trunking is ordered.

Before cables are laid in the ducting, the Contractor is to ensure that all sections of the ducting are free from sharp edges, burrs, and weld spots which could cause damage to cable insulation.

The Contractor shall include in his tender for the supply and installation of all necessary ducting suspension brackets for fixing the ducting as shown on the drawings. Where ducting turns through 90°, 45° purpose made suitably sized corner chamfer units shall be installed where specified.

The Contractor shall be responsible for the lining-up' of all ducting regardless of building wall, floor or ceiling deviations.

22.4. CABLE TRAY

Cable trays shall be of perforated mild steel in standard sections and lengths as supplied by the manufacturer. The metal thickness shall not be less than 2,5 mm. The tray width shall not be less than 150 mm, and the flange shall not be less than 12 mm.

Where a tray is damaged or cut, filed or shaped, the affected portion shall be given a coat of red lead or anti-corrosive paint. Where the touched up sections are visible to the public eye, they shall additionally be painted with two coats of paint to match the tray finish. All painting must be complete before running cables on the cable tray.

Cable tray accessories such as bends, tees and intersections shall have an inside radius of at least 50 mm and shall be of the same construction and finish as the cable tray.

Cable trays shall be securely fixed with brackets at not more than 1 500 mm intervals, with additional fixings provided at bends, tees and intersections.

Cable trays shall be mechanically continuous throughout.

Mushroom headed corrosion resistant screws and nuts shall be used on all joints and for fixing to brackets. There shall be at least two bolts per joint of fixing.

All brackets supporting cable trays shall be a fabricated "L" shaped type, manufactured from at least 2,5 mm mild steel, or other approved. Brackets shall be hot dipped galvanised or approved equal corrosion resistant finish.

22.5. CABLE LADDER

Cable ladder where specified shall be constructed of mild steel, 2 mm thick and 76 mm high side rails jointed at 250 mm intervals by means of P4000 41,3 mm x 20 mm x 6 mm x 1,6 mm thick steel channel sections, or of anodised aluminium Grade B.

All accessories such as elbows, tees and cross-overs shall have a 450 mm
internal radius.

**Ladders are to be provided in 3000 mm lengths and are to be fixed at 1 500 mm intervals as specified in detail and/or as shown on the drawings. See the Project Specification.

A steel Cable ladder is to be supplied finished hot dipped galvanised.

Aluminium cable ladder is to be supplied complete with all necessary fixing brackets. Where joints between the aluminium and other metals are required, these are to be insulated to prevent galvanic corrosion.

### 22.6. IN-SCREED FLOOR TRUNKING

In-screed floor trunking shall be constructed of galvanised sheet steel of minimum 2 mm thickness of rectangular cross section keyed into the screed.

### 22.7. LABELLING

Each wireway outlet box shall be labelled using approved nominally 25 mm adhesive disc labels, marked to identify the number of the circuit which supplies the outlet.

**Trunking wireways shall be colour coded as specified in the Project Specification. The colour coding shall be painted on fish plates nearest to changes of direction, intersections and where passing through structural barriers.

Trunking covers shall be similarly colour coded with approved adhesive discs at 9 000 mm intervals and at changes in direction, intersections and where passing through structural barriers.

In a conspicuous place along cable ladders their identity shall be stencilled on.

### 23. EARTHING INSTALLATION

#### 23.1. GENERAL

Earth continuity conductors shall be made of copper, except for where the size required is equal or greater than 10 sq mm copper, in which case the earth continuity conductors shall be made of composite strands of copper and steel equivalent to "Interlock" by Walro Flex, having the equivalent copper cross-section specified.

Self-tapping screws are not acceptable as a method of fixing earth terminations.

Where required a 10 mm² BARE COPPER CONDUCTOR is to be run the full length of the roof space, securely fixed to top purlin and is to be bonded to the main lightning conductor. The roofs are to be bonded from this conductor at intervals not exceeding 18 000 mm.

All ends of earth conductors shall be tinned. All joints shall be tinned and clamped using a minimum of two copper rivets cadmium plated or high tensile steel bolts and nuts, or otherwise made off in specific instances, as detailed further. Clamped joints shall be tinned overall after completion.
Cable armouring shall be internally bonded to the cable gland using cable glands fitted with screw-on earth tag with 50% cross-section of the maximum conductor size and a max cross section of 70 sq mm and connected to the adjacent earth bar using an earth continuity conductor.

Earth terminations into the general mass of ground shall be installed as early as possible in the building programme, and the onus is on the Contractor to arrange this so as to avoid later disturbance of completed construction. Before proceeding, however, the attention of the Engineer is to be drawn to the exact proposals, and approval obtained.

23.2. HV. SWITCHGEAR

Where HV switchgear is included in the installation, completely separate connections to the main earth bar as detailed below are to be provided for this, by connecting a 70 mm$^2$ bare copper earth continuity conductor into each HV panel.

HV Switchgear is to have an earth tape to which the armouring of connecting cables is bonded. A section of the tape is to be clearly identified as an earth bar to which all external earth connections are made, such as connections to fencing and the neutral earth bar. These connections are to be clearly labelled.

Where an HV switch panel is remote from any transformer sub-station, the local earth bar is to be connected to an earth termination of either two 20 000 mm lengths of 70 mm$^2$ minimum copper conductors run in separate trenches or a rod earth.

23.3. TRANSFORMERS

Where transformers are included in the installation, the neutral of each shall be earthed by means of a separate copper strap each connected to the main earth bar as detailed below. These straps shall be P.V.C. insulated copper conductors, tape wrapped and fixed by means of porcelain insulators away from other earthed material.

Transformer frames shall be earthed by separate bare copper conductors to the main earth bar.

Transformers are to have a clearly identified earth bar of 95 mm$^2$ min copper section established at the tank earth stud. To this bar armouring tails for cables, fence connections and neutral earth bar connections are to be made and labelled.

If the transformer is in the form of a mini-sub then the Neutral Earth Bar is to be established on stand-off insulators in the LV section so as to be easily accessible for further connections. All connections to be clearly labelled.

23.4. NEUTRAL EARTHING BAR

The neutral earthing bar, shall consist of a length of copper busbar at least equal in section to 40 mm x 6 mm. It shall be supported on the substation wall by means of shock resisting insulators, in a suitable position above floor level over the end of a trench readily accessible for inspection and within 10 000 mm of the transformer(s). Conductors connected to it shall be fitted with crimped lugs and shall be securely bolted to it using high tensile steel bolts. Each conductor shall
be clearly labelled.

The main switchboard is to be earthed by means of 70 mm$^2$ minimum bare copper conductor or equivalent connected to the main earth bar.

Metal cold water mains entering the building is to be earthed by means of a 95 mm$^2$ minimum bare copper conductor, connected to the main earth bar.

From the main earth bar, two conductors of at least the same cross sectional area as the bar, shall be led to the main earth electrode. These conductors shall be green P.V.C. insulated and shall be supported on shock resisting insulators until they are connected to the earth termination system.

23.5. EARTH ELECTRODES

Where earth electrodes are required, two shall be provided, each electrode consisting of one, or more as required, to meet the earth resistance laid down elsewhere "Copperweld" rods driven vertically into the ground at least 3 000 mm apart, in location specified, or if not specified, in the nearest open area to the switch room concerned.

Where earth electrodes are required by the Supply Authority, they are to be installed to their approval.

The extensible earthing rods are to conform to the following specification:

The earthing rods are to be copper clad steel manufactured of a steel core with a copper covering, the conductivity of the rod should be not less than 40% of that of pure copper, thoroughly molten welded thereto so that an interlocking crystalline union exists between the two metals.

The earthing rod when broken by successive bends shall not show seams, pits, slivers or separation of copper from steel.

The rods shall have rolled and not machine cut threads on both ends.

The tensile strength of the earthing rods shall not be less than 400 Megapascals.

External sleeve type threaded couplings made of non zinc bronze for connecting the earthing rods.

High tensile steel driving bolts.

Phosphor bronze stirrup type termination clamp with 10 mm set screw.

The heads of these spikes shall be accessible, below 250 mm x 250 mm cast iron inspection covers, where they shall be fixed to the straps from the main earth bar, using the "Cadweld" or other approved process. The section of weld shall be at least 2 times the outside diameter of the rod in each case.

The termination to these is to be clamped twice, and at a depth of at least 300 mm.

The inspection covers shall be supplied and installed by the Contractor.
Where more than one rod is required per earth these shall again be 3000 mm from the nearest rod. The heads of all rods forming an earth electrode shall be jointed by a full copper section strap.

Where ground conditions, e.g. rock, do not permit the use of driven rods, with the approval of the Engineer, a mat of at least 25 mm² copper at least 6000 mm by 2000 mm, or 4000 mm by 4000 mm, with a 20 mm mesh, shall be buried as deep as possible. Earth straps shall be bonded to this in at least two places on opposite sides. The ground filled in shall be clean and well consolidated.

Where ground conditions are not suitable for driven rods or earth mats a trench earth consisting of 20 mm x 3 mm copper strip 20 000 mm long, buried in the ground at a minimum depth of 450 mm may be installed.

Earth connections must under no circumstances be carried through steel or iron conduits or sleeves.

In a building which has a structural column and beam framework, the main earths are to be made off to suitable clamps of stainless steel or other anti-corrosive material, attached to structural steel members in the concrete in positions as indicated so as to avoid current concentration at any one point and to provide good conductivity into the general mass of the structure and ground.

The tenderer shall allow for testing the earth resistivity at termination points and the earth resistance of the main earth electrodes in the presence of the Engineer. The earth resistance for each electrode shall be less than 1 ohm. Earth resistivity tests are to be submitted timeously to the Engineer to allow for revision of earth termination where required.

23.6. MAIN LV BOARD

An earth bar shall be run the full length of each Main Board and Sub-Main Board. Each panel is bonded to this earth bar together with earth tapes mounted on gland support unistrut.

The following labelled connections are made to the earth bar:-

Neutral Earthing Bar.
E.C. conductor tails from outgoing cable glands.
E.C. conductors run to distribution boards.
Metering Earths.

23.7. MAIN AND DISTRIBUTION BOARDS

In all Main and Distribution Boards a clearly identifiable earth bar is to be provided, in an easily accessible position for making connections after wiring is complete.

To this earth bar is connected:-

Incoming cable gland earth tail.
Incoming E.C. conductor where applicable.
Bonding to other earth bars in board and bolted metal sections.
Sub-circuiting earth bar.

Where a tray is provided above an SDB in the ceiling space or in the concrete ceiling slab for the purposes of simplifying the conduit and wiring an earth bar
similar to the unit in the SDB is to be established. The purpose of the bar is to
gather all sub-circuiting earths and then link with a labelled conductor to the SDB
earth bar.

23.8. SUB CIRCUITS

In all sub-circuits a green PVC insulated earth conductor is to run to each outlet.

In conduiting systems the E.C. conductors are to accumulate at the SDB draw
tray where they are to be connected to the local sub-circuit earth bar.

In trunking systems a main green P.V.C. earth continuity conductor of size
specified shall be run and continuously crimped lugs used to connect it to studs in
each section of the trunking and to multi-way earth bars mounted on trunk
sections every 6 000 mm. These earth bars are to have drilled and tapped holes
with screws. The earth continuity conductors entering the trunk may be made off
to the nearest earth bar.

All connections of sub-circuiting earths are to be continuous and crimped together
by means of crimped lugs or ferrules prior to making off a connection, so that loss
of the connection will not result in a loss of earth continuity.

All earth wires are to be uniquely labelled in ducting systems as for wiring, as well
as at all earth bar terminations, associating them with the circuit they earth.

Under no circumstances shall fixings, which are being used for other purposes,
be used for an earthing termination. If an earth terminal is not provided on the
apparatus the Contractor shall be deemed to have included in his costing for
drilling, tapping and supplying the necessary brass nut, set screw and washers to
form an effective earthing terminal.

24. LUMINAIRE OUTLETS

The conduit to all wall and ceiling surface mounted luminaires shall be terminated in a flush
mounted standard 50 mm round draw-in conduit outlet box. Free bushed entries and wood
blocks will not be permitted, unless otherwise stated in the specific section of this
document, or shown on the drawings.

This conduit outlet box shall be adequately supported in an approved manner such that a
mass of 1 kilogram could be permanently attached to the outlet box fixing cover screws,
without appreciable deflection. Additional adequate timber beams may have to be provided
to meet this requirement.

In roof spaces the building contractor shall arrange for the framing of brandering around
and the cutting of ceiling boards for outlet boxes and for the installation of the wooden
supports for boxes and fittings. The Contractor shall then check that these wooden
supports are correct and notify the Engineer if they are not satisfactory for his installation.

All luminaires are to be earthed in an approved manner via a 2.5 mm² as specified earth
conductor.

Every luminaire shall be adequately secured by not less than two suitable fixing screws and
washers, screwed into the outlet box. Rustproofed steel screws shall be used.

All fluorescent luminaires shall be fixed at each end through the stand-off points with an
additional fixing at the central outlet box. This additional fixing point shall be utilised for the
purpose of providing a standby anchorage, but shall not be tightened up such as to distort
the luminaire. The fixing points shall be as detailed for the fittings in question in the relevant portion of this document.

All outdoor mounted luminaire are to be connected via a bushed conduit end rather than mounted over a conduit box, to ensure the integrity of the waterproofing.

24.1. OUTLETs FOR FLAMEPROOF LUMINAIRES

Where more than one luminaire is required, a 100 mm x 100 mm outlet box shall be built flush into the outside wall of the room. A 20 mm dia. conduit shall be provided for each light point from this outlet box. The luminaire shall be screwed directly onto the protruding threaded conduit end. The outlet box shall be covered with a waterproof cover, if externally situated. The switch controlling these light points is to be mounted outside the room.

24.2. ADDITIONAL FIXING METHODS FOR LUMINAIRES

Shall be as specified above.

25. SWITCH OUTLETS

25.1. GENERAL LIGHTING FLUSH MOUNTED SWITCHES

The switches shall be rated for at least 16 amperes, 250 volts, 50 Hz.

The switches shall be of the positive snap-action, quick make, quick break, type.

The cover plates shall be fixed with chromium plated (or similar corrosion resistant) countersunk screws.

The cover plates shall be flush with the wall, i.e. there shall be no gaps between the wall and cover plates.

25.2. DOOR FRAME SWITCHES

These switches shall generally be as per specified above except that they shall fit flush into special slots in door frames of structures such as prefab buildings.

Where door frame switches are used door frames shall be bonded by means of an earth conductor.

25.3. COVER PLATES

All cover plates shall be colour matched.

25.4. INDUSTRIAL TYPE SURFACE MOUNTED SWITCHES

These switches shall be rated for at least 16 amperes, 250 volts, 50 Hz.

The switches shall be of the positive snap-action quick make, quick break type.

Cover plates shall be fixed with chromium plated (or similar corrosion resistant)
countersunk screws.

Shrouded switch toggle protection is required.

All corners and sides of the pressed steel box and cover are to be rounded. The cover must fit neatly over the box.

25.5. WATERPROOF SURFACE MOUNTED SWITCHES

These switches shall be rated for 16 amperes, 250 volts, 50 Hz.

The switches shall be of the positive snap-action quick make, quick break type.

The housing shall be of die cast aluminium or cast iron with machined joints and approved operating handles, of robust design.

The switches shall be designed for unprotected outdoor mounting in coastal areas.

25.6. BELL PUSHES

Bell pushes shall match the light switches provided under the contract in all respects.

25.7. TIME SWITCHES

Time switches shall be suitable for use on a 220 V / 250 V 50 Hz AC supply.

The contacts shall be silver to silver or other approved contacts, operated by a spring driven clockwork, electrically wound with a spring reserve of approximately 24 hours.

A suitable 24 hours night and day astronomical dial with hour indicator and two adjustable strikers, one "OFF" and one "ON" must be provided. Time switches shall be provided with "WEEKEND OFF" facilities.

The whole mechanism is to be totally enclosed in a dustproof box.

25.8. PHOTO-ELECTRIC CELL

Plug-in type units shall be provided and installed as light sensitive relays for the automatic control of the external lighting as a function of the ambient daylight intensity.

The units shall be suitable for operating the coil of a contactor switching the external lighting. The units shall have a built-in switching delay of at least one minute of the preset illuminance value and incorporate a self contained approved test switch facility.

25.9. LABELLING

The cradles of switch outlets shall be labelled with approved nominally 20 mm diameter adhesive labels marked to identify the circuit number supplying the outlet.
26. SWITCHED SOCKET OUTLETS

26.1. FLUSH MOUNTED SWITCH SOCKET OUTLETS

These units shall be of the standard round 2 pole and earthing pin type. They shall be rated for 16 Amp, 250 volts, 50 Hz, shall be shuttered and shall be switch socket outlets with the switch and the socket power outlet manufactured and assembled as one combined unit, or mounted on a common plate.

These outlets shall be so designed that live parts cannot be exposed without removing the cover plates from the box.

The switches shall be rated for at least 16 Amp, 250 volts, 50 Hz and shall be of the positive snap-action, quick make, quick break type.

The cover plates shall be fixed with chromium plated (or similar corrosion resistant) counter-sunk screws and shall be as described above.

26.2. SWITCH SOCKET OUTLETS MOUNTED IN POWER SKIRTING, TRUNKING OR BEDHEAD DUCTING

These units shall be similar in all respects to those specified above, but shall be designed for the purpose of mounting in power skirting or trunking as specified. Each unit will be mounted on a pre-punched 150 mm length of lidding.

26.3. SWITCH SOCKET OUTLETS IN OPERATING THEATRES, INTENSIVE CARE UNITS AND OTHER AREAS WHERE ISOLATED SUPPLIES ARE USED

These shall be similar to those specified above but switches shall be of the double pole type.

26.4. WEATHERPROOF SURFACE MOUNTED 16 AMPERE SWITCH SOCKET OUTLETS

These units shall be of the standard round 2 pole and earthing pin type. They shall be rated for 16 Amps, 250 volt, 50 Hz, and shall be shuttered.

These outlets shall be switch socket outlets, and shall be so designed that live parts cannot be exposed without removing the cover from the box.

The switches shall be rated for 16 Amp, 250 volt, 50 Hz and shall be of the positive snap action, quick make quick break type.

The housing shall be of brass or galvanised cast iron with machined joints and brass operating handles and of robust design.

The switches shall be designed for unprotected outdoor mounting in coastal areas.

26.5. SWITCH SOCKET OUTLETS FOR DOMESTIC IRONS

These surface mounted units shall be Siemens HPlOOO type or other approved. Switch Socket Outlets shall be of the flat 13 Amp 2 pole and earthing pin type. They shall be rated for 13 Amp, 250 volts, 50 Hz and shall be shuttered.
These thirteen ampere socket outlets shall be switch socket outlets with the switch and the power socket outlet manufactured and assembled as one combined unit.

These switch socket outlets shall be so designed that live parts cannot be exposed without removing the cover from the box. Twin switch socket outlets mounted in one box are not permitted.

