



CALL FOR BIDS

BID NO: ECDC ECDC/INFRA/22/112023

BID SUBJECT: THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Consisting Of:

- The Tender (Returnable) - This Document**
- The Bills of Quantities - This Document**
- Annexures – This Document**

BIDDER NAME:

CSD No.:

CRS No.:

CLOSING DATE:	19 JANUARY 2024
CLOSING TIME:	12h00

Head office: EAST LONDON T: (+27) 043 704 5600 • PORT ELIZABETH T: (+27) 041 373 8260 • QUEENSTOWN T: (+27) 045 838 1910
 MTHATHA T: (+27) 047 501 2200 • Satellite offices: KING WILLIAM'S TOWN T: (+27) 043 604 8800 • MOUNT AYLIFF T: (+27) 039 254 0584
 T: (+27) 047 401 2700 • ALIWAL NORTH T: (+27) 051 633 3007

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SECTION A:
ABBREVIATIONS AND ACRONYMS

CIDB	Construction Industry Development Board
DTI	Department of Trade and Industry
ECDC	Eastern Cape Development Corporation
EME	Exempt Micro Enterprise
IRBA	Independent Regulatory Board of Auditors
PCCA	Prevention and Combating of Corrupt Activities Act 12 of 2004
PFMA	Public Finance Management Act (Act 1 of 1999)
PPPFA	Preferential Procurement Policy Framework Act (Act 5 of 2000)
QSE	Qualifying Small Enterprise
SABS	South African Bureau of Standards
SANAS	South African National Accreditation System
SARS	South African Revenue Service
SASAE	South African Standard on Assurance Engagements
SCM	Supply Chain Management
SMME	Small, Medium and Micro Enterprises
ToR	Terms of Reference
CSD	National Treasury Central Supplier Database for South African Government

B: DEFINITIONS

Acceptable tender	Means any tender which, in all respects, complies with the specifications and conditions of tender as set out in the tender document.
Accreditation Body	Means the South African National Accreditation System or any other entity appointed by the Minister from time to time whose function it is to: Accrediting verification agencies Developing, maintaining and enforcing of Verification Standards
Affordable	Means (in terms of a PPP-Agreement) that the financial commitments to be incurred can be met by funds: Designated within ECDC's existing budget for the function to which the agreement relates; and Destined for ECDC in accordance with the relevant Treasury's future budgetary projections.
All applicable taxes	Includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.
Bid	Means a written offer or proposal to supply goods and/or provide services, submitted in response to the ECDC's invitation to quote or submit proposals which includes advertised competitive bids, written price quotations or proposals.
Bid Specification	A specification that lays down the characteristics of goods to be procured or their related processes and production methods, or the characteristics of services to be procured or their related operating methods, including the applicable administrative provisions, and a detailed requirement relating to conformity assessment procedures that an entity prescribes and shall

	Include TOR for specialised services.
Black People	means 'African', 'Indian' and 'Coloured' people who are citizens of the Republic of South Africa by birth; or are citizens of the Republic of South Africa by naturalisation before the commencement date of the Constitution of South Africa Act (1993); or became citizens of the Republic of South Africa after the commencement of the of the Constitution of South Africa Act (1993), but who for the Apartheid policy that has been in place to that date, would have been entitled to acquire citizenship by naturalisation prior to that date.
Specific goal	<p>2.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table in SBD 6.1 as may be supported by proof/ documentation stated in the conditions of this tender:</p> <p>2.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—</p> <p>(a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or</p> <p>(b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,</p> <p>then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.</p>
Close Family Member	Shall mean: - member of the same household, parent (including adoptive parent), parent-in-law, son (including adoptive son), son-in-law, daughter (including adoptive daughter), daughter-in-law, step-parent, step-son, step-daughter, brother, sister, grandparent, grandchild, uncle, aunt, nephew, niece, the spouse or unmarried partner with relation to any of the person's above.
Code of Ethics	refer to the ECDC Code of Ethics for Management and Staff as may be amended from time to time.
Comparative Price	Means the price after the factors of a non-firm price and all the unconditional discounts that can be utilised have been taken into consideration.
Consortium or Joint Venture	Means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.
Contract	Means the agreement that results from the acceptance of a bid by ECDC.
Designated Sector	Means a sector, sub-sector or industry that has been designated by the DTI in line with national development and industrial policies for local production, where on local produced goods or locally manufactured goods meet the stipulated minimum threshold for local production and content.
Duly Sign	means a document that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility (close corporation, partnership or individual).
Exempt Micro Enterprise (EME)	means an enterprise with a specified total annual revenue as per Department of Trade and Industry Codes of Good Practice on Broad Based Black Economic Empowerment
Family Member	Means a husband or wife, any partner in a customary union according to indigenous law or any partner in a relationship where the parties live together in a manner resembling a marital partnership or a customary union; and any person related to either one or both persons referred above within the second degree through a marriage, a customary union or a relationship or the third degree of consanguinity.

Firm Price	Means the price that is only subject to adjustments in accordance with the actual increase or decrease resulting from the change, imposition, or abolition of customs or excise duty and any other duty, levy, or tax, which, in terms of the law or regulation, is binding on the contractor and demonstrably has an influence on the price of any supplies, or the rendering costs of any service, for the execution of the contract.
Fronting	Means a deliberate circumvention or attempted circumvention of the B-BBEE Act and the Codes. Fronting commonly involves reliance on data or claims of compliance based on misrepresentation of facts, whether made by the party claiming compliance or by any other person.
Functionality	Means the measurement according to predetermined norms, as set out in the tender documents, of a service or commodity that is designed to be practical or useful, working or operating, taking into account, among other factors, the quality, reliability, viability and durability of a service and the technical capacity and ability of the tenderer.
Imported Content	Means that portion of the tender price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the bidder or its subcontractors) and which costs are inclusive of the costs abroad (this includes labour or intellectual property costs), plus freight and other direct importation costs, such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African port of entry.
In the service of the state	means: an employee of any municipality who has a performance contract with the municipality and is employed on a permanent, temporary or short term basis. an employee or public servant of any national or provincial government as defined in terms of Public Services Act. a member who – is a councillor of any municipal council as defined in the Local Government Municipal Structures Act (Act No 117 of 1998); is a politician serving in any provincial legislature; or is a politician serving in the National Assembly or the National Council of Provinces; a member of the board of directors of any municipal entity; an employee and a member of a government owned entity as defined in the Public Finance Management Act (Act No 1 of 1999); and / or such other meaning ascribed to it by National Legislation from time to time.
Local content	Means a portion of the tender price which is not included in the imported content, provided that local manufacture does take place.
Non-firm prices	Means all prices other than “firm” prices
Person	Includes a juristic person.
Price Quotation	An estimate describing the product, stating its price, time of shipment, and specifies the terms of the sale and terms of the payment.
Property	Includes all movable and immovable property and intellectual property belonging to ECDC.
Public Private partnership	Means a commercial transaction between ECDC and a private party in terms of which: the private party either performs a function o.b.o. ECDC for a specified or indefinite period, or acquires the use of state property for its own commercial purposes for a specified or indefinite period; the private party receives a benefit for performing the function or by utilizing state property, either by way of: compensation from a revenue fund charges or fees collected by the private party from users or customers of a service provider to them; or a combination of such compensation and such charges or fees
Qualifying Small Entity	means an enterprise with a specified total annual revenue as per Department of Trade and Industry Codes of Good Practice on Broad Based Black Economic Empowerment

Rand value	means the total estimated value of a contract in South African currency, calculated at the time of bid invitations, and includes all applicable taxes and excise duties.
Related enterprise	Means an entity controlled by a measured entity whether directly or indirectly controlled by the natural persons who have direct or indirect control over that measured entity or the immediate family of those natural persons.
Service Level Agreement	Shall have the same meaning assigned as “Contract”
Shareholder	Means a person who owns shares in the company and is actively involved in the management of the enterprise or business and exercises control over the enterprise.
State	Means: any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the PFMA any municipality or municipal entity national Assembly or the national Council of Provinces; or parliament
Stipulated minimum threshold	Means that portion of local production and content as determined by the DTI
Sub-Contract	Means the primary contractor’s assigning, leasing, making out work to, or employing, another person to support such primary contractor in the execution of part of a project in terms of the contract.
Tender	The same meaning is assigned as ‘Bid” above.
Threshold	Shall mean the financial limits on the value of goods or services to be procured as set and prescribed in this policy which shall determine the manner in which these goods and services will be procured
Total revenue	Means the total income of an entity from its operations as determined under South African Generally Accepted Accounting Practice.
Trust	Means the arrangement through which the property of one person is made over or bequeathed to a trustee to administer such property for the benefit of another person.
Trustee	Means any person, including the founder of a trust, to whom property is bequeathed in order for such property to be administered for the benefit of another person.
Value for Money	Means that the item (public-private partnership agreement) results in a net benefit to ECDC defined in terms of cost, price, quality, quantity, or risk transfer, or a combination thereof.

Part T1: Tendering procedures

T.1.1 TENDER NOTICE AND INVITATION TO BID

1. Invitation to Bid

Eastern Cape Development Corporation (ECDC) wishes to engage with a suitable contractor with a CIDB Grading of 7 GB or Higher for the Repairs, Refurbishments of Site 8, 12 And 21 in Dimbaza Industrial Park in Eastern Cape.

The sites are in Dimbaza Industrial Park, Eastern Cape, South Africa.

Site 8:



Site 12:



Site 21:



A Detailed scope of services is described in Scope of Work Section Below.

2. Eligibility to Bid

- a) Bidders should meet the Mandatory Requirements in order to be evaluated T2.1 (**Mandatory List of Tender Returnables**)
- b) **It is estimated that bidders should have a CIDB grading of 7GB or Higher.**
- c) Only those tenderers who are registered with the CIDB prior to submissions of bid with a contractor grading equal in accordance with the sum tendered, or a value determined in accordance with Regulation **25 (1B) or 25 (7A) of the Construction Industry Development Regulations, for the above-mentioned grading classes of construction work, are eligible to have their tenders evaluated.**

3. Payment of Bid Document

No payment is due to obtain tender documents.

4. Collection /Availability of Documents

Documents will be available for downloading from the ECDC website at www.ecdc.co.za .

5. Queries on Bid Document

Queries relating to the issue of these documents may be addressed to Ms N. Norexe,
E- Mail at tenders@ecdc.co.za and cc nnorexe@ecdc.co.za

6. Estimated Timeline

Activity		Date	Time
1.	Placing of Advert	Daily Dispatch, Treasury, CIDB and Load on ECDC Website for 30 Days after Advert on Friday 24 November 2023	N/A
2.	Compulsory Briefing Meeting	A compulsory briefing meeting to be held at Dimbaza Mohair Weavers, 8 Maqoma Street, Dimbaza Industrial Park, ERF: 2947- Site 8 on Thursday 07 December 2023 starting at 11h00.	
3.	Last day of questions	7 calendar days before closing date	16H00
4.	Final date of submission of bids	19 January 2024	12h00
5.	Bid Validity	120 days	

6.1. Briefing Session and Site Location

A compulsory briefing meeting to be held at Dimbaza Mohair Weavers, 8 Maqoma Street, Dimbaza Industrial Park-ERF: 2947- Site 8 on Thursday 07 December 2023 starting at 11h00.

Part 2 of the Briefing will be visiting the following sites:

ERF: 2947- Site 8

ERF: 2950- Site 21

ERF: 2957- Site 12

For any enquiries relating to this Bid please email the procurement department at tenders@ecdc.co.za; attention N Norexe

Communication with the Bidders and any clarity on Queries regarding the Bid will be posted on the website at www.ecdc.co.za and will also be communicated to the bidders via email where the Bidder has indicated to ECDC that they are interested in submitting a bid.

Bidders must visit the site to ensure that their proper assessment of the site is done and that the Bill of Quantities is Priced Correctly.

Bidders must acquaint themselves of the current site conditions, works complexity and associated safety risks.

ECDC will only consider bidders that have attended the briefing meeting.

Geographical Site Layout

Site 8

GPS Co-ordinates: 32°49'50.37"S 27°12'2.40"E



Site 12:

GPS Co-ordinates: 32°49'53.21"S 27°12'10.76"E



Site 21:

GPS Co-ordinates: 32°49'52.10"S 27°12'2.64"E



Telephonic, emailed, telexed, facsimile, and late tenders will not be accepted.

Tenders may only be submitted on the tender documentation that is issued.

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

T1.2 Tender Data

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity in Construction Procurement (January 2019) as published in Government Gazette No 42622, Board Notice 423 of 2019 on the 8th of August 2019 (See www.cidb.org.za).

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

Clause number	Tender Data
A.1.1	The employer is Eastern Cape Development Cooperation (ECDC)
A.1.2	<p>The Tender Documents issued by the Employer comprise the following documents:</p> <p>THE TENDER</p> <p>Part T1: Tendering procedures T1.1 - Tender notice and invitation to tender T1.2 - Tender data</p> <p>Part T2 : Returnable documents T2.1 - List of returnable documents T2.2 - Returnable schedules</p> <p>THE CONTRACT</p> <p>Part C1: Agreements and Contract data C1.1 - Form of offer and acceptance C1.2 - Contract data C1.3 - Performance Bond C1.4 - Adjudicator's contract</p> <p>Part C2: Pricing data C2.1 - Pricing instructions C2.2 - Bill of Quantities</p> <p>Part C3: Scope of work C3.1 - Scope of work C3.2 - Health and Safety Specification</p> <p>Part C4: Site information C4 - Site information/Drawings</p>
A.1.4	<p>During Tender stage all communication shall be through the Procurement Department for attention:</p> <p>Name: Ms. N. Norexe, Address: ECDC Head Office at ECDC House Ocean Terrace Park Moore Street Quigney, East London</p> <p>Tel: 043 704 5600 E-mail: tenderes@ecdc.co.za cc nnorexe@ecdc.co.za</p>

A.2.1	<p>Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with CIDB Regulations are eligible to have their tenders evaluated</p> <p>Joint ventures are eligible to submit tenders provided that:</p> <ol style="list-style-type: none"> 1. every member of the joint venture is registered with the CIDB; 2. the lead partner has a contractor grading designation in the GB (General Building) class of construction work; not lower than one level below the required grading designation in the class of works construction works under considerations and possess the required recognition status. 3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a GB class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.
A.2.1	<p>Not Applicable for this Bid</p> <p>The following tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated:</p> <ol style="list-style-type: none"> a) contractors who have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a or*. class of construction work; and b) contractors registered as potentially emerging enterprises with the CIDB who are registered in one contractor grading designation lower than that required in terms of a) above and who satisfy the following criteria:**
A.2.2	<p>Not Applicable for this Bid</p> <p>The employer will compensate the tender as follows</p>
A.2.7	<p>The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender.</p> <p>Paragraph Below is Not Applicable. Bidder to refer to Tender Notice</p> <p>Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list.</p>
A.2.12	<p>Not Applicable for this Bid</p> <p>Main tender offers are not required to be submitted together with alternative tenders.</p>
A.2.12	<p>No alternative tender offers will be considered</p>

<p>A.2.12</p>	<p>Not Applicable for this Bid</p> <p>If a tenderer wishes to submit an alternative tender offer, the only criteria permitted for such alternative tender offer is that it demonstrably satisfies the Employer's standards and requirements, the details of which may be obtained from the Employer's Agent.</p> <p>Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal.</p> <p>Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer's standards and requirements.</p> <p>The modified Pricing Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the Employer's costs in confirming the acceptability of the detailed design.</p>
<p>A.2.13.3</p>	<p>One original duly signed (by authorised representative) and completed bid document (hardcopy) MUST be submitted inclusive of the terms and conditions of this bid document with any attachments/annexures /returnable required for this Bid.</p> <p>A PDF soft copy of the duly signed and completed original bid (e.g., PDF format in Flash drive/disc) should be submitted with the Original duly signed and completed hardcopy bid document however non-submission of a soft copy will not result in the Bid being disqualified</p> <p>ECDC will not be responsible if your bid is not submitted on time</p> <p>All bid documents are to be completed in permanent black ink.</p> <p>No alterations of the Bid Document will be allowed.</p> <p>No correction fluid will be allowed. Corrections should be initialled.</p>

<p>A.2.13.5 A.2.15.1</p>	<p>Valid original firmly bound signed complete tender document (by authorized representative) must be placed in the Bid Box on or before the final date and time of submission.</p> <p>The employer's details and address for delivery of tender offers and identification details that are to be shown on each tender offer package are:</p> <p>a) Location of tender box:</p> <p>Bid Reference Number: ECDC/INFRA/22/112023</p> <p>Project Name: THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK</p> <p>Delivered at Physical Address: ECDC Head Office at ECDC House, Ocean Terrace Park, Moore Street, Quigney, East London,</p> <p>Bids/Tender offers must be submitted on or before the final date and time of submission of bids as indicated in the Tender Notice and invitation to Tender</p> <p>It is the Bidders responsibility to ensure that all the documents are received on time.</p> <p>The bid box is open on weekdays between 08h00 and 16h30</p>
<p>A.2.13.6 A.3.5</p>	<p>Not Applicable for this Bid</p> <p>A two-envelope procedure is required.</p>
<p>A.2.13.9</p>	<p>Telephonic, email, telegraphic, telex, email, or facsimile tender offers will not be accepted.</p>
<p>A.2.15</p>	<p>The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.</p>
<p>A.2.16</p>	<p>The tender offer validity period is 120 days.</p>
<p>A.2.18</p>	<p>The tenderer shall, when requested by the Employer to do so, submit the names of all management and supervisory staff that will be employed to supervise the Labour-Intensive portion of the works together with satisfactory evidence that such staff members satisfy the eligibility requirements.</p>
<p>A.2.19</p>	<p>Access shall be provided for the following inspections, tests and analysis:</p> <p>The site is available for viewing the location of the works.</p>
<p>A.2.20</p>	<p>The tenderer is required to submit with his tender a letter of intent from an approved insurer undertaking to provide the Performance Bond to the format included in Contract Data/Contract of this procurement document</p>
<p>A.2.22</p>	<p>Not Applicable for this Bid</p> <p>Return all retained tender documents within 28 days after the expiry of the validity period</p>

A.2.23	<p>The tenderer is required to submit with his tender:</p> <p>Tax Compliance</p> <p>Bidders must ensure compliance with their tax obligations.</p> <p>In Bids where Consortia/Joint venture/Sub-Contractors are involved; each party must submit a separate proof of Tax Compliance Status.</p> <p>The bidders' Tax status will be verified on the CSD prior to the bid award and where the preferred bidders is not compliant, 7 working days will be granted for remedy, failing which the bidder will be disqualified</p>						
A.3.1.1	<p>The Employer will respond to requests for clarification received up to 7 working days before the tender closing time.</p>						
A.3.4	<p>Opening of the Bids</p> <p>Tenders will be opened immediately after the closing time for tenders at 12h00 hrs</p> <p>There will be NO PUBLIC OPENING of the Bids received; however, the list of bids received may be published on the ECDC website and will be sent to the Bidders that have submitted bids via email.</p> <p>There will be no discussions with any Bidder/Interested Party that Submitted Proposals/ Bids until evaluation have been complete. Any subsequent discussions shall be at the discretion of ECDC.</p>						
A.3.11.1	<p>The financial offer will be reduced to a comparative basis.</p>						
A.3.11.2	<p>Not Applicable for this Bid</p> <p>The procedure for the evaluation of responsive tenders is Method 1</p>						
<p>A.3.11.3 Evaluation Criteria</p> <p>This bid is subject to the Preferential Procurement Policy Framework Act and the Preferential Procurement Regulations 2022 as applicable to provincial government business enterprises as listed under schedule 3(D) of the Public Finance Management Act and the ECDC Procurement Policy as amended from time to time.</p> <p>The procedure for evaluation of tenders is as follows:</p> <table border="1"> <tr> <td>Stage 1</td> <td> <p>Mandatory Tender Returnables</p> <p>Service Providers are to meet all the Mandatory Requirements in order to be evaluated further. Failure to submit the Mandatory Requirements as required will result in the bid being disqualified</p> <p>Involves a valuation of local production and content (goods) only. At this stage Bidders must meet the minimum threshold for local production and content as determined by the DTI for local content before they will be evaluated in terms of preferential procurement points.</p> <p>Bidders to complete the Declaration for Local Production and Content for Designated Sectors and Local Content Declaration: Summary Schedule (Annex C)</p> </td> </tr> <tr> <td>Stage 2</td> <td> <p>Functionality:</p> <p>Involves an evaluation of Functionality only – At this stage Bidders must score a minimum score of 70% for functionality (services) in order to be evaluated for stage 2 (Preferential procurement points).</p> </td> </tr> <tr> <td>Stage 3</td> <td> <p>Preferential Procurement points:</p> <p>Price: Points will be calculated for price on the relevant prices in accordance with the preference point system, 80/20.</p> </td> </tr> </table>		Stage 1	<p>Mandatory Tender Returnables</p> <p>Service Providers are to meet all the Mandatory Requirements in order to be evaluated further. Failure to submit the Mandatory Requirements as required will result in the bid being disqualified</p> <p>Involves a valuation of local production and content (goods) only. At this stage Bidders must meet the minimum threshold for local production and content as determined by the DTI for local content before they will be evaluated in terms of preferential procurement points.</p> <p>Bidders to complete the Declaration for Local Production and Content for Designated Sectors and Local Content Declaration: Summary Schedule (Annex C)</p>	Stage 2	<p>Functionality:</p> <p>Involves an evaluation of Functionality only – At this stage Bidders must score a minimum score of 70% for functionality (services) in order to be evaluated for stage 2 (Preferential procurement points).</p>	Stage 3	<p>Preferential Procurement points:</p> <p>Price: Points will be calculated for price on the relevant prices in accordance with the preference point system, 80/20.</p>
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Stage 2	<p>Functionality:</p> <p>Involves an evaluation of Functionality only – At this stage Bidders must score a minimum score of 70% for functionality (services) in order to be evaluated for stage 2 (Preferential procurement points).</p>						
Stage 3	<p>Preferential Procurement points:</p> <p>Price: Points will be calculated for price on the relevant prices in accordance with the preference point system, 80/20.</p>						

A.3.11.3	<p>The evaluation criteria and maximum score in respect of each of the criteria are as follows: (Details on Functionality Evaluation are on T2.1)</p> <table border="1"> <thead> <tr> <th>Functionality Criteria</th> <th>Maximum number of points</th> </tr> </thead> <tbody> <tr> <td>Completed Similar Projects</td> <td>30</td> </tr> <tr> <td>Experience and Qualifications of the Key Personnel</td> <td>30</td> </tr> <tr> <td>Submission of proposed methodology and construction program</td> <td>10</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>Maximum possible score for functionality (M_s)</td> <td>70</td> </tr> </tbody> </table> <p>Functionality shall be scored by not less than three evaluators in accordance with the Functionality Criteria Evaluation below</p> <p>The minimum percentage to be achieved for functionality is 70%</p>	Functionality Criteria	Maximum number of points	Completed Similar Projects	30	Experience and Qualifications of the Key Personnel	30	Submission of proposed methodology and construction program	10			Maximum possible score for functionality (M_s)	70
Functionality Criteria	Maximum number of points												
Completed Similar Projects	30												
Experience and Qualifications of the Key Personnel	30												
Submission of proposed methodology and construction program	10												
Maximum possible score for functionality (M_s)	70												
A.3.13	<p>Tender offers will only be accepted if:</p> <ul style="list-style-type: none"> a) the tenderer is Tax Compliant <ul style="list-style-type: none"> ✓ tenderers must ensure compliance with their tax obligations. ✓ in Bids where Consortia/Joint venture/Sub-Contractors are involved; each party must submit a separate proof of Tax Compliance Status. ✓ the tenderer Tax status will be verified on the CSD prior to the bid award and where the preferred bidders is not compliant, 7 working days will be granted for remedy, failing which the bidder will be disqualified b) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation; c) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement; d) the tenderer has not: <ul style="list-style-type: none"> i) abused the Employer's Supply Chain Management System; or ii) failed to perform on any previous contract and has been given a written notice to this effect. e) the tenderer is able, in the opinion of the employer, to perform the contract free of conflicts. f) the employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2003, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely. g) the tenderer can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract. h) the tenderer has the legal capacity to enter into the contract; i) the tenderer is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing; j) the tenderer complies with the legal requirements, if any, stated in the tender data; and 												
A.3.17	<p>The number of paper copies of the signed contract to be provided by the employer is one (1).</p>												

Part T2 : Returnable documents

T2.1 - List of returnable documents

T2.2 - Returnable schedules

1. Evaluation Criteria

This bid is subject to the CIDB and Preferential Procurement Policy Framework Act and the Preferential Procurement Regulations 2022 as applicable to provincial government business enterprises as listed under schedule 3(d) of the Public Finance Management Act and the ECDC Procurement Policy as amended from time to time.

The procedure for evaluation of tenders is as follows:

Stage 1	Mandatory Tender Returnables Service Providers are to meet all the Mandatory Requirements in order to be evaluated further. Failure to submit the Mandatory Requirements as required will result in the bid being disqualified. Involves an evaluation of local production and content (goods) only. At this stage Bidders must meet the minimum threshold for local production and content as determined by the DTI for local content before they will be evaluated in terms of preferential procurement points. Service provider to complete the Declaration for Local Production and Content for Designated Sectors and Local Content Declaration: Summary Schedule (Declaration C)
Stage 2	Functionality: Involves an evaluation of Functionality only – At this stage Bidders must score a minimum score of 70% for functionality (services) in order to be evaluated for stage 3 (Preferential procurement points).
Stage 3	Preferential Procurement points: Price: Points will be calculated for price on the relevant prices and specific goals in accordance with the preference point system, 80/20.

1.1. MANDATORY LIST OF TENDER RETURNABLES

Service Providers are to meet all the Mandatory Tender Requirements in order to be evaluated further for Stage 1. Failure to submit the Mandatory Requirements as required will result in this bid being disqualified.

	Description	Disqualification if not submitted with Bid Document or Bidder is found to be Non-Compliant at the Time of Bid Close	Mandatory Requirement for Award
1.	<p>Bidders must be registered on the National Treasury Central Supplier Database (CSD). The following information will be verified on the National Treasury Central Supplier Database:</p> <ul style="list-style-type: none"> • Business Registration including details of directorship and membership, - The bidders' Business Registration Status will be verified on the CSD prior to the bid award and where the preferred bidders status is under deregistration, 7 working days will be granted for remedy, failing which the bidder will be disqualified. • ID Number, • Government Employee • Tender Defaulting and Restriction Status. Should the Tender be a restricted supplier or a defaulting supplier they will be disqualified <p><u>Onus on the Service Provider</u></p> <p>Onus is on the Service Provider to make sure that all these are active and compliant on the CSD at the time of bid closing and tender award.</p> <p>ECDC will verify if the Service Provider has been registered on CSD. Service Provider to submit CSD Number as required in the Cover Page. It is the responsibility of the Service Provider to ensure that the correct CSD Number is provided.</p> <p>If Service Provider is not registered on CSD by the time of closing of the bid they will not be considered for evaluation.</p> <p><u>Directors in the Service of State</u></p> <p>Where a person within the Bidding Entity is an Employee of the State, Bidder should</p> <ol style="list-style-type: none"> a. submit a signed letter on a letter head from their Accounting Officer/Accounting Authority (AO/AA of the Government Institution where they are employed) stating that they are not prohibited from conducting business with the State in terms of Section 8 of the Public Administration Management Act, 2012 (Act No.11 of 2014- "The PFMA") b. submit a signed letter on a letter from their AO/AA granting permission to perform other remunerative work outside of their employment where the PAMA does not apply to such an employee 	Yes	Yes

	ECDC reserves the right to verify such information from their AO/AA		
2	<u>JV's and Consortium</u> Where the Bidder is a JV/Consortium, each firm must be registered on the CSD.		
3.	Tax Compliance Requirements: <ul style="list-style-type: none"> • Bidders must ensure compliance with their tax obligations. • The bidders' Tax status will be verified on the CSD prior to the bid award and where the preferred bidders is not compliant, 7 working days will be granted for remedy, failing which the bidder will be disqualified. • In Bids where Consortia/Joint venture/sub-contractors are involved, each party must submit a separate proof of Tax Compliance Status Certificate/SARS Pin Number/CSD Number. 	No	Yes
4.	CIDB Requirements: Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations , for a GB (General Building) class of construction work, are eligible to have their tenders evaluated. Joint ventures are eligible to submit tenders provided that: <ol style="list-style-type: none"> 1. every member of the joint venture is registered with the CIDB; 2. the lead partner has a contractor grading designation in the GB (General Building) class of construction work; not lower than one level below the required grading designation in the class of works construction works under considerations and possess the required recognition status. 3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a GB class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations. ECDC will verify whether the Bidders have an active and valid CIDB registration as required above	Yes (Evaluation Stage)	Yes 7 GB or higher
5.	Annexure A – Supplier Information (Completed and Signed by the Delegated Authority) Attach Delegation of Authority	Yes	Yes

6.	Annexure B – C.1.1 Form of Offer and Acceptance Offer (Completed and Signed by the Delegated Authority) Attach Delegation of Authority	Yes	Yes
7	Annexure C – Local Content Declaration (Summary Schedule) (Completed and Signed by the Delegated Authority) Attach Delegation of Authority	Yes	Yes
8	Annexure D - (SBD 4): Bidder's Disclosure (Completed and Signed by the Delegated Authority) Attach Delegation of Authority	Yes	Yes
9	Annexure E: Statement of Consent to Data Processing (Completed and Signed by the Delegated Authority) Attach Delegation of Authority	Yes	No (Should be completed before evaluation)
10	Annexure F – (SBD 6.1.): Preferential Points Claim (Signed and Completed). CSD report will be used to confirm other specific goals listed in Table 1 of the SBD 6.1 document. Failure to submit the preference points claim and proof of address may result in awarding of 0 (zero) points preference points under Eastern Cape locality. It must be noted that the scoring of joint ventures/consortia on a proportional basis applies to bids for both the acquisition of goods and services and income generating contracts.	No	No
11	Annexure G (which includes Annexure C): Declaration with regards to Company / Firm Location (Completed and Signed by the Delegated Authority) Attach Delegation of Authority Attach a proof of address to claim points for the Eastern Cape base locality as the specific goal as advised in the tender / quotation qualifies the company/firm for the PPR of 2022 preference points claim. Failure to submit the declaration and proof of address for each JV /Consortium member may result in awarding of 0 (zero) points preference points under Eastern Cape Locality. This information will be verified from the FICA documents (Physical Address, Utility Bill, Telephone, Tax Clearance, lease agreement submitted by the bidder. Failure to submit the declaration and proof of address may result in awarding of 0 (zero) points preference points under Eastern Cape locality.	No	No

12	<p>Duly signed Letter of Authority MUST be submitted authorising the individual to sign on behalf of the bidder if:</p> <p>a) If there are more than one Owner/ Director / Shareholder / Member / Trustee etc. OR</p> <p>b) If there is only one Director / Shareholder / Member / Trustee / Owner etc. and they are not the one completing the bid document.</p> <p>Note: The Letter of Authority MUST be signed by all directors of the Bidder (or a signed Board Resolution authorising the signatory will be accepted).</p>	Yes	Yes
13	Priced Bills of Quantities completed in black ink.	Yes	Yes
The following will be applicable to Joint Ventures/Consortium			
14	Consortium/Joint Venture Agreement to enter in a Consortium / Joint Venture signed by all Consortium Members who are Duly Authorized	Yes	Yes
15	Resolution of the Board of Directors to enter into a Consortium or Joint Venture from each member firm of the Consortium/Joint Venture for this Bid.	Yes	Yes
16	Letter of Authority of Signatory(individual) authorizing the Signatory to sign on behalf of the Consortium/JV. The Letter of Authority should be from each member firm and must be signed by all directors of each member firm (or Board Resolution will be accepted).	Yes	Yes

KINDLY NOTE THAT, FAILURE TO SUBMIT THE REQUIRED MANDATORY DOCUMENTATION WITH THE BID WILL RESULT IN YOUR BID BEING DISQUALIFIED WITHOUT FURTHER CONSIDERATION.

Bidders shall take note of the following conditions:

1. The successful bidder will be required to submit a Letter of Good Standing from the Compensation Commission within 14 days after award and before the contract can be signed
2. Performance Guarantee to be submitted within 14 days after award.
3. The Bid Validity period is 120 days.
4. An approved and project specific Health and Safety file within 14 days upon appointment.
5. An Approved Construction Methodology shall be submitted.
6. At Site Handover the Contractor takes full responsibility for Site Security until completion of the project.
7. No correction fluid to be used and all errors to be initialled

Queries relating to the issue of these documents may be addressed in writing to:

Ms N. Norexe

tenders@ecdc.co.za or nnorexe@ecdc.co.za

1.2. Stage 1 - Local Production and Content for Designated Sectors and Local Content Declaration

This Standard Bidding Document (SBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the ECDC Supply Chain Management Policy, the South African Bureau of Standards (SABS) approved technical specification number SATS

1286.:2011 (Edition I) and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C {Local Content Declaration: Summary Schedule), D

{Imported Content Declaration: Supporting Schedule to Annex CJ and E {Local Content Declaration: Supporting Schedule to Annex CJ].

I . General Conditions

I.1 ECDC Supply Chain Management policy makes provision for the promotion of local production and content.

1.2 ECDC Supply Management Policy prescribes that in the case of designated sectors, tenders must be advertised with the specific bidding condition that only locally produced or manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

1.3 Where necessary, for tenders referred to in paragraph 1.2 above, a three stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage functionality with a minimum threshold of 60% and third stage of price and specific goals.

1.4 A person awarded a contract in relation to a designated sector, may not sub-contract in such

a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.

1.5 The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows: $LC = \frac{x}{y} \times 100$

$\frac{x}{y}$

100

Where

x is the imported content in Rand

I.6 A bid may be disqualified if this Declaration Certificate and the Annex C {Local Content Declaration: Summary Schedule) are not submitted as part of the bid documentation.

y is the bid price in Rand excluding value added tax (VAT) Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by

South African Reserve Bank (SARB) at 12:00 on the date of advertisement of the bid as indicated in paragraph 4.1 below.

The SABS approved technical specification number SA TS 1286:2011 is accessible on http://www.thedti.gov.za/industrial_development/ip.jsp at no cost.

3.3 Table 1 provides the stipulated minimum threshold for local content and production for steel products and components for construction (as described in 3.2)

Table 1a: Minimum local content for Steel Value-added Products

Steel Construction Materials	Components	Local Content Threshold
Fabricated Structural Steel	Latticed steelwork, reinforcement steel, columns, beams, plate girders, rafters, bracing, cladding supports, stair stringers & treads, ladders, steel flooring, floor grating, handrailing and balustrading, scaffolding, ducting, gutters, launders, downpipes and trusses	100%
Joining/Connecting Components	Gussets, cleats, stiffeners, splices, cranks, kinks, doglegs, spacers, tabs, brackets	100%
Frames	Doors and Windows	100%
Roof and Cladding	Bare steel cladding, galvanised steel cladding, colour coated cladding	100%
Fasteners	Bolts, nuts, rivets and nails	100%
Wire Products	All fencing products: all barbed wire and mesh fencing, fabric/mesh reinforcing, gabions, wire rope/strand and chains, welding electrodes, nails/tacks, springs and screws	100%
Ducting and Structural Pipework	Non-conveyance tubing fabricated from steel sheeting and plate with structural supports	100%
Gutters, downpipes & launders	Fabricated materials made from sheeting associated with roof drainage systems	100%

Table 1b: Minimum local content for Primary Steel Products

Steel Construction Materials	Local Content Threshold
Plates (>4.5mm thick and supplied in flat pieces)	100%
Sheets (<4.5mm thick and supplied in coils)	100%
Galvanised and Colour Coated Coils	100%
Wire Rod and Drawn Wire	100%
Sections (Channels; Angles, I-Beams and H-Beams)	100%
Reinforcing bars	100%

.....

SIGNATURE(S) OF BIDDERS(S)

DATE:

ADDRESS:

.....

.....

WITNESSES:

1.

2.

1.3. STAGE 2 - FUNCTIONALITY

Involves an evaluation of Functionality only – At this stage Bidders must score a minimum score of **70%** for functionality (services) in order to be evaluated for stage 2 (Preferential procurement points).

Bidder to note the following for Functionality Evaluation:

- a) Adequate proof supporting the points claimed must be provided. (e.g. documents, agreements, qualifications, previous experience, certifications, etc.)
- b) Failure to submit relevant information with supporting document and adequate proof may result in ECDC not being able to allocate points for the Evaluation Criteria outlined below.

Table 1: Functionality Evaluation Criteria – Stage 2

EXPERIENCE (Read with Schedule T.2.2.2(a) requirements)	Allocated Points
Reference letter for building/refurbishments/maintenance projects completed as stipulated below: (Bidder to submit a reference letter for each project completed.)	
5 or more reference letters	30
4 reference letters	20
3 reference letters	15
2 reference letters	10
Less than 2 reference letters	0
<u>Document to be submitted for points allocation</u>	
The Bidder must demonstrate that they have the relevant experience in general building works submitting completed T.2.2.2 (a) reference forms or reference letters for completed general building works (Read with Schedule T.2.2.2(a) requirements)	
Reference letter should indicate the following.	
<ul style="list-style-type: none"> • Signature of the client • Client’s Letter head or Client Stamp • Company name, contact person, contact details (telephone number and email address) • Value of the project • Works carried out • Works have been completed on time /within the stipulated contract period • Good or better quality of workmanship • Assessment of the quality of work performed 	
EXPERTISE (CV's of other Key Personnel to be included in Returnables)	
Construction Manager (Minimum of National Diploma in The Built Environment Qualifications to be supplied with CV)	
10 years or more experience on general building contracts	15
5 years but less than 10 years’ experience on general building contracts	10
3 years but less than 5 years on general building contracts	5
Less than 3 years’ experience on general building contracts	0
Construction Supervisor (Minimum of National Diploma in The Built Environment Qualifications to be supplied with CV)	
10 years or more experience on general building projects	
5 years but less than 10 years’ experience on general building projects	10
3 years but less than 5 years on general building projects	5
Less than 3 years’ experience on general building projects	3
	0

Health and Safety Officer (Professionally registered CHSO with the SACPCMP)	
10 years or more experience as a Health and Safety Officer in the construction industry	5
5 years but less than 10 years' experience as a Health and Safety Officer in the construction industry	3
3 years but less than 5 years as a Health and Safety Officer in the construction industry	2
Less than 3 years' experience as a Health and Safety Officer in the construction industry (Not professionally registered)	0
Submission of proposed methodology and construction program	10
TOTAL MAXIMUM ACHIEVEABLE POINTS	70
MINIMUM POINTS REQUIRED	49

- a) Only bids that have achieved the minimum qualifying score for functionality will be evaluated further in terms of preferential procurement points (stage 2).
- b) All bids that fail to achieve the minimum score will be disqualified.
- c) The minimum qualifying score (in a percentage) for functionality shall be calculated as follows:

$$P_s = \frac{S_o}{M_s} \times 100 \text{ Where:}$$

Ps = percentage scored for functionality by bid under consideration

So = Total score for bid under consideration

Ms = Maximum possible score

The percentages of each panel member shall be added and divided by the number of panel members to establish the average percentage obtained by each bidder for functionality.

1.4. Stage 3 – Preference Procurement Point - Evaluation Criteria

Preference points for this bid shall be awarded for price and the specific goal. The maximum points for this bid are allocated as follows:

CRITERIA	POINTS
Price	80
Specific goal	20
TOTAL POINTS	100

- a) Points awarded for price based will be based on the 80/20 Preference point systems
- b) The points scored by the tenderer/bidder for Price will be added to the points scored for ECDC specific goal to obtain the bidder's total points scored out of 100 points.
- c) In the event that two or more bids have scored equal total points, the successful bid will be the one scoring the highest number of preference points for ECDC specific goal
- d) However, when functionality is part of the evaluation process and two or more bids have scored equal points including equal preference points for specific goal, the successful bid must be the one scoring the highest score for functionality.
- e) Should two or more bidders/tenderers be equal in all respects, the award shall be decided by the drawing of lots.
- f) The bidder obtaining the highest number of total points will be awarded the contract.
- g) Points scored will be rounded off to the nearest 2 decimal places.
- h) Price**
 - (i) The lowest acceptable bid will score 80 points for price.
 - (ii) The following formula will be used to calculate the points out of 80 for price in respect of the bid/tender.

(iii) Preference points for price shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts;

DETAILS	80/20 PREFERENCE POINT SYSTEM
Rand value (competitive bids or quotations) all applicable taxes included.	<ul style="list-style-type: none"> Equal and above R30 000 to R50 million, inclusive of all applicable taxes. Below R30 000 if and when considered to be appropriate
Formulae	$P_s = 80 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$ <p>Ps = Points scored for comparative price of bid / offer under consideration</p> <p>Pt = Comparative price of bid / offer under consideration</p> <p>Pmin = Comparative price of lowest acceptable bid / offer</p>

Standard Conditions of Tender

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity in Construction Procurement (January 2019) as published in Government Gazette No 42622, Board Notice 423 of 2019 on the 8th of August 2019 (See www.cidb.org.za).

A.1 General

A.1.1 Actions

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

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

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

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

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

A.1.2 Tender Documents

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

A.1.3 Interpretation

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

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

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

a) conflict of interest means any situation in which:

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

- b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration.
- c) **corrupt practice** means the offering, giving, receiving, or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process.
- d) **fraudulent practice** means the misrepresentation of the facts to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels.

A.1.4 Communication and employer's agent

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

A.1.5 Cancellation and Re-Invitation of Tenders

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

- a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation.
- b) funds are no longer available to cover the total envisaged expenditure; or
- c) no acceptable tenders are received.
- d) there is a material irregularity in the tender process.

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

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

A.1.6 Procurement procedures

A.1.6.1 General

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

A.1.6.2 Competitive negotiation procedure

A.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of A.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of A.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

A.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of A.2.17, the employer may request that tenders be clarified, specified and fine-

tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

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

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

A.2 Tenderer's obligations

A.2.1 Eligibility

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

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

A.2.2 Cost of tendering

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

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

A.2.3 Check documents

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

A.2.4 Confidentiality and copyright of documents

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

A.2.5 Reference documents

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

A.2.6 Acknowledge addenda

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

A.2.7 Clarification meeting

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

A.2.8 Seek clarification

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

A.2.9 Insurance

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

A.2.10 Pricing the tender offer

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

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

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

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

A.2.11 Alterations to documents

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

A.2.12 Alternative tender offers

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

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

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

A.2.13 Submitting a tender offer

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

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

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

A.2.13.4 Sign (Signature by authorized personnel) the original and all copies of the tender offer where required in

terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

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

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

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

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

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

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

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

A.2.15 Closing time

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

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

A.2.16 Tender offer validity

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

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

A.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

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

A.2.17 Clarification of tender offer after submission

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

substance of the tender offer is sought, offered, or permitted.

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

A.2.18 Provide other material

A.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.

Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

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

A.2.19 Inspections, tests and analysis

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

A.2.20 Submit securities, bonds and policies

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

A.2.21 Check final draft

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

A.2.22 Return of other tender documents

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

A.2.23 Certificates

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

A.3 The employer's undertakings

A.3.1 Respond to requests from the tenderer

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

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

- a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements.
- b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
- c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

A.3.2 Issue Addenda

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

A.3.3 Return late tender offers

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

A.3.4 Opening of tender submissions N/A

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

A.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points ECDC specific goal and time for completion for the main tender offer only.

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

A.3.5 Two-envelope system

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

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

A.3.6 Non-disclosure

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

A.3.7 Grounds for rejection and disqualification

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

A.3.8 Test for responsiveness

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

- a) complies with the requirements of these Conditions of Tender,
- b) has been properly and fully completed and signed, and
- c) is responsive to the other requirements of the tender documents.

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

- a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
- c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

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

A.3.9 Arithmetical errors, omissions and discrepancies

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

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

- a) the gross misplacement of the decimal point in any unit rate.
- b) omissions made in completing the pricing schedule or bills of quantities; or
- c) arithmetic errors in:
 - (i) line-item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
 - (ii) the summation of the prices.

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

A.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

- a) If bills of quantities or pricing schedules apply and there is an error in the line-item total resulting from the product of the unit rate and the quantity, the line item total shall govern, and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line-item total as quoted shall govern, and the unit rate shall be corrected.
- b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

A.3.10 Clarification of a tender offer

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

A.3.11 Evaluation of tender offers

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

Conditions of tender are by definition the document that establishes a tenderer's obligations in submitting a tender and the employer's undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from

the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

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

The activities associated with evaluating tender offers are as follows:

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

A.3.11.1 General

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

A.3.12 Insurance provided by the employer

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

A.3.13 Acceptance of tender offer

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

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

- b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract.
- c) has the legal capacity to enter into the contract.
- d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;
- e) complies with the legal requirements, if any, stated in the tender data; and
- f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

A.3.14 Prepare contract documents

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

- a) addenda issued during the tender period,
- b) inclusion of some of the returnable documents and other revisions agreed between the employer and the successful tenderer.

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

A.3.15 Complete adjudicator's contract

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

A.3.16 Registration of the award

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

A.3.17 Provide copies of the contracts

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

A.3.18 Provide written reasons for actions taken

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

ADDITIONAL CONDITIONS OF TENDER OF ECDC

Where the CIDB standard condition of tender does not address the following, clauses on the ECDC standard conditions of tender, the ECDC Standard condition of tender will be additional.

1.1 Alteration or withdrawal of Proposals

Bidders may withdraw their proposal by written notification on or before the date Specified for the evaluation of Bids.

1.2 Alternative Bid

Alternative Bids will not be accepted

1.3 Costs for preparation of Proposals/presentations

The costs incurred by Bidders in respect of the attendance of any briefing or presentation meetings if necessary or costs incurred in preparing any proposal will be borne by the Bidder and the ECDC shall in no way be liable to reimburse such costs incurred.

1.4 Ownership of Proposals and presentations

The ECDC shall on receipt of any proposal relating to this request and submitted in accordance with the procedure set out herein, shall become the owner thereof and the ECDC shall not be obliged to return any proposal.

1.5 Tax Clearance Certificate requirement

It is a condition of all bids inclusive of foreign bidders / individuals) that the South African taxes of the successful bidder must be in order.

The bidders' Tax status will be verified on the CSD prior to the bid award and where the preferred bidders is not compliant, **5 working days** will be granted for remedy, failing which the bidder will be disqualified.

In Bids where Consortia/Joint venture/Sub-Contractors are involved, each party will be verified separately for proof of Tax Compliance Status.

In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate. Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za

1.6 Confidentiality

The entire process of calling for Bids was initiated by the ECDC in terms of its procurement policy and is confidential. All deliberations in respect of the acceptability or otherwise of the proposals shall be conducted in closed sessions and members of the Evaluation and Procurement Committee and prospective service providers are bound to treat all discussions as highly confidential.

The service provider shall not divulge directly or indirectly to any other person than a person employed by ECDC, make copies or extracts of any of the information obtained during this assignment, while they may have access to ECDC's trade secrets, confidential information which may include, specifications, plans, drawings, pattern, samples, written instructions, notes, memoranda, technical information, know-how or process or method or any other records of whatsoever nature without the written consent of ECDC and shall surrender all these items to ECDC on termination of the assignment or on demand of ECDC.

The service provider shall not be entitled to make use of the information whether for its own benefit or that of others, to make available or derive any profit from any of the information or knowledge specifically related to the business or affairs of ECDC.

Any document shall remain the property of ECDC and shall be returned (all copies) to ECDC on completion of the contract if so required by ECDC.

1.7 Inventions Patent and Copy-Rights

The service provider cedes, assigns and transfers to ECDC all rights, title and interest in and to any and all copyright in all works and inventions which relates to the business of ECDC (which includes, but is not limited to, methodologies and products) which arises within the course and scope of this services will be assigned to ECDC.

The Service Provider shall Provide ECDC the sole and exclusive right to alter and adapt the work.

The service provider shall indemnify ECDC against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the goods or any part thereof by ECDC.

1.8 Ethics

Any attempt by an interested Bidder to obtain confidential information, or enter into unlawful agreements with competitors or influence the various ECDC Procurement Committee's or the ECDC during the process of examining, evaluating and comparing Bids/Proposals or Proposals will lead to the rejection of its bid/quotation/proposal in its entirety.

The Bidder must declare any business or other interests it has with the ECDC or any employee of the ECDC, as per the declaration of interest form annexed hereto marked in Section D; failing which the Bidder shall be automatically disqualified from further participation in the Bid or call for proposals. The disqualification will be applicable at any stage of the bidding and / or engagement process.

1.9 Competition

Bidders and their respective officers, employees and agents are prohibited from engaging in any collusive action with respect to the bidding process which serves to limit competition amongst bidders.

In general, the attention of bidders is drawn to Section 4(1) (b) (iii) of the Competition Act 1998 (Act No. 89 of 1998) (the Competition Act) that prohibits collusive bidding.

An agreement between, or concerted practice by, firms, or a decision by an association of firms, is prohibited if it is between parties in a horizontal relationship and if a bidder/s is / are or a contractor(s) was / were involved in collusive bidding.

If bidders have reason to believe that competition issues may arise from any submission of a response to this bid invitation they may make, they are encouraged to discuss their position with the competition authorities before submitting response.

Any correspondence or process of any kind between bidders and the competition authorities must be documented in the responses to this invitation to bid.

In this regard bidders are required to complete the Certificate of Independence Bid Determination, failing which the Bidder shall be automatically disqualified from further participation in the Bid or call for proposals. The disqualification will be applicable at any stage of the bidding and / or engagement process.

If a bidder (s) or contractor (s), based on reasonable grounds or evidence obtained by ECDC, has /have engaged in the restrictive practice referred to above, ECDC may refer the matter to the Competition Commission for investigation and possible imposition of an administrative penalty as contemplated in Section 59 of the Competition Act 89 of 1998.

If a bidder(s) or contractor(s) has / have been found guilty by the Competition Commission of the restrictive practice referred to above, ECDC may in addition and without prejudice to any other remedy provided for, invalidate the bid(s) for such an item(s) offered, and / or terminate the contract in whole or part, and / or restrict the bidder(s) or contractor(s) for conducting business with the public sector for a period of not exceeding 10 (ten) years and / or claim damages from the bidder(s) / contractor(s) concerned.

1.10 Cancellation of Bid Process

The ECDC shall be entitled, within its sole and entire discretion, to cancel this Bid/Call for Proposals and/or Quotations at any time and shall notify the interested service providers accordingly. The ECDC shall in no way be liable for any damages whatsoever, including, without limitation, damages for loss of profit, in any way connected with the cancellation of this bid. The publication of the bid does not commit the ECDC to appoint any of the qualifying Bidders.

1.11 Interviews

In terms of the bid evaluation process short listed bidders may be interviewed. This will entail the bidder being invited to a venue as determined by the bid committee. All transport and accommodation costs incurred by the bidder will be for the bidders account and will not be reimbursed in any way. Failure to attend a scheduled interview will lead to immediate disqualification from the bid process. The ECDC reserves the right to appoint a bidder without conducting interviews.

1.12 Contract award

The successful bidder will be notified of the bid award in writing by the Procurement Department.

The acceptance of any proposal shall only be confirmed with the conclusion of a final written signed service level agreement or any other appropriate agreement between the ECDC and the successful Bidder, in terms of which the rights and duties of the parties are recorded, which agreement shall regulate the relationship between the ECDC and the Successful Bidder.

As a guideline regarding the content of the service level agreement, the bidder is referred to the JBCC PBA (6.2 edition) incorporating the Contract Data for use by Organs of State (copy attached).

Until such time that an appropriate agreement has been concluded in writing between the ECDC and the successful Bidder, no rights shall be conferred nor shall any legitimate expectations be conferred to the successful Bidder to carry out the works or services provided for in this Bid.

The ECDC, the Accounting Officer and the Bid Committee (as the case may be) does not bind itself to accept either the lowest (price), highest (points) or any other bid and reserves the right to accept the bid which it deems to be in the best interest of the Institution even if it implies a waiver by the ECDC, the Accounting Officer, or the Bid Committee, (as the case may be) of certain requirements which the ECDC, the Accounting Officer, the Bid Committee, (as the case may be) considers to be of minor importance and not complied with by the bidder.

The ECDC will not entertain any request of feedback before the final awarding of the contract.

1.13 Supplier Due Diligence

ECDC reserves the right to conduct supplier due diligence prior to final award or at any time during the contract period. This may include site visits and requests for additional information.

1.14 Disclaimer

This Bid document has been prepared for the purpose of providing information to interested Bidders. The provision of any additional information about the organization to Bidders, are disclosed and will be made available to enable the prospective Bidders to submit comprehensive proposals.

Interested Bidders are accordingly required to conduct their own due diligence in respect of the ECDC and its business operations and the nature and scope of the services required.

The ECDC accepts no responsibility for the fairness, accuracy or completeness of any information or opinions, for any errors, omissions or misstatements, negligent otherwise, made by any person in this Bid document or at any Compulsory briefing session

The ECDC accepts no liability for any loss incurred by any person(s) due to events or action taken as a consequence of the preparation and dissemination of this bid request.

Except in cases of criminal negligence or wilful misconduct, and in the case of infringement the bidder shall not be liable to ECDC, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the bidder to pay penalties and/or damages to ECDC; and

The aggregate liability of the bidder to ECDC, whether under the contract, in tort or otherwise, shall not exceed the total contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.

1.15 Contact and Communication

A nominated official of the bidder(s) can make enquiries in writing, to the specified person on the table below. Bidder(s) must reduce all telephonic enquiries to writing and send to the above email address.

The delegated office of ECDC, Procurement Department, may communicate with Bidder(s) where clarity is sought in the bid proposal.

Any communication to an official or a person acting in an advisory capacity for ECDC in respect of the bid between the closing date and the award of the bid by the Bidder(s) is discouraged.

All communication between the Bidder(s) and ECDC must be done in writing.

Details	Bidding Procedure
Department	Procurement Department
Contact person	Ms N. Norexe
Telephone number	043 704 5600
E-mail address	tenders@ecdc.co.za or nnorexe@ecdc.co.za

ETHICS & FRAUD HOTLINE REPORTING CHANNELS



HOTLINE DETAILS Ethics & Fraud Hotline

HOTLINE DETAILS	
Hotline Name:	ECDC Ethics & Fraud Hotline
Contact Number:	0800 116 665
WhatsApp Number:	0860 004 004
Dedicated Email Address:	ecdc@behonest.co.za aidc@behonest.co.za
SMS Number:	48691
Free Post	BNT165, Advance Call Pty (Ltd), Brooklyn Square, 0075
Website Link	www.behonest.co.za
Chat	www.behonest.co.za

Whilst all due care has been taken in connection with the preparation of this bid, ECDC makes no representations or warranties that the content of the bid or any information communicated to or provided to Bidder(s) during the bidding process is, or will be, accurate, current or complete. ECDC, and its employees and advisors will not be liable with respect to any information communicated which may not be accurate, current or complete.

If Bidder(s) finds or reasonably believes it has found any discrepancy, ambiguity, error or inconsistency in this bid or any other information provided by ECDC (other than minor clerical matters), the Bidder(s) must promptly notify ECDC

in writing of such discrepancy, ambiguity, error or inconsistency in order to give ECDC an opportunity to consider what corrective action is necessary (if any).

Any actual discrepancy, ambiguity, error or inconsistency in the bid or any other information provided by ECDC will, if possible, be corrected and provided to all Bidder(s) without attribution to the Bidder(s) who provided the written notice.

All persons (including Bidder(s)) obtaining or receiving the bid and any other information in connection with the Bid or the Tendering process must keep the contents of the Bid and other such information confidential, and not disclose or use the information except as required for the purpose of developing a proposal in response to this Bid. All persons (including Bidder(s)) obtaining or receiving the bid and any other information in connection with the Bid or the Tendering process must keep the contents of the Bid and other such information confidential, and not disclose or use the information except as required for the purpose of developing a proposal in response to this Bid.

T2.2. - Returnable schedules

T2.2.1 – Declarations

T2.2.2 – Functionality Evaluation Schedules

ANNEXURE A: SUPPLIER INFORMATION/COMPANY ENTERPRISE QUESTIONNAIRE

Note: Mandatory Requirement. Failure to complete and Sign this document will result in the bid being non responsive.

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

Legal Name of Bidder : (Same as CSD)	
Trading Name of Bidder: (Same as CSD)	
Registration Number (Same as CSD)	
Physical Address	
Postal Address	
Contact Person (of the JV if the Bidder is a JV)	
Title/Position in the Firm	
Mobile Number (of the JV if the Bidder is a JV)	
Bidder Telephone Number (of the JV if the Bidder is a JV)	
Facsimile Number	
Email Address of Contact Person (of the JV if the Bidder is a JV)	
Email Address of Bidder (of the JV if the Bidder is a JV)	
VAT Registration Number (Same as CSD)	

Central Supplier Database Number		MAAA	
CIDB Registration Number			
Are the Accredited Representative in South Africa for the Goods/Services/Works Offered?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes enclose Proof)	Are you a foreign based supplier for the Goods/Services/Works Offered?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, answer the questionnaire Below)
QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS			
Is the Entity a resident of the Republic of South Africa (RSA)		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Does the Entity have a branch in the RSA?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Does the Entity have a permanent establishment in the RSA?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Does the Entity have any source of income in the RSA		<input type="checkbox"/> Yes	<input type="checkbox"/> No
If the answer is "No" to all of the above, then it is not a requirement to register for a Tax Compliance Status system pin code from the South African Revenue (SARS) and if not register			
<u>VERY IMPORTANT</u>			
Where a person within the Bidding Entity is an Employee of the State, Bidder should			
a. submit a signed letter on a letter head from their Accounting Officer/Accounting Authority (AO/AA of the Government Institution where they are employed) stating that they are not prohibited from conducting business with the State in terms of Section 8 of the Public Administration Management Act, 2012 (Act No.11 of 2014- "The PFMA")			
b. submit a signed letter on a letter from their AO/AA granting permission to perform other remunerative work outside of their employment where the PAMA does not apply to such an employee			
ECDC reserves the right to verify such information from their AO/AA			

SERVICE PROVIDER ACKNOWLEDGEMENT OF REQUEST AND TERMS AND CONDITIONS:

I..... (NAME) HEREBY ACCEPT THE TERMS OF THIS REQUEST FOR BID AND ACKNOWLEDGE THAT I AM APPROPRIATELY DELEGATED TO RESPOND ON BEHALF OF (ATTACH DELEGATION OF AUTHORITY)

.....

(NAME OF BIDDER).

Print Name

Date

Designation

Signature

Annexure D: BIDDER'S DISCLOSURE (SBD4)

Note: Mandatory Requirement. Failure to complete and Sign this document will result in the bid being non responsive.

1. PURPOSE OF THE FORM

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

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

2. Bidder's declaration

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

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

Full Name	Identity Number	Name of State institution

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

2.2.1 If so, furnish particulars:
.....
.....

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

2.3.1 If so, furnish particulars:
.....
.....

3 DECLARATION

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

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

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium² will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
- 3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.
- 3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

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

.....
 Signature Date

 Position Name of bidder

SIGNATURE OF BIDDER OF DELEGATED AUTHORITY		DATE	
---	--	-------------	--

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

ANNEXURE E: STATEMENT OF CONSENT TO DATA PROCESSING

In terms of the provisions of the Protection of Personal Information Act, 2013 (Act No. 4 of 2013)

1. I, _____ (full names of the **client/applicant**),
 Identity number _____ (**“the applicant”**)
 do hereby grant my consent to the Eastern Cape Development Corporation (“the ECDC”) and its appointed processor to process my personal data for the purpose of any or all of the undermentioned actions, being the legitimate reasons for processing and/or using my personal data.
2. I accept that my personal information will only be utilized for the purposes it was collected, that the information will only be retained for as long as is necessary and required by law, and that I have the right to view such information at any time, as well as requested correction or deletion of my personal information held by the ECDC.
3. I am aware that I may withdraw my consent at any time by using the relevant Data Subject Consent Withdrawal Form.
4. I herewith consent to the ECDC official / staff member / employee or agent collecting and having access to my personal information.
5. I expressly consent to the ECDC official / staff member / employee or agent to collect and process this information for the purpose of **considering my application for funding / leasing / employment alternatively for considering our bid document.**
6. I expressly consent to the ECDC or its official / staff member / employee or agent having access to my personal information contained in my application for lease, employment, funding, my bid document or any other administrative document required by the ECDC for processing.
7. I expressly consent to the ECDC or its official / staff member / employee or agent using my personal information to communicate with me in person / via telephone / email / video call / fax / WhatsApp / any form of social media.
8. I expressly consent that the ECDC or its official / staff member / employee or agent may discuss any of my personal information with any of its officials / staff members / employees or agents that may at any stage of my application be involved in considering same and forward any such information to any ECDC relevant committee or forum.
9. I expressly consent to the ECDC or its official / staff member / employee or agent **handing over any outstanding accounts to debt collection third parties (applicable to properties/development finance and business support unit).**
10. I expressly consent to the ECDC or its official / staff member / employee or agent handing over my personal information for purposes of verification of my credit profile or record, references or any purpose required in terms of the law.