The switches shall be rated for 16 Amp, 250 volts, 50 Hz and shall be of the positive snap-action, quick make, quick break type which cannot be inadvertently activated. The “Touch” type “micro-gap” switch is not acceptable.

A manually activated timing device (e.g. a pneumatic stairway lighting switch) is to be provided in the housing, which interrupts the power supply to the socket power outlet after approx. 10 minutes.

A red, white or blue pilot light is to be provided, which is to indicate that power is available at the Socket Outlet.

The surface mounted housing is to be designed to enable mounting directly onto a flush mounted 100 mm x 100 mm x 50 mm outlet box. This housing dimensions should not exceed 200 mm long x 150 mm high x 60 mm deep (i.e. front to back).

The unit housing shall be earthed.

The unit shall be pre-wired to a fixed 3 way marked terminal strip, (i.e. L, N & E) so that this switch socket outlet can easily replace an existing standard switch socket outlet, using only the existing power conductors. The housing should be provided with a 20 mm "Knockout" at the bottom.

An alternative arrangement may be offered for these outlets obtainable from Cantron Electronics, Cape Town comprising the following:

- SCR controlled
- light emitting diode indication
- fuse protection
- 1.5 kW rating
- preset time steps from 10 minutes
- 13 amp Crabtree grid-mounted push switch
- physical accommodation in 100 x 100 x 50 mm conduit box.

26.6. LABELLING

The cradles of switch socket outlets shall be labelled with nominally 20 mm diameter adhesive labels marked to identify the circuit number supplying the outlet.

27. SPECIAL OUTLETS, CONNECTIONS AND DEVICES

**Each special outlet shall be labelled with an approved adhesive label as specified in the Project Specification, which label shall be visible on the permanent fixture once the protective cover has been removed.

27.1. STOVE CONNECTIONS

**Stove disconnector shall be single phase or three phase units complete with
neutral link and earth bars mounted next to the stove position as indicated on the drawings, at a height as specified in the Project Specification.

A 25 mm flush conduit is to be run from the stove disconnector to a standard 50 mm round conduit box at 450 mm a.f.f.l., from where the final connection is to be made using standard stove plugs or a dome cover and Kopex or other approved flexible conduit or cable.

27.2. CONNECTIONS TO PACKAGED AIR CONDITIONING UNITS

Individual air conditioners, where installed, are each to be fed from a separate 20 Amp m.c.b. on the relevant sub-distribution board. A 100 x 100 x 50 mm flush box is to be mounted adjacent to the A.C. unit position, and is to contain a 15 Amp D.P. disconnector and cord grip. A terminal block is to be mounted in the box, and a three core cabtyre flex run via the cord grip to the unit.

27.3. CONNECTIONS TO PANEL HEATERS

These are to be as specified above, except that more than one heater per circuit may be installed, as specified.

27.4. HOT WATER CYLINDER CONNECTIONS

The circuit conduit for a hot water cylinder shall terminate in a round conduit end box suitably positioned adjacent to the cylinder. A 30 Amp double pole disconnector is to be mounted over the round box, and the final connection made on surface from this disconnector, by means of Kopex or other approved flexible conduit or cable.

A 2,5 mm² green P.V.C. insulated stranded copper conductor shall be installed together with the circuit conductors from the distribution board and shall be bolted to the earth terminal inside the inspection cover of the cylinder.

27.5. CONNECTIONS TO MOTORS

Extend from the disconnector on the wall or panel close to the motor by means of the necessary current carrying conductors plus a green insulated earth conductor in conduit terminating in a round conduit outlet box close to the motor connection box. Final connection to the motor shall be by means of P.V.C. sheathed flexible conduit with purpose made lockable glands.

27.6. FLOOR MOUNTED PEDESTAL UNITS

Pedestals shall be constructed of 1,2 mm thick sheet metal 150 mm x 150 mm x 600 mm high, finished to match distribution boards.

One side shall form a cover to the unit.

Inside the unit 150 mm from the floor a suitable bracket for terminating incoming and outgoing conduit or cables, shall be provided.

A 6 mm earth stud shall be welded to the side of the unit 50 mm above the termination bracket.
Space shall be provided for mounting a contactor and emergency stop button, or a 16 Amp socket outlet and stove socket outlet if required.

The bottom of the unit shall be returned to the inside to form a flange of 25 mm with four (4) x 12 mm holes drilled in the four sides of the flanged section. These holes are for fixing bolts.

The cover shall be fixed to the unit by means of machine screws at suitably spaced positions.

**Equipment to be housed in the unit and paint finishes shall be as described in the Project Specification.**

27.7. **WELDING PLUGS**

27.7.1. **Construction**

The welding plug shall be of the single phase metal clad interlocked type, rated at 25 A complete with earth connection and plug top. The plug top shall be suitable for connecting a heavy duty, tough rubber trailing cable. The socket portion of the welding portion of the welding plug shall be fitted with a spring actuated metal cover which must close when the plug top is removed.

**NOTE:**

Additional three phase plugs specified for an existing institution shall be similar to the existing plugs, to ensure that the plug tops of the additional and existing plugs are interchangeable.

27.7.2. **Mounting and Wiring**

The welding plugs shall be mounted over a flush 100 mm x 100 mm x 50 mm wall box 1 400 mm above finished floor level. Tubing and wiring shall consist of 2 x 4 mm² conductors and a green P.V.C. insulated copper earth wire in 20 mm dia. conduit.

27.8. **FEEDERS TO PETROL PUMPS**

Feeders to petrol pumps shall consist of 2.5 mm² x 3 core P.V.C. insulated underground cables. The third core to be used as an earth conductor.

The exact position of outlet points to be determined on site in collaboration with the Engineer.

**The installation shall comply with the requirements of the relevant applicable Code of Practice for Explosive Atmospheres and as detailed in the Project Specification.**
27.9. OUTLETs FOR LIFTS

27.9.1. Outlet Point in Machine Room

**Normal and Standby power shall be supplied to the lift motor room as specified in the Project Specification.**

27.9.2. Extract Fan in Machine Room

The extract fan in the machine room shall be thermostatically controlled and shall be similar to WOODS or other approved with a fan diameter of 630 mm and a speed of 560 r/min.

The thermostat shall be installed 2 400 mm above floor level and shall have a minimum rating of 10 Amp.

Fans shall be complete with a 30 Amp 2-pole disconnector (1 400 mm above floor level next to the door), cowl and wire guard on motor side.

Circuit wiring shall consist of 2 x 1,5 mm² p.v.c. insulated conductors and a 2,5 mm² green P.V.C. insulated copper earthwire in a 20 mm dia. conduit.

27.9.3. Sump Pump Connection

Install in a position as indicated an approved 3 kW automatic starter.

The starter coil shall be controlled by a float switch which is to be mounted in the sump. Control wiring shall consist of 2 x 1,5 mm² earthwire in a 20 mm dia. galvanised conduit. The float switch shall be of the mercury type with adjustable high and low water levels on a rust resistant mounting rod 4 000 mm long. Float switch shall be complete with rust resistant mounting brackets to be mounted against the sump wall.

Circuit wiring shall consist of 3 x 4 mm² P.V.C. insulated conductors and a 2,5 mm² green P.V.C. insulated copper earthwire in a 20 mm dia. conduit.

**Final connection to pump motor shall be as specified in the Project Specification.**

27.9.4. Light in Pit

A bulkhead luminaire complete with switch shall be installed in the pit in position as indicated on the drawing. The switch shall be installed 1 200 mm from floor level and within reach, next to the first door above the pit and the lighting fitting 300 mm below this door.
27.9.5. Conduit for Call System

A 20 mm dia. conduit complete with galvanized draw wire shall be installed in the concrete slab of the middle floor, from lift shaft to the motor room and to the telephone exchange, or to Reception. The conduit shall terminate in a 100 mm x 100 mm x 50 mm deep standard wall box at both ends. The metal box in telephone exchange or Reception shall be installed 300 mm above floor level in position as indicated on the drawing.

27.10. INDICATORS, PUSH BUTTONS AND SELECTOR SWITCHES

Illuminated indication is to be done using cluster type light emitting diodes, rated at 220 volt AC or low voltage DC as required.

The lenses shall be nominal 22 mm dia. suitable for fitting various colours and symbols as specified further.

These units are not to be mounted on unhinged removable access panel sections.

28. COMMUNICATION OUTLETS

28.1. WIREWAY REQUIREMENTS

**The communications systems, e.g. the P.& T. telephones, the Internal telephone system, the Radio Paging, the Nurse/Patient Call System, the Entertainment Radio Distribution, the Fire Alarm System, the Patient Electronic Monitoring Systems, the Television Systems Building Management and intercom systems, etc., will be installed by Specialist Contractors, unless otherwise specified in the Project Specification.

**The Contractor shall, however, provide the required outlets, conduits, trunking and duct cable trays and distribution boards fitted with 20 mm thick wooden back boards as specified in the Project Specification.

The relevant requirements of clause "Conduit and Conduit Fittings", "Steel Cable Trunking and Ducting", "Aluminium Ducting and Cable Trays" and clause, "Distribution Boards", shall apply.

All communication systems (excluding Entertainment Radio and Television Systems) are to be connected to the alternative power supply, if provided.

Conduit shall be 25 mm complete with bushed ends unless otherwise specified. Galvanised draw wires shall be left in all conduit.

Draw boxes shall finish flush with ceilings, being accessible from below where applicable.

Outlet boxes shall consist of a 100 mm x 100 mm x 50 mm deep standard box complete with metal overlapping coverplate, finished to match with the 16 Amp switch socket outlets. Outlets mounted on ducting shall be fitted to 150 mm length of lid.

29. INTERIOR LUMINAIRES FOR FLUORESCENT LAMPS
29.1. SCOPE

This specification covers luminaires for fluorescent lamps.

29.2. DEFINITIONS

Approved/Acceptable: shall mean approved by and acceptable to the Engineer.

Engineer: shall mean the Chief Engineer Electrical or his Representative/Agent.

Project Specification: is the specification dealing with a particular project.

29.3. GENERAL REQUIREMENTS

Luminaires to comply with S.A.B.S 1119 and S.A.B.S 0157 where applicable.

**The luminaire is to be rated for a nominally 230 volt 50 Hz supply unless otherwise specified in the Project Specification.

The luminaire operation is to be suppressed so as to comply with Section XIII Radio Regulations promulgated under Act No. 3 of 1952, as amended.

**Lamps to be S.A.B.S colour 2 or as detailed in the Project Specification.

The complete luminaire is to start and operate silently.

29.4. CONSTRUCTIONAL

29.4.1. METALWORK

Metalwork is to be finished as per S.A.B.S 064 and painted or epoxy powder coated to a minimum dry film thickness of 40 microns.

Metalwork is to be finished white.

29.4.2. STAND-OFF MOUNTING

Four stand-off mounting points or other approved type are to be provided to afford secure mounting of the luminaire.

29.4.3. CONDUIT ENTRY.

Channel luminaires: Provide a Beza type conduit entry in the centre of the rear of the luminaire and a 20 mm conduit knock out at each end.

In Sealed Diffused luminaires purpose made seals are to be provided for wire and conduit entries in lieu of the Beza type conduit entry.

The luminaire body shall be wide enough to cover a standard 50 mm round conduit outlet box.

29.4.4. COMPONENT RETAINERS
Component retainers shall facilitate replacing of components without removing the luminaire from the installed position.

Component retainers shall fix components securely to the luminaire body work or sub assembly.

29.4.4.1. Removable Cover

External Removable Covers are to be secured to the bodywork by metal captive nuts, screws or bolts.

29.4.4.2. Lampholder

This is to be securely located to the bodywork restricting movement of the holder to the minimum required for the functioning of that type of holder.

29.4.4.3. Diffuser

The diffuser is to be firmly and positively clamped with a clip assembly (six clips per unit, that is three per side), to the body so as to prevent sagging and to ensure that it cannot be dislodged by wind, vibration or distortion but is reasonably easy to remove for maintenance. Failure of the diffuser to be properly seated is to be clearly indicated by mechanical displacement.

Diffuser material shall be on all sides of the unit, without metal end caps.

29.4.4.4. Gasket

The gasket is to be glued into a purpose made fold in the metal bodywork or diffuser, which fold will ensure the correct location and formation of the gasket.

29.4.4.5. Capacitor

The capacitor is to be securely fixed to the bodywork or sub-assembly.

29.4.5. NUTS, BOLTS AND FASTENING AUXILIARIES

All nuts, bolts and studs are to be fitted with washers and lockwashers or palnuts.

29.5. COMPONENTS

29.5.1. LAMP.

Lamps are to comply with S.A.B.S 1041.

**Lamp colour shall be colour 2 or as specified in the Project Specification.

29.5.2. BALLASTS
Ballasts shall be of the switch start type and shall carry the S.A.B.S. mark of approval.

A particular ballast shall control one tube only.

Ballasts are to be of the dry type with internal air gap, external laminations orientated transversely and welded to a base plate.

Ballasts are to start and operate inaudible with minimum vibration.

29.5.3. LAMP HOLDER

The holder is to have a positive built-in facility to align with lamp pins and accommodate tolerance in lamp length.

The holder shall be of the telescopic or "ratchet" type with spring loaded base.

Where push type connections are used two terminals per connection point are to be provided unless only one conductor is required in the circuit.

Provision is to be made to withdraw the conductor from the connection.

29.5.4. STARTER

The starter is to comply with the V.D.E. Standard or other approved. It is to be correctly rated for the lamp it operates.

The starter case and holder are to be made of insulating material. Starter mounting position is to be easily accessible for maintenance purposes without removing the lamps or luminaire cover.

The starter is to be clearly marked as to its manufacture, rating and standard with which it complies.

29.5.5. TERMINAL BLOCK

The terminal block shall be located adjacent to the conduit entry point and positioned so as not to obstruct wireway access and fixing.

29.5.6. CAPACITOR.

The capacitor is to comply with S.A.B.S 1250.
29.5.7. DIFFUSER

Diffusers are to be Acrylic, of robust construction, particularly at clamping edges.

29.5.8. GASKET

The gasket is to be made of non-hardening resilient material purposely sized to be received by the bodywork or diffuser shape into which it is to be located. The gasket shall take up its original shape when not in compression. It is to be sized so as to provide effective sealing of the diffuser to the luminaire bodywork.

29.6. INTERNAL WIRING

Conductors are to be run neatly strapped or clipped together and secured to the bodywork using strapping material which will not deteriorate with heat.

Conductors shall not be obtrusive through the diffuser.

29.7. TYPE OF LUMINAIRE:

**The types of luminaires to be used shall be detailed in the Project Specification.

29.8. INFORMATION TO BE PROVIDED BY THE PURCHASER

** Type of luminaire as detailed in the project specification.

Rated voltage and frequency of luminaire.

Lamp colour:

- S.A.B.S. colour 2: (previously for general use).
- Osram 26 mm diameter lamps colour 23: (general use)
- Osram 26 mm diameter lamps colour 21: (good colour rendering e.g. operating rooms)

Ambient temperature of luminaire if other than 25°C.

Terminal size if other than that which accepts two 2,5 mm conductors.

Approval of stand off mountings.

30. STREET LIGHT POLES

30.1. 24.1 FIBRE GLASS

Street lighting poles shall be of a smooth, tapered seamless design, constructed out of fibre glass reinforced polyester and bear the S.A.B.S. mark for glass fibre polyester laminates for structural and flame retardant products.
The minimum cross sectional wall thickness shall be 6 mm with the pole material coloured throughout in a uniform colour, protected by a minimum of 1 mm surface resin coat with UV resistance.

The approximate measurements are to be as follows:

<table>
<thead>
<tr>
<th>LENGTH:</th>
<th>BASE DIA:</th>
<th>SPIGOT DIA.</th>
<th>SPIGOT LENGTH.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4100 mm</td>
<td>160 mm</td>
<td>75 mm</td>
<td>100 mm</td>
</tr>
<tr>
<td>3600 mm</td>
<td>150 mm</td>
<td>75 mm</td>
<td>100 mm</td>
</tr>
</tbody>
</table>

An electrical protection chamber shall be provided as follows:

- **Width:** 85 mm
- **Length:** 300 mm
- **Height from base of the pole to the bottom of the chamber:** 1500 mm

The chamber shall have a galvanised sheet metal backing plate suitably angled and punched to accommodate 3 cable glands.

The following equipment shall be provided on the backing plate:

- One 5 A MCB.
- One 5 way neutral link of 30 A rating.
- One 5 way earth bar of 30 A rating.

The cover shall be of 2 mm thick fibre glass fastened with stainless steel "Allen Key" screws and shall provide total protection against rain and a jet of water.

A cable entry of approximately 80 mm diameter shall be provided close to the pole base.

The pole is to be guaranteed against any defects in workmanship or material for a period of at least 10 years.

The pole will be sunk to a depth of at least 900 mm into the ground and therefore a suitable base plate of minimum 300 mm x 300 mm x 6 mm galvanised steel is to be provided that will withstand the back fill completely compacted.

### 30.2. WOODEN

Wooden poles shall be of the tapered turned type Tanalith treated, fitted with a conduit for the wiring and a Captive Cone Gland (CCG) type or other approved cable end box to house a 5 A miniature circuit breaker and neutral link as well as an earthing stud. The pole shall be complete with a spigot.
The approximate measures shall be as follows:

<table>
<thead>
<tr>
<th>LENGTH:</th>
<th>BASE DIA:</th>
<th>SPIGOT DIA.</th>
<th>SPIGOT LENGTH.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000 mm</td>
<td>160 mm</td>
<td>75 mm</td>
<td>100 mm</td>
</tr>
</tbody>
</table>

An electrical protection chamber shall be provided as follows:

- **Width:** 85 mm
- **Length:** 300 mm
- **Height from base of the pole to the bottom of the chamber:** 1500 mm

The chamber shall have a galvanised sheet metal backing plate suitably angled and punched to accommodate 3 cable glands.

The following equipment shall be provided on the backing plate:

- One 5 A MCB
- One 5 way neutral link of 30 A rating
- One 5 way earth bar of 30 A rating.

The cover shall be of 2 mm thick fibre glass fastened with stainless steel "Allen Key" screws and shall provide total protection against rain and a jet of water.

A cable entry of approximately 80 mm diameter shall be provided close to the pole base.

The pole is to be guaranteed against any defects in workmanship or material for a period of at least 10 years.

The pole will be sunk to a depth of at least 900 mm into the ground and therefore a suitable base plate of minimum 300 mm x 300 mm x 6 mm galvanised steel is to be provided that will withstand the back fill completely compacted.

### 31. CONTRACT ADMINISTRATION, COMPLETION, TESTING AND COMMISSIONING

#### 31.1. QUALITY CONTROL DURING THE EXECUTION OF THE CONTRACT

Day by day inspections of the Works will be expected to be carried out by the Contractor to ensure that all work is executed in accordance with the drawings and specifications. These inspections will be monitored by the Engineer or his duly authorised representative.

The contractor shall arrange for a "Certificate of Compliance" to be handed to the Engineer on completion of the contract.

#### 31.2. MAINTENANCE OF AS-BUILT DRAWINGS

The Contractor shall be required to hold on site a set of drawings which he keeps fully marked up with “as built” information, and he shall pass this information regularly to the Consulting Engineers who will ensure that master “as built” drawings are kept up to date.
At the end of the contract the Contractor shall provide the Consultant with the above information together with relevant other drawings, wiring diagrams, service and instruction manuals for equipment supplied as part of the contract.

31.3. **SETTING OF PROTECTIVE DEVICES AND CONTROLS**

All protective devices installed throughout shall be correctly adjusted by the Contractor to the approval of the Engineer before any circuit is energised. The Contractor is required to obtain all data necessary for establishing the correctness of the settings. Where doubts exist the Engineer's confirmation is to be sought. Data with regard to all such settings is to be provided as part of the commissioning documentation.

Diagrams of all control alarm and indication circuits are to be provided for approval prior to their installation.

These diagrams shall include:

- Wiring diagram.
- Schematic wiring diagram.
- Control function diagram.
- Device operating sequence diagram.
- Operational narrative of the control Protective devices.

The correct operation of all such circuits as well as of all interlocks is to be verified on site in the presence of the Engineer or his authorised Representative.

31.4. **PRELIMINARY TESTING OF MANUFACTURED EQUIPMENT**

**All items of manufactured equipment are, where feasible, to be factory tested prior to delivery to site, and results of such tests, in a format as specified in the Project Specification, are to be produced before the equipment is delivered.**

All such tests are to be in accordance with the relevant codes of practice, and with any other requirements as set out in this document.

31.5. **COMPLETION OF INSTALLATION**

Before the commencement of any tests or commissioning procedures, the Contractor is to ensure that all nuts and bolts are securely fastened, and that paintwork on all items supplied has been touched up where damage has occurred.

31.6. **INSPECTION AND TESTING**

On completion of the entire installation or any particular section thereof, as may be decided by the Engineer, tests shall be carried out in full accordance with the current edition of the "Code of Practice for the Wiring of Premises", in the presence of the Engineer or his authorised Representative.

NOTE::

All instrumentation necessary for testing shall be provided by the contractor.
The results of the above tests must be clearly recorded, signed and handed to the Engineer or his authorised Representative together with the necessary completion form as specified by the Supply Authority, in terms of the Machinery and Occupational Safety Act of 1983.

Once the Engineer has inspected the complete installation and satisfied himself that all testing has been completed and the contract is complete in all respects, can the Administration be approached in writing with the above documentation with a view to arranging a hand-over date.

The Contractor should note that where applicable at least the following tests must be carried out:

### 31.6.1. HV. Switchgear and Protective Relays
Insulation resistance of primary and secondary circuits and of insulating oil.

Current transformer ratio and polarity checks.

Primary and secondary current injection tests to check functioning of meters and relays.

Tripping, closing and indication of switchgear.

Testing of all relays and their operation in accordance with manufacturer’s requirements.

### 31.6.2. LV Switchgear and Distribution Equipment
Insulation test.

Continuity test.

Loop Line Earth Impedance test.

Polarity test.

Earth Leakage Circuit Breaker test.

Any further tests to meet the local Supply Authority requirements or as deemed necessary by the Engineer.

Earth termination test.

### 31.7. OTHER EQUIPMENT

#### 31.7.1. Standby Generators
Tests as specified above "Settings of Protective Devices and Controls" are to be carried out on site after installation.

In addition, to the tests as specified above "Settings of Protective Devices and Controls", detailed verification of the correct logical
functioning of the control board must be carried out.

31.7.2. **Battery and Charger Sets**

In addition to the verification of the operation of all control and logic circuitry, and the verification of all settings as set out above in clause "Settings of Protective Devices and Controls", it will be required that charge/discharge characteristics of the batteries be verified on site, as well as curves of output voltage regulation verses load and verses time.

31.8. **UNACCEPTABLE TESTS AND ABORTIVE HAND OVERS**

Should the Administration find at the time of hand over that work is defective to the extent that they have to return for further inspections and the hand over aborted, then the Administration reserves the right to claim its extra expenses in whole or part from the Contractor.

31.9. **FINISHES**

All circuits and apparatus on switchboards shall be suitably and correctly labelled. Covers for draw boxes, expansion boxes, etc., shall be finished to match the paintwork of the ceiling or wall surface. All cable pipes and ducts entering buildings are to be sealed against the ingress of vermin, water, etc.

31.10. **LABELLING**

All new switchgear and equipment installed in switchboards, plus disconnector boxes, cables, etc., shall be clearly labelled as indicated elsewhere in this specification.

31.11. **TRAINING OF INSTITUTIONAL STAFF**

Allowance is to be made by the Contractor for the training of Institutional Staff in the setting up and operation of the various items of equipment supplied under the contract.

31.12. **TESTING AND COMMISSIONING DOCUMENTATION**

On completion of testing and commissioning, a set of documents shall be compiled and presented to the Engineer.

31.12.1. **This set shall include:**

Completion form and Certificate of Compliance, as specified by the Supply Authority, in terms of the Machinery and Occupational Safety Act of 1983.

A sepia copy of the drawings marked up "as built".

Completed set of workshop drawings.
Completed set of test and commissioning sheets.

Schedule of protection and control settings.

Set of schematic wiring and function diagrams.

Sequence diagram and control functional narrative for each control panel.

File of cable schedule.

File of distribution legends.

Operating and maintenance instructions on equipment.

Guarantees ceded to the Administration.

32. UNINTERRUPTIBLE POWER SUPPLY (UPS)

32.1. GENERAL

Uninterruptible power supplies shall mean power supplies that accept a three phase or single phase supply from a nominal 380 volt 3 phase 50 Hz system and rectify this input to supply an inverter across a battery. The output of the supply system shall be an uninterruptible stable single or three phase output at 220 volts or 380 volts respectively. The "in-line" type system shall supply the output continuously across the inverter (uninterrupted power supply system). The "off-line" system shall supply the load, via a filter, directly from the a.c. input and should the supply deviate the system shall switch in some 4 msec. to the inverted output (short break supply).

The system shall be accommodated in a housing suitable for shelf or floor mounting. Where the batteries are too large to be accommodated in the cabinet containing the electronic equipment they shall be accommodated in a separate suitability ventilated floor-standing cabinet.

Units up to 1.5 kVA output shall be single phase, fitted with an input comprising a 2 meter length of suitably rated cord and a 16 amp plugtop. The output shall be a 16 amp socket outlet mounted in an accessible part of the unit.

** Where the units are larger than 1.5 kVA, the input and output arrangement shall be suitable for:

- suitably rated plugs and sockets or
- suitable 20 mm dia. conduit entries

as detailed in the Project Specification.

33. UPS SYSTEM LESS THAN 1.5 KVA RATED OUTPUT

33.1. GENERAL

** The system shall be either "in-line" with no break or "off-line" with a short break (some 4 msec.) as per Project Specification.
No manual by-pass is required.

Voltage input and output: 220 volt nominal single phase
System efficiency: >80 %
Noise suppression: 80 dB
Operating temperature: 40°C
Acoustic noise: <50 dBA
Operating temperature: 0 to 40°C

Automatic battery shut down required.
Automatic restart on mains after battery shutdown.

33.1.1. Input

Voltage 220
Voltage variance 10 %
Frequency 50 Hz
Frequency variance 5 %

33.1.2. Output

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ON INVERTER</th>
<th>NOT ON INVERTER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated kVA output</strong></td>
<td>Per Project Specification</td>
<td>Per Project Specification</td>
</tr>
<tr>
<td>Voltage:</td>
<td>220</td>
<td>220</td>
</tr>
<tr>
<td>Voltage variance steady:</td>
<td>3 %</td>
<td>3 %</td>
</tr>
<tr>
<td>Voltage variance dynamic:</td>
<td>6 %</td>
<td>6 %</td>
</tr>
<tr>
<td>Frequency:</td>
<td>50 Hz</td>
<td>mains</td>
</tr>
<tr>
<td>Frequency variance:</td>
<td>1 %</td>
<td>5 %</td>
</tr>
<tr>
<td>Power factor:</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Waveform:</td>
<td>sine wave</td>
<td></td>
</tr>
<tr>
<td>Distortion:</td>
<td>&lt;8 %</td>
<td></td>
</tr>
<tr>
<td>Load crest factor:</td>
<td>3:1</td>
<td></td>
</tr>
</tbody>
</table>

Duration of output:
- during mains failure or 7 min or
- as specified further: 1 hour or 2 hours

Secondary isolated from input.

Protected electronically against a short circuit.
33.1.3. Battery

Type: sealed maintenance free lead calcium.
Amp-hour rating to suit specified output of UPS system.
Life expectancy 3 to 5 years.

The battery shall be provided with fused isolation between battery and inverter.

33.1.4. Charger

The charger shall be suitable for correct charging of the battery in accordance with the battery manufacturer's recommendations.

Recharge time Capacity/10 of ampere hour rating to 90% charge.
Operation Constant voltage current limiting with temperature compensation.

33.1.5. Indication and Alarms

The unit shall be fitted with led indication lights indicating:

- Inverter On (indication only)
- Mains Fail
- Low Battery Voltage

33.1.6. Remote Alarm

A pair of voltage-free contacts shall be provided for remote general alarm indication.

33.2. UNINTERRUPTIBLE POWER SUPPLY SYSTEMS GREATER THAN 1.5 KVA

These systems shall be as for in-line UPS units with the following additional requirements.

33.2.1. General:

Each unit shall be contained in a floor standing sheet metal housing with separate compartments for components and the battery respectively. The unit shall be well ventilated and vermin proof. It shall have adequate space to allow for easy servicing of components and battery.

The housing shall be fitted with hinged lockable doors to all compartments. The unit shall be suitable to accept cable, trunking or conduit entry at the top or bottom with the necessary glanding off facilities. Where conduit wireways are used, separate wireways for alternating and direct current circuits shall be provided.

The layout of UPS components shall conform to good engineering practice. The instruments and pilot lamps shall be mounted on the
face of the top compartment door. All switches, circuit breakers and fuses shall be concealed behind this door. The wiring to the above shall be neatly loomed to enable unrestricted opening of the door.

33.2.2. Rectifier:

The output of the rectifier shall be such as to give maximum charge conservation.

The rectifier shall be designed to recharge the battery, after a mains failure, to 90% of its fully charged capacity, at a rate of Capacity/10.

The rectifier shall be fitted with an ammeter to indicate whether the battery is charging or discharging.

33.2.3. Battery

** The battery shall be of the maintenance-free lead calcium type, capable of supplying the full rated power of the unit for a minimum of 7 minutes or for a period as specified in the Project Specification.

33.2.4. Inverter:

A solid state inverter capable of supplying power, stabilized within the specified tolerances and under the specified operating conditions.

The inverter shall be fitted with a voltmeter frequency meter and a combined instantaneous and maximum demand ammeter. The maximum demand ammeter shall have a 15 minute response time.

33.2.5. Switching:

Switching of the unit shall be as follows:

** (See the Project Specification)

For a no-break supply:

Solid state switching

Automatic / Manual by-pass:

Automatic static switches where specified for additional security of supply.

Manual by-pass switches where specified to enable the user to by-pass the complete UPS in case of a fault on the unit.

33.2.6. Output:

** The UPS shall have output criteria as specified in the Project Specification.
Rated kVA output: See the Project Specification

Input voltage: 380 volt three phase or 220 volts single phase.

Output voltage: 380 volt three phase
220 volts single phase.
Steady state: +/- 2%
Dynamic state: < +/- 5%

Output wave form: Sine-wave

Harmonic distortion: Not greater than 8%

The inverter shall be capable of the following overloads:

10% continuously
25% for 1 minute
50% for 200 milliseconds.

33.2.7. Efficiency:

The unit shall be designed for maximum operating efficiency with full load efficiencies of 94% for the rectifier and 88% or greater for the inverter.

The overall efficiency shall be better than 80% for units greater than 3 kVA.

Tenderers shall state full load and half load efficiencies of each section of the unit and shall furnish curves showing the variation in efficiencies with load. The same figures and curves shall be provided for the overall efficiencies.

33.2.8. Indication and Alarms:

The following alarms shall be provided:

Mains failure
Rectifier failure
** Battery half time discharge.
Equipment over-temperature
Inverter failure
Lamp test.
Battery minimum voltage. (Battery voltage sensitive alarm to be initiated when approximately 5 minutes remains assuming full load discharge rate)

The required alarms shall consist of a steady light indicating a fault, coupled with an audio alarm. The audio alarm shall be silenced by pressing the appropriate button but the lamp shall remain on until the fault has been removed. It shall be possible to disable the local audio alarm altogether.

33.2.9. Remote Alarm

A pair of voltage-free contacts shall be provided for remote general
alarm indication.

34. PART B: HIGH VOLTAGE SWITCHGEAR, TRANSFORMERS, MINI SUBSTATIONS, OVERHEAD LINES AND BUNDLE CONDUCTORS:

PART B: HIGH VOLTAGE SWITCHGEAR, TRANSFORMERS, MINI SUBSTATIONS, OVERHEAD LINES AND BUNDLE CONDUCTORS: Shall be read with this Part A: when referred to in the Project Specification.

35. PART C: HOSPITAL INSTITUTIONS:

PART C: HOSPITAL INSTITUTIONS: Shall be read with this Part A: when referred to in the Project Specification.

36. PART A: ADDENDUM PVC CONDUITING:

PART A: ADDENDUM PVC CONDUITING: Shall be read with this Part A.
PROVINCIAL ADMINISTRATION
WESTERN CAPE

GENERAL TECHNICAL
SPECIFICATION
FOR
ELECTRICAL INSTALLATION:

PART A:
GENERAL
AND
LOW VOLTAGE (400 V) INSTALLATION:

ADDENDUM:
PVC CONDUITING:

 Specification No.

Revision: October 1999
1. GENERAL 电站建设..<------------------  1
2. CONDUIT AND ACCESSORIES 电站建设..<------------------  1
3. SURFACE MOUNTED PVC CONDUIT 电站建设..<------------------  2
4. PVC CONDUIT IN ROOF SPACES 电站建设..<------------------  3
5. PVC CONDUIT IN CONCRETE SLABS 电站建设..<------------------  3
PROVINCIAL GOVERNMENT WESTERN CAPE:

GENERAL TECHNICAL SPECIFICATION:

INSTALLATION OF PVC CONDUIT

1. GENERAL

This specification covers the installation method required for the use of approved PVC conduit and accessories where specified for the electrical and electronic services installation.

The conduit and conduit accessories shall comply fully with the applicable SANS 950: Non-metallic Conduit and Accessories. Conduit shall bear the mark of approval of the South African Bureau of Standards.

PVC non metallic conduits shall be supplied in 2400mm lengths and shall display the SABS label on each length supplied. The markings shall be legible and permanent.

The conduit shall be manufactured from polyvinyl chloride (PVC) compound which includes inert modifiers to improve heat distortion.

The conduit and fittings shall be free from visible cracks, holes or foreign inclusions. The conduit bore shall be smooth and free of blisters, nicks or other imperfections that may cause the conductors to be damaged.

All conduits, conduit fittings and the solvent cement shall all be produced by the same manufacturer to assure system integrity.

External diameter for conduit shall be as follows:

- 20mm lighting and switched socket circuits
- 25mm communications circuits
- 32mm where specified
- Sized for wiring capacity in compliance with SANS 10142.

PVC conduits shall be manufactured with a minimum thickness of 1.2mm.

PVC conduit and conduit accessories shall not be used for:

- flameproof or explosion proof installations,
- suspension of luminaires,
- load bearing applications.

2. CONDUIT AND ACCESSORIES

All conduit jointing shall be glued with solvent cement adhesive as recommended by the manufacturer of the conduit.

Steel Couplings shall be used to join conduit lengths.

Conduits terminated into steel Trunking shall be fitted with Steel Termination fixed with two steel locknuts and male bush.
All bushes shall be female type additional washers shall be installed where necessary.

Conduit ends not connected to any fittings shall be terminated in a female bush.

All conduit fittings except pre-manufactured bends and tubular couplings, shall be of the inspection type.

Only pre-manufactured conduit bends shall be used for 90 degree bends. All bends required shall as far as possible be set or bent to ninety (90) degree angles and follow the line of the roof truss or ceiling support structure.

Conduit runs between shall comprise a maximum of 2-off 90deg. bends.

Running Joints in PVC conduit shall be provided in long straight lengths of conduit to prevent distortion and snaking.

Draw-boxes are to be provided in accordance with the requirements of SANS 10142 and facilitate easy wiring. They shall be manufactured of galvanised steel complete with matching coverplates. PVC non metallic type outlet boxes and draw boxes will not be allowed.

Bending and setting of conduit, where necessary, must be done with special bending apparatus manufactured for the purpose and which are obtainable from the manufacturers of the conduit systems.

3. **SURFACE MOUNTED PVC CONDUIT**

Wherever possible, the conduit installation shall be concealed in the building work; however, where unavoidable or otherwise specified, conduit installed on the surface must be plumbed or levelled and only straight lengths shall be used.

To avoid distortion from temperature changes and plastic deformation, conduit runs shall be rigidly fixed to the building structure by means of approved spaced saddles at:

\[
\begin{align*}
450 \text{mm centres,} \\
450 \text{mm from changes in direction}
\end{align*}
\]

Where several conduits are installed side by side, they shall be evenly spaced and each conduit fixed with individual saddles.

The use of inspection bends shall be avoided and instead the conduit shall be set uniformly and inspection coupling used where necessary.

Crossing of PVC non metallic conduits is to be avoided wherever possible. Should it however become necessary then purpose-made galvanised metal boxes shall be provided at the junction. The finish of the boxes and positioning shall be in keeping with the general layout.

In situations where there are no ceilings the conduits are to be run along the wall plates and the beams.

Painting of surface conduit shall match the colour of the adjacent wall finishes.

Only approved plugging materials such as aluminium inserts, fibre plugs, plastic plugs, etc., and round-head screws shall be used for fixing saddles, and conduit outlet boxes. to building structure. Wood plugs and the plugging in joints in brick walls are not acceptable.
4. PVC CONDUIT IN ROOF SPACES

Conduit installed in Roof Spaces shall comply generally with Clause “Surface Mounted PVC Conduit.”

Conduit in roof spaces shall be installed parallel or at right angles to the roof members and shall be secured at intervals not exceeding 450mm by means of manufactured saddles screwed to the roof timbers.

Where PVC non-metallic conduit has been specified for a particular service, the electrical contractor shall supply and install all additional supporting timbers in the roof space as required to ensure that a saddle spacing of 450mm is maintained throughout the installation.

Where roof space provides for less than 900mm height clearance or is inaccessible by electricians or where the ceiling is covered with insulating material, the arrangement of the conduit shall be a “loop-in” system accessible from the room space below, to facilitate wiring to be done from an accessible location.

To facilitate the wiring, a drawtray shall be installed above or near the distribution board, into which drawtray the conduits shall be terminated.

Where a galvanised steel wireway system is specified to run in the roof space, the conduits shall be made off to this wireway system.