SIGNATURE of the DELEGATED AUTHORITY		DATE	
---	--	-------------	--

SBD 6.1

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

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

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

1. GENERAL CONDITIONS

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

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

1.2 **Principle applicable for this tender /quotation is:**

- a) The value of this bid is estimated not to exceed R50 000 000 (all applicable taxes included) and therefore the applicable preference point system for this tender is the 80/20 preference point system.

1.3 Points for this tender shall be awarded for:

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

1.4 The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	
51% and above black owned enterprise	10
Eastern Cape Based Supplier	5
51 % and above woman owned enterprises.	3
51 % and above youth owned enterprises	2
Total points for Price and SPECIFIC GOALS	100

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

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

2. DEFINITIONS

“**tender**” means a written offer in the form determined by an organ of state in response to an invitation to

- (a) provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;
- (b) “**price**” means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;
- (c) “**rand value**” means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- (d) “**tender for income-generating contracts**” means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and
- (e) “**the Act**” means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

2.3. POINTS AWARDED FOR PRICE

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

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

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

Where

- P_s = Points scored for price of tender under consideration
- P_t = Price of tender under consideration
- P_{min} = Price of lowest acceptable tender

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

2.4.1. POINTS AWARDED FOR PRICE

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

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

Where

- P_s = Points scored for price of tender under consideration
- P_t = Price of tender under consideration
- P_{max} = Price of highest acceptable tender

3. POINTS AWARDED FOR SPECIFIC GOALS

- 3.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:
- 3.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—
- (c) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or
 - (d) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,
- then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

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

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

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

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
SPECIFIC GOALS				
51% and above black owned enterprises		10		
Eastern Cape Based Supplier		5		
51 % and above woman owned enterprises.		3		
51 % and above youth owned enterprises		2		

DECLARATION WITH REGARD TO COMPANY/FIRM

3.3. Name of company/firm.....

3.4. Company registration number:

3.5. TYPE OF COMPANY/ FIRM

- Partnership/Joint Venture / Consortium
- One-person business/sole propriety
- Close corporation
- Public Company

- Personal Liability Company
- (Pty) Limited
- Non-Profit Company
- State Owned Company

[TICK APPLICABLE BOX]

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

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
 - (a) disqualify the person from the tendering process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
 - (e) forward the matter for criminal prosecution, if deemed necessary

.....
SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME:

DATE:

ADDRESS:

.....
.....
.....

ANNEXURE H: SBD 6.2 – Declaration Certificate For Local Production And Content for Designated Sector
Note: Mandatory Requirement. Failure to complete and Sign this document will result in the bid being non responsive.

This Standard Bidding Document (SBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017 and the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates C (Local Content Declaration: Summary Schedule) , D (Imported Content Declaration: Supporting Schedule to Declaration C) and E (Local Content Declaration: Supporting Schedule to Declaration C) .

1. General Conditions

- 1.1 Preferential Procurement Regulations, 2022 make provision for the promotion of local production and content.
- 1.2 Regulation 8.(2) prescribes that in the case of designated sectors, organs of state must advertise such tenders with the specific bidding condition that only locally produced/manufactured goods with a stipulated minimum threshold for local production and content will be considered.
- 1.3 Where necessary, for bids referred to in paragraphs 1.2 , a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.
- 1.4 A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 1.5 The local content (LC) as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows:

$$LC = 1 - \left[\frac{x}{y} \right] \times 100$$

Where

- x imported content
y bid price excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by South African Reserve Bank (SARB) at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid as indicated in paragraph 4.1 below.

The SABS approved technical specification number SATS 1268:2011 is accessible on <http://www.thedti/industrialdevelopment/ip.jsp> at no cost

- 1.6 A bid will be disqualified if this Declaration Certificate and Declaration C (Local Content Declaration : Summary Schedule) are not submitted as part of the bid documentation;.

2. Definitions

- 2.1 “**bid**” includes advertised competitive bids, written price quotations or proposals;
- 2.2 “**bid price**” price offered by the bidder, excluding value added tax (VAT);
- 2.3 “**contract**” means the agreement that results from the acceptance of a bid by an organ of state;
- 2.4 “**designated sector**” means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production,

- 2.5 where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;
- 2.6 “**duly sign**” means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility(close corporation, partnership or individual).
- 2.7 “**imported content**” means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and
- 2.8 which costs are inclusive of the costs abroad, plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;
- 2.9 “**local content**” means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;
- 2.10 “**stipulated minimum threshold**” means that portion of local production and content as determined by the Department of Trade and Industry; and
- 2.11 “**sub-contract**” means the primary contractor’s assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract in the execution part of a project in terms of the contract.

The stipulated minimum threshold(s) for local production and content (refer to SATS 1286:2011) for this bid is/are as follows:

Table 1

Designated Sector /Sub-sector/ Industries	Minimum threshold for local content
For more details on the designated sectors for local production and their minimum threshold and any amendment from time to time, please visit the following website http://www.thedt.gov.za/industrial development/ip.jsp	

**3. Does any portion of the services, works or goods offered have any imported content?
(Tick Applicable Box)**

YES		NO	
------------	--	-----------	--

3.1. If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.5 of the general conditions must be the rate(s) published by SARB for the specific currency at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid.

The relevant rates of exchange information is accessible on www.reservebank.co.za.

Indicate the rate(s) of exchange against the appropriate currency in the table below:

Currency	Rates of exchange
US Dollar	
Pound Sterling	
Euro	
Yen	
Other	

NB: Bidders must submit proof of the SARB rate (s) of exchange used.

4. Where , after the award of a Bid, challenges are experienced in the meeting the stipulated minimum threshold for local content, the DTI must be informed accordingly in order for the DTI to verify and consultation with the AO/AA provide directive in this regard.

LOCAL CONTENT DECLARATION BY THE CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID No.

ISSUED BY: (Procurement Authority / Name of Institution):

.....

NB

The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.

Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Declaration C, D and E) is accessible on http://www.thdti.gov.za/industrial_development/ip.jsp

Bidders should first complete Declaration D After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C.

Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate the declaration made in paragraph C below.

Declaration D and E should be kept by the Bidder for verification purposes for a period of at least 5 years. The successful bidder is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

I, the undersigned, (full names), do hereby declare, in my capacity as

of(name of bidder entity), the following:

The facts contained herein are within my own personal knowledge.

I have satisfied myself that

- the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011 and

The local content percentage (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 and information contained in Declaration D and E which has been consolidated in Declaration C above :

Bid price, excluding VAT (y)	R
Imported content (x)	R
Stipulated minimum threshold for Local content (paragraph 3 above)	
Local content %, as calculated in terms of SATS 1286:2011	

If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above.

The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration

D and E

(d) I accept that the Procurement Authority / Institution has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Institution imposing any or all of the remedies as provided for in Regulation 14 of the Preferential Procurement Regulations, 2017 promulgated under the Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

NAME: _____

SIGNATURE: _____

DATE: _____

WITNESS No. 1 _____

DATE: _____

WITNESS No. 2 _____

DATE: _____

The below listed declarations are attached in the next three pages that follow;

- **Declaration C SATS 1286.2011**
 - Local Content Declaration – Summary Schedule
- **Declaration D SATS 1286.2011**
 - Imported Content Declaration – Supporting Schedule to declaration C
- **Declaration E SATS 1286.2011**
 - Local Content Declaration _ - Supporting Schedule to declaration C
- Bidders should first complete Declaration D. After completing Declaration D, bidders should complete Declaration E and then consolidate the information into Declaration C.
- Declaration C should be submitted with the bid documentation on the closing date in order to substantiate the declaration made on annexure J.
- The successful bidder is required to continuously update Declarations C, D and E with the actual for the duration of the contract.
- Bidders should obtain copies of certificates of trading the subject materials from manufactures/suppliers and attach them in the bid document in order to substantiate annexure J above.

Templates of Declarations C, D and E follow:

Declaration D

Imported Content Declaration - Supporting Schedule to Annex C

<i>(D1)</i> Tender No.	ECDC/INFRA/22/112023	Note: VAT to be excluded from all calculations
<i>(D2)</i> Tender description:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK	
<i>(D3)</i> Designated Products:		
<i>(D4)</i> Tender Authority:		
<i>(D5)</i> Tendering Entity name:		
<i>(D6)</i> Tender Exchange Rate:	Pula <input style="width: 50px;" type="text"/> EU <input style="width: 50px;" type="text"/> R 9.00 GBP <input style="width: 50px;" type="text"/> R 12.00	

A. Exempted imported content

Calculation of imported content										Summary	
Tender item no's	Description of imported content	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Exchange Rate	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Exempted imported value
<i>(D7)</i>	<i>(D8)</i>	<i>(D9)</i>	<i>(D10)</i>	<i>(D11)</i>	<i>(D12)</i>	<i>(D13)</i>	<i>(D14)</i>	<i>(D15)</i>	<i>(D16)</i>	<i>(D17)</i>	<i>(D18)</i>
<i>(D19)</i> Total exempt imported value										R 0	

This total must correspond with Annex C - C 21

B. Imported directly by the Tenderer

Calculation of imported content										Summary	
Tender item no's	Description of imported content	Unit of measure	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Total imported value
<i>(D20)</i>	<i>(D21)</i>	<i>(D22)</i>	<i>(D23)</i>	<i>(D24)</i>	<i>(D25)</i>	<i>(D26)</i>	<i>(D27)</i>	<i>(D28)</i>	<i>(D29)</i>	<i>(D30)</i>	<i>(D31)</i>
<i>(D32)</i> Total imported value by tenderer										R 0	

C. Imported by a 3rd party and supplied to the Tenderer

Calculation of imported content										Summary	
Description of imported content	Unit of measure	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Quantity imported	Total imported value
<i>(D33)</i>	<i>(D34)</i>	<i>(D35)</i>	<i>(D36)</i>	<i>(D37)</i>	<i>(D38)</i>	<i>(D39)</i>	<i>(D40)</i>	<i>(D41)</i>	<i>(D42)</i>	<i>(D43)</i>	<i>(D44)</i>
<i>(D45)</i> Total imported value by 3rd party										R 0	

D. Other foreign currency payments

Calculation of foreign currency payments					Summary of payments
Type of payment	Local supplier making the payment	Overseas beneficiary	Foreign currency value paid	Tender Rate of Exchange	Local value of payments
<i>(D46)</i>	<i>(D47)</i>	<i>(D48)</i>	<i>(D49)</i>	<i>(D50)</i>	<i>(D51)</i>
<i>(D52)</i> Total of foreign currency payments declared by tenderer and/or 3rd party					

Signature of tenderer from Annex B _____

(D53) Total of imported content & foreign currency payments - *(D32)*, *(D45)* & *(D52)* above R 0

Date: _____

This total must correspond with Annex C - C 23

Declaration E

Local Content Declaration - Supporting Schedule to Annex C

(E1)	Tender No.	ECDC/INFRA/22/112023	Note: VAT to be excluded from all calculations
(E2)	Tender description:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK	
(E3)	Designated products:	<input type="text"/>	
(E4)	Tender Authority:	<input type="text"/>	
(E5)	Tendering Entity name:	<input type="text"/>	

Local Products (Goods, Services and Works)	Description of items purchased	Local suppliers	Value
	(E6)	(E7)	(E8)
(E9) Total local products (Goods, Services and Works)			R 0

(E10) **Manpower costs** (Tenderer's manpower cost)

(E11) **Factory overheads** (Rental, depreciation & amortisation, utility costs, consumables etc.)

(E12) **Administration overheads and mark-up** (Marketing, insurance, financing, interest etc.)

(E13) Total local content

This total must correspond with Annex C - C24

Signature of tenderer from Annex B

Date: _____

Guidance Document for the Calculation of Local Content

1. DEFINITIONS

Unless explicitly provided in this guideline, the definitions given in SATS 1286:2011 apply.

2. GENERAL

2.1. Introduction

This guideline provides tenderers with a detailed description of how to calculate local content of products (goods, services and works) by components/material/services and enables them to keep an updated record for verification requirements as per the SATS 1286:2011 Annexure A and B.

The guideline consists of two parts, namely:

- a written guideline; and
- three declarations that must be completed:
 - Declaration C: “Local Content Declaration – Summary Schedule” (see Annexure C);
 - Declaration D: “Imported Content Declaration – Supporting Schedule to Declaration C” (see Annexure D); and
 - Declaration E: “Local Content Declaration – Supporting Schedule to Declaration C” (see Annexure E).

The guidelines and declarations should be used by tenderers when preparing a tender. A tenderer must complete Declarations D and E, and consolidate the information in Declaration C.

Declaration C must be submitted with the tender by the closing date and time as determined by the Tender Authority. The Tender Authority reserves the right to request that Declarations D and E also be submitted.

If the tender is successful, the tenderer must continuously update Declarations C, D and E with actual values for the duration of the contract.

NOTE:

Annexure A is a note to the purchaser in SATS 1286:2011; and
Annexure B is the Local Content Declaration IN SATS 1286:2011.

2.2. What is local content?

According to SATS 1286:2011, the local content of a product is the tender price less the value of imported content, expressed as a percentage. It is, therefore, necessary to first compute the imported value of a product to determine the local content of a product.

2.3. Categories: Imported and Local Content

The tenderer must differentiate between imported content and local content.

Imported content of a product by components/material/services is separated into two categories, namely:

- products imported directly by the tenderer; and
- products imported by a third party and supplied to the tenderer.

2.3.1. Imported Content

Identify the imported content, if any, by value for products by component/material/services. In the case of components/materials/services sourced from a South African manufacturer, agent, supplier or subcontractor (i.e. third party), obtain that information and Declaration D from the third party.

Calculate the imported content of components/materials/services to be used in the manufacture of the total quantity of the products for which the tender is to be submitted.

As stated in clause 3.2.4 of SATS 1286:2011: "If information on the origin of components, parts or materials is not available, it will be deemed to be imported content."

2.3.1.1 Imported directly by the tenderer:

When the tenderer import products directly, the onus is on the tenderer to provide evidence of any components/materials/services that were procured from a non-domestic source. The evidence should be verifiable and pertain to the tender as a whole. Typical evidence will include commercial invoices, bills of entry, etc.

When the tenderer procures imported services such as project management, design, testing, marketing, etc. and makes royalty and lease payments, such payments relating to the tender must be included when calculating imported content.

2.3.1.2. Imported by a third party and supplied to the tenderer:

When the tenderer supplies components/material/services that are imported by any third party (for example, a domestic manufacturer, agent, supplier or subcontractor in the supply chain), the onus is on the tenderer to obtain verifiable evidence from the third party.

The tenderer must obtain Declaration D from all third parties for the related tender. The third party must be requested by the tenderer to continuously update Declaration D. Typical evidence of imported content will include commercial invoices, bills of entry etc.

When a third party procures imported services such as project management, design, testing, marketing etc. and makes royalty and lease payments, such payments relating to the tender must be included when calculating imported content.

2.3.1.3. Exempt Imported Content:

Exemptions, if any, are granted by the Department of Trade and Industry (**the dti**). Evidence of the exemptions must be provided and included in Declaration D.

2.3.2. Local Content

Identify and calculate the local content, by value for products by components/materials/services to be used in the manufacture of the total quantity of the products.

3. ANNEXURE C

3.1. Guidelines for completing Declaration C: Local Content Declaration –

Summary Schedule

Note: The paragraph numbers correspond to the numbers in Declaration C.

C1. Tender Number

Supply the tender number that is specified on the specific tender documentation.

C2. Tender description

Supply the tender description that is specified on the specific tender documentation.

C3. Designated products

Supply the details of the products that are designated in terms of this tender (i.e. buses).

C4. Tender Authority

Supply the name of the tender authority.

C5. Tendering Entity name

Provide the tendering entity name (for example, Anybody Bus Builders (Pty) Ltd).

C6. Tender Exchange Rate

Provide the exchange rate used for this tender, as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

C7. Specified local content %

Provide the specified minimum local content requirement for the tender (i.e. 80%), as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MDB) 6.2.

C8. Tender item number

Provide the tender item number(s) of the products that have a local content requirement as per the tender specification.

C9. List of items

Provide a list of the item(s) corresponding with the tender item number.
This may be a short description or a brand name.

Calculation of local content

C10. Tender price

Provide the unit tender price of each item excluding VAT.

C11. Exempted imported content

Provide the ZAR value of the exempted imported content for each item, if applicable. These value(s) must correspond with the value(s) of column D16 on Declaration D.

C12. Tender value net of exempted imported content

Provide the net tender value of the item, if applicable, by deducting the exempted imported content (C11) from the tender price (C10).

C13. Imported value

Provide the ZAR value of the items' imported content.

C14. Local value

Provide the local value of the item by deducting the Imported value (C13) from the net tender value (C12).

C15. Local content percentage (per item)

Provide the local content percentage of the item(s) by dividing the local value (C14) by the net tender value (C12) as per the local content formula in SATS 1286.

Tender Summary

C16. Tender quantity

Provide the tender quantity for each item number as per the tender specification.

C17. Total tender value

Provide the total tender value by multiplying the tender quantity (C16) by the tender price (C10).

C18. Total exempted imported content

Provide the total exempted imported content by multiplying the tender quantity (C16) by the exempted imported content (C11). These values must correspond with the values of column D18 on Declaration D.

C19. Total imported content

Provide the total imported content of each item by multiplying the tender quantity (C16) by the imported value (C13).

C20. Total tender value

Total tender value is the sum of the values in column C17.

C21. Total exempted imported content

Total exempted imported content is the sum of the values in column C18. This value must correspond with the value of D19 on Declaration D.

C22. Total tender value net of exempted imported content

The total tender value net of exempt imported content is the total tender value (C20) less the total exempted imported content (C21).

C23. Total imported content

Total imported content is the sum of the values in column C19. This value must correspond with the value of D53 on Declaration D.

C24. Total local content

Total local content is the total tender value net of exempted imported content (C22) less the total imported content (C23). This value must correspond with the value of E13 on Declaration E.

C25. Average local content percentage of tender

The average local content percentage of tender is calculated by dividing total local content (C24) by the total tender value net of exempted imported content (C22).

4. ANNEXURE D**4.1. Guidelines for completing Declaration D: “Imported Content Declaration – Supporting Schedule to Declaration C”**

Note: The paragraph numbers correspond to the numbers in Declaration D.

D1. Tender number

Supply the tender number that is specified on the specific tender documentation.

D2. Tender description

Supply the tender description that is specified on the specific tender documentation.

D3. Designated products

Supply the details of the products that are designated in terms of this tender (i.e. buses).

D4. Tender authority

Supply the name of the tender authority.

D5. Tendering entity name

Provide the tendering entity name (i.e. Anybody Bus Builders (Pty) Ltd).

D6. Tender exchange rate

Provide the exchange rate used for this tender, as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

Table A. Exempted Imported Content**D7. Tender item number**

Provide the tender item number(s) of the product(s) that have imported content.

D8. Description of imported content

Provide a list of the exempted imported product(s), if any, as specified in the tender.

D9. Local supplier

Provide the name of the local supplier(s) supplying the imported product(s).

D10. Overseas supplier

Provide the name(s) of the overseas supplier(s) supplying the exempted imported product(s).

D11. Imported value as per commercial invoice

Provide the foreign currency value of the exempted imported product(s) disclosed in the commercial invoice accepted by the South African Revenue Service (SARS).

D12. Tender exchange rate

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D13. Local value of imports

Convert the value of the exempted imported content as per commercial invoice (D11) into the ZAR value by using the tender exchange rate (D12) disclosed in the tender documentation

D14. Freight costs to port of entry

Provide the freight costs to the South African Port of the exempted imported item.

D15. All locally incurred landing costs and duties

Provide all landing costs including customs and excise duty for the exempted imported product(s) as stipulated in the SATS 1286:2011.

D16. Total landed costs excluding VAT

Provide the total landed costs (excluding VAT) for each item imported by adding the corresponding item values in columns D13, D14 and D15. These values must be transferred to column C11 on Declaration C.

D17. Tender quantity

Provide the tender quantity of the exempted imported products as per the tender specification.

D18. Exempted imported value

Provide the imported value for each of the exempted imported product(s) by multiplying the total landed cost (excl. VAT) (D16) by the tender quantity (D17). The values in column D18 must correspond with the values of column C18 of Declaration C.

D19. Total exempted imported value

The total exempted imported value is the sum of the values in column D18. This total must correspond with the value of C21 on Declaration C.

Table B. Imported Directly By Tenderer

D20. Tender item numbers

Provide the tender item number(s) of the product(s) that have imported content.

D21. Description of imported content:

Provide a list of the product(s) imported directly by tender as specified in the tender documentation.

D22. Unit of measure

Provide the unit of measure for the product(s) imported directly by the tenderer.

D23. Overseas supplier

Provide the name(s) of the overseas supplier(s) supplying the imported product(s).

D24. Imported value as per commercial invoice

Provide the foreign currency value of the product(s) imported directly by tenderer disclosed in the commercial invoice accepted by the South African Revenue Service (SARS).

D25. Tender rate of exchange

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D26. Local value of imports

Convert the value of the product(s) imported directly by the tenderer as per commercial invoice (D24) into the ZAR value by using the tender exchange rate (D25) disclosed in the tender documentation.

D27. Freight costs to port of entry

Provide the freight costs to the South African Port of the product(s) imported directly by the tenderer.

D28. All locally incurred landing costs and duties

Provide all landing costs including customs and excise duty for the product(s) imported directly by the tenderer as stipulated in the SATS 1286:2011.

D29. Total landed costs excluding VAT

Provide the total landed costs (excluding VAT) for each item imported directly by the tenderer by adding the corresponding item values in columns D26, D27 and D28.

D30. Tender quantity

Provide the tender quantity of the product(s) imported directly by the tenderer as per the tender specification.

D31. Total imported value

Provide the total imported value for each of the product(s) imported directly by the tenderer by multiplying the total landed cost (excl. VAT) (D29) by the tender quantity (D30).

D32. Total imported value by tenderer

The total value of imports by the tenderer is the sum of the values in column D31.

Table C. Imported by Third Party and Supplied to the Tenderer**D33. Description of imported content**

Provide a list of the product(s) imported by the third party and supplied to the tenderer as specified in the tender documentation.

D34. Unit of measure

Provide the unit of measure for the product(s) imported by the third party and supplied to tenderer as disclosed in the commercial invoice.

D35. Local supplier

Provide the name of the local supplier(s) supplying the imported product(s).

D36. Overseas supplier

Provide the name(s) of the overseas supplier(s) supplying the imported products.

D37. Imported value as per commercial invoice

Provide the foreign currency value of the product(s) imported by the third party and supplied to the tenderer disclosed in the commercial invoice accepted by SARS.

D38. Tender rate of exchange

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D39. Local value of imports

Convert the value of the product(s) imported by the third party as per commercial invoice (D37) into the ZAR value by using the tender exchange rate (D38) disclosed in the tender documentation.

D40. Freight costs to port of entry

Provide the freight costs to the South African Port of the product(s) imported by third party and supplied to the tenderer.

D41. All locally incurred landing costs and duties

Provide all landing costs including customs and excise duty for the product(s) imported by third party and supplied to the tenderer as stipulated in the SATS 1286:2011.

D42. Total landed costs excluding VAT

Provide the total landed costs (excluding VAT) for each product imported by third party and supplied to the tenderer by adding the corresponding item values in columns D39, D40 and D41.

D43. Quantity imported

Provide the quantity of each product(s) imported by third party and supplied to the tenderer for the tender.

D44. Total imported value

Provide the total imported value of the product(s) imported by third party and supplied to the tenderer by multiplying the total landed cost (D42) by the quantity imported (D43).

D45. Total imported value by third party

The total imported value from the third party is the sum of the values in column D44.

Table D. Other Foreign Currency Payments**D46. Type of payment**

Provide the type of foreign currency payment. (i.e. royalty payment for use of patent, annual licence fee, etc.).

D47. Local supplier making the payment

Provide the name of the local supplier making the payment.

D48. Overseas beneficiary

Provide the name of the overseas beneficiary.

D49. Foreign currency value paid

Provide the value of the listed payment(s) in their foreign currency.

D50. Tender rate of exchange

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D51. Local value of payments

Provide the local value of each payment by multiplying the foreign currency value paid (D49) by the tender rate of exchange (D50).

D52. Total of foreign currency payments declared by tenderer and/or third party

The total of foreign currency payments declared by tenderer and/or a third party is the sum of the values in column D51.

D53. Total of imported content and foreign currency payment

The total imported content and foreign currency payment is the sum of the values in column D32, D45 and D52. This value must correspond with the value of C23 on Annexure C.

5. ANNEXURE E

5.1. Guidelines to completing Declaration E: “Local Content Declaration- Supporting Schedule to Declaration C”

The paragraph numbers correspond to the numbers in Declaration E

E1. Tender number

Supply the tender number that is specified on the specific tender documentation.

E2. Tender description

Supply the tender description that is specified on the specific tender documentation.

E3. Designated products

Supply the details of the products that are designated in terms of this tender (for example, buses/canned vegetables).

E4. Tender authority

Supply the name of the tender authority.

E5. Tendering entity name

Provide the tendering entity name (for example, Anybody Bus Builders (Pty) Ltd) Ltd).

Local Goods, Services and Works

E6. Description of items purchased

Provide a description of the items purchased locally in the space provided.

E7. Local supplier

Provide the name of the local supplier that corresponds to the item listed in column E6.

E8. Value

Provide the total value of the item purchased in column E6.

E9. Total local products (Goods, Services and Works)

Total local products (goods, services and works) is the sum of the values in E8.

E10. Manpower costs:

Provide the total of all the labour costs accruing only to the tenderer (i.e. not the suppliers to tenderer).

E11. Factory overheads:

Provide the total of all the factory overheads including rental, depreciation and amortisation for local and imported capital goods, utility costs and consumables. (Consumables are goods used by individuals and businesses that must be replaced regularly because they wear out or are used up. Consumables can also be defined as the components of an end product that are used up or permanently altered in the process of manufacturing, such as basic chemicals.)

E12. Administration overheads and mark-up:

Provide the total of all the administration overheads, including marketing, insurance, financing, interest and mark-up costs.

E13. Total local content:

The total local content is the sum of the values of E9, E10, E11 and E12. This total must correspond with C24 of Declaration C.

T2.2 .2- Functionality Evaluation Schedules

T2.2.2a: SIMILAR PROJECTS COMPLETED SUCCESSFULLY WITH REFERENCE LETTERS

Note: Mandatory Returnable Schedule. Failure to submit as required will result in the bid being nonresponsive.

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Bidders are required to provide a schedule of similar work in complexity that was successfully completed with contactable references as per the attached forms below.

OR

Submit a reference letter that indicates the following

Signature of the Client

On Clients Letter Head or Client Stamp

Company Name, contact person, contact details (telephone number and email etc)

Value of the Project

Scope of works carried out

Works have been completed on time/within stipulated contract period

Good or better workmanship

Reference No 1



Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Sir/Madam,

We are in the process of evaluating _____ for the above project.
Tenderers Company Name

They have listed you as a reference. Please evaluate the contractor's performance on the criteria listed below by ticking the appropriate boxes. This form to be submitted with the bid. If you have any questions, please do not hesitate to contact us.

NAME OF EMPLOYER	NAME OF PROJECT	CONTRACT PERIOD	VALUE OF WORK

1. KNOWLEDGEABLE IN THE FIELD IN WHICH THIS BID RELATES TO

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

2. TIME PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

3. FINANCIAL PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

4. COMMENTS:

Project Manager/Principal Agent: _____

Place company stamp below:

Tel: _____

E-mail Address: _____

Signature: _____ Date: _____

Reference No 2



Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Sir/Madam,

We are in the process of evaluating _____ for the above project.

Tenderers Company Name

They have listed you as a reference. Please evaluate the contractor's performance on the criteria listed below by ticking the appropriate boxes. This form to be submitted with the bid. If you have any questions, please do not hesitate to contact us.

NAME OF EMPLOYER	NAME OF PROJECT	CONTRACT PERIOD (Start and End Date)	VALUE OF WORK

1. KNOWLEDGEABLE IN THE FIELD IN WHICH THIS QUOTATION RELATES TO

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

2. TIME PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

3. FINANCIAL PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

4. COMMENTS:

Project Manager/Principal Agent: _____ **Place company stamp below:**

Tel: _____

E-mail Address: _____

Signature: _____ Date: _____



Reference No 3

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Sir/Madam,

We are in the process of evaluating _____ for the above project.
Tenderers Company Name

They have listed you as a reference. Please evaluate the contractor's performance on the criteria listed below by ticking the appropriate boxes. This form to be submitted with the bid. If you have any questions, please do not hesitate to contact us.

NAME OF EMPLOYER	NAME OF PROJECT	CONTRACT PERIOD (Start and End Date)	VALUE OF WORK

1. KNOWLEDGEABLE IN THE FIELD IN WHICH THIS QUOTATION RELATES TO

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

2. TIME PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

3. FINANCIAL PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

4. COMMENTS:

Project Manager/Principal Agent: _____ **Place company stamp here:**

Tel: _____

E-mail Address: _____

Signature: _____ Date: _____



Reference No 4

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Sir/Madam,

We are in the process of evaluating _____ for the above project.
Tenderers Company Name

They have listed you as a reference. Please evaluate the contractor's performance on the criteria listed below by ticking the appropriate boxes. This form to be submitted with the bid. If you have any questions, please do not hesitate to contact us.

NAME OF EMPLOYER	NAME OF PROJECT	CONTRACT PERIOD (Start and End Date)	VALUE OF WORK

1. KNOWLEDGEABLE IN THE FIELD IN WHICH THIS QUOTATION RELATES TO

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

2. TIME PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

3. FINANCIAL PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

4. COMMENTS:

Project Manager/Principal Agent: _____ **Place company stamp here:**

Tel: _____

E-mail Address: _____

Signature: _____ Date: _____



Reference No 5

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Sir/Madam,

We are in the process of evaluating _____ for the above project.
Tenderers Company Name

They have listed you as a reference. Please evaluate the contractor's performance on the criteria listed below by ticking the appropriate boxes. This form to be submitted with the bid. If you have any questions, please do not hesitate to contact us.

NAME OF EMPLOYER	NAME OF PROJECT	CONTRACT PERIOD (Start and End Date)	VALUE OF WORK

k) KNOWLEDGEABLE IN THE FIELD IN WHICH THIS QUOTATION RELATES TO

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

l) TIME PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

m) FINANCIAL PERFORMANCE

EXCELLENT	VERY GOOD	GOOD	FAIR	POOR
5	4	3	2	1

n) COMMENTS:

Project Manager/Principal Agent: _____ **Place company stamp here:**

Tel: _____

E-mail Address: _____

Signature: _____ Date: _____

T2.2.2 b – Construction Method Statement

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Work Organization Program and Scheduling

Bidder to provide a Detailed Gantt Chart (Works Breakdown Structure Program) Showing:

- **Summary tasks**
- **Indicating a Critical Path**
- **Time-lines within the project period**

Work organization program and scheduling to be attached here

**T2.2.2 c – Key Personnel Qualifications
(Construction Manager)**

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Attach document here

**T2.2.2 d – Key Personnel Qualifications
(Construction Supervisor)**

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Attach document here

**T2.2.2 e – Key Personnel Qualifications
(OHS Safety Officer)**

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Attach document here

**T2.2.2 f – Key Personnel Qualifications
(Skilled Staff)**

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Attach document here

**T2.2.2 g – Key Personnel Experience
(Semi-Skilled Support Staff)**

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Attach document here

T2.2.2 h – Company Experience

(1) Practical Completion Certificate (completed projects)

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Supply and Installation of related projects with similar scope of works and complexity will be considered for evaluation purposes.

Projects with no-related scope of works will be disqualified.

Attach document here

T2.2.2 i – Contactable References

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Provide a schedule of contactable references

Attach document here

T2.2.2 j – Scope of Works and Detailed Specifications

Note: Mandatory Returnable Schedule. Failure to submit as required will result in the bid being non-responsive.

Project title:	THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK
Bid No:	ECDC/INFRA/22/112023

Tenderer herewith confirms by signing below that he has read and understand the full scope of works and associated detailed specifications of this contract.

The client will not entertain any additional amount claimed due to a lack of understanding the full spectrum of the works.

Company Name:

.....

Tenderer

Name:.....Signature.....Date.....

Company Authorised/

Accountable Person Name:.....Signature.....Date.....

Company Stamp:

THE CONTRACT

Part C1: Agreements and Contract data

C1.1 - Form of offer and acceptance

C1.2 - Contract data

C1.3 - Form of Guarantee

C1.1 - Form of offer and acceptance

Annexure B:

C.1.1 FORM OF OFFER AND ACCEPTANCE OFFER

Note: Mandatory Requirement. Failure to complete and Sign this document will result in the bid being non responsive.

OFFER

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract in respect of the following works:

PROJECT: THE REPAIRS, REFURBISHMENTS OF SITE 8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Bid No : ECDC/INFRA/22/112023

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

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

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

R (in figures)

Rand (in words)

This offer may be accepted by the Employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the tenderer before the end of the period of validity stated in the Tender data, whereupon the tenderer becomes the party named as the Service Provider in the conditions of Contract identified in the Contract Data.

THIS OFFER IS MADE BY THE FOLLOWING LEGAL ENTITY: (cross out block which is not applicable)

Company or close corporation:

.....
And: whose registration number is:

.....
And: whose income tax reference number is:

.....

Trading under the name and style of:

<p>AND WHO IS:</p> <p>Represented herein, and who is duly authorized to do so, by:</p> <p>Mr/Mrs/Ms:</p> <p>.....</p> <p>In his/her capacity as:</p> <p>.....</p>	<p>Note:</p> <p>A resolution/power of attorney, signed by all the directors/ members/ partners of the legal entity must accompany this offer, authorizing the representative to make this offer.</p>
--	---

SIGNED FOR THE TENDERER:

Name of Representative	Signature	Date

SIGNED BY WITNESS:

Name of Representative	Signature	Date

The tenderer elects as its *domicilliumcitandi et executandi* in the Republic of South Africa, where any and all legal notices may be served, as (physical address)

.....

.....

Other contact details of the tenderer are:

Telephone no

.....

Cellular phone no

.....

Fax no

.....

Postal address

.....

Banker

.....

Branch

.....

ACCEPTANCE

By signing this part of this form of offer and acceptance, ECDC accepts the bidder's offer. Acceptance of the bidder's offer shall form an agreement between the ECDC and the bidder upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract are contained in the contract to be concluded.

- Agreements and Contract Data, (which includes this Agreement)
 - Pricing data
 - Scope of work.
 - Site information and drawings
- and documents or parts thereof, which may be incorporated by reference into the volumes above.

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

The bidder shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the ECDC's Legal Department to arrange documentation to be provided in terms of the conditions of contract identified in the contract. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

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

Signed for the ECDC:

Name of representative	Capacity	Date
.....		
.....		
.....		
.....		
Address	Signature	

Witnessed by:

Name of witness	Signature	Date

Schedule of deviations

Notes:

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

1	Subject	
	Details	
2	Subject	
	Details	
3	Subject	
	Details	

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

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

Signed for the ECDC

Name of Representative	Capacity	Signature

Signed by Bidder:

Name of Representative	Capacity	Signature

C1.2 - Contract data

PART 1: DATA PROVIDED BY THE EMPLOYER

CONDITIONS OF CONTRACT

The JBCC Principal Building Agreement Edition 6.2, May 2018 is applicable to this Contract and is incorporated herein by reference a copy of these.

Copies of these Conditions of Contract may be obtained from the offices of ECDC, Ocean Terrace, Quigney, East London Tel. No. +27 43 704 5600

The JBCC Contract makes several references to the Contract Data for specific data, which together with these conditions collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the Contract. The Contract Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the general conditions of contract.

The Contract Data and The JBCC Principal Building Agreement Edition 6.2, May 2018 shall have precedence over the Drawings, Scope of Work and Standardised Specifications in the interpretation of any ambiguity or inconsistency.

The following contract specific data are applicable to this Contract:

CONTRACT SPECIFIC DATA													
Clause	Data												
27.1	The Latent Defects Liability Period is: Ten (10) years commencing at the start of the construction period and ending 10 years from the date of final completion.												
24.0	The time for achieving Practical Completion for this project is: Ten (10) calendar months from the Commencement Date. The construction period excludes the period that will be taken for acquiring the construction work Permit. (Contractor to communicate this with the Client)												
1.0	The name of the Employer is: Eastern Cape Development Corporation												
1.0	The name of the Employer's Agent is Osmond Lange Architects and Planners												
1.0	The address of the Employer for receipt of communications is: <table><tr><td><u>Physical address:</u></td><td><u>Postal address:</u></td></tr><tr><td>Eastern Cape Development Corporation</td><td>P.O Box 11197</td></tr><tr><td>Ocean Terrace Park</td><td>Southernwood</td></tr><tr><td>Moore Street</td><td>5213</td></tr><tr><td>Quigney, East London</td><td></td></tr><tr><td>5201</td><td></td></tr></table> Tel : +27 43 704 5600	<u>Physical address:</u>	<u>Postal address:</u>	Eastern Cape Development Corporation	P.O Box 11197	Ocean Terrace Park	Southernwood	Moore Street	5213	Quigney, East London		5201	
<u>Physical address:</u>	<u>Postal address:</u>												
Eastern Cape Development Corporation	P.O Box 11197												
Ocean Terrace Park	Southernwood												
Moore Street	5213												
Quigney, East London													
5201													
CONTRACT SPECIFIC DATA: ADDITIONAL CLAUSES													
	The following additional clause applies:- In the event of any discrepancy or conflict between any parts of the Contract Documents, the order of preference shall be as follows:												

	<ol style="list-style-type: none"> 1. Project Specifications 2. Special Conditions of Contract 3. General Conditions of Contract 4. Conditions of Tender 5. Standardized/Particular Specifications 6. Contract Drawings (No drawings available) 7. Schedule of Quantities
	<p>The following additional clause applies:-</p> <p>The Employer may make direct payments to suppliers on behalf of the Contractor subject to the receipt of a specific request from the Contractor and subject to the following conditions:</p> <p>An original of the invoice together with a signed Cession Form is submitted together with a certificate approved by the Employer's Agent.</p> <p>The Contractor cedes, transfers and assigns all the rights, title and interest in and to the materials and goods to the total value of the invoice.</p> <p>The cession shall become effective as soon as payment is made by the Employer or on behalf of the Employer.</p> <p>The Contractor indemnifies the Employer against any loss or damage whatsoever to the said material and goods whilst they are in the Contractors possession and in transit to the site and until such time as they are safely and properly stored on the site, and the Contractor undertakes to effect adequate insurance against these risks. Such insurance shall be for the full value of the materials and goods and goods certified for payment and the insurance policy ceded in full to the Employer.</p>
	<p>The Employer's Agent shall obtain the specific approval of the Employer before executing any of his functions or duties according to the Contract:</p> <ul style="list-style-type: none"> • Nomination of Employer's Agent's Representative • Employer's Agent's authority to delegate • Non-working times • Suspension of the Works • Acceleration instead of extension of time
	<p>The following additional clause applies:-</p> <p>The onus rests with the Contractor to raise any item about which the Contractor may be uncertain, with the Employer's Agent's Representative. Any advice given to the Contractor by the Employer's Agent's Representative in response to matters so raised shall not be construed as instructions and shall be held to have been given without prejudice.</p>
	<p>The following additional clause applies:-</p> <p>The Employer or the Employer's Agent under delegated authority, reserves the right to obtain the services of consultants on any matter pertaining to this contract; the employment of such consultants forms no part of this contract; a consultant's advice and/or documentation is to be followed only if the Employer's Agent or the Employer's Agent's Representative so instructs.</p>

	<p>All references to “design” are deemed to be deleted and the Contractor shall bear no liability in respect of the Projects design, other than the temporary works and items clearly indicated to design on drawings.</p>
	<p>The following additional clause applies:-</p> <p>The Employer and the Contractor shall enter into an agreement to complete the work required for the construction of the works in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act (Act 85 of 1993) and the Construction Regulations promulgated thereunder.</p> <p>An agreement is included in the Contract Document (C1.1 of Contract Data) and shall be completed and submitted to the Employer together with a letter of good standing from the Compensation Commissioner (if not insured with a Licenced Compensation Insurer) within fourteen (14) days after the Commencement Date. The Contractor shall ensure that any letter of good standing shall be timeously renewed in order that it remains in full force for the duration of the Contract.</p>
	<p>The total value of work executed by subcontractors shall be agreed on by the Client and awarded Bidder upon acceptance of appointment.</p>
	<p>The documentation required before commencing with the Works execution are:</p> <ul style="list-style-type: none"> • Health and Safety Plan • Methodology on how to proceed with work while the building has tenants • Initial programme • Security • Insurance • Letter of Good Standing from the Compensation Commissioner (if not insured with a Licenced Compensation Insurer)
	<p>The time to submit the documentation required before commencement of the Works is:</p> <p>14 calendar days</p>
	<p>Access and possession of site shall not be exclusive to the Contractor but will be shared by the Employers management / maintenance and operational staff on site.</p>
	<p>The Contractor shall bear all costs and charges for special and temporary rights of way required by him in connection with access to the Site.</p>
	<p>The non-working days are: Saturdays and Sundays The special non-working days are:</p> <p>(1) All gazetted public holidays falling outside the year end break. (2) The year end break commencing on 15 December 2023 and ending on 14 January 2024 both days included.</p>
	<p>The following additional clause shall apply:</p> <p>Should the Employer’s Agent permit work outside of normal Employer working hours (viz Mondays to Fridays inclusive sunrise to sunset) and on Saturdays, Sundays or on any of the non-working days stated in the Appendix and if he deems the presence of the Employer’s Agent’s Representative or other duly authorised representative to be necessary, the Contractor will be liable for the cost of such supervision (calculated at a daily rate of 1/130 of the annual salary of such representative). Where the Employer’s</p>

	<p>Agent has ordered such work, the salary of the representative will be to the account of the Employer.</p> <p>A minimum of 24 hours notification of intent to work outside normal working hours shall be regarded as sufficient notice as set out above.</p>
	<p>The penalty for failing to complete the Works is: 3.50 cents / R100 of contract value (excl. VAT) per calendar day</p>
	<p>The security to be provided by the Contractor shall be performance guarantee and shall be one of the alternatives scheduled in Part 2: Data Provided by the Contractor. The performance guarantee shall contain the wording of the document included in PART 3 (Pro-forma Forms).</p>
	<p>The percentage allowances to cover overhead charges for day work are as follows:</p> <ul style="list-style-type: none"> • 15% of the gross remuneration of workmen and foremen actually engaged in the day work; • 15% on the net cost of materials actually used <p>No allowance will be made for work done, or for materials and equipment for which day work rates have been quoted at tender stage.</p>
	<p>The following additional clause shall apply: Should the necessity arise the Contractor will have to provide a Bank approved guarantee as a payment guarantee for the sum of materials off site, on proof of order of such materials</p>
	<p>The provisional sums stated in the Schedule of Quantities are net amounts covering the actual expenditure which the Employer may incur.</p>
	<p>The following additional clause shall apply: The Works are measured in accordance with the current Standard System of in Measuring Building Works South Africa, No claims arising from the method of measurement will be entertained.</p>
	<p>Contract Price Adjustment: Is applicable</p> <p>The value of all certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule with the following values:</p> <p>The value of $x = 0.15$</p> <p>The value of coefficients are: $a = 0.30$</p> <p style="padding-left: 100px;">$b = 0.30$</p> <p style="padding-left: 100px;">$c = 0.35$</p> <p style="padding-left: 100px;">$d = 0.05$</p> <p>The province wherein the larger part of the Site is located is the Eastern Cape.</p> <p>The area for the Producer Price Index for fuel is Inland.</p> <p>The base month is the month prior to tender closing.</p>

The additional Conditions of Contract are:

	Public Liability : R 10 million per incident.
	<p>Add new sub clause</p> <p>Applicable labour laws</p> <p>The Ministerial Determination, Special Public Works Programmes, issued in terms of the Basic</p>

The additional Conditions of Contract are:

Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice No R63 of 25 January 2002, as reproduced below, shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled or semi-skilled workers.

1 Introduction

1.1 This document contains the standard terms and conditions for workers employed in elementary occupations on a Special Public Works Programme (SPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of a SPWP.

1.2 In this document –

- (a) “department” means any department of the State, implementing agent or contractor;
- (b) “employer” means any department, implementing agency or contractor that hires workers to work in elementary occupations on a SPWP;
- (c) “worker” means any person working in an elementary occupation on a SPWP;
- (d) “elementary occupation” means any occupation involving unskilled or semi-skilled work;
- (e) “management” means any person employed by a department or implementing agency to administer or execute an SPWP;
- (f) “task” means a fixed quantity of work;
- (g) “task-based work” means work in which a worker is paid a fixed rate for performing a task;
- (h) “task-rated worker” means a worker paid on the basis of the number of tasks completed;
- (i) “time-rated worker” means a worker paid on the basis of the length of time worked.

2 Terms of work

2.1 Workers on a Special Public Works Programme (SPWP) are employed on a temporary basis.

2.2 A worker may NOT be employed for longer than 24 months in any five-year cycle on a SPWP.

2.3 Employment on a SPWP does not qualify as employment as a contributor for the purposes of the Unemployment Insurance Act 30 of 1966.

3 Normal hours of work

3.1 An employer may not set tasks or hours of work that require a worker to work–

- (a) more than forty hours in any week;
- (b) on more than five days in any week; and
- (c) For more than eight hours on any day.

3.2 An employer and worker may agree that a worker will work four days per week. The worker may then work up to ten hours per day.

3.3 A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks allocated (based on a 40-hour week) to that worker.

4 Meal breaks

4.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

4.2 An employer and worker may agree on longer meal breaks.

4.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

The additional Conditions of Contract are:

4.4 A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

5 Special conditions for security guards

5.1 A security guard may work up to 55 hours per week and up to eleven hours per day.

5.2 A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

6 Daily rest period

Every worker is entitled to a daily rest period of at least eight consecutive hours.

The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

7 Weekly rest period

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

8 Work on Sundays and public holidays

8.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.

8.2 Work on Sundays is paid at the ordinary rate of pay.

8.3 A task-rated worker who works on a public holiday must be paid –

(a) the worker's daily task rate, if the worker works for less than four hours;

(b) Double the worker's daily task rate, if the worker works for more than four hours.

8.4 A time-rated worker who works on a public holiday must be paid –

(a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;

(b) Double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

9 Sick leave

9.1 Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.

9.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract.

9.3 A worker may accumulate a maximum of twelve days sick leave in a year.

9.4 Accumulated sick leave may not be transferred from one contract to another contract.

9.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.

9.6 An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.

9.7 An employer must pay a worker sick pay on the worker's usual pay day.

9.8 Before paying sick pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –

(a) absent from work for more than two consecutive days; or

(b) absent from work on more than two occasions in any eight-week period.**8**

9.9 A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.

9.10 A worker is not entitled to be paid sick leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

The additional Conditions of Contract are:

10 Maternity leave

10.1 A worker may take up to four consecutive month's unpaid maternity leave.

10.2 A worker is not entitled to any payment or employment-related benefits during maternity leave.

10.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.

10.4 A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.

10.5 A worker may begin maternity leave –

(a) four weeks before the expected date of birth; or

(b) on an earlier date –

(i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or

(ii) if agreed to between employer and worker; or

(c) On a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

10.6 A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.

10.7 A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the SPWP on which she was employed has ended.

11 Family responsibility leave

11.1 Workers who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances:

(a) when the employee's child is born;

(b) when the employee's child is sick;

(c) in the event of a death of

(i) the employee's spouse or life partner;

(ii) The employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

12 Statement of conditions

12.1 An employer must give a worker a statement containing the following details at the start of employment:

(a) the employer's name and address and the name of the SPWP;

(b) the tasks or job that the worker is to perform; and

(c) the period for which the worker is hired or, if this is not certain, the expected duration of the contract;

(d) the worker's rate of pay and how this is to be calculated;

(e) The training that the worker will receive during the SPWP.

12.2 An employer must supply each worker with a copy of these conditions of employment.

The additional Conditions of Contract are:

13 Keeping records

13.1 Every employer must keep a written record of at least the following:

- (a) the worker's name and position;
- (b) in the case of a task-rated worker, the number of tasks completed by the worker;
- (c) in the case of a time-rated worker, the time worked by the worker;
- (d) Payments made to each worker.

13.2 The employer must keep this record for a period of at least three years after the completion of the SPWP.

14 Payment

14.1 An employer must pay all wages at least monthly in cash or by cheque or into a bank account.

14.2 A task-rated worker will only be paid for tasks that have been completed.

14.3 An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

14.4 A time-rated worker will be paid at the end of each month.

14.5 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

14.6 Payment in cash or by cheque must take place –

- (a) at the workplace or at a place agreed to by the worker;
- (b) during the worker's working hours or within fifteen minutes of the start or finish of work;
- (c) In a sealed envelope which becomes the property of the worker.

14.7 An employer must give a worker the following information in writing:

- (a) the period for which payment is made;
- (b) the numbers of tasks completed or hours worked;
- (c) the worker's earnings;
- (d) any money deducted from the payment;
- (e) The actual amount paid to the worker.

14.8 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.

14.9 If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

15 Deductions

15.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.

15.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

15.3 An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.

15.4 An employer may not require or allow a worker to –

- (a) repay any payment except an overpayment previously made by the employer by mistake;
- (b) state that the worker received a greater amount of money than the employer actually paid to the worker; or
- (c) Pay the employer or any other person for having been employed.

The additional Conditions of Contract are:

16 Health and safety

16.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

- (e) Report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

16.2 A worker must –

- (a) work in a way that does not endanger his/her health and safety or that of any other person;
- (b) obey any health and safety instruction;
- (c) obey all health and safety rules of the SPWP;
- (d) use any personal protective equipment or clothing issued by the employer;

17 Compensation for injuries and diseases

17.1 It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on a SPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.

17.2 A worker must report any work-related injury or occupational disease to their employer or manager.

17.3 The employer must report the accident or disease to the Compensation Commissioner.

17.4 An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

18 Termination

18.1 The employer may terminate the employment of a worker for good cause after following a fair procedure.

18.2 A worker will not receive severance pay on termination.

18.3 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.

18.4 A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

18.5 A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

19 Certificate of service

19.1 On termination of employment, a worker is entitled to a certificate stating –

- (a) the worker's full name;
- (b) the name and address of the employer;
- (c) the SPWP on which the worker worked;
- (d) the work performed by the worker;
- (e) any training received by the worker as part of the SPWP;
- (f) the period for which the worker worked on the SPWP;
- (g) Any other information agreed on by the employer and worker."

C1.3 – Form of Guarantee

Part C2: Pricing data

C2.1 - Pricing instructions

C2.2 – Bill of Quantities

C2.1 - Pricing instructions

C2.1: Pricing Instructions

C2.1.1 PREAMBLE TO THE SCHEDULE OF PRICES

- C2.1.1.1 **All** prices shall be quoted in the currency of the Republic of South Africa and will be held to be firm unless otherwise stated, in which case sufficient information must be afforded at the time of tendering to indicate the basis on which payment shall be adjusted.
- C2.1.1.2 The Tenderer shall enter a price against each item in the schedule of prices. If the Tenderer fails to enter a price against any item in the schedule of prices the relevant cost for such item shall be regarded as being covered by other prices in the schedule of prices. **Should an item specifically be excluded from the offer submitted, such tender will be regarded as non-responsive and not be considered.**
- C2.1.1.3 The prices quoted against each item of these schedules shall cover the full inclusive cost of everything required for the execution of the work under the item plus an apportionment of any cost involved in meeting the obligations and liabilities imposed by the conditions of contract and in complying with the specifications.
- C2.1.1.4 The prices quoted for the supply of plant and equipment shall include for all handling, loading, transporting and of-loading required for the delivery of the plant and equipment to the site, including in the case of of-site storage for double handling at the store.
- C2.1.1.5 The prices quoted for erection and installation shall include for all handling, loading, transporting and of-loading, to take plant and equipment to place on site where required, erection, installation, painting, commissioning, operating, testing, adjusting, handing over in proper working order and upholding for a period of 12 months, all as specified.
- C2.1.1.6 Any additional charges in connection with of-site storage which there may be over and above the prices quoted in the various sections of these schedules of prices shall be set out in detail by the Tenderer.
- C2.1.1.7 The tendered rates and amounts must exclude Value Added Tax (VAT) but must include all levies, other taxes and duties on items to which they apply. Separate provision has been made in the Tender Summary for the purpose of VAT.
- C2.1.1.8 Amounts allowed for contingencies will be spent in part or as a whole at the sole discretion of the Principal Agent.
- C2.1.1.9 Schedule of Prices shall be completed and signed in **black ink**. Corrections must be done by deleting, rewriting and initialling next to the amendment.
- C2.1.1.10 **The Bills of Quantities are not to be used for the purpose of ordering materials**

DAYWORK SCHEDULE

This Day work Schedule shall be used at the discretion of the Principal Agent for the valuation of extra work, which cannot conveniently be valued at the rates submitted in the Schedule of Quantities.

The rates entered for labour and materials shall not be inclusive of overhead charges and profit, site supervision of staff, insurance, holidays with pay, use and maintenance of small hand tools and non-mechanical plant, travelling allowances, other emoluments and allowances, provision being made for the insertion of percentage, to cover all these items which are henceforth termed "on-costs". The rate used in the deduction of the value of the day work being thus the basic rate plus the percentage "on-costs".

In the case of plant no "on-cost" item is provided. The rate entered shall include any of the above "on-costs" which are pertinent and shall include operator's costs, consumable stores, maintenance, etc.

The Tenderer must fill in each item listed below, or his tender may be rejected as being incomplete.

A LABOUR

1. Labourers per hour plus% "On-Cost"
2. **Gangers per hour plus% "On-Cost"**
3. Tradesmen per hour plus% "On-Cost"

B EQUIPMENT (where not listed in scheduled items)

Description of Work	Rate per hour
.....
.....
.....

Rate for standing time: % of working rate

C MATERIAL

The Tenderer shall state here the percentage "On-Cost" he will add to the basic price of materials:%

TENDERER'S NAME:COMPANY STAMP:

SIGNATURE:

DATE:

C2.2 - Bill of Quantities



BILLS OF QUANTITIES FOR:

THE REPAIRS, REFURBISHMENTS OF SITE 8, 12,

AND 21 IN DIMBAZA INDUSTRIAL PARK

PROJECT NUMBER: ECDC/INFRA/22/112023

NOVEMBER 2023

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 1</u></p> <p><u>PRELIMINARY AND GENERAL</u></p> <p><u>BUILDING AGREEMENT AND PRELIMINARIES</u></p> <p>The JBCC Principal Building Agreement (Edition 6.2 - May 2018) prepared by the Joint Building Contracts Committee shall be the applicable building agreement, amended as hereinafter described</p> <p>The JBCC Principal Building Agreement contract data form an integral part of this agreement</p> <p>The JBCC General Preliminaries (May 2018) published by the Joint Building Contracts Committee for use with the JBCC Principal Building Agreement (Edition 6.2 - May 2018) shall be deemed to be incorporated in these bills of quantities, amended as hereinafter described</p> <p>The contractor is deemed to have referred to the above mentioned documents for the full intent and meaning of each clause</p> <p>The clauses in the above mentioned documents are hereinafter referred to by clause number and heading only</p> <p>Where any item is not relevant to this agreement such item is marked N/A signifying "not applicable"</p> <p>Where standard clauses or alternatives are not entirely applicable to this agreement such amendments, modifications, corrections or supplements as will apply are given under each relevant clause heading and such amendments, modifications, corrections or supplements shall take precedence notwithstanding anything to the contrary contained in the above mentioned documents</p> <p style="text-align: right;">Carried Forward</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			<p style="text-align: right;">R</p>

<p style="text-align: right;">Brought Forward</p> <p><u>PREAMBLES FOR TRADES</u></p> <p>The General Preambles for Trades 2017 published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said General Preambles will be entertained</p> <p>Supplementary preambles and/or specifications are incorporated in these bills of quantities to satisfy the requirements of this project. Such supplementary preambles and/or specifications shall take precedence over the provisions of the General Preambles</p> <p>The contractor's prices for all items throughout these bills of quantities shall take account of and include where applicable for all of the obligations, requirements and specifications given in the General Preambles and in any supplementary preambles and/or specifications</p> <p><u>STRUCTURE OF THIS PRELIMINARIES BILL</u></p> <p>Section A : A recital of the headings of the individual clauses in the aforementioned JBCC Principal Building Agreement</p> <p>Section B : A recital of the headings of the individual clauses in the aforementioned JBCC General Preliminaries</p> <p>Section C : Any special clauses to meet the particular circumstances of the project</p> <p><u>PRICING OF PRELIMINARIES</u></p> <p>Should the contractor select Option A in the contract data for the adjustment of preliminaries, the amounts entered against the relevant items in these preliminaries are to be divided into one or more of the three categories provided namely fixed (F), value related (V) and time related (T)</p>			R	
<p style="text-align: right;">Carried Forward</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			R	

	Brought Forward		R	
	<p><u>SECTION A: PRINCIPAL BUILDING AGREEMENT</u></p> <p><u>Interpretation (A1-A7)</u></p> <p>1 Clause 1.0 - Definitions and interpretation</p> <p>Pricing of bills of quantities</p> <p>The contractor is to allow opposite each item for all costs in connection therewith. All prices to include, unless otherwise stated, for all materials, fabrication, conveyance and delivery, unloading, storing, unpacking, hoisting, labour, setting, fitting and fixing in position, cutting and waste (except where to be measured in accordance with the standard system of measurement), patterns, models and templates, plant, temporary works, returning of packaging, duties, taxes (other than Value Added Tax), imposts, establishment charges, overheads, profit and all other obligations arising out of this agreement. Value Added Tax (VAT) is to be separately stated on the summary page of these bills of quantities</p> <p>Items left unpriced will be deemed to be covered in prices against other items throughout these bills of quantities and no claim for any extras arising out of the contractor's omission to price any item will be entertained</p> <p>Prices for all construction equipment, temporary works, services and other items shall include for the supply, maintenance, operating cost and subsequent removal and making good as necessary</p>			
	Carried Forward		R	
	<p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			

	Brought Forward		R	
	<p>Abbreviated descriptions</p> <p>The items in these bills of quantities utilise abbreviated descriptions. It is the intention that the abbreviated descriptions be fully described when read with the applicable measuring system and the relevant preambles and/or specifications. However, should the full intent and meaning of any description not be clear, the contractor shall, before submission of his tender, call for a written directive from the principal agent, failing which it shall be assumed that the contractor has allowed in his pricing for materials and workmanship in terms of international best practice</p> <p>Legal status of contractor</p> <p>If the contractor constitutes a joint venture, consortium or other unincorporated grouping of two or more persons then:</p> <ol style="list-style-type: none"> 1. These persons are deemed to be jointly and severally liable to the employer for the performance of this agreement 2. These persons shall notify the employer of their leader who has assigned authority to bind the contractor and each of these persons 3. The contractor shall not alter its composition or legal status without the prior written consent of the employer <p>F:.....V:.....T:.....</p>	Item		
2	Clause 2.0 - Law , regulations and notices			
3	<p>NHBRC levies</p> <p>The employer shall allow for and pay any levies required by the National Home Builders Registration Council (NHBRC). The contractor warrants that he is registered and will maintain registration with the NHBRC for the duration of this agreement [2.1]</p>	N/A		
4	F:.....V:.....T:.....	N/A		
	Carried Forward		R	
	SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL			

	Brought Forward		R	
5	<p>Clause 3.0 - Offer and acceptance</p> <p>F:.....V:.....T:.....</p>	Item		
6	<p>Clause 4.0 - Cession and assignment</p> <p>F:.....V:.....T:.....</p>	Item		
7	<p>Clause 5.0 - Documents</p> <p>Value Added Tax</p> <p>Provision is made in the summary page of these bills of quantities for the inclusion of Value Added Tax (VAT)</p> <p>Priced document as specification</p> <p>Clause 5.4 is deemed to be deleted</p> <p>The principal agent shall decide which portion of the priced document may be used as a specification of materials and goods or methods, if any</p> <p>Electronic issue of drawings</p> <p>All drawings for this project will be issued electronically and the contractor shall be deemed to have received such drawings on the date that such drawings have been dispatched electronically [5.6]</p> <p>F:.....V:.....T:.....</p>	Item		
8	<p>Clause 6.0 - Employer's agents</p> <p>The authority of the principal agent to issue contract instructions [17.1] and perform duties for specific aspects of the works is delegated to agents as follows [6.2]. This does not preclude the principal agent from issuing such contract instructions:</p>			
	Carried Forward		R	
	<p>SECTION 1: PRELIMINARY AND GENERAL</p> <p>Bill No. 1</p> <p>PRELIMINARY AND GENERAL</p>			

	Brought Forward		R	
<p>1. <u>Architect</u></p> <p>2. <u>Structural Engineer</u></p> <p>3. <u>Civil Engineer</u></p> <p>4. <u>Electrical Engineer</u></p> <p>5. <u>Mechanical Engineer</u></p> <p>1.1 Duties [6.2] :</p> <p>The architect is responsible for the architectural design, functional design and quality inspection of the works</p> <p>1.2 Contract instructions [6.2; 17.1] :</p> <p>1.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement</p> <p>1.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works</p> <p>1.2.3 The site [13.0]</p> <p>1.2.4 Compliance with the law, regulations and bylaws [2.1]</p> <p>1.2.5 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works</p> <p>1.2.6 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]</p> <p>1.2.7 Removal or re-execution of work</p> <p>1.2.8 Removal or substitution of any materials and goods</p> <p>1.2.9 Protection of the works</p>				
	Carried Forward		R	
<p>SECTION 1: PRELIMINARY AND GENERAL</p> <p>Bill No. 1</p> <p>PRELIMINARY AND GENERAL</p>				

<p style="text-align: center;">Brought Forward</p> <p>1.2.10 Making good physical loss and repairing damage to the works [23.2.2]</p> <p>1.2.11 Rectification of defects [21.2]</p> <p>1.2.12 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion, a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion</p> <p>1.2.13 Expenditure of budgetary allowances, prime cost amounts and provisional sums shall be activated by means of 3 x quotation system unless advised otherwise</p> <p>1.2.14 Appointment of a subcontractor [14.0; 15.0]</p> <p>1.2.15 Work by direct contractors [16.0]</p> <p>1.2.16 On suspension or termination, protection of the works, removal of construction equipment and surplus materials and goods [29.0]</p> <p>2. <u>Quantity Surveyor</u></p> <p>2.1 Duties [6.2] :</p> <p>The Quantity Surveyor is responsible for all measurements, valuations, financial assessments and all other quantity surveying and cost control functions of the works</p> <p>2.2 Contract instructions [6.2; 17.1] :</p> <p>2.2.1 No contract instructions delegated to the Quantity Surveyor</p> <p>3. <u>Civil and Structural Engineer</u></p> <p>3.1 Duties [6.2] :</p> <p>The Civil and Structural Engineer is responsible for all aspects of Civil and Structural Engineering design and quality inspection of the works</p>			R	
<p style="text-align: center;">Carried Forward</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			R	

<p style="text-align: center;">Brought Forward</p> <p>3.2 Contract instructions [6.2; 17.1] :</p> <p>3.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement</p> <p>3.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works</p> <p>3.2.3 The site [13.0]</p> <p>3.2.4 Compliance with the law, regulations and bylaws [2.1]</p> <p>3.2.5 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works</p> <p>3.2.6 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]</p> <p>3.2.7 Removal or re-execution of work</p> <p>3.2.8 Removal or substitution of any materials and goods</p> <p>3.2.9 Protection of the works</p> <p>3.2.10 Making good physical loss and repairing damage to the works [23.2.2]</p> <p>3.2.11 Rectification of defects [21.2]</p> <p>3.2.12 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion, a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion</p> <p>3.2.13 Expenditure of budgetary allowances, prime cost amounts and provisional sums shall be activated by means of 3 x quotation system unless advised otherwise</p> <p style="text-align: center;">Carried Forward</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			R	
			R	

<p style="text-align: center;">Brought Forward</p> <p>4. <u>Mechanical Engineer</u></p> <p>4.1 Duties [6.2] :</p> <p>The Mechanical Engineer is responsible for all aspects of mechanical engineering design and quality inspection of the works and, where appointed by the employer for Quantity Surveying services in respect of the Mechanical installations, for all measurements, valuations, financial assessments and all other Quantity Surveying and cost control functions</p> <p>4.2 Contract instructions [6.2; 17.1] :</p> <p>4.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement</p> <p>4.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works</p> <p>4.2.3 Compliance with the law, regulations and bylaws [2.1]</p> <p>4.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works</p> <p>4.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]</p> <p>4.2.6 Removal or re-execution of work</p> <p>4.2.7 Removal or substitution of any materials and goods</p> <p>4.2.8 Protection of the works</p> <p>4.2.9 Making good physical loss and repairing damage to the works [23.2.2]</p> <p>4.2.10 Rectification of defects [21.2]</p> <p style="text-align: center;">Carried Forward</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			R	
			R	

<p style="text-align: center;">Brought Forward</p> <p>4.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion, a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion</p> <p>4.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums shall be activated by means of 3 x quotation system unless advised otherwise</p>				R
<p style="text-align: center;">Carried Forward</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>				R

<p style="text-align: center;">Brought Forward</p> <p>5. <u>Electrical Engineer</u></p> <p>5.1 Duties [6.2] :</p> <p>The Electrical Engineer is responsible for all aspects of electrical engineering design and quality inspection of the works and, where appointed by the employer for Quantity Surveying services in respect of the electrical installations, for all measurements, valuations, financial assessments and all other Quantity Surveying and cost control functions</p> <p>5.2 Contract instructions [6.2; 17.1] :</p> <p>5.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement</p> <p>5.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works</p> <p>5.2.3 Compliance with the law, regulations and bylaws [2.1]</p> <p>5.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works</p> <p>5.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]</p> <p>5.2.6 Removal or re-execution of work</p> <p>5.2.7 Removal or substitution of any materials and goods</p> <p>5.2.8 Protection of the works</p> <p>5.2.9 Making good physical loss and repairing damage to the works [23.2.2]</p> <p>5.2.10 Rectification of defects [21.2]</p> <p style="text-align: center;">Carried Forward</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			R	
			R	

<p style="text-align: center;">Brought Forward</p> <p>5.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion, a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion</p> <p>5.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums shall be activated by means of 3 x quotation system unless advised otherwise</p> <p>6. <u>Wet Services Engineer</u></p> <p>6.1 Duties [6.2] :</p> <p>The Wet Services Engineer is responsible for all aspects of Wet Services Engineering design and quality inspection of the works</p> <p>6.2 Contract instructions [6.2; 17.1] :</p> <p>6.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement</p> <p>6.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works</p> <p>6.2.3 Compliance with the law, regulations and bylaws [2.1]</p> <p>6.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works</p> <p>6.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]</p> <p>6.2.6 Removal or re-execution of work</p> <p>6.2.7 Removal or substitution of any materials and goods</p> <p style="text-align: center;">Carried Forward</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			R	
			R	

	Brought Forward		R	
6.2.8	Protection of the works			
6.2.9	Making good physical loss and repairing damage to the works [23.2.2]			
6.2.10	Rectification of defects [21.2]			
6.2.11	A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion			
6.2.12	Expenditure of budgetary allowances, prime cost amounts and provisional sums shall be activated by means of 3 x quotation system unless advised otherwise			
7.	<u>Fire Consultant</u>			
7.1	Duties [6.2] :			
	The Fire Consultant is responsible for all aspects of rational fire design and quality inspection of the works			
7.2	Contract instructions [6.2; 17.1] :			
7.2.1	Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement			
7.2.2	Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works			
7.2.3	Compliance with the law , regulations and bylaws [2.1]			
7.2.4	Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works			
7.2.5	Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]			
	Carried Forward			
	SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL		R	

<p style="text-align: center;">Brought Forward</p> <p>7.2.6 Removal or re-execution of work</p> <p>7.2.7 Removal or substitution of any materials and goods</p> <p>7.2.8 Protection of the works</p> <p>7.2.9 Making good physical loss and repairing damage to the works [23.2.2]</p> <p>7.2.10 Rectification of defects [21.2]</p> <p>7.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion, a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion</p> <p>7.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums shall be activated by means of 3 x quotation system unless advised otherwise</p> <p>8. <u>Health and Safety Consultant</u></p> <p>8.1 Duties [6.2] :</p> <p>The Health and Safety Consultant is responsible for all aspects of Health and Safety of the works. Without derogating from the generality thereof, the health and safety consultant will perform the following specific functions and duties in respect of the Health and Safety aspects of the works. He shall:</p> <p>8.1.1 Act as the employer's agent in terms of the Construction Regulations issued in terms of the Occupational Health and Safety Act,1993 as amended</p> <p>8.1.2 Prepare and update the health and safety specification for the works</p> <p>8.1.3 Agree with the contractor the health and safety plan for the works</p> <p style="text-align: center;">Carried Forward</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			R	
			R	

	Brought Forward		R	
	8.1.4 Carry out regular audits to ensure adherence to the safety plan and compliance with the act and regulations			
	8.1.5 Stop the execution of the works where the agreed specification or plan is not adhered to			
	F:..... V:..... T:.....	Item		
9	Clause 7.0 - Design responsibility			
	F:..... V:..... T:.....	Item		
	<u>Insurances and securities (A8-A11)</u>			
10	Clause 8.0 - Works risk			
	F:..... V:..... T:.....	Item		
11	Clause 9.0 - Indemnities			
	F:..... V:..... T:.....	Item		
12	Clause 10.0 - Insurances			
	F:..... V:..... T:.....	Item		
13	Clause 11.0 - Securities			
	Guarantee for payment			
	The employer shall provide to the contractor a guarantee for payment in the amount ofRand (R.....) [11.5.1]. <i>Not Applicable</i>			
	The contractor shall consequently waive his lien or right of continuing possession of the works [11.10]			
	Carried Forward			
	SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL		R	

	Brought Forward		R	
	<p>Extension of waiver of lien</p> <p>The contractor shall ensure that a waiver of lien is included in all subcontracts and that the works executed on the site are kept free of all liens and other encumbrances at all times [11.10]</p> <p>F:.....V:.....T:.....</p> <p>Execution (A12 - A17)</p>	Item		
14	<p>Clause 12.0 - Obligations of the parties</p> <p>Office accommodation</p> <p>The contractor shall provide, maintain and remove on practical completion air conditioned office accommodation with suitable tables and chairs for meetings to be held on the site. Such offices shall be kept clean and fit for use at all times [12.2.18]</p> <p>Notice board</p> <p>The contractor shall erect in a position approved by the principal agent, maintain and remove on practical completion a notice board recommended by the South African Institute of Architects and as approved by the principal agent listing the names and logos of the employer, the contractor and the professional consultants. No subcontractor or supplier notice boards may be erected unless permission is granted by the principal agent for such notice boards to be erected [12.2.18]</p> <p>Statutory and other notices</p> <p>The contractor shall submit and/or comply with all statutory and other notices that may be required by any local or other authority in order not to cause any delay to the commencement of the works by the contractor. The contractor shall pay all deposits or fees in this regard</p> <p>It is, however, specifically recorded that the employer shall be responsible for the timeous approval of building plans by any local or other authorities and the payment of any fees or charges related thereto</p>			
	Carried Forward		R	
	<p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			

	Brought Forward		R
	F:.....V:.....T:.....	Item	
15	Clause 13.0 - Setting out		
	F:.....V:.....T:.....	Item	
16	Clause 14.0 - Nominated subcontractors		
	F:.....V:.....T:.....	Item	
17	Clause 15.0 - Selected subcontractors		
	F:.....V:.....T:.....	Item	
18	Clause 16.0 - Direct contractors		
	Attendance on direct contractors		
	In respect of direct contractors the contractor shall:		
	1. Designate an area for the direct contractor to establish a temporary office and workshop and storage of equipment and materials		
	2. Allow the use of personnel welfare facilities, where provided		
	3. Provide water, lighting and single phase electric power to a position within 50m of the place where the direct contract work is to be carried out, other than fuel or power for commissioning of any installation		
	4. Permit the direct contractor to use erected scaffolding, hoisting facilities, etc. provided by the contractor , in common with others having the like right, while it remains erected on the site [16.1]		
	F:.....V:.....T:.....	Item	
19	Clause 17.0 - Contract instructions		
	Site instructions		
	Instructions issued on site are to be recorded in a site instruction book which is to be supplied and maintained on site by the contractor		
	Carried Forward		R
	SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL		

	Brought Forward		R
	F:.....V:.....T:.....	Item	
	<u>Completion (A18 - A24)</u>		
20	Clause 18.0 - Interim completion	N/A	
21	Clause 19.0 - Practical completion		
	F:.....V:.....T:.....	Item	
22	Clause 20.0 - Completion in sections		
	F:.....V:.....T:.....	Item	
23	Clause 21.0 - Defects liability period and final completion		
	F:.....V:.....T:.....	Item	
24	Clause 22.0 - Latent defects liability period		
	F:.....V:.....T:.....	Item	
25	Clause 23.0 - Revision of the date for practical completion		
	Substitution of materials and goods		
	The removal or substitution of any materials and goods which do not conform to the specification or the contract drawings shall not constitute grounds for the extension of the construction period nor for the adjustment of the contract value [17.1.8; 23.1 & 2]		
	F:.....V:.....T:.....	Item	
26	Clause 24.0 - Penalty for late or non-completion		
	F:.....V:.....T:.....	Item	
	<u>Payment (A25 - A27)</u>		
27	Clause 25.0 - Payment		
	Carried Forward		R
	SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL		

	Brought Forward		R	
	<p>Prices submitted</p> <p>Where prices are submitted by the contractor or subcontractor during the progress of the works in respect of contract instructions or in regard to a claim under the terms of this agreement and notwithstanding the fact that such prices may be used in an interim payment certificate, there is to be no presumption of acceptance. Should the principal agent wish to accept any such prices prior to the issue of the certificate of final completion, it shall be in writing</p> <p>F:.....V:.....T:.....</p>	Item		
28	<p>Clause 26.0 - Adjustment of the contract value and final account</p> <p>Fluctuations in costs</p> <p>All fluctuations in costs, with the exception of fluctuations in the rate of Value Added Tax, shall be for the account of the contractor [26.9.5]</p> <p>Tenant installation/user requirements delayed</p> <p>There is a possibility that certain works related to tenant installation/user requirements may have to be delayed and may consequently not be executed prior to practical completion</p> <p>Not Applicable</p> <p>Should the contractor be instructed to do so he shall execute this work under the conditions pertaining to this agreement on the basis that a separate amount for preliminaries appurtenant to this work (if applicable) is agreed to between the contractor and the principal agent and on condition that instruction to proceed with such work is given to him within a period of three (3) calendar months after the date of practical completion of the works</p> <p>The employer reserves the right to omit such work without compensation to the contractor for loss of profit or any other loss which the contractor may suffer as a result of such omission</p>			
	Carried Forward		R	
	<p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			

	Brought Forward		R	
	<p>Cost of claims</p> <p>All costs incurred by the contractor in the preparation of claims shall be borne by the contractor. This provision shall not preclude an adjudicator or an arbitrator appointed in terms of this agreement [30.6 & 7] from making a determination on costs</p> <p>Claims from subcontractors</p> <p>The contractor shall review, assess and adjudicate any claims received by him from any subcontractor and thereafter submit same to the principal agent with a recommendation in order to assist the principal agent in adjudicating the claim [26.6]</p> <p>F:.....V:.....T:.....</p>			
29	<p>Clause 27.0 - Recovery of expense and/or loss</p> <p>F:.....V:.....T:.....</p>	Item		
	<p><u>Suspension and termination (A28 - A29)</u></p>			
30	<p>Clause 28.0 - Suspension by the contractor</p> <p>F:.....V:.....T:.....</p>	Item		
31	<p>Clause 29.0 - Termination</p> <p>F:.....V:.....T:.....</p>	Item		
	<p><u>Dispute resolution (A30)</u></p>			
32	<p>Clause 30.0 - Dispute resolution</p> <p>F:.....V:.....T:.....</p>	Item		
	Carried Forward		R	
	<p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			

	Brought Forward		R	
33	<p><u>Agreement</u></p> <p>The required information of the parties and the amount of the contract sum shall be inserted in the agreement for signature of the agreement by the parties</p> <p>F:.....V:.....T:.....</p>	Item		
34	<p><u>Contract data</u></p> <p>Tenderer's selections</p> <p>Before submission of his tender the contractor is to complete the tenderer's selections in the contract data</p> <p>F:.....V:.....T:.....</p>	Item		
	<u>SECTION B: GENERAL PRELIMINARIES</u>			
	<u>Definitions and interpretation (B1)</u>			
35	<p>Clause 1.1 - Definitions</p> <p>F:.....V:.....T:.....</p>	Item		
36	<p>Clause 1.2 - Interpretation</p> <p>F:.....V:.....T:.....</p>	Item		
	<u>Documents (B2)</u>			
37	<p>Clause 2.1 - Checking of documents</p> <p>F:.....V:.....T:.....</p>	Item		
38	<p>Clause 2.2 - Provisional bills of quantities</p> <p>Multiple procurement</p> <p>These bills of quantities are not in multiple procurement format ie the "wet trades" - earthworks, concrete, formwork and reinforcement, precast concrete, masonry, waterproofing and sub-surface drainage - are provisionally measured and the subsequent trades are budgetary allowances and/or provisional sums</p> <p>F:.....V:.....T:.....</p>	Item		
	Carried Forward		R	
	SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL			

Brought Forward			R
39	Clause 2.3 - Availability of construction information F:.....V:.....T:.....	Item	
40	Clause 2.4 - Ordering of materials and goods F:.....V:.....T:.....	Item	
<u>Previous work and adjoining properties (B3)</u>			
41	Clause 3.1 - Previous work - dimensional accuracy F:.....V:.....T:.....	Item	
42	Clause 3.2 - Previous work - defects F:.....V:.....T:.....	Item	
43	Clause 3.3 - Inspection of adjoining properties F:.....V:.....T:.....	Item	
<u>The site (B4)</u>			
44	Clause 4.1 - Handover of site in stages F:.....V:.....T:.....	N/A	
45	Clause 4.2 - Enclosure of the works F:.....V:.....T:.....	Item	
46	Clause 4.3 - Geotechnical and other investigations F:.....V:.....T:.....	Item	
47	Clause 4.4 - Encroachments F:.....V:.....T:.....	Item	
48	Clause 4.5 - Existing premises occupied F:.....V:.....T:.....	Item	
49	Clause 4.6 - Services - known F:.....V:.....T:.....	Item	
Carried Forward			R
SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL			

	Brought Forward		R	
	<u>Management of contract (B5)</u>			
50	Clause 5.1 - Management of the works F:.....V:.....T:.....	Item		
51	Clause 5.2 - Progress meetings F:.....V:.....T:.....	Item		
52	Clause 5.3 - Technical meetings F:.....V:.....T:.....	Item		
	<u>Samples, shop drawings and manufacturer's instructions (B6)</u>			
53	Clause 6.1 - Samples of materials F:.....V:.....T:.....	Item		
54	Clause 6.2 - Workmanship samples F:.....V:.....T:.....	Item		
55	Clause 6.3 - Shop drawings F:.....V:.....T:.....	Item		
56	Clause 6.4 - Compliance with manufacturer's instructions F:.....V:.....T:.....	Item		
	<u>Deposits and fees (B7)</u>			
57	Clause 7.1 - Deposits and fees F:.....V:.....T:.....	Item		
	<u>Temporary services (B8)</u>			
58	Clause 8.1 - Water F:.....V:.....T:.....	Item		
	Carried Forward		R	
	SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL			

	Brought Forward		R
59	Clause 8.2 - Electricity F:.....V:.....T:.....	Item	
60	Clause 8.3 - Ablution and welfare facilities F:.....V:.....T:.....	Item	
61	Clause 8.4 - Communication facilities F:.....V:.....T:.....	Item	
	<u>Prime cost amounts (B9)</u>		
62	Clause 9.1 - Responsibility for prime cost amounts Where details of materials for which prime cost amounts are to be allowed <u>are</u> readily available, the Quantity Surveyor may elect to insert the relevant prime cost amounts in measured items, which measured items shall contain sufficient detail for the contractor to price for fixing and installation, waste, etc. F:.....V:.....T:.....	Item	
	<u>Attendance on subcontractors (B10)</u>		
63	Clause 10.1 - General attendance F:.....V:.....T:.....	Item	
64	Clause 10.2 - Special attendance It is important to note that general attendance only requires the contractor to "permit the subcontractor to use erected scaffolding, hoisting facilities, etc. provided by the contractor, in common with others having the like right while it remains erected on the site" (refer to 12.2.13 of the JBCC n/s subcontract agreement). Many n/s subcontractors qualify their tenders to exclude scaffolding and/or hoisting facilities. Especially scaffolding could be an expensive item and it may be necessary in order to avoid claims to require the contractor to provide for the extended use of scaffolding for specific subcontracts within a description of "special attendance" in the applicable bill F:.....V:.....T:.....	Item	
	Carried Forward		R
	SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL		

	Brought Forward		R	
	General (B11)			
65	Clause 11.1 - Protection of the works F:.....V:.....T:.....	Item		
66	Clause 11.2 - Protection/isolation of existing works and works occupied in sections F:.....V:.....T:.....	Item		
67	Clause 11.3 - Security of the works F:.....V:.....T:.....	Item		
68	Clause 11.4 - Notice before covering work F:.....V:.....T:.....	Item		
	Carried Forward		R	
	SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL			

Brought Forward			R
69	<p>Clause 11.5 - Disturbance</p> <p>Disturbance</p> <p>All work is to be carried out in such a manner as to cause no unacceptable or unreasonable dust, noise, vibrations, nuisance, inconvenience, annoyance and the like to the public, others, other properties and traffic in so far as they exceed the permissible limitations set by government legislation or by the local authority. Any delays, stoppages and the like arising from or in order to comply with the above will not constitute grounds for an adjustment to the construction period or contract value whatsoever</p> <p>F:..... V:..... T:.....</p>	Item	
70	<p>Clause 11.6 - Environmental disturbance</p> <p>Controlling all forms of pollution</p> <p>The contractor shall be responsible for and take all precautions in controlling by whatever means necessary all forms of pollution emanating from the site during the construction period due inter alia to noise, artificial light, wind-blown sand, dust, deposits of mud, etc.</p> <p>The contractor is to ensure that all roads which border the site and are used by the contractor during the execution of the works are kept clean and free of any dirt or debris caused by the execution of the works</p>		
71	<p>Environmental management plan</p> <p>The employer has prepared an environmental management plan (EMP). The contractor shall price opposite this item for compliance with all the requirements of such EMP</p> <p>F:..... V:..... T:.....</p>	N/A	
72	<p>Clause 11.7 - Works cleaning and clearing</p> <p>F:..... V:..... T:.....</p>	Item	
73	<p>Clause 11.8 - Vermin</p> <p>F:..... V:..... T:.....</p>	Item	
Carried Forward			R
<p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			

	Brought Forward		R	
74	Clause 11.9 - Overhand work F:.....V:.....T:.....	Item		
75	Clause 11.10 - Tenant installations F:.....V:.....T:.....	N/A		
76	Clause 11.11 - Advertising F:.....V:.....T:.....	N/A		
<u>SECTION C: SPECIFIC PRELIMINARIES</u>				
77	Warranties for materials and workmanship Where warranties for materials and/or workmanship are called for, the contractor shall obtain a written warranty, addressed to the employer , from the entity supplying the materials and/or executing the work and shall deliver same to the principal agent on final completion of the contract The warranty shall state that workmanship, materials and installation are warranted for a specific period from the date of practical completion and that any defects that may arise during the specified period shall be made good at the expense of the entity supplying the materials and/or doing the work, upon written notice to do so The warranty will not be enforced if the work is damaged by defects in the execution of the works , in which case the responsibility for replacement shall rest entirely with the contractor F:.....V:.....T:.....	Item		
78	Overtime Should overtime be required to be worked for any reason whatsoever, the cost of such overtime is to be borne by the contractor unless the principal agent has specifically authorised, prior to execution thereof, that costs for such overtime are to be borne by the employer F:..... V:.....T:.....	Item		
Carried Forward				
SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL				
			R	

	Brought Forward		R	
79	<p>Cooperation of the contractor for cost management</p> <p>It is specifically agreed that the contractor accepts the obligation of assisting the principal agent in implementing proper cost management. The contractor will be advised by the principal agent of all cost management procedures which will be implemented to ensure that the contract value does not exceed the budget</p> <p>F:..... V:..... T:.....</p>	Item		
80	<p>Overloading</p> <p>The contractor shall take all necessary steps to ensure that no damage occurs due to overloading of any portion of the works or temporary works e.g. scaffolding, etc. The contractor shall submit details of his proposed loading, storage, plant erection, etc. to the principal agent for approval prior to proceeding with such loading, storing or erecting and shall comply with and pay for the principal agent's requirements in connection with the provision of temporary support work, etc. Any damage caused to the works by overloading shall be made good by the contractor at his sole expense</p> <p>F:..... V:..... T:.....</p>	Item		
81	<p>Propping of floors below</p> <p>The contractor is advised that propping of floors below may be required if he wishes to use any areas of completed suspended reinforced concrete slabs for vehicle access, storage of materials and goods and location of plant, scaffolding, etc. The location of these areas and any necessary propping shall be approved by the principal agent and the cost thereof shall be borne by the contractor</p> <p>F:..... V:..... T:.....</p>	Item		
	Carried Forward		R	
	<p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			

	Brought Forward		R	
82	<p>Testing of flat roof waterproofing for watertightness</p> <p>Flat roof waterproof areas shall be flooded and kept "ponded" for at least forty eight (48) hours as a test to ensure the watertightness of the waterproofing and before any further construction work is carried out above the waterproofing</p> <p>F:..... V:..... T:.....</p>	Item		
83	<p>Health and Safety</p> <p>Without limiting the generality of the provisions of clause 2.0, the contractor's attention is drawn to the provisions of the Construction Regulations issued in terms of the Occupational Health and Safety Act, 1993 as amended. It is specifically stated that the employer shall prepare a documented health and safety specification for the works and that the employer shall ensure that the contractor has made provision for the cost of health and safety measures during the execution of the works. The contractor shall price opposite this item for compliance with the act and the regulations and the reasonable provisions of the aforementioned health and safety specification [2.1]</p> <p>The contractor shall:</p> <ol style="list-style-type: none"> 1. Comply with the Health and Safety specification for the works 2. Prepare and agree with the Health and Safety Consultant the health and safety plan for the works 3. Cooperate with the Health and Safety Consultant in all respects 4. Manage the compliance of all subcontractors with the regulations and with the Health and Safety plan and specification 5. Conform to the conditions contained in the employer's Health and Safety specification 			
	Carried Forward		R	
	<p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			

Brought Forward			R
<u>OCCUPATIONAL HEALTH AND SAFETY:</u>			
<u>HEALTH AND SAFETY PERSONNEL</u>			
84	Allow for the notification of the provincial director in writing of the commencement of construction work with and including submission of a letter of receipt and acknowledgement of the aforementioned notice by the director of his/her representative	Item	
85	Allow for the necessary Workman's Compensation Fund or approved Insurer contributions for the duration of the project with and including renewals	Item	
86	Allow for the preparation and approval of project-specific H&S Plan & File [CR 7(1)(a)]s	Item	
87	Allow for the implementation and maintenance of project-specific H&S Plan & File. [CR 7] including implementation of and handling ACM as per Asbestos Abatement Regulations 2020 as per ECDC H&S Specification	Month	10
88	Allow for the appointment of a full-time Construction Health & Safety Officer or Manager (CHSO/M) registered with SACPCMP to assist in the control of all health and safety related aspects on site as per [CR 8(5)]	Month	10
89	Provide for appointment of responsible and competent person/s to manage and supervise the works and administer and enforce health and safety on site as per [CR 8(1) & CR 8(7)]	Month	10
90	Allow for provision of telecommunication facilities for the appointed CHSO/M i.e. desktop/laptop, cellphone etc.	Month	10
91	Allow for provision of Basic Emergency Preparedness and Response equipment & at least one Level 2 and Level 1 First Aider/s	Month	10
<u>OCCUPATIONAL HEALTH AND SAFETY:</u>			
<u>PERSONAL PROTECTIVE EQUIPMENT</u>			
Carried Forward			R
SECTION 1: PRELIMINARY AND GENERAL			
Bill No. 1			
PRELIMINARY AND GENERAL			

Brought Forward			R
<u>Provide, supply and maintenance for each employee the following SANS approved personal protective equipment & clothing dependent on site-specific risk assessments:</u>			
92	Hard Hats (High Density polyethylene, & 6-point lining)	Item	
93	Overall/work suit (100% Cotton)	Item	
94	Disposable overall	Item	
95	Safety boots/shoes (Steel-Toe)	Item	
96	Safety gloves	Item	
97	Ear Plugs/Muffs	Item	
98	Dust Masks (at least FF2 type)	Item	
99	Particulate Masks (FF3 type)	Item	
100	Respirators	Item	
101	Safety goggles	Item	
102	High visibility reflective vests	Item	
103	SANS approved safety netting (orange colour with minimum of 1,2 meters high)	Item	
104	Allow for Pre-employment medical examinations	Item	
105	Allow for exit medical examinations before demobilization	Item	
<u>OCCUPATIONAL HEALTH AND SAFETY: EDUCATION</u>			
106	Allow for verification valid of medical certificates not conducted by ECDC Clinic at the prescribed cost by the clinic	Item	
107	Allow for HIV/AIDS awareness and Implementation programmes, including STI, and TB etc.	Month	10
Carried Forward			R
SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL			

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

Brought Forward			R
108	Allow for all compulsory health and safety awareness programme (e.g. inductions, toolbox talks, safety promotions, H&S related training, etc.)	Month	10
109	Allow for provision of Management of Pandemic diseases e.g. COVID -19		Item
<u>OCCUPATIONAL HEALTH AND SAFETY: ENVIRONMENTAL</u>			
110	Provide for adequate handling and storage of materials to minimize contamination of ground, air or water		Item
111	Provide for the adequate safe collection and disposal of waste material from site by an approved method		Item
112	Provide Facilities and Eating Area for workers and to be COVID-19 compliant		Item
113	Provide for rehabilitation on completion of site disturbed areas and temporary access routes not covered by construction, grass seeding/hydro seeding		Item
114	Maintenance of alien vegetation or landscaping specifications upon completion of construction work and during defects liability		Item
115	Provide for stockpiling of topsoil for re-use		Item
<u>OCCUPATIONAL HEALTH AND SAFETY: FALL PREVENTION /PROTECTION</u>			
116	Personal Fall arrest and rescue equipment with and including lifelines and associated equipment		Item
117	Temporary handrails, toe boards other than for access scaffolding (Rate Only)		Item
118	Allow for appointment of Fall Protection Plan Construction Regulation 10		Item
119	Green star building certification		N/A
	F:..... V:..... T:.....		
Carried Forward			R
SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL			

	Brought Forward		R	
120	<p>Broad based black economic empowerment (BBBEE)</p> <p>Tenders submitted will be evaluated taking into account their empowerment rating</p> <p>The employer will be monitoring the broad based black economic empowerment (BBBEE) status of the contractor throughout the execution of the works</p> <p>The contractor is to submit to the principal agent on an annual basis a schedule of spend, split into vendors engaged as subcontractors and suppliers indicating their BBBEE rating including proof of the said rating</p> <p>F:..... V:..... T:.....</p>	Item		
121	<p>Advertising rights</p> <p>The employer may elect to contract with advertising agencies for the erection of advertising hoardings, banners, wraps or the like for the duration of the contract. The contractor shall not prevent such an arrangement and will assist in the facilitation of same. The position and type of advertising structure to be agreed with the principal agent so as not to hinder the contractor in meeting his obligations under this agreement</p> <p>F:..... V:..... T:.....</p>	Item		
122	<p>Confidentiality</p> <p>The contractor undertakes to maintain in confidence any and all information regarding this project and shall obtain appropriate similar undertakings from all subcontractors and suppliers. Such information shall not be used in any way except in connection with the execution of the works</p> <p>No information regarding this project shall be published or disclosed without the prior written consent of the employer</p> <p>F:..... V:..... T:.....</p>	Item		
	Carried Forward		R	
	<p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>			

123	<p style="text-align: center;">Brought Forward</p> <p>Media releases</p> <p>All rights of publication of articles in the media, together with any advertising relating thereto or in any way connected with this project, shall vest with the employer</p> <p>The contractor together with his subcontractors shall not, without the prior written consent of the employer, cause any statement or advertisement connected with this project to be printed, screened or aired by the media</p> <p>F:..... V:.....T:.....</p> <p><u>SUMMARY OF CATEGORIES</u></p> <p>Category : Fixed R.....</p> <p>Category : Value R.....</p> <p>Category : Time R.....</p>	Item	R	
	<p>Carried to Final Summary</p> <p>SECTION 1: PRELIMINARY AND GENERAL Bill No. 1 PRELIMINARY AND GENERAL</p>		R	

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 1</u></p> <p><u>ALTERATIONS (PROVISIONAL)</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>View Site</u></p> <p>Before submitting his tender the contractor shall visit the site and satisfy himself as to the nature and extent of the work to be done and the value of the materials contained in the buildings or portions of the buildings to be demolished. No claim for any variations of the contract sum in respect of the nature and extent of the work or of inferior or damaged materials will be entertained.</p> <p><u>General</u></p> <p>Water supply pipes and other piping that may be encountered and found necessary to disconnect or cut, shall be effectually stopped off or grubbed up and removed, and any new connections that may be necessary shall be made with proper fittings, to the satisfaction of the principal agent.</p> <p>Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary.</p> <p>The contractor will be required to take all dimensions affecting the existing buildings on the site and he will be held solely responsible for the accuracy of all such dimensions where used in the manufacture of new items (doors, windows, fittings, etc.).</p> <p>Removing of material shall include loading and carting away to a dump-site located by the contractor. It shall include any dumping fees etc.</p> <p><u>Old Materials</u></p> <p>Old materials resulting from the alterations and demolitions are to be remain the property of the school unless otherwise stated.</p>			
	Carried Forward			R
	SECTION 2: ALTERATIONS Bill No. 1 ALTERATIONS			

<p style="text-align: right;">Brought Forward</p> <p><u>Notices</u></p> <p>Special care is to be taken not to interfere unnecessarily with any electrical or telephone installations that may be met with and due notice is to be given to the Principal Agent when any disconnections or removal of wires, fittings, etc. are necessary and the contractor is to afford every facility to the electricians carrying out this work.</p>			R	
<p>SECTION 2: ALTERATIONS Bill No. 1 ALTERATIONS</p>			R	

<p style="text-align: right;">Brought Forward</p> <p><u>Demolitions</u></p> <p>All demolition work is to be carried out in accordance with the Local By-laws and to the requirements of the requirements of the Local Health Authorities. The contractor is to allow for giving notices and paying any fees related to municipal requirements.</p> <p>All demolition work is to be carried out in strict accordance with the instructions and to the satisfaction of the Principal Agent.</p> <p><u>Temporary coverings, Screens etc.</u></p> <p>The contractor will be held responsible for any damage to property or goods in the existing buildings due to his not having taken adequate precautions, and all damage caused is to be made good at the contractors own expense. The contractor must provide for all necessary screens, partitions, tarpaulins, barriers, signage, demarcation etc. to protect the work and prevent any nuisance from dust as may be required or directed.</p> <p><u>Damage to persons or property</u></p> <p>The contractor will be held responsible for any damage to persons or property and for the safety of the structures and he is to allow for protecting and indemnifying persons using the existing buildings from injury by virtue of the building operations, including providing necessary barriers, signs, etc.</p> <p><u>Setting out</u></p> <p>All dimensions affecting work in the existing buildings are to be taken on the site and the contractor will be responsible for taking correct sizes of all new work, the sizes given in this bill are approximate.</p>		R	
<p style="text-align: right;">Carried Forward</p> <p>SECTION 2: ALTERATIONS Bill No. 1 ALTERATIONS</p>		R	

<p style="text-align: center;">Brought Forward</p> <p><u>Making good</u></p> <p>Prices for all works described throughout the Bills of Quantities are to include for making good, whether specifically mentioned or not in all trades except Painting, unless otherwise described.</p> <p>The contractor must make good to existing work damaged or disturbed through alterations and to existing work remaining after doors, screens, fittings, walls, etc. are removed, by fitting in short lengths of skirting, architrave's, etc. and taking out and making good suspended ceilings and floors on necessary joists etc.</p> <p>Plaster finishing to walls and ceilings and rendering floor tiles, etc. to floors for facing up walls with brickwork cut, toothed and bonded to existing with facing bricks, quarry tiles or common brickwork to receive finishing, unless otherwise described.</p> <p>All materials in making good are to match existing and the work is to be left complete and perfect in every respect.</p> <p><u>Fixing in position</u></p> <p>Fixing new and re-fixing existing materials is to include for cutting and fitting over existing skirtings, cornices, quadrants, etc. or for cutting existing work and for finishing up to new and for making good as previously described.</p> <p>Re-fixing existing materials is to include for all necessary cutting to suit, forming mitres, fair ends, etc. for supplying short lengths of new materials to make up for any deficiencies and for supplying new screws, nails, etc. as is necessary.</p> <p><u>Junction of new and existing</u></p> <p>Making good at junctions of new and existing works is to include for piercing out, cutting through and removing short lengths of existing materials and for jointing to match existing.</p> <p><u>DEMOLITIONS ETC.</u></p>			R	
<p style="text-align: center;">Carried Forward</p> <p>SECTION 2: ALTERATIONS Bill No. 1 ALTERATIONS</p>			R	

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R
<u>Taking down and removing from site</u>			
1	100mm x 50mm Welded mesh fence 1800m high fixed to a combination of concrete and steel posts embedded in 400mm x 400mm x 500mm deep concrete bases averagely spaced at 2400mm to 2700mm centres and cart away to a dumpsite located by the Contractor	m	358
<u>REMOVAL OF EXISTING WORK</u>			
<u>Breaking up and removing reinforced concrete including cutting off, removing reinforcement and cart away to a dumpsite as approved by the BCM including payable levies for disposal thereof.</u>			
2	100mm Thick Apron and cart away	m ²	3
3	150mm Thick surface bed and cart away	m ²	224
<u>Breaking down and removing brickwork etc. and cart away to a dumpsite as approved by the BCM including payable levies for disposal thereof.</u>			
4	Half brick wall and cart away	m ²	308
5	One brick wall and cart away	m ²	29
6	270mm wide walls including concrete cavity infill and cart away	m ²	41
<u>Taking out and removing doors, windows, etc. including thresholds, sills, placing temporary propping, etc. (building up openings and making good elsewhere measured)</u>			
7	Steel window frames not exceeding 2,5m ²	No	58
8	Timber single door including frames not exceeding 2,5m ²	No	38
9	Timber double door including frames exceeding 2,5m ² and not exceeding 5m ²	No	1
Carried Forward			R
SECTION 2: ALTERATIONS Bill No. 1 ALTERATIONS			

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R
<u>Taking out and removing doors, windows, etc. including thresholds, sills, etc. and replacing with new aluminium windows</u>			
10	Galvanised roller shutter door size 1200mm x 3000mm high from 230mm wide brick wall	No	1
11	Galvanised roller shutter door size 3000mm x 3000mm high from 230mm wide brick wall	No	2
12	Galvanised roller shutter door size 3100mm x 3400mm high from 230mm wide brick wall	No	2
<u>Taking down and removing roofs, floors, panelling, ceilings, partitions, etc. and cart away to a dumpsite as approved by the BCM including payable levies for disposal thereof.</u>			
13	Asbestos roof covering and timber purlins by an approved operator including disposal, fees and supplying of the disposal certificate	m ²	385
14	Asbestos roof covering including sisalation with all structural steel members to remain by an approved operator including disposal, fees and supplying of the disposal certificate	m ²	1 562
15	Asbestos side cladding and timber purlins by an approved operator including disposal, fees and supplying of the disposal certificate	m ²	414
16	Asbestos side cladding, leaving all girths remaining in place by an approved operator including disposal, fees and supplying of the disposal certificate	m ²	464
17	Asbestos ceilings including insulation and timber battens by an approved operator including disposal, fees and supplying of the disposal certificate	m ²	706
18	IBR Corrugated iron roof covering and cart away	m ²	234
19	Damaged sisalation and cart away	m ²	516
20	Remove barge boards and cart away	m	47
21	Timber fascia boards and cart away	m	815
Carried Forward			R
SECTION 2: ALTERATIONS Bill No. 1 ALTERATIONS			

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THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward				R
22	Remove gutters and cart away	m	460	
23	Remove downpipes and cart away	m	139	
24	600mm Wide roof ventilation duct and cart away	m	7	
25	800mm Wide roof ventilation duct and cart away	m	7	
26	1000mm Wide roof ventilation duct and cart away	m	15	
27	300mm Wide roof ventilation duct and cart away	m	21	
<u>Taking down and removing roofs, floors, panelling, ceilings, partitions, etc. and reinstall in new or current position as illustrated on site</u>				
28	100mm x 50mm x 20mm x 2.5mm Lipped channel and place in new position as illustrated	t	1.01	
<u>Taking out and removing joinery fittings etc.</u>				
29	1200mm x 600mm x 900mm High floor cupboard and cart away	No	1	
30	2700mm x 600mm x 900mm High floor cupboard and cart away	No	1	
<u>Taking out/off and removing sundry joinery work</u>				
31	110mm Thick timber partitions and cart away	m ²	14	
<u>Taking out/off and removing sundry metalwork</u>				
32	Steel gates size 4000mm x 2100mm high overall and cart away including gate posts.	No	1	
33	Steel gates size 4500mm x 2100mm high overall and cart away including gate posts.	No	1	
34	1000mm x 400mm Canopy and cart away	No	1	
<u>Hacking up/off and removing wall tiles from brickwork and preparing surfaces for new tiles (elsewhere measured)</u>				
35	Wall tiles and cart away	m ²	40	
Carried Forward				R
SECTION 2: ALTERATIONS Bill No. 1 ALTERATIONS				

Brought Forward			R
<u>Taking out and removing piping, sanitary fittings, etc. including disconnecting piping from fittings and making good floor and wall finishes (making good tiling and paintwork elsewhere)</u>			
36	Vitreous china wash hand basin, with taps including short lengths of piping and cart away	No	17
37	Stainless steel sink and drainer on timber cupboard 1200mm x 600mm x 900mm high, including short lengths of piping and cart away	No	2
38	Vitreous china wall hung urinal with flush valve, including short lengths of piping and cart away	No	1
39	Vitreous china WC pan with cistern, including short lengths of piping and cart away	No	19
40	Fire hose reels, including short lengths of piping and cart away	No	3
<u>PREPARATORY WORK TO EXISTING SURFACES</u>			
<u>Making good doors, windows, etc. including thresholds, sills, etc. and setting aside for re-use and refurbish as prescribed by the Architect</u>			
41	Glazed steel window overall size 680mm x 1400mm high built into various brick walls sizes, including removal of perspex glass panes and replace with 6.38mm glazing (elsewhere measured)	No	3
42	Glazed steel window overall size 1000mm x 1400mm high built into various brick walls sizes, including removal of perspex glass panes and replace with 6.38mm glazing (elsewhere measured)	No	10
43	Glazed steel window overall size 1200mm x 1400mm high built into various brick walls sizes, including removal of perspex glass panes and replace with 6.38mm glazing (elsewhere measured)	No	2
44	Glazed steel window overall size 2000mm x 1400mm high built into various brick walls sizes, including removal of perspex glass panes and replace with 6.38mm glazing (elsewhere measured)	No	12
Carried Forward			R
SECTION 2: ALTERATIONS Bill No. 1 ALTERATIONS			

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

Brought Forward			R
45	Glazed steel window overall size 1000mm x 2400mm high fbuilt into various brick walls sizes, including removal of perspex glass panes and replace with 6.38mm glazing (elsewhere measured)	No	7
46	Glazed steel window overall size 2000mm x 2400mm high built into various brick walls sizes, including removal of perspex glass panes and replace with 6.38mm glazing (elsewhere measured)	No	10
<u>OPENINGS THROUGH EXISTING WALLS ETC.</u>			
<u>Altering openings</u>			
47	Altering opening in 160mm wide brick walls where 1000mm x 600mm high steel window was removed to form opening for new aluminium window size 900mm x 600 mm high overall by breaking to accommodate the length and bottom including necessary pre-cast concrete lintels, placing temporary propping and making good plaster on both sides and into reveals and with brick on edge finish to window sill (new window and making good paintwork elsewhere)	No	7
48	Altering opening in 160mm wide brick walls where 600mm x 600mm high steel window was removed to form opening for new aluminium window size 600mm x 600 mm high overall by breaking to accommodate the length and bottom including necessary pre-cast concrete lintels, placing temporary propping and making good plaster on both sides and into reveals and with brick on edge finish to window sill (new window and making good paintwork elsewhere)	No	12
49	Altering opening in 160mm wide brick walls where 2700mm x 2400mm high steel window was removed to form opening for new aluminium window size 1200mm x 900 mm high overall by breaking to accommodate the length and bottom including necessary pre-cast concrete lintels, placing temporary propping and making good plaster on both sides and into reveals and with brick on edge finish to window sill (new window and making good paintwork elsewhere)	No	1
Carried Forward			R
SECTION 2: ALTERATIONS Bill No. 1 ALTERATIONS			

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

Brought Forward				R
50	Altering opening in 220mm wide brick wall where 2000mm x 1000mm high steel window was removed to form opening for new timber door size 900mm x 2100 mm high overall by breaking to accommodate the length and bottom including necessary pre-cast concrete lintels, placing temporary propping and making good plaster on both sides and into reveals (new window and making good paintwork elsewhere)	No	2	
51	Altering opening in 220mm wide brick walls where 1500mm x 1400mm high steel window was removed to form opening for new aluminium window size 600mm x 1500 mm high and 600mm x 1200mm high respectively overall by breaking to accommodate the length and bottom including necessary pre-cast concrete lintels, placing temporary propping and making good plaster on both sides and into reveals and with brick on edge finish to window sill (new window and making good paintwork elsewhere)	No	15	
52	Altering opening in 270mm wide brick walls where 1200mm x 1400mm high steel window was removed to form opening for new aluminium window size 900mm x 1790 mm high overall by breaking to accommodate the length and bottom including necessary pre-cast concrete lintels, placing temporary propping and making good plaster on both sides and into reveals and with brick on edge finish to window sill (new window and making good paintwork elsewhere)	No	4	
53	Altering opening in 270mm wide brick walls where 700mm x 1000mm high steel window was removed to form opening for new aluminium window size 600mm x 1200 mm high overall by breaking to accommodate the length and bottom including necessary pre-cast concrete lintels, placing temporary propping and making good plaster on both sides and into reveals and with brick on edge finish to window sill (new window elsewhere measured)	No	6	
Carried Forward				R
SECTION 2: ALTERATIONS				
Bill No. 1				
ALTERATIONS				

Brought Forward				R
54	Altering opening in 270mm wide brick walls where 677mm x 1400mm high steel window was removed to form opening for new aluminium window size 1200mm x 1900 mm high overall by breaking to accommodate the length and bottom including necessary pre-cast concrete lintels, placing temporary propping and making good plaster on both sides and into reveals and with brick on edge finish to window sill (new window elsewhere measured)	No	2	
<u>MAKING GOOD OF FINISHES ETC</u>				
<u>Clean surface thoroughly with Polycel Sugar Soap Powder solution or an (equally approved) Remove-all High Strength Cleaner & Degreaser and scouring pads to remove smoke and grime and rinse thoroughly using clean water to neutralise and allow to dry out</u>				
55	Concrete floors	m ²	2 911	
<u>Making good roofing</u>				
56	Make good to ploycarb side cladding	m ²	81	
57	Make good to metal sheeting	m ²	426	
<u>Making good roof coverings and side claddings (refixing loose sheets and replacing damaged sheets)</u>				
58	Corrugated IBR side cladding, penetrations to be sealed and made good	m ²	138	
59	Corrugated IBR roof sheets, roof penetrations to be sealed and made good	m ²	516	
Carried to Final Summary				R
SECTION 2: ALTERATIONS				
Bill No. 1				
ALTERATIONS				

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 1</u></p> <p><u>EARTHWORKS (PROVISIONAL)</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved - by the Head: Works</p> <p><u>Nature of material to be excavated</u></p> <p>The material to be excavated is assumed to be predominantly of a composition that will allow "soft excavation" as specified, but including a percentage of "intermediate excavation" and "hard rock excavation"</p> <p><u>Carting away of excavated material</u></p> <p>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 to a suitable tip site approved by the BCM and paying for any fees levied by the authorities.</p> <p><u>Dewatering of excavations</u></p> <p>The Contractor shall allow for removing seepage and other water from subterranean sources from the excavations by pumping, baling or otherwise</p> <p>Accurate records of all such dewatering shall be kept to determine the total volume of water so removed and a clear distinction shall be made between water from subterranean sources and other water</p> <p style="text-align: center;">-----</p> <p><u>Site clearance</u></p>			
1	Reduced levels under floors	m ³	138	
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 1 EARTHWORKS			

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THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

	Brought Forward			R
	<u>EXCAVATION, ETC.</u>			
	<u>Excavation in earth not exceeding 2m deep</u>			
2	Trenches	m ³	63	
3	Bases	m ³	2	
	<u>Extra over trench and hole in excavations for</u>			
4	Soft rock	m ³	6	
5	Hard rock	m ³	3	
	<u>Extra Over carting away for surplus material</u>			
6	Cart away to a dumpsite as approved by the BCM including payable levies for disposal thereof.	m ³	29	
	<u>FILLING ETC.</u>			
	<u>Earth filling obtained from the excavations and/or prescribed stock piles on site, compacted to 93% Mod AASHTO density</u>			
7	Backfilling to trenches, holes, etc.	m ³	33	
	<u>Earth Filling Supplied by contractor compacted to 93% ModAASHTO</u>			
8	G7 Under floors, steps, paving etc.	m ³	46	
	<u>Earth Filling Supplied by contractor compacted to 95% ModAASHTO</u>			
9	G7 Under floors, steps, paving etc.	m ³	46	
	<u>Earth Filling Supplied by contractor compacted to 95% ModAASHTO</u>			
10	G5 Under floors, steps, paving etc.	m ³	46	
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 1 EARTHWORKS			

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THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward				R
<u>Compaction of surfaces</u>				
11	Compaction of ground surface including scarifying for a depth of 150mm, including breaking down oversize material, adding suitable material where necessary and compacting to 98% Mod AASHTO density	m ²	385	
<u>Prescribed density tests on filling</u>				
12	"Modified AASHTO Density" test on fill material	No	84	
<u>WORKING SPACE EXCAVATIONS</u>				
<u>Back excavation of vertical sides of excavation in earth exceeding 500mm and not exceeding 1,5m deep for working space, including backfilling compacted to 93% Mod AASHTO density</u>				
13	For placing and removing formwork to walls etc. against excavated face	m ²	6	
<u>Extra over all excavations for carting away</u>				
14	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor including all levies payable for the disposal thereof.	m ³	139	
<u>Risk of collapse of excavations</u>				
15	Sides of trench and hole excavations not exceeding 1,5m deep	m ²	146	
<u>Keeping excavations free of water</u>				
16	Keeping excavations free of water		Item	
Carried Forward				R
SECTION 3: BUILDING WORKS Bill No. 1 EARTHWORKS				

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 2</u></p> <p><u>CONCRETE, FORMWORK AND REINFORCEMENT</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p>Cost of tests</p> <p>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 the purpose, for testing costs and for submitting reports on the tests to the architect. The testing shall be undertaken by an independent firm or institution nominated by the contractor and to the approval of the architect. (Test cubes are measured separately)</p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved - by the Head: Works</p> <p><u>Cost of tests</u></p> <p>Descriptions of concrete items shall be deemed to include for all necessary testing of concrete components and trial mixes</p> <p>Testing of concrete strength test cubes is measured separately in an inclusive item. The Contractor shall make an assessment of all testing required and include the cost in the item rate</p> <p>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.</p> <p style="text-align: right;">Carried Forward</p> <p>SECTION 3: BUILDING WORKS Bill No. 2 CONCRETE, FORMWORK AND REINFORCEMENT</p>			<p style="text-align: right;">R</p>

	Brought Forward			R
	<p>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"</p> <p>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 reconditioning as necessary before re-use.</p> <p>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.</p> <p>Formwork to soffits of solid slabs etc. shall be deemed to be to slabs not exceeding 250mm thick unless otherwise described</p> <p>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"</p> <p style="text-align: center;">-----</p> <p><u>UNREINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u></p> <p><u>"No fines" concrete</u></p>			
1	Filling to cavity of hollow walls	m ³		
	<u>15MPa/19mm concrete</u>			
2	Surface blinding under footings and bases	m ³	0.2	
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 2 CONCRETE, FORMWORK AND REINFORCEMENT			

Brought Forward			R
<u>REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u>			
<u>25MPa/19mm concrete</u>			
3	Strip footings	m ³	18
4	Bases	m ³	1
5	Surface beds cast in panels on waterproofing	m ³	57
<u>30MPa/19mm concrete</u>			
6	Surface beds cast in panels on waterproofing	m ³	40
<u>REINFORCED CONCRETE</u>			
<u>25MPa/19mm concrete</u>			
7	Surface beds cast in panels on waterproofing	m ³	13
8	Plinths	m ³	3
9	Counter tops	m ³	0.1
10	Columns	m ³	1
<u>30MPa/19mm concrete</u>			
11	Slabs, including beams and inverted beams	m ³	1
12	Isolated beams	m ³	1
<u>REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u>			
<u>30MPa/19mm concrete</u>			
13	Surface beds cast in panels on waterproofing	m ³	44
<u>TEST CUBES</u>			
14	Making and testing 150mm x 150mm x 150mm concrete strength test cube (Provisional) (The contractor is to provide an approved mix design and provide one concrete test cube based on this mix design)	No	21
Carried Forward			R
SECTION 3: BUILDING WORKS Bill No. 2 CONCRETE, FORMWORK AND REINFORCEMENT			

	Brought Forward			R
	<u>CONCRETE SUNDRIES</u>			
	<u>Finishing top surfaces of concrete smooth with a power float</u>			
15	Surface beds, slabs, etc.	m ²	597	
	<u>Finishing top surfaces of concrete smooth with a steel trowel</u>			
16	Slabs including beams and inverted beams	m ²	8	
17	Counter tops	m ²	1	
18	On plinths	m ²	9	
19	On plinths circular on plan	m ²	9	
	<u>25MPa non-shrink grout</u>			
20	Bedding approximately 25mm thick under 203mm x 133mm steel column	m ²	0.2	
	<u>ROUGH FORMWORK (DEGREE OF ACCURACY II)</u>			
	<u>Rough formwork to sides</u>			
21	Bases	m ²	4	
	Carried Forward			R
	SECTION 3: BUILDING WORKS			
	Bill No. 2			
	CONCRETE, FORMWORK AND REINFORCEMENT			

Brought Forward			R
<u>SMOOTH FORMWORK (DEGREE OF ACCURACY I)</u>			
<u>Smooth formwork to sides</u>			
22	Beams	m ²	10
23	Columns	m ²	9
24	Edges, risers, ends and reveals not exceeding 300mm high or wide	m	25
25	Edges, risers, ends and reveals not exceeding 300mm high or wide circular on plan	m	23
<u>Sundries</u>			
26	Striping of formwork and preparing of sides to a smooth finish	m ²	19
<u>Smooth formwork to soffits</u>			
27	Slabs not exceeding 3500mm high	m ²	8
28	Counter tops	m ²	1
<u>Boxing out smooth formwork to form</u>			
29	3500mm x 1500mm x 100mm opening to surface beds	m	10
30	10 000mm Diameter x 100mm opening to surface beds circular on plan	m	23
<u>MOVEMENT JOINTS ETC.</u>			
<u>Expansion joints with "Sagex" softboard between vertical concrete and brick surfaces</u>			
31	10mm Joints not exceeding 300mm high	m	1 051
<u>Saw cut joints</u>			
32	50mm x 3mm Saw cut joints in top of concrete	m	19
Carried Forward			R
SECTION 3: BUILDING WORKS			
Bill No. 2			
CONCRETE, FORMWORK AND REINFORCEMENT			

	Brought Forward				R
	<u>Construction joints</u>				
33	8mm x 20mm Construction joints in top of concrete including 8mm foam backing strip	m	139		
	<u>REINFORCEMENT (PROVISIONAL)</u>				
	<u>High tensile steel reinforcement to structural concrete work</u>				
34	Various diameter bars	t	0.39		
	<u>Fabric reinforcement</u>				
35	Type 193 fabric reinforcement in concrete surface beds, slabs, etc.	m ²	597		
	Carried Forward to Summary of Section No.				R
	SECTION 3: BUILDING WORKS				
	Bill No. 2				
	CONCRETE, FORMWORK AND REINFORCEMENT				

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 3</u></p> <p><u>PRECAST CONCRETE</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p>Cost of tests</p> <p>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 the purpose, for testing costs and for submitting reports on the tests to the architect. The testing shall be undertaken by an independent firm or institution nominated by the contractor and to the approval of the architect. (Test cubes are measured separately)</p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved - by the Head: Works</p> <p><u>Sizes:</u></p> <p>Blocks, sills, etc. measured linear shall be made in suitable lengths. Large size setting out drawings shall be prepared where necessary and submitted to the architect for approval before moulds are made</p> <p><u>General:</u></p> <p>Where kerbstones, blocks, etc. are laid in ground descriptions shall be deemed to include necessary excavation, filling in and ramming</p> <p style="text-align: center;">-----</p> <p><u>PRECAST CONCRETE</u></p>			
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 3 PRECAST CONCRETE			

	Brought Forward			R	
1	<p><u>Precast concrete concrete bollards finished smooth on exposed surfaces, including bedding, jointing and installation on concrete surfaces</u></p> <p>250mm Diameter x 1200mm high bollards supplied and installed as per manufacturer's instructions to the Architect and Engineer's approval</p>	No	20		
	<p>Carried Forward to Summary of Section No.</p> <p>SECTION 3: BUILDING WORKS Bill No. 3 PRECAST CONCRETE</p>			R	

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 4</u></p> <p><u>MASONRY</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved - by the Head: Works</p> <p><u>BRICKWORK</u></p> <p><u>Sizes in descriptions</u></p> <p>Where sizes in descriptions are given in brick units, "one brick" shall be the length and "half brick" the width of a brick</p> <p><u>Cement mortar</u></p> <p>Unless otherwise described, all brickwork shall be built in 1:5 cement mortar</p> <p><u>Brick reinforcement</u></p> <p>Descriptions of brickwork shall be deemed to include for steel reinforcing fabric as specified every fourth course in superstructure and every course in foundations. Additional reinforcement in lintels, etc. are measured separately</p> <p><u>Face bricks</u></p> <p>Bricks shall be ordered timeously to obtain uniformity in size and colour</p> <p><u>Pointing</u></p> <p>Descriptions of recessed pointing to fair face brickwork and face brickwork shall be deemed to include square recessed, hollow recessed, weathered pointing, etc.</p>			
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 4 MASONRY			

Brought Forward				R
<u>Samples, etc</u>				
Rates for brickwork, faced brickwork, etc. shall include for all required samples				

<u>FOUNDATIONS</u>				
<u>Brickwork of NFX bricks (14 MPa nominal compressive strength) in class 1 mortar</u>				
1	One brick walls	m ²	50	
2	270mm Cavity walls of two half brick skins with cavities filled in including wire ties	m ²	26	
3	330mm brick walls of two half brick skins including wire ties	m ²	9	
4	440mm Brick walls including wire ties	m ²	1	
Carried Forward				R
SECTION 3: BUILDING WORKS				
Bill No. 4				
MASONRY				