In false ceiling spaces under ceiling slabs, which spaces are accessible through a demountable false ceiling, conduits shall be installed as detailed in Clause “Surface Mounted PVC Conduit.”

5. PVC 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. Sharp bends of any nature will not be allowed in concrete slabs.

Draw and/or inspection boxes shall be grouped under one common cover plate and shall be installed in passages or male toilets.

All boxes, etc., are to be securely fixed to the shuttering to prevent displacement when concrete is cast. The conduit shall be supported and secured at regular intervals (minimum 450mm spacing) and installed as close as possible to the neutral axis of concrete slabs and/or beams.
All non metallic conduit lengths shall be properly joined using steel couplings fixed with solvent cement to ensure that the conduits do not pull loose when the concrete is being poured.

Before any concrete slab is cast, all conduit droppers to switchboards, switch drops or socket outlets shall be neatly spaced and rigidly fixed.

End of document.
PROVINCIAL ADMINISTRATION
WESTERN CAPE

GENERAL TECHNICAL
SPECIFICATION
FOR
ELECTRICAL INSTALLATION:

PART C:
HOSPITAL INSTITUTIONS

Specification No.
Revision No:
October 1999
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1. **INTRODUCTION**

This PART C shall be read together with GENERAL TECHNICAL SPECIFICATION: ELECTRICAL INSTALLATION: PART A: GENERAL AND LOW VOLTAGE (400 VOLT) INSTALLATION where Hospital Institutions are referred to in the Project Specification.

This General Technical Specification will form part of the contract documents, but will only be issued on request.

2. **OPERATING THEATRE LAMPS**

Facilities to be provided to enable the Installation of Operating Theatre Lamps

2.1. **GENERAL**

**Where the theatre lamp shall be installed the following provisions shall be made, unless otherwise specified in the Project Specification.**

The ceiling (lamp suspension point) shall be designed to support a lamp mass point load of 150 kg. The torque exerted by the lamp on the suspension point is 4000 Newton metres.

***The lamp anchorage ring as per Chief Engineer Reference Drawing 004 01 00 E, shall be provided with 14 mm countersunk holes, which have adequate clearance for the M.12 securing bolts. These holes may not, under any circumstances, be enlarged.***

***The countersunk 14 mm holes, in the anchorage ring, as per Chief Engineer Reference Drawing 004 01 00 E provided for mounting the anchorage ring provide for adequate clearance for the M.12 securing bolts, and may not under any circumstances be enlarged.***

2.2. **FINISHED FLOOR TO CEILING HEIGHTS**

The mounting height of the anchorage ring shall be 3 300 mm a.f.f.l.

***Where the mounting height of the anchorage ring exceeds 3 300 mm, an extension piece shall be provided, manufactured in accordance with Chief Engineer Reference Drawing number 004 02 00 E.***

***The bottom flange of the extension piece, Chief Engineer Reference Drawing 004 02 00 E shall be flush with the bottom of the false ceiling and shall be absolutely level.***

2.3. **TIMBER JOIST CEILING SUSPENSION**

***Where timber joist ceilings apply, the same anchorage ring, as detailed on Chief Engineer Reference Drawing 004.01.00 E shall be used, but drawings shall be referred to the Structural Engineer for detailing of fixing.***

2.4. **CONDUIT ENTRY**

Conduit entry to the fitting shall be by means of 3 x 25 mm diameter conduits
from a draw tray, terminating in a flush 150 mm x 150 mm deep conduit box in the centre of the anchorage ring.

A draw tray shall be mounted in one of the following positions:

- Space above the ceiling if access is convenient (above slab).
- In the false ceiling above the corridor.
- High up on the wall of the corridor.

The draw tray shall be of minimum size 300 x 300 x 50 mm deep.

***The general arrangement of the wireways for the operating theatre lamp is shown on Chief Engineer Reference Drawing 004 03 00 E.

2.5. WIRING

Power supply to the operating theatre lamp will be from the following two sources:

- 220 volt single phase A.C. supply to each theatre.
- 24 volt DC. from a theatre standby battery supply.

Wiring will be brought through the draw tray into the change-over box with tails of 1000 mm coiled up for the lamp supplier to connect.

Conductor sizes shall be as follows:

- For the 220 volt single phase AC supply: 2,5 mm\(^2\).
- For the 24 volt DC. supply: 10 mm\(^2\).

For each operating theatre lamp switch draw in 2 x 6 mm\(^2\) PVC. insulated conductors from the change-over box via the draw tray to the switches and from the switches to the operating theatre lamp outlet box via the draw tray.

The conductors shall be terminated to the switch and at the other end coiled up in the theatre lamp outlet box.

2.6. SWITCH FOR OPERATING THEATRE LAMP FLUSH MOUNTING

The switch shall be double pole, rated for at least 25 amperes per pole, 32 volts, D.C, and A.C. (50 Hz) and of the rotary type. It shall be provided with terminals to take 10 mm\(^2\) wiring connections.

Separate switches shall be provided for the main lamp and each satellite.

Each switch shall be mounted in a purpose made 100 mm x 100 mm x 100 mm deep box and shall be supplied complete with a stainless steel coverplate and chromium plated, or other approved corrosion resistant fixing screws.

The switch and the coverplate shall be flush with the wall, i.e. there shall be no gaps between the wall and coverplate.

The switches shall be the Santon Type RP225, rated at 25 A AC/DC, or other approved.
2.7. **BATTERY MAINTAINED THEATRE LAMP SUPPLY SYSTEM**

2.7.1. **General**

***This section shall only apply where the Project Specification calls for a Battery Maintained System to supply theatre lamps as opposed to an Unterrupted Supply System to supply the theatre lamps.***

The equipment specified under this particular section of the Specification refers specifically to battery maintained supplies for operating theatre lamps.

2.7.2. **Operating lamp Supplies**

The standby battery power supply for operating theatre lamps shall comprise:

- A single electrical supply connected to the standby plant.
- A regulated nominal 220 volt a.c. output via a regulating transformer;
- A regulated DC. voltage output via a Battery Charger,
- A double-pole DC. m.c.b. protecting DC. outgoing supplies to operating lamp loads as detailed further.

2.7.3. **Battery**

The battery shall either be of the stationary heavy duty low gassing lead-acid type, or of the nickel alkaline type.

**The battery shall comprise a set of cells, tubular lead acid or nickel alkaline, connected in series operating at 25°C capable of providing a discharge voltage of 26 volts maximum to 23.4 volts minimum after 2 hrs, or as specified in the Project Specification at the specified load with a minimum finishing voltage of 1.8 volts per cell for lead acid and 1.05 volts per cell for nickel alkaline units respectively. The cells shall be contained in sealed-in glass or similarly acceptable transparent material containers, in which the electrolyte and sediment levels are clearly visible. Maximum and minimum electrolyte level markings are required.**

Upon handing over, the battery shall be in a fully charged condition, ready for use.

The cell polarity shall be clearly and indelibly marked.

2.8. **BATTERY AND CHARGER**

2.8.1. **Cubicle**

This shall be a floor standing sheet metal self contained unit, well ventilated and vermin proof. It shall have adequate space to allow for
easy servicing of components and battery but the overall dimensions shall not exceed 600 mm wide x 700 mm deep and 2 000 mm high. Final paint finish shall be epoxy powder coated. Access to the panel shall be from the front only.

The housing shall be fitted with hinged lockable doors to all compartments. The unit shall be suitable to accept cable, trunking or conduit entry at the top or bottom with the necessary glanding off facilities. Where conduit wireways are used separate wireways for a.c. and DC. shall be provided.

The layout of charger components shall conform to good engineering practice. The instruments and pilot lamps shall be mounted on the face of the Battery Charger compartment door. All switches, circuit breakers and fuses shall be concealed behind these doors. The wiring to the above shall be neatly loomed to enable the door to be opened unrestricted.

All components in the battery charger, such as contactors, circuit breakers, copper bars, wiring, etc. shall have ample current carrying capacity to handle the applicable currents.

The charger shall be complete with all indicating labels, terminals and the main and auxiliary wiring in colour coded or numerically ferruled multi-strand PVC. insulated copper cable. The DC. polarity shall be clearly and indelibly marked on all circuit terminals.

Suitably rated terminals of the sprung cage clamp type or other approved shall be provided for all main circuits and for the control and protection circuits.

For cable terminations lugs or ferrules of the crimped type or other approved shall be used.

All termination points shall be numerically ferruled to correspond to terminal numbers of the wiring diagram(s)

All devices, relays and plug-in bases shall be suitably and uniquely labelled in accordance with the wiring diagram.

The DC. system shall be electrically isolated from the A.C. mains input system and earth, using a double wound transformer with an earthed screen between the primary and secondary windings.

2.8.2. Operation

The battery charging equipment shall be specifically designed for the specified batteries and for this application, and shall be of the full wave rectifier type.

The float voltage shall be set according to the battery manufacturer's recommendation. Above the recommended battery float voltage, the charger output shall be constant voltage controlled. Below the recommended float voltage the charger's output shall be current limited to a recommended maximum setting regardless of output voltage.

The system shall be designed to only connect the load to the batteries when the power to the charger is off.
If the battery charger manufacturer is not the Battery Manufacturer, then a statement from the Battery Manufacturer shall be included in this tender, stating that the battery charger offered in this tender is acceptable by the Battery Manufacturer for use with and specifically designed for the batteries offered.

The tenderer shall guarantee that the battery and charger are compatible.

The charger shall be designed for a single phase mains supply of 220 volts (10%), 50 Hz (2.5%) and the output shall be relatively unaffected by voltage fluctuations. The charger output shall be completely and automatically self-regulating to maintain the battery in a fully charged state.

The charger shall be capable of restoring the battery from a fully discharged state to 80 % of the fully charged state in ten (10) hours.

In order to prevent a build up of deposits on the electrodes, and to introduce a degree of gassing under controlled conditions an "equalising charge" mode, selectable by means of a key switch labelled "equalising mode initiate", shall be provided on the control panel door.

When this mode has been initiated the battery shall be charged to the manufacturers recommendations.

While the battery is in the equalising charge mode, a 10 min. to 60 min. timer shall maintain this mode and a local l.e.d. indication, labelled, "equalising charge mode on" shall be provided.

**Required alarm signals shall be as detailed in the Project Specification.

The operation of the alarm indication shall be as follows:

> When an alarm occurs it shall initiate a visual l.e.d. indication and a local audible signal.

An "Alarm Accept" button shall be depressed to accept and silence the audible alarm.

As the alarm is cleared the visual indication shall reset automatically.

2.8.3. Instrumentation and Protection

The charger shall be provided with:

- A marked DC. voltmeter reflecting the battery voltage.
- A DC. ammeter with centre zero indicating the battery charge and discharge rate.
- Key switch for equalising mode charge.

2.8.4. Pilot Indicator Lamps
The following pilot indicator lamps shall be provided on the charger panel:

- Charger fail
- Mains "ON"
- On Battery
- Equalising charge mode.

These lamps shall be light emitting diodes, minimum 60 milli-candela, or other approved.

Provision shall be made via a 24 volt switched supply in the charger panel to enable the connection of remote indication for "General Alarm" and "On Battery" in the theatre corridor as indicated on the drawings.

2.8.5. Connections

Robust and suitable sprung cage clamp or other approved terminal connections, suitably rated and labelled shall be provided for each of the following circuits:

- Mains supply disconnector.
- The battery charger output fuses to the battery.
- The DC. fused output system output to each theatre via 10 mm² PVC. insulated conductors.
- Remote common alarm.
- The output of the Power Supply Units to each of the load cable terminals. (For at least 10 mm² to 16 mm² cable lugs for DC. and 6 mm² terminals for a.c.).

2.9. MAINTENANCE INSTRUCTIONS

2.9.1. Wiring Diagrams

A permanent non fading suitably protected print of the wiring diagram for the above unit shall be fixed in a suitable position adjacent to the panel or inside the panel.

This wiring diagram shall indicate all circuit numbers, terminal numbers, voltages and wiring colours used for the above unit.

One plastic sepia copy of the above shall be supplied to the Engineer.

Two (2) full sets of complete operating and maintenance instructions (including the charger settings), on the entire installed system, shall be supplied to the Engineer upon handing over the battery/charger set.

2.10. SPARES AND ACCESSORIES
A spare fuse of each size shall be supplied in an appropriate holder within the panel.

2.11. TESTING AND COMMISSIONING

Testing, commissioning and records to demonstrate the correct working of the installation shall be approved by the Engineer.

3. ISOLATED SUPPLY SYSTEMS

3.1. GENERAL

Isolated supply systems are generally required for theatres or those intermediate and critical care areas where the skin resistance is broken down or where invasive techniques are employed, e.g. intensive care and renal dialysis units.

These systems shall generally be supplied via an isolated supply transformer from the Alternate or emergency supply network where this exists.

**In general the isolated supply systems shall be applied as follows and as specified in the Project Specification:

Operating Room and Associated Induction Room:

This unit shall be supplied from one isolated supply system supplying Switch Sockets:

Intensive Care Unit:

Switch Socket Outlets (Clinical use only)
Special Bed Head Clinical Lights.

Recovery Rooms:

As for intensive care units.

3.2. ISOLATED SUPPLY TRANSFORMERS

3.2.1. General

Isolated supply transformers shall be double-wound single phase units to provide electrical isolation of the secondary winding from the primary winding and earth. It shall be constructed so as to have a low leakage to earth so as to limit earth fault currents that flow should either end of the secondary winding be shorted to earth.

3.2.2. Construction

The transformer shall be double-wound, dry type unit.
3.2.3. **Rated Output**

** Rated output shall be a minimum of 5 kVA unless otherwise detailed in the Project Specification.

3.2.4. **Voltage Ratio and Tappings**

Primary winding: 220 volt  
Secondary winding: 110 / 110 volt  
Primary tappings: + 2.5 % +/- 0.5 %  
- 2.5 % +/- 0.5 %  
Secondary tapping: Centre-tapped.

3.2.5. **Polarity**

The primary and secondary shall be wound to provide the polarity as indicated on the diagram plate.

Terminal potential $A_3$ above $A_1$ when  
Terminal potential $a_3$ above $a_1$.

3.2.6. **Electrostatic Safety Shield**

An electrostatic safety shield shall be provided to conduct insulation faults on the primary winding safely to earth prior to them adversely affecting the secondary windings. This shield shall be brought out to a suitably marked terminal.

3.2.7. **Terminals**

Labelled terminals shall be provided for the following:

<table>
<thead>
<tr>
<th>CODE</th>
<th>WINDING</th>
<th>VOLTS</th>
<th>OUTLET</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_4$</td>
<td>primary winding</td>
<td>225.5 v</td>
<td>phase</td>
</tr>
<tr>
<td>$A_3$</td>
<td>primary tapping</td>
<td>220.0 v</td>
<td>phase</td>
</tr>
<tr>
<td>$A_2$</td>
<td>primary tapping</td>
<td>214.5 v</td>
<td>phase</td>
</tr>
<tr>
<td>$A_1$</td>
<td>primary winding</td>
<td>0 v</td>
<td>neutral</td>
</tr>
<tr>
<td>S</td>
<td>electrostatic shield</td>
<td></td>
<td>network</td>
</tr>
<tr>
<td>C</td>
<td>core</td>
<td></td>
<td>network</td>
</tr>
<tr>
<td>E</td>
<td>earthing</td>
<td></td>
<td>network</td>
</tr>
<tr>
<td>CODE</td>
<td>WINDING</td>
<td>VOLTS</td>
<td>OUTLET</td>
</tr>
<tr>
<td>------</td>
<td>--------------------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>a₃</td>
<td>secondary winding</td>
<td>220 v</td>
<td>line L2</td>
</tr>
<tr>
<td>a₂</td>
<td>secondary winding</td>
<td>0 v</td>
<td></td>
</tr>
<tr>
<td>a₁</td>
<td>secondary winding</td>
<td>0 v</td>
<td>line L1</td>
</tr>
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### 3.2.8. Diagram and Rating Plate

A Diagram Plate shall be fixed in an easily observable and easily readable location detailing:

- Manufacturer's Name
- Serial Number
- Winding configuration
- Terminal markings
- Rated kVA output
- Voltage ratios
- Polarity

### 3.2.9. Enclosure

The transformer shall be installed in a metal enclosure fitted with an access cover to the terminal block and a removable cover to facilitate the removal of the transformer. The enclosure shall have the following features:

- ventilated
- vermin proof
- fitted with "unistrut" section for easy fixing to unistrut mountings
- provision for 4 off 20 mm conduit entries (two at the rear and two underneath).

ready access to:

- terminals
- diagram plate
- conduit entries
- switched disconnector.

### 3.2.10. Electrical Connection

The electrical connection shall be via double pole switched disconnector mounted on the fixed part of the enclosure. The disconnector shall not be affected by the removal of the access plate or the ventilated housing cover providing access to the transformer itself.

The circuit breaker, protecting the circuit supplying the transformer, shall be rated at 30 amp with delayed tripping characteristics in order to accommodate switching in-rush currents.
3.2.11. Voltage Regulation

Voltage regulation shall not exceed:

- <2 % at unity power factor
- <2 % at 0.8 power factor.

3.2.12. Leakage Current

With the rated voltage connected to the primary winding and the transformer core and electrostatic safety shield connected to earth, the leakage currents measured first between earth and Line L2 and thereafter between earth and line L1, shall not exceed 50 micro amps.

3.3. ISOLATED SUPPLY DISTRIBUTION BOARD

The Board shall be constructed as for Distribution Boards and fitted with:

- 20 Amp 2.5 kA double pole disconnectors and M.C.B.’s.
- Earth bar mounted on insulators.
- Potential equalising bar which shall be used as a reference for equalising the potentials of all non current carrying conductive material associated with the isolated supply system. This bar shall be insulated from the Isolated Power Supply Panel and shall consist of either a 25 mm x 6 mm copper bar or other approved earthing terminal strip.
- A metal stud on the board for bonding the metal.

3.4. ISOLATED SUPPLY: LINE ISOLATION MONITOR

**A line isolation monitor shall be provided as specified in the Project Specification.**

The line isolation monitor shall continuously monitor the isolation of the system. It shall not cause interference to equipment, and shall have its own inherent leakage hazard current.

A manual test feature shall be provided but operation of this shall not introduce additional hazard to the system.

**Audible and visual alarms shall be provided as specified in the Project Specification.**

The audible alarm shall be provided with muting facilities.

3.5. WIRING

All line wiring shall be 2.5 mm².

Transformer secondary wiring insulation shall be coloured as follows:

Line 1 insulation shall be coloured amber.
Line 2 insulation shall be coloured white.

Potential equalising and earth continuity conductor insulation shall be coloured green/yellow.

3.6. WIREWAYS

Isolated supply systems shall be run in individual 20 mm dia metal wireways to outlets or service outlet trunking.

Separate wireways shall be provided to run equipotential bonding conductors to potential equalising bars.

Insulating collars, to isolate these metal wireways from the rest of the installation shall be installed as follows:

- At the isolating transformer wireway to the isolated supply distribution board.
- At the isolating supply distribution board, wireways to non isolated supply earth connections eg. gas outlets etc.
- Both sides of the "q bar" outlet boxes.
- At the 16 amp isolated supply switch socket outlet boxes.