Brought Forward			R
<u>SUPERSTRUCTURE</u>			
<u>Brickwork of NFP bricks in class II mortar</u>			
5	Half brick walls	m ²	369
6	One brick walls	m ²	156
7	270mm Cavity walls of two half brick skins	m ²	32
8	330mm brick walls of two half brick skins including wire ties	m ²	55
9	440mm Brick walls of two half brick skins including wire ties	m ²	10
<u>Miscellaneous</u>			
10	Beam filling	m ²	14
11	Splayed mortar fillet one course high in 50mm cavity	m	25
12	Closing 50mm cavity of hollow wall horizontally with one course of brickwork	m	25
<u>Brick-on-edge header course copings, sills, etc. of NFP bricks pointed with recessed joints on all exposed faces</u>			
13	150mm Wide sills set sloping and slightly projecting	m	70
<u>Brickwork reinforcement</u>			
14	75mm Wide reinforcement built in horizontally	m	1 445
15	150mm Wide reinforcement built in horizontally	m	1 571
16	220mm Wide reinforcement built in horizontally	m	1 221
<u>Concrete prestressed fabricated lintels</u>			
17	110mm x 70mm Lintels in lengths not exceeding 3m	m	66
18	150mm x 70mm Lintels in lengths not exceeding 3m	m	134
Carried Forward			R
SECTION 3: BUILDING WORKS			
Bill No. 4			
MASONRY			

	Brought Forward				R
19	150mm x 70mm Lintels in lengths exceeding 3m and not exceeding 4,5m	m	13		
20	150mm x 70mm Lintels in lengths exceeding 4,5m and not exceeding 6m	m	5		
	<u>NUTEC-CEMENT WINDOW SILLS</u>				
	<u>Natural grey sills in single lengths bedded in class I mortar, including metal fixing lugs etc.</u>				
21	150mm x 15mm Wide sills set flat and slightly projecting	m	34		
	<u>Sundries</u>				
	<u>Air bricks etc.</u>				
22	229mm x 76mm Clay vermin proof air brick	No	24		
	<u>BUDGETARY ALLOWANCE</u>				
	<u>The following in Budgetary Allowance for work to be carried out by the contractor</u>				
	<u>"Corobrik Cape Stormberg (Rustic)" Brick-on-edge header course copings, sills, etc. of Travertine face bricks pointed with recessed joints on all exposed faces</u>				
23	150mm Wide sills set sloping and slightly projecting	m	40		
	Carried Forward to Summary of Section No.				R
	SECTION 3: BUILDING WORKS				
	Bill No. 4				
	MASONRY				

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 5</u></p> <p><u>WATERPROOFING</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p>Waterproofing to roofs, basements, etc. shall be carried out by workmen who are experienced in this type of work.</p> <p>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</p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved - by the Head: Works</p> <p style="text-align: center;">-----</p> <p><u>DAMPPROOFING OF WALLS AND FLOORS</u></p> <p><u>One layer of 375 micron "Consol Plastics Brikgrip DPC" embossed damp proof course to manufacturer's specification</u></p>			
1	In walls	m ²	81	
	<p><u>One layer of 250 micron "Consol Plastics Gunplas USB Green" waterproof sheeting sealed at laps with "Gunplas Pressure Sensitive Tape" all to manufacturer's specification</u></p>			
2	Under surface beds	m ²	597	
	<p><u>WATERPROOFING TO ROOFS, BASEMENTS, ETC.</u></p>			
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 5 WATERPROOFING			

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THE REPAIRS, REFURBISHMENTS OF SITE
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	Brought Forward			R	
3	<p><u>One layer "Derbigum SP4" on one layer "Derbigum CG3" or similar and approved fully bonded waterproofing including turn-ups, etc. applied by approved waterproofing specialist</u></p> <p>On slabs</p>	m ²	8		
	Carried Forward			R	
	<p>SECTION 3: BUILDING WORKS Bill No. 5 WATERPROOFING</p>				

	Brought Forward				R
	<u>JOINT SEALANTS ETC.</u>				
	<u>"Thioflex" two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc.</u>				
4	10mm x 10mm In expansion joints in walls	m	149		
	<u>Approved silicone pointing</u>				
5	Between aluminium frames and walls	m	403		
	Carried Forward to Summary of Section No.				R
	SECTION 3: BUILDING WORKS				
	Bill No. 5				
	WATERPROOFING				

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 6</u></p> <p><u>ROOF COVERINGS ETC.</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Straight cutting</u></p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved</p> <p><u>Fixing</u></p> <p>Fixing shall be done according to SABS 1200HB with minimum 225mm end laps</p> <p style="text-align: center;">-----</p>			
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 6 ROOF COVERINGS			

**THE REPAIRS, REFURBISHMENTS OF SITE
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Brought Forward			R
<p><u>PROFILED METAL SHEETING AND ACCESSORIES</u></p> <p>Where roof coverings are fixed on top of rigid board insulation to purlins etc. descriptions of roof coverings shall include therefore Note that sheeting is also available in corten steel, stainless steel, copper and aluminium</p> <p><u>Klip-Lok 406™ profile roll-formed in continuous lengths from 0.8mm thick Galvanised steel, Z200 spelter ISQ550 Chromadek® Colour Dark Dolphin finish topcoat and Pebble Grey backing coat profile roll-formed in continuous lengths from 0.8mm thick Galvanised steel, Z200 spelter ISQ550 Chromadek® sheeting and accessories, concealed fixed to steel hot dipped galvanised and painted purlins or rails, with KL 65 clips fixed in strict accordance with the Manufacturer's details and specifications with all lengths of side laps and end laps, fixing and fastening types and methods and details, strictly to manufacturer's specification and recommendation</u></p>			
1	Roof coverings with pitches not exceeding 25 degrees	m ²	1 945
2	Ridge end cap	No	159
3	Side wall flashing 550mm girth	m	195
<p><u>0.47mm (Heavy Industrial) Concealed Fix concealed fix angular interlocking standing seam trapezoidal rib profile side cladding, made from a blend of aluminium with zinc in an alloy coating, suitable for coastal corrosion conditions (200 Grade), on steel substructure as per Engineer's details and specifications</u></p>			
4	Extra over 3000mm x 3000mm opening for door	No	4
5	Extra over 4500mm x 3500mm opening for door	No	1
Carried Forward			R
<p>SECTION 3: BUILDING WORKS Bill No. 6 ROOF COVERINGS</p>			

Brought Forward				R
	<p><u>BR7 profile roll-formed in continuous lengths from 0.80mm thick Galvanised steel, Z200 spelter ISQ550 Chromadek® Dark Dolphin finish topcoat and Pebble Grey backing coat, all to the Architectural and Structural Engineer's detailed drawings and approval</u></p>			
6	Side cladding screwed vertically to sheeting rails to Architect and Engineer details using screws to manufacturer specifications installed by specialist's in the field, all following the manufacturer's specifications and details	m ²	81	
7	Side cladding screwed to steel frame made of various members (elsewhere measured) to Architects and Engineer details	m ²	86	
	<p><u>Extra over Opal White 50 Translucent Glassfibre Reinforced Polyester sheets, at alternate sheet spacing for natural light to match existing, compatible with side cladding profile, fixed to steel sheeting rails, including all connections and weather tight seals, installed in strict accordance with manufacturer's specifications</u></p>			
8	PALRAM 'Suntuf' or "Equally Approved" 1.2mm Industrial BR7 profiled clear polycarbonate UV stabilised roof sheeting laid in position, with sheets screwed to steel purlins at every sheeting ridge complete with double layer of sheeting at each purlin, double layer to be 100mm wide with the weathering side facing up, all to be installed strictly in strict accordance with the manufacturer's instructions	m ²	71	
	<p><u>Sundries</u></p>			
9	Serrated galvanised mild steel broad flute closers with polyclosers (Provisional)	m	50	
Carried Forward				R
SECTION 3: BUILDING WORKS				
Bill No. 6				
ROOF COVERINGS				

<p style="text-align: center;">Brought Forward</p> <p><u>ROOF VENTILATORS</u></p> <p><u>0.80 mm Thick Z275 glvanized heavy industrial 762mm cover width factory painted roof sheeting in single lengths, and 0.8mm thick accessories, finished with approved colour finish to underside, fixed to steel purlins.</u></p> <p><u>75mm x 5mm glvanized steel battens fitted in between 57 mm X 50mm structural supports that is fixed to 300mm x 100mm outer U-channels with pre-welded cleat fixings.</u></p> <p><u>300mm x 100mm glvanized U-channel to form outer edge of the roof structure incorporating 2 x galvanized steel angle fixing welded to bottom of glvanized 300x 100mm U-channel acting as gutter fixed to the glvanized square tube 60mm x 60mm posts.</u></p> <p><u>300mm x 100mm U-channel acting as gutter welded to the 300mm x 100mm U-channel acting as outer edge.50mm x 50mm opening to be cut in the 300mmx100mm U-channel at every 2nd post fixing interval.</u></p> <p><u>60mm x 50mm x 50mm square tube to be welded to the opening on 300mm x 100mm U channel acting as gutter.This will form a leave for 60mmx60mm posts to slide over acting as down pipe.</u></p> <p><u>60mm x 60mm square tubing as support post100mm x 70 mm unequal leg angle welded to the 300mm x 100 mm gutter channel to act as fixing to ceiling support, 8mm fibre cement board drilled and fixed to 50mmx 50mm glvanized square tubing acting as supporting battens, fixing, cover strips and painting to be as manufacturers specifications.</u></p> <p><u>50mm x 50 mm glvanized square tubing acting as supporting battens and fixed to pre-welded angles on either side by self cutting screw fixings.</u></p> <p><u>The supply and Installation shall be deemed to include all the above and conform to the Engineers details</u></p>			R	
<p style="text-align: center;">Carried Forward</p> <p>SECTION 3: BUILDING WORKS Bill No. 6 ROOF COVERINGS</p>			R	

**THE REPAIRS, REFURBISHMENTS OF SITE
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Brought Forward			R
10	300mm x 100mm U Channel to form outer edge of roof structure (Coping) welded to 300mm x 100mm U channel acting as gutter with 100mm x 70mm unequal angle	m	188
11	50mm x 50mm Opening to gutter	No	41
<p><u>Smoke Ventilation Equipment Installation all supplied in installed as per Drawing No: 2318-T-M-101 SV S12 Rev B and Drawing No: 2318-T-M-101 SV S21 Rev B and to Engineer's Approval and Manufacturer's Specifications</u></p>			
12	Supply and install Curvent Fire X 1620 B (1595mm wide x 1620mm long) louvered slope mounted smoke ventilators aluminium material, including a fusible link to automatically open at 74°C as a primary activating mechanism	No	22
13	Supply and install Curvent Fire X Vertical FXV-10 (1395mm wide x 1000mm high) louvered slope mounted smoke ventilators aluminium material, including a fusible link to automatically open at 74°C as a primary activating mechanism	No	11
<p><u>Controller</u></p>			
14	Ten Zone Master Control Panel, installed. Including provision for rain sensors	No	1
15	Eight Zone Master Control Panel, installed. Including provision for rain sensors	No	1
<p><u>Cable</u></p>			
16	PH30 fire rated reticulation between control panel and each smoke ventilator. Including Galvanized Conduit to roof eve	No	640
<p><u>Burglar Bars</u></p>			
17	Burglar Bars	No	33
Carried Forward			R
<p>SECTION 3: BUILDING WORKS Bill No. 6 ROOF COVERINGS</p>			

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Brought Forward			R	
<u>Bird Guards</u>				
18	Bird Guards	No	33	
<u>Dust Seals</u>				
19	Dust Seals	No	33	
<u>MISCELLANEOUS</u>				
20	Delivery of Ventilators	No	2	
21	Travelling Installation		Item	Not Priced
22	Travelling Installation		Item	
23	Site Visits, Handover & Commissioning		Item	Not Priced
24	Site Visits, Handover & Commissioning		Item	
25	12 Month System Inspection & Guarantee		Item	Not Priced
26	12 Month System Inspection & Guarantee		Item	
27	Hoist Ventilators to Working Height	No	2	
28	Site Establishment		Item	Not Priced
29	Site Establishment		Item	
30	O&M Manuals, including Laminated Block Diagrams	No	2	
31	Health & Safety File		Item	Not Priced
32	Health & Safety File		Item	
33	Scaffolding for Reticulation Installation		Item	Not Priced
34	Scaffolding for Reticulation Installation		Item	
35	Interface – Labour Only		Item	Not Priced
36	Interface – Labour Only		Item	
Carried Forward			R	
SECTION 3: BUILDING WORKS				
Bill No. 6				
ROOF COVERINGS				

Brought Forward			R
<u>ROOF AND WALL INSULATION</u>			
<u>Industrial grade aluminium foil based sisalation</u>			
37	Isover 75mm thick Factorylite non-combustible flexible lightweight industrial fibreglass roof insulation with white metalized foil facing, fixed concurrent with the roof covering above purlins with galvanised steel straining wires at 300mm centres and tied down top and bottom after tensioning with galvanized hoop iron ties with overlaps stapled together, all in accordance with manufacturer's recommendations.	m ²	1 890
38	Isover 75mm thick Factorylite non-combustible flexible lightweight industrial fibreglass roof insulation with white metalized foil facing, retrofitted and laid taut between existing purlins and existing roof sheet coverings including galvanised steel straining wires as necessary fixed concurrent with the roof covering above purlins with galvanised steel straining wires at 300mm centres and tied down top and bottom after tensioning with galvanized hoop iron ties with overlaps stapled together, all in accordance with manufacturer's recommendations.	m ²	516
Carried Forward to Summary of Section No.			R
SECTION 3: BUILDING WORKS			
Bill No. 6			
ROOF COVERINGS			

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 7</u></p> <p><u>CARPENTRY AND JOINERY</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p>Plate nailed timber roof truss construction</p> <p>The following is applicable in respect of roof trusses:</p> <p>Trusses are at maximum 1,20m centres.</p> <p>Joinery</p> <p>Descriptions of frames shall be deemed to include frames, transomes, mullions, rails, etc.</p> <p>Descriptions of hardwood joinery shall be deemed to include pelleting of bolt holes</p> <p style="text-align: center;">-----</p> <p><u>Sawn softwood</u></p>			
1	50mm x 75mm Purlins fixed to timber trusses at spacings as recommended and approved by Engineer	m	438	
2	50mm x 75mm Purlins fixed to existing timber trusses in forming South light opening as approved by Engineer	m	60	
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 7 CARPENTRY AND JOINERY			

Brought Forward		R
<u>EAVES, VERGES, ETC.</u>		
<u>Sawn softwood</u>		
3	50mm x 38mm Tilting batten nailed to timber roof truss	m 114
<u>Wrought meranti</u>		
4	10mm x 19mm Glazing beads to timber doors	m 66
<u>"Everite" medium density plain nutec-cement</u>		
5	10mm x 225mm Fascias and barge boards, including aluminium H-profile jointing strips nailed to tilting batten (elsewhere measured)	m 114
Carried Forward		R
SECTION 3: BUILDING WORKS Bill No. 7 CARPENTRY AND JOINERY		

Brought Forward				R
<u>DOORS, ETC.</u>				
<u>Semi-solid flush doors with commercial veneer on both sides hung to timber frames</u>				
6	813mm x 1932mm x 40mm Solid core door with 100mm undercut (D6, D8, D9)	No	15	
7	813mm x 2032mm x40mm Flush panel solid core single door with 10mm hardwood edges all round, faced with 4mm tempered smooth faced hardwood (D2, D3)	No	2	
8	813mm x 2032mm x 40mm Flush panel solid core single door with 10mm hardwood edges all round, faced with 6mm tempered smooth. and cut out for and including 450mm x 600mm clear safety glass viewing panel.	No	1	
9	813mm x 2032mm high x 40mm Solid core door including natural anodised aluminium louvre grille size 450mm x 450mm to mechanical engineers detail and specification (D1, D5)	No	2	
10	813mm x 2032mm x 40mm Solid core door including natural anodised aluminium louvre grille size 450mm x 450mm to mechanical engineers detail and specification (D5, D18, D21)	No	11	
11	813mm x 2032mm x 44mm Selected red meranti framed ledged braced and battened door with 6mm smooth tempered hardboard flush panel internally.and 108mm x 44mm top rails and stiles. and 220mm x 22mm lock rail and bottom rail. with 22mm V-Jointed meranti tongue & groove boarding. fitted with standard 70mm x 4mm hardwood weather-bar to bottom edge of door. (D23,24,25)	No	5	
12	900mm x 2380mm x 40mm Flush panel solid core single door with 10mm hardwood edges all round, faced with 4mm tempered smooth faced hardwood including natural anodised aluminium louvre grille size 450mm x 450mm to mechanical engineers detail and specification (D11)	No	1	
Carried Forward				R
SECTION 3: BUILDING WORKS Bill No. 7 CARPENTRY AND JOINERY				

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	<p style="text-align: center;">Brought Forward</p> <p>13 900mm x 2032mm x 40mm Flush panel solid core single door with 10mm hardwood edges all round, faced with 4mm tempered smooth faced hardwood. including natural anodised aluminium louvre size 450mm x 450mm grille to mechanical engineers detail and specification (D12, D13)</p> <p style="text-align: right;">No</p>	<p style="text-align: center;">2</p>	<p style="text-align: center;">R</p>	
	<p style="text-align: center;">Carried Forward</p> <p>SECTION 3: BUILDING WORKS Bill No. 7 CARPENTRY AND JOINERY</p>		<p style="text-align: center;">R</p>	

	Brought Forward				R
	<u>FRAMED FRAMES, ETC.</u>				
	<u>Wrought meranti</u>				
14	70mm x 44mm Meranti frame with with 12mm x 28mm stop, countersunk hilti fixed & pelleted to brickwork	No	32		
15	70mm x 44mm Meranti frame with fanlight, fixed with countersunk hilti fixed & pelleted to brickwork	No	2		
16	69mm x 108mm Meranti frame with 12mm rebate, countersunk hilti fixed & pelleted to brickwork/steel channel frame	No	5		
	Carried Forward to Summary of Section No.				R
	SECTION 3: BUILDING WORKS				
	Bill No. 7				
	CARPENTRY AND JOINERY				

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 8</u></p> <p><u>CEILING, PARTITIONS AND ACCESS FLOORING</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Descriptions</u></p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved</p> <p><u>Descriptions</u></p> <p>Hangers, suspension grids, "laying" panels, etc. are to be in accordance with the manufacturers' recommendations</p> <p>Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete</p> <p>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</p> <p><u>Drawings and Specifications</u></p> <p>All ceilings and partitions shall be done in strict accordance to the engineer's and Architect's specification</p> <p><u>Branding</u></p> <p>Branding shall be nailed and in addition be tied with a wire tie at every third junction to the support structure</p> <p style="text-align: center;">-----</p> <p><u>CEILING, ETC.</u></p>			
	Carried Forward		R	
	SECTION 3: BUILDING WORKS Bill No. 8 CEILING ETC			

Brought Forward				R
<u>NAILED UP CEILINGS</u>				
<u>6mm Thick fibre cement ceiling boards with H-type pressed steel jointing strips fixed to and including 38mm x 38mm SA pine battens</u>				
1	Eaves including 38mm x 38mm battens at 450mm centres	m ²	68	
<u>SUSPENDED CEILINGS</u>				
<u>Vinyl faced ceiling tiles size 600mm x 600mm on and including fixing in exposed suspended ceiling grid comprising main tees at 600mm centres and cross tees at 600mm centres with capping of aluminium pre-painted low sheen satin</u>				
2	Horizontal ceilings suspended not exceeding 1000mm below purlins	m ²	715	
<u>Approved cornice</u>				
3	"DONN" or equally approved LSM25 pre-painted pressed metal shadow-line cornice, plugged	m	784	
<u>INSULATION</u>				
<u>"Aerolite" insulation</u>				
4	100mm Aerolite glasswool insulation laid over the top of the ceiling tiles, with 100mm overlaps.in accordance with the manufacturers recommendations or equally approved	m ²	715	
Carried Forward to Summary of Section No.				R
SECTION 3: BUILDING WORKS				
Bill No. 8				
CEILINGS ETC				

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 9</u></p> <p><u>IRONMONGERY</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Finishes to ironmongery</u></p> <p>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 SS Stainless steel</p> <p><u>NOTE:</u></p> <p>Tenderers are advised to study the Specification of Materials and Methods to be used (PW371) before pricing this bill.</p> <p>-----</p> <p>Ironmongery is fixed to timber unless otherwise described.</p> <p>-----</p> <p><u>HINGES, BOLTS, ETC.</u></p> <p><u>"Dorma" or Equally Approved</u></p>			
1	102mm x 75mm x 3mm Two Ball Bearing Butt Hinge code TS73V (SS)	No	113	
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 9 IRONMONGERY			

Brought Forward			R
<u>HANDLES</u>			
<u>"Dorma" or Equally Approved</u>			
2	Protea lever door handle	Pairs	6.0
<u>"Dorma" or Equally Approved</u>			
3	382mm x 32mm Straight Tubular Pull Handle code DPH213 BTB fixed to the door.	Pairs	15
4	Lever handle on plate with cylinder cut out code: CB30 (SC)	Sets	1
<u>LOCKS</u>			
<u>"Dorma" or Equally Approved</u>			
5	Cisa Double throw profile cylinder mortice dead lock code: 52310	No	5
6	Cylinder sash lock code: D036S SS (Stainless Steel)	No	2
7	Bathroom WC indicator and turn knob code DWC-006 with escutcheon plates epoxy glued (SS)	No	22
Carried Forward			R
SECTION 3: BUILDING WORKS			
Bill No. 9			
IRONMONGERY			

Brought Forward			R
<u>PUSH PLATES AND KICKING PLATES</u>			
<u>"Dorma" or Equally Approved 1,2mm Satin finish stainless steel plates counter sunk screwed along edges at not exceeding 200mm centres</u>			
8	150mm x 150mm Stainless steel push plate	No	13
9	800mm x 150mm Stainless steel kick plate	No	27
<u>BATHROOM FITTINGS</u>			
<u>"Cobra" or Equally Approved</u>			
10	900mm x 19mm Chromium plated steel towel rail with chromium plated flanged wall brackets screwed to plugs in wall.	No	20
11	500mm x 600mm x 6mm Float Glass silvered back mirror, with polished edges, four time holed for and screwed to plugs in wall with chromium plated dome headed screws and cork washer at back.	No	19
<u>"Serra" or Equally Approved</u>			
12	ROL TR3 Toilet roll holder, mild steel in high quality appliance white powder-coated finish fixed to wall	No	35
13	Janitorial Wall Mounted Soap Dispenser (Manual 500ml White/Grey Gel Pump) Code: JA0501DG	No	11
14	Folded paper towel dispenser in stainless steel fining (Code: AYT-001B)	No	10
<u>"Franke" or Equally Approved</u>			
15	32mm Diameter stainless steel angle grab rail adjacent to WC, (code CNTX PAR) fitted according to standard universal design and manufacturer's instructions	No	3
16	32mm Diameter stainless steel 550mm long horizontally placed grab rail to rear of WC (code CNTX 550) fitted according to standard universal design and manufacturer's instructions	No	3
Carried Forward			R
SECTION 3: BUILDING WORKS			
Bill No. 9			
IRONMONGERY			

	Brought Forward				R
	<u>SUNDRIES</u>				
	<u>"Dorma" or Equally Approved</u>				
17	Regular arm "Non hold open" door closer (code TS73V EN-2-4) with adjustable strength and hydraulic speed control	No	40		
18	150mm x 150mm "MALE" sign code DSS-130 M (SS)	No	6		
19	150mm x 150mm "FEMALE" sign code DSS-130 F (SS)	No	5		
20	150mm x 150mm "DISABLED PERSONS" sign code DSS-133 P (SS)	No	3		
21	Door stop and holder code:401 (SC)	No	1		
	<u>STEEL LOCKERS</u>				
	<u>"Greenfield" or "Equally Approved" Guardsman Baseline epoxy coated mild steel lockers (Code: GB002)</u>				
22	Two door locker size 300mm x 450mm x 1800mm high, each door complete with 2no off hinges, hasp and staple, 2no off coat hooks, 1no of intermediate shelf and sets of three ventilation louvres per door all complete to manufacturer	No	20		
	Carried Forward to Summary of Section No.				R
	SECTION 3: BUILDING WORKS				
	Bill No. 9				
	IRONMONGERY				

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 10</u></p> <p><u>STRUCTURAL STEELWORK</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved</p> <p><u>Descriptions</u></p> <p>Descriptions</p> <p>Descriptions of bolts shall be deemed to include nuts and washers</p> <p>Descriptions of L-shaped and U-shaped anchor bolts shall be deemed to include bending, threading, nuts and washers and embedding in concrete</p> <p>Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete</p> <p>Descriptions of bolts shall be deemed to include nuts and washers</p> <p>Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork of concrete</p> <p>Metalwork described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described</p> <p style="text-align: center;">-----</p> <p><u>STEEL COLUMNS AND BEAMS</u></p> <p><u>Welded columns in single lengths with flat section base, top, bearer and connection plates, bolted to concrete including connections</u></p>			
1	IPE 140mm x 73mm IPE Section column	t	0.37	
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 10 STRUCTURAL STEELWORK			

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Brought Forward			R
2	203mm x 133mm x 25kg/m I-section column	t	0.69
	<u>Welded beams in single lengths with flat section base, top, bearer and connection plates, bolted to steel</u>		
3	305mm x 102mm x 25mm Universal Beams	t	0.04
	<u>Bolts to columns, beams, etc.</u>		
4	M12 U-shaped anchor bolt 1000mm girth embedded in top of concrete including 150mm x 75mm 25MPa non shrink grout pocket on both ends	No	139
5	M12 x 60mm Bolt and nut	No	85
6	M12 Chemical anchors	No	12
7	M16 Chemical anchors	No	9
8	M12 U-bolt inserted vertically and horizontally to fix new steel column to existing	No	23
9	Canopy M12 U-shaped anchor bolt 1000mm girth embedded in top of concrete including 150mm x 75mm 25MPa non shrink grout pocket on both ends	No	150
Carried Forward			R
SECTION 3: BUILDING WORKS			
Bill No. 10			
STRUCTURAL STEELWORK			

Brought Forward			R
<u>HOT DIPPED GALVANISED PURLINS, GIRTS, BRACING, ETC.</u>			
<u>Galvanised steel purlins, grits, etc. bolted to steel and/or concrete</u>			
10	100mm x 50mm x 20mm x 2.5mm Lipped Channel	t	0.13
11	125mm x 75mm x 8mm RSA purlin split joint	t	0.14
12	150mm x 65mm x 20mm x 2.5mm Lipped Channel	t	0.38
13	150mm x 65mm x 20mm x 2.5mm CFLC Purlins elsewhere removed	t	0.04
14	150mm x 65mm x 20mm x 2.5mm CFLC Purlins	t	1.61
15	175mm x 50mm x 20mm x 2.5mm CFLC Girts	t	1.07
16	175mm x 50mm x 20mm x 2.5mm Lipped channel	t	0.58
<u>Welded bracing etc. with flat section connection plates bolted to steel</u>			
17	50mm x 50mm x 6mm RSA Bracing and verticals	t	0.03
18	50mm x 50mm x 3mm Sag bar	t	0.90
19	12mm Fixing plate with 2 x M12 bolts (elsewhere measured)	t	0.01
20	60.3mm x 2mm Diameter Hollow section	t	0.11
21	50mm x 50mm x 3mm False Rafter	t	0.15
<u>Welded plates and base plates flat section connection plates bolted to steel or concrete</u>			
22	150mm x 8mm Flat bar	t	0.52
23	75mm x 50mm 6mm Angle	t	0.07
24	6mm Plate	t	0.13
25	10mm Base Plate	t	0.02
26	215mm x 140mm x 6mm Base plate	t	0.01
Carried Forward to Summary of Section No.			R
SECTION 3: BUILDING WORKS			
Bill No. 10			
STRUCTURAL STEELWORK			

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 11</u></p> <p><u>METALWORK</u></p> <p>Descriptions</p> <p>Descriptions of bolts shall be deemed to include nuts and washers</p> <p>Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete</p> <p>Metalwork described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved</p> <p><u>Descriptions</u></p> <p>Descriptions of bolts shall be deemed to include nuts and washers</p> <p>Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork of concrete</p> <p>Metalwork described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described</p> <p style="text-align: center;">-----</p>			
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 11 METALWORK			

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

Brought Forward				R
<u>ALUMINIUM WINDOWS, DOORS, ETC.</u>				
<u>Anodised aluminium windows glazed with obscure toughened safety glass and plugged to brickwork or concrete. Refer to Window Schedules attached</u>				
1	HBS Nuklip purpose made powder coated aluminium window with made up as 36mm Aluminium casement and mullion profile sections to make up window size 900mm x 600mm high overall indicated on elevation. With opening section as per elevation, designed to meet the performance requirements of SANS 613 for wind loads of up to 1500Pa (wind load to be confirmed by structural engineer). Aluminium surface colour - RAL 7016- anthracite grey or similar approved anodising in accordance with SANS 999 for anodising, supplied by a manufacturer complying with SANS 1578 and applied in accordance with SANS 1796 by an approved applicator. Casement system to be lugged with pre-fitted DPC built into brickwork. All aluminium to be AAAMSA certified as to performance, glazing, surface finishing, hardware, fasteners, product certification and, when required, energy rating. With obscure toughened safety glass. All glazing shall be in accordance with SABS 0400-1990, SABS 0137 and SABS 1263 - 1. All safety glazing materials (individual panes) shall be permanently marked by etching or sand blasting. Such marking shall be visible after glazing process. If it is not marked, it is not safety glass. One pair of hinges per opening section to be supplied and fitted by manufacturer and in accordance with AAAMSA requirements. One pair of concealed securi-stays per opening section to be supplied and fitted by manufacturer and in accordance with AAAMSA requirements. All fittings – fixed catch lugs, handle, hinges, stops to be bolted to the frame with stainless steel anti-vandal bolts and Nyloc nuts. Euro cast aluminium handle to have the fixing bolts and screw capping applied with lock-tite or similar approved to prevent vandalism and removal. The aluminium casement to be fitted with a two point locking mechanism or four point locking mechanism for opening sections larger than 900mm in conjunction with the euro cast aluminium handle. (W9)	No	1	
2	Ditto, but 550mm x 650mm high overall indicated on elevation. (W6)	No	13	
3	Ditto, but 600mm x 600mm high overall indicated on elevation. (W16)	No	10	
Carried Forward				R
SECTION 3: BUILDING WORKS Bill No. 11 METALWORK				

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

	Brought Forward			R	
4	Ditto, but 900mm x 600mm high overall indicated on elevation. (W17)	No	4		
5	Ditto, but 1000mm x 650mm high overall indicated on elevation. (W8)	No	2		
6	Ditto, but 600mm x 1200mm high overall indicated on elevation. (W5)	No	4		
7	Ditto, but 600mm x 1900mm high overall indicated on elevation. (W2)	No	1		
8	Ditto, but 1460mm x 650mm high overall indicated on elevation. (W7)	No	7		
Carried Forward				R	
SECTION 3: BUILDING WORKS Bill No. 11 METALWORK					

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

Brought Forward				R
9	<p><u>Anodised aluminium windows glazed with 6.38mm "Solarvue HL" Neutral safety glass and plugged to brickwork or concrete. Refer to Window Schedules attached</u></p> <p>36mm Aluminium casement and mullion profile sections to make up window size 450mm x 1800mm high overall indicated on elevation. With opening section as per elevation, designed to meet the performance requirements of SANS 613 for wind loads of up to 1500Pa (wind load to be confirmed by structural engineer). Aluminium surface colour - RAL 7016-anthracite grey or similar approved anodising in accordance with SANS 999 for anodising, supplied by a manufacturer complying with SANS 1578 and applied in accordance with SANS 1796 by an approved applicator. Casement system to be lugged with pre-fitted DPC built into brickwork. All aluminium to be AAAMSA certified as to performance, glazing, surface finishing, hardware, fasteners, product certification and, when required, energy rating. With 6.38mm 'Solarvue HL' neutral safety glass. All glazing shall be in accordance with SABS0400-1990, SABS 0137 and SABS 1263 - 1. All safety glazing materials (individual panes) shall be permanently marked by etching or sand blasting. Such marking shall be visible after glazing process. If it is not marked, it is not safety glass. One pair of hinges per opening section to be supplied and fitted by manufacturer and in accordance with AAAMSA requirements. One pair of concealed securi-stays per opening section to be supplied and fitted by manufacturer and in accordance with AAAMSA requirements. All fittings – fixed catch lugs, handle, hinges, stops to be bolted to the frame with stainless steel anti-vandal bolts and Nyloc nuts. Euro cast aluminium handle to have the fixing bolts and screw capping applied with lock-tite or similar approved to prevent vandalism and removal. The aluminium casement to be fitted with a two point locking mechanism or four point locking mechanism for opening sections larger than 900mm in conjunction with the euro cast aluminium handle.(W23)</p>	No	1	
10	Ditto, but 1200mm x 760mm high overall indicated on elevation. (W12)	No	1	
11	Ditto, but 600mm x 1200mm high overall indicated on elevation. (W15)	No	1	
Carried Forward				R
SECTION 3: BUILDING WORKS				
Bill No. 11				
METALWORK				

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R
12	Ditto, but 1200mm x 600mm high overall indicated on elevation. (W19)	No	3
13	Ditto, but 600mm x 2070mm high overall as per elevation high overall indicated on elevation (W4)	No	3
14	Ditto, but 1500mm x 600mm high overall indicated on elevation. (W20)	No	4
15	Ditto, but 1300mm x 1200mm high overall indicated on elevation. (W14)	No	1
16	Ditto, but 1200mm x 900mm high overall indicated on elevation. (W21)	No	1
17	Ditto, but 600mm x 1200mm high overall indicated on elevation. (W11)	No	4
18	Ditto, but 600mm x 1500mm high overall indicated on elevation. (W10)	No	4
19	Ditto, but 600mm x 1800mm high overall indicated on elevation. (W18)	No	3
20	Ditto, but 1200mm x 1200mm high overall indicated on elevation. (W13)	No	1
21	Ditto, but 1800mm x 1200mm high overall indicated on elevation. (W22)	No	1
22	Ditto, but 995mm x 2070mm high overall indicated on elevation. (W3)	No	2
23	Ditto, but 1200mm x 1900mm high overall indicated on elevation. (W1)	No	10
<u>Anodised aluminium windows burglar bars to windows. Refer to Window Schedules attached</u>			
24	Aluminium burglar bars size 550mm x 650mm high fitted using anti vandal bolt and nut, fitted through a washer and mild steel flat bar in the casement section of the window. Mild steel flat bar to have spacers between the aluminium and mild steel to prevent material corrosion. Aluminium burglar bars to be positioned not more than 150mm apart on all section of the window. (W6)	No	13
Carried Forward			R
SECTION 3: BUILDING WORKS			
Bill No. 11			
METALWORK			

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R
25	Ditto, but 600mm x 600mm high. (W16)	No	10
26	Ditto, but 900mm x 600mm high. (W17)	No	4
27	Ditto, but 1000mm x 650mm high. (W8)	No	2
28	Ditto, but 600mm x 1200mm high (W11, W12)	No	8
29	Ditto, but 600mm x 1200mm high (W15)	No	1
30	Ditto, but 1200mm x 600mm high (W19)	No	3
31	Ditto, but 1200mm x 760mm high (W12)	No	1
32	Ditto, but 450mm x 1800mm high (W23)	No	1
33	Ditto, but 1460mm x 650mm high (W7)	No	7
34	Ditto, but 600mm x 1500mm high. (W10)	No	4
35	Ditto, but 1500mm x 600mm high. (W20)	No	4
36	Ditto, but 600mm x 1800mm high. (W18)	No	3
37	Ditto, but 1200mm x 900mm high. (W21)	No	1
38	Ditto, but 600mm x 1900mm high. (W2)	No	1
39	Ditto, but 1200mm x 1200mm high. (W13)	No	1
40	Ditto, but 1300mm x 1200mm high. (W14)	No	1
41	Ditto, but 1200mm x 1900mm high. (W4)	No	10
42	Ditto, but 1800mm x 1200mm high. (W22)	No	1
Carried Forward			R
SECTION 3: BUILDING WORKS			
Bill No. 11			
METALWORK			

Brought Forward			R
43	<p><u>Anodised aluminium doors glazed with obscure toughened safety glass and plugged to brickwork or concrete. Refer to Door Schedules attached</u></p> <p>Primador framed single pivot door size 800mm x 2000mm high aluminium finish with and including suitable frame for door size and sealed all round all to AAMSA standards Door to have 30mm jamb extensions for 1044mm opening and pivot to be stainless steel with built in water strip, designed to open outward. Glass to be toughened obscure safety glass to comply with SANS10400 part N and SANS 613 for performance standards. All supplied and installed as per manufacturer's instructions. (D6, D10, D16, D19)</p>	No	4
44	<p><u>"Aluglass" anodised aluminium doors with 6.38mm "Intruderprufe " Neutral safety glass plugged to brickwork. Refer to Door Schedules attached</u></p> <p>HBS Nuklip purpose made powder coated aluminium door of size 900mm x 2100mm high with and including hardware and suitable ironmongery furniture and including suitable frame as per door schedule all in RAL 7016 Anthracite Grey colour. All aluminium to be AAAMSA certified as to performance, glazing, surface finishing, hardware, fasteners, product certification and, when required, energy rating. With 6.38mm 'Intruderprufe Natural Safety' clear laminated safety glass. All glazing shall be in accordance with SABS 10400-1990, SABS 0137 and SABS 1263 - 1. All safety glazing materials (individual panes) shall be permanently marked by etching or sand blasting. Such marking shall be visible after glazing process. If it is not marked, it is not safety glass. Supplied and installed to manufacturer's instructions. (D2, D3, D12, D28)</p>	No	4
45	<p>Ditto, but 900mm x 2100mm high purpose made powder coated door. (D2)</p>	No	1
Carried Forward			R
<p>SECTION 3: BUILDING WORKS Bill No. 11 METALWORK</p>			

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

Brought Forward			R
46	HBS Nuklip purpose made powder coated aluminium door of size 900mm x 2790mm high with and including hardware and suitable ironmongery furniture and including suitable fanlight frame as per door schedule all in RAL 7016 Anthracite Grey colour. All aluminium to be AAAMSA certified as to performance, glazing, surface finishing, hardware, fasteners, product certification and, when required, energy rating. With 6.38mm 'Intruderprufe Natural Safety' clear laminated safety glass. All glazing shall be in accordance with SABS 10400-1990, SABS 0137 and SABS 1263 - 1. All safety glazing materials (individual panes) shall be permanently marked by etching or sand blasting. Such marking shall be visible after glazing process. If it is not marked, it is not safety glass. Supplied and installed to manufacturer's instructions. (D1)	No	1
47	Ditto, but 1500mm wide x 2400mm high purpose made powder coated aluminium door with side light as per the schedule. (D3, D4, D6)	No	3
48	HBS Nuklip purpose made powder coated aluminium double door of size 1470mm x 2100mm high with side light with and including hardware and suitable ironmongery furniture and including suitable frame as per door schedule all in RAL 7016 Anthracite Grey colour. All aluminium to be AAAMSA certified as to performance, glazing, surface finishing, hardware, fasteners, product certification and, when required, energy rating. With 6.38mm 'Intruderprufe Natural Safety' clear laminated safety glass. All glazing shall be in accordance with SABS 10400-1990, SABS 0137 and SABS 1263 - 1. All safety glazing materials (individual panes) shall be permanently marked by etching or sand blasting. Such marking shall be visible after glazing process. If it is not marked, it is not safety glass. Supplied and installed to manufacturer's instructions. (D1, D4)	No	3
Carried Forward			R
SECTION 3: BUILDING WORKS Bill No. 11 METALWORK			

Brought Forward			R
49	<p>HBS Nuklip purpose made powder coated aluminium double door of size 1700mm x 2790mm high with and including hardware and suitable ironmongery furniture and including suitable frame as per door schedule all in RAL 7016 Anthracite Grey colour. All aluminium to be AAAMSA certified as to performance, glazing, surface finishing, hardware, fasteners, product certification and, when required, energy rating. With 6.38mm 'Intruderprufe Natural Safety' clear laminated safety glass. All glazing shall be in accordance with SABS 0400-1990, SABS 0137 and SABS 1263 - 1. All safety glazing materials (individual panes) shall be permanently marked by etching or sand blasting. Such marking shall be visible after glazing process. If it is not marked, it is not safety glass. Supplied and installed to manufacturer's instructions (D1,D13, D10)</p> <p><u>Anodised aluminium doors glazed with 6.38mm "Solarvue HL" Neutral safety glass and plugged to brickwork or concrete. Refer to Door Schedules attached</u></p>	No	3
50	<p>HBS Nuklip purpose made powder coated aluminium double door of size 2500mm x 2400mm high with 2 x side lights on either side as per the schedule and including hardware and suitable ironmongery furniture and including suitable frame as per door schedule all in RAL 7016 Anthracite Grey colour. All aluminium to be AAAMSA certified as to performance, glazing, surface finishing, hardware, fasteners, product certification and, when required, energy rating. With 6.38mm 'Solarvue HL' neutral clear laminated safety glass. All glazing shall be in accordance with SABS 10400-1990, SABS 0137 and SABS 1263 - 1. All safety glazing materials (individual panes) shall be permanently marked by etching or sand blasting. Such marking shall be visible after glazing process. If it is not marked, it is not safety glass. Supplied and installed to manufacturer's instructions (D1)</p>	No	1
Carried Forward			R
<p>SECTION 3: BUILDING WORKS Bill No. 11 METALWORK</p>			

	Brought Forward			R
	<u>STEEL ROLLER SHUTTERS ETC.</u>			
	<u>"Serranda" Series 500 Push-Up type door or Equally Approved. Refer to Door Schedule attached</u>			
51	Galvanised chain operated industrial type roller shutter door with 75mm x 0,8mm thick end locked slatted curtain roller shutter for opening 3000mm x 3000mm high with overhead box 335mm high including canopy cover, standard bottom rail, 75mm wide guides, extruded aluminium T-bar with rubber seal, galvanised ancillary components including 4,5mm thick end plates, guide rails, guide lock, fixed to brick jambs and concrete lintel. All supplied and installed as per manufacturer's instructions. (D26, D27)	No	4	
52	Galvanised chain operated industrial type roller shutter door with 75mm x 0,8mm thick end locked slatted curtain roller shutter for opening 4500mm x 3500mm high with overhead box 335mm high including canopy cover, standard bottom rail, 75mm wide guides, extruded aluminium T-bar with rubber seal, galvanised ancillary components including 4,5mm thick end plates, guide rails, guide lock, fixed to brick jambs and concrete lintel. All supplied and installed as per manufacturer's instructions. (D22)	No	1	
	Carried Forward to Summary of Section No.			R
	SECTION 3: BUILDING WORKS			
	Bill No. 11			
	METALWORK			

Item No		Quantity	Rate	Amount R
	<u>BILL NO 12</u>			
	<u>PLASTERING</u>			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	<u>Proprietary items or materials</u>			
	Proprietary items or materials where specified are to be of the brand specified - or other approved			
	<u>Drawings and Specifications</u>			
	All plastering work shall be done in strict accordance to the engineer's and Architect's specification			

	<u>INTERNAL PLASTER</u>			
	<u>One coat cement plaster (5:1) on brickwork finished with a wood float</u>			
1	On walls	m ²	654	
2	On narrow widths not exceeding 300mm wide	m ²	74	
	<u>One coat cement plaster (5:1) with an approved bonding liquid agent on concrete finished with a wood float</u>			
3	On projecting and isolated beams	m ²	12	
	<u>EXTERNAL PLASTER</u>			
	<u>One coat cement plaster (5:1) on brickwork finished with a wood float</u>			
4	On walls	m ²	592	
5	On narrow widths not exceeding 300mm wide	m ²	42	
	Carried Forward to Summary of Section No.			R
	SECTION 3: BUILDING WORKS			
	Bill No. 12			
	PLASTERING			

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 13</u></p> <p><u>TILING</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved</p> <p><u>Fixing</u></p> <p>Tiling shall be fixed with an approved tile epoxy adhesive to a plaster backing. Plaster backing is measured elsewhere</p> <p>Descriptions</p> <p>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</p> <p style="text-align: center;">-----</p>			
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 13 TILING			

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

Brought Forward			R
<u>WALL TILING</u>			
<u>200mm x 200mm Gloss White Ceramic Tiles fixed with waterproof professional adhesive tile to wood floated class II mortar plaster (plaster elsewhere measured), adhesive applied using a notched trowel, with 3mm joints continuous in both directions grouted with fine white epoxy tile grout with minimum 5mm expansion joint at perimeter</u>			
1	On walls	m ²	635
<u>FLOOR TILING</u>			
<u>600mm x 600mm Porcelain floor tiles fixed with fixed with waterproof professional adhesive tile to screed (screed elsewhere measured), adhesive applied using a notched trowel, with joints continuous in both directions and flush pointed with tile grout tile grout</u>			
2	On floors	m ²	558
3	Porcelain half cut skirting not exceeding 150mm	m	700
<u>600mm x 600mm Porcelain floor tiles (Ash and Deep) cut to 100mm x 100mm sizes to allow for falls to floor outlets fixed with waterproof professional adhesive tile to screed (screed elsewhere measured), adhesive applied using a notched trowel, with joints continuous in both directions and flush pointed with dark grey tile grout</u>			
4	On floors	m ²	9
<u>SUNDRIES</u>			
<u>Tile expansion joint</u>			
5	M-Trim 12mm high brushed stainless steel straight edge trim (Code: SSE120)	m	59
Carried Forward to Summary of Section No.			R
SECTION 3: BUILDING WORKS			
Bill No. 13			
TILING			

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 14</u></p> <p><u>PLUMBING AND DRAINAGE (PROVISIONAL)</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved</p> <p><u>Fixing</u></p> <p>Descriptions of wall mounted, floor standing, drop-in, etc. type sanitary fittings shall be deemed to include fixing in position and all fixing accessories</p> <p>Descriptions of proprietary items shall include fixing in position and all fixing accessories as specified by the manufacturer</p> <p><u>Chasing</u></p> <p>Chasing pipes into new walls shall be regarded as "building in" and is not measured separately. The cost of chasing and making good shall be included in the rates for pipes</p> <p><u>Stainless steel sanitary fittings</u></p> <p>Units shall have standard aprons on all exposed edges and tiling keys against walls where applicable</p> <p><u>Waste unions</u></p> <p>Descriptions of waste unions shall be deemed to include rubber or vulcanite plugs and linked chains fixed to fittings</p> <p><u>RAINWATER DISPOSAL</u></p> <p style="text-align: right;">Carried Forward</p> <p>SECTION 3: BUILDING WORKS Bill No. 14 PLUMBING AND DRAINAGE</p>			R

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward				R
	<u>Galvanised sheet metal gutter size 317mm x 200mm x 3mm thick including matching rivet-fixed mitres and end caps internally sealed using Silicone Mastic, hung by nail fixed internal aluminium hangers at 800mm centres all to Engineer's approval</u>			
1	317mm x 200mm Gutters in continuous lengths, including brackets as prescribed by the Engineer at appropriate centres	m	22	
	<u>"Ogee" or equally approved profile colourbond pre-coated Zinalume seamless gutter size 150mm x 100mm x 0.5mm thick in colour (to be confirmed) including matching rivet-fixed mitres and end caps internally sealed using Silicone Mastic, hung by nail fixed internal aluminium hangers at 800mm centres</u>			
2	125mm x 150mm x 125mm Eaves Gutter	m	485	
3	100 x 75mm Rainwater pipes in continuous lengths	m	120	
	<u>HDPE Pipes</u>			
4	110mm Pipes laid in and including trenches, backfilling, compaction and encasing not exceeding 1000mm deep	m	10	
	<u>Extra over HDPE pipes for fittings</u>			
5	110mm Bend	No	3	
6	50mm Bends	No	72	
	Carried Forward			R
SECTION 3: BUILDING WORKS Bill No. 14 PLUMBING AND DRAINAGE				

Brought Forward			R
<u>SANITARY FITTINGS</u>			
<u>E.O Stainless Steel pipes for fittings</u>			
7	Vaal Flamingo vitreous china wall mounted basin (Code: 7007), size 560mm x 405mm with one taphole including integrated overflow and chainstay hole, bolted to wall with 2 x No.10mm bolts (Code: 8448Z0) and sealed with silicone sealant where basin meets wall, manufactured in accordance with SANS 226:2004 Type 1 (BS 5412)	No	19
8	Cobra Arrive wall hung toilet pan (Code:CARPAWH1-6DT01) with Cobra Arrive seat for WH Toilet pan (code:CARSTWH1-6DT01) suite colour White, and Cobra concealed cistern (Code: CENSHJNN-2CO) with Cobra Dynamic dit flush plate (Code: MZ007187)	No	16
9	Vaal vitreous china "Protea Paraplegic" 90° outlet pan (Code 7502) and matching 9 litre cistern (Code 710539) complete with lid, fittings and purpose-made Chrome .Plated. side-flush lever mounted on wall adjacent to cistern (left). Bottom inlet water supply must be on same side as flush lever. Colour: White	No	3
10	Vaal Sanitaryware vitreous china wall hung "Flatback" waterless urinal (Code: 705327). Supplied with waterless waste union, fixed on and including two hanger brackets (Code: 8127Z0)	No	6
<u>"Franke" or Equally approved</u>			
11	Trendline Model 1200mm x 535mm DEB Grade 304 18/10 polished stainless steel double end bowl drop on sink (Code: 312081), overall size 1200mm x 535mm with two 343mm x 410mm x 140mm deep bowls, fitted onto cupboard (elsewhere specified) including PVC traps (traps elsewhere measured) with 38mm waste fitting fitted complete as per manufacturer's instructions	No	3
12	540mm x 455mm Franke Economy ET 101 single stainless steel wash trough	No	1
Carried Forward			R
SECTION 3: BUILDING WORKS Bill No. 14 PLUMBING AND DRAINAGE			

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward				R
<u>"Panda Master" or Equally Approved</u>				
13	Floor drain (or similar approved) with permanent water seal to prevent sewer smell in the interior environment. Manufactured from stainless steel 304. Floor drain to be connected in accordance with the SAN 10400 requirements and manufacturer's instructions	No	1	
<u>TRAPS ETC.</u>				
<u>"Marley" or Equally approved</u>				
14	40mm shower trap supplied and installed complete	No	7	
<u>Chromium plated</u>				
15	40mm Deep Seal Bottle trap with outlet for 50mm PVC supplied and installed complete as per manufacturer's instruction	No	26	
<u>"Panda" or Equally approved</u>				
<u>Shower outlet</u>				
16	Gio A1015 100mmx100mm Gio chrome plated square shower trap supplied and installed complete (Code: A1015)	No	7	
17	138mm x 138mm Square floor drain fixed onto 50mm diameter vertical outlet pipe supplied and installed complete	No	1	
<u>Gulleys</u>				
18	150mm x 110mm Diameter PVC gully head including 2 x 45° long radius bends all encased in 25MPa/19mm concrete encasing as per Engineer's detail supplied and installed complete	No	3	
<u>TAPS, VALVES, ETC.</u>				
<u>"Cobra" or Equally Approved</u>				
19	Cobra LEDIMO pillar tap SQ15mm chrome plated (Code: FPT2A1LE-0GT01) and 1 x 400mm long flexible inlets, supplied and installed complete	No	1	
Carried Forward				R
SECTION 3: BUILDING WORKS Bill No. 14 PLUMBING AND DRAINAGE				

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R
20	Cobra Zambezi PT Single lever Basin mixer (Code: FBN1D1ZM-0GT0425) and 2 x 400mm long flexible inlets, supplied and installed complete	No	19
21	15mm Chrome plated star sink mixer (Code 296) with aerated swivel spout and 2 x 400mm long flexible inlets, supplied and installed complete	No	3
22	15mm Cobra focus chrome plated under wall shower mixer (Code:956) supplied and installed complete	No	7
23	15mm Plumline standard chrome plated shower arm & flange, supplied and installed complete	No	7
24	15mm Plumline chrome plated standard ball-joint shower rose supplied and installed complete	No	7
25	Cobra Flushmaster code:FJ6000 supplied and installed complete	No	6
26	Cobra or "Equally Approved" isolating ball valves supplied and installed supplied and installed complete	No	1
<u>SANITARY PLUMBING</u>			
<u>uPVC pipes</u>			
27	50mm Pipes	m	99
28	50mm Pipes chased into walls	m	5
<u>Extra over uPVC pipes for uPVC fittings</u>			
29	110mm Pan connector supplied and installed complete	No	19
<u>WATER SUPPLIES</u>			
<u>Class 2 copper pipes</u>			
30	15mm Pipes chased into walls	m	84
31	15mm Pipes	m	101
32	22mm Pipes	m	102
33	22mm Pipes chased in walls	m	44
Carried Forward			R
SECTION 3: BUILDING WORKS Bill No. 14 PLUMBING AND DRAINAGE			

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

		Brought Forward				R
34	35mm Pipes chased into walls	m	99			
		Carried Forward				R
SECTION 3: BUILDING WORKS Bill No. 14 PLUMBING AND DRAINAGE						

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R
<u>Extra over class 2 copper pipes for capillary fittings</u>			
35	15mm Fittings	No	32
36	22mm Fittings	No	15
<u>BUDGETARY ALLOWANCE</u>			
<u>The following in Budgetary Allowance for work to be carried out by the contractor</u>			
37	Provide the sum of R100 000.00 One Hundred Thousand Rands for unblocking existing stormwater channels and construction of 500mm wide stormwater trapezoidal channels as and where required subject to inspection and directive from the Civil Engineer	Item	100 000.00
38	Provide the sum of R100 000.00 One Hundred Thousand Rands for unblocking existing sewer network and relaying of new lines and network and cutting through concrete surfaced etc. where required, subject to inspection and directive from the Civil Engineer	Item	100 000.00
39	Provide the sum of R35 000.00 (Thirty Five Thousand Rands) for supply and installation of HDPE and uPVC piping for water supply, including cutting through concrete surfaces and brick surfaces as and where required subject to inspection and directive from the Civil Engineer	Item	35 000.00
Carried Forward to Summary of Section No.			R
SECTION 3: BUILDING WORKS			
Bill No. 14			
PLUMBING AND DRAINAGE			

Item No		Quantity	Rate	Amount R
	<u>BILL NO 15</u>			
	<u>GLAZING</u>			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	<u>Proprietary items or materials</u>			
	Proprietary items or materials where specified are to be of the brand specified - or other approved			
	<u>GLAZING TO STEEL WITH PUTTY</u>			
	<u>6.38mm Clear laminated safety glass. All glazing shall be in accordance with SABS 0400- 1990, SAB 0137 and SABS 1263-1.All safety glazing materials (individual panes)shall be permanently marked by etching or sand blasting. Such marking shall be visible after glazing process. If it is not marked, it is not safety glass. All in accordance with the manufactures specification</u>			
1	Panes exceeding 0,5m ² and not exceeding 2m ²	m ²	3	
2	Panes exceeding 2m ² and not exceeding 4m ²	m ²	82	
3	Panes exceeding 4m ² and not exceeding 6m ²	m ²	48	
	Carried Forward			R
	SECTION 3: BUILDING WORKS Bill No. 15 GLAZING			

	Brought Forward			R
	<p><u>GLAZING TO WOOD WITH PINNED-ON BEADS (ELSEWHERE MEASURED)</u></p> <p><u>6.38mm Clear laminated safety glass. All glazing shall be in accordance with SABS 0400- 1990, SAB 0137 and SABS 1263-1.All safety glazing materials (individual panes) shall be permanently marked by etching or sand blasting. Such marking shall be visible after glazing process. If it is not marked, it is not safety glass. All in accordance with the manufactures specification</u></p>			
4	Panes exceeding 0,5m ² and not exceeding 2m ²	m ²	1	
5	Panes exceeding 2m ² and not exceeding 4m ²	m ²	4	
	<p>Carried Forward to Summary of Section No.</p> <p>SECTION 3: BUILDING WORKS Bill No. 15 GLAZING</p>			R

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 16</u></p> <p><u>PAINTWORK</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>DESCRIPTIONS</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary items or materials</u></p> <p>Proprietary items or materials where specified are to be of the brand specified - or other approved</p> <p>Descriptions of paintwork shall be deemed to include for all cutting in</p> <p><u>PREPARATORY WORK TO EXISTING WORK</u></p> <p>Previously painted plastered surfaces</p> <p>Surfaces shall be thoroughly washed down and allowed to dry completely before any paint is applied. Blistered or peeling paint shall be completely removed and cracks shall be opened, filled with a suitable filler and finished smooth</p> <p>Previously painted metal surfaces</p> <p>Surfaces shall be thoroughly rubbed and cleaned down. Blistered or peeling paint shall be completely removed down to bare metal</p> <p>Previously painted wood surfaces</p> <p>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</p> <p><u>PAINT SPECIFICATIONS</u></p> <p>All painting shall be done in accordance with "Plascon-Evans" specifications</p>			
	Carried Forward		R	
	SECTION 3: BUILDING WORKS Bill No. 16 PAINTWORK			

Brought Forward				R
<u>PAINTWORK, ETC. TO NEW WORK ON</u>				
<u>ON INTERNAL FLOATED PLASTER SURFACES</u>				
<u>Prepare and apply, fill with an approved filler, sand touch up as required and apply one coat alkali resistant plaster primer and two coats PVA acrylic emulsion paint on or "Equally approved" paint</u>				
1	Internal walls	m ²	502	
<u>ON EXTERNAL FLOATED PLASTER SURFACES</u>				
<u>Prepare and apply, fill with an approved filler, sand touch up as required and apply one coat alkali resistant plaster primer and two coats modified acrylic fine textured emulsion paint on or "Equally approved" paint</u>				
2	External walls	m ²	592	
<u>FIBRE-CEMENT SURFACES WITH</u>				
<u>Two coats pure acrylic paint on</u>				
3	Eaves	m ²	68	
<u>METAL SURFACES WITH</u>				
<u>One coat acrylic emulsion metal primer, one coat universal undercoat and two coats super universal enamel paint on steel</u>				
4	Windows	m ²	416	
5	Gates, grilles, burglar screens, balustrades, etc. (both sides measured over the full flat area)	m ²	129	
6	Structural steel members	m ²	0.1	
<u>WOOD SURFACES WITH</u>				
Carried Forward				R
SECTION 3: BUILDING WORKS				
Bill No. 16				
PAINTWORK				

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Brought Forward			R
	<u>One coat oil wood primer, one coat universal undercoat and two coats super universal enamel paint on</u>		
7	Door frames	m ²	38
	<u>Prepare and apply one coat polyurethane varnish diluted 20% with turpentine and two coats polyurethane varnish lightly sanded between coats on</u>		
8	Door frames with fanlights	m ²	2
9	Door Frames	m ²	10
10	Doors	m ²	151
	<u>Prepare and apply one coat woodcoat varnish diluted 20% with turpentine and two coats woodcoat varnish lightly sanded between coats on</u>		
<u>PAINT TO PREVIOUSLY PAINTED SURFACES</u>			
	<u>Prepare and apply, fill with an approved filler, sand touch up as required and apply one coat alkali resistant plaster primer and two coats PVA acrylic emulsion paint on (Colour tbc) or "Equally approved" paint</u>		
11	Internal walls	m ²	1 155
12	External walls	m ²	286
Carried Forward			R
SECTION 3: BUILDING WORKS			
Bill No. 16			
PAINTWORK			

Bill No	Section No. 3	Page No	Amount R
	SECTION 3: BUILDING WORKS		
	<u>SECTION SUMMARY - SECTION 3: BUILDING WORKS</u>		
1	EARTHWORKS	49	
2	CONCRETE, FORMWORK AND REINFORCEMENT	55	
3	PRECAST CONCRETE	57	
4	MASONRY	61	
5	WATERPROOFING	64	
6	ROOF COVERINGS	71	
7	CARPENTRY AND JOINERY	76	
8	CEILINGS ETC	78	
9	IRONMONGERY	82	
10	STRUCTURAL STEELWORK	85	
11	METALWORK	95	
12	PLASTERING	96	
13	TILING	98	
14	PLUMBING AND DRAINAGE	105	
15	GLAZING	107	
16	PAINTWORK	111	
	Carried to Final Summary		
	SECTION 3: BUILDING WORKS		R