See Chief Engineer Reference Chief Engineer Reference Drawing No: 005 05 00.

3.7. SWITCHES AND SWITCHED SOCKET OUTLETS

All switches on isolated supply shall be double pole.

3.8. POTENTIAL EQUALISING BONDING

Patient Potential Equalising Outlet:(q)

**These outlets shall be established at positions as described in the Project Specification.

3.9. PATIENT POTENTIAL EQUALISING OUTLET (q)

This outlet shall comprise a copper or brass bar mounted on insulators in a 150 mm x 100 mm x 50 mm box suitable for screw-connecting or clamping 2.5 mm$^2$ green PVC insulated conductors. A 100 mm x 15 mm x 4 mm tinned copper bar shall be mounted on insulators on the box cover and connected to the inside bar by means of a 2.5 mm$^2$ PVC insulated conductor.

This outlet shall be bonded to the following, using 2.5 mm$^2$ green, yellow PVC insulated conductors:

Operating Rooms:

Switch Socket Outlet on isolated supply earth terminal.
Potential Equalising bar in Isolated Supply Distribution board (Q).

Intensive Care Bedheads On Isolated Supply:

Switch Socket Outlet on isolated supply earth terminal.
Clinical examination lamp earth terminal.
Potential equalising bar in Isolated Supply Distribution Board (Q).

3.10. POTENTIAL EQUALISING BAR (Q)

This unit mounted in the Isolated Supply Distribution Board shall be bonded to:

Operating Room:

Patient Potential Equalising Outlet.
Operating Lamp earth terminal.

Terminals of non-isolated supply circuits in the patient area such as:

General Lighting.
X-Ray outlet.
X-Ray viewer.
Gas outlet.
Localised Water outlet.
Earth terminal on service pendant.
Earth terminal on Line Isolation Monitor.
Earth terminal On Isolating Supply Transformer.
Terminal to Antistatic Floor.
Electrical system earth bar at the Isolated Supply Distribution Board.

Intensive Care Units:

As above where applicable.

4. SPECIAL PURPOSE LIGHTING LUMINAIRES

Generally these luminaires shall comply with the Specification for Interior Luminaires for Fluorescent Lamps see Part A: Clause 29.

4.1. DARK ROOM SAFE LIGHTS

4.1.1. General

Safe Light units shall be of robust design and shall be neatly finished off.

This luminaire is intended for surface mounting (i.e. to a ceiling or to wall) and shall be designed for mounting via fixing screws through the base directly to the wall or a standard flush mounted 50 mm round draw-in conduit box.

The luminaire shall be connected to the electrical outlet by means of a 3-pin 5 amp plug and socket at the end of a 3-core cord.
Heat from the lamp shall not cause the filter to crack, craze, discolor or sag in any way, or affect the paint work.

Each safe light shall be provided with the following permanently mounted, permanently legible information:-

The name and address of the R.S.A. Manufacturer or the main R.S.A. Supplier, lamp type and wattage.

4.1.2. Lampholder:

This luminaire shall preferably be provided with a standard porcelain Edison screw brass lampholder. A standard bayonet brass lampholder will however also be accepted.

4.1.3. Light Source:

The light source shall be a standard 15 watt, 230 V pygmy lamp, preferably of the "Pearl" type.

4.1.4. Filter:

Filters shall be Kodak GBX-2 Compact Safe light or other approved.

Dimensions:

The outside plan dimensions shall be approximately 203 x 254 mm.

4.1.5. Construction:

All exposed metal edges shall be neatly finished off.

Filters shall slide easily into the luminaire body.

All metal work must be treated for corrosive conditions.

The pre-treatment of finished metalwork must be in accordance with S.A.B.S. O64/1960 "Preparation of steel surfaces for Painting", after manufacture.

The interior finish shall be non-yellowing white stove enamel, acrylic or epoxy resin, applied on a suitable primer after rustproofing.

The exterior finish shall be matt stove enamel.

Self tapping screws may not be used for any purpose.

4.1.6. Swivel Action:

It shall be possible to tilt the housing.
4.2. X-RAY VIEWING BOXES FLUSH MOUNTING

***These viewing boxes will be used only in operating theatres. Unless specifically stated in the Project Specification, for special cases, they will always be three plate viewing boxes, i.e. viewing area will be 430 mm x 1200 mm.

Internally, the boxes shall be finished in white stove enamel and equipped with three 40 watt fluorescent tubes and thermal trip switch start ballasts. No separation of plate viewing screens or switching is required, as switching will be effected from a flush switch adjacent to the panel.

The front of the panel shall be surrounded by a stainless steel architrave similar to that specified for flush mounting boards see the switchboard clause Part A , while the viewing plate and clips shall be mounted on a metal section finished flush with the architrave and secured by means of two coin slot knurled stainless steel screws at the top and locating pins at the bottom. Finish shall be stainless steel.

5. SPECIAL OUTLETS

5.1. POWER OUTLETS FOR LARGE MOBILE X-RAY MACHINES

These power outlets shall each consist of a 30 Amp triple pole miniature disconnector and a 4 pin, 25 Amp "Cekon" or other approved socket outlet. This unit shall be mounted at a height of 1500 mm from finished floor level.

The socket outlet shall be wired clockwise when viewed from the front as follows:-

1st pin (R) - Earth
2nd pin (S) - Phase
3rd pin (T) - Phase
4th pin (N) - Neutral

5.2. AUTOMATIC FILM PROCESSOR

The outlet shall consist of 4 x 6 mm² PVC insulated conductors plus a 4 mm² green PVC insulated earth conductor run in 25 mm diameter conduit from the nearest distribution board to a 30 amp T.P. isolator, mounted on the wall, at a height of 1500 mm above finished floor(a.f.f.l.), over a 100 X 100 x 50 mm conduit outlet box.

Extend from the isolator with 4 x 6 mm² PVC insulated conductors plus a 4 mm² green PVC insulated earth conductor run in 25 mm conduit to a flush mounted 100 x 100 x 50 mm conduit outlet box mounted 450 mm a.f.f.l.. Ends of conductors shall be left 1.5 m long and a blank coverplate shall cover the box.

5.3. FILM HOPPER

In the film cabinet install a micro switch which shall be wired in series with the light switch controlling the main light in the dark room.

This micro switch shall be installed in such a way that the main light in the dark room will be switched off as soon as the film cabinet door starts to open.
5.4. FAN IN THE DARK ROOM

The fan in the dark room shall be mounted 300 mm below the ceiling and shall be light trapped on both sides. Fans shall be Woods Xpelair 230 mm dia. Cat No GX 9 with speed regulator Cat No DC 9, or other approved.

Suitable PVC. conductors and a 2.5 mm^2 green PVC. insulated copper earth conductor in a 20 mm dia. conduit shall be extended from the nearest distribution board to a flush mounted 5 ampere three pin socket outlet next to the fan. From this outlet extend to the speed regulator specified above.

The speed regulator shall be installed over a flush mounted 100 mm x 100 mm x 50 mm deep outlet box, installed 1500 mm above finished floor level.

5.5. DARKROOM SAFELIGHT OUTLETS:

Install in positions as specified, 5 amp unswitched socket outlets, to provide power for the safelights.

These 5 amp three pin socket outlets shall be controlled by a separate light switch at the door mounted at a height of 1100 mm above finished floor level.

The light switch for the general light point in the darkroom shall be installed at a height of 1800 mm above finished floor level.

5.6. NURSE CALL

**Nurse call outlets shall be as specified in the Project Specification but shall in general be as follows:

All conduits shall be 25 mm diameter and provided with draw wires.

5.6.1. Bedhead Outlet

Install at each bed head an outlet point consisting of a 100 x 100 x 50 mm deep conduit outlet box complete with cover as specified. These outlets shall be linked with the wireway system for communications by means of 25 mm conduit.

5.6.2. Bathroom and Toilet Outlet

Bathroom and toilet call points shall be as specified above, but in bathrooms a ceiling outlet shall be installed in a position over the bath within easy reach of the patient. This outlet shall also consist of a 100 x 100 x 50 mm deep conduit outlet box complete with cover mounted flush with the ceiling.

5.6.3. Overdoor Indicator Outlet

Overdoor indicator light outlets shall relate to the door and be installed where they are visible from the corridor. These outlets shall consist of 100 mm x 100 mm X 50 mm conduit outlet boxes complete with covers and shall be linked to the communications wireway system by means of 25 mm conduit.
5.6.4. Nurse Station Indicator Outlet

Indicator panel outlets shall be installed at Nurses' stations as depicted on the drawing. These outlets shall consist of 100 x 100 x 50 mm conduit outlet box complete with cover as specified and shall be linked to the communications wireway system by means of 25 mm conduit.

5.6.5. Power Outlet Point for Nurse Call System

Install from the respective S.D.B. a 20 mm dia. conduit to a 100 mm x 100 mm x 50 mm deep sheet steel box with cover, next to the indicator panel outlet. Wiring shall consist of 2 x 2,5 mm² PVC. insulated conductors and a 2,5 mm² PVC. insulated green earth wire.

6. INDICATION AND INFORMATION

6.1. GAS BANK ALARMS

In the theatre complex in a position as depicted on the drawing, install a 300 mm x 300 mm x 75 mm deep purpose made conduit outlet box complete with cover plate.

**This outlet box shall be linked with the gas bank alarms, as specified in the Project Specification, by means of 25 mm conduit.

6.2. ANESTHETIZING LOCATION ANTI-STATIC FLOORS

Where these are required they shall comply with S.A.B.S. 051 Part 2.

6.3. LABORATORY BENCH PEDESTALS

**Power services distribution in laboratories shall be accomplished as detailed in the Project Specification using galvanised steel trunking below the benches. Where actual outlet points are required, extend with 20 mm conduits isolated by means of PVC. couplings from extruded aluminium pedestals with lids which shall be supplied, in lengths as detailed, to carry the necessary socket outlets.

7. MOUNTING HEIGHTS AND POSITIONS

The required mounting heights and positions will be indicated on drawings.

The mounting heights of components will be given in parenthesis adjacent to the component symbol on plan drawings.

All dimensions are to the bottom of square boxes and the bottom of round boxes.

The undermentioned mounting heights are the most commonly required, and shall be used where no height is indicated on the drawings:-
7.1. **WALL SWITCHES**

1100 mm above finished floor level. Switches required adjacent to door frames shall be located between 150 mm and 300 mm from the door frame edges.

7.2. **AMPERE SWITCH SOCKET OUTLETS**

300 mm above finished floor level or as otherwise specified. 1500 mm above finished floor level in theatres.

7.3. **STOVE, SINGLE AND THREE PHASE POWER OUTLETS**

The disconnector shall be mounted at a height of 1400 mm above finished floor level.

The 50 mm round conduit end outlet box shall be mounted at a height of 450 mm above the finished floor level.

7.4. **THREE PHASE SWITCHED SOCKET OUTLETS 16 AMP, 32 AMP AND 63 AMP.**

1400 mm above finished floor level.

7.5. **NURSE CALL SYSTEM**

Over-door lights 300 mm above and approximately centre of the door frame, unless otherwise indicated.

7.6. **NURSE CALL SYSTEM**

Mimic Panels 1 200 mm above finished floor level.

7.7. **OPERATING THEATRE CLOCKS**

2100 mm above finished floor level.

7.8. **BELL PUSHES**

1100 mm above finished floor level.

7.9. **TELEPHONE OUTLET BOXES**

300 mm above finished floor level unless otherwise specified or 1400 mm above finished floor level in telephone booths.

7.10. **INTERCOM OUTLET BOXES**

300 mm above finished floor level unless otherwise specified.
7.11. FANS AND FAN HEATERS

2100 mm above finished floor level.
Thermostats
2100 mm above finished floor level.

7.12. X-RAY VIEWING SCREEN

1300 mm above finished floor level.

END OF PART C:
HOSPITALS INSTITUTIONS:
ANNEXURE D: MECHANICAL INSTALLATIONS TECHNICAL SPECIFICATIONS
CLINICS - GROUP D HOSPITALS

GROUP 2

Albertina Clinic
Riversdale Clinic
Riversdale Hospital

MECHANICAL INSTALLATIONS

2.3.3 TECHNICAL & PARTICULAR SPECIFICATIONS

2.3.3.1 FIRE DETECTION & ALARM SYSTEMS
2.3.3.2 FIRE EQUIPMENT AND SYMBOLIC SIGNS
2.3.3.3 HVAC & VENTILATION
2.3.3.1 FIRE DETECTION AND ALARM SYSTEMS

DOCUMENTATION
The Department of Public Works and the Department of Health proposes to upgrade the Fire detection and Alarm Installations in various clinics & hospitals in the Eden District. The complete scope of the Engineering Works is described in this and the Bill of Quantities.

2.3.3.1 SUB-SECTION 1- SITE INFORMATION

General
The sites of the proposed engineering works for this project are located in the Western Cape. The facilities are occupied by the Department of Health and is operated as Clinics & Hospitals.

The contractor shall assess the sites to determine relevant data.

The Contractor shall be responsible for making arrangements with the Officer in Charge of the site or building regarding the availability of the proposed installation to the Contractor, for inspection for the purpose of preparing his Bid, and to execute the works should he be the successful contractor.

The successful contractor must obtain access cards for his personnel and employees who work within such an area.

The contractor must comply with any regulations or instructions issued from time to time, concerning the safety of patients, staff members and property, by the Engineer or various Departments.

The Department may require the Contractor to have his personnel or a certain number of them security classified.

In the event of either the Department, or the S.A Police Services requesting the removal of a person or persons from the site security reasons, the Contractor shall do so forthwith and the Contractors shall thereafter ensure that such person or persons are denied access to the site and/or to any documents or information relating to the work.

The contractor shall inform the Officer in charge at least 7 days prior to working on or servicing as to which equipment will be affected, so as to enable the Client to arrange for inspections if it is considered necessary.

The appointed Contractor shall be responsible for making arrangements for the purpose of New Installations, Repairs, Maintenance and Servicing. In the event of the Contractor failing to make such arrangements, admission to the site may be refused by the Officer in charge and the Department will not be responsible for any additional costs which the Contractor may incur by such refusal.

Environmental Conditions
Environmental statistics for the sites and surrounding area may be obtained from the SA Weather Office.

Electricity Supply
The permanent supply parameters are: 400/230V 50Hz.
Supplier: The relevant local Municipality or Eskom.
Electricity for the Works: Refer to Facilities.

Water supply
The water supply to the property is generally provided by the local Municipality.

Existing Mechanical Plant
The schedule of existing plant is in general presented on the drawings.
STANDARD SPECIFICATIONS

The specifications make reference to certain national and international standard specifications as well as the standard specifications published by the Department of Public Works and the Department of Health. Such specifications are not issued with this document but may be obtained from the relevant Department’s Websites.

The Contractor shall be entirely responsible for referencing all relevant standard specifications of the DPW, SANS, Department of Health or other applicable published standard whether such standard is referenced in this document or not and ensuring compliance of the Engineering Works therewith. The references in this document to standard specifications shall not be construed as limiting, and are given merely as a guide for basic reference. Where SABS is stated, the applicable SANS shall apply.
2.3.3.1 SUB-SECTION 2- PROJECT SPECIFICATION

2.1 Scope
The purpose of this upgrading and repairs project is to ensure that the Mechanical components & fire related equipment is complying with SANS, the Local Fire Department and the Requirements of the Dept. of Health in all respects and to deliver full performance as and when required during fire conditions.

2.2 Supervision and Management
The contractor shall supervise and manage the scope of work and provide everything necessary for the complete installation and maintenance of the plant whether described in precise detail or not. Such supervision and management shall include periodic inspection of the site to check that the installation work complies with the specifications and instructions, attendance at site meetings and inspections as necessary or required. This item shall include allowances for construction tools specific to the installation and all relevant provisions. Arrangements shall be made with the occupants of buildings regarding access to the premises in order to execute the required services.

All electrical work under the mechanical contract shall be performed by subcontractors or employees who are registered or licensed, as required by legal statute. Copies of registration or licence documents shall be submitted on instruction of this project. Electrical testers for single phase do not comply with this requirement, a registered electrician and suitably skilled personnel shall be available to carry out any emergency repair work on a 24 hours basis including week-ends and public holidays.

The Contractor shall provide at his own cost a supply of Job Cards in accordance with the example included herein. The Job Card must be completed legibly in ink after completion of each service. In addition to the original completed Job Card submitted with the account, the contractor must submit a copy of the Job Card to the User Department for audit purposes.

2.3 Accommodation of Tenants (Client) Departments
The hospital will be in full operation at all times. The presence of patients and staff shall be respected at all times without interference. Where it is necessary to isolate any electrical/mechanical services, specific arrangements shall be made with the Client Department & confirmed in writing to the Engineer.

2.4 Access Control & Identity of Staff
The User Departments maintain various levels of access control systems at the entrances to the sites and wards. It may not always be possible to gain entry to such areas upon arrival and delays can occur. In certain areas Contractor’s may require escorting by User Department staff. The Contractor shall comply with the requirements and instructions of such staff at all times. The Contractor shall bear the sole responsibility for arranging access to the sites as necessary.

The contractor shall maintain a daily schedule of employees at each site including time of entry to the site and any specific facility. Each employee shall display a company identity card with name, company and photograph. Working garments (not orange in colour) shall identify the contractor.

Should the work fall within a security or sensitive area, the contractor must obtain, either from the Officer in charge or the Department’s Head permission for his personnel and employees who work within such an area. The contractor must comply with any regulations or instructions issued from time to time, concerning the safety of Patients, Hospital Staff and Contractor’s staff.

The Department of Health or the Officer in charge of the hospital require the Contractor to have his personnel or a certain number of them security classified and/or to pass a clean bill of health. In the event of either the Department of Health or the Officer in charge of the hospital requesting the removal of a person or persons from the site for above reasons, the Contractor shall do so forthwith and the Contractor shall thereafter ensure that such person or persons are denied access to the site and/or to any documents or information relating to the work.
2.5 Rubbish and Waste Management
All rubbish and waste arising from the work must be removed and the site and buildings left clean and tidy. Waste including items such as used strainers, hemp, paint, cleaning solutions etc. shall be disposed of in an environmentally safe manner.

2.3.3.1 SUB-SECTION 3 - CONTRACTOR DRAWINGS & EQUIPMENT SPECIFICATIONS

3.1 Scope
Such drawings and/or documents for new and replacement equipment or components where required or necessary shall be submitted for record purposes. Documents for electrical and control equipment shall include full wiring diagrams and component schedules which are suitable for incorporation into the O&M Manuals. Documents (Block Plan drawings), clearly indicating the zones, shall be included in the O&M Manuals.

3.2 Particulars of Equipment & Materials
All equipment new & replacement shall be selected with due regard to the installation site conditions.

Equipment shall at all times be selected to operate within the limits recommended by the particular manufacturer.

Where equipment will be required to operate at conditions deviating from the manufacturer’s standard selection tables, re-rating shall be performed strictly in accordance with the manufacturer’s methods.

Product references, where given in this document, shall be taken merely as a guide to product selection, notwithstanding which, all equipment and materials shall comply fully with the specifications.

3.3 Material of Equal Quality
Replacement parts, spares and materials used shall be of equal specification to the component that is being replaced and must where possible carry the SANS mark of approval, but can be of a different size if specifically required by the Department. If such equivalent component is not available, then the alternative component must be approved by the Engineer prior to installation.

2.3.3.1 SUB-SECTION 4 - HAZARDOUS MATERIAL REMOVAL

4.1 Normative Reference
Occupational Health & Safety Act 1993 (85 of 1993) : Asbestos Regulations

2.3.3.1 SUB-SECTION 5 - FIRE DETECTION EQUIPMENT

5.1 General
Where installed, and measured in the Bill of Quantities, this tender involves the upgrading and repairs of the existing fire detection equipment in the buildings, hereafter referred to as “user” departments.

Where it is necessary to replace any plant the Department reserves the right to ask for quotations and to accept the lowest such quotation.

The fire detection equipment covered under this contract comprises of various equipment: detectors, control panels, wire ways and wiring, audible alarms etc.

The base of a detector shall always be mounted in the area which it protects so that the indicator LED can be seen from the doorway which normally provides access to the room. The indicator LED shall face towards the
main entrance or lobby or side of main approach in the passage. See also clause 2.1.1.

The following methods are acceptable for the wiring of detector circuits:
   a) Steel conduit and conduit accessories cast into, or built into, the building structure and wired with insulated conductors of a type which complies with the requirements of this specification.
   b) Steel conduit and conduit accessories, surface mounted in building structures and wired with PH 30 conductors as approved by the Department.

At premises where services cannot be done during normal working hours and arrangement must be made for performing the services on Saturdays or after hours, which shall form part of the contract at no extra cost.

No claims will be considered for specialized labour and advice, equipment or special equipment or transportation of same for services/repairs/maintenance.

Certain new replacement components are specified on a provisional basis to be installed as required.

During the contract period, the contractor shall attend to all items called for attention, as listed by the Engineer. All irregularities and comments must be reported by the contractor in writing, or reported in the Site Instruction Book on site. The work shall be carried out by a competent technician all in accordance with the Basic Conditions of Employment Act no 75 of 1997, as well as the requirements of the SAQCC – Handling or Fire Protection Equipment.

All work carried out and all equipment and material supplied in terms of this procedure shall comply with the original equipment manufacturer’s specifications and operation and maintenance instructions. The contractor shall be responsible for obtaining such documents, however, copies of the existing operating & maintenance manuals may be obtained from the Officer in Charge. The existence or suitability of such documents is not warranted.

The Contactor shall report in writing to the Department or Engineer any contraventions of the Act and Code as far as the installation is concerned.

The Department reserves the right to inspect the Contractor and his Supplier’s works to assess calibration, testing, storage and handling facilities to assure itself of the capabilities of the Contactor to perform in accordance with the Specifications and delivery requirements of the Bid.

In the event of failure of the Contractor to install, maintain and/or repair any installation to the satisfaction of the Department, the latter reserves the right to make any arrangements necessary or expedient in regards to said maintenance and/or repairs to any installation appearing in the document attached hereto, and the Contractor shall be liable to the State for payment of any additional expenditure thereby incurred, as well as for payment of damages which the State may have suffered as a result of the Contactor’s default or negligence.

In the event of it becoming evident that there is any deterioration or defects, in part or as a whole of the system or systems under this contract, especially towards the end of the maintenance contact period, such a deterioration or defect shall be rectified and made good by the Contactor. Failure to do so, either the incoming Contactor or others will do such rectification and the cost thereof shall be then for the account of the outgoing Contractor.

All quantities in this tender are provisional and inserted in order to obtain competitive tenders. The Department reserves the right to increase or decrease quantities during the progress of the contract and such increases or decrease shall not alter the rates for any item.

5.2 General Scope of works – Fire Detection

The scope of the Works described in this document shall include (but not limited to) the following:

- Smoke-test all existing detectors for correct operation.
- Compare detectors installed per zone and confirm the correctness as shown on the control panels.
- Supply and install additional detectors in areas as will be depicted by the Engineer. A provisional quantity has been allowed in the Bill of Quantities.
- Check all control panels. Replace all batteries with new. Check all circuits. Replace indication lamps as required. Test audible alarms and replace if found faulty.
- Check and confirm links between control panels and repeater panels.
- Check links between control panels in the wards / reception and the main control panel in the Admin building. Restore links if required.
- Remove all current Block Plans. Provide new updated Block Plans in clear, easy readable coloured zones, on A3 paper. Block Plans to be mounted in an aluminium frame behind Perspex glass. Fix Block Plans to walls next to the control / Repeater Panels. Engineer to approve Block Plans before installation.
- Investigate ways and means to link Fire Alarm Signals to the Local Fire Department. A Provisional amount is allowed in the Price Schedule for this purpose.
- Extend wiring and wire ways from the nearest wire circuit to the nearest fire exit door. Supply and install the required door alarm sensors. Connect to Alarm Panel and Audible Alarm as an addressable point.
- Training of and attendance register of selected staff to react responsively in case of fire or alarm activations, included hard copies of training material.
- The contractor will provide a pull-down history of all alarms since the previous inspection and present it with his service job card to the Maintenance Officer.

2.3.3.1 SUB-SECTION 6 - EQUIPMENT MAINTENANCE AND SERVICING (PLANNED)

6.1 Scope: Twelve Monthly Maintenance & Servicing

The successful contractor will be responsible to warrant, service and maintain ALL NEW fire Detection related equipment for 12 months, starting from the date of Practical Completion.

The condition of the existing fire detection installations, as applicable shall be verified and recorded to the Engineer on the contractor’s first visit to each installation.

Drawings of the existing installations are limited and schematic.

Service schedules shall comply with the service schedules as per the SANS Requirements.

*The Contractor shall be responsible for the compulsory services of NEW equipment as per the supplier’s requirements, to comply with the Supplier’s Warrantee Clauses, for the compulsory 12 month warrantee period.*

The Contractor shall fully acquaint themselves with the nature of the work to be carried out, the locality of the equipment and any possible hindrances in the execution of the service (entry clearance, etc) and to allow for all of these factors in their prices, as any later claim bases on want knowledge will not be entertained.

The condition of the fire detection installations shall be surveyed on the first service visit to each building, the information being recorded and submitted in schedule format to the Engineer for record. Such records shall include any damage or equipment faults. The information shall include relevant to the fire protection and symbolic signs installations. Attention shall be given to reporting the corrosion of any metallic components during the inspection visits.

All replacement parts and spares shall comply with the original equipment manufacturer’s (OEM) specifications.

Used components shall be safely disposed at an approved facility.
6.2 Measurement
The rate shall include all necessary labour, materials, parts, consumables, reports, document copies and disposal of used waste materials and parts. Materials and parts shall include but not limited to; Wiring, lamps, smoke test equipment, electronic parts, fixing material etc. for the complete servicing of the plant.

6.3 Payment
Payment will be subject to the contract conditions as per the Main Contractor’s accepted Tender document.

2.3.3.1 SUB-SECTION 7 - TESTING, COMMISSIONING & MAINTENANCE

7.1 Operating & Maintenance (O&M) Documents

Comprehensive supplementary O&M documents shall be compiled for any new components which have been installed or where equipment has been altered in the course of the maintenance and servicing of the Servicing of Fire Detection Equipment.

Draft copies of the documents shall be submitted to the Engineer for scrutiny and any necessary revisions shall be made prior to submission of multiple copies of the approved document. The final copies shall be submitted in a ring binder file or files divided into sections per affected plant.

7.2 Block Plan

An approved block plan, indicating the zones and appropriate zone reference numbers, shall be installed at all control panels and repeater panels.

The block plan shall have a professional appearance. Text shall be in English and at least one other official language to be decided in conjunction with the Department and the User Department. A freehand drawing or badly finished plan will not be acceptable.

The block plan shall clearly indicate the position of the zone in which a fire has started, when read together with the displays and indications on the control panel.

For an addressable system, the addresses of all field devices shall be shown on the block plan.

7.3 Operating instructions

Instruction cards, indicating clearly the procedure to be followed in the event of a "FIRE" alarm, shall be supplied and framed under Perspex in approved teak or non-ferrous material frames. The instruction cards shall be in English and at least one other official language to be decided in conjunction with the Department and the User Department. The frame shall be neatly mounted on the walls alongside the control panel and external indicator panels respectively, where they can be.

First delivery of an installation will not be taken unless acceptable manuals are submitted prior to the first hand-over inspections.

2.3.3.1 SUB-SECTION 8 - UNPLANNED REPAIRS/MAINTENANCE

1.1 Scope

During the contract period, the User Client or Tenant Department staff may report such plant faults or breakdowns to the Maintenance Manager or Engineer. The Contractor will action only on a site instruction from the Maintenance Manager or the Engineer.

The contractor shall respond to the complaint reported by the Appointed Call Centre as necessary in accordance
with the assigned priority level & the breakdown (complaint) shall be repaired as necessary to restore the plant to full operation in the minimum time. On completion of the complaint remedy the contractor shall complete a Job Card and submit to the Engineer with a copy to the facility concerned. The Contractor shall attach to the Job Card the following documents associated with the complaint.

* Copies of vendor tax invoices for materials used, each endorsed with the Site Instruction Number, the Contractor’s stamp and the Contractor’s original signature.
* Time sheets of staff who attended to the Complaint all stamped and endorsed with the Contractor’s original signature.
* Further information which may be necessary or instructed.

2.3.3.2 FIRE EQUIPMENT AND SYMBOLIC SIGNS

DOCUMENTATION
The Department of Public Works and the Department of Health proposes to upgrade the Fire Protection and Symbolic Signs in Hospitals & Clinics in the Eden District. The complete scope of the Engineering Works is described in this document and the Bill of Quantities.

2.3.3.2 SUB-SECTION 1 - SITE INFORMATION

General
The site of the proposed engineering works for this project are located in the Western Cape. The facilities are occupied by the Department of health.

The contractor shall assess each site to determine relevant data.

The Contractor shall be responsible for making arrangements with the Officer in Charge of the site or building regarding the availability of the proposed installation to the Contractor, for inspection for the purpose of preparing his Bid, and to execute the works should he be the successful contractor.

The successful contractor must obtain access cards for his personnel and employees who work within such an area.

The contractor must comply with any regulations of instructions issued from time to time, concerning the safety of patients, staff members and property, by the various departments.

The Department may require the Contractor to have his personnel or a certain number of them security classified.

In the event of either the Department, or the S.A Police Services requesting the removal of a person or persons from the site security reasons, the Contractor shall do so forthwith and the Contractors shall thereafter ensure that such person or persons are denied access to the site and/or to any documents or information relating to the work.

The contractor shall inform the Officer in charge at least 7 days prior to working on or servicing as to which equipment will be affected, so as to enable the Client to arrange for inspections if it is considered necessary.

The appointed Contractor shall be responsible for making arrangements for the purpose of New Installations, Repairs, Maintenance and Servicing. In the event of the Contractor failing to make such arrangements, admission to the site may be refused by the Officer in charge and the Department will not be responsible for any additional costs which the Contractor may incur by such refusal.

Environmental Conditions
Environmental statistics for the sites and surrounding area may be obtained from the SA Weather Office.
Electricity Supply
The permanent supply parameters are: 400/230V 50Hz.
Supplier: The relevant local Municipality or Eskom.
Electricity for the Works: Refer to Facilities.

Water supply
The water supply to the property is generally provided by the local Municipality.

STANDARD SPECIFICATIONS
The specifications make reference to certain national and international standard specifications as well as the standard specifications published by the Department of Public Works and the Department of Health. Such specifications are not issued with this document but may be obtained from the relevant source:

The Contractor shall be entirely responsible for referencing all relevant standard specifications of the DPW, SANS, Department of Health or other applicable published standard whether such standard is referenced in this document or not and ensuring compliance of the Engineering Works therewith. The references in this document to standard specifications shall not be construed as limiting, and are given merely as a guide for basic reference. Where SABS is stated, the applicable SANS shall apply.

2.3.3.2 SUB-SECTION 2- PROJECT SPECIFICATION

2.1 Scope
The scope of the Works described in this document shall include the upgrading, repairs and servicing of existing fire protection equipment and symbolic sign installations and guaranteeing free of defects for the full maintenance period of the complete installations specified.

2.2 Purpose of the Proposed Engineering Works
The purpose of this upgrading and repairs project is to ensure that the fire protection equipment and symbolic signs are complying with SANS, the Local Fire Department and the Requirements of the Dept. of Health in all respects and to deliver full performance as and when required during fire conditions.

The upgrading may require additional fire hose reels and the replacement of all fire extinguishers to 5kg CO₂ units where extinguishers are installed in wards or hospital corridors.

Installation of new fire extinguishers will include the varnished hardwood back-board, fixed to walls, including the hook.

The installation of fire hose reels will include the supply, installation and connection of extended pipe work to the new hose reels. Unless otherwise pointed out, the horizontal pipe work will be routed through the ceiling space, and droppers to the new hose reels will be surface mounted on the walls.

Where underground pipe work is required, the following will apply:

- Excavations will be strictly with hand tools only, and must be executed with due care, to avoid undue damages to existing under-ground surfaces.
- Excavations will be 400mm wide by 600mm deep. Allowance must be made for more than 600mm depth in specific areas, to avoid existing services where applicable.
- The new pipe work will be HDPE class 16. Dimensions are as per measurements in the Price Schedule.
- Pipes will be laid on selected soil, will be covered in 150mm layers and will be compacted to original soil conditions.
- Concrete, paving or tar crossings will be restored to original condition.
- The disconnections of existing fire hydrants from existing pipe work, and the connection to the new mains ring feed forms part of this specification.
- The disconnections of existing supply to hose reels in buildings from existing pipe work, and the new connections from the new mains ring feed also forms part of this specification.
- The system shall be pressure tested at 600kPa over a period of 12 hours, before any joint, T-off or
The maintenance manager, the engineer or authorized representative will have to sign off the pressure testing results. The final pipe route will be pegged out site, with the consent of the maintenance manager and the engineer. Pipe work will be measured separately in the Bill.

2.3 Supervision and Management
The contractor shall supervise and manage the scope of work and provide everything necessary for the complete installation and maintenance of the plant whether described in precise detail or not. Such supervision and management shall include periodic inspection of the site to check that the installation work complies with the specifications and instructions, attendance at site meetings and inspections as necessary or required. This item shall include allowances for construction tools specific to the installation and all relevant provisions. Arrangements shall be made with the occupants of buildings regarding access to the premises in order to execute the required services.

All electrical work shall be performed by subcontractors or employees who are registered or licensed, as required by legal statute. Copies of registration or licence documents shall be submitted on instruction of this project. Electrical testers for single phase do not comply with this requirement. A registered electrician and suitably skilled personnel shall be available to carry out any emergency repair work on a 24 hours basis including week-ends and public holidays.

The Contractor shall provide at his own cost a supply of Job Cards in accordance with the example included herein. The Job Card must be completed legibly in ink after completion of each service. In addition to the original completed Job Card submitted with the account, the contractor must submit a copy of the Job Card to the User Department for audit purposes.

2.4 Accommodation of Tenants (Client) Departments
The hospitals/clinics will be in full operation at all times. The presence of patients and staff shall be respected at all times without interference. Where it is necessary to isolate any electrical/mechanical services, specific arrangements shall be made with the Client Department & confirmed in writing to the Engineer.

2.5 Access Control & Identity of Staff
The User Departments maintain various levels of access control systems at the entrances to the sites and wards. It may not always be possible to gain entry to such areas upon arrival and delays can occur. In certain areas Contractor’s may require escorting by User Department staff. The Contractor shall comply with the requirements and instructions of such staff at all times. The Contractor shall bear the sole responsibility for arranging access to the sites as necessary.

The contractor shall maintain a daily schedule of employees at each site including time of entry to the site and any specific facility. Each employee shall display a company identity card with name, company and photograph. Working garments (not orange in colour) shall identify the contractor.

Should the work fall within a security or sensitive area, the contractor must obtain, either from the Officer in charge or the Department’s Head permission for his personnel and employees who work within such an area. The contractor must comply with any regulations or instructions issued from time to time, concerning the safety of Patients, Hospital Staff and Contractor’s staff.

The Department of Health or the Officer in charge of the hospital require the Contractor to have his personnel or a certain number of them security classified and/or to pass a clean bill of health. In the event of either the Department of Health or the Officer in charge of the hospital requesting the removal of a person or persons from the site for above reasons, the Contractor shall do so forthwith and the Contractor shall thereafter ensure that such person or persons are denied access to the site and/or to any documents or information relating to the work.

2.6 Rubbish and Waste Management
All rubbish and waste arising from the work must be removed and the site and buildings left clean and tidy. Waste including items such as used strainers, hemp, paint, cleaning solutions etc. shall be disposed of in an environmentally safe manner.

2.3.3.2 SUB-SECTION 3 - CONTRACTOR DRAWINGS & EQUIPMENT SPECIFICATIONS

3.1 Scope
Such drawings and/or documents for new and replacement equipment or components where required or necessary shall be submitted for record purposes. Documents for electrical and control equipment shall include full wiring diagrams and component schedules which are suitable for incorporation into the O&M Manuals. Documents (general arrangement drawings) showing the location of fire equipment on a premises shall be submitted for record purposes.

3.2 Particulars of Equipment & Materials
All equipment new & replacement shall be selected with due regard to the installation site conditions.

Equipment shall at all times be selected to operate within the limits recommended by the particular manufacturer.

Where equipment will be required to operate at conditions deviating from the manufacturer’s standard selection tables, re-rating shall be performed strictly in accordance with the manufacturer’s methods.

Product references, where given in this document, shall be taken merely as a guide to product selection, notwithstanding which, all equipment and materials shall comply fully with the specifications.

3.3 Material of Equal Quality
Replacement parts, spares and materials used shall be of equal specification to the component that is being replaced and must where possible carry the SANS mark of approval, but can be of a different size if specifically required by the Department. If such equivalent component is not available, then the alternative component must be approved by the Engineer prior to installation.

A representative of the “user” department must sign for spares that have been used in the execution of services and details entered on the Job Cards.

The serial numbers of original and new components shall be entered on job cards and invoices presented for payment. The guarantee cards for items must also be attached to job cards.

2.3.3.2 SUB-SECTION 4 - HAZARDOUS MATERIAL REMOVAL

4.1 Normative Reference
Occupational Health & Safety Act 1993 (85 of 1993) : Asbestos Regulations

2.3.3.2 SUB-SECTION 5 - BUILDING & GENERAL WORK
N/A

2.3.3.2 SUB-SECTION 6 - PAINTING & SURFACE COATINGS: BUILDINGS
N/A

2.3.3.2 SUB-SECTION 7 - FIRE PROTECTION EQUIPMENT AND SYMBOLIC SIGNS

7.1 Scope Summary
This tender involves the upgrading and repairs of the existing fire protection equipment and installation of symbolic signs in Hospitals & Clinics buildings, hereafter referred to as “user” departments.