Item No	Quantity	Rate	Amount R
<p><u>BILL NO 1</u></p> <p><u>EXTERNAL WORKS (PROVISIONAL)</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Method of measurement and Bills of Quantities</u></p> <p>This section has been measured according to the Standard System of Measuring Building Work - (Sixth edition) and billed along the guidelines of A.S.A.Q.S. Model Bills of Quantities. Only measured items must be priced and no changes made by the tenderer will be recognised</p> <p><u>Pricing</u></p> <p>The tenderer must price each item in this section individually and no changes made by the tenderer shall be recognised</p> <p>Where inclusive items are measured and priced, the contractor must on request, supply full details of the components and prices making up the inclusive items. If the contractor does not supply such details and prices within fourteen days after having been requested to do so, the Quantity Surveyor will determine such at his own discretion</p> <p><u>Excavations</u></p> <p>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"</p> <p><u>Laying, backfilling, bedding, etc. of pipes</u></p> <p>Pipes shall be laid and bedded and trenches shall be carefully backfilled in accordance with manufacturers' and engineer instructions</p> <p>Unless otherwise described bedding of rigid pipes shall be class B bedding</p> <p>Unless otherwise described bedding of flexible pipes shall be class C bedding</p> <p style="text-align: right;">Carried Forward</p> <p>SECTION 4: EXTERNAL WORKS Bill No. 1 SECTION 4: EXTERNAL WORKS</p>			R

<p style="text-align: center;">Brought Forward</p> <p><u>Coding and Marking</u></p> <p>All pipes are to be colour coded in accordance with the SABS specifications and all are to be provided with Stainless Steel or Galvanised Steel Name Tags</p> <p><u>General</u></p> <p>Descriptions of pipes laid in and including trenches and of inspection chambers, catchpits, etc. shall be deemed to include excavation, bedding, backfilling, compaction to a minimum of 98% Mod AASHTO density and disposal of surplus material on site</p> <p>Descriptions of service pipes and flexible connecting pipes shall be deemed to include connections to taps, cisterns, etc. and to steel pipes (adaptors for connections to copper pipes, etc. are given separately)</p> <p style="text-align: center;">-----</p> <p><u>EARTHWORKS</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary products in descriptions</u></p> <p>Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval of the Principal Agent</p> <p><u>Nature of ground</u></p> <p>The material to be excavated is assumed to be predominantly of a composition that will allow excavation in earth as specified, but including a percentage of excavation in 'soft rock' and 'hard rock'</p> <p><u>Carting away of excavated material</u></p> <p>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</p>			R	
<p style="text-align: center;">Carried Forward</p> <p>SECTION 4: EXTERNAL WORKS Bill No. 1 SECTION 4: EXTERNAL WORKS</p>			R	

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

	<p style="text-align: right;">Brought Forward</p> <p><u>Dewatering of excavations</u></p> <p>The Contractor shall allow for removing seepage and other water from subterranean sources from excavations by pumping, bailing or otherwise. Accurate records of all such dewatering shall be kept to determine the total volume of water so removed and a clear distinction shall be made between water from subterranean sources and other water</p> <p><u>SITE CLEARANCE, ETC.</u></p> <p><u>Site clearance</u></p> <p>1 Digging up and removing rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etc. and 100mm deep topsoil to be carted away to a dumping site located by the contractor.</p>	<p style="text-align: right;">m²</p> <p style="text-align: center;">621</p>	<p style="text-align: right;">R</p>	
	<p style="text-align: right;">Carried Forward</p> <p>SECTION 4: EXTERNAL WORKS Bill No. 1 SECTION 4: EXTERNAL WORKS</p>		<p style="text-align: right;">R</p>	

Brought Forward		R
<u>EXCAVATIONS</u>		
<u>Excavation in earth not exceeding 2m deep</u>		
2	Trenches	m ³ 5
3	Holes	m ³ 50
<u>EXCAVATIONS IN STRATA OF A MORE DIFFICULT CHARACTER</u>		
<u>Extra over trench and hole excavations in earth for excavation in</u>		
4	Soft rock	m ³ 5
5	Hard rock	m ³ 5
<u>Extra over all excavations for carting away</u>		
6	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor as approved by the BCM including payable levies for disposal thereof.	m ³ 502
<u>Keeping excavations free from water</u>		
7	Keeping excavations free from water	Item
<u>Risk of collapse of excavation</u>		
8	Sides of trench and hole not exceeding 1.5m deep	m ² 583
<u>BULK EXCAVATION, FILLING, ETC.</u>		
<u>Open face excavation in earth over sloping site</u>		
9	Open face excavation	m ³ 448
<u>Extra over trench and hole in bulk excavations for</u>		
10	Soft rock	m ³ 45
11	Hard rock	m ³ 22
<u>FILLING ETC.</u>		
Carried Forward		R
SECTION 4: EXTERNAL WORKS Bill No. 1 SECTION 4: EXTERNAL WORKS		

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THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R
<u>Earth filling supplied by the contractor compacted to 93% Mod AASHTO density including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary</u>			
12	Over site in G9	m ³	75
13	Over site in G7	m ³	108
<u>Earth filling supplied by the contractor compacted to 95% Mod AASHTO density including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary</u>			
14	Over site in G7	m ³	75
<u>Earth filling supplied by the contractor compacted to 98% Mod AASHTO density including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary</u>			
15	Over site in C4	m ³	5
16	Over site in G7	m ³	6
17	Over site in G5	m ³	305
<u>Coarse river sand filling supplied by the contractor</u>			
18	Under pavings	m ²	1
<u>Compaction of surfaces</u>			
19	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	m ²	621
<u>Prescribed density tests on filling</u>			
20	"Modified AASHTO Density" test on fill material	No	76
<u>Soil insecticide</u>			
21	Under hard stands	m ²	499
Carried Forward			R
SECTION 4: EXTERNAL WORKS Bill No. 1 SECTION 4: EXTERNAL WORKS			

Brought Forward			R
<u>CONCRETE, FORMWORK AND REINFORCEMENT</u>			
<u>UNREINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u>			
<u>15Mpa / 19mm Concrete</u>			
22	Holes	m ³	50
<u>REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u>			
<u>15MPa/20mm Concrete</u>			
23	Concrete plinth under vehicular gates	m ³	5
<u>25MPa/20mm concrete</u>			
24	Hard stands	m ³	100
<u>TEST BLOCKS</u>			
25	Making and testing 150mm x 150mm x 150mm concrete strength test cube (Provisional) (The contractor is to provide an approved mix design and provide one concrete test cube based on this mix design)	No	165
<u>ROUGH FORMWORK (DEGREE OF ACCURACY II)</u>			
<u>Rough formwork to sides</u>			
26	Edges, risers, ends and reveals not exceeding 300mm high or wide	m	125
<u>CONCRETE SUNDRIES</u>			
<u>Finishing of concrete surfaces with powerfloat</u>			
27	Hard stands	m ²	499
<u>Finishing of concrete surfaces with wood float</u>			
28	Concrete plinth under vehicular gates	m ²	10
Carried Forward			R
SECTION 4: EXTERNAL WORKS			
Bill No. 1			
SECTION 4: EXTERNAL WORKS			

Brought Forward			R
29	Bases	m ²	83
<u>MOVEMENT JOINTS</u>			
<u>Grooves, channels, mortices, sinkings, etc in concrete</u>			
30	6mm x 25mm Average deep keyed-construction joints	m	135
31	6mm x 10mm 2-Part polysulphide sealant in keyed-construction joints	m	210
32	6mm x 50mm Saw cut joints	m	75
<u>REINFORCEMENT (PROVISIONAL)</u>			
<u>Mild steel reinforcement to structural concrete work</u>			
33	Various diameter bars	t	0.41
<u>Fabric reinforcement</u>			
34	Type 888 fabric reinforcement in concrete surface beds, slabs, etc.	m ²	30
<u>PRECAST CONCRETE</u>			
<u>Precast concrete kerbing finished smooth on exposed surfaces including bedding, jointing and pointing, etc. complete as per engineer's drawing No C-SER-01</u>			
35	Barrier kerb 125mm x 400mm High overall with and including unreinforced concrete haunching, bedding, concrete foundation under and behind complete as per engineers drawing	m	288
<u>WATERPROOFING</u>			
<u>One layer of 275 micron "Consol Plastics Brikgrip DPC" embossed damp proof course to manufacturers specification</u>			
36	Under hard stands	m ²	499
37	Under paving	m ²	122
Carried Forward			R
SECTION 4: EXTERNAL WORKS			
Bill No. 1			
SECTION 4: EXTERNAL WORKS			

Brought Forward			R
<u>JOINT SEALANTS ETC.</u>			
<u>"Thioflex" two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc.</u>			
38	10mm x 10mm In expansion joints in walls	m	210
<u>SUNDRY GALVANIZED STEELWORK</u>			
<u>PAVING</u>			
<u>Grey "Bosun Bevel Bond Paver" interlocking precast concrete (25 MPa) paving blocks laid with butt joints on 25mm thick river sand bed with joint filling sand swept into joints, including preparation of ground or filling</u>			
39	Bosun 200mm x100mm x 50mm Bevel Bond Paver including edge blocks	m ²	122
40	Fair edge to paving	m	52
41	Roller face brick-on-edge to edges	m	68
<u>FENCING</u>			
<u>Site clearance</u>			
42	Allow for clearing site for the width of 1000 mm where fencing runs are to be erected including removing trees, shrubs etc. not exceeding 200 mm girth, grubbing up roots and roughly levelling and cart away.	m	1 392
Carried Forward			R
SECTION 4: EXTERNAL WORKS Bill No. 1 SECTION 4: EXTERNAL WORKS			

Brought Forward				R
43	<p><u>Zincalu Manufactured Super Wire and PVC coated Weldmesh panels with rectangular apertures of 76.2 x 12.7mm with horizontal and vertical wire of 3mm diameter thickness. Tensile strength of Wire to be 500 N/mm² with weld mesh strength of 60% of the minimum tensile strength of the wire. Panels to be 2400mm high with a maximum width of 3050mm as determined on site and laterally strengthened by 4 x 43mm deep V-profiled horizontal stiffener bends as per manufacturer's specification to ensure sufficient rigidity for the 2400mm height or Equally Approved as per description.</u></p> <p>Fencing formed of panels size 2100mm x 3050 mm high overall including steel posts size 76mm x 76mm fixed to concrete footing in 3050mm intervals to match existing</p>	m	696	
44	<p><u>PVC coated with a minimum thickness layer of 200 micron H-shaped posts, 2700mm long, with a 70mm x 44mm x 2mm profile with holes inside flanges for fixations of panels with manufacturer approved clamps, anti vandal bolts, nuts and washers or Equally Approved as per description all set vertically in the ground at 3070mm centres</u></p> <p>Posts</p>	No	230	
45	<p><u>Heavy duty pedestrian gate matching fence panel cladding, lockable, including heavy duty support posts, etc. made from steel with minimum yield strength of 235 N/mm² having wing and posts hot dip galvanised in accordance with ISO1461, coated with zing & polyester and a finished polyester colour of Anthracite RAL 7021 with (foundation for latching and hinge posts of 15 Mpa concrete 400 mm x 400 mm x 600mm deep elsewhere measured) or Equally Approved and installed strictly to Manufacturer's Specifications</u></p> <p>970mm x 2100mm High pedestrian gate installed to Manufacturer's Specifications and set at maximum 50mm above natural ground level</p>	No	1	
Carried Forward				R
SECTION 4: EXTERNAL WORKS				
Bill No. 1				
SECTION 4: EXTERNAL WORKS				

Brought Forward			R
<p><u>Heavy duty sliding vehicle gate matching fence panel cladding, lockable, including heavy duty support posts, stoppers and drop tubes, made from steel with minimum yield strength of 235 N/mm² having wing and posts hot dip galvanised in accordance with ISO1461, coated with zing & polyester and a finished polyester colour of Anthracite RAL 7021 with (foundation for gate plinth to as per Structural Engineer Detail and 400 mm x 400 mm x 600mm deep foundation for mounting the portals elsewhere measured) or Equally Approved and installed strictly to Manufacturer's Specifications</u></p>			
46	3500mm x 2100mm High gate installed to Manufacturer's Specifications and set at maximum 50mm above natural ground level as per Architect Detail Drawing	No	1
47	Ditto, but 4500mm x 2100mm high gate	No	1
48	Ditto, but 6500mm x 2100mm high gate	No	1
<p><u>Sundries</u></p>			
<p><u>Zincalu Manufactured Super Wire and PVC coated Weldmesh underdig panels with rectangular apertures of 76.2 x 12.7mm with horizontal and vertical wire of 3mm diameter thickness. Tensile strength of Wire to be 500 N/mm² with weld mesh strength of 60% of the minimum tensile strength of the wire. Underdig panels to be 450mm high with a maximum width of 3050mm as determined on site or Equally Approved as per description</u></p>			
49	Underdig	m	696
<p><u>100 mm high Top Rail with serrated tooth spike 2.5mm thick hot dip galvanised and PVC coated with a finished colour Anthracite RAL 7021 or Equally Approved</u></p>			
50	Panel Topping bolted to mesh fencing panel	m	696
<p><u>Stainless steel Discus Padlocks keyed alike with keys</u></p>			
51	70mm Diameter padlocks with keys keyed alike	No	4
Carried Forward			R
<p>SECTION 4: EXTERNAL WORKS Bill No. 1 SECTION 4: EXTERNAL WORKS</p>			

Brought Forward				R
<u>SLIDING GATE OPERATORS</u>				
<u>Sliding gate hardware</u>				
52	Galvanised mild steel sliding gate track formed of 40mm x 40mm x 5mm Angle section with 150mm x 25mm x 5mm fishtailed lugs at 500mm centres	m	28	
53	Universal 125mm wide x 200mm long L-shape adjustable guide mount bracket made of 75mm x 5mm galvanised flat iron, 4 times holed on one the short face for fixing bolts and two adjustable holes for guide rollers on other face	No	12	
54	Heavy duty hard nylon guide rollers	No	12	
55	80mm Ball bearing fitted machined V-goove heavy duty rigid caster with bracket fixed to steel gate frame (Load capacity 1500kg)	m	28	
<u>SOIL DRAINAGE</u>				
<u>MANHOLES</u>				
<u>EXCAVATIONS</u>				
<u>Excavation in earth not exceeding 2m deep</u>				
56	Holes	m ³	1	
<u>EXCAVATIONS IN STRATA OF A MORE DIFFICULT CHARACTER</u>				
<u>Extra over trench and hole excavations in earth for excavation in</u>				
57	Soft rock	m ³	0.1	
58	Hard rock	m ³	0.1	
<u>Extra over all excavations for carting away</u>				
59	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor as approved by the BCM including payable levies for disposal thereof.	m ³	1	
Carried Forward				R
SECTION 4: EXTERNAL WORKS Bill No. 1 SECTION 4: EXTERNAL WORKS				

Brought Forward			R
<u>Risk of collapse of excavations</u>			
60	Sides of bulk excavations not exceeding 1,5m deep	m ²	5
<u>Keeping excavations free of water</u>			
61	Keeping excavations free of water		Item
<u>Compaction of surfaces</u>			
62	Compaction of ground surface under floors etc. to 93% Mod AASHTO density	m ²	1
<u>UNREINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u>			
<u>25MPa/19mm Concrete</u>			
63	Unreinforced concrete in bottoms of manholes	m ³	0.1
<u>CONCRETE SUNDRIES</u>			
<u>Finishing top surfaces of concrete smooth with a wood float</u>			
64	Surface beds	m ²	1
<u>MASONRY</u>			
65	Half brick walls	m ²	4
<u>Bagging of 1:3 cement and sand mixture</u>			
66	On brick walls	m ²	4
<u>Brickwork reinforcement</u>			
67	75mm Wide reinforcement built in horizontally	m	17
<u>Concrete prestressed fabricated lintels</u>			
68	110mm x 70mm Lintels in lengths not exceeding 3m	m	4
Carried Forward			R
SECTION 4: EXTERNAL WORKS			
Bill No. 1			
SECTION 4: EXTERNAL WORKS			

	Brought Forward			R
	<u>SUNDRIES</u>			
	<u>Manholes, gully traps, etc.</u>			
69	450mm x 600mm Cast iron manhole cover including frame (Code: DS8A) with double seal, set in position on top of slabs	No	1	
70	Lifting key for manhole cover	No	1	
	Carried to Final Summary			R
	SECTION 4: EXTERNAL WORKS			
	Bill No. 1			
	SECTION 4: EXTERNAL WORKS			

**THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK**

Item No		Quantity	Rate	Amount R
	<p><u>BILL NO 1</u></p> <p><u>PROVISIONAL SUMS ETC.</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Work executed by direct contractors</u></p> <p>Work listed under the heading "DIRECT CONTRACTORS WORK" will commence during the execution of this contract and the contractor shall allow free access to the site for these direct contractors. The contractor shall prepare a programme in conjunction with these direct contractors in order to complete the work successfully. The direct contractors will be regarded as nominated sub-contractors but payment will not be made to them via the contractor. The estimated values of these contracts are listed to enable the contractor to determine profit and attendances, if required</p> <p><u>General</u></p> <p>Unless otherwise described, all prime cost amounts and provisional sums exclude the cash discount of 5% and include for delivery to site of all articles concerned</p> <p>All prime cost amounts and provisional sums are net and include for delivery to site of all articles concerned</p> <p><u>Preliminaries</u></p> <p>The contractor is referred to the Preliminaries for further amplification of "Prime Cost Amounts and Provisional Sums"</p>			
	<p>Carried Forward</p>			R
	<p>SECTION 5: PROVISIONAL AMOUNTS Bill No. 1 PROVISIONAL AMOUNTS</p>			

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R	
<u>RUBBLE REMOVAL</u>				
1	Allow the Provisional Amount of R45 000.00 (Forty Five Thousand Rands) for digging up and removing rubbish and debris etc. of all material form and cart away to a site located by the contractor	Item		45 000.00
2	Add for Profit		%	
3	Add for general attendance		%	
<u>CANOPIES</u>				
4	Allow the Provisional Amount of R100 000.00 (One Hundred Thousand Rands) for installation of Canopies, executed complete	Item		100 000.00
5	Add for Profit		%	
6	Add for general attendance		%	
<u>STRUCTURAL STEEL CANOPY REMOVAL</u>				
7	Allow the Provisional Amount of R49 000.00 (Forty Nine Thousand Rands) for the removal of Structural canopy including all associated steel members and cart away to dumping site selected by the Contractor	Item		49 000.00
8	Add for Profit		%	
9	Add for general attendance		%	
<u>BENCHES</u>				
10	Allow the Provisional Amount of R 50,000.00 (Fifty Thousand Rand) for the supply and installation of benches to change rooms, executed complete	Item		50 000.00
11	Add for Profit		%	
12	Add for general attendance		%	
Carried Forward			R	
SECTION 5: PROVISIONAL AMOUNTS				
Bill No. 1				
PROVISIONAL AMOUNTS				

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R
<u>STATUTORY SIGNAGE</u>			
13	Allow the Provisional Amount of R15 000.00 (Fifteen Thousand Rands) for Statutory Signage to be executed by contractor complete	Item	15 000.00
14	Add for Profit	%	
15	Add for general attendance	%	
<u>BUILDING SIGNAGE</u>			
16	Allow the Provisional Amount of R60 000.00 (Sixty Thousand Rands) for Building Signage to be executed by contractor complete	Item	60 000.00
17	Add for Profit	%	
18	Add for general attendance	%	
<u>GENERAL JOINERY</u>			
19	Allow the Provisional Amount of R180 000.00 (One Hundred and Eighty Thousand Rands) for General Joinery to be executed by contractor, complete	Item	180 000.00
20	Add for Profit	%	
21	Add for general attendance on sub-contractor	%	
<u>111 - ROOF RECONFIGURATION</u>			
22	Allow the Provisional Amount of R75 000.00 (Seventy Five Thousand Rands) for the structural roof truss configuration in forming fenestrations only, executed complete	Item	75 000.00
23	Add for Profit	%	
24	Add for general attendance	%	
Carried Forward			R
SECTION 5: PROVISIONAL AMOUNTS			
Bill No. 1			
PROVISIONAL AMOUNTS			

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Brought Forward			R
<u>TRAINING PROVISIONS</u>			
25	Allow the Provisional Amount of R150 000.00 (One Hundred and Fifty Thousand Rands) for the placement of Three unemployed graduates remunerated R5 000.00 per month per graduate	Item	150 000.00
26	Add for Profit	%	
27	Add for general attendance	%	
<u>COMMUNITY LIASON OFFICER</u>			
28	Allow the Provisional Amount of R50 000.00 (Fifty Thousand Rands) for the employment of a CLO (R 5000.00/month)	Item	50 000.00
<u>STEERING COMMITTEE</u>			
29	Allow the Provisional Amount of R21 000.00 (Twenty One Thousand Rands) for the payment of The Steering Committee Members.	Item	21 000.00
30	Add for Profit	%	
31	Add for general attendance	%	
<u>LANDSCAPING</u>			
32	Allow the Provisional Amount of R60 000.00 (Sixty Thousand Rands) for landscaping to be executed by the contractor including clearing of overgrown vegetation etc. on all sites, complete	Item	60 000.00
33	Add for Profit	%	
34	Add for general attendance	%	
Carried Forward			R
SECTION 5: PROVISIONAL AMOUNTS			
Bill No. 1			
PROVISIONAL AMOUNTS			

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

	Brought Forward		R	
	<u>BUDGETARY ALLOWANCE</u>			
	<u>The following in Budgetary Allowance for work to be carried out by the contractor</u>			
35	Provide the sum of R7 500.00 (Seven Thousand Five Hundred Rands) for dismantling, moving and transporting weaving equipment to the temporary premises within the Dimbaza Industrial area, assist in re-erecting the equipment and then on completion assist with the same process to reinstall in the refurbished building	Item		7 500.00
	<u>The following in Budgetary Allowance for Economic Empowerment Costs to cater for SMME Requirement as required by Eastern Cape Development Corporation</u>			
36	Provide the sum of R2 605 304.62 (Two Million Six Hundred and Five Thousand Three Hundred and Four Rands and Sixty Two Centss) for Extra over Economic Empowerment Costs to cater for SMME Requirement as required by the Eastern Cape Development Corporation	Item		2 605 304.62
	Carried to Final Summary		R	
	SECTION 5: PROVISIONAL AMOUNTS			
	Bill No. 1			
	PROVISIONAL AMOUNTS			

BID NO: ECDC/INFRA/22/112023
THE REPAIRS, REFURBISHMENTS OF SITE
8, 12, AND 21 IN DIMBAZA INDUSTRIAL PARK

Section No	<u>FINAL SUMMARY</u>	Page No	Amount R
1	SECTION 1: PRELIMINARY AND GENERAL	34	
2	SECTION 2: ALTERATIONS	45	
3	SECTION 3: BUILDING WORKS	112	
4	SECTION 4: EXTERNAL WORKS	125	
5	SECTION 5: PROVISIONAL AMOUNTS	130	
	<u>SPECIALIST INSTALLATION</u>		
	Part B1: ELECTRICAL INSTALLATION, (See separate document)	Item	
	Part B2: HVAC, (See separate document)	Item	
	Part B3: DOMESTIC WATER, (See separate document)	Item	
	Part B4: FIRE WATER, (See separate document)	Item	
	Part B5: FIRE SUPPRESSION, (See separate document)	Item	
	SUB TOTAL		R
	Provide the amount of R1 387 123.34 (One Million Three Hundred and Eighty Seven Thousand One Hundred and Twenty Three Rands and Thirty Four Cents) for Contingencies, to be adjusted, used and paid as instructed and approved by the Client in terms of clauses 17, 31 and 32 of the Principal Building Agreement (refer JBCC)	Item	1 387 123.34
	SUB TOTAL		R
	<u>ESCALATION</u>		
	Allow the sum of R1 610 078.26 (One Million Six Hundred and Ten Thousand and Seventy Eight Rands and Twenty Six Cents) for Building Cost Escalation to be adjusted in terms of the JBCC Contract Price Adjustment Provisions.	Item	1 610 078.26
	Carried Forward		R

Section No	<u>FINAL SUMMARY</u>	Page No		Amount R
	Brought Forward			R
	SUB TOTAL			R
	ADD VAT @ 15%			R
	TOTAL CARRIED TO FORM OF TENDER			R
	TOTAL CARRIED TO FORM OF OFFER			R

Part B1 – Electrical Installation

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

ITEM	DESCRIPTION	UNIT	RATE			AMOUNT
			Fixed	Value Related	Time Related	
1.0	<u>BILL NO. 1 : PRELIMINARY & GENERAL</u>					
1.1	Contract Works Insurances	Sum				
1.2	Supplementary Insurance	Sum				
1.3	Public Liability Insurance	Sum				
1.4	Construction Guarantee / Security	Sum				
1.5	Establish on Site and provision of buildings and materials storage facilities including de-establishment of site, cleaning and tidying up after completion of contract	Sum				
1.6	Contract Management and supervision of the Works including Contractor's Monthly Reports and attendance of site meetings (2 per month)	Sum				
1.7	Compliance with Construction Regulations and Health and Safety Act	Sum				
1.8	Compliance with EPWP Labour Intensive Specification	Sum				
1.9	Tools and Equipment	Sum				
1.10	Provision of shop drawings and manuals as specified	Sum				
TOTAL BILL NO.1 TO PRICE SUMMARY						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
2.0	<u>BILL No. 2: DISTRIBUTION BOARDS</u>					
2.1	Indoor distribution boards <u>with cascaded protection</u> as specified and shown on the drawings. NOTE: All equipment to be SABS approved and bear the SABS performance mark					
2.1.1	MDB-S08 (Site 08 Main DB - Factory Floor)	No.	1			
2.1.2	MDB-S12 (Site 12 Main DB - Factory Floor)	No.	1			
2.1.3	MDB-S21 (Site 21 Main DB - Factory Floor)	No.	1			
2.1.4	SDB-S12 (Site 12 Sub DB - Office Space)	No.	1			
2.1.5	SDB-S21 (Site 21 Sub DB - Office Space)	No.	1			
2.1.6	SDB-GH (Site 21 - Guardhouse DB)	No.	1			
2.2	3CR12 outdoor distribution kiosk (EDK-S08) with 3-phase & neutral busbars, earth bar and plinth, no circuit breakers	No.	1			
2.3	<u>Distribution Board Equipment</u> The rates below will be used to add or omit relevant equipment into or out of distribution boards including wiring. All equipment to have a SABS stamp.					
2.3.1	10A - 20A 6kA SP circuit breaker (Curve-1)	No.	1			Rate Only
2.3.2	10A - 20A 6kA SP circuit breaker (Curve-2)	No.	1			Rate Only
2.3.3	25A - 32A 6kA SP circuit breaker (Curve-1)	No.	1			Rate Only
2.3.4	25A - 32A 6kA SP circuit breaker (Curve-2)	No.	1			Rate Only
2.3.5	10A - 20A 6kA SP circuit breaker (Curve-1)	No.	1			Rate Only
2.3.6	6A - 10A 6kA TP circuit breaker (Curve-2)	No.	1			Rate Only
2.3.7	20A - 32A 6kA DP circuit breaker (Curve-1)	No.	1			Rate Only
2.3.8	20A - 32A 6kA DP circuit breaker (Curve-2)	No.	1			Rate Only
2.3.9	32A - 63A 6kA DP circuit breaker (Curve-2)	No.	1			Rate Only
2.3.10	32A - 63A 6kA TP circuit breaker (Curve-1)	No.	1			Rate Only
2.3.11	32A - 63A 6kA TP circuit breaker (Curve-2)	No.	1			Rate Only
2.3.12	63A 30mA Earth Leakage Unit with protective circuit breaker (single-phase)	No.	1			Rate Only
2.3.13	63A 30mA Earth Leakage Unit with protective circuit breaker (three-phase)	No.	1			Rate Only
2.3.14	63A - 80A 10kA TP circuit breaker (Curve-1)	No.	1			Rate Only
2.3.15	63A - 80A 10kA TP circuit breaker (Curve-2)	No.	1			Rate Only
TOTAL BILL No. 2 CARRIED TO PRICE SUMMARY PAGE						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
3.0	<u>BILL No. 3: CABLING AND CABLE SLEEVES</u>					
3.1	<u>LV Cabling</u> Multicore ECC PVCSWAPVC cable with stranded copper conductors to SANS 1507-3 drawn into cable sleeves, installed on cable trays/ladders or laid in open trenches and ducts					
3.1.1	95mm ² x 4 core	m	1			Rate Only
3.1.2	70mm ² x 4 core	m	600			
3.1.3	50mm ² x 4 core	m	30			
3.1.4	25mm ² x 4 core	m	1			Rate Only
3.1.5	16mm ² x 4 core	m	1			Rate Only
3.1.6	16mm ² x 2 core	m	100			
3.1.7	10mm ² x 2 core	m	60			
3.1.8	6mm ² x 2 core	m	1			Rate Only
3.1.9	4mm ² x 2 core	m	1			Rate Only
3.1.10	2,5mm ² x 2 core	m	1			Rate Only
3.2	<u>LV Cable Terminations for</u>					
3.2.1	95mm ² x 4 core	No.	1			Rate Only
3.2.2	70mm ² x 4 core	No.	8			
3.2.3	50mm ² x 4 core	No.	2			
3.2.4	25mm ² x 4 core	No.	1			Rate Only
3.2.5	16mm ² x 4 core	No.	1			Rate Only
3.2.6	16mm ² x 2 core	No.	4			
3.2.7	10mm ² x 2 core	No.	2			
3.2.8	6mm ² x 2 core	No.	1			Rate Only
3.2.9	4mm ² x 2 core	No.	1			Rate Only
3.2.10	2,5mm ² x 2 core	No.	1			Rate Only
Carried Forward from Next Page						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
Brought Forward from Previous Page						
3.3	<u>LV Trenching</u> Excavation 600mm deep x 400mm wide including backfilling and compacting					
3.3.1	In earth	m	530			
3.3.2	Soft rock EXTRA OVER earth (Proof of amount required)	m ³	1			
3.3.3	Selected fines bedding 150mm under cable and 150mm on top of cable (when required by soil conditions & Proof of amount utilised require)	m ³	5			
3.3.4	Excavation concrete & asphalt road crossings 600mm deep x 650mm wide including backfilling and compaction and re-instating the road surface to the original specification. The project's Civil Engineer to certify the road crossing re-instatement.	m	25			
3.3.5	LV Cable marker tape laid in an open trench and 150mm above a cable 150mm wide 800 gauge cable marker tape.	m	500			
3.3.6	250mm High truncated pyramid cable route marker with stainless steel insert engraved with the cable details e.g. "Low Voltage 25mm² 4C CABLE from DB-A to DB-B/Load X" . installed to protrude 150mm above ground on soft soil and be flush with paved surfaces. At every cable start point and end point and every 30m along the length and at every cable route direction change.	No.	6			
3.3.7	Double skin brick manhole, 900mm x 900mm x 600mm deep minimum inside dimensions with heavy duty cover for polymer Power Cabling	No.	3			
3.4	<u>LV Cable Sleeves & Bends</u> Corrugated (Kabelflex) cable sleeve laid in open trench including cutting and joining NOTE: Spare sleeves for future use to be sealed at both ends					
3.4.1	110mm diameter	m	80			
3.4.2	50mm diameter	m	1			
3.4.3	90 degrees slow bends for 110mm dia. sleeve	No.	6			
3.4.4	90 degrees slow bends for 50mm dia. Sleeve	No.	1			
3.5	Optex Pull Tape, or equivalent, with thickness of 1.0mm (±0.2mm) x width 16mm (±1.0mm) and breaking strain of 800kg, draw tape into conduit or sleeve(s)	m	100			
Carried Forward from Next Page						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
Brought Forward from Previous Page						
3.6	<u>Cable Ladder</u> Medium duty hot dipped galvanised cable ladder including splices clamps, hold down saddles and suspension materials installed at high level. Ladder spanning to be at 1.6m intervals					
3.6.1	50mm wide	m	50			
3.6.2	90 degrees Horizontal elbow	No.	3			
3.6.3	External elbow (dropper)	No.	3			
3.6.4	Internal elbow (riser)	No.	1			
3.7	Label cables on both ends with numbering beads or non-corroding straps to indicate their connection points [Refer to Technical Specification – Electrical Installation].	Sum	1			
TOTAL BILL No. 3 CARRIED TO PRICE SUMMARY PAGE						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
4.0	<u>BILL No. 4 : GENERAL LIGHTING</u>					
4.1	<u>Conduit</u>					
	Conduit chased into brickwork, cast in concrete, laid in trench or fixed on I-beams, trusses in ceiling void including cutting, bending, reaming, setting, joining, draw boxes and fixing material					
4.1.1	20mm - PVC	m	7000			
4.1.2	25mm - PVC	m	1			Rate Only
4.1.3	20mm - Galvanised/Bosal (ORANGE)	m	3000			
4.1.4	25mm - Galvanised/Bosal (ORANGE)	m	1			Rate Only
4.2	<u>Conduit Boxes</u>					
4.2.1	PVC Round box for 20-25mm conduit, back or side entry for 1, 2, 3 or 4-way chased into brickwork, cast into concrete or fixed onto trusses including couplings bushes cover plates and fixing materials	No.	275			
4.2.2	Galvanised/Bosal Round box for 20-25mm conduit, back or side entry for 1, 2, 3 or 4-way chased into brickwork, cast into concrete or fixed onto trusses including couplings bushes cover plates and fixing materials (ORANGE)	No.	100			
4.2.3	Galvanised steel, 100 x 50 x 50mm box for 20-25mm conduit built into brickwork or cast in concrete. (cover plates measured elsewhere)	No.	45			
4.3	<u>Luminaires</u>					
	Luminaires must be delivered with lamps packed separately. For Types, see "Detailed Installation Specification".					
4.3.1	Type-A (incl. mounting clips)	No.	20			
4.3.2	Type-AE (incl. mounting clips)	No.	2			
4.3.3	Type-B (incl. suspension kit)	No.	91			
4.3.4	Type-BE (incl. suspension kit)	No.	12			Rate Only
4.3.5	Type-EX	No.	9			
4.3.6	Type-G (incl. suspension kit)	No.	6			
4.3.7	Type-GE (incl. suspension kit)	No.	1			Rate Only
4.3.8	Type-G1 (incl. mounting clips)	No.	6			
4.3.9	Type-G1E (incl. mounting clips)	No.	1			Rate Only
4.3.10	Type-G2 (incl. mounting clips)	No.	6			
4.3.11	Type-G2E (incl. mounting clips)	No.	1			Rate Only
Carried Forward from Next Page						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
Brought Forward from Previous Page						
4.3.12	Type-JS	No.	54			
4.3.13	Type-JSE	No.	6			
4.3.14	Type-L	No.	24			
4.3.15	Type-LE	No.	10			
4.3.16	Type-P	No.	13			
4.3.17	Type-P1	No.	8			
4.3.18	Type-R1	No.	3			
4.3.19	Type-R2	No.	1			
4.3.20	Type-ZD	No.	35			
4.4	<u>Equipment and Control Gear</u>					
	16 Amp rocker type light switch with coverplate installed into a flush box (box measured elsewhere)					
4.4.1	1-Lever, 1-Way	No.	11			
4.4.2	1-Lever, 2-Way	No.	1			Rate Only
4.4.3	2-Lever, 1-Way	No.	4			
4.4.4	Rotary switch weatherproof	No.	1			Rate Only
4.4.5	Photocell	No.	6			
4.4.6	230-250V _{AC} Ceiling mount occupancy sensors passive Infrared with IntelliDAPT self-adjusting technology, all digital passive infrared sensor, auto-on and manual-on operating modes, 180 degrees coverage area, zero arc point switching and built-in photo-cell with supersaver mode	No.	34			
4.5	<u>Conductors: 600/1000 grade PVC insulated single core copper conductors</u>					
4,5,1	2,5mm ² red/black	m	15000			
4,5,2	2,5mm ² red/black/Yellow-Green	m	8000			
4.6	Labelling of all Light switches with circuit numbers [Refer to Technical Specification – Electrical Installation].	Sum	1			
4.7	<u>Poles</u>					
4.7.1	5.7m long (5.0m mounting height) glass fibre reinforced polyester (GRP) pole with 50mm dia spigot, 6A SP circuit breaker and 6mm thick hot dip galvanised base plate	No.	1			Rate Only
Carried Forward from Next Page						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
Brought Forward from Previous Page						
4.8	<u>Wiring Channel</u> Hot dip galvanised channel with cover including propriety suspension hangers splices, end caps and joints; channel to be powder coated ORANGE & installed at high level (<i>for power and lighting conductors</i>).					
4.8.1	P2000 single channel including PVC cover, splices and hangers	m	950			
4.8.1.1	P2000 90 bends	No.	1			Rate Only
4.8.1.2	P2000 T piece	No.	1			Rate Only
4.8.1.3	P2000 DB inlet	No.	6			
4.8.1.4	P2000 End Caps	No.	17			
4.8.1.5	P2000 Crossover Radiused	No.	17			
4.8.2	P8000 single channel including PVC cover, splices and hangers	m	60			
4.8.2.1	P8000 90 bends	No.	1			Rate Only
4.8.2.2	P8000 T piece	No.	1			Rate Only
4.8.2.3	P8000 DB inlet	No.	6			
4.8.2.4	P8000 End Caps	No.	17			
4.8.2.5	P8000 Crossover Radiused	No.	3			
TOTAL BILL No. 4 CARRIED TO PRICE SUMMARY PAGE						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
5.0	<u>BILL No. 5 : GENERAL SMALL POWER</u>					
5.1	<u>Powerskirting</u>					
	Two tier PVC power skirting complete with covers and cover strips. Colour to be selected by the Architect.	m	115			
5.1.1	End caps	No.	18			
5.1.2	Internal angles	No.	6			
5.1.3	External angles	No.	1			
5.1.4	Flat Tee	No.	3			
5.1.5	Power Skirting riser	No.	10			
5.2	<u>Wiring Channel</u>					
	Cabstruct powder coated orange 1-tier wiring channel with cover including propriety suspension hangers splices, end caps, joints & powder coated ORANGE					
5.2.1	P8200 channel with PVC covers	m	1			Rate Only
5.2.2	N8/1 channel with PVC covers	m	25			
5.2.3	Endcaps	No.	4			
5.2.4	Internal angles	No.	15			
5.2.5	External angles	No.	15			
5.2.6	Flat Elbow	No.	2			
5.3	<u>Conduit</u>					
	Conduit chased into brickwork, cast in concrete, laid in trench or fixed on I-beams, trusses in ceiling void including cutting, bending, reaming, setting, joining, draw boxes and fixing material					
5.3.1	20mm - PVC	m	1500			
5.3.2	25mm - PVC	m	1			Rate Only
5.3.3	20mm - Galvanised/Bosal (ORANGE)	m	500			
5.3.4	25mm - Galvanised/Bosal (ORANGE)	m	1			Rate Only
5.4	<u>Conduit Boxes</u>					
5.4.1	PVC round box for 20mm conduit, back or side entry for 1, 2, 3 or 4-way chased into brickwork, cast into concrete or fixed onto trusses including couplings bushes, cover plates and fixing materials	No.	60			
Carried Forward from Next Page						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
Brought Forward from Previous Page						
5.4.2	Galvanised/Bosal Round box for 20-25mm conduit, back or side entry for 1, 2, 3 or 4-way chased into brickwork, cast into concrete or fixed onto trusses including couplings bushes cover plates and fixing materials (ORANGE)	No.	20			
5.4.3	Galvanised steel, 100 x 100 x 50mm box for 20mm - 32mm conduit built into brickwork or cast in concrete. (cover plates measured elsewhere)	No.	56			
5.5	<u>Conductors</u> The supply and installation of PVC insulated stranded single core copper conductors drawn into conduits and ducting					
5.5.1	2.5mm ² PVC black and red	m	8000			
5.5.2	4mm ² PVC black and red	m	100			
5.5.3	2.5mm ² PVC insulated green/yellow earth wire	m	4200			
5.5.4	4mm ² Surfex Cable	m	1			Rate Only
5.6	<u>Equipment and Control Gear</u>					
5.6.1	Flush mounted 16 Amp 3 pin switched socket outlets with cover plates (Boxes measured elsewhere):					
5.6.1,1	Standard Single switched socket outlet with 3-Pin (SANS 164-1 & SANS 164-2)	No.	50			
5.6.1,2	Weatherproof Standard Single switched socket outlet with 3-Pin (SANS 164-1 & SANS 164-2)	No.	3			
5.6.2	Surface mounted 16 Amp 3 pin switched socket outlets with cover plates (Boxes measured elsewhere):					
5.6.2.1	6Amp 3-pin unswitched socket outlet fitted in a round box for light fittings & extract fans	No.	75			
5.6.2.2	Dedicated (Red) Single switched socket outlet with 3-Pin (SANS 164-1 & SANS 164-2)	No.	1			Rate Only
5.6.3	Power Skirting mounted 16 Amp 3-pin switched socket outlets with mounting cradle and cover plates:					
5.6.3.1	Standard single switched socket outlet (SANS 164-1)	No.	48			
5.6.3.2	Standard 3-Pin socket outlet (SANS 164-2) & Switch	No.	24			
5.6.3.3	Dedicated (red) single switched socket outlet (SANS 164-1)	No.	1			Rate Only
5.6.4	N8/1 trunking mounted 16 Amp 3-pin switched socket outlets with mounting cradle and cover plates:					
5.6.4.1	Standard single switched socket outlet (SANS 164-1)	No.	24			
5.6.4.2	Standard 3-Pin socket outlet (SANS 164-2) & Switch	No.	12			
Carried Forward from Next Page						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
Brought Forward from Previous Page						
5.6,5	Indoor surface mounted 20A - 32A DP switched industrial (welding) socket outlets	No.	2			
5.6,6	Indoor surface mounted 20A - 32A DP isolator including box	No.	6			
5.6,7	Indoor surface mounted 20A - 32A TP isolator including box	No.	1			
5.6,8	Outdoor surface mounted 20A - 32A DP isolator including box	No.	1			Rate Only
5.6,9	Outdoor surface mounted 20A - 32A TP isolator including box	No.	1			Rate Only
5.7	Labelling of all Power points with circuit numbers [Refer to Technical Specification – Electrical Installation].	Sum	1			
TOTAL BILL No. 5 CARRIED TO PRICE SUMMARY PAGE						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
6.0	<u>BILL No. 6 : TELEPHONE AND DATA SYSTEM</u>					
6.1	Double skin brick 600mm deep manhole with heavy duty polymer cover with the following minimum inside dimensions:					
6.1.1	inside dimensions:900mm x 900mm	No.	1			Rate Only
6.1.1	inside dimensions: 600mm x 600mm	No.	3			
6.2	Surface mounted distribution board with architrave, 10mm thick soft wood back board (plywood or shutter board) and hinged door:					
6.2.1	450mm x 450mm	No.	3			
6.2.2	650mm x 650mm	No.	1			Rate Only
6.3	<u>Cable sleeves</u>					
	Heavy duty or flexible (Kabelflex) PVC cable sleeves laid in open trench including cutting, backfilling and compacting. NOTE: Spare sleeves for future use to be sealed at both ends					
6.3.1	110mm diameter	m	100			
6.3.2	50mm diameter	m	1			Rate Only
6.3.4	90 degrees slow bends for 110mm sleeve	No.	6			
6.3.5	90 degrees slow bends for 50mm sleeve	No.	1			Rate Only
6.4	<u>Conduit</u>					
	The supply and installation of conduit including cutting, bending, joints, settings, fittings, boxes, fixing materials					
6.4.1	25mm - PVC	m	50			
6.4.2	32mm - PVC	m	1			Rate Only
6.4.3	25mm - Galvanised/Bosal (ORANGE)	m	100			
6.4.4	32mm - Galvanised/Bosal (ORANGE)	m	1			Rate Only
6.5	200 x 200 x 100 PVC wall boxes for 25mm & 32mm conduits installed in ceiling void including cover plates	No.	1			Rate Only
6.6	Optex Pull Tape, or equivalent, with thickness of 1.0mm (±0.2mm) x width 16mm (±1.0mm) and breaking strain of 800kg, draw tape into conduit or sleeve(s)	m	100			
Carried Forward from Next Page						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
Brought Forward from Previous Page						
6.7	<u>Cable Tray</u>					
6.7.1	100mm wide medium duty hot dipped galvanised welded wire mesh cable tray including splices clamps, hold down saddles and suspension materials installed at high level (for ICT cabling).	m	1			Rate Only
6.7.1.1	90 degrees Horizontal elbow	No.	1			Rate Only
6.7.1.2	Tee piece	No.	1			Rate Only
6.7.1.3	Four way crossover	No.	1			Rate Only
6.7.1.4	Internal elbow (riser)	No.	1			Rate Only
6.7.1.5	External elbow (dropper)	No.	1			Rate Only
6.8	<u>Powerskirting Modules</u>					
6.8.1	Data RJ45 CAT6	No.	1			Rate Only
TOTAL BILL No. 6 CARRIED TO PRICE SUMMARY PAGE						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
7.0	<u>BILL No. 7 : SUNDRY ITEMS</u>					
7.1	Earthing and Bonding of the building installation	Sum	1	-----		
7.2	Test the completed electrical installations and issue Certificates of Compliance	Sum	1	-----		
7.3	Prepare and issue marked-up "As-Built" drawings for the Electrical and Lightning Protection System installations including Distribution Boards.	Sum	1	-----		
7.4	Electrical Contractor is to return to site at Final Completion to take current readings from all the distribution boards and balance the loads where necessary.	Sum	1	-----		
7.5	Attendance to any specialist contractors during the installation of their respective plant, if required.	Sum	1	-----		
7.6	Prepare and conduct detailed Training Programme, including training documentation, for Tenant, Clients Staff and Maintenance Personnel. This will be training of 4 groups, each of up to 4 personnel. Each group shall receive a minimum of two 1-hour training sessions.	Sum	1	-----		
TOTAL BILL No. 7 CARRIED TO PRICE SUMMARY PAGE						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

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ITEM	DESCRIPTION	UNIT	QNTY	RATE		AMOUNT
				SUPPLY	INSTALL	
8.0	<u>BILL No. 8 : PROVISIONAL SUMS</u>					
8.1	Lightning Protection System (LPS) including soil resistivity testing, testing and issuing of an SABS prescribed certificate for LPS, Maintenance Manuals, As-built drawings and profit. (Quotations to be provided from Specialists, as per Electrical Specification)	Sum	1	104 000.00	-----	104 000.00
8.1.1	Mark-up on item above	%			-----	
8.2	Liasoning with the Supply Authority (Buffalo City Metropolitan Municipality - BCMM) for the electrical supply connection of the factories to the existing minisub-stations as and when required to execute the works.	Sum	1	-----		
8.2.1	BCMM 150kVA Electricity Connection Fee - Site 12 & Site 21	Sum	2	58 024.69	-----	R116 049.38
8.2.1.1	Mark-up on Item 8.2.1 above	%			-----	
8.2.2	BCMM 150kVA Electricity Financial Deposit - Site 12 & Site 21	Sum	2	219 204.38	-----	R438 408.75
8.2.2.1	Mark-up on Item 8.2.2 above	%			-----	
TOTAL BILL No. 8 CARRIED TO PRICE SUMMARY PAGE						

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

ITEM	DESCRIPTION	UNIT	QNTY	RATE
9.0	<u>BILL No. 9 : ADJUSTMENTS TO N/S CONTRACT VALUE</u>			
9.1	An adjustment to the contract value resulting from a contract instruction for additional work not covered by the rates in the n/s priced document shall be determined in terms clause 32.0 of the JBCC Series 2000. NOTE: For the Public Sector Clause 3.2.2 is deleted			
9.2	Rates excluding mark-up for adjustment to the contract value under clause 32.2.3			
9.3	<u>Labour</u>			
9.3.1	Master Electrician			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	
9.3.2	Licensed Electrician			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	
9.3.3	Artisan			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	
9.3.4	Apprentice stage 1			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	
9.3.5	Apprentice stage 2			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	
9.3.6	Apprentice stage 3			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	

NOTE: ITEMS ENTERED ON THIS PAGE ARE NOT CARRIED FORWARD TO PRICE SUMMARY

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

ITEM	DESCRIPTION	UNIT	QNTY	RATE
9.3.7	Econop 1			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	
9.3.8	Econop 2			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	
9.3.9	Econop 3			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	
9.3.10	Electrician Assistant			
(a)	Normal time	Hour	1	
(b)	Week overtime	Hour	1	
(c)	Sunday	Hour	1	
(d)	Public Holidays	Hour	1	
9.4	<u>Materials</u>			
9.4.1	At cost. Invoices to be submitted as proof			
9.5	<u>Transport</u>			
9.5.1	0,5 ton bakkie	km	1	
9.5.2	1 ton bakkie	km	1	
9.5.3	3 ton bakkie	km	1	
9.5.4	Crane truck	Hour	1	
9.5.5	Other (Specify)			
9.6	<u>Plant</u>			
9.6.1	100W - 500W Drilling machine	Hour	1	
9.6.2	Angle Grinder	Hour	1	
9.6.3	Cutting Disc	Hour	1	
9.6.4	Rock Breaker	Hour	1	
9.6.5	Chasing machine	Hour	1	
9.6.6	Generator	Hour	1	
9.6.7	Vacuum cleaner for dust extraction from grinder	Hour	1	
9.6.8	Other (Specify)	Hour	1	
NOTE: ITEMS ENTERED ON THIS PAGE ARE NOT CARRIED FORWARD TO PRICE SUMMARY				



RNA CONSULTING ENGINEERS

Consulting Electrical & Mechanical Engineers

(PTY) LTD 2021/724549/07

PO Box 12359, Amalinda,
East London, 5252
11 Bonza Bay Rd,
Beacon Bay,
East London, 5241

Tel: (043) 742 0041
Fax: (043) 742 3883

E-mail: office@rnaconsulteng.co.za

2318 - ECDC DIMBAZA FACTORIES - SITE 08, 12 & 21 - ELECTRICAL INSTALLATION

PRICE SUMMARY PAGE

ITEM NO.	DESCRIPTION	AMOUNT
1	PRELIMINARY & GENERAL	
2	DISTRIBUTION BOARDS	
3	CABLING AND CABLE SLEEVES	
4	GENERAL LIGHTING	
5	GENERAL SMALL POWER	
6	TELEPHONE AND DATA SYSTEM	
7	SUNDRY ITEMS	
8	PROVISIONAL SUMS (LPS & Connection Fees)	
9	ADJUSTMENTS TO N/S CONTRACT VALUE	NO AMOUNT
	SUBTOTAL	
	ADD 5% CONTINGENCY	
	SUBTOTAL	
	ADD 15% VAT	
	TOTAL incl. V.A.T.	

Part B2 – HVAC Installation

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
<u>Bill No. 1 : Preliminary and General</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
2,0	<u>Bill No. 2 : Fresh Air Ventilation Equipment Installation</u>				
	<u>Weather Louvers</u> Supply and install as specified				
2,1	450 x 450 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	0		RATE
2,2	250 x 250 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	0		RATE
2,3	150 x 150 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	1		
	<u>Galvanised Sheet Metal Transfer</u> Supply and install as specified				
2,4	400 x 200 mm rectangular to 160 mm diam round fan transfer.	no.	0		RATE
2,5	250 x 200 mm rectangular to 160 mm diam round fan transfer.	no.	0		RATE
2,6	150 x 150 mm rectangular to 100 mm diam round fan transfer.	no.	1		
2,7	160 mm rectangular to 200 mm diam round fan transfer.	no.	0		RATE
2,8	160 mm rectangular to 250 mm diam round fan transfer.	no.	0		RATE
2,9	100 mm rectangular to 160 mm diam round fan transfer.	no.	1		
	<u>In Line Axial Fans</u> Supply and install as specified				
2,10	FAF 1 Axial in line silent fan, 500 / 160; Q = 140 l/s @ 45 Pa & 21 dB.	no.	0		RATE
2,11	FAF 2 Axial in line silent fan, 500 / 160; Q = 100 l/s @ 75 Pa & 21 dB.	no.	0		RATE
2,12	FAF 3 Axial in line silent fan, 250 / 100; Q = 45 l/s @ 70 Pa & 21 dB.	no.	1		
2,13	FAF 4 Axial in line silent fan, 500 / 160; Q = 100 l/s @ 42 Pa & 21 dB.	no.	0		RATE
2,14	FAF 5 Axial in line silent fan, 160 / 100; Q = 15 l/s @ 42 Pa & 21 dB.	no.	0		RATE
	<u>Galvanised Sheet Metal Ducting</u> Supply and install as specified				
2,15	250 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
2,16	200 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE

DIMBAZA FACTORIES SITE 08
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
2,17	160 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	12		
2,18	100 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
Carried forward to Next Page					

DIMBAZA FACTORIES SITE 08
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
Carried forward from Previous Page					
	Flexible Ducting Supply and install as specified				
2,19	100 mm diameter Insulated Flexible Ducting	m	0		RATE
2,20	160 mm diameter Insulated Flexible Ducting	m	1		
	Galvanised Sheet Metal Spigot Supply and install as specified				
2,21	45 deg shoe spigot to 100 mm outlet, c/w externally insulated with two layer bubble pack reflective insulation.	No	0		RATE
2,22	45 deg shoe spigot to 160 mm outlet, c/w externally insulated with two layer bubble pack reflective insulation.	No	1		
	Galvanised Sheet Metal End Cap Supply and install as specified				
2,23	250 mm galvanised steel end cap, c/w externally insulated with two layer bubble pack reflective insulation.	No	0		RATE
2,24	160 mm galvanised steel end cap, c/w externally insulated with two layer bubble pack reflective insulation.	No	1		
	Diffusers Supply and install as specified				
2,25	100 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	0		RATE
2,26	160 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	1		
	Fan Controller Supply and install as specified				
2,27	2 pole fan controller, on / off wired remotely and installed in conduit and round box provided by others.	No	1		
	Sleeve Supply and install as specified				
2,28	Supply and install 400 x 200 mm internal sleeve for weather louvre.	no.	0		RATE
2,29	Supply and install 250 x 200 mm internal sleeve for weather louvre.	no.	0		RATE
2,30	Supply and install 150 x 150 mm internal sleeve for weather louvre.	no.	1		
	12 Month Service Plan				
2,31	Supply 12 month service plan, for each ventilation system, consisting of 3 quarterly minor services, and 1 final major service at 12 months from Practical Completion	No	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
4,0	<u>Bill No. 3 : Extract Air Ventilation Equipment Installation</u>				
	<u>Weather Louvers</u> Supply and install as specified				
3,1	400 x 400 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	0		RATE
	<u>Galvanised Sheet Metal Transfer</u> Supply and install as specified				
3,2	400 x 400 mm rectangular to 200 mm diam round fan transfer.	no.	0		RATE
3,3	200 mm rectangular to 300 mm diam round fan transfer.	no.	0		RATE
	<u>In Line Axial Fans</u> Supply and install as specified				
3,4	EAF 1 Axial in line silent fan, 1000 / 200; Q = 240 l/s @ 80 Pa & 21 dB.	no.	0		RATE
3,5	EAF 2 Axial in line silent fan, 1000 / 200; Q = 160 l/s @ 77 Pa & 21 dB.	no.	0		RATE
3,6	EAF 4 Axial in line silent fan, 1000 / 200; Q = 80 l/s @ 60 Pa & 21 dB.	no.	0		RATE
	<u>Galvanised Sheet Metal Ducting</u> Supply and install as specified				
3,7	300 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
3,8	250 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
3,9	200 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
3,10	150 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
	<u>Flexible Ducting</u> Supply and install as specified				
3,11	200 mm diameter Insulated Flexible Ducting	m	0		RATE
	<u>Galvanised Sheet Metal Spigot</u> Supply and install as specified				

DIMBAZA FACTORIES SITE 08
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
3,12	45 deg shoe spigot to 200 mm outlet, c/w externally insulated with two layer bubble pack reflective insulation. Door Grills Supply and install as specified	No	0		RATE
3,13,1	Aluminium door grill 200 x 200 mm	No	0		RATE
3,13,2	Aluminium door grill 250 x 250 mm	No	0		RATE
3,13,3	Aluminium door grill 300 x 300 mm	No	0		RATE
Carried forward to Next Page					

DIMBAZA FACTORIES SITE 08
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
Carried forward from Previous Page					
	Galvanised Sheet Metal End Cap Supply and install as specified				
3,14	200 mm galvanised steel end cap, c/w externally insulated with two layer bubble pack reflective insulation.	No	0		RATE
	Diffusers Supply and install as specified				
3,15	150 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	0		RATE
3,16	200 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	0		RATE
	Fan Controller Supply and install as specified				
3,17	2 pole fan controller, on / off wired remotely and installed in conduit and round box provided by others.	No	0		RATE
	Sleeve Supply and install as specified				
3,18	Supply and install 400 x 400 mm internal sleeve for weather louvre.	no.	0		RATE
	12 Month Service Plan				
3,19	Supply 12 month service plan, for each ventilation system, consisting of 3 quarterly minor services, and 1 final major service at 12 months from Practical Completion	No	0		RATE
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	Bill No. 1 : Preliminary and General	
2	Bill No. 2 : Fresh Air Ventilation Equipment Installation	
3	Bill No. 3 : Extract Air Ventilation Equipment Installation	
4	Carried to Main Contractors Final Summary (Ex VAT)	

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
<u>Bill No. 1 : Preliminary and General</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
2,0	<u>Bill No. 2 : Fresh Air Ventilation Equipment Installation</u>				
	<u>Weather Louvers</u> Supply and install as specified				
2,1	450 x 450 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	1		
2,2	250 x 250 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	0		RATE
2,3	150 x 150 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	1		
	<u>Galvanised Sheet Metal Transfer</u> Supply and install as specified				
2,4	400 x 450 mm rectangular to 200 mm diam round fan transfer.	no.	1		
2,5	250 x 250 mm rectangular to 160 mm diam round fan transfer.	no.	0		RATE
2,6	150 x 150 mm rectangular to 100 mm diam round fan transfer.	no.	0		RATE
2,7	200 mm rectangular to 300 mm diam round fan transfer.	no.	1		
2,8	300 mm rectangular to 200 mm diam round fan transfer.	no.	1		#REF!
2,9	100 mm rectangular to 160 mm diam round fan transfer.	no.	0		RATE
	<u>In Line Axial Fans</u> Supply and install as specified				
2,10	FAF 1 Axial in line silent fan, 1000 / 200; Q = 230 l/s @ 145 Pa & 21 dB.	no.	1		
2,11	FAF 2 Axial in line silent fan, 500 / 160; Q = 100 l/s @ 75 Pa & 21 dB.	no.	0		RATE
2,12	FAF 3 Axial in line silent fan, 250 / 100; Q = 45 l/s @ 70 Pa & 21 dB.	no.	0		RATE
2,13	FAF 4 Axial in line silent fan, 500 / 160; Q = 100 l/s @ 42 Pa & 21 dB.	no.	0		RATE
2,14	FAF 5 Axial in line silent fan, 160 / 100; Q = 15 l/s @ 42 Pa & 21 dB.	no.	0		RATE

DIMBAZA FACTORIES SITE 12
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
	<u>Galvanised Sheet Metal Ducting</u> Supply and install as specified				
2,15	300 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	2		
2,16	250 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	3		
2,17	200 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	8		
2,18	160 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	12		
Carried forward to Next Page					

DIMBAZA FACTORIES SITE 12
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
Carried forward from Previous Page					
	<u>Flexible Ducting</u> Supply and install as specified				
2,19	250 mm diameter Insulated Flexible Ducting	m	1		
2,20	160 mm diameter Insulated Flexible Ducting	m	4		
	<u>Galvanised Sheet Metal Spigot</u> Supply and install as specified				
2,21	45 deg shoe spigot to 250 mm outlet, c/w externally insulated with two layer bubble pack reflective insulation.	No	1		
2,22	45 deg shoe spigot to 160 mm outlet, c/w externally insulated with two layer bubble pack reflective insulation.	No	4		
	<u>Galvanised Sheet Metal End Cap</u> Supply and install as specified				
2,23	200 mm galvanised steel end cap, c/w externally insulated with two layer bubble pack reflective insulation.	No	1		
2,24	160 mm galvanised steel end cap, c/w externally insulated with two layer bubble pack reflective insulation.	No	0		RATE
	<u>Diffusers</u> Supply and install as specified				
2,25	250 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	1		
2,26	160 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	4		
	<u>Fan Controller</u> Supply and install as specified				
2,27	2 pole fan controller, on / off wired remotely and installed in conduit and round box provided by others.	No	1		
	<u>Sleeve</u> Supply and install as specified				
2,28	Supply and install 450 x 450 mm internal sleeve for weather louvre.	no.	1		
2,29	Supply and install 250 x 200 mm internal sleeve for weather louvre.	no.	0		RATE
2,30	Supply and install 150 x 150 mm internal sleeve for weather louvre.	no.	0		RATE