The contractor will provide a fire equipment register to the client. The register will have a suitable schedule to enable the client to execute his monthly inspections of equipment in the register, per 12 month cycle.

Where it is necessary to replace any plant the Department reserves the right to ask for quotations and to accept the lowest such quotation.

The fire protection equipment covered under this contract comprises of various equipment: hose reels, hydrants, hand held extinguishers etc.

At premises where services cannot be done during normal working hours and arrangement must be made for performing the services on Saturdays or after hours, which shall form part of the contract at no extra cost.

No claims will be considered for specialized labour and advice, equipment or special equipment or transportation of same for services/repairs/maintenance.

Certain new replacement components are specified on a provisional basis to be installed as required.

During the contract period, the contractor shall attend to all items called for attention, as listed by the Engineer. All irregularities and comments must be reported by the contractor in writing, or reported in the Site Instruction Book on site.

The work shall be carried out by a competent technician all in accordance with the Basic Conditions of Employment Act no 75 of 1997, as well as the requirements of the SAQCC – Handling or Fire Protection Equipment.

All work carried out and all equipment and material supplied in terms of this procedure shall comply with the original equipment manufacturer’s specifications and operation and maintenance instructions. The contractor shall be responsible for obtaining such documents, however, copies of the existing operating & maintenance manuals may be obtained from the Officer in Charge. The existence or suitability of such documents is not warranted.

The Contactor shall report in writing to the Department any contravention’s of the Act and Code as far as the installation is concerned.

The Department reserves the right to inspect the Contractor and his Supplier’s works to assess calibration, testing, storage and handling facilities to assure itself of the capabilities of the Contactor to perform in accordance with the Specifications and delivery requirements of the Bid.

In the event of failure of the Contractor to install, maintain and/or repair any installation to the satisfaction of the Department, the latter reserves the right to make any arrangements necessary or expedient in regards to said maintenance and/or repairs to any installation appearing in the document attached hereto, and the Contractor shall be liable to the State for payment of any additional expenditure thereby incurred, as well as for payment of damages which the State may have suffered as a result of the Contactor’s default or negligence.

In the event of it becoming evident that there is any deterioration or defects, in part or as a whole of the system or systems under this contract, especially towards the end of the maintenance contact period, such a deterioration or defect shall be rectified and made good by the Contactor. Failure to do so, either the incoming Contactor or others will do such rectification and the cost thereof shall be then for the account of the outgoing Contractor.

All quantities in this tender are provisional and inserted in order to obtain competitive tenders. The Department reserves the right to increase or decrease quantities during the progress of the contract and such increases or decrease shall not alter the rates for any item.
2.3.3.2 SUB-SECTION 8 - WARNING NOTICES

8.1 Scope
It is the intention to replace all existing signs, where these signs do not comply with the latest SANS Requirements. Existing signs shall be removed and the remaining fixing holes in the wall, door or panel shall be made good and refinished to match the surrounding area. Refinishing is measured elsewhere.

The signs shall comply with SANS Requirements in all respects. Fixing holes (4) shall be formed at each corner of the sign.

The format & artwork of all signs are subject to the approval of the Engineer.

Fixings, including the making of holes in the support surface shall consist of the following:
- On timber: Stainless steel roundhead wood screws and washers
- On brick work: As for timber but with a plastics wall plug in the wall, hole drilled for the purpose.
- On panels or enclosures: Stainless Steel “pop” rivets & washers.

2.3.3.2 SUB-SECTION 9 - MAINTENANCE OF METAL COMPONENTS

9.1 Scope
Where required, any corroded or damaged components of the fire protection equipment or symbolic signs etc shall be repaired such as to match the surrounding components of the plant. In the case of in-situ repairs, the corroded surface area shall be completely cleaned of corrosion products, degreased, treated with a suitable metal primer and undercoat prior to over coating the complete panel on which the repair has been made.

Any firmly adhering paint outside the repaired area shall be abraded and degreased prior to over coating. The edges of surrounding firm paintwork shall be faired such that edges are not visible after the finish coats have been applied. All surface coatings shall be applied strictly in accordance with the product manufacturer’s specifications. The contractor shall ensure that the new coating products are compatible with any existing finish which is over coated.

In-situ repairs shall be performed using an air powered spray applicator. Areas surrounding the work section shall be effectively masked to prevent overspray. Should overspray occur, the contaminated surface shall be immediately cleaned.

All products shall be suitable for interior and exterior use. Manufacturer’s data sheets shall be submitted to demonstrate compliance with the specification and for application monitoring purposes.

9.2 Particulars
In-situ repair: Gloss air drying spray applied enamel
Minimum two coats of finish colour for an overall minimum dry film thickness (dft) of 100μm, including primer & undercoat.

9.3 Measurement
Area in square metres (m²) coated including surface preparations & all coats distinguished by process.

2.3.3.2 SUB-SECTION 10 - EQUIPMENT MAINTENANCE AND SERVICING (PLANNED)

10.1 Scope: Twelve Months Maintenance & Servicing
The successful contractor will be responsible to service and maintain ALL NEW fire related equipment for 12 months, starting from the date of Practical Completion.
The existing fire protection and symbolic signs installations, as applicable shall be verified and recorded on the contractor’s first service visit to each installation.
Drawings of the existing installations are limited and schematic.
The Contractor shall be responsible for the compulsory services of NEW equipment as per the supplier’s requirements, to comply with the Supplier’s Warrantee Clauses, for the compulsory 12 month warrantee period as well as with the service schedules as per the SANS Requirements.

The first service to existing equipment shall be executed within the first 2 months after site hand-over, immaterial if the service dates on existing equipment is still within limits.

The next service of ALL equipment shall be completed as per the SANS stipulated period after the first service.

The required Service Register as per SANS Requirements will be compulsory and must form part of the priced Service Schedule.

The Contractor shall fully acquaint themselves with the nature of the work to be carried out, the locality of the equipment and any possible hindrances in the execution of the service (entry clearance, etc) and to allow for all of these factors in their prices, as any later claim bases on want knowledge will not be entertained.

The condition of the fire protection and symbolic signs installations shall be surveyed on the first service visit to each building, the information being recorded and submitted in schedule format to the Engineer for record. Such records shall include any damage or equipment faults. The information shall include relevant to the fire protection and symbolic signs installations. Attention shall be given to reporting the corrosion of any metallic components during the inspection visits.

All replacement fluids and spares shall comply with the original equipment manufacturer’s (OEM) specifications. Drain, flush and refill actions shall likewise comply with the OEM maintenance procedure set out in the relevant operating & maintenance manual. New replacement components shall be inscribed with the date & time (hours) when installed.

Used components shall be safely disposed at an approved facility. A certificate of disposal shall be obtained. Such waste materials may be temporarily stored at the Contractor’s premises until such time as the quantity is sufficient for bulk disposal as specified above.

On completion of each inspection the contractor shall complete a Job Card and submit to the Engineer with a copy to the facility concerned. The contractor shall attach to the Job Card the following documents associated with the inspection.

* Servicing Checklists as required by completed and endorsed with the contractor’s original signature.

10.2 Contract for the servicing and repairs of hand held fire extinguishers, hose reels, fire hydrants and Safety Signage.

The contractor shall undertake the required servicing and repairs to all the Fire Fighting equipment as detailed below and in accordance with all the relevant specifications.

The maintenance work shall be executed in accordance with all the relevant codes of practices, statutory regulations, standards, regulations, municipal laws and by-laws and the manufacturer’s specifications and codes of practice.

The maintenance work and items are to be categorized by the Contractor for each maintenance activity under the following heading:

- Fire Hydrants
- Fire Hose Reels, nozzles, stop cocks
- Fire Extinguishers & wall brackets
- Safety Signage.
10.3 Measurement
The rate shall include all necessary labour, materials, parts, consumables, reports, document copies and
disposal of used waste materials and parts. Materials and parts shall include but not limited to; gasses (CO₂,
Nitrogen), DCP powder, lubricating oil, corrosion inhibitor, filters, gaskets, etc as necessary for the complete
servicing of the plant.

10.4 Payment
Payment will be subject to the conditions of Contract as per the Main Contractor.

2.3.3.2 SUB-SECTION 11 - TESTING, COMMISSIONING & MAINTENANCE

11.1 Operating & Maintenance (O&M) Documents
11.1.1 Scope
Comprehensive supplementary O&M documents shall be compiled for any new components which have been
installed or where equipment has been altered in the course of the maintenance and servicing of the Servicing
of Fire Protection Equipment and Symbolic Signage.

Draft copies of the documents shall be submitted to the Engineer for scrutiny and any necessary revisions shall
be made prior to submission of multiple copies of the approved document. The final copies shall be submitted
in a ring binder file or files divided into sections per affected plant.

Final copies: Number of copies of the complete set of supplementary documents per affected plant. Four copies
each set of documents shall be submitted.

2.3.3.2 SUB-SECTION 12 - UNPLANNED REPAIRS/MAINTENANCE

12.1 Scope
During the contract period, the User Client or Tenant Department staff may report such plant faults or
breakdowns to the appointed Call Centre. The Contractor will action immediately on receiving a request for
repairs from the Call Centre.

The contractor shall respond to the complaint as necessary in accordance with the assigned priority level & the
breakdown (complaint) shall be repaired as necessary to restore the plant to full operation in the minimum
time. On completion of the complaint remedy the contractor shall complete a Job Card and submit to the
Engineer with a copy to the facility concerned. The Contractor shall attach to the Job Card the following
documents associated with the complaint.
* Copies of vendor tax invoices for materials used, each endorsed with the Site Instruction Number, the
  Contractor’s stamp and the Contractor’s original signature.
* Time sheets of staff who attended to the Complaint all stamped and endorsed with the Contractor’s
  original signature.
* Further information which may be necessary or instructed.

2.3.3.2 SUB-SECTION 13 – BULK STORAGE & PUMPS FOR FIRE FIGHTING WATER

N/A

2.3.3.3 OUDTSHOORN HOSPITAL – HVAC & LP GAS

DOCUMENTATION
The Department of Public Works and Department of Health proposes to upgrade and Repair the
existing air conditioning, ventilation, refrigeration and heating plants at the Hospitals & Clinics in the
Eden District. The complete scope of the Engineering Works is described in this document and the Bill of Quantities.

2.3.3.3 SUB-SECTION 1- SITE INFORMATION

General
The sites of the proposed engineering works for this project is in the Eden District and are occupied by Department of Health.

The contractor shall assess each site to determine relevant data.

The Contractor shall be responsible for making arrangements with the Offices in charge of each site or building regarding the availability of the installation to the Contractor for inspection for the purpose of preparing his Bid, and to execute maintenance work should he be the successful contractor.

Should the work fall within a security area, the contractor must obtain access cards for his personnel and employees who work within such an area.

The contractor must comply with any regulations of instructions issued from time to time, concerning the safety of Hospital Staff, Patients, Work Force and Property, by the various departments.

The Department may require the Contractor to have his personnel or a certain number of them security classified.

In the event of either the Department, or the S.A Police Services requesting the removal of a person or persons from the site security reasons, the Contractor shall do so forthwith and the Contractors shall thereafter ensure that such person or persons are denied access to the site and/or to any documents or information relating to the work.

The contractor shall inform the Hospital’s Officer in Charge 7 days prior to servicing as to which equipment will be services, so as to enable the necessary arrangements to be made.

The appointed Contractor shall be responsible for making arrangements for the purpose of Maintenance, Servicing and Repairs. In the event of the Contractor failing to make such arrangements, admission to the site may be refused by the Officer in Charge and the Department will not be responsible for any additional costs which the Contractor may incur by such refusal.

Environmental Conditions
Environmental statistics for the sites and surrounding area may be obtained from the SA Weather Office.

Electricity Supply
The permanent supply parameters are: 400/230V 50Hz.
Supplier: The relevant local Municipality or Eskom.
Electricity for the Works: Refer to Facilities.

Water supply
The water supply to the property is generally provided by the local Municipality.

**STANDARD SPECIFICATIONS**

The specifications make reference to certain national and international standard specifications as well as the standard specifications published by the Department of Public Works and **the Department of Health**. Such specifications are not issued with this document but may be obtained from the relevant source websites.

The Contractor shall be entirely responsible for referencing all relevant standard specifications of the DPW, SANS, **Department of Health** or other applicable published standard whether such standard is referenced in this document or not and ensuring compliance of the Engineering Works therewith. The references in this document to standard specifications shall not be construed as limiting, and are given merely as a guide for basic reference. Where SABS is stated, the applicable SANS shall apply.

### 2.3.3.3 SUB-SECTION 2 – PROJECT SPECIFICATION

#### 2.1 Scope

The scope of the Works described in this document shall include (but not be limited to) the following:

- a) Upgrade and Repairs of the Air Conditioning systems.
- b) Upgrade and Repairs of the Ventilation systems in all buildings.
- c) Upgrade and Repairs of all Refrigeration systems on this site.
- d) Upgrade and repairs of all Heating systems (industrial geysers etc).
- e) Medical vacuum plant
- f) Compulsory 12 months all-inclusive warrantee on *new items* as well as full maintenance on all other HVAC equipment, during construction period.

(A) **AIR CONDITIONING INSTALLATION**

- The current installations may consist of various window/wall units, split units, cassette units and medium size central plant units.

(A.1) **Existing window/wall units, split units, cassette units:**

- All condenser mounting brackets will be checked for proper fixing to walls, will be de-rusted and painted one coat external under coat and two coats final exterior high quality paint to specified colour.
- All condenser coils will be washed out with bio-degradable de-greaser, and coil fins will be comb with correct sized fin comb where necessary. Clean condenser body parts. Where body parts require paint treatment, report to Engineer for site instruction.
- Check for gas leaks on piping and service valves. Repair leaks, re-check refrigerant charge and correct if necessary.
- Replace/repair pipe insulation where necessary.
- Replace filter media on all indoor units.
- Clean indoor coils and body parts.
- Check temperature control systems. Replace faulty or missing control devices.
- Report noisy or faulty indoor fans to Engineer for further action.
(A.2) New window/wall units, split units, cassette units:

- Under specific conditions, new AC units will be required. The Price Schedule allows for the installation of new units of specified cooling capacities. The positions will be pointed out on site.
- Where existing un-serviceable units need to be replaced with new, the existing units including wiring will be dismantled and removed from site. The existing piping will be re-used. Clean out existing piping with Nitrogen before re-connecting.
- For complete new installations, the installation shall include and be complete with condenser brackets, indoor brackets, piping shall be insulated and suitable for R410A, control wiring between indoor and outdoor, Power supply from the nearest DB, suitable sized circuit breaker, isolators indoor and outdoor, deep vacuum and refrigerant charge.

(A.3) Existing medium sized central plants (Theatre etc)

- The existing central plant used for cooling Theatre areas, consists of the following major components namely:
  - Air cooled chiller –
  - Air Handling Unit – 100% fresh air
  - Insulated ducting into theatre area, diffusers etc.

- The following upgrading / repair work will be required (but not limited to):
  - Air Handling Unit;
    - Replace all primary filters, secondary filters and HEPA filters (H13 / 99.75%) in the AHU.
    - Replace fan belt(s) and align pulleys properly.
    - Clean out entire inside of AHU with dis-infect solution, fan drum/blades and coil included.
  - Air Cooled Chiller;
    - Check local chiller control panel for hot spots and inferior wiring and connections and fix.
    - Check for refrigerant leaks and repair.
    - Wash down condenser coils.
    - Check operation of condenser fans and fan motors.
    - Check correct operation of all pressure gauges.
    - Re-Commission chiller to full operation.
    - A provisional amount is allowed in the Price Schedule for unforeseen repairs to the local chiller control panel and control system.
  - Pipe Work;
    - Replace all damaged pipe insulation with 40mm# insulation on all chill water lines. Strap insulation every 300mm.
    - Repair all water leaks, chill water side and condenser water side.
    - Fix all loose hold-down brackets.
    - Replace all thermometers and pressure gauges with new.
    - Check operation of flow control valves.
  - Pumps;
    - Check existing chill water pump(s) for water leaks, faulty bearings or overheating.
  - Electrical;
    - A provisional amount has been allowed for in the Price Schedule for
unforeseen upgrading required in the main control panel and control system.

- Possible repairs will have to take up the minimum time to allow minimum shut-down time in the theatres.
- Room temperatures will be set at 21°C +/- 1.5°C.

- Ducting, diffusers etc;
  - Check for damaged duct insulation in the plant room and ceiling voids and repair.
  - Clean and dis-infect all diffusers in the theatre area.
  - Re-balance air flow to engineer’s specification.

(B) VENTILATION SYSTEMS

- The current installations may consist of various fresh air and extract fans in the form of window mount / wall mount / duct mount and ceiling mount fans, and /or kitchen canopy extract systems.

(B.1) Existing Ventilation Fans – window / wall mount - Fresh air and extract systems:

- Remove all existing fans from mounting positions, clean mountings/plates thoroughly, clean fans and blades thoroughly.
- Check fan motors electrically, check shafts and bearings for malfunction. Report any anomalies to Engineer for further action.
- Re-assemble and re-mount fans in position.
- Check electrical supply to be functional and complying to SANS
- In cases where existing fans will be removed permanently, openings will have to be closed up to original condition.

(B.2) Extract Systems - Theatres:

Scope of work to be confirmed on site. Provisional amounts allowed in the Bill.

(B.3) Existing main kitchen Extract Systems:

Scope of work to be confirmed on site. Provisional amounts allowed in the Bill.

(B.4) New Ventilation Systems:

- Where ventilation systems do not comply with SANS and Health Regulations, the intention is to provide the required extract system and fresh air make-up system, including (but not limited to) the following:
  - New ceiling mounted grills.
  - Ducting system (un-insulated heavy duty) flex and rigid ducting combination, in the ceiling void for the extract system, as well as a ducting system (external insulated) for the fresh air make-up system.
  - Extract fan – duct mounted – in a fan box, weather cowl and vermin proof s/steel wire mesh.
  - Fresh air fan – duct mounted – c/w filter box, filters, weather cowl and s/steel vermin proof wire mesh screen.
  - Extract grilles to be aluminium - white
  - Discharge louvres to be aluminium double deflection – colour white.
o Extract fan will be VSD driven with remote speed control to provide the correct extraction air as required, under specific conditions.
o Fresh air make-up air complete with VSD driven fan, galvanized external insulated ducting & flex combination, ceiling mounted double deflection aluminium (white) grilles. The fresh air fan speed will be synchronized with the extract air fan speed to always provide 5% less air than the extract air fan, (slightly negative pressure to prevent contamination from Casualties to the rest of the hospital).

• Where applicable, a sketch is included as addendum, showing more detail of the ducting, fan duties, grill & diffuser positions etc. The layout is provisional and suitable for pricing.