DIMBAZA FACTORIES SITE 12
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
	<u>12 Month Service Plan</u>				
2,31	Supply 12 month service plan, for each ventilation system, consisting of 3 quarterly minor services, and 1 final major service at 12 months from Practical Completion	No	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
4,0	<u>Bill No. 3 : Extract Air Ventilation Equipment Installation</u>				
	<u>Weather Louvers</u> Supply and install as specified				
3,1	400 x 400 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	1		
	<u>Galvanised Sheet Metal Transfer</u> Supply and install as specified				
3,2	400 x 400 mm rectangular to 200 mm diam round fan transfer.	no.	1		
3,3	200 mm rectangular to 300 mm diam round fan transfer.	no.	2		
	<u>In Line Axial Fans</u> Supply and install as specified				
3,4	EAF 1 Axial in line silent fan, 1000 / 200; Q = 240 l/s @ 80 Pa & 21 dB.	no.	1		
3,5	EAF 2 Axial in line silent fan, 1000 / 200; Q = 160 l/s @ 77 Pa & 21 dB.	no.	0		RATE
3,6	EAF 4 Axial in line silent fan, 1000 / 200; Q = 80 l/s @ 60 Pa & 21 dB.	no.	0		RATE
	<u>Galvanised Sheet Metal Ducting</u> Supply and install as specified				
3,7	300 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	6		
3,8	250 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	10		
3,9	200 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	4		
3,10	150 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
	<u>Flexible Ducting</u> Supply and install as specified				
3,11	200 mm diameter Insulated Flexible Ducting	m	5		
	<u>Galvanised Sheet Metal Spigot</u> Supply and install as specified				

DIMBAZA FACTORIES SITE 12
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
3,12	45 deg shoe spigot to 200 mm outlet, c/w externally insulated with two layer bubble pack reflective insulation.	No	5		
	Door Grills Supply and install as specified				
3,13,1	Aluminium door grill 200 x 200 mm	No	4		
3,13,2	Aluminium door grill 250 x 250 mm	No	0		
3,13,3	Aluminium door grill 300 x 300 mm	No	2		
Carried forward to Next Page					

DIMBAZA FACTORIES SITE 12
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
Carried forward from Previous Page					
	Galvanised Sheet Metal End Cap Supply and install as specified				
3,14	200 mm galvanised steel end cap, c/w externally insulated with two layer bubble pack reflective insulation.	No	1		
	Diffusers Supply and install as specified				
3,15	150 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No			
3,16	200 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	5		
	Fan Controller Supply and install as specified				
3,17	2 pole fan controller, on / off wired remotely and installed in conduit and round box provided by others.	No	1		
	Sleeve Supply and install as specified				
3,18	Supply and install 400 x 400 mm internal sleeve for weather louvre.	no.	1		
	12 Month Service Plan				
3,19	Supply 12 month service plan, for each ventilation system, consisting of 3 quarterly minor services, and 1 final major service at 12 months from Practical Completion	No	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	Bill No. 1 : Preliminary and General	
2	Bill No. 2 : Fresh Air Ventilation Equipment Installation	
3	Bill No. 3 : Extract Air Ventilation Equipment Installation	
4	Carried to Main Contractors Final Summary (Ex VAT)	

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
<u>Bill No. 1 : Preliminary and General</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
2,0	<u>Bill No. 2 : Fresh Air Ventilation Equipment Installation</u>				
	<u>Weather Louvers</u> Supply and install as specified				
2,1	450 x 450 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	4		
2,2	250 x 250 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	0		RATE
2,3	150 x 150 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	0		RATE
	<u>Galvanised Sheet Metal Transfer</u> Supply and install as specified				
2,4	400 x 450 mm rectangular to 200 mm diam round fan transfer.	no.	0		RATE
2,5	250 x 250 mm rectangular to 160 mm diam round fan transfer.	no.	0		RATE
2,6	150 x 150 mm rectangular to 100 mm diam round fan transfer.	no.	0		RATE
2,7	200 mm rectangular to 300 mm diam round fan transfer.	no.	0		RATE
2,8	300 mm rectangular to 200 mm diam round fan transfer.	no.	0		RATE
2,9	100 mm rectangular to 160 mm diam round fan transfer.	no.	0		RATE
	<u>In Line Axial Fans</u> Supply and install as specified				
2,10	FAF 1 Axial in line silent fan, 1000 / 200; Q = 230 l/s @ 145 Pa & 21 dB.	no.	0		RATE
2,11	FAF 2 Axial in line silent fan, 500 / 160; Q = 100 l/s @ 75 Pa & 21 dB.	no.	0		RATE
2,12	FAF 3 Axial in line silent fan, 250 / 100; Q = 45 l/s @ 70 Pa & 21 dB.	no.	0		RATE
2,13	FAF 4 Axial in line silent fan, 500 / 160; Q = 100 l/s @ 42 Pa & 21 dB.	no.	0		RATE
2,14	FAF 5 Axial in line silent fan, 160 / 100; Q = 15 l/s @ 42 Pa & 21 dB.	no.	0		RATE
	<u>Galvanised Sheet Metal Ducting</u> Supply and install as specified				
2,15	300 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE

DIMBAZA FACTORIES SITE 21
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
2,16	250 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
2,17	200 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
2,18	160 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
Carried forward to Next Page					

DIMBAZA FACTORIES SITE 21
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
Carried forward from Previous Page					
	<u>Flexable Ducting</u> Supply and install as specified				
2,19	250 mm diameter Insulated Flexable Ducting	m	0		RATE
2,20	160 mm diameter Insulated Flexable Ducting	m	0		RATE
	<u>Galvanised Sheet Metal Spigot</u> Supply and install as specified				
2,21	45 deg shoe spigot to 250 mm outlet, c/w externally insulated with two layer bubble pack reflective insulation.	No	0		RATE
2,22	45 deg shoe spigot to 160 mm outlet, c/w externally insulated with two layer bubble pack reflective insulation.	No	0		RATE
	<u>Galvanised Sheet Metal End Cap</u> Supply and install as specified				
2,23	200 mm galvanised steel end cap, c/w externally insulated with two layer bubble pack reflective insulation.	No	0		RATE
2,24	160 mm galvanised steel end cap, c/w externally insulated with two layer bubble pack reflective insulation.	No	0		RATE
	<u>Diffusers</u> Supply and install as specified				
2,25	250 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	0		RATE
2,26	160 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	0		RATE
	<u>Fan Controller</u> Supply and install as specified				
2,27	2 pole fan controller, on / off wired remotely and installed in conduit and round box provided by others.	No	0		RATE
	<u>Sleeve</u> Supply and install as specified				
2,28	Supply and install 450 x 450 mm internal sleeve for weather louvre.	no.	0		RATE
2,29	Supply and install 250 x 200 mm internal sleeve for weather louvre.	no.	0		RATE
2,30	Supply and install 150 x 150 mm internal sleeve for weather louvre.	no.	0		RATE
	<u>12 Month Service Plan</u>				
2,31	Supply 12 month service plan, for each ventilation system, consisting of 3 quarterly minor services, and 1 final major service at 12 months from Practical Completion	No	0		RATE
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS**DIMBAZA FACTORIES SITE 21****HEATING VENTILATION AND AIR CONDITIONING INSTALLATION****PROVISIONAL BILL OF QUANTITIES**

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
4,0	<u>Bill No. 3 : Extract Air Ventilation Equipment Installation</u>				
	<u>Weather Louvers</u> Supply and install as specified				
3,1	400 x 400 mm external weather louvre, powder coated to Architect's approval colour with concealed fixing, all as specified.	no.	0		RATE
	<u>Galvanised Sheet Metal Transfer</u> Supply and install as specified				
3,2	400 x 400 mm rectangular to 200 mm diam round fan transfer.	no.	0		RATE
3,3	200 mm rectangular to 300 mm diam round fan transfer.	no.	0		RATE
	<u>In Line Axial Fans</u> Supply and install as specified				
3,4	EAF 1 Axial in line silent fan, 1000 / 200; Q = 240 l/s @ 80 Pa & 21 dB.	no.	0		RATE
3,5	EAF 2 Axial in line silent fan, 1000 / 200; Q = 160 l/s @ 77 Pa & 21 dB.	no.	0		RATE
3,6	EAF 4 Axial in line silent fan, 1000 / 200; Q = 80 l/s @ 60 Pa & 21 dB.	no.	0		RATE
	<u>Galvanised Sheet Metal Ducting</u> Supply and install as specified				
3,7	300 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
3,8	250 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
3,9	200 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
3,10	150 mm diam round sheet metal ducting, c/w externally insulated with two layer bubble pack reflective insulation.	m	0		RATE
	<u>Flexible Ducting</u> Supply and install as specified				
3,11	200 mm diameter Insulated Flexible Ducting	m	0		RATE
	<u>Galvanised Sheet Metal Spigot</u> Supply and install as specified				

DIMBAZA FACTORIES SITE 21

HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
3,12	45 deg shoe spigot to 200 mm outlet, c/w externally insulated with two layer bubble pack reflective insulation. Door Grills Supply and install as specified	No	0		RATE
3,13,1	Aluminium door grill 200 x 200 mm	No	0		RATE
3,13,2	Aluminium door grill 250 x 250 mm	No	0		RATE
3,13,3	Aluminium door grill 300 x 300 mm	No	0		RATE
Carried forward to Next Page					

DIMBAZA FACTORIES SITE 21

HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
Carried forward from Previous Page					
	<u>Galvanised Sheet Metal End Cap</u> Supply and install as specified				
3,14	200 mm galvanised steel end cap, c/w externally insulated with two layer bubble pack reflective insulation.	No	0		RATE
	<u>Diffusers</u> Supply and install as specified				
3,15	150 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	0		RATE
3,16	200 mm diam. supply air ceiling disc diffuser. Pressed steel construction powder coated white, c/w mouting brackets.	No	0		RATE
	<u>Fan Controller</u> Supply and install as specified				
3,17	2 pole fan controller, on / off wired remotely and installed in conduit and round box provided by others.	No	0		RATE
	<u>Sleeve</u> Supply and install as specified				
3,18	Supply and install 400 x 400 mm internal sleeve for weather louvre.	no.	0		RATE
	<u>12 Month Service Plan</u>				
3,19	Supply 12 month service plan, for each ventilation system, consisting of 3 quarterly minor services, and 1 final major service at 12 months from Practical Completion	No	0		RATE
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
HEATING VENTILATION AND AIR CONDITIONING INSTALLATION
PROVISIONAL BILL OF QUANTITIES

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	Bill No. 1 : Preliminary and General	
2	Bill No. 2 : Fresh Air Ventilation Equipment Installation	
3	Bill No. 3 : Extract Air Ventilation Equipment Installation	
4	Carried to Main Contractors Final Summary (Ex VAT)	

Part B3 – Domestic Water

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
<u>BILL NO. 1 : PRELIMINARY AND GENERAL</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1.2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1.3	Tools and equipment, Communication, transport.				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1.5	Provision of all drawings and manuals as specified including As-Installed drawings	No.	1		
1.6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	No.	1		
1.7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	No.	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
2,0	<u>BILL NO. 2 : HOT & COLD WATER PIPING</u>				
	<u>Copper Piping</u> Copper piping above ground to SANS 460 class 2 installed in accordance with the specification, drawings and manufacturer's recommendations. Pipe hanger & support bracket spacing to be as per the table on the drawings. Piping - chased into brickwork must be wrapped in two layers of kraft paper as specified. Supply and install as specified				
2,1	76 mm dia	m	0		RATE
2,2	54 mm dia	m	0		RATE
2,3	42 mm dia	m	0		RATE
2,4	35 mm dia	m	0		RATE
2,5	28 mm dia	m	34		
2,6	22 mm dia	m	78		
2,7	15 mm dia	m	134		
	<u>Bends</u> Capillary soldered bends: (Maksal or equal and approved) Supply and install as specified				
2,8	76 mm dia	No.	0		RATE
2,9	54 mm dia	No.	0		RATE
2,10	42 mm dia	No.	0		RATE
2,11	35 mm dia	No.	0		RATE
2,12	28 mm dia	No.	8		
2,13	22 mm dia	No.	10		
2,14	15 mm dia	No.	52		
	<u>Tees</u> Capillary soldered tees: (Maksal or equal and approved) Supply and install as specified				
2,15	76 mm dia	No.	0		RATE
2,16	54 mm dia	No.	0		RATE
2,17	42 mm dia	No.	0		RATE
2,18	35 mm dia	No.	0		RATE
2,19	28 mm dia	No.	4		
2,20	22 mm dia	No.	18		
2,21	15 mm dia	No.	18		
Total Carried forward to Next Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	AMOUNT		
			QTY	SUPPLY RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Isolating valves</u> Ball valves, full bore with lever, hard chrome plated balls and teflon seats Supply and install as specified				
2,22	54 mm dia	No.	0		RATE
2,23	42 mm dia	No.	0		RATE
2,24	35 mm dia	No.	0		RATE
2,25	28 mm dia	No.	3		
2,26	22 mm dia	No.	8		
2,27	15 mm dia	No.	20		
	<u>Pipe hangers and brackets</u> Supply and install as specified				
2,28	76 mm dia	No.	0		RATE
2,29	54 mm dia	No.	0		RATE
2,30	42 mm dia	No.	0		RATE
2,31	35 mm dia	No.	0		RATE
2,32	28 mm dia	No.	34		
2,33	22 mm dia	No.	78		
2,34	15 mm dia	No.	134		
	<u>Non Return Valves</u> Supply and install as specified				
2,35	28 mm dia	No.	1		
2,36	22 mm dia	No.	2		
	<u>Vacuum Breakers</u> Supply and install as specified				
2,37	35 mm dia	No.	0		RATE
2,38	28 mm dia	No.	1		
2,39	22 mm dia	No.	4		
Total Carried forward to Next Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Insulation</u> All exposed hot water piping to be insulated with R value or not less than 1 m ² .KW Supply and install as specified				
2,40	76 mm dia	m	0		RATE
2,41	54 mm dia	m	0		RATE
2,42	42 mm dia	m	0		RATE
2,43	35 mm dia	m	0		RATE
2,44	28 mm dia	m	34		
2,45	22 mm dia	m	78		
2,46	15 mm dia	m	134		
	<u>Reducers</u> Supply and install as specified				
2,47	42 to 35 mm dia	No.	0		RATE
2,48	35 to 28 mm dia	No.	0		RATE
2,49	28 to 22 mm dia	No.	3		
2,50	22 to 15 mm dia	No.	30		
	<u>Braided Flexible Hoses</u> Supply and install as specified				
2,51	15 mm	m	20		
	<u>Bib tap</u> Supply and install as specified				
2,52	15 mm	No.	1		
	<u>Pressure Reducing Valve</u> Supply and install as specified				
2,53	28 mm	No.	1		
	<u>Pressure Balancing Valve</u> Supply and install as specified				
2,54	28 mm	No.	1		
Total Carried forward to Next Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Sundry Items</u>				
2,56	Solder, flux, consumables required to complete the installation	Lot	1		RATE
2,57	Connection to sanitary ware fittings	No.	20		RATE
2,58	Flushing & cleaning pipework system	m	70		
2,59	Pressure testing of parts of the installation	No.	8		
2,60	Pressure testing complete installation	No.	1		
2,61	Painting of piping	m	246		
2,62	Labelling of valves & piping	Lot	1		
2,63	De-zincification tests	Lot	1		
	<u>Manhole</u>				
	Supply and install as specified				
2,64	Supply, install, test and commission domestic water manhole 400 x 400 mm with hinged cover.	No.	1		
2,65	Supply, install, test and commission domestic water manhole 1000 x 1000 mm with hinged cover.	No.	0		RATE
	<u>Connection to Civil Mains</u>				
	Supply and install as specified				
2,66	Trenching and laying of pipe from installation to civil main, incl backfilling.	m	1		
2,67	Connection of domestic water main to civil main	No.	1		
	<u>Coring Through Brickwork</u>				
	Supply and install as specified				
2,68	Core through 220 mm brick work, 100 mm diam	No	6		
	<u>Training of Staff</u>				
2,69	Training of staff on operation of units; ; location	No	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
DOMESTIC WATER INSTALLATION

BILL NO. 3: WATER HEATING EQUIPMENT

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
3,0	BILL NO. 3 : WATER HEATING EQUIPMENT				
3,1	<u>Solar Water Heating Cylinder</u> Solar evacuated tube water heater SANS 10254 approved, c/w temperature and pressure valves, drain cock, pressure control valve, drip trays, vacuum breakers and polyurethane insulation with protective outer casing + electrical back up. Supply and install as specified				
3.1.1	100 litre capacity units complete .	No.	1		
3.1.2	Circulation pump	No.	1		
3.1.3	Mixing valve	No.	1		
3,1,4	Connection of 100 geyser to electrical isolator provided by others	No.	1		
3,1,5	10 Litre PRISMA Under counter water heater	No.	1		
3,1,6	Connection of 10 geyser to electrical isolator provided by others	No.	1		
Total Carried forward to Summary Page					

**RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
DOMESTIC WATER INSTALLATION**

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	BILL NO. 1 : PRELIMINARY AND GENERAL	
2	BILL NO. 2 : HOT & COLD WATER PIPING	
3	BILL NO. 3 : WATER HEATING EQUIPMENT	
4	Carried to Main Contractors Final Summary (Ex VAT)	

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
<u>BILL NO. 1 : PRELIMINARY AND GENERAL</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1,3	Tools and equipment, Communication, transport.				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	No.	1		
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	No.	1		
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	No.	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
2,0	BILL NO. 2 : HOT & COLD WATER PIPING				
	Copper Piping				
	Copper piping above ground to SANS 460 class 2 installed in accordance with the specification, drawings and manufacturer's recommendations. Pipe hanger & support bracket spacing to be as per the table on the drawings. Piping - chased into brickwork must be wrapped in two layers of kraft paper as specified. Supply and install as specified				
2,1	76 mm dia	m	0		RATE
2,2	54 mm dia	m	0		RATE
2,3	42 mm dia	m	0		RATE
2,4	35 mm dia	m	30		
2,5	28 mm dia	m	78		
2,6	22 mm dia	m	24		
2,7	15 mm dia	m	198		
	Bends				
	Capillary soldered bends: (Maksal or equal and approved) Supply and install as specified				
2,8	76 mm dia	No.	0		RATE
2,9	54 mm dia	No.	0		RATE
2,10	42 mm dia	No.	0		RATE
2,11	35 mm dia	No.	10		
2,12	28 mm dia	No.	16		
2,13	22 mm dia	No.	12		
2,14	15 mm dia	No.	88		
	Tees				
	Capillary soldered tees: (Maksal or equal and approved) Supply and install as specified				
2,15	76 mm dia	No.	0		RATE
2,16	54 mm dia	No.	0		RATE
2,17	42 mm dia	No.	0		RATE
2,18	35 mm dia	No.	1		
2,19	28 mm dia	No.	40		
2,20	22 mm dia	No.	12		
2,21	15 mm dia	No.	12		
Total Carried forward to Next Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Isolating valves</u> Ball valves, full bore with lever, hard chrome plated balls and teflon seats Supply and install as specified				
2,22	54 mm dia	No.	0		RATE
2,23	42 mm dia	No.	0		RATE
2,24	35 mm dia	No.	2		
2,25	28 mm dia	No.	5		
2,26	22 mm dia	No.	2		
2,27	15 mm dia	No.	44		
	<u>Pipe hangers and brackets</u> Supply and install as specified				
2,28	76 mm dia	No.	0		RATE
2,29	54 mm dia	No.	0		RATE
2,30	42 mm dia	No.	0		RATE
2,31	35 mm dia	No.	30		
2,32	28 mm dia	No.	78		
2,33	22 mm dia	No.	24		
2,34	15 mm dia	No.	198		
	<u>Non Return Valves</u> Supply and install as specified				
2,35	28 mm dia	No.	2		
2,36	22 mm dia	No.	1		
	<u>Vacuum Breakers</u> Supply and install as specified				
2,37	35 mm dia	No.	1		
2,38	28 mm dia	No.	4		
2,39	22 mm dia	No.	1		
Total Carried forward to Next Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Insulation</u> All exposed hot water piping to be insulated with R value or not less than 1 m ² .KW Supply and install as specified				
2,40	76 mm dia	m	0		RATE
2,41	54 mm dia	m	0		RATE
2,42	42 mm dia	m	0		RATE
2,43	35 mm dia	m	30		
2,44	28 mm dia	m	78		
2,45	22 mm dia	m	24		
2,46	15 mm dia	m	198		
	<u>Reducers</u> Supply and install as specified				
2,47	42 to 35 mm dia	No.	0		RATE
2,48	35 to 28 mm dia	No.	2		
2,49	28 to 22 mm dia	No.	26		
2,50	22 to 15 mm dia	No.	6		
	<u>Braided Flexible Hoses</u> Supply and install as specified				
2,51	15 mm	m	30		
	<u>Bib tap</u> Supply and install as specified				
2,52	15 mm	No.	1		
	<u>Pressure Reducing Valve</u> Supply and install as specified				
2,53	28 mm	No.	1		
	<u>Pressure Balancing Valve</u> Supply and install as specified				
2,54	28 mm	No.	1		
Total Carried forward to Next Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Sundry Items</u>				
2,56	Solder, flux, consumables required to complete the installation	Lot	1		RATE
2,57	Connection to sanitary ware fittings	No.	30		RATE
2,58	Flushing & cleaning pipework system	m	126		
2,59	Pressure testing of parts of the installation	No.	8		
2,60	Pressure testing complete installation	No.	1		
2,61	Painting of piping	m	330		
2,62	Labelling of valves & piping	Lot	1		
2,63	De-zincification tests	Lot	1		
	<u>Manhole</u>				
	Supply and install as specified				
2,64	Supply, install, test and commission domestic water manhole 400 x 400 mm with hinged cover.	No.	1		
2,65	Supply, install, test and commission domestic water manhole 1000 x 1000 mm with hinged cover.	No.	0		RATE
	<u>Connection to Civil Mains</u>				
	Supply and install as specified				
2,66	Trenching and laying of pipe from installation to civil main, incl backfilling.	m	1		
2,67	Connection of domestic water main to civil main	No.	1		
	<u>Coring Through Brickwork</u>				
	Supply and install as specified				
2,68	Core through 220 mm brick work, 100 mm diam	No	6		
	<u>Training of Staff</u>				
2,69	Training of staff on operation of units; ; location	No	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
DOMESTIC WATER INSTALLATION

BILL NO. 3: WATER HEATING EQUIPMENT

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
3,0	BILL NO. 3 : WATER HEATING EQUIPMENT				
3,1	<u>Solar Water Heating Cylinder</u>				
	Solar evacuated tube water heater SANS 10254 approved, c/w temperature and pressure valves, drain cock, pressure control valve, drip trays, vacuum breakers and polyurethane insulation with protective outer casing + electrical back up. Supply and install as specified				
3.1.1	200 litre capacity units complete .	No.	2		
3.1.2	Circulation pump	No.	1		
3.1.3	Mixing valve	No.	1		
3,1,4	Connection of 200 geyser to electrical isolator provided by others	No.	2		
3,1,5	10 Litre PRISMA Under counter water heater	No.	1		
3,1,6	Connection of 10 geyser to electrical isolator provided by others	No.	1		
Total Carried forward to Summary Page					

**RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
DOMESTIC WATER INSTALLATION**

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	BILL NO. 1 : PRELIMINARY AND GENERAL	
2	BILL NO. 2 : HOT & COLD WATER PIPING	
3	BILL NO. 3 : WATER HEATING EQUIPMENT	
4	Carried to Main Contractors Final Summary (Ex VAT)	

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
<u>BILL NO. 1 : PRELIMINARY AND GENERAL</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1,3	Tools and equipment, Communication, transport.				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	No.	1		
	Value Related	No.	1		
	Time Related	No.	1		
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	No.	1		
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	No.	1		
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	No.	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
2,0	<u>BILL NO. 2 : HOT & COLD WATER PIPING</u>				
	<u>Copper Piping</u> Copper piping above ground to SANS 460 class 2 installed in accordance with the specification, drawings and manufacturer's recommendations. Pipe hanger & support bracket spacing to be as per the table on the drawings. Piping - chased into brickwork must be wrapped in two layers of kraft paper as specified. Supply and install as specified				
2,1	76 mm dia	m	0		RATE
2,2	54 mm dia	m	0		RATE
2,3	42 mm dia	m	64		
2,4	35 mm dia	m	66		
2,5	28 mm dia	m	12		
2,6	22 mm dia	m	16		
2,7	15 mm dia	m	270		
	<u>Bends</u> Capillary soldered bends: (Maksal or equal and approved) Supply and install as specified				
2,8	76 mm dia	No.	0		RATE
2,9	54 mm dia	No.	0		RATE
2,10	42 mm dia	No.	10		
2,11	35 mm dia	No.	20		
2,12	28 mm dia	No.	5		
2,13	22 mm dia	No.	8		
2,14	15 mm dia	No.	135		
	<u>Tees</u> Capillary soldered tees: (Maksal or equal and approved) Supply and install as specified				
2,15	76 mm dia	No.	0		RATE
2,16	54 mm dia	No.	0		RATE
2,17	42 mm dia	No.	2		
2,18	35 mm dia	No.	14		
2,19	28 mm dia	No.	10		
2,20	22 mm dia	No.	12		
2,21	15 mm dia	No.	17		
Total Carried forward to Next Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Isolating valves</u> Ball valves, full bore with lever, hard chrome plated balls and teflon seats Supply and install as specified				
2,22	54 mm dia	No.	0		RATE
2,23	42 mm dia	No.	2		
2,24	35 mm dia	No.	2		
2,25	28 mm dia	No.	1		
2,26	22 mm dia	No.	1		
2,27	15 mm dia	No.	45		
	<u>Pipe hangers and brackets</u> Supply and install as specified				
2,28	76 mm dia	No.	0		RATE
2,29	54 mm dia	No.	0		RATE
2,30	42 mm dia	No.	64		
2,31	35 mm dia	No.	66		
2,32	28 mm dia	No.	12		
2,33	22 mm dia	No.	16		
2,34	15 mm dia	No.	270		
	<u>Non Return Valves</u> Supply and install as specified				
2,35	42 mm dia	No.	1		
2,36	35 mm dia	No.	3		
	<u>Vacuum Breakers</u> Supply and install as specified				
2,37	35 mm dia	No.	5		
2,38	28 mm dia	No.	1		
2,39	22 mm dia	No.	1		
Total Carried forward to Next Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Insulation</u> All exposed hot water piping to be insulated with R value or not less than 1 m ² .KW Supply and install as specified				
2,40	76 mm dia	m	0		RATE
2,41	54 mm dia	m	0		RATE
2,42	42 mm dia	m	64		
2,43	35 mm dia	m	66		
2,44	28 mm dia	m	12		
2,45	22 mm dia	m	16		
2,46	15 mm dia	m	270		
	<u>Reducers</u> Supply and install as specified				
2,47	42 to 35 mm dia	No.	2		
2,48	35 to 28 mm dia	No.	14		
2,49	28 to 22 mm dia	No.	10		
2,50	22 to 15 mm dia	No.	16		
	<u>Braided Flexible Hoses</u> Supply and install as specified				
2,51	15 mm	m	45		
	<u>Bib tap</u> Supply and install as specified				
2,52	15 mm	No.	1		
	<u>Pressure Reducing Valve</u> Supply and install as specified				
2,53	42 mm	No.	1		
	<u>Pressure Balancing Valve</u> Supply and install as specified				
2,54	35 mm	No.	1		
Total Carried forward to Next Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
DOMESTIC WATER INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT			
			QTY	SUPPLY RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Sundry Items</u>				
2,56	Solder, flux, consumables required to complete the installation	Lot	1		RATE
2,57	Connection to sanitary ware fittings	No.	45		RATE
2,58	Flushing & cleaning pipework system	m	178		
2,59	Pressure testing of parts of the installation	No.	8		
2,60	Pressure testing complete installation	No.	1		
2,61	Painting of piping	m	428		
2,62	Labelling of valves & piping	Lot	1		
2,63	De-zincification tests	Lot	1		
	<u>Manhole</u>				
	Supply and install as specified				
2,64	Supply, install, test and commission domestic water manhole 400 x 400 mm with hinged cover.	No.	1		
2,65	Supply, install, test and commission domestic water manhole 1000 x 1000 mm with hinged cover.	No.	0		RATE
	<u>Connection to Civil Mains</u>				
	Supply and install as specified				
2,66	Trenching and laying of pipe from installation to civil main, incl backfilling.	m	1		
2,67	Connection of domestic water main to civil main	No.	1		
	<u>Coring Through Brickwork</u>				
	Supply and install as specified				
2,68	Core through 220 mm brick work, 100 mm diam	No	6		
	<u>Training of Staff</u>				
2,69	Training of staff on operation of units; ; location	No	1		
Total Carried forward to Summary Page					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
DOMESTIC WATER INSTALLATION

BILL NO. 3: WATER HEATING EQUIPMENT

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	AMOUNT
3,0	BILL NO. 3 : WATER HEATING EQUIPMENT				
3,1	<u>Solar Water Heating Cylinder</u>				
	Solar evacuated tube water heater SANS 10254 approved, c/w temperature and pressure valves, drain cock, pressure control valve, drip trays, vacuum breakers and polyurethane insulation with protective outer casing + electrical back up. Supply and install as specified				
3.1.1	200 litre capacity units complete .	No.	3		
3.1.2	Circulation pump	No.	1		
3.1.3	Mixing valve	No.	1		
3,1,4	Connection of 200 geyser to electrical isolator provided by others	No.	3		
3,1,5	10 Litre PRISMA Under counter water heater	No.	1		
3,1,6	Connection of 10 geyser to electrical isolator provided by others	No.	1		
Total Carried forward to Summary Page					

**RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
DOMESTIC WATER INSTALLATION**

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	BILL NO. 1 : PRELIMINARY AND GENERAL	
2	BILL NO. 2 : HOT & COLD WATER PIPING	
3	BILL NO. 3 : WATER HEATING EQUIPMENT	
4	Carried to Main Contractors Final Summary (Ex VAT)	

Part B4 – Fire Water

**RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
FIRE FIGHTING EQUIPMENT INSTALLATIONS**

SCHEDULE NO 1: PRELIMINARY & GENERAL

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
1.0	<u>CONTRACTUAL CONDITIONS</u>				
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
1.2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
	Attendance at site meetings	Sum	1		
1.5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1.6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1.7	<u>DAYWORK SCHEDULE</u>				
	Personnel				
	Coded welder	hr			Rate only
	Registered electrician	hr			N/A
	Registered HVAC technician	hr			N/A
	Apprentice	hr			Rate only
	Labourer	hr			Rate only
Carried forward					

SCHEDULE NO 1: PRELIMINARY & GENERAL

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	RATE	AMOUNT
Brought forward					
1.9	<p><u>GUARANTEE</u></p> <p>12 month guarantee of plant and equipment as specified</p> <p>Allowance for servicing the plant during the guarantee period</p> <p>Monthly service calls to check plant operation, clean filters, etc</p> <p>3 monthly minor service as specified</p> <p>Annual major service at the end of the guarantee period</p>	Sum	1		
1.10	<p>Additional Tests</p> <p>Allow for additional tests as direct by the Consulting Engineer</p>	Item			
1.11	<p><u>Additional items</u></p> <p>Any additional items the contractor wishes to allow for: (Specify)</p>				
TOTAL SCHEDULE NO 1 - CARRIED TO SUMMARY					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
FIRE FIGHTING EQUIPMENT INSTALLATIONS

SCHEDULE NO 2: FIRE FIGHTING EQUIPMENT INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
3,0	FIRE FIGHTING EQUIPMENT				
3,1	<u>Steel Piping</u> Supply and install steel piping to ASTM A106 #40 or SANS 62 as specified (heavy quality)				
	.01 200 mm	m	0		RATE
	.02 150 mm	m	0		RATE
	.03 100 mm	m	150		
	.04 80 mm	m	25		
	.05 65mm	m	0		RATE
	.06 50mm	m	0		RATE
	.07 40mm	m	0		RATE
	.08 32mm	m	10		
	0.09 25mm	m	27		
	0.10 Thrust Block 2,4 Ton/m ²	m ²	6		
3,2	<u>Pipe Hangers & Brackets(steel piping)</u> Supply and install as specified				
	.01 200 mm	no	0		RATE
	.02 150 mm	no	0		RATE
	.03 100 mm	no	75		
	.04 80 mm	no	13		
	.05 65mm	no	0		RATE
	.06 50mm	no	0		RATE
	.07 40mm	no	0		RATE
	.08 32mm	no	5		
	.09 25mm	no	14		
3,3	<u>Pipe Fittings</u> <u>Bends</u> Supply and install as specified				
	.01 200 mm	no	0		RATE
	.02 150mm	no	0		
	.03 100mm	no	7		
	.04 80 mm	no	7		
	.05 50mm	no	0		RATE
	.06 40mm	no	0		RATE
	.07 32mm	no	2		
	.08 25mm	no	4		
3,4	<u>Tees Equal</u> Supply and install as specified				
	.01 150mm	no	0		RATE
	.02 100mm	no	4		
	.03 80 mm	no	4		
	.04 50mm	no	0		RATE
	.05 40mm	no	0		RATE
	.06 32mm	no	4		
	.07 25mm	no	3		
		no			
Carried forward					

SCHEDULE NO 2: SPRINKLER INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
Brought forward					
3,5	<u>Reducers</u> Supply and install as specified				
	.01 100 - 75 mm	no	4		
	.02 75 - 65 mm	no	1		
	.03 65 - 50 mm	no	1		
	.04 50 - 40 mm	no	1		
	.05 40 - 32 mm	no	1		
	.06 32 - 25 mm	no	1		
3,6	<u>Couplings</u> Supply and install as specified				
	.01 100 - 75 mm	no	0		RATE
	.02 75 - 65 mm	no	50		
	.03 65 - 50 mm	no	8		
	.04 50 - 40 mm	no	0		RATE
	.05 40 - 32 mm	no	0		RATE
	.06 32 - 25 mm	no	1		
3,7	<u>Isolating Valves</u> Supply and install as specified				
	.01 150mm	no	0		RATE
	.02 100mm	no	1		
	.03 65mm	no	0		RATE
	.04 50mm	no	0		RATE
	.05 40mm	no	0		RATE
	.06 32mm	no	1		
	.07 25mm	no	4		
3,8	<u>Painting and Finishing</u> Allow for painting sprinkler and fire hose reel piping as follows				
	.01 Etching primer coat	sum	1		
	.02 Undercoat (different colour to primer)	sum	1		
	.03 Final coat - colour as specified by architect	sum	1		
	Testing and Commissioning Allow for testing and commissioning of the systems	sum	1		
3,9	<u>Valve Chamber</u> Supply and install as specified Bulk Valve Chamber - Cover Dimension 400 x 324 mm; Frame Dimension 533 x 458 x 152 mm, clear opening 380 x 305 mm	no	1		
Carried forward					

SCHEDULE NO 2: SPRINKLER INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
Brought forward					
	<p><u>Fire Hose Reels</u> Supply and install as specified</p> <p>Fire hose reels to comply with requirements contained in SANS 543 and maintained in accordance with the requirements as given in SANS 1475-2.</p> <p>Supply, install, test and commission:</p>				
3,9	30 m length of fibre braid reinforced neoprene mm internal diameter	no	4		
3,10	Tamper seals	no	4		
	<p><u>Fire Extinguishers</u> Supply and install as specified</p> <p>Hand held fire extinguishers shall comply with the requirements contained in SANS 1910 or SANS 1151, and shall be installed, maintained and serviced in accordance with SANS 10105-1 and SANS 1475-1.</p>				
3.11	5 kg CO2 hand held fire extinguisher.	no	9		
3.12	4,5 kg DCP hand held fire extinguisher.	no	9		
3.13	Tamper seals	no	18		
	<p><u>Waterproof Tape</u> Supply and install as specified</p>				
3.14	Self adhesive waterproof tape 2,5 mm	m	175		
	<p><u>Hydrant</u> Supply and install as specified</p> <p>80 x 65mm "Woodlands Type" or equally approved brass right-angle hydrant valve with cap and chain</p>				
	<p><u>Hydrant Pedestal</u> Supply and install as specified</p> <p>Unreinforced concrete hydrant pedestal 1.1m high overall cast around vertical pipe with bottom 600mm below ground, 340 x 340mm square at base and tapering to 210 x 210mm overall octagonal shaped top, finished in all exposed faces in 1:3 cement plaster with all angles rounded including formwork and setting 600mm deep in ground, excavation in all material, backfilling, carting away surplus material, risk of collapse, dewatering, backfilling, compaction, and two coats of approved golden yellow paint to exposed surfaces, as per Engineer's drawing.</p>				
		no	3		
Carried forward to summary					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
FIRE FIGHTING EQUIPMENT INSTALLATIONS

SCHEDULE NO 3: FIRE SIGNAGE INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
4,0	<p>Fire Signage Equipment</p> <p><u>Fire Signage</u></p> <p>Aluminium Framed Wall Mounted Brackets ABS PVC 150 mm Signs</p> <p>ALL "E" TYPE SIGNS IS WHITE FIGURES AND BORDER ON GREEN BACKGROUND</p> <p>ALL "F" TYPE SIGNS ARE RED REVERSE ENGRAVED ON ON WHITE BACKGROUND WITH 4mm RED BORDER LINE</p> <p>All internal signage to be SANS 1186/5</p> <p>Supply and install the following:</p>				
4,1	2 compartment Type F1 (Arrow & Extinguisher)	No	3		
4,2	3 compartment Type F4 (Arrow; Extinguisher & Hose Reel)	No	2		
4,3	4 compartment Type F7 (Arrow & Running Man)	No	2		
4,4	1 Compartment Type E1 (EXIT sign)	No	5		
4,5	2 compartment Type E1 (Arrow & Running Man)	No	26		
Carried forward to summary					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
FIRE FIGHTING EQUIPMENT INSTALLATIONS

SCHEDULE NO 4: EXCAVATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
4,0	<p><u>EXCAVATION</u></p> <p><u>Trenches for 100 mm uPVC pipe not</u></p> <p>Trenches for 100 mm uPVC pipe not exceeding 1m deep, including excavation in running length, laid on 100mm thick selected granular bedding material (SABS 1200 LB), filled with 460mm high selected fill material (SABS 1200 LB) and backfilling the rest of the trenches with suitable material compacted to 93% Mod ASHTO density including carting away surplus excavated material, risk of collapse, keeping excavations free of water, etc.</p>	Metre	175		
Carried forward to summary					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 21
FIRE FIGHTING EQUIPMENT INSTALLATIONS

FINAL SUMMARY PAGE

Item No.	Description	Amount
1	SCHEDULE NO 1: PRELIMINARY & GENERAL	
2	SCHEDULE NO 2: FIRE FIGHTING EQUIPMENT INSTALLATION	
3	SCHEDULE NO 3: FIRE SIGNAGE INSTALLATION	
4	SCHEDULE NO 4: EXCAVATION	
5	Carried to Main Contractors Final Summary (Ex VAT)	

Part B5 – Fire Suppression Installation

**RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
FIRE FIGHTING EQUIPMENT INSTALLATIONS**

SCHEDULE NO 1: PRELIMINARY & GENERAL

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
1.0	<u>CONTRACTUAL CONDITIONS</u>				
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
1.2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
	Attendance at site meetings	Sum	1		
1.5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1.6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1.7	<u>DAYWORK SCHEDULE</u>				
	Personnel				
	Coded welder	hr			Rate only
	Registered electrician	hr			N/A
	Registered HVAC technician	hr			N/A
	Apprentice	hr			Rate only
	Labourer	hr			Rate only
Carried forward					

SCHEDULE NO 1: PRELIMINARY & GENERAL

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	RATE	AMOUNT
Brought forward					
1.9	<u>GUARANTEE</u>				
	12 month guarantee of plant and equipment as specified	Sum	1		
	Allowance for servicing the plant during the guarantee period				
	Monthly service calls to check plant operation, clean filters, etc	No	8		
	3 monthly minor service as specified	No	3		
	Annual major service at the end of the guarantee period	No	1		
1.10	Additional Tests				
	Allow for additional tests as direct by the Consulting Engineer	Item			
1.11	<u>Additional items</u>				
	Any additional items the contractor wishes to allow for: (Specify)				
TOTAL SCHEDULE NO 1 - CARRIED TO SUMMARY					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
FIRE FIGHTING EQUIPMENT INSTALLATIONS

SCHEDULE NO 2: FIRE FIGHTING EQUIPMENT INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
3,0	FIRE FIGHTING EQUIPMENT				
3,1	<u>Steel Piping</u> Supply and install steel piping to ASTM A106 #40 or SANS 62 as specified (heavy quality)				
	.01 200 mm	m	0		RATE
	.02 150 mm	m	0		RATE
	.03 100 mm	m	0		RATE
	.04 80 mm	m	0		RATE
	.05 65mm	m	0		RATE
	.06 50mm	m	0		RATE
	.07 40mm	m	0		RATE
	.08 32mm	m	0		RATE
	0.09 25mm	m	28		
	0.10 Thrust Block 2,4 Ton/m ²	m ²	0		RATE
3,2	<u>Pipe Hangers & Brackets(steel piping)</u> Supply and install as specified				
	.01 200 mm	no	0		RATE
	.02 150 mm	no	0		RATE
	.03 100 mm	no	0		RATE
	.04 80 mm	no	0		RATE
	.05 65mm	no	0		RATE
	.06 50mm	no	0		RATE
	.07 40mm	no	0		RATE
	.08 32mm	no	0		RATE
	.09 25mm	no	14		
3,3	<u>Pipe Fittings</u> <u>Bends</u> Supply and install as specified				
	.01 200 mm	no	0		RATE
	.02 150mm	no	0		RATE
	.03 100mm	no	0		RATE
	.04 65mm	no	0		RATE
	.05 50mm	no	0		RATE
	.06 40mm	no	0		RATE
	.07 32mm	no	0		RATE
	.08 25mm	no	4		
3,4	<u>Tees Equal</u> Supply and install as specified				
	.01 150mm	no	0		RATE
	.02 100mm	no	0		RATE
	.03 65mm	no	0		RATE
	.04 50mm	no	0		RATE
	.05 40mm	no	0		RATE
	.06 32mm	no	0		RATE
	.07 25mm	no	1		
		no			
Carried forward					

SCHEDULE NO 2: SPRINKLER INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
Brought forward					
3,5	<u>Reducers</u> Supply and install as specified				
	.01 100 - 75 mm	no	0		
	.02 75 - 65 mm	no	0		RATE
	.03 65 - 50 mm	no	0		RATE
	.04 50 - 40 mm	no	0		RATE
	.05 40 - 32 mm	no	0		RATE
	.06 32 - 25 mm	no	0		RATE
3,6	<u>Couplings</u> Supply and install as specified				
	.01 100 - 75 mm	no	0		RATE
	.02 75 - 65 mm	no	0		RATE
	.03 65 - 50 mm	no	0		RATE
	.04 50 - 40 mm	no	0		RATE
	.05 40 - 32 mm	no	0		RATE
	.06 32 - 25 mm	no	0		RATE
3,7	<u>Isolating Valves</u> Supply and install as specified				
	.01 150mm	no	0		RATE
	.02 100mm	no	0		RATE
	.03 65mm	no	0		RATE
	.04 50mm	no	0		RATE
	.05 40mm	no	0		RATE
	.06 32mm	no	0		RATE
	.07 25mm	no	1		
3,8	<u>Painting and Finishing</u> Allow for painting sprinkler and fire hose reel piping as follows				
	.01 Etching primer coat	sum	1		
	.02 Undercoat (different colour to primer)	sum	1		
	.03 Final coat - colour as specified by architect	sum	1		
	Testing and Commissioning Allow for testing and commissioning of the systems	sum	1		
3,9	<u>Valve Chamber</u> Supply and install as specified Bulk Valve Chamber - Cover Dimension 400 x 324 mm; Frame Dimension 533 x 458 x 152 mm, clear opening 380 x 305 mm	no	1		
Carried forward					

SCHEDULE NO 2: SPRINKLER INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
Brought forward					
	<p><u>Fire Hose Reels</u> Supply and install as specified</p>				
	<p>Fire hose reels to comply with requirements contained in SANS 543 and maintained in accordance with the requirements as given in SANS 1475-2.</p>				
	<p>Supply, install, test and commission:</p>				
3,9	<p>30 m length of fibre braid reinforced neoprene mm internal diameter</p>	no	1		
3,10	<p>Tamper seals</p>	no	1		
	<p><u>Fire Extinguishers</u> Supply and install as specified</p>				
	<p>Hand held fire extinguishers shall comply with the requirements contained in SANS 1910 or SANS 1151, and shall be installed, maintained and serviced in accordance with SANS 10105-1 and SANS 1475-1.</p>				
3.11	<p>5 kg CO2 hand held fire extinguisher.</p>	no	1		
3.12	<p>4,5 kg DCP hand held fire extinguisher.</p>	no	4		
3.13	<p>Tamper seals</p>	no	5		
	<p><u>Waterproof Tape</u> Supply and install as specified</p>				
3.14	<p>Self adhesive waterproof tape 2,5 mm</p>	m	0		RATE
	<p><u>Hydrant</u> Supply and install as specified</p>				
	<p>80 x 65mm "Woodlands Type" or equally approved brass right-angle hydrant valve with cap and chain</p>	no	1		
	<p><u>Hydrant Pedestal</u> Supply and install as specified</p>				
	<p>Unreinforced concrete hydrant pedestal 1.1m high overall cast around vertical pipe with bottom 600mm below ground, 340 x 340mm square at base and tapering to 210 x 210mm overall octagonal shaped top, finished in all exposed faces in 1:3 cement plaster with all angles rounded including formwork and setting 600mm deep in ground, excavation in all material, backfilling, carting away surplus material, risk of collapse, dewatering, backfilling, compaction, and two coats of approved golden yellow paint to exposed surfaces, as per Engineer's drawing.</p>	no	1		
Carried forward to summary					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
FIRE FIGHTING EQUIPMENT INSTALLATIONS

SCHEDULE NO 3: FIRE SIGNAGE INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
4,0	<p>Fire Signage Equipment</p> <p><u>Fire Signage</u></p> <p>Aluminium Framed Wall Mounted Brackets ABS PVC 150 mm Signs</p> <p>ALL "E" TYPE SIGNS IS WHITE FIGURES AND BORDER ON GREEN BACKGROUND</p> <p>ALL "F" TYPE SIGNS ARE RED REVERSE ENGRAVED ON ON WHITE BACKGROUND WITH 4mm RED BORDER LINE</p> <p>All internal signage to be SANS 1186/5</p> <p>Supply and install the following:</p>				
4,1	2 compartment Type F1 (Arrow & Extinguisher)	No	1		
4,2	3 compartment Type F4 (Arrow; Extinguisher & Hose Reel)	No	1		
4,3	4 compartment Type F7 (Arrow & Running Man)	No	1		
4,4	1 Compartment Type E1 (EXIT sign)	No	2		
4,5	2 compartment Type E1 (Arrow & Running Man)	No	1		
Carried forward to summary					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
FIRE FIGHTING EQUIPMENT INSTALLATIONS

SCHEDULE NO 4: EXCAVATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
4,0	<p><u>EXCAVATION</u></p> <p><u>Trenches for 100 mm uPVC pipe not</u></p> <p>Trenches for 100 mm uPVC pipe not exceeding 1m deep, including excavation in running length, laid on 100mm thick selected granular bedding material (SABS 1200 LB), filled with 460mm high selected fill material (SABS 1200 LB) and backfilling the rest of the trenches with suitable material compacted to 93% Mod ASHTO density including carting away surplus excavated material, risk of collapse, keeping excavations free of water, etc.</p>	Metre	48		
Carried forward to summary					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 08
FIRE FIGHTING EQUIPMENT INSTALLATIONS

FINAL SUMMARY PAGE

Item No.	Description	Amount
1	SCHEDULE NO 1: PRELIMINARY & GENERAL	
2	SCHEDULE NO 2: FIRE FIGHTING EQUIPMENT INSTALLATION	
3	SCHEDULE NO 3: FIRE SIGNAGE INSTALLATION	
4	SCHEDULE NO 4: EXCAVATION	
5	Carried to Main Contractors Final Summary (Ex VAT)	

**RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
FIRE FIGHTING EQUIPMENT INSTALLATIONS**

SCHEDULE NO 1: PRELIMINARY & GENERAL

ITEM NO	DESCRIPTION	UNIT	QUANTITY	SUPPLY RATE	AMOUNT
1.0	<u>CONTRACTUAL CONDITIONS</u>				
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
1.2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
	Attendance at site meetings	Sum	1		
1.5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1.6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1.7	<u>DAYWORK SCHEDULE</u>				
	Personnel				
	Coded welder	hr			Rate only
	Registered electrician	hr			N/A
	Registered HVAC technician	hr			N/A
	Apprentice	hr			Rate only
	Labourer	hr			Rate only
Carried forward					

SCHEDULE NO 1: PRELIMINARY & GENERAL

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	RATE	AMOUNT
Brought forward					
1.9	<p><u>GUARANTEE</u></p> <p>12 month guarantee of plant and equipment as specified</p> <p>Allowance for servicing the plant during the guarantee period</p> <p>Monthly service calls to check plant operation, clean filters, etc</p> <p>3 monthly minor service as specified</p> <p>Annual major service at the end of the guarantee period</p>	Sum	1		
1.10	<p>Additional Tests</p> <p>Allow for additional tests as direct by the Consulting Engineer</p>	Item			
1.11	<p><u>Additional items</u></p> <p>Any additional items the contractor wishes to allow for: (Specify)</p>				
TOTAL SCHEDULE NO 1 - CARRIED TO SUMMARY					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
FIRE FIGHTING EQUIPMENT INSTALLATIONS

SCHEDULE NO 2: FIRE FIGHTING EQUIPMENT INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
3,0	FIRE FIGHTING EQUIPMENT				
3,1	<u>Steel Piping</u> Supply and install steel piping to ASTM A106 #40 or SANS 62 as specified (heavy quality)				
	.01 200 mm	m	0		RATE
	.02 150 mm	m	0		RATE
	.03 100 mm	m	20		
	.04 80 mm	m	25		
	.05 65mm	m	0		RATE
	.06 50mm	m	0		RATE
	.07 40mm	m	0		RATE
	.08 32mm	m	10		
	0.09 25mm	m	53		
	0.10 Thrust Block 2,4 Ton/m ²	m ²	2		
3,2	<u>Pipe Hangers & Brackets(steel piping)</u> Supply and install as specified				
	.01 200 mm	no	0		RATE
	.02 150 mm	no	0		RATE
	.03 100 mm	no	10		
	.04 80 mm	no	13		
	.05 65mm	no	0		RATE
	.06 50mm	no	0		RATE
	.07 40mm	no	0		RATE
	.08 32mm	no	5		
	.09 25mm	no	27		
3,3	<u>Pipe Fittings</u> <u>Bends</u> Supply and install as specified				
	.01 200 mm	no	0		RATE
	.02 150mm	no	0		RATE
	.03 100mm	no	4		
	.04 80 mm	no	2		
	.05 50mm	no	0		RATE
	.06 40mm	no	0		RATE
	.07 32mm	no	3		
	.08 25mm	no	6		
3,4	<u>Tees Equal</u> Supply and install as specified				
	.01 150mm	no	0		RATE
	.02 100mm	no	1		
	.03 65mm	no	0		RATE
	.04 50mm	no	0		RATE
	.05 40mm	no	0		RATE
	.06 32mm	no	1		
	.07 25mm	no	1		
		no			
Carried forward					

SCHEDULE NO 2: SPRINKLER INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
Brought forward					
3,5	<u>Reducers</u> Supply and install as specified				
	.01 100 - 75 mm	no	1		
	.02 75 - 65 mm	no	1		
	.03 65 - 50 mm	no	1		
	.04 50 - 40 mm	no	1		
	.05 40 - 32 mm	no	1		
	.06 32 - 25 mm	no	1		
3,6	<u>Couplings</u> Supply and install as specified				
	.01 100 - 75 mm	no	0		RATE
	.02 75 - 65 mm	no	7		
	.03 65 - 50 mm	no	8		
	.04 50 - 40 mm	no	0		RATE
	.05 40 - 32 mm	no	0		RATE
	.06 32 - 25 mm	no	1		
3,7	<u>Isolating Valves</u> Supply and install as specified				
	.01 150mm	no	0		RATE
	.02 100mm	no	1		
	.03 65mm	no	0		RATE
	.04 50mm	no	0		RATE
	.05 40mm	no	0		RATE
	.06 32mm	no	0		RATE
	.07 25mm	no	1		
3,8	<u>Painting and Finishing</u> Allow for painting sprinkler and fire hose reel piping as follows				
	.01 Etching primer coat	sum	1		
	.02 Undercoat (different colour to primer)	sum	1		
	.03 Final coat - colour as specified by architect	sum	1		
	Testing and Commissioning Allow for testing and commissioning of the systems	sum	1		
	<u>Valve Chamber</u> Supply and install as specified				
	Bulk Valve Chamber - Cover Dimension 400 x 324 mm; Frame Dimension 533 x 458 x 152 mm, clear opening 380 x 305 mm	no	1		
3,9					
Carried forward					

SCHEDULE NO 2: SPRINKLER INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
Brought forward					
	<p><u>Fire Hose Reels</u> Supply and install as specified</p> <p>Fire hose reels to comply with requirements contained in SANS 543 and maintained in accordance with the requirements as given in SANS 1475-2.</p> <p>Supply, install, test and commission:</p>				
3,9	30 m length of fibre braid reinforced neoprene mm internal diameter	no	2		
3,10	Tamper seals	no	2		
	<p><u>Fire Extinguishers</u> Supply and install as specified</p> <p>Hand held fire extinguishers shall comply with the requirements contained in SANS 1910 or SANS 1151, and shall be installed, maintained and serviced in accordance with SANS 10105-1 and SANS 1475-1.</p>				
3.11	5 kg CO2 hand held fire extinguisher.	no	7		
3.12	4,5 kg DCP hand held fire extinguisher.	no	7		
3.13	Tamper seals	no	14		
	<p><u>Waterproof Tape</u> Supply and install as specified</p>				
3.14	Self adhesive waterproof tape 2,5 mm	m	45		
	<p><u>Hydrant</u> Supply and install as specified</p> <p>80 x 65mm "Woodlands Type" or equally approved brass right-angle hydrant valve with cap and chain</p>				
	<p><u>Hydrant Pedestal</u> Supply and install as specified</p> <p>Unreinforced concrete hydrant pedestal 1.1m high overall cast around vertical pipe with bottom 600mm below ground, 340 x 340mm square at base and tapering to 210 x 210mm overall octagonal shaped top, finished in all exposed faces in 1:3 cement plaster with all angles rounded including formwork and setting 600mm deep in ground, excavation in all material, backfilling, carting away surplus material, risk of collapse, dewatering, backfilling, compaction, and two coats of approved golden yellow paint to exposed surfaces, as per Engineer's drawing.</p>				
		no	1		
Carried forward to summary					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
FIRE FIGHTING EQUIPMENT INSTALLATIONS

SCHEDULE NO 3: FIRE SIGNAGE INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
4,0	<p>Fire Signage Equipment</p> <p><u>Fire Signage</u></p> <p>Aluminium Framed Wall Mounted Brackets ABS PVC 150 mm Signs</p> <p>ALL "E" TYPE SIGNS IS WHITE FIGURES AND BORDER ON GREEN BACKGROUND</p> <p>ALL "F" TYPE SIGNS ARE RED REVERSE ENGRAVED ON ON WHITE BACKGROUND WITH 4mm RED BORDER LINE</p> <p>All internal signage to be SANS 1186/5</p> <p>Supply and install the following:</p>				
4,1	2 compartment Type F1 (Arrow & Extinguisher)	No	3		
4,2	3 compartment Type F4 (Arrow; Extinguisher & Hose Reel)	No	2		
4,3	4 compartment Type F7 (Arrow & Running Man)	No	1		
4,4	1 Compartment Type E1 (EXIT sign)	No	3		
4,5	2 compartment Type E1 (Arrow & Running Man)	No	16		
Carried forward to summary					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
FIRE FIGHTING EQUIPMENT INSTALLATIONS

SCHEDULE NO 4: EXCAVATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	AMOUNT
4,0	<p><u>EXCAVATION</u></p> <p><u>Trenches for 100 mm uPVC pipe not</u></p> <p>Trenches for 100 mm uPVC pipe not exceeding 1m deep, including excavation in running length, laid on 100mm thick selected granular bedding material (SABS 1200 LB), filled with 460mm high selected fill material (SABS 1200 LB) and backfilling the rest of the trenches with suitable material compacted to 93% Mod ASHTO density including carting away surplus excavated material, risk of collapse, keeping excavations free of water, etc.</p>	Metre	45		
Carried forward to summary					

RNA CONSULTING ENGINEERS
DIMBAZA FACTORIES SITE 12
FIRE FIGHTING EQUIPMENT INSTALLATIONS

FINAL SUMMARY PAGE

Item No.	Description	Amount
1	SCHEDULE NO 1: PRELIMINARY & GENERAL	
2	SCHEDULE NO 2: FIRE FIGHTING EQUIPMENT INSTALLATION	
3	SCHEDULE NO 3: FIRE SIGNAGE INSTALLATION	
4	SCHEDULE NO 3: FIRE SIGNAGE INSTALLATION	
5	Carried to Main Contractors Final Summary (Ex VAT)	

Part C3: Scope of work

- C3.1 - Scope of work
- 4 - Conditions of Scope of Works
- C3.2 - Health and Safety Specification
- C3.3 - Electrical Specification
- C3.4 - Mechanical Specification

1 Background To ECDC

Vision

To be an innovative leader in promoting sustainable economic growth and development of the Eastern Cape.

Mission

To promote sustainable economic development in the Eastern Cape through focused:

- a) Provision of innovative development finance
- b) Leveraging of resources, strategic alliances, investment and partnerships.

Legislative Mandate

ECDC draws its mandate directly from the Eastern Cape Development Corporation Act (Act 2 of 1997) and is led by the economic development priorities of the provincial government, as detailed in the Provincial Growth and Development Plan (PGDP), Eastern Cape Provincial Industrial Development Strategy (PIDS), the policy statement and budget speech of the Member of the Executive Council (MEC) of Economic Development, Environment Affairs and Tourism (DEDEAT)

Section 3 of the ECDC Act states that the Corporation shall “plan, finance, co-ordinate, market, promote and implement development of the Province and its people in the field of industry, commerce, agriculture, transport and finance”.

2 Scope of Works

2.1 General description of the works

The description and scope of works, as described hereunder are a general guide only and may be subject to change. No liability or claim will be accepted should this information provided change or be regarded as misleading.