(B.5) New extract systems for all sluice rooms and local kitchens:

• The majority of sluice rooms and local kitchen areas are without mandatory extract systems.
• New extract fans will be mounted in these rooms. The majority of the fans will be window mounted.
• The window glass will either be cut on site, or removed and replaced with new, cut to size to fit the new fan.
• Fan duty will be 380m$^3$/hr – long life bearings, continuous running – equal to the Vario range V150/6 AR LLS.
• The contractor will provide the necessary power supply from the nearest power source, with a local 2 pole isolator surface mounted next to the fan.

(B.6) New fresh air fans where required:

• To comply with the latest SANS requirements where AC Split / Cassette or other type of units are installed without built-in fresh air provisions, additional fresh air fans will be required, the fan capacities & quantities will be noted in the Bill of Quantities.

Were ducted ventilation systems are required, the following will be applicable:
o Supply and install new duct mounted fans for fresh air supply, complete with weather cowl, filter box and s/steel vermin proof wire mesh.
o Supply and install new extract fans, roof top mounted to maintain negative pressure in wards. Fans will be connected between rooftop unit and ceiling via un-insulated ducting.
o Allow for 3000mm lengths soaker sheets and water proofing.
o Fan speed will be VSD controlled, with selector switch mounted in the Ward Supervisor’s office for speed control.
o Duty of both fans will be 0.95m$^3$/sec. Synchronize the two fans – extract fan will always deliver 5% less air that the supply air fan.
o The contractor will provide the necessary power supply from the nearest power source, with a local 2 pole isolator surface mounted close to the fan.
o Ducting (rigid) will be external insulated with 1 x layer foil-faced bubble wrap.
o Flex ducting will be the standard external insulated type.
o Diffusers will be the adjustable 200mm$^2$ PVC disc valves.

• Where required a sketch is included as addendum, showing the general layout of the fresh air systems in wards. The layout is provisional and suitable for pricing.
(C) REFRIGERATION SYSTEMS

The scope of the Works for the refrigeration systems shall include the following:

(C.1) KITCHENS

Where required, a provisional amount will be allowed in the Bill to perform the following:

- Dismantle existing condensing unit for the kitchen cold room and remove from site.
- Replace existing condensing unit with new – of the same capacity, including new in-line filter drier.
- Treat condensing unit coil with Blue-Chem.
- Supply and install new Burn-out kit. Kit to be replaces after one (1) month operation with filter drier.
- Supply and install new electronic expansion valve to match the unit cooling capacity.
- Supply and install new thermostatic control system. Operating range to be between (-)2°C and (+)10°C.
- Operating set point will be 2°C.
- Blow out entire system with Nitrogen, deep vacuum and re-charge with R404A or approved alternative.
- Provide new door seal and door handle complete.
- Supply and install new 1.2mm open type single tube fluorescent fitting in condenser plant room.
- Replace lamps inside cold room.
- Suction piping will be insulated with 10mm# Armaflex.
- Commission to full operation and maintain for 12 months from date of Practical Completion.

(C.2) MORTUARY

Where required, a provisional amount will be allowed in the Bill to perform the following:

- Dismantle existing 2 x condensing units for the Mortuary cabinets and remove from site.
- Provide 2 x new wall mounted galvanised brackets – fix to wall.
- Supply and install 2 x new condensing units of suitable capacity.
- Treat condensing unit coils with Blue-Chem.
- Supply and install new Burn-out kits. Kits to be replaces after one (1) month operation with filter drier.
- Blow out entire systems with Nitrogen, deep vacuum and re-charge with R404A or approved alternative.
- Supply and install new 300mm Ø heavy duty extractor fan in condenser plant room, including power supply and isolator next to fan.
- Suction piping will be insulated with 10mm# Armaflex.
- Commission to full operation and maintain for 12 months from date of Practical Completion.
D) CENTRAL HEATING SYSTEMS

Where Central heating systems consist of Heat pumps, of the following applies:

- Clean out heat pump coils, check refrigerant charge and operating pressures.
- Repair insulation on hot water pipe work.

E) MEDICAL VACUUM PLANT

N/A

2.2 Purpose of the Proposed Engineering Works
The purpose of the maintenance project is to ensure that the plant and equipment is able to deliver full performance as and when required during normal operating conditions.

2.3 Supervision and Management
The contractor shall supervise and manage the scope of work and provide everything necessary for the complete maintenance of the plant whether described in precise detail or not. Such supervision and management shall include regular inspection of the site to check that the installation work complies with the quality specifications and instructions, attendance at site meetings and inspections as necessary or required. This item shall include allowances for construction tools specific to the installation and all relevant provisions. Arrangements shall be made with the occupants of buildings regarding access to the premises in order to execute the required services.

All electrical work shall be performed by subcontractors or employees who are registered or licensed, as required by legal statute. Copies of registration or licence documents shall be submitted on instruction of this project. Electrical testers for single phase do not comply with this requirement. A registered electrician and suitably skilled personnel shall be available to carry out any emergency repair work on a 24 hours basis including week-ends and public holidays.

The Contractor shall provide at his own cost a supply of Job Cards in accordance with the example included herein. The Job Card must be completed legibly in ink after completion of each service. In addition to the original completed Job Card submitted with the account, the contractor must submit a copy of the Job Card to the User Department for audit purposes.

2.4 Accommodation of Staff and Patients
It is possible that hospital staff and/or patients may be present on the site during the repairs / maintenance activities period. Such presence shall be respected without interference. Where it is necessary to isolate any electrical services, specific arrangements shall be made with the Officer in Charge & confirmed in writing to the Engineer.

2.5 Access Control & Identity of Staff
The User Departments maintain various levels of access control systems at the entrances to the site and the wards on the site. It may not always be possible to gain entry to such areas upon arrival and delays can occur. In certain areas Contractor’s may require escorting by User Department staff. The Contractor shall comply with the requirements and instructions of such staff at all times. The Contractor shall bear the sole responsibility for arranging access to the sites as necessary.
The contractor shall maintain a daily schedule of employees at each site including time of entry to the site and any specific facility. Each employee shall display a company identity card with name, company and photograph. Working garments (not orange in colour) shall identify the contractor.

Should the work fall within a security or sensitive area, the contractor must obtain permission from the Officer in Charge for personnel and employees who work within such an area. The contractor must comply with any regulations or instructions issued from time to time, concerning the safety of persons and property.

The Department of Health, or the Officer in Charge or the Commissioner of the SAPS may require the Contractor to have his personnel or a certain number of them security classified. In the event of either the Department of Health, or the Officer in Charge or the Commissioner of the SAPS requesting the removal of a person or persons from the site for security reasons, the Contractor shall do so forthwith and the Contractor shall thereafter ensure that such person or persons are denied access to the site and/or to any documents or information relating to the work.

2.6 Rubbish and Waste Management
All rubbish and waste arising from the work must be removed and the site and buildings left clean and tidy. All defective items that have been replaced are to be considered redundant, and are to be removed from site by contractor.
Waste oil & refrigerant gas including items such as used filters shall be disposed of in an environmentally safe manner.

2.3.3.3 SUB-SECTION 3 - CONTRACTOR’S DRAWINGS & EQUIPMENT SPECIFICATIONS

3.1 Scope
Such drawings and/or documents for new and replacement equipment or components where required or necessary shall be submitted for record purposes. Documents for electrical equipment shall include full wiring diagrams and component schedules which are suitable for incorporation into the O&M Manuals.

3.2 Particulars of Equipment & Materials
All equipment new & replacement shall be selected with due regard to the installation site conditions.

Equipment shall at all times be selected to operate within the limits recommended by the particular manufacturer.

Where equipment will be required to operate at conditions deviating from the manufacturer’s standard selection tables, re-rating shall be performed strictly in accordance with the manufacturer’s methods.

Product references, where given in this document, shall be taken merely as a guide to product selection, notwithstanding which, all equipment and materials shall comply fully with the specifications.
3.3 Material of Equal Quality
Replacement parts, spares and materials used shall be of equal specification to the component that is being replaced and must where possible carry the SANS mark of approval, but can be of a different size if specifically required by the Department. If such equivalent component is not available, then the alternative component must be approved by the Engineer prior to installation.

A representative of the “user” department must sign for spares that have been used in the execution of services and details entered on the Job Cards.

The serial numbers of original and new components shall be entered on job cards and invoices presented for payment. The guarantee cards for items must also be attached to job cards.

2.3.3.3 SUB-SECTION 4 - HAZARDOUS MATERIAL REMOVAL

4.1 Normative Reference
Occupational Health & Safety Act 1993 (85 of 1993) : Asbestos Regulations

4.2 Scope: Insulation, Lagging and sheeting
Certain plant may be fitted with asbestos fibre based lagging or sheeting. In such instances the existing asbestos material shall be removed completely and the equipment and/or system cleaned of all vestiges of the old lagging or sheeting prior to fitting new material. Risk analysis & safe work procedures relating to all asbestos work shall be included in the Health & Safety Plan as elsewhere measured.

Materials containing asbestos are extremely hazardous to personal health and shall therefore be handled in terms of the Asbestos Regulations.

All handling of asbestos based material shall be executed by a authorised person/s complying with the requirements of the Asbestos Regulations clause 5(1). The certificate of the said authorised person/s shall be submitted to the Engineer. The certificate shall remain valid for the entire period during which the said person/s is/are performing work on hazardous material. Allowance shall be made for everything necessary including but not limited to safety containers, protective clothing, signs, tools & complete decontamination upon the removal of samples or bulk lagging.

All the asbestos material on each affected plant shall be removed and safely disposed in terms of the Asbestos regulations. A disposal certificate shall be submitted on completion of all removals. The waste from individual plant shall be safely stored until such time as the removal of asbestos material from all plant has been completed such that one bulk disposal can be made.

4.3 Removal: Square meter of the material which has been removed with respect to lagging or sheeting. Per meter length of material in the case of rope wound around the pipe or cylinder circumference or moulded lagging.

4.4 Disposal: Mass of material actually disposed of including samples & used parts. The mass shall be recorded by the contractor & submitted for measurement and payment. The mass shall be the net mass of asbestos based material only excluding containers, liquid, etc. The provision of a disposal certificate shall be included.
2.3.3.3 SUB-SECTION 5 - BUILDING & GENERAL WORK

N/A

2.3.3.3 SUB-SECTION 6 - PAINTING & SURFACE COATINGS: BUILDINGS

N/A

2.3.3.3 SUB-SECTION 7 - PLANT AND EQUIPMENT

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2.3.3.3 SUB-SECTION 8 - ELECTRONIC CONTROLLERS

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2.3.3.3 SUB-SECTION 9 - CORROSIVE PROTECTION

9.1 Particulars
All condenser coils shall be sprayed with two coats of a corrosive protective product similar or equal to Tectyl or Coilguard.

All condenser mounting brackets shall be treated with a rust neutralizer and re-painted with 1 x undercoat and 2 x final coats COLD GALV.

All body parts shall be sprayed with two coats of protective material (transparent colour), as recommended by paint specialists. Prior approval of the material to be used shall be obtained from the engineer.

All screws, bolts and nuts on electrical components (including items inside electrical panels) shall be sprayed one coat of approved material suitable for electrical components and shall be non-conductive. Prior approval of the material to be used shall be obtained from the engineer.

9.2 Measurement
Per meter square area on coils and body works.
Per volume of protective material used on electrical components.
2.3.3.3 SUB-SECTION 10 - CONSTRUCTION MANAGEMENT

10.1 General

The contractor further undertakes to:

- Arrange with the occupants of buildings regarding access to the premises in order to execute the required services
- Take adequate precautions to prevent damage to buildings, fittings and furnishing inside the premise and elsewhere on the site
- Accept liability and to indemnify the Department against any claims whatsoever arising from his conduct and/or the conduct of his employees
- Safeguard all his employees in accordance with the regulations of the Unemployment insurance Act 1966, (Act no.30 of 1966) and any amendments thereof.
- Comply with all By-laws and requirements of the local authority
- Should the contractor be uncertain about the scope of any work to be executed under this contract, the Department must be immediately requested to clarify the scope.

The contractor shall only service items as per the Bill of Quantities. Should the contractor upon servicing of the items find that there are more items on the premises to be services in addition to those listed in the activity schedule; he shall not service those items prior to receipt of written authorization received from the Engineer.

Unit prices for items of work executed but not specified in this contract, must be verified by means of a quotation submitted for approval.

Quotations will be based on the net value of the supplier’s price, plus contractors profit as per Bill.

All relevant invoice documentation must be attached to each individual account.

Any normal discounts allowed to the contractor shall be passed on to the Department. When determining the profit on non-scheduled material the contractor shall FIRST DEDUCT ANY VALUE ADDED TAX from the cost price of the material AND THEN ADD BACK VAT on the full amount including the contractor’s profit.

Check GCC

2.3.3.3 SUB-SECTION 11 - WARNING NOTICES

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2.3.3.3 SUB-SECTION 12 - MAINTENANCE OF METAL PLANT COMPONENTS

12.1 Scope

Where required, any corroded or damaged components and/or enclosures shall be repaired such as to match the surrounding components of the plant. In the case of in-situ repairs, the corroded surface
area shall be completely cleaned of corrosion products, degreased, treated with a suitable metal primer and undercoat prior to over-coating the complete panel on which the repair has been made.

Any firmly adhering paint outside the repaired area shall be abraded and degreased prior to over-coating. The edges of surrounding firm paintwork shall be faired such that edges are not visible after the finish coats have been applied. All surface coatings shall be applied strictly in accordance with the product manufacturer’s specifications. The contractor shall ensure that the new coating products are compatible with any existing finish which is over-coated.

In-situ repairs shall be performed using an air powered spray applicator. Areas surrounding the work section shall be effectively masked to prevent overspray. Should overspray occur, the contaminated surface shall be immediately cleaned.

All products shall be suitable for interior and exterior use. Manufacturer’s data sheets shall be submitted to demonstrate compliance with the specification and for application monitoring purposes.

12.2 Particulars
In-situ repair: Gloss air drying spray applied enamel
Minimum two coats of finish colour for an overall minimum dry film thickness (dft) of 100μm, including primer & undercoat.

12.3 Measurement
Area in square metres (m²) coated including surface preparations & all coats distinguished by process.

2.3.3.3 SUB-SECTION 13 - HVAC PLANT MAINTENANCE AND SERVICING (PLANNED)
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2.3.3.3 SUB-SECTION 14 - UNPLANNED MAINTENANCE (BREAKDOWNS)

14.1 Scope
During the contract period, the contractor shall respond to complaints reported by the assigned Maintenance Manager or Engineer. The level of priority of the breakdown (complaint) shall be carefully considered as necessary to restore the plant to full operation in the minimum time. On completion of the complaint remedy the contractor shall complete a Job Card and submit to the Engineer with a copy to the facility concerned. The Contractor shall attach to the Job Card the following documents associated with the complaint:

- Copies of vendor tax invoices for materials used, each endorsed with the date, time and name of the Complainant, the Contractor’s stamp and the Contractor’s original signature.
- Travel log sheet for travel exclusively incurred in attending to the Complaint. If the Complaint was repaired during a scheduled service visit to the plant concerned, then the travel log for the complaint shall be appropriately endorsed.
- Time sheets of staff who attended to the Complaint all stamped and endorsed with the Contractor’s
original signature.
- Further information which may be necessary or instructed.

<table>
<thead>
<tr>
<th>Priority Level</th>
<th>Maximum Down-Time Allowed (MDTA)</th>
<th>Penalties for non-performance per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal breakdown: (Refrigerant plant, AC and Vent for Theatres)</td>
<td>4 hours (immediate response)</td>
<td>R 1,500.00</td>
</tr>
<tr>
<td>Emergency breakdown: (Casualty ward AC and Vent, Heating system for Theatres, Fire Detection, Water Supply)</td>
<td>24 hours</td>
<td>R 750.00</td>
</tr>
<tr>
<td>Ordinary breakdown: (AC and Vent for General Wards, Balance of works)</td>
<td>7 days</td>
<td>R 1000.00</td>
</tr>
<tr>
<td>Quoted work</td>
<td>Agreed program - failure</td>
<td>R 1000.00</td>
</tr>
</tbody>
</table>

“Maximum down time” shall mean the period of time allowed to repair a breakdown, and “actual down-time” shall mean the measured period from the instant when the breakdown was logged with the contractor until the installation has been repaired to its functional specification.

14.2 Measurement & Payment
a) Breakdown Repair work:
Materials, labour & transport elsewhere measured under Dayworks.

14.3 Payment
Payment will be subject to the submission of detailed claims for materials utilised and transport, together with the submission of unplanned maintenance Job Cards. Payment claims shall include full details of the work performed with supporting materials invoices, Job Cards, labour time sheets & transport details with distance travelled log, as well as the report from the Call Centre.

2.3.3.3 SUB-SECTION 15 - TESTING, COMMISSIONING & MAINTENANCE

15.1 Operating & Maintenance (O&M) Documents

15.1.1 Scope
Comprehensive supplementary O&M documents shall be compiled for any new components which have been installed or where plant, circuits, panels etc have been altered in the course of the maintenance and servicing of the plant.

Where control panel alterations have been executed, complete schedules of approved components and wiring diagrams shall be included.
Draft copies of the documents shall be submitted to the Engineer for scrutiny and any necessary revisions shall be made prior to submission of multiple copies of the approved document. The final copies shall be submitted in a ring binder file or files divided into sections per affected plant.

15.1.2 Measurement
Number of copies of the complete set of supplementary documents per affected plant. Copies of each set of documents shall be submitted – 3 x hard copies plus 1 x soft copy on CD in Windows or Excel format.

2.3.3.3 SUB-SECTION 16 - DAYWORKS, PROVISIONAL SUMS & CONTINGENCIES

16.1 Day Works

16.1.1 Scope
Provide for certain works to be executed on the basis of Dayworks where specified or instructed. This item may only be utilised on the specific instruction of the Engineer. All overhead costs shall be included.

In the case of work provided for in terms of Provisional Sums the Contractor shall submit a detailed quotation prior to commencing work. The amount of the quotation shall not be exceeded without approval prior to completion of the work concerned. In the case of Transport for planned maintenance, a prior quotation is not required.

16.1.2 Measurement
Labour: Time (hrs) including the full cost of employment such as wages, transport (excluding authorised transport), insurances, subsistence, allowances, overheads, etc. Materials markup as a portion of proven materials cost eg 15% = 0.15.

Materials: An allowance for the cost of materials utilised in connection with work performed in terms of dayworks. The materials mark-up rate shall include full compensation to the Contractor for quotation profit & attendance costs. The mark-up rate shall be given as a portion of the proven cost of the materials utilised, ie 15% must be entered as 0.15.

Transport: The reference point for all the sites in this contract shall be Mosselbay Hospital site, in terms of transport claims. Transport between the contractor’s head office and the reference location is not reimbursable, the costs thereof being an overhead for the contractor’s own account. Where more than one service is performed on the same day on the same site, transport will be calculated as a single trip.

16.1.3 Payment
Payment will be subject to the submission of a detailed claim for materials utilised, together with the submission of job cards for servicing or other tasks rendered as instructed. Payment claims shall include full details of the work performed with supporting materials invoices, close-out reports and labour time sheets.
1. DRAWINGS