The work comprises the following sections:

2.1.1 Alterations and Refurbishment: Site 8

This work to the existing small scale single storey weaving facility (Dimbaza Weavers) includes the following items:

- Site clearance and cutting off grass and trees
- Scrutiny and location of existing underground service connections
- Assistance with dismantling of existing weaving equipment, moving and transporting the weaving equipment to the temporary premises in Dimbaza, re-erecting the equipment.
- Removal and safe disposal of Asbestos Cement roof, gutters and rainwater pipes including issuing of Compliance certificates
- Removal and safe disposal of Asbestos Cement ceiling including issuing of Compliance certificates
- Modification of existing timber roof trusses to accommodate a south facing clearstorey along length of ridge
- Construction of new sheet metal roofing, flashing, gutters and rainwater pipes
- Construction of new ceiling and internal vertical lining to south clearstorey window aperture
- Demolition of certain internal walls as per drawings
- Construction of new internal walls as per drawings
- Construction of new entrance portal in plastered brick with new entrance door and shopfront
- Construction of steel framed covered outdoor dyeing area with metal roof sheeting, gutters and rainwater pipes, concrete surface bed, screen walls, secure store, floor drains to sewer.
- Installation of new door in external wall to connect dyeing area to weaving hall
- Removal of certain existing steel windows and replacement with larger aluminium windows
- Reglazing balance of existing steel windows and servicing and painting same
- Removal of existing floor finishes and replace with new
- Repairs of damaged plastered walls internal and external
- Repainting of internal areas including ceilings
- Repainting of external plastered walls

- General repairs to internal doors and ironmongery
- General repairs to existing joinery work including aligning of doors and new joinery
- Decommissioning and reinstatement of electrical installation, including issuing of Compliance certificates
- Decommissioning and reinstatement of plumbing installation, including new geyser and issuing of Compliance certificates
- Construction of new delivery driveway
- Construction of new perimeter security fence and access gate/s
- Assistance on completion of the construction, with the dismantling, transport and reinstallation of the weaving equipment in the refurbished building.
- Etc - as contained in the attached BOQ

2.1.2 Alterations and Refurbishment: Site 12

The work to the existing vacant single storey portal frame factory and attached service building includes the following:

- Site clearance and cutting off grass and the felling of a mature gum tree on east side
- Scrutiny and location of existing underground service connections,
- Removal and safe disposal of Asbestos Cement products (if required), including issuing of Compliance certificates
- Modification of steel portal frame factory structure to accommodate east facing clearstorey structures
- Removal of existing IBR roof sheeting and construction of new sheet metal roofing, flashing, gutters and rainwater pipes
- Demolition of portions of existing surface bed in factory, making good of layerworks and replacement with new surface concrete surface bed
- Demolition of certain internal walls in service building as per drawings
- Construction of new internal walls in service building as per drawings
- Construction of new entrance to service building in plastered brick with new entrance door and shopfront as per drawing
- Removal of certain existing steel windows and replacement with larger aluminium windows
- Reglazing existing steel windows in factory
- Removal of existing floor finishes and replace with new
- Repairs of damaged plastered walls internal and external
- Repainting of internal areas including main steel structure of factory
- Repainting of external plastered walls and other painted surfaces
- New joinery
- New floor finishes
- Construction of new cantilevered canopies over external roller shutter doors to factory
- Reinstatement of electrical installation, including issuing of Compliance certificates
- Reinstatement of plumbing installation, including new geyser and issuing of Compliance certificates
- Construction of new perimeter security fence and access gates
- Etc (As contained in the attached BOQ)

2.1.3 Alterations and Refurbishment: Site 21

The work to the existing vacant single storey portal frame factory and attached service building includes the following:

- Site clearance and cutting off grass
- Scrutiny and location of existing underground service connections,
- Removal and safe disposal of Asbestos Cement products, roof sheeting, side cladding, ceilings, rainwater goods etc , including issuing of Compliance certificates
- Modification of steel portal frame factory structure to accommodate east facing clearstorey structures
- Construction of new sheet metal roofing, flashing, gutters and rainwater pipes
- Demolition of certain internal walls in service building as per drawings
- Construction of new internal walls in service building as per drawings
- Construction of new entrance to service building in plastered brick with new entrance door and shopfront as per drawing
- Plastering and painting of all existing facebrick finishes
- Modifications to new entrance to guardhouse as per drawing
- Removal of certain existing steel windows and replacement with larger aluminium windows
- Removal of existing floor finishes and replace with new
- Repairs of damaged plastered walls internal and external
- Repainting of internal areas including main steel structure of factory
- Repainting of external plastered walls
- New joinery
- New floor finishes

- Reinstatement of electrical installation, including issuing of Compliance certificates
- Reinstatement of plumbing installation, including new geyser and issuing of Compliance certificates
- Construction of new hardstanding areas as shown on drawing
- Construction of new cantilevered canopies over external roller shutter doors to factory
- Construction of new perimeter security fence and access gates
- Etc (As contained in the attached BOQ)

2.2 Variation in the Scope of Work

The Client retains the right to omit specific sections of the work prior to signing the contract and in the event that such omissions are incorporated in the contract it is hereby agreed that no claim for loss of profit will be entertained. In addition, tenderers are required to price all work in a “stand-alone fashion” so that profit/mark-up etc are such that omission of any of the tendered works will NOT render the remaining contract work visible.

2.4 Temporary works, etc.

Tenderers are advised that, in view of the nature and extent of the works temporary works are an essential part of the works. Tenderers must therefore fully examine and understand the nature and extent of the proposed works and must allow in their pricing for all access, structures, hoardings and other temporary works. Refer also to Clause 4.2: Enclosure of the Works in the Preliminaries Section of this document.

3. General

3.1 Damage to other services

The Contractor shall assume full responsibility in the event where he or any person in his service is directly or indirectly responsible for any damages caused to other services already installed (water, sewerage, storm water, roads, surveyors’ pegs, etc.) Any such damage shall immediately be reported to the Principal Agent.

The Contractor shall be held fully responsible for the repair of such damage to the satisfaction of the Principal Agent.

The costs for the repair of such damage shall be borne by the Contractor. Claims by the Contractor in this connection will not be considered. Should any portion of the works in terms of this Contract, for which the Contractor is responsible, be damaged by other Contractors, the Contractor shall repair such damage at the tendered rate and shall submit full details of such damage to the Principal Agent so that he can recover such costs from the responsible party.

This repair work may only be done on the written instruction from the Principal Agent.

The contractor shall make provision for a full scan of the area to determine the position of services in the area.

3.2 Local labour and local authorities

Local Labour:

It is intended that the project must make maximum possible use of local labour which is presently unemployed in the area of which the project is performed.

All unskilled labour shall be from the Local Municipal Supply area.

Engagement of local labour shall be controlled in a formal manner through the client’s labour liaison body. It is furthermore expected that the labour liaison body will assist in the monitoring of labour goals.

3.3 Liaison with Local Authorities

The contractor will have to liaise with local authorities regarding the following matters:

3.3.1 Locating of existing underground services.

3.3.2 Protection of existing services during construction.

It is the contractor's onus to immediately contact all these authorities and to accommodate their involvement in his programme of work.

The contractor should also warn the authorities at least 48 hours before the actual work commence.

Compensation for delays, losses or accidents will not be considered should the contractor at any time have failed to keep the local authorities informed.

The Principal Agent or employer must immediately be notified, should the contractor experience any problem regarding work, which involves a local authority.

3.4 Community Liaison and Community Relations

In all dealings with the community and workers employed from within the community, the Contractor shall take due cognisance of the character, culture and circumstances of the community involved and shall at all times use his best endeavours to avoid the development of disputes and to foster a spirit of co-operation and harmony towards the project.

The Contractor shall at all times, keep the Principal Agent fully informed on all matters affecting the contractor and the community, and shall attend all community meetings relating to the project as may be reasonably required by the Principal Agent.

All matters concerning the community shall be discussed and where possible, resolved at such meetings. Where any resolution of a community meeting shall be contrary to the terms and provisions of the Contract, the Contractor shall not give effect thereto without a prior written instruction from the Principal Agent.

Where the Contractor is of the opinion that any instruction of the Principal Agent issued in terms of this clause will result in the incurring of additional costs which were not provided for in his tendered rates and/or that a delay in the progress of the works will result, he shall be entitled to submit a claim in terms of the conditions of contract.

3.5 OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993)

Contractors shall meet the health and safety requirements as stipulated in health and safety plan.

3.5.1 Safety Precautions

Notwithstanding the fact that the Contractor is solely responsible for the actions of his staff and any duly appointed sub-contractors, the Principal Agent reserves the right for himself, or his nominated representative, to inspect and monitor working methods and materials handling to ensure that safe working practices are being adhered to at all times.

3.5.2 Health and Safety Specifications

Please refer to Annexure A in Part C3.2 for the Health and Safety Specification.

4. CONDITIONS SPECIFIC TO THIS BID

4.1 Responsibilities and duties

Notwithstanding the fact that a description of the services has been provided above, ECDC shall be entitled to request additional services related to deliverables required to ensure the successful completion of the services set out above on such further terms and conditions as may be agreed between the parties in writing.

The service provider shall at all times faithfully and timeously carry out and perform the Services and shall use its best endeavours to properly conduct, improve, extend and develop the business of ECDC in the provisioning of the services.

The Services Provider shall as part of his duties, attend such meetings as may be required by ECDC from time to time and submit weekly or monthly progress reports on the services as may be required and requested by ECDC.

4.2 Obligation to perform and sub-contracting

The bidder shall notify ECDC in writing of all subcontracts awarded under this contract if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the bidder from any liability or obligation under the contract.

The bidder shall not assign, in whole or in part, its obligations to perform under the contract, except with ECDC's prior written consent.

4.3 Performance guarantee

Within fourteen (14) days of receipt of the notification of contract award, the successful bidder shall furnish to ECDC the performance security of the amount specified above.

The proceeds of the performance security shall be payable to ECDC as compensation for any loss resulting from the bidder's failure to complete his obligations under the contract.

The performance security shall be denominated in the currency of the contract or in a freely convertible currency acceptable to ECDC and shall be in one of the following forms:

A bank guarantee or an irrevocable letter of credit issued by a reputable bank located in South Africa, acceptable to ECDC, in the form provided in the bid documents or another form acceptable to ECDC; or

A cashier's or certified cheque

The performance security will be discharged by ECDC and returned to the bidder not later than thirty (30) days following the date of completion of the bidder's performance obligations under the contract, including any warranty obligations, unless otherwise specified in SCC.

Notwithstanding the provisions above, the bidder shall not be liable for forfeiture of its performance security, damages, or termination for default if and to the extent that his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.

4.4 Anti-dumping and countervailing duties and rights

When, after the date of bid, provisional payments are required, or anti-dumping or countervailing duties are imposed, or the amount of a provisional payment or anti-dumping or countervailing right is increased in respect of any dumped or subsidized import, ECDC is not liable for any amount so required or imposed, or for the amount of any such increase. When, after the said date, such a provisional payment is no longer required or any such anti-dumping or countervailing right is abolished, or where the amount of such provisional payment or any

such right is reduced, any such favourable difference shall on demand be paid forthwith by the contractor to ECDC or ECDC may deduct such amounts from moneys (if any) which may otherwise be due to the contractor in regard to supplies or services which he delivered or rendered, or is to deliver or render in terms of the contract or any other contract or any other amount which may be due to him.

4.5 ECDC facilities

Unless otherwise agreed in writing by ECDC, the Service Provider will work from its own office and provide its own facilities, such as transport, telephone, cell phone, fax and computer facilities to perform the services.

The service provider may use certain facilities made available by ECDC to assist in performing the services, including but not limited to computer facilities, telephone and fax facilities and stationery. In this regard the service provider agrees to:

Abide by the health, safety and security measures as prescribed by ECDC from time to time;

To use such accommodation and facilities entirely at his own risk and ECDC shall not be liable for any loss or damage whatsoever and howsoever caused arising out of or in connection with the use of these items, other than loss or damage caused as a result of ECDC's own wilful misconduct.

4.6 Force majeure

If a force majeure situation arises, the bidder shall promptly notify ECDC in writing of such condition and the case thereof. Unless otherwise directed by ECDC in writing, the bidder shall continue to perform its obligations under the contract as far as is reasonably practical and shall seek all reasonable alternative means for performance not prevented by the force majeure event.

4.7 Insurance

The contractor shall affect and maintain all required and/or necessary insurances in accordance with Clause 12 of the JBCC Contract Edition 4.1, as applicable.

4.8 Responsibility to perform

Delivery of the goods and performance of services shall be made by the bidder in accordance with the time schedule prescribed by ECDC in the contract.

If at any time during performance of the contract, the bidder or its subcontractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the bidder shall promptly notify ECDC in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the bidder's notice, ECDC shall evaluate the situation and may at his discretion extend the bidder's time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the parties by amendment of contract.

ECDC reserves the right to procure outside of the contract small quantities or to have minor essential services executed if an emergency arises, the bidder's point of supply is not situated at or near the place where the supplies are required, or the bidder's services are not readily available.

A delay by the bidder in the performance of its delivery obligations may render the bidder liable to the imposition of penalties, unless an extension of time is agreed upon without the application of penalties.

ECDC shall, without prejudice to its other remedies under the contract, deduct from the contract price, as a penalty, a sum calculated on the delivered price of the delayed goods or unperformed services using the current prime interest rate calculated for each day of the delay until actual delivery or performance.

ECDC may also consider termination of the contract.

4.9 Duration of the contract

The construction project duration is **10 Months** from date of appointment.

The successful Bidder shall be required to complete and submit the signed and duly completed **client recommended Services Level Agreement**.

Upon any delay beyond the delivery period in the case of a supplies contract, ECDC shall, without cancelling the contract, be entitled to purchase supplies of a similar quality and up to the same quantity in substitution of the goods not supplied in conformity with the contract and to return any goods delivered later at the bidder's expense and risk, or to cancel the contract and buy such goods as may be required to complete the contract and without prejudice to his other rights, be entitled to claim damages from the bidder. (N/A)

4.10 Payments and tax

Payments shall only be made in accordance with the fees as quoted in this documentation. Prices charged by the bidder for goods delivered and services performed under the contract shall not vary from the prices quoted by the bidder in this bid, with the exception of any price adjustments authorized at ECDC's request for bid validity extension, as the case may be.

ECDC will reimburse the service provider for expenses and disbursements incurred subject to the submission of satisfactory proof that such expenses and disbursements have been incurred and subject to it being within the budget as indicated in this documentation.

The service provider shall from time to time during this contract duration furnish ECDC with a VAT compliant tax invoice accompanied by a copy of the delivery note and upon fulfilment of other obligations stipulated in the contract.

Each invoice must be accompanied by a detailed timesheet and expense claim forms substantiating the amount claimed.

Payments shall be made promptly by ECDC in Rand, but in no case later than thirty (30) days after submission of a VAT compliant tax invoice and supporting documentation by the service provider if the services have been properly executed as agreed.

The service provider shall retain all proof of expenditure and maintain such accounts and records as are reasonably necessary, claimed above, should ECDC require an audit to substantiate that expenditure and allows ECDC's own personnel or an independent auditor access to those records.

Should the above audit reveal that ECDC has been overcharged, the Service Provider will re-imburse the ECDC the amount overcharged within 30 days inclusive of interest calculated at prime plus 2% per annum.

A foreign bidder shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the Republic of South Africa.

A local bidder shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted goods to ECDC.

4.11 Subcontracting

The successful Contractor will subcontract and employ workers from the local communities in close proximity to the project, to execute labour related activities.

Further, and as indicated earlier in this document the contractor will ensure that a minimum of 30% of the overall work will be undertaken by SMME entities.

C3.2 HEALTH AND SAFETY SPECIFICATION

PROJECT HEALTH AND SAFETY SPECIFICATION

**PROJECT : EASTERN CAPE DEVELOPMENT
CORPORATION THE REPAIRS AND
REFURBISHMENTS OF SITE 8, 12 AND 21 IN
DIMBAZA INDUSTRIAL PARK**



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1. PROJECT AND SCOPE OF WORK DETAILS

1.1 Appointment of Health and Safety Agent

Gatsheni Sizwe(Pty)Ltd has been appointed by Eastern Cape Development Corporation for the following project : The Repairs and Refurbishments of Site 8, 12 and 21 in Dimbaza Industrial Park as the Professional Construction Health and Safety Agent.

In terms of Construction Regulations, 2014:

Regulation 5(1), 5(5), 5(6) and 5(7)

Where a construction work permit is required as contemplated 3(1), the client must, without derogating from his or her health and safety responsibilities or liabilities, appoint a competent person in writing as an agent to act as his or her representative

5 (1) a client must –

- (a) Prepare a baseline risk assessment for an intended construction work project;
- (b) Prepare a suitable, sufficiently documented and coherent site-specific health and safety specification for the intended construction work based on the baseline risk assessment contemplated in paragraph (a):

Therefore Gatsheni Sizwe (Pty) Ltd on behalf of Eastern Cape Development Corporation has therefore prepared the following specification below, must be provided and adhered to by Principal Contractor by means of a Health and Safety File, Plan and Health and Safety Compliance on the following project: The Repairs and Refurbishments of Site 8, 12 and 21 in Dimbaza Industrial Park

The Repairs and Refurbishments of Site 8, 12 and 21 in Dimbaza Industrial Park

The objective of this specification is to ensure that Principal Contractor entering a contract with Eastern Cape Development Corporation achieves and maintains an acceptable level of occupational health, safety and environmental performance and compliance.

NOTE PRINCIPAL CONTRACTOR AND ITS SUB-CONTRACTORS

The SHE specification provided by Gatsheni Sizwe (Pty) Ltd on behalf of Eastern Cape Development Corporation is the minimum requirement. Principal Contractor must develop an HSE File and Plan that meets all the requirements and all relevant and applicable legislation. Gatsheni Sizwe (Pty) Ltd and Eastern Cape Development Corporation in No way assumes Principal Contractor Legal responsibilities and liability. Principal Contractor is accountable for the quality, execution of the Health, Safety and Environmental program and management for its employees, sub-contractors, and sub-contractors' employees. The SHE specification provides the minimum requirements and shall not be construed as exhaustive and all encompassing.

Principal Contractor must include a copy of the following documents:

- a) Construction Regulation, 2014
- b) OHS Act 85 of 1993
- c) Appointment Letter from Eastern Cape Development Corporation
- d) Form of a Guarantee

e) Notification of Asbestos Work: Department of Employment and Labour

1.2 Project Title as per Tender Document:

The Repairs and Refurbishments of Site 8, 12 and 21 in Dimbaza Industrial Park

1.3 Project description/detailed scope of work:

General description of the works

The description and scope of works, as described hereunder are a general guide only and may be subject to change. No liability or claim will be accepted should this information provided change or be regarded as misleading.

The work comprises the following sections:

Alterations and Refurbishment: Site 8

This work to the existing small scale single storey weaving facility (Dimbaza Weavers) includes the following items:

- Site clearance and cutting off grass and trees
- Scrutiny and location of existing underground service connections
- Assistance with dismantling of existing weaving equipment, moving and transporting the weaving equipment to the temporary premises in Dimbaza, re-erecting the equipment.
- Removal and safe disposal of Asbestos Cement roof, gutters and rainwater pipes including issuing of Compliance certificates : asbestos disposal site" means a site specifically designated for the purpose of asbestos disposal in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008);
- Removal and safe disposal of Asbestos Cement ceiling including issuing of Compliance certificates
- Modification of existing timber roof trusses to accommodate a south facing clearstory along length of ridge
- Construction of new sheet metal roofing, flashing, gutters and rainwater pipes
- Construction of new ceiling and internal vertical lining to south clearstory window aperture
- Demolition of certain internal walls as per drawings
- Construction of new internal walls as per drawings
- Construction of new entrance portal in plastered brick with new entrance door and shopfront
- Construction of steel framed covered outdoor dyeing area with metal roof sheeting, gutters and rainwater pipes, concrete surface bed, screen walls, secure store, floor drains to sewer.
- Installation of new door in external wall to connect dyeing area to weaving hall
- Removal of certain existing steel windows and replacement with larger aluminium windows
- Reglazing balance of existing steel windows and servicing and painting same
- Removal of existing floor finishes and replace with new
- Repairs of damaged plastered walls internal and external
- Repainting of internal areas including ceilings
- Repainting of external plastered walls
- General repairs to internal doors and ironmongery
- General repairs to existing joinery work including aligning of doors and new joinery
- Decommissioning and reinstatement of electrical installation, including issuing of Compliance certificates

- Decommissioning and reinstatement of plumbing installation, including new geyser and issuing of Compliance certificates
- Construction of new delivery driveway
- Construction of new perimeter security fence and access gate/s
- Assistance on completion of the construction, with the dismantling, transport and reinstallation of the weaving equipment in the refurbished building.
- Etc - as contained in the attached BOQ

Alterations and Refurbishment: Site 12

The work to the existing vacant single storey portal frame factory and attached service building includes the following:

- Site clearance and cutting off grass and the felling of a mature gum tree on east side
- Scrutiny and location of existing underground service connections,
- Removal and safe disposal of Asbestos Cement products including issuing of Compliance certificates and Waste Management certificates or Disposal certificates from the disposal site
- Modification of steel portal frame factory structure to accommodate east facing clearstorey structures
- Removal of existing IBR roof sheeting and construction of new sheet metal roofing, flashing, gutters and rainwater pipes
- Demolition of portions of existing surface bed in factory, making good of layer works and replacement with new surface concrete surface bed
- Demolition of certain internal walls in service building as per drawings
- Construction of new internal walls in service building as per drawings
- Construction of new entrance to service building in plastered brick with new entrance door and shopfront as per drawing
- Removal of certain existing steel windows and replacement with larger aluminium windows
- Reglazing existing steel windows in factory
- Removal of existing floor finishes and replace with new
- Repairs of damaged plastered walls internal and external
- Repainting of internal areas including main steel structure of factory
- Repainting of external plastered walls and other painted surfaces
- New joinery
- New floor finishes
- Construction of new cantilevered canopies over external roller shutter doors to factory
- Reinstatement of electrical installation, including issuing of Compliance certificates
- Reinstatement of plumbing installation, including new geyser and issuing of Compliance certificates
- Construction of new perimeter security fence and access gates
- Etc (As contained in the attached BOQ)

Alterations and Refurbishment: Site 21

The work to the existing vacant single storey portal frame factory and attached service building includes the following:

- Site clearance and cutting off grass
- Scrutiny and location of existing underground service connections,
- Removal and safe disposal of Asbestos Cement products, roof sheeting, side cladding, ceilings, rainwater goods etc , including issuing of Compliance certificates

- Modification of steel portal frame factory structure to accommodate east facing clearstory structures
- Construction of new sheet metal roofing, flashing, gutters and rainwater pipes
- Demolition of certain internal walls in service building as per drawings
- Construction of new internal walls in service building as per drawings
- Construction of new entrance to service building in plastered brick with new entrance door and shopfront as per drawing
- Plastering and painting of all existing face brick finishes
- Modifications to new entrance to guardhouse as per drawing
- Removal of certain existing steel windows and replacement with larger aluminium windows
- Removal of existing floor finishes and replace with new
- Repairs of damaged plastered walls internal and external
- Repainting of internal areas including main steel structure of factory
- Repainting of external plastered walls
- New joinery
- New floor finishes
- Reinstatement of electrical installation, including issuing of Compliance certificates
- Reinstatement of plumbing installation, including new geyser and issuing of Compliance certificates
- Construction of new hardstanding areas as shown on drawing
- Construction of new cantilevered canopies over external roller shutter doors to factory
- Construction of new perimeter security fence and access gates
- Etc (As contained in the attached BOQ)

2. ROLES AND RESPONSIBILITIES

Eastern Cape Development Corporation Project Manager: Graham Cowley Pr Eng.

Project Manager on behalf of Eastern Cape Development Corporation He/she is responsible for managing the contract with the Professional Architect, Professional Quantity Surveyor , Consulting Mechanical Engineers ,Consulting Structural Engineers ,Consulting Civil Engineers, Environmental Management Consultants , Health and Safety Consultants and Principal Contractor and ensure overall construction works are completed and Compliance with relevant legislation: General Conditions of Contract for Construction Works, 2015 and OHS Act 85 of 1993 and Construction Regulations 2014and other related legislation.

In regard regulation 5 Duties of the Client and Particulars of Contract including but not limited as per Health and Safety Specification and Baseline Risk Assessment.

Architects and Principal Agent	Osmond Lange Architects
Quantity Surveyors	Abamiseli Quantity Surveyors
Structural and Civil Engineers	Lukhozi Consulting Engineers
Mechanical and Electrical Engineers	RNA Consulting Engineers
Social Facilitator	Zintle Rural Development

Health and Safety Consultants: Gatsheni Sizwe (Pty) Ltd

Gatsheni Sizwe(Pty)Ltd has been appointed by Eastern Cape Development to perform the duties of Health and Safety Manager or Agent to ensure that Principal Contractor and Subcontractor adheres to all Health and Safety standards , legislation including other applicable legislation and must be complied with as per relevant and applicable legislation in terms Health and Safety *Inter Alia* OHS Act 85 of 1993 , National Environmental Management Act 1998 (Act 107 of 1998) , Asbestos abatement Regulations 2020 and Construction Regulations 2014

Principal Contractor: Principal Contractor

Principal Contractor is the appointment principal contractor by Eastern Cape Development Corporation to execute the General Building works as per tender and the contractor to which compliance with the Health and Safety legislation on site will be required, in executing General Building works for the Eastern Cape Development Corporation for the following project: The Repairs and Refurbishments of Site 8, 12 and 21 in Dimbaza Industrial Park

Principal Contractor carries primarily accountability and responsibility for ensuring full compliance to the provision of the OHS Act as contemplated by Section 37(2) written agreements and Construction Regulation (7). The section 37(2) of the OHS Act agreement must be signed by Eastern Cape Development Corporation and Principal Contractor be part of the Health and Safety File

3. COMPLIANCE

The Health and Safety Manager or Agent on behalf of Eastern Cape Development Corporation requires the Principal Contractor to comply with legislation as part of the contract. All expenses to the Principal Contractor, which result from non-compliance with this legislation as well as special requirements specific to the site, will be for the Contractors account.

No claim or standing time will be accepted as a result of any costs or delays being incurred due to Principal Contractor and sub-contractors not complying or non-conformance with legislation, this SHE specification or their SHE Plan approved by the Eastern Cape Development Corporation and Health and Safety Manager or Agent.

Should Principal Contractor appoint a sub-contractor, the Principal Contractor would then have the same role and responsibility in relation to the sub-contractors and accountability on the: The Repairs and Refurbishments of Site 8, 12 and 21 in Dimbaza Industrial Park

The requirements within this specification should not be considered to be exhaustive and the Health and Safety Manager or Agent on behalf of Eastern Cape Development Corporation reserves the right to add, delete or modify conditions where it is considered to be appropriate.

The following applicable legislation has been identified which may impact the Project. The list is not exhaustive:

- Construction Regulations, 2014
- The Constitution of the Republic of South Africa (particularly Section 24 of the Bill of Rights).
- Occupational Health and Safety Act 1993 (Act 85 of 1993) and its Regulations.
- Asbestos abatement Regulations 2020
- National Environmental Management Act 1998 (Act 107 of 1998).
- National Road Traffic Act (93 of 1996) National Environmental Management: Waste Act 59

of 2008

- Air Quality Act 39 of 2004
- Hazardous Substances Act 15 of 1973
- National Water Act 36 of 1998
- Conservation of Agricultural Resources Act 1983 (Act 43 of 1983).
- Mine Health and Safety Act 29 of 1996
- Compensation for Occupational Injuries and Diseases Act No 130 of 1993 (COIDA)
- Applicable South African National Standards (SANS).
- ISO 9001:2008 –Quality Management Systems requirements
- ISO 14001:2004–Environment Management Systems requirements
- OHSAS 18001:2007 –Occupational Health and Safety Management Systems Requirements
- General Administrative Regulations, of the OHS Act
- Hazardous Chemical Agents Regulations, of the OHS Act
- National Environmental Management: Waste Act, No 59 of 2008

4. LETTER OF GOOD STANDING –(COIDA)

The Compensation for Occupational Injuries and Diseases Act, No 130 of 1993 (**COIDA**) provides for compensation for disablement caused by occupational injuries or diseases sustained or contracted by employees in the course of their employment, or for death resulting from such injuries or diseases.

Principal Contractor must have their Letter of Good Standing in the Health and Safety file including the Section 6 (A)- Annexure 13 W.Cl.2 and other related forms

5. NOTIFICATION OF CONSTRUCTION WORK

Notification of Asbestos work

Regulation 10(1) notification of asbestos work as per Annexure 2 of the Asbestos abatement Regulations 2020 to the Department of Employment and Labour

In terms of Construction Regulations, 2014:

4(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 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
- d) Include the use of explosives to perform construction

Principal Contractor must therefore provide Notification of Construction in terms of Construction Regulations, 2014. Therefore, **No** construction works shall commence before notification of

construction work has been submitted at the relevant Department of Employment and Labour by the Principal Contractor. The copy of the notification stamped on both pages must be provided in the Safety File.

6. CONSTRUCTION WORK PERMIT

Regulation 5(1), 5(5) and 5(6)

Where a construction work permit is required as contemplated 3(1), the client must, without derogating from his or her health and safety responsibilities or liabilities, appoint a competent person in writing as an agent to act as his or her representative

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 will involve more than 3600-person days of construction work; or
- (b) The tender value limit is grade 6,7,8 or 9 of the Construction Industry Development Board (CIDB) grading.

7. NON-CONFORMANCES / WORK STOPPAGE

The Health and Safety Manager or Agent reserves the right to stop work and issue a non-conformance report whenever safety, health or environmental violations are observed for both Principal Contractor and their sub-contractors. Expenses incurred as a result of such work stoppage and standing time shall be for the Principal Contractor account. Any non-conformances/findings/observations found in these audits/inspections on sub-contractors shall be raised and discussed with the relevant Principal Contractor.

The conditions that lead to work stoppages are based on but not all encompassing:

Management of change – this is when there are changes to the work environment (e.g.: climatic changes) and/construction work (e.g.: modifications to the design), in any phase of the construction project, and/or amendments with regulations and/or legislative amendments; unsafe acts/behaviors;

Unsafe working conditions: Principal Contractor and subcontractors shall ensure that no other work is being performed during this time. Should the estimated time from the outset to make the area safe where life threatening/imminent danger situations exist, then the area will be barricaded and a sign placed with the wording “Unsafe Area – Authorized Access Only”. Principal Contractor shall address the unsafe working condition and then revise the relevant sections in the SHE Plan to accommodate the changes.

8. APPLICATION OF ASBESTOS ABATEMENT REGULATIONS

The following must be implemented by the principal contractor and Subcontractors due to Asbestos work on the site; The Repairs and Refurbishments of Site 8, 12 and 21 in Dimbaza Industrial, as per Asbestos Management plan developed by Eastern Cape Development Corporation and Asbestos abatement Regulations 2020:

"asbestos" means the following fibrous silicates:

1. (a) Asbestos actinolite, CAS No. 77536-66-4;
2. (b) asbestos grunerite (amosite), CAS No. 12172-73-5;
3. (c) asbestos anthophyllite, CAS No. 77536-67-5;
4. (d) chrysotile, CAS No. 12001-29-5 or CAS No. 132207-32-0;
5. (e) crocidolite, CAS No. 12001-28-4;
6. (f) asbestos tremolite, CAS No. 77536-68-6; and
7. (g) any mixture containing these fibrous silicates;

"asbestos risk assessment" means a risk assessment and risk categorisation of potential exposure to asbestos dust;

"approved plan of work" means a written site-specific methodology as contemplated in regulation 15 that is at least co-signed by the asbestos client, registered asbestos contractor and approved inspection authority;

"asbestos waste" means an undesirable or superfluous asbestos or asbestos- containing product or by-product or the undesirable or superfluous asbestos or asbestos-containing emission or residue of any process or activity, which has been

"asbestos disposal site" means a site specifically designated for the purpose of asbestos disposal in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008);

The principal contractor and Subcontractors must comply and implement as per regulation 11 ,Regulation 12 ; Duties of the Registered Asbestos Contractor for Asbestos work , and Regulation 13 , Regulation 15 , Regulation 18, 19, 21 ,22 and Regulation 23 Records but not limited to the above regulations.

9. HSE POLICIES

Principal Contractor and sub-contractor shall each have a SHE Policy authorized by OHS Act Section 16(1) appointee that clearly states overall, SHE objectives and commitment to improving Safety, Health, Environment and Quality performance and Compliance. Including but not limited to:

- HSE Policy
- Disciplinary policy for employees transgressing occupational health, safety and environmental requirements
- Drug, alcohol & substance abuse policy
- Smoking policy
- HIV/AIDS policy

10. SHE PLAN

a) SHE Plan

In terms of Construction regulation 7(1): Principal Contractor and any sub-contractors appointed must provide a Health and Safety Plan which must be constantly be reviewed as per regulation:

- (a) Provide and demonstrate to the client a suitable, sufficiently documented and coherent site-specific health and safety plan, based on the client's documented health and safety specifications contemplated in regulation 5(1)(b), which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the principal contractor as work progresses;

- (b) Open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, which must be available on request to an inspector, the client, the client's agent or a contractor

Including but not limited to the following documentation:

- Duties and safety responsibilities of all appointed persons on the project.
 - Selection, placement and training procedures, including induction and on-going training in 'Basic Safe Work' and Occupational Health and Safety training for newly hired or promoted supervisors.
 - Baseline risk assessments, review & monitoring plan & safe work procedures.
 - Occupational health and safety goals for the project and arrangements for monitoring and reviewing occupational health and safety performance.
 - Occupational Health and Safety communications and meetings, including daily safe task instructions and project safety meetings.
 - Assessment of sub-contractors, including requirements for safety plans
 - Nomination of personnel to carry out safety inspections. The task may be shared with other duties and provided within the resources of individual gangs and may be rotated
 - Rules and regulations including safety procedures the Contractor has in place for recurring work activities.
 - Personal protective equipment rules.
 - Control of dangerous and hazardous substances.
 - Hazard identification and risk control, such as Risk assessments, Daily Safe Task Instructions and communication.
 - Audits to ensure compliance with safety plans.
 - Daily site safety inspections and audits.
 - Inspection of plant, tools and equipment prior to introduction to site and regularly thereafter.
 - Accident incident reporting, recording, investigation and analysis, which ensure that corrective action, are taken and this action is communicated to report initiators.
 - First aid arrangements.
 - Evacuation and emergency planning.
 - Substance abuse program
 - Record keeping
 - Personal Protective equipment arrangements.
 - Worker's welfare facilities.
 - Induction and toolbox talk's arrangements.
 - Training arrangements.
- b) Fall Protection Plan

Principal Contractor must include a Fall Protection Plan as contemplated in regulation 10. Therefore, must appoint a competent person responsible for the preparation of the plan include the requirements in regulation 10(2), continuously adhere and implement the fall protection plan as per regulation 10(3), 10(4) and 10(5).

c) Traffic Management Plan

The scope - the safe movement of vehicular and pedestrian traffic, protection of workers from passing traffic, provision for access to properties located within the limits of Network Road .The

design, construction, maintenance and implementing of any necessary temporary roadways and detours, the provision of traffic controllers, the installation of temporary signs, road markings, lighting , safety , Jersey , temporary speed humps and solid barriers as per Road Traffic Act, 1989 (Act No. 29 of 1989),Road Traffic Sign Applications .

Principal Contractor must provide a comprehensive and detailed a Traffic Management Plan and must include Traffic Control Plans, Emergency Readiness Plan, Objectives of the Traffic Management Plan, Traffic Management Officer, Communications with community, stakeholders. The traffic Management must be in accordance with the South African Road legislation and Signs Manual as modified to suit site conditions. Application of the Act shall apply throughout the Republic: Provided that any provision thereof shall only apply to those areas of the Republic in respect of which the Road Traffic Act, 1989 (Act No. 29 of 1989), did not apply before its repeal by section 93, as from a date fixed by the Minister by notice in the *Gazette*.

11. APPOINTMENTS AND COMPETENCIES

Principal Contractor must submit in writing the appointments and competences of all competent person appointed, which form part of the SHE Plan in terms of Construction Regulation 8. An organogram must also submit including all legislative appointments, defined responsibility structure, OHS meetings and period of appointment. All appointees and appointers must sign the legislative appointments.

Principal Contractor Chief Executive Officer, in terms of Section 16(1) of the Occupational Health and Safety Act (Act no 85 of 1993), is to ensure that the Employer (as defined in the Occupational Health and Safety Act (Act no. 85 of 1993) – hence the Contractor) complies with the Occupational Health and Safety Act (Act no 85 of 1993) and Construction Regulations (2014) as well as all other applicable legislative requirements.

a) Construction Managers

Principal Contractor, appointed in terms of Construction Regulations is responsible for implementing and maintaining the SHE Plan. Regulation 8 (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.

No construction manager appointed under sub 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. Regulation 8(7): Principal Contractor Construction managers, in writing must appoint construction supervisors responsible for activates on site and ensuring compliance with occupational health and safety regulations on site. Regulation 8(8) Principal Contractor considering and depending on the size of the project or construction site must appoint in writing one or more competent employees for different sections to assist the construction supervisor envisaged in sub regulation (7)

REGULATION	APPOINTMENT /COMPETENCIES /RESPONSIBILTY
Chief Executive Officer (OSH Act 16(1))	Chief Executive Officer -Principal Contractor
Contract Director / Manager (OSH Act	Contract Director / Manager- Principal Contractor

EASTERN CAPE DEVELOPMENT CORPORATION THE REPAIRS AND REFURBISHMENTS OF SITE 8,12 and 21
IN DIMBAZA INDUSTRIAL PARK : OHS SPECIFICATION 13112023

16(2))	
1. 5(1)(K)	Eastern Cape Development Corporation appointment of Principal Contractor
2. 8(1)	Construction Manager – Principal Contractor: Managing Construction works and ensuring Health and Safety Compliance
3. 8(2)	Assistant Construction Manager and Traffic Management Officer – Principal Contractor: Assist the Construction Manager
4. 8(5)	Health and Safety Officer – Principal Contractor: Ensuring Health and Safety Compliance
5. 8(7)	Construction Supervisor – Principal Contractor: Supervision of certain type of construction works
6. 7	Appointment and management of Sub-contractor – Principal Contractor
7. 9(1) Risk Assessor	Risk Assessor to conduct risk assessments – Principal Contractor

8. 10(1)(a)	Appointee for preparation of fall protection plan – Principal Contractor
9. General Safety Regulation 3	First Aider – Principal Contractor
10.12(1) Temporary works designer	Appointee for inspect and approve erected temporary works on site – Principal Contractor
11.12(2) Temporary works Supervisor	Appointee for Supervision of Temporary works on site – Principal Contractor
12. 12(3)(a) Temporary Works Erector	Erect temporary works on site – Principal Contractor
13. 12(3)(f) Temporary Works Inspector	Inspector of Temporary Works on site – Principal Contractor
14. 13(1)(a) Excavation Supervisor	Excavation Supervision – Principal Contractor
15. 13(2)(h) Excavation Inspector	Excavation Inspection – Principal Contractor

16.14(1) Supervisor demolition work	Demolition Supervision – Principal Contractor
17. 16(1) and16 (2) Scaffold Supervisor, Erector, Inspector	Supervision, Inspection and Erection of Scaffolding – Principal Contractor

18. 14(11) Competent Person for Explosives	Legally certified competent explosives person Principal Contractor
19. 20(1) Batch Plant Supervisor	Supervision of Batch plant – Principal Contractor
20. 22(a) Crane Supervision	Certified Crane Supervisor Principal Contractor
21. 23(1)(d) Construction Vehicle and Mobile Plants Operator	Certified Plant Operator and Vehicle – Principal Contractor
22.24(d) Electrical Machinery Inspector	Inspection of Electrical Machinery – Principal Contractor
23. 24(e) Temporary Electrical Installations Inspector and Controller	Control all temporary electrical installations – Principal Contractor

24.28(a) Stacking and Storage Supervisor	Supervision of Stacking and Storing – Principal Contractor
25.29(h) Fire Equipment Inspector	Inspection of Fire Equipment – Principal Contractor
26.29(i) Fire extinguisher Users	Operator of extinguisher – Principal Contractor
27. Hand Tool Inspector	Inspection of Hand tool inspector – Principal Contractor
28. 20(2)(g)(i) Person to control and do the issuing and collection of Cartridges and nails/studs	Certified competent control of explosive equipment – Principal Contractor
29.21(2)(b) Explosive actuated fastening device inspector	Inspection of explosive device fastening- Principal Contractor
30. 21(2)(g)(i) Explosive actuated fastening controller	Controller of explosive device fastening- Principal Contractor
31. Explosive Operator	Operator of explosive device- Principal Contractor
32. General Safety Regulation 13A	Ladder Inspector- Principal Contractor

b) Construction Health and Safety Officers and Manager /Practitioners

Regulation 8(5) and 8(6) Principal Contractor must appoint a full time Health and Safety Officer in writing that is registered with approved statutory body. Therefore, the appointed Construction Safety Officer must be registered with the statutory body approved by Chief Inspector the South African Council for Project and Construction Management Professionals (SACPCMP) and have SAMTRAC or safety diploma and at least 4 years relevant construction safety experience.

c) Occupational Health and Safety Representatives

Section 17 and Section 18 of the OHS Act provides for appointment of the Health and Safety Representative and functions thereof. Every employer who has more than 20 employees in his employment at any workplace, shall designate in writing for a specified period health and Safety representative for such workplace. Principal Contractor must therefore appoint a Health and Safety Representative if Principal Contractor employs on site on than 20 employees including sub-contractors and their employees. Shall appoint one SHE representative for every 50 employees or part thereof.

d) Health and Safety Committee

In regards to section 19 and section 20 of the OHS Act 85 of 1993 Principal Contractor must establish an occupational health and safety committee consisting of all the designated occupational health and safety representatives together with a number of management representatives. The management representatives shall not exceed the number of occupational health and safety representatives on the committee. The members of the occupational health and safety committee must be appointed in writing. Representatives from Gatsheni Sizwe (Pty) Ltd will act as co-opted members to the Health and Safety Committee meetings as and when required. Principal Contractor is required to compile a schedule for the statutory occupational health and safety committees for the duration of the project and supply the proposed schedule in the SHE Plan.

12. TRAINING

Inductions and Training must be submitted with SHE Plan and SHE File with all the registers for specific training, which will be conducted. Training is to be carried out as required by the Occupational Health and Safety Act (Act no 85 of 1993) and the Construction Regulations (2014). All training courses required and attended are to be included in the principal contractor's SHE File. All members of Principal Contractor site management as well as all the persons appointed responsible for occupational health, safety and environmental management in terms of the Construction Regulations (2014) and other legislative requirements, will be required to attend a SHE System Induction training

Construction Site induction carried out by the Principal Contractor

The aim of this section is to outline expectations in respective of the scope of the training, which Principal Contractor and Sub Contractor employees receive. The scope of the training includes but is not limited to the type of work being performed and the relevant procedures. Additional to the requirements, will be that Principal Contractor and sub-contractors would have the 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, certificates and are under competent supervision. Records of all training and qualifications of all contractor employees must be kept. Principal Contractor shall maintain comprehensive records of all employees under his control (including all employees of the sub-contractor) attending induction training.

Acknowledgement of receiving and understanding the induction must be signed by all persons receiving the induction respectively and the Induction Register be kept in the Health and Safety File.

When there is an amendment to the Acts and/or to the regulations, SHE specification and SHE

plan, all affected staff shall undergo the relevant re-training. For appointees that do not meet the minimum competencies as indicated above: full compliance to the above competencies would be expected. A training plan must be submitted on a monthly basis to reflect progress of meeting the minimum training requirements.

Medicals

Prior to induction all Principal Contractor and Sub-contractor employees must undergo a pre-employment medical examination and found fit for duty. A copy of the certificate of medical fitness must be presented for permanent record at the induction venue and kept at Health and Safety File and site offices for permanent record.

The contractor must comply with the provisions and contractual arrangements of the Occupational Health and Safety Act (OHSA) as well as the Environmental Management Act (NEMA): Waste Management. All workers of any project undertaken as part of this bid must undergo a medical fitness test by an Occupational Health and Safety Practitioner or Medical Practitioner who is registered with the South African Nursing Council (SANC) and or HPSCA. The medical test certificates must be presented by the Principal Contractor to Eastern Cape Development Corporation.

Job specific induction carried out by the Principal Contractor/Sub-Contractor Supervisor on the site

Principal Contractor shall ensure that all his employees and his contractors' employees working on the site are adequately trained in the type of work/tasks to be performed. The training shall extend to include relevant procedures, hazard identification and risk assessment. They shall have the appropriate qualifications, certificates and are under competent supervision. Copies of records of appropriate training and qualifications for all employees must be kept and maintained.

Principal Contractor shall ensure that all his employees, agents and contractors have undergone the Project safety induction program prior to commencing work on site. Appropriate time must be set-aside for training (induction and other) for all employees.

All employees and visitors on site shall carry the proof of induction training. The relevant site Risk Control/SHE Training Officer shall keep a database of all records pertaining to induction and will inform contractors of pending expiry.

Principal Contractor shall ensure that all his employees and sub-contractor employees undergo general work induction with regard to the approved SHE plan, general hazards prevalent on the construction site, construction risk assessment, rules and regulations, and other related aspects. The induction should also include identification of sensitive features such as wetlands areas, red data species, graves, etc.

Principal Contractor will be required to ensure that before an employee commences work on the project that the supervisor in control with responsibility for the employee has informed the employee of his scope of authority, any hazards associated with the work to be performed as well as the control measures to be taken. This will include man- task specifications, the discussion of any standard task procedures or hazardous operational procedures to be performed by the employee. Principal Contractor is to ensure that the supervisor has satisfied himself that the employee understands the hazards associated with any work to be performed by conducting task/job observations.

Other Training

All Operators, Drivers and Users of construction vehicles, mobile plant and other equipment must be in possession of valid proof of training. All employees in jobs requiring training in terms of the Act and Regulations must be in possession of valid proof of training.

The principal contractor is required to have a promotion and awareness program in place to create an occupational health and safety culture within employees E.g.: Toolbox Talks, Videos, Health, and Safety circles.

13. CONTRACTOR'S SITE FACILITIES AND ACCESS CONTROL TO THE CONSTRUCTION SITE

Principal Contractor must manage site facilities as per Environmental Regulations for workplaces, Facility Regulation, Security Personnel, General safety regulation as framed under the OHS Act.

Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must, amongst other, include the rule that non-employees will not be allowed on site unaccompanied.

Principal Contractor shall provide a guardhouse for a security working during the day and at night. The guardhouse should be in good condition and at-least meet minimum requirements as per environmental regulations for workplaces.

Temporary Facility

Ablution facilities, Site Offices and Amenities, lay down and Storage, Site Access, Temporary Site Services Principal Contractor employees are registered on the site access system and are issued with access certificates. Access certificates to be kept with the Contractor at all times within the site.

Principal Contractor and his sub-contractors shall adhere to the site traffic plan to ensure the safe movement of all construction related mobile plant. Principal Contractor shall adhere to the pedestrian and vehicle routings and Traffic Authority.

The project/site security arrangements are: Site Safeguarding: Nets, Canopies, Platforms, Fans, Barriers etc. to protect members of the public passing / entering the site

14. RISK MANAGEMENT AND ASSESSEMENTS

Regulation 9(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 site

Principal Contractor must identify the construction site SHE risks and hazards before commencing any construction works on site as per regulation 9 and his/her subcontractors to identify hazardous and potentially hazardous work operations. Principal Contractor needs to demonstrate that the site hazards and the contractor's activity risks and the mitigating measure have been considered in his risk assessments.

The Occupational Health and Safety Act (Act no. 85 of 1993) specifically requires that employers shall provide and maintain working environments that are safe and without risk to health. The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk-free

environment on an on-going basis. This is achieved by continuous risk assessments, a form of risk assessment that takes place as an integral part of day-to-day management.

There must be method statements or written safe work procedures for all the Principal Contractor activities

Emerging risks and hazards must be managed during construction work. Activity based risk assessments must be conducted by an appointed and competent person of the Principal Contractor on a regular basis. Principal Contractor prior to daily work beginning on site shall conduct Preliminary hazard identification.

Site Specific Health and Safety Hazards

Principal Contractor Site-Specific list may not be totally comprehensive and it is the duty of Principal Contractor to ensure that all the hazards are identified, before and during the project, and the necessary activity-based risk assessments are carried out. These risk assessments shall form part of the SHE Plan. The site-specific health and safety hazards are on continuous during the duration of the project.

Hazardous and potentially hazardous work operations and Emerging Risks

Principal Contractor shall identify hazards and potentially hazardous work operations. For each work operation Identified, the Contractor shall supply Risk Assessment, which shall:

1. Describe the operation to be performed in the sequence of the basic job steps.
2. Identify and rank the hazard or potential hazard.
3. A plan to review the risk assessments as the work progresses and changes are introduced;
4. Describe how the hazard will be managed therefore a documented plan and Safe Working Procedures, and its relevance to the risk assessment, to mitigate, reduce or control the risks and hazards that have been identified.
5. A plan to monitor the application of the Safe Working Procedures
6. Signature of appointed competent person conducting risk assessment; and Signature of Principal Contractor management and employees involved in risk assessment.
7. Review plan; Based on the risk assessments, the principal contractor must develop a set of site-specific occupational SHE rules that will be applied to regulate the health, safety and environmental aspects of the construction work.
8. Identify the responsible person for each mitigation action.

The hazards and risk to which persons, plant, vehicles and facilities may be exposed during the construction should be identified and evaluated. The aspects and impacts resulting in environmental pollution or degradation should also be identified and evaluated. Measures to reduce or control these risks or hazards should be defined during this assessment.

Principal 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 procedure and or control measure before any work commences, and thereafter at the times determined in the risk assessment monitoring and review plan of the relevant site.

During construction work, Principal Contractor, his sub-contractors or Eastern Cape Development Corporation representative or agent may identify emerging hazards and risks. For each such newly identified hazard or risk, the Eastern Cape Development Corporation representative or agent shall review the baseline site hazard identification and the relevant section(s) of the Baseline Risk Assessment during Audits. The hazard identification shall be submitted to the Principal Contractor who will review his own risk assessments and relevant sections of the SHE Plan, as well as those of the sub-contractors.

Principal Contractor representative or agent will prepare and submit to the Eastern Cape Development Corporation representative or agent, both documents for approval.

Principal Contractor and his subcontractors shall not proceed with the work/operation in hazardous areas until the Client/Agent's representative has reviewed the Risk Assessment and has approved and signed the revised SHE plan and issued a valid permit to work.

Principal Contractor shall on a daily basis and for every task to be performed, conduct a pre-task risk assessment with all employees involved with the task(s). The pre-task risk assessment will form the basis of the daily pre-job brief/toolbox talks prior to the start of work. Proof of communication as well as confirmation that it was received and understood by all will be noted on a standard form, which will be kept at the job site during the job execution. The completed signed pre-task risk assessment form will be filed in the Principal Contractor **SHE** files.

The Contractor must ensure through his risk management process the hierarchy of controls stipulated as follows, are implemented:

1. **Eliminate** - The complete elimination of the hazard.
2. **Substitute** - Replacing the material or process with a less hazardous one.
3. **Redesign** - Redesign the equipment or work process.
4. **Separate** - Isolating the hazard by guarding or enclosing it.
5. **Administrate** - Providing control such as training, procedures etc.
6. **Personal Protective Equipment (PPE)** - Use of appropriate and properly fitted PPE where other controls are not practical. (PPE as the last resort)

15. SAFE WORK PROCEDURES AND PRACTICES

Principal Contractor is to provide an indication of the activities that require safe work procedures and practices to mitigate the identified risks. There must be written safe work procedures or method statements for all activities. Risk Assessments should refer to the safe work procedures.

- A safe working procedure should be written when
- Designing a new job or task;
- Changing a job or task;
- Introducing new equipment or substances; and
- Reviewing a procedure when problems have been identified, e.g., from near miss incidents or accident/incident investigation. The safe working procedure should identify:
- The supervisor for the task or job and the employees who will undertake the task
- The tasks that are to be undertaken that pose risks
- The equipment and substances that are used in these tasks

- The control measures that have been built into these tasks
- Any training or qualification needed to undertake the task
- The personal protective equipment to be worn;
- Actions to be undertaken to address safety issues that may arise while undertaking the task
- The methodology that will be used to ensure compliance with the method statement/
procedure.
- Any other information deemed to be necessary by the Eastern Cape Development
Corporation Project team.
- Associated responsibilities and authorities
- Authorized staff positions to conduct the relevant activities contained in the Safe Work
Procedure.

16. EMERGENCY PREPAREDNESS AND RESPONSE

Principal Contractor and his sub-contractors must develop a site-specific emergency response plan and contingency plan, appoint a competent person to act as emergency controller and/or coordinator.

Principal Contractor, together with his sub-contractors, must develop their own emergency response for both site and offices and submit this plan to Eastern Cape Development Corporation representative or agent for approval. Principal Contractor must ensure that his employees and his sub-contractor employees are trained on this plan. Principal Contractor must initiate his own emergency drills and must hold regular practice drills of contingency plans and emergency procedures to test them and familiarize employees with them, have written arrangements in place with his other contractors regarding the responsibility of the other contractors towards their own injured and/or ill employee

Principal Contractor must provide third parties and other specialized sub-contractors with training of emergency response plan and contingency plan, such training must be written be part of SHE Plan.

General Safety Regulations promulgated in terms of the Occupational Health and Safety Act (Act no. 85 of 1993) provides for a qualified First Aider and First Aid Equipment regulation 7

17. ENVIRONMENTAL MANAGEMENT

Principal Contractor must comply with the National Environmental Management Act 107 of 1998 and Amendments, therefore must provide a comprehensive Environmental Management Plan

Spillage of Hazardous Chemical Substances

Principal Contractor must have register of Hazardous Chemical Substances and Material Safety Data Sheets should be kept on site. Herbicide usage

Principal Contractor must have an Herbicide register for usage to be compiled and maintained if such will be utilized on site. The application of herbicides to be in accordance with the Fertilizers,

Farm Feeds, Agricultural Remedies and Stock Remedies Act No. 36 of 1947. Only approved and tested herbicides with a low environmental risk shall be used. Only registered pest control operators may apply herbicides on a commercial basis. All staff applying herbicides must be trained in the application of herbicides.

Fire hazard

Principal Contractor shall comply with regulation 29 in terms of Fire precautions on construction site, ensure that staff are educated in fire prevention and will be held responsible to avoid the risk of fire. No area is to be denuded of vegetation to create firebreaks, to prevent or make fires. No open fires are allowed on site. Principal Contractor must ensure that operations are in compliance with statutory requirements at all times.

Waste

Principal Contractor must compile and submitted waste management plan included the SHE File before commencement of construction works on site. Registers of hazardous and non-hazardous waste to be kept on-site. Principal Contractor must include in the SHE File and a record of disposal and continuous updating of records. No waste, whether it be biodegradable or not, is to be left on site once work has ended. Domestic and hazardous waste generated will not be burned, buried, or disposed of on site or other Landowners' property but will be controlled and removed to a registered waste site on a regular basis (Daily/Weekly/Monthly) must be taken to the appropriate local government site

Principal Contractor and sub-contractor working on site must ensure that oil, fuel, and chemicals are confined to specific and secure areas throughout the construction period and appropriate signage. These materials must be stored in a barricade area with adequate containment for potential spills and leaks. Principal Contractor must ensure that sufficient waste bins / containers are made available for waste control.

Dust and Noise

Principal Contractor shall monitor dust and noise caused by mobile equipment, generators and other equipment during construction must have a Dust and Noise Management Plan. Factors such as wind can often affect the intensity to which these impacts are experienced. To ensure that noise does not constitute a disturbance during construction activities, all construction works shall occur between specific working hours. Dust suppression measures must be in place to reduce the dust caused by the movement of heavy vehicles.

Environmental Incidents

All environmental incidents such as pollution (air, water, land, noise, etc.), bird kills, animals killed, plants destroyed, public complaints etc. must be reported to Eastern Cape Development Corporation or representative or agent within 24 hours of its occurrence. All environmental incidents occurring on site must be recorded; detailing how each incident was dealt with. Proof thereof must be kept in an incident register. Principal Contractor will be held liable for any infringement of statutory requirements of the National Environmental Management Act of 1998 or any other relevant legislation.

Water

Principal Contractor must comply with regulation 26. Should observe and water restrictions on site. Must provide water for consumption for by employees during extreme weather conditions. Should

any pollution of the watercourse occur, t Eastern Cape Development Corporation or representative or agent the Department of Water Affairs (DWA) must be notified immediately via the ECO/Corporate Environmental Advisor. Bore hole water must be verified for human consumption fitness. All incidents related to water contamination to be reported within 24 hours. Chemical toilets may not be within close proximity of the drainage lines / ways.

Flora

All suitable and rare flora and seeds will be rescued and removed from the site. They must be suitably stored, for future use in rehabilitation. The felling and/or cutting of trees and clearing of bush will be minimized. Bush will only be cleared to provide essential access for construction purposes. The spread of alien vegetation must be minimized. Any incident of unauthorized removal of plant material, as well as accidental damage to priority plants, will be documented.

Fauna

No species of animal may be poached, snared, hunted, captured or wilfully damaged or destroyed. Snakes and other reptiles that may be encountered on the construction site will not be killed unless the animal endangers the life of an employee. Principal Contractor will ensure that the work site is kept clean and free from rubbish, which could attract pests.

Soil pollution management

Topsoil will be temporarily stockpiled, separately from (clay) subsoil and rocky material, when areas are cleared. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost. Stockpiled topsoil will not be compacted but will be replaced as the final soil layer. No vehicles will be allowed access onto the stockpiles after they have been placed. Stockpiled soil will be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season. The need for such measures will be indicated in the site-specific report. Topsoil stripped from different sites will be stockpiled separately and clearly identified as such. Topsoil obtained from sites with different soil types will not be mixed. Topsoil stockpiles will not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and microorganisms in the soil.

Aesthetic and visual impact management

Damage to the natural environment must be minimized. Trees and tall woody shrubs will be protected from damage to provide a natural visual shield. Excavated material will not be placed on such plants and movement across them will not be allowed, as far as practical. All above ground structures will be located in areas where the visual impact from roads, houses etc. is minimised. All above ground structures could be treated or painted to blend in with the natural environment. Cut and fill areas, river and stream crossings and other soil stabilization works will be constructed to blend in with the natural environment.

All finds of human remains will be reported to the nearest police station. Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA).

18. SHE AUDITS AND INSPECTIONS

17.1 Compliance with OHS ACT and Construction Regulations

In terms of Construction Regulations 2014, regulation 5(1)(n) to 5(1)(q) the client must take reasonable steps the client must ensure periodic health and safety audits and document verification are conducted at intervals mutually agreed upon between the principal contractor any contractor, but at least once every 30 days. Regulation 5(1)(q) stop any contractor from executing a construction activity which poses a threat to health and safety of persons

17.2 Contractor SHE Performance Evaluation

Gatsheni Sizwe (Pty) Ltd shall evaluate contractor SHE performance on an on-going basis against the requirements of OHS ACT and Construction Regulations. There will be monthly audits/inspections conducted by Gatsheni Sizwe (Pty) Ltd on Principal Contractor and/or sub- contractors. The contractor's site manager or his representative shall attend these audits. Find SHE Performance Evaluation attached.

18. INCIDENT MANAGEMENT (PRINCIPAL CONTRACTOR AND SUB- CONTRACTORS)

Reporting of Accidents and Incidents

Principal Contractor shall compile and implement procedure for Reporting and investigation of incidents – This document sets out the procedures to be followed when reporting, recording and investigating incidents that occur on a construction site.

Principal Contractor must report to Eastern Cape Development Corporation or representative or agent within 24 Hours and to the Provincial Director of the Department of Labour within seven days from date of incident (Section 24 of the Occupational Health and Safety Act (Act no. 85 of 1993)

Principal Contractor shall report all incidents/accidents as required in terms of legislation including near miss incidents, first aid, medical treatment, lost time incidents (lost time injuries and fatalities); Section 24 and 25 incidents; electrical contact; major equipment damage; chemical spillage and other environmental incidents within 24 hours or before the end of the work shift.

All fatal incidents, employee and contractor incidents, shall be reviewed by the committee within one week after the incident and the members of the Project Progress meeting notified of corrective actions taken. Preliminary investigation information shall be shared

A comprehensive and detailed investigation report shall be submitted to the Gatsheni Sizwe (Pty) Ltd manager within 7 -14 days after the incident which shall include: Date, time and place of incident; Description of incident; Root cause of incident/accident; Type of injury (if any); Medical treatment provided (if any); Persons involved; Names of witness/s; Corrective action to prevent recurrence (with clear deadlines and responsible persons). It is required that all corrective action is closed out within 3 months. If this is not practicable within the time frame, then it is to be submitted at a later date agreed to by the Eastern Cape Development Corporation or Gatsheni Sizwe (Pty) Ltd.

Gatsheni Sizwe (Pty) Ltd shall ensure that all accidents/incidents are investigated by him/her and are discussed at the SHE committee meeting held on site. Accidents/incidents shall be investigated and recorded in terms of the requirements of the Occupational Health and Safety Act, the National Environmental Management Act and National Water Act as applicable.

Please note that providing the Accident/incident investigation report does not exempt the Principal Contractor from providing accident reports required by Statutory Authorities, in particular, the Contractors' responsibility for reporting accidents in accordance with the requirements of the OHS

Act and COID Act.

Gatsheni Sizwe (Pty) Ltd will participate in any accident/incident investigation if the accident/incident is directly linked to any activity within the scope of the construction project. Principal Contractor shall keep on site/workplace a record of all accidents and incidents reported in the form of the OHS Act Annexure 1 investigation form as referenced in the OHS Act. (Incident Investigation Report)
Gatsheni Sizwe (Pty) Ltd on behalf of Eastern Cape Development Corporation reserves the right to conduct an independent investigation in any incident.

Principal Contractor shall report **all Incidents/Accidents** where an employee is injured on duty to the extent that he:

- Dies
- Becomes unconscious
- Loses a limb or part of a limb
- Is injured or becomes ill to such a degree that he is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he was usually employed

Or where -

- A major incident occurred
- The health or safety of any person was endangered
- Where a dangerous substance was spilled
- The uncontrolled release of any substance under pressure took place
- Machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
- Machinery ran out of control

To Eastern Cape Development Corporation or representative or agent within two days and to the Provincial Director of the Department of Labour within seven days from date of incident (Section 24 of the Occupational Health and Safety Act (Act no. 85 of 1993) and General Administrative Regulations), except that, where a person has died, has become unconscious for any reason or has lost a limb or part of a limb or may die or suffer a permanent physical defect, the incident must be reported to both Eastern Cape Development Corporation and the Provincial Director of the Department of Labour forthwith by telephone, telefax or e-mail.

Principal Contractor shall provide Eastern Cape Development Corporation with copies of all statutory reports required in terms of the Occupational Health and Safety Act (Act no. 85 of 1993) within 7 days of the incident occurring.

Principal Contractor shall provide Eastern Cape Development Corporation with copies of all internal and external accident/incident investigation reports, within 7 days of the incident occurring.

Accident and Incident Investigation

Principal Contractor will be responsible for the investigation of all accidents and/or incidents where employees and non-employees were injured to the extent that they had to receive medical treatment other than first aid.

The results of the investigation will be entered into the accident and/or incident register. Principal Contractor will be responsible for the investigation of all minor and non-injury incidents as described in Section 24(1)(b) and (c) of the Occupational Health and Safety Act (Act no. 85 of 1993) and for keeping a record of the results of the investigations including the steps taken to prevent similar accidents in future. Principal Contractor will be responsible for the investigation of all road traffic accidents, related to the construction activities, and for keeping a record of the results of the investigations including the steps taken to prevent similar accidents in future.

19. MONTHLY STATISTICAL REPORTING AND WEEKLY STATISTICAL REPORTING

Principal Contractor must report to Gatsheni Sizwe (Pty) Ltd on the 2nd of every month, each company's performance which includes the following as a minimum: Incidents: Lost time /Disabling Injuries, Medical; first aid, near misses reported; Staff Complement per principal contractor and Sub-Contractor Company; Actual man-hours worked; Status on incidents investigated and recommendations closed out and Status on audits conducted and findings closed out. Principal Contractor Safety Officer where appointed must report all the SHE Matters to Gatsheni Sizwe (Pty) Ltd on include day and time using the Weekly Report Template.

20. OPERATIONAL CONTROL REQUIREMENTS

Notices and Signs

It's mandatory for Principal Contractor and their sub-contractors to display construction notices and signage.

- The location of every first aid box; fire extinguisher and emergency exit are to be clearly indicated by means of a sign.
- At the entrance to premises where machinery is used: Restricted access on "**Authorized Person Only**" signs on entry. Notices & Signs at entrances and along perimeters indicating "No Unauthorized Entry".
- When in use, an Explosive Power Tool shall have a sign, warning people of its use.
- Principal Contractor shall provide the signage where work is conducted and where unauthorized entry is prohibited and/or where alerting and cautioning passers-by to be aware of potential dangers.
- Notices & Signs at entrance instructing visitors and non - employees what to do, where to go and where to report on entering the site/yard with directional signs. e.g., "Visitors to report to Office"
- Notices & Signs posted to warn of overhead work and other hazardous activities. e.g., **General Warning Sign's**
- All equipment brought onto the construction site, (including motorized equipment, e.g., bobcat) that requires PPE to be worn during operation, must have the relevant PPE mandatory sign/s attached. The type and use of PPE will be placed at all entry points to the construction site.
- At every place where machinery is used a notice (English & Pictograms) shall be posted.
- Explosive Power Tool shall have a sign warning people when it is in use.

- Electrical Control Gear. A notice shall be posted so as to warn against the re-closing of a switch of control gear whilst a person is working on such equipment.
- Emergency contact telephone numbers.
- Adequate scaffolding signs. (When applicable).
- Adequate firefighting equipment signs.
- Speed limit signs.
- "MEN WORKING ABOVE"
- "MEN WORKING BELOW"
- "ROAD CLOSED - DETOUR"
- "CAUTION - MEN WORKING - DRIVE SLOWLY"
- "EXCAVATION IN PROGRESS"
- "NO WALKWAY"
- "NO CLEARANCE"
- "WALKWAY"
- "RED AND YELLOW DANGER FLAGS"
- "DANGER - LIVE CABLES"
- Warning notices at openings through which people may fall.
- Risk based signage depending on the task being performed i.e., overhead work, hot work etc.
- No-entry signs to incomplete platforms

Barricading

Principal Contractor will erect barricading for any major operations involving site works for approval by Eastern Cape Development Corporation . Examples are Man at work, Narrow, Arrow etc. Where there is a risk of injury, Principal Contractor will erect the area secure solid barricades. The barricade will be constructed a minimum of 1,5m away from the area. All physical barricades must be covered with netting ensuring visibility for personnel and operators of machinery.

Barricading for the prevention of access into areas with a potential risk of injury shall as a minimum be constructed of a handrail, knee-rail and appropriately supported as to prevent any person from falling into the restricted/risk area.

Working in confined spaces (manholes)

Principal Contractor will take adequate steps to eliminate or control hazards when the workers working inside confined space. Before working in an area, which contains dust, the area is to be ventilated and hosed down to settle and dampen the dust.

Principal Contractor shall provide all necessary equipment to manage confined spaces, including all necessary monitoring and rescue equipment (such as tripods, breathing equipment and the like). Principal Contractor shall ensure that all persons working in a

confined space or managing entry to a confined space are appropriately trained.

Construction Vehicles and Mobile Plant

In terms of regulation 23(1) to 23 (2) provides regulations which Principal Contractor must comply with in regards to construction vehicles and mobile plant:

All lifting equipment and cranes must load test certificates.

All motor vehicles operated by Contractors within the area shall, in all respects, comply with the Road Traffic Ordinance and Road Traffic Act. Designated drivers shall be in possession of a driver's license, valid for the class of vehicle. The person or operator so authorized and shall produce such card on request shall keep the driver's license.

All drivers of construction vehicles and mobile plant to have medical certificates of fitness. Each Project site will have system/ process to manage vehicle access to site.

The speed limit within the bounds of the construction site is 40 km/h.

No drivers or operator may talk on cell phones or two-way radios whilst driving, unless a hands-free kit is used.

It is the responsibility of the driver to ensure:

- He/ She and his/her passengers wear seat belts whilst the vehicle is in motion.
- Comply with all safety, direction and speed signs.
- Ensure that vehicle loads are properly secured and loaded onto vehicles.
- Ensure that vehicles are not overloaded.

The requirements with regard to the transportation of tools/equipment/material and persons on the back of construction vehicles must be adhered to:

- No Personnel to be transported in the back of construction vehicles with tools.
- Tools, equipment and material to be secured in order to prevent movement;
- Fixed and firmly secured seats with seat belts – Number of passengers
- The driver and all passengers must have seatbelts fastened whilst driving

Principal Contractor shall ensure that his employees and those of his subcontractors do not:

- Ride on back of elevators, cranes or other mobile plant equipment. Only competent Machine, Equipment operator in Construction Vehicles.
- Leave vehicles unattended with the engine running.
- Park vehicles in unauthorized zones/areas.

Principal Contractor shall be solely responsible for the safety and security of any of his vehicles (including private vehicles) on the premises.

A current maintenance logbook is required for all cranes and large plant equipment, and shall be available for inspection at any time. The logbook shall be located in the cabin of the crane or plant equipment.

Principal Contractor is to ensure that visibility (e.g.: switching on of lights, reflectors, barricades equipped with lights, etc.) is enhanced on all Construction Vehicles and Mobile plants in order to identify

the location of the vehicles or plant.

Principal Contractor must maintain his vehicles in roadworthy condition and a valid license. These vehicles shall be subject to inspection by the Client/Agent's representative. Vehicles, which are not roadworthy, will not be allowed onto the site.

In the event where the Principal Contractor and his sub-contractor do not own the equipment, the Principal Contractor is still responsible for ensuring all conditions are complied with by all of his subcontractors or hire companies. Drivers/operators shall be responsible for the travel-worthiness of all loads conveyed by them. Precautions

Cranes and lifting equipment

Regulation 22 provides for requirement for Principal Contractor to provide risk assessments and procedure or method statements in regards cranes and for competent operators with medical certificates of plant and cranes. Compliance with Driven Machinery Regulations promulgated in terms of the Occupational Health and Safety Act (Act no 85 of 1993)

Lifting equipment must be designed and constructed in accordance with the manufactures/designer's specifications as well as generally accepted technical standards and operated, used, inspected and maintained in accordance with the manufactures requirements as well as that of the of Driven Machinery Regulations promulgated in terms of the Occupational Health and Safety Act (Act no 85 of 1993)

Lifting equipment is clearly and conspicuously marked with the maximum mass load (MML) that it is designed to carry safely. Lifting equipment shall be fitted with a load limiting device that automatically arrest the lift when the load reaches its highest safe position or when the mass of the load is greater than the MML. No person may be lifted by a lifting machine not designed for lifting persons unless in a cradle approved by the inspector of the Department of Labour.

All lifting equipment and cranes must load test certificates.

No Crane shall be used without a pre-use check and findings entered on an approved checklist. Before any cranes are established on site the following must be inspected and approved. Certification will be required for record purpose, and shall cover the following:

Brake or other device capable of holding the maximum mass should the power fail, or which is such that it shall automatically prevent the uncontrolled downward movement of the load when the raising effort is interrupted; and Limiting device that shall automatically arrest the driving effort when:

The Hook or Load attachment point of the Power-Driven lifting machine reaches its highest safe position; and in the case of a Winch Operated lifting machine with a lifting capacity of 5000kg or more; the load is greater than the rated mass load of such machine.

Bulk Mixing Plant

Regulation 20 provides:

Principal Contractor must ensure that the operations of a bulk mixing plants are operated and 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.

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.

Principal 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.

Structures

In terms of regulation 11 Principal Contractor must comply with regulation –

He or she prevent uncontrolled collapse of any new/existing structure

Ensure structures are not overloaded to the extent that it becomes unsafe

Contractor to ensure all drawing are kept on site and available to interested parties

Owners of structures to ensure inspections are conducted by competent persons at least once every 6 months for the first 2 years and thereafter annually.

Owner to retain records to ensure maintenance of a structure and ensure records are kept

Scaffolding

Principal Contractor compliance with regulation 16(1), 16(2) and usage complies with regulation 44 of the Act. Principal Contractor must a appoint a competent person in writing to supervise all scaffolding works, erection, team leaders and inspectors are competent.

A scaffold is a temporary structure for the purpose of creating a work platform, on which workers can carry out their work at varying heights, whether on buildings under construction, or during maintenance of buildings.

The most serious risks associated with scaffolds are firstly that the structure itself may collapse, leading to damage and injuries. Secondly, the items on the scaffold may fall and be damaged or cause damage to items on a lower level or injure or kill people. Thirdly, people may fall from the scaffold and the results are usually serious or fatal.

Personal and other Protective Equipment

In terms of Section 8 of the OHS Act, the duty of the employer is to take steps to eliminate or mitigate (hierarchy of control measures) any hazard or potential hazard to the safety or health of employees before resorting to PPE.

Principal Contractor employees and his sub-contractor employees at the construction site, including visitors, shall use the following SANS or the relevant internationally recognized authority approved risk-

based PPE at all times, as a minimum:

- Head protection (Hard hat).
- Steel toe capped safety boots.
- Eye protection.
- Long sleeved and long pants protective clothing.
- High visibility vests.

Refer to General Safety Regulation 2 of the OHS Act However, if there are particular activities/areas/risk assessments that require a specific type of PPE, then that specific PPE requirement must be adhered to (e.g.: for dusty environments – eye goggles; for welding – welding helmet; etc.).

Principal Contractor must provide a detailed program on the issuing, maintenance and replacement of PPE for all his employees and subcontractors on site. Principal Contractor required to keep an updated register of all PPE issued to staff, including that of his sub-contractors

The principal contractor is required continuously to identify the hazards in the workplace and deal with them. He must either remove them or, where impracticable take steps to protect workers and make it possible for them to work safely and without risk to health under the hazardous conditions.

Personal protective equipment should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of personal protective equipment is considered.

Where it is not possible to create an absolutely safe and healthy workplace the principal contractor is required to inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.

Suspended Platforms

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. Principal Contractor must adhere to the requirements by regulation 17.

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 in subparagraph (b) and applicable to the environment in which the system is

being used, which operational compliance plan must include proof.

Explosive Actuated Fastening Devices

No contractor may use or permit any person to use an explosive actuated fastening device unless:

- The user is provided with and uses suitable protective equipment
- User is trained in the operation, maintenance and use of such a device
- Firing mechanism designed to ensure no accidental firing

Blasting Operations

No blasting shall be done by Principal Contractor or subcontractors without the approval and permission of Eastern Cape Development Corporation or Gatsheni Sizwe (Pty)Ltd. The Contractor shall apply in writing to Eastern Cape Development Corporation for permission to blast. All contact with the Inspector of Labour shall be done through the appropriate channels.

Principal Contractor must furnish the following information to Eastern Cape Development Corporation and Gatsheni Sizwe (Pty)Ltd before blasting takes place:

- The blaster must hold a surface-blasting permit for blasting.
- The name of the blaster.
- The number of his blasting permit.
- The registration number of the explosive vehicle.
- The number of the continuous transport permit held.
- The blasting method statement in detail.

Hazard Identification Risk Assessment. The Occupational Health and Safety Act (Act no. 85 of 1993) and Mine Guidelines are to be strictly adhered to at all times. NB: Insofar as those Regulations shall apply in all cases, irrespective of the depth of the hole to be blasted. The Site Manager of Principal Contractor is to be advised each morning as to the blasting program for the day.

Electrical installations and machinery on construction sites

Principal Contractor must, in addition to compliance with the Electrical Installation Regulations, 2009, and the Electrical Machinery Regulations, 1988, promulgated by Government Notice No. R. 1593 of 12 August 1988, ensure that:

- 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;
- All parts of electrical installations and machinery are of adequate strength to withstand the working conditions on construction sites;

Electrical and mechanical lockout

An electrical and mechanical (as applicable) lockout procedure must be developed by the principal contractor and submitted to Eastern Cape Development Corporation or Gatsheni

Sizwe (Pty)Ltd for approval before construction commences. All contractors on site must adhere to this lockout procedure.

Fuel Storage

No petrol or fuel oil shall be stored in bulk on the surface in quantities in excess of two thousand liters in any tank above or below ground level except with the prior written approval of the Chief Inspector. No petrol shall be stored in drums in excess of a total of two hundred liters in any building or other place except with

The prior written approval of the Department of Labour Chief Inspector. No fuel oil shall at any time be stored underground unless it is stored in a suitable container or tank, which does not leak.

Every storage tank provided at any filling station on the surface for the purpose of containing petrol or fuel oil shall be suitably constructed to an acceptable standard that would ensure the safe storage thereof. Suitable means for firefighting shall be installed at a safe location for the extinguishing of fire in the event of an incident. Fire equipment supply shall be appropriate to the quantity being stored.

All storage facilities shall be banded 110% of the quantity contained and banded areas will be supplied with a drain facility to enable the banded area to be drained in a receptacle for disposal in the event of a spill or accumulation of water.

Housekeeping and general safeguarding on construction sites

Principal 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:

- The proper storage of materials and equipment;
- The removal of scrap, waste and debris at appropriate intervals;
- 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
- Ensuring that materials which are no longer required for use, do not accumulate on and are removed from the site at appropriate intervals;
- 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);
- 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;
- 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.

Stacking and storage on construction sites

Principal Contractor must, in addition to compliance with the provisions for the stacking of articles in the General Safety Regulations, 2014, regulation 28 ensure that:

A competent person is appointed in writing with the duty of supervising all stacking and storage on a construction site;

Adequate storage areas are provided;

There are demarcated storage areas; and

Storage areas are kept neat and under control.

Fire precautions on construction sites

The principal contractor must, in addition to compliance with the Environmental Regulations for Workplaces, 1987, ensure that:

- All appropriate measures are taken to avoid the risk of fire;
- Sufficient and suitable storage is provided for flammable liquids, solids and gases;
- Smoking is prohibited and notices in this regard are prominently displayed in all places containing readily combustible or flammable materials;
- In confined spaces and other places in which flammable gases, vapors or dust can cause danger –
- Only suitably protected electrical installations and equipment, including portable lights, are used;
- There are no flames or similar means of ignition; There are conspicuous notices prohibiting smoking;
- Oily rags, waste and other substances liable to ignite are without delay removed to a safe place; and
- Adequate ventilation is provided;
- Combustible materials do not accumulate on the construction site;
- Welding, flame cutting and other hot work are done only after appropriate precautions have been taken to reduce the risk of fire;

Excavations

Principal Contractor must ensure compliance regulation 13 amongst other must appoint competent person for supervision of excavation works. Principal Contractor must provide for Excavation and Back Filling Plan.

Principal Contractor who performs excavation work 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. 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 were.

Appropriate signage shall be affixed to the barricade indicating the risk associated (i.e., deep excavation, lifting operations etc.) and the responsible Supervisor and contact details shall be displayed

The process of excavation and back filling must be carried out as a sequential process following one another as quickly as possible. Excavations must only remain open for a minimum period of time and during this time they must be clearly demarcated. If excavations place the public at risk these sites must be fenced. The residents directly affected by open trenches must be notified of the dangers. This will be done during the site-specific phase.

21. HEALTH AND SAFETY AWARENESS PROGRAMME

The awareness program must be provided by Principal Contractor for community awareness, Schools, Clinic, local Vendors etc., must be in place to create an occupational health and safety culture within employees. The following are some of the methods that may be used:

- Toolbox talks;
- Posters;
- Videos;
- Competitions;
- Suggestion schemes;
- Participative employee activities such as “occupational health and safety circles”.

22. Minimum requirements of the SHE File

As required by the Construction Regulations (2014) and Asbestos abatement Regulations 2020, Principal Contractor and other Contractors will each keep an SHE File on site containing the following minimum documentation:

Approval letter by Eastern Cape Development Corporation on contents of Health and Safety File / SHE Plan.

Notification of construction work to the relevant Department of Labour (stamped on each page / no faxed copies).

Scope of work to be performed;

OH&S / SHE Policy and other Policies;

Updated copy of the Occupational Health and Safety Act (Act no. 85 of 1993) and its Regulations.

Updated copy of the Compensation for Occupational Injuries and Diseases Act (Act no. 130 of 1993) and its Regulations;

Proof of registration and good standing with the Compensation Commissioner or another licensed Insurer;

SHE plans agreed with Eastern Cape Development Corporation including the underpinning risk assessment(s).

A list of contractors (sub-contractors) including copies of the agreements between the parties and the type of work being done by each contractor;

- Notice of new projects;

- Designs and/or drawings;
- Copies of occupational health and safety committee meetings and other relevant minutes;
- Copies of written designations and appointments of competencies;
- Management structure (inclusive of OH&S responsibility & meeting structure);
- Induction training and site, SHE rules;
- Occupational health and safety training;
- Arrangements with contractors and/or mandatories;
- Description of security measures;
- Occupational health and safety rules and procedures;

The following registers:

- Accident and/or incident register;
- Occupational health and safety representative's inspection register;
- Construction vehicles and mobile plan inspections;
- Daily inspections of construction vehicles, plant and other equipment by the operator, driver and/or user;
- Daily inspections of excavations by competent person;
- Daily inspections of demolition work by competent person;
- Record of entry to confined space;
- Record of training;
- Record of toolbox talks;
- Designer's inspections and structures record;
- Inspection and maintenance of explosive powered tools;
- Inspection of electrical installations (including inspection of portable electrical tools, electrical equipment and other electrical appliances);
- Fall protection inspections;
- First-aid box content;
- Record of first-aid treatment;
- Fire equipment inspection and maintenance;
- Record of hazardous chemical substances kept and used on site;
- Ladder inspection;
- Machine safety inspections (including machine guards, lock-outs etcetera);
- Inspection registers and logbooks for lifting machines and –tackle (including daily

inspections by drivers/operators);

- Inspection of temporary work
- Inspection of scaffolding;
- Inspection of excavation
- Inspection of demolition work
- Inspection of tunneling
- Inspection of stacking and storage;
- Inspections of structures;
- Inspection of use and temporary storage of flammable liquids on construction sites
- Inspection of water environments
- Inspection of housekeeping and general safeguarding on construction site
- Inspection of construction employees' facilities
- Inspection of suspended platforms
- Inspection of rope access work
- Inspection of material hoists
- Inspection of bulk mixing plant
- Inspection of explosive actuated fastening device
- Inspection of cranes and Load Test Certificates
- Inspection of construction vehicles and mobile plant Inspections of vessels under pressure;
- Inspection of electrical installations and machinery on construction sites; and
- Records of issuing of Personal Protective Equipment;
- Eastern Cape Development Corporation Master Way Leaves

Monthly reporting and recording of statistics;

Keeping of any other record in terms of applicable legislation falling within the scope of SHE Legislation applicable to the project and the Principal Contractor/ Contractor's activities and organization.

Emergency preparedness and response program;

Investigation and reporting of incidents and/or accidents (internal to Client and Department of Labour / Compensation Commissioner

All other applicable records. Principal Contractor duties are to ensure compliance with the Construction Regulation (2014) and Asbestos abatement Regulations 2020, which are to:

Provide a suitably documented health and safety plan based on the health and safety specification

- Keep a health and safety file on site, which must include all documentation required in terms of the Act and

- Regulations, and which are made available on request to an inspector, the client, the client's agent or a Contractor
- Ensure appointed contractor complies with the Act
- Perform duties of client with regard to contractors
- Appoint contractors in writing
- Ensure a contractor's health and safety plan is implemented and maintained
- Ensure that potential contractors submitting tenders have made sufficient provision for health and safety
- Ensure Principal Contractor is satisfied that contractor that he/she intends to appoint, is competent and has resources to perform work safely
- Prior to work commencing, every contractor needs to be registered and in good standing with the compensation fund or with a licensed compensation insurer – COID Act, 1993
- Audit contractor monthly
- Stop any contractor from executing work which is not in accordance with health and safety plan for the site or which poses a threat to health and safety of persons
- Where changes are made to the design and construction, make available sufficient health and safety information and resources
- After discussions and negotiations with Principal Contractor on the contents of the health and safety plan, it must be sent for final approval
- Ensure copies of all health and safety plans are available on request to an employee, an inspector, a contractor, the client or the client's agent
- Hand over the consolidated health and safety file to the client on completion of the construction work (Include drawings, designs, materials used, etc.)
- Provide updated list and agreements/contracts of all contractors on-site to the client
- Ensure all employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3
- Principal Contractor must ensure cooperation between all appointed contractors.
- Principal Contractor allows or permit any employee or person to enter any site, unless they have undergone a health and safety induction training

Principal Contractor must ensure all visitors to a construction site have personal protective equipment. The regulations require that the duties extend through to all levels of responsibility to sub - contractors. For this reason, it is advised that contractors require sub-contractors to be up front on their intent to further sub- contract any aspects of their work. Eastern Cape Development Corporation will conduct an inspection and evaluation of the principal contractor's SHE File on a monthly basis.

Principal Contractor is required to submit the SHE File after receiving letter of appointment from Eastern Cape Development Corporation. Eastern Cape Development Corporation will allocate a day to evaluate the file and to give feedback on the evaluation report of the file to the contractor. The approval letter from Eastern Cape Development Corporation must be kept in the SHE File, and any letter issued concerning the evaluation of the file.

EASTERN CAPE DEVELOPMENT CORPORATION

THE REPAIRS AND REFURBISHMENTS OF SITE 8,12 and 21 IN DIMBAZA INDUSTRIAL PARK

BASELINE RISK ASSESSMENT



TERMS OF REFERENCE

The Health and Safety Baseline Risk Assessment was conducted based on scope of works set out and site visit. The objective of this baseline risk assessment is to identify and evaluate all baseline risks associated with the execution of the **EASTERN CAPE DEVELOPMENT CORPORATION: THE REPAIRS AND REFURBISHMENTS OF SITE 8,12 and 21 IN DIMBAZA INDUSTRIAL PARK**

EXECUTIVE SUMMARY

All construction and maintenance activities can subject workers to levels of Occupational stressors and safety factors, e.g., noise, fumes, revolving motor machinery, tools, moving vehicles, electricity, etc., which permanently harm the health and physical wellbeing of persons at work and greatly reduce productivity. The Occupational Health and Safety Act of 1993, and its relevant regulations, require employers to conduct surveys of the actual situation at every site. Measurements must be taken, and the identified problems addressed by the employer. Improved conditions ensure better worker morale, loyalty, and greater productivity.

SCOPE OF WORK

EASTERN CAPE DEVELOPMENT CORPORATION: THE REPAIRS AND REFURBISHMENTS OF SITE 8,12 and 21 IN DIMBAZA INDUSTRIAL PARK

The work comprises the following sections:

Alterations and Refurbishment: Site 8

This work to the existing small-scale single-story weaving facility (Dimbaza Weavers) includes the following items:

- Site clearance and cutting off grass and trees.
- Scrutiny and location of existing underground service connections
- Assistance with dismantling of existing weaving equipment, moving and transporting the weaving equipment to the temporary premises in Dimbaza, re-erecting the equipment.
- Removal and safe disposal of Asbestos Cement roof, gutters and rainwater pipes including issuing of Compliance certificates: asbestos disposal site" means a site specifically designated for the purpose of asbestos disposal in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008);
- Removal and safe disposal of Asbestos Cement ceiling including issuing of Compliance certificates.
- Modification of existing timber roof trusses to accommodate a south facing clearstory along length of ridge.
- Construction of new sheet metal roofing, flashing, gutters, and rainwater pipes
- Construction of new ceiling and internal vertical lining to south clearstory window aperture
- Demolition of certain internal walls as per drawings
- Construction of new internal walls as per drawings
- Construction of new entrance portal in plastered brick with new entrance door and shopfront
- Construction of steel framed covered outdoor dyeing area with metal roof sheeting, gutters and rainwater pipes, concrete surface bed, screen walls, secure store, floor drains to sewer.
- Installation of new door in external wall to connect dyeing area to weaving hall.
- Removal of certain existing steel windows and replacement with larger aluminum windows
- Reglazing balance of existing steel windows and servicing and painting same
- Removal of existing floor finishes and replace with new.
- Repairs of damaged plastered walls internal and external
- Repainting of internal areas including ceilings

- Repainting of external plastered walls
- General repairs to internal doors and ironmongery
- General repairs to existing joinery work including aligning of doors and new joinery.
- Decommissioning and reinstatement of electrical installation, including issuing of Compliance certificates.
- Decommissioning and reinstatement of plumbing installation, including new geyser and issuing of Compliance certificates.
- Construction of new delivery driveway
- Construction of new perimeter security fence and access gate/s
- Assistance on completion of the construction, with the dismantling, transport, and reinstallation of the weaving equipment in the refurbished building.
- Etc - as contained in the attached BOQ.

Alterations and Refurbishment: Site 12

The work to the existing vacant single story portal frame factory and attached service building includes the following:

- Site clearance and cutting off grass and the felling of a mature gum tree on east side.
- Scrutiny and location of existing underground service connections,
- Removal and safe disposal of Asbestos Cement products including issuing of Compliance certificates and Waste Management certificates or Disposal certificates from the disposal site.
- Modification of steel portal frame factory structure to accommodate east facing clearstorey structures.
- Removal of existing IBR roof sheeting and construction of new sheet metal roofing, flashing, gutters, and rainwater pipes
- Demolition of portions of existing surface bed in factory, making good of layer works and replacement with new surface concrete surface bed.
- Demolition of certain internal walls in service building as per drawings
- Construction of new internal walls in service building as per drawings
- Construction of new entrance to service building in plastered brick with new entrance door and shopfront as per drawing
- Removal of certain existing steel windows and replacement with larger aluminum windows
- Reglazing existing steel windows in factory
- Removal of existing floor finishes and replace with new.
- Repairs of damaged plastered walls internal and external
- Repainting of internal areas including main steel structure of factory
- Repainting of external plastered walls and other painted surfaces
- New joinery
- New floor finishes
- Construction of new cantilevered canopies over external roller shutter doors to factory
- Reinstatement of electrical installation, including issuing of Compliance certificates
- Reinstatement of plumbing installation, including new geyser, and issuing of Compliance certificates
- Construction of new perimeter security fence and access gates
- Etc. (As contained in the attached BOQ)

Alterations and Refurbishment: Site 21

The work to the existing vacant single story portal frame factory and attached service building includes the following:

- Site clearance and cutting off grass.
- Scrutiny and location of existing underground service connections,
- Removal and safe disposal of Asbestos Cement products, roof sheeting, side cladding, ceilings, rainwater goods etc., including issuing of Compliance certificates.

- Modification of steel portal frame factory structure to accommodate east facing clearstorey structures.
- Construction of new sheet metal roofing, flashing, gutters, and rainwater pipes
- Demolition of certain internal walls in service building as per drawings
- Construction of new internal walls in service building as per drawings
- Construction of new entrance to service building in plastered brick with new entrance door and shopfront as per drawing
- Plastering and painting of all existing face brick finishes
- Modifications to new entrance to guardhouse as per drawing
- Removal of certain existing steel windows and replacement with larger aluminum windows
- Removal of existing floor finishes and replace with new.
- Repairs of damaged plastered walls internal and external
- Repainting of internal areas including main steel structure of factory
- Repainting of external plastered walls
- New joinery
- New floor finishes
- Reinstatement of electrical installation, including issuing of Compliance certificates
- Reinstatement of plumbing installation, including new geyser, and issuing of Compliance certificates
- Construction of new hard standing areas as shown on drawing
- Construction of new cantilevered canopies over external roller shutter doors to factory
- Construction of new perimeter security fence and access gates
- Etc. (As contained in the attached BOQ)

THE REPAIRS AND REFURBISHMENTS OF SITE 8,12 and 21 IN DIMBAZA INDUSTRIAL PARK: OHS BASELINE RISK ASSESSMENT: DEFINITIONS

Hazard:	A situation that poses a level of threat to People, production, property, or the environment.
Risk:	The probability that something unwanted/ unpleasant will happen
Severity:	Is the anticipated extent or damage that may occur because of an unplanned event.
Frequency:	How often does activity occur within a predetermined time?
Likelihood:	How likely are the consequences to occur

RISK RATING:

1	Consider what can go wrong that can hurt someone.
2	Determine what the most likely outcome would be - Consequences.
3	Determine worst case scenario how likely those consequences are - Likelihood.
4	Calculate the risk rating.
5	Required action

CONSEQUENCES:

1. Severe	Death or permanent disability to one or more persons
2. Major	Hospital admission required.
3. Moderate	Medical treatment required.
4. Minor	First aid required
5. Insignificant	Injuries not requiring first aid.

LIKELIHOOD:

1. Almost certain	Expected to occur in most circumstances.
2. Likely	Hospital admission required.
3. Possible	Could occur at some time.
4. Unlikely	Is not likely to occur in normal circumstances.
5. Rare	May occur only in exceptional circumstances.

METHOD:

The basic risk assessment principles that will be followed are hazard identification, hazard quantification, risk identification, risk evaluation and ranking and lastly risk management recommendations. (Risk evaluation is described under the heading “Risk evaluation criteria”.) This assessment will be reviewed whenever the Project Scope is altered or after serious / repetitive incidents.

RESPONIBILITIES:

1. Site Management	To ensure that Risk Assessments are conducted, assessed, communicated, addressed, and signed.
2. Occupational Health Safety Officer	To ensure and enforce that Risk Assessments are communicated and utilized as a tool during work activities on site, as well as activities in the lay down areas.
3. Supervision	To ensure that existing Risk Assessments remain applicable and regularly updated upon changes and replacements.
4. OHS Representative	To discuss risks daily and to assist employees regarding changes in risks

1. LEGISLATIVE REQUIREMENTS

The following are legislation or guidelines that were identified as most applicable to this project:

- Construction Regulations, 2014
- The Constitution of the Republic of South Africa (particularly Section 24 of the Bill of Rights).
- Occupational Health and Safety Act 1993 (Act 85 of 1993) and its Regulations.
- Asbestos abatement Regulations 2020
- National Environmental Management Act 1998 (Act 107 of 1998).
- National Road Traffic Act (93 of 1996) National Environmental Management: Waste Act 59 of 2008
- Air Quality Act 39 of 2004
- Hazardous Substances Act 15 of 1973
- National Water Act 36 of 1998
- Conservation of Agricultural Resources Act 1983 (Act 43 of 1983).
- Mine Health and Safety Act 29 of 1996
- Compensation for Occupational Injuries and Diseases Act No 130 of 1993 (COIDA)
- Applicable South African National Standards (SANS).
- ISO 9001:2008 –Quality Management Systems requirements
- ISO 14001:2004–Environment Management Systems requirements
- OHSAS 18001:2007 –Occupational Health and Safety Management Systems Requirements
- General Administrative Regulations, of the OHS Act
- Hazardous Chemical Agents Regulations, of the OHS Act
- National Environmental Management: Waste Act, No 59 of 2008

1.1. Risk Management (RM)
The RM methodology comprises five key elements, which are:
1.1.1. Identify site hazards.
These are conditions on site that could present Health and Safety risks. e.g., dust, noise, work at heights, travelling, trenching, rigging, uneven terrain, construction vehicle, traffic, and hazardous chemical substances.
1.1.2. Identify the risks.
These are events that could adversely affect the Health and Safety of people as well as the environment. Included in this step is the identification of causal factors. The risk owner is the person accountable for ensuring that controls are in place, implemented and reviewed/ monitored. Highlight unanticipated risks due to abnormal conditions (e.g., sudden unexpected and short-term changes to environmental conditions).
1.1.3. Analyze the Risks
With the hazards and risks identified, start with listing potential consequences and existing control measures. Then assess

the effectiveness of the existing controls. Also considering existing controls, determine the anticipated consequences and the likelihood of these consequences using the prescribed framework for health, safety, and environmental risks.

1.1.4. Evaluate Risks

This step aimed at ensuring that adequate controls have been identified for the risks, adequate resources have been allocated and adequate progress is being made with implementation. The level of managerial oversight and the timeframe within which the treatment strategy must be established is dictated by the priority rating matrix.

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

Evaluation includes:

1.1.4.1.	Agreement by appropriate managerial levels, that appropriate risk and control measures have been identified.
1.1.4.2.	Review of the appropriateness of the control measures them.
1.1.4.3.	Review of additional controls/ tasks that have been identified as necessary.
1.1.4.4.	Assessment of the measures proposed for measuring the progress of implementation.
1.1.4.5.	Assessment of the measures proposed for monitoring effectiveness of the controls.

The Contractor must ensure through his risk management process the hierarchy of controls stipulated as follows, are implemented:

1.	<i>Eliminate</i>	The complete elimination of the hazard.
2.	<i>Substitute</i>	Replacing the material or process with a less hazardous one.
3.	<i>Redesign</i>	Redesign the equipment or work process.
4.	<i>Separate</i>	Isolating the hazard by guarding or enclosing it.

**EASTERN CAPE DEVELOPMENT CORPORATION
BASELINE RISK ASSESSMENT**

**CONTRACT
NUMBER:**

**BASELINE RISK
13112023**

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
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5. <i>Administrate</i>	Providing control such as training, procedures etc.
6. <i>Personal Protective Equipment (PPE)</i>	Use of appropriate and properly fitted PPE where other controls are not practical. (PPE as the last resort)

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
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APPOINTMENTS AS PER THE CONSTRUCTION REGULATIONS

Item	Regulation	Appointment	Responsible Person
1.	5(1)(k)	Principal contractor for each phase or project	Client
2.	7.(1)(v)	Contractor	Principal Contractor
3.	7(3)	Sub-Contractors	Contractor
4.	8(1)	Construction Manager	Contractor
5.	8(2)	Assistant Construction Managers	Contractor
6.	8(5)	Construction Safety Officer	Contractor
7.	8(7)	Construction supervisor	Contractor
8.	9(1)	Person to carry out Risk Assessment	Contractor
9.	9(3)	Risk Assessment Trainer/Instructor	Contractor
10.	10(1)(a)	Fall Protection Planner	Contractor
11.	12 (2)	Temporary Works Supervisor	Contractor
12.	11 (2))	Structures Examiner	Contractor
13.	13(1)	Excavation Supervisor	Contractor
14.	13(2)(ii)(bb)	Professional Engineer or Technologist	Contractor
15.	13(2)(k)	Explosives Expert	Contractor
16.	14(1)	Demolition Work Supervisor	Contractor

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17.	14(2)	Demolition Expert	Contractor
18.	14(11)	Explosives Expert	Contractor
19.	16(1)	Scaffold Supervisor	Contractor
20.	17(2)(b)	Compliance Plan Developer	Contractor
21.	17(2)(ii)	Rigger	Contractor
22.	18 (1)	Rope Access Work Supervisor	
23.	19(8)(a)	Material Hoist Inspector	Contractor
24.	20(1)	Bulk Mixing Plant Supervisor	Contractor
25.	20(2)	Bulk Mixing Plant Operator	Contractor
26.	21(2)(b)	Explosive Actuated Fastening Device Operator	Contractor
27.	21.2 (g) (i)	Explosive Actuated Fastening Device Controller	Contractor
28.	22(a)	Crane Operator	Contractor
29.	23(d)(i)(ii)	Construction Vehicle and Mobile Plant Operator	Contractor

Item	Regulation	Appointment	Responsible Person
30.	23(1)(k)	Construction Vehicle and Mobile Plant Inspector	Contractor
31.	24(d)	Temporary Electrical Installations Inspector	Contractor
32.	24 (c)	Temporary Electrical Installations Controller	Contractor
33.	28 (a)	Stacking and Storage Supervisor	Contractor

EASTERN CAPE DEVELOPMENT CORPORATION BASELINE RISK ASSESSMENT	CONTRACT NUMBER:	BASELINE RISK 13112023
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34.	29 (h)	Fire Equipment Inspector	Contractor
35.	29 (i)	Fire Fighter	Contractor

This list may be used as a reference or tool to determine which components of the Act and Regulations would be applicable to a particular site. This list must not be assumed to be exclusive or exhaustive.

Activities

A. Administration

B. Site Establishment and Construction Works

1. Site Establishment Camp
2. Fencing around Site Camp
3. Erection of Barricades
4. Security at Camp site
5. Erection of signs on Construction Site
6. Delivery of materials at camp site
7. Loading and unloading of site materials (Roof Sheeting, and General Building Materials)
8. Stacking and storage of materials
9. Handling of hazardous chemicals
10. Environmental protection, sanitation, and waste removal

C. Construction Works and General Building Works

1. Installation of Roof Sheeting, glazing, painting, and other building works and working at heights
2. Backfill and compaction.
3. Entering a confined space
4. Asbestos handling and Removal
5. Use of cement and tilling works
6. Use of hand tools
7. Use of machinery

D. Emergency preparedness

1. Evacuation during site emergencies
2. Providing first aid
3. Firefighting activities

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- E. Electrical power supply system, Electrical and energy powered tools
 - 1. Working with electrical power supply system, portable electrical equipment
- F. Housekeeping
 - 1. Cleaning
 - 2. Cleaning oil spillages
 - 3. Waste disposal

- G. Public Safety
 - 1. Unauthorized Personnel
 - 2. Working near offices and confined spaces
 - 3. Public passing near construction site
- H. Night work
 - 1. Working at Nigh

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
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REF	ACTIVITY, HAZARD & RISK IDENTIFICATION			LOSS TYPE	CONTROLS TO BE IMPLEMENTED	RISK ASSESSMENT			SWP / SOP /MS REF NUMBER
	ACTIVITY	HAZARD	RISK			(C)	(L)	CLASS	
A. Administration									
	Medical examinations	Employees unfamiliar with their medical conditions	Health problems resulting in time loss and project delays.	H	<ul style="list-style-type: none"> All employees are to be declared medically fit by a registered occupational health practitioner. 	3	3	13(H)	
	Admin documentation	Nonconformance issues	Work stopped due to non-compliance.		<ul style="list-style-type: none"> All necessary permits, method statements and plans to be in place prior to commencement of task. 	3	3	13(H)	
	Application of wayleaves	No wayleave and supporting permits.	Time loss due to work stoppage by authorities resulting in unnecessary costs.		<ul style="list-style-type: none"> Ensure that all documentation and permits are in place. 	3	3	13(H)	
		Employees exposed to							

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	Entering site without being inducted	unknown hazards.	Moderate to severe injuries	S	<ul style="list-style-type: none"> SHE induction must be given to persons before entering site. 	4	4	21(CR)	
	Appointments	Appointments not done as per construction regulation.	Time loss due to work stoppage by authorities	S	<ul style="list-style-type: none"> Standard appointment letters should be completed as required by the OHS Act. Refer to Appointments in the safety file. 	3	2	9(M)	
	Induction training	Persons have not received induction training before starting work.	Employees are not aware of the risks associated with their activities.	S	<ul style="list-style-type: none"> Management is to ensure that all workers have received health & safety induction training pertaining to the hazards associated with the activities performed. Proof of the induction training must be maintained for all persons that perform high risk activities. Complete the Induction Form. 	4	3	18(H)	
	Performing Risk Assessments	Risk assessments not performed before commencement of any new work and during	Employees are not aware of the risks they are exposed to during work	S	<ul style="list-style-type: none"> Appoint a competent Supervisor in writing and provide HSE Representative Training. Supervisor to do a risk assessment that includes the following: The identification of risks and hazards to which persons may be exposed. 	4	3	18(H)	

EASTERN CAPE DEVELOPMENT CORPORATION BASELINE RISK ASSESSMENT	CONTRACT NUMBER:	BASELINE RISK 13112023
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		hazardous activities			<ul style="list-style-type: none"> The analysis and evaluation of the risks and hazards identified. A plan to mitigate, reduce or control the risks and hazards that have been identified. 				
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B. Site Establishment and Construction Works

01	Establishing Site Camp	Incompetent Employees,	Injury, injuries to third parties & fatalities & fatalities pollution	S	<ul style="list-style-type: none"> Operator must have knowledge, experience, training, and qualifications specific to the work they have been appointed to do. Oil spills must be cleaned out. Spill kits must be available onsite. Workers to be trained on safe working procedures. 	4	4	21(CR)	Environmental Management Plan
		Oil leakages from machines, Generators		E		2	4	12(M)	
		Eastern Cape Development Corporation 's	Injuries	S		5	4	24(CR)	

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	workers not following Safe Working Procedures (SWP)				<ul style="list-style-type: none"> • Toolbox talks on importance of following SWP'S. 	4	4	21(CR)	
	Working on uneven surfaces	Leg & ankle injuries	S		<ul style="list-style-type: none"> • Use of proper footwear PPE 	3	3	13(H)	
	Damage to adjacent private property by machine bumping into private property.	property damage	S		<ul style="list-style-type: none"> • Prior to the beginning of clearing or grubbing activities, the project engineer or the certified inspector is to inspect the area to determine if these activities are likely to cause damage or require access to adjacent private property. 	3	4	17(H)	
	Non disposal of generated waste	Environment al pollution			<ul style="list-style-type: none"> • When felling, topping or trimming trees, broken or cut limbs are not to fall on or damage overhead wires. 				
		Manifestation of rodents	E		<ul style="list-style-type: none"> • The disposal of all cleared or grubbed materials is the responsibility of the Eastern Cape Development Corporation to remove from the right-of-way and disposed at locations off 	2	4	12(M)	
		Insect bites and illness	H			3	5	20(H)	

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**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

		Exposure to venomous reptiles and insect bites	Illnesses associated with lungs, Pollution		the project outside the limits of view of the traveling public.				
		Exposure to dust from Construction work site		H	<ul style="list-style-type: none"> All waste must be removed from site through a formal waste management program. No littering is allowed on site. 	3	4	17(H)	
				H	<ul style="list-style-type: none"> Use of insect repellents Environmental awareness during toolbox talks Spay water on ground to minimize the production of dust. Employees working close to the machines, generators and exposed for longer periods to the machine must be provided with dust masks. 	3	4	17(H)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

02	Fencing around Camp Site	Substandard fencing	Fence blown down in high winds.	S	<ul style="list-style-type: none"> The safety fencing should be strong enough and durable enough to withstand the elements. Wear proper PPE. It should be of a design that makes it difficult to climb. It should have reinforcement at the bottom so that one cannot climb underneath it. Gates or joins should not provide a security threat. Persons must wear correct PPE before entering site. Use of protective safety eyewear(goggles) 	3	3	13(H)	
		Exposure to sharp edges	Cuts & lacerations	S		2	3	8(M)	
		Unauthorized persons accessing site via poor fencing and green netting.	Theft	S		5	4	24(CR)	
		Persons entering site without PPE.	Moderate to severe Injuries	S		4	4	21(CR)	
		Use of hand tools to erect fence.	Injuries to eyes	S		4	4	21(CR)	
03	Erection of barricades on work site	Work site not barricaded from unauthorized personnel	Moderate to severe injuries		<ul style="list-style-type: none"> Erect barricades to control access to the job site from the public and control the worksite as a whole 	4	3	18(H)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

04	Security at camp site	Un-authorized persons entering site.	Injuries	S	<ul style="list-style-type: none"> No Eastern Cape Development Corporation may allow or permit any employee or person to enter site unless the person has undergone Health and safety induction training. Security system and guards should be used. Use very secure, lockable storage units. Equipment and tools to be locked inside secure area. Use net to increase security 	4	4	21(CR)	
		Unsecured storage facilities	Theft	S		1	4	7(M)	
	Substandard fencing	Fence blown away by wind if there is no net.	Theft	S		1	4	7(M)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

05	Erection of signs on Construction Site	Speeding vehicles on site	Vehicle accidents	S	<ul style="list-style-type: none"> Ensure erection of site speed signs Use of proper PPE (protective gloves and goggles) Training on proper bending postures Allocation of designated parking areas for delivery/plant vehicles and staff/visitors 	4	4	21(CR)	To be included in Traffic Management Plan
		Poor condition of hand tools used to erect signs.	Hand and eye injuries	S		4	3	18(H)	
		Manual use of hand tools to Erection of Signs	Back injuries from bending	S		3	3	13(H)	
		No signage on construction site	Employees parking vehicles anywhere on site	S		2	3	8(M)	
06	Delivery of materials at camp site	Incompetent vehicle and machinery operators	Accidents	S	Employment controls for persons required to drive. Valid driver's license. Safe driving techniques to be adhered to at all times.	4	4	21(CR)	
		Driver not adhering to Safe driving techniques	Injuries	S		3	4	17(H)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

		Machinery operators not competent to perform specific appointed work.	Injuries to third parties	S	Operator must have knowledge, experience, training, and qualifications specific to the work they have been appointed to do; follow SWP's.	4	4	21(CR)	
		Oil spills from machinery and generators		E	Use of spill kits and persons trained on using them; use of drip trays.	4	4	21(CR)	
		Inhalation of fumes	Environmental pollution	H	Air quality monitoring and surveys Use of masks	3	5	20(H)	
		Dust inhalation	Lung illnesses	H		3	5	20(H)	
		Dropping of loads	Lung illnesses	S	Correct positioning of equipment and low loaders	3	4	17(H)	
			Property damage						

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

07	Loading and off-loading of site materials	Manual lifting	Musculoskeletal injuries	S	<ul style="list-style-type: none"> Practice corrects lifting techniques when lifting loads. Do not lift heavy loads without assistance. Correct handling techniques, proper posture techniques when handling heavy or big loads of equipment. Avoid twisting the upper body suddenly whilst carrying heavy loads. Ask for assistance to carry heavy and awkward loads. Use correct lifting method and ask for assistance for loads exceeding 25kg. Employees should be properly trained and follow safe work procedures. Only Trained First Aider must perform treatment of injury. Woman should avoid strenuous work from early pregnancy onwards to well after the birth. 	3	4	17(H)	Procedure for manual handling
		Carrying heavy loads	Back Injuries	S		3	4	17(H)	Procedure for manual handling
		Twisting	Spinal injuries	S		3	4	17(H)	
		Handling exceeding loads	Back and spinal injuries	S		3	4	17(H)	
		Workers not following SWP's for manual handling.	Back and spinal injuries	S		3	4	17(H)	
		Pregnant women doing strenuous work	Miscarriage in pregnant women	H		3	4	17(H)	
								17(H)	

**EASTERN CAPE DEVELOPMENT CORPORATION
BASELINE RISK ASSESSMENT**

**CONTRACT
NUMBER:**

**BASELINE RISK
13112023**

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

08	Stacking and storage of materials including general building materials	Improper Stacking of general building material resulting in materials falling	Injuries	S	<ul style="list-style-type: none">• Follow proper stacking procedures.• Proper supervision and inspections	4	4	21(H)	
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PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

9	Handling of hazardous chemicals	No bunding for Storage of Cement, Glue resulting in spills.	Environmental pollution	E	<ul style="list-style-type: none"> All fuel storage to be in specific banded fuel storage tanks that holds 110% of the capacity of the container. Spill kits required and persons trained on using them. 	4	4	21(CR)	Environmental management plan/ Fire Protection Plan
		Fire extinguishers not accessible	Property damage from fire	S		4	5	23(CR)	
		Skin contacts with chemicals	Skin irritation and skin dermatitis	H		1	4	7(M)	
		Inhalation of hazardous chemicals	Illnesses associated with lungs.	H		3	3	13(H)	
		Incorrect disposal of chemicals	Environmental pollution	E		3	4	17(H)	
		Inventory list of chemicals not kept.		S		3	3	13(H)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

		Ingestion	poisoning	S	<ul style="list-style-type: none"> • Compile a complete list of the chemicals in your workplace. 	3	3	13(H)	
		Employees not trained on working with hazardous chemicals.	risks associated with incorrect use of chemicals.	S	<ul style="list-style-type: none"> • Making available emergency medical help 	3	3	13(H)	
		Unmarked chemicals	risks associated with using unknown chemicals	S	<ul style="list-style-type: none"> • Trained personnel to handle hazardous chemicals. • All chemicals on site must be correctly marked and labeled 	3	4	17(H)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

10	Environmental protection and sanitation	Employees smoking anywhere on site.	Risk of a fire starting from a lit cigarette	E	<ul style="list-style-type: none"> Smoking must be prohibited outside designated smoking areas. 	1	4	7(M)	Environmental Management Plan
		Use of unhygienic toilets according to regulation requirements	Bacterial/viral/fungi and parasite infections	H	<ul style="list-style-type: none"> Ensure that toilets are regularly cleaned and maintained, including temporary units. Employees are required to wash their hands after going to the toilets/ using urinals. 	2	4	12(M)	
		Working in extreme weather i.e., hail, strong winds, Heat	Heatstroke	H	<ul style="list-style-type: none"> EHS weather watch via internet Find shelter in a secure building. All work must be halted under such conditions. Provide employees with water. 	2	4	12(M)	Environmental Management Plan
			Noise exposure to ears	H	<ul style="list-style-type: none"> Ensure that there is no un-natural flow into storm water channels. 	3	4	17(H)	Environmental Management Plan
						2	4	12(M)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

					<ul style="list-style-type: none"> Laborers can sustain noise-induced hearing loss when not using correct PPE. I.e., Earmuffs, ear plugs 				
C. Construction Works, Removal Asbestos handling and removal and General Building Works									
01	Installation of Roof, and other general building works: Painting Tiling Brickwork Plastering Plastering Roof works Removal Asbestos handling and removal	Installations done by incompetent supervisor.	Installations work on unstable Surface or Walls	S	<ul style="list-style-type: none"> Evaluate the stability of the walls before Installations work begins. Inspection by a qualified engineer A Eastern Cape Development Corporation must ensure that all Installation work is carried out under the supervision of a competent person. 	5	3	22(CR)	Appointment of competent person
		Fall or dislodgement of material in an Installations.	Being buried/trapped	S		4	4	21(CR)	
		Exposed to Work at Heights Workers not following safe	Injuries	S		4	4	21(CR)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

		working procedures. Excavations not being inspected	Fall of ground	S	<ul style="list-style-type: none"> No load, material, plant or equipment is to be placed or moved near the edge of any excavation where it may cause its collapse and consequently endangers the safety of any person. (1m distance from excavation) <p>Every excavation must be inspected daily and after rain or fall of ground.</p>	4	4	21(CR)	
02	Backfill and compaction.	Flying debris getting into eyes of workers	Loss of sight – Backfill and Compaction works create flying debris which may pose a significant eye hazard	S	<ul style="list-style-type: none"> Workers must be issued eye protection upon hire. E.g., eye goggles Re-enforcement on the use of eye protection during site toolbox talks 	4	4	21(CR)	
03	Entering a confined space	No gas detectors- Air quality is not tested before entering confined space.	Fires and explosion can occur causing multiply injuries to employees.	S	<ul style="list-style-type: none"> Before a person enters a confined space, gas detectors must be used to determine the need for breathing apparatus. 	4	4	21(CR)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

		Entering a confined space without inspection	Injuries to workers	S	<ul style="list-style-type: none"> All confined spaces must be inspected before any person enters the confined space. SWP training must be given to workers. Only competent persons must be appointed in writing. When oxygen drops to less than 20% by volume, the area must be cleared of all people and artificial ventilation systems put into place. 	4	3	18(H)	
		Inadequate symbolic safety signs and notices	May result in fatalities to workers.	S		4	3	18(H)	
		Oxygen content dropping to less than 20% by volume.	Insufficient % of oxygen can have a serious impact on the entrant working inside the confined space, suffocate.	S		4	4	21(CR)	
04	Asbestos Handling and Removal	Inhalation of Asbestos fibers Improper Asbestos removal	May result in fatalities to workers.	S	Risk Assessment and Method statement of Asbestos to be communicated to the relevant exposed employees.	4	3	21(CR)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

		Incompetent person conducting removal	Insufficient % of oxygen can have a serious impact on workers, Lung disease, suffocation		Only registered contractor must handle and remove asbestos. Only workers with the required task specific PPE will be allowed to handle and remove asbestos.				
05	Use of Cement	Workers not trained on working with concrete mix.	Severe chemical burns to exposed skin and eyes	S	<ul style="list-style-type: none"> Task to be done by competent shutter hands and concrete hands. Use of correct PPE, i.e. Waterproof gloves, overalls, eye goggles 	3	3	13(H)	
06	Use of hand tools	Incorrect use of hand tools	Hand loss	S	<ul style="list-style-type: none"> Practice correct use of tools for the correct task 	4	4	21(CR)	
		Not following Safe Working Procedures	Injuries	S	<ul style="list-style-type: none"> Training on safe working procedures Correct use of PPE 	4	4	21(CR)	
		Using sub-standard tools	Injuries to hands	S	<ul style="list-style-type: none"> Regular tool inspections 	4	5	23(CR)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

		Using homemade tools to perform tasks	Injuries to hands	S	<ul style="list-style-type: none"> Removal of damaged tools Use the correct tools for the correct task Conduct Hand tool Risk Assessment 	4	4	21(CR)	
07	Use of machinery and Tools	Use of faulty equipment	Injuries	S	<ul style="list-style-type: none"> Maintenance of equipment as per manufacturer's requirements periodic repairs removal of faulty equipment 	4	5	23(CR)	
		Contact with exposed/damaged wires	Electrocution	S	<ul style="list-style-type: none"> display visible signage that indicates faulty equipment 	3	3	13(H)	
		Work stoppages	Loss of production	E	<ul style="list-style-type: none"> toolbox talks proper supervision 	3	4	17(H)	
		Oil and fuel spills	Environmental pollution	S	<ul style="list-style-type: none"> Any leaks must be contained with drip trays and spill kits must be used to minimize environmental damage 	3	4	17(H)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

D. Emergency Preparedness									
01	Evacuation during site emergencies	Workers uninformed of emergency evacuation routes.	Injuries	S	<ul style="list-style-type: none"> Conduct emergency drills SHE Orientation 	3	4	17(H)	Emergency Plan
			Stampede	S	<ul style="list-style-type: none"> Supervision during evacuation 	4	4	21(CR)	
		Emergency evacuation signs not visible to employees	Fatalities	S	<ul style="list-style-type: none"> Emergency evacuation routes and assembly points must be clearly marked 	5	4	24(CR)	
02	Providing first aid	Incompetent first aider	Escalation of injuries	S	<ul style="list-style-type: none"> Trained first aiders. 	4	4	21(CR)	Emergency plan
		Untrained persons attending to first aid cases	Fatalities	S	<ul style="list-style-type: none"> Trained first aiders. 	5	4	24(CR)	
		First aider not using PPE	Bacterial, viral infections	S	<ul style="list-style-type: none"> Use gloves and CPR mask. 	4	4	21(CR)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

03	Firefighting activities	Incompetent fire fighter	Burns	S	<ul style="list-style-type: none"> Trained fire fighters 	4	4	21(CR)	Fire Protection Plan	
		Workers not trained on emergency plan.	Injuries	S		<ul style="list-style-type: none"> Conduct fire drills Emergency plan must be in place. 	4	4		21(CR)
		Emergency numbers not displayed on site for everyone to see.	Fatalities	S		<ul style="list-style-type: none"> Emergency numbers must be visible to everyone. 	5	3		22(CR)
		Fire extinguishers not working and not inspected.	Property damage			<ul style="list-style-type: none"> Fire extinguishers must be easily accessible and available. Firefighting equipment must be inspected. 	4	5		23(CR)
		Smoke inhalation	Suffocation	H		<ul style="list-style-type: none"> Use of masks 	4	4		21(CR)

E. Electrical power supply system, Electrical and energy powered tools

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

01	Working with electrical power supply system, portable electrical equipment	Exposure to faulty electrical equipment/tools	Shock	S	<ul style="list-style-type: none"> Regular tool inspections Ensure that the connections. (DB Boards, cables to equipment, equipment, etc.) are tight. Risk Assessments 	3	4	17(H)	
		Use of incorrect tools for the wrong job	Fatalities	S	<ul style="list-style-type: none"> Equipment must be in good working condition. Correct use of the correct tool for the correct task Access to live equipment is to be controlled. Regular maintenance of equipment 	5	4	24(CR)	
		Incompetent person performing electrical work.	Fire	S	<ul style="list-style-type: none"> Only competent persons to perform tasks. 	4	3	18(H)	
		Contact with live /damaged wires.	Electrocution	S	<ul style="list-style-type: none"> Safe work procedure/lock out procedure to be available and followed when working on electrical machinery and/or equipment. Certificate of compliance to be issued before the electrical installation is handed over for use, or if alterations and modifications have been done. 	4	4	21(CR)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

					<ul style="list-style-type: none"> Correct usage; do not work on live equipment. 				
F. Housekeeping									
01	Sweeping/cleaning	Exposure to cleaning chemicals	Skin irritation	S	<ul style="list-style-type: none"> Use of PPE (gloves) Use of PPE (gloves) Use of masks where necessary Practice corrects bending postures 	1	4	7(M)	
			Skin dermatitis	H		2	4	12(M)	
		Inhalation of chemicals	Dizzy spell	H		1	4	7(M)	
		Musculoskeletal from repetitive motion including bending, stretching, reaching etc.	Back injuries	H		3	4	17(H)	
02	Cleaning oil spillages	Spill kits not available	Slips and falls	E	<ul style="list-style-type: none"> Spill kits must be available and accessible on site 	3	4	17(H)	Environmental Management Plan
				E		2	4	12(M)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

03	Waste disposal	Untrained persons doing spill cleanups.	Improper clean ups	E	<ul style="list-style-type: none"> • Training must be provided to persons responsible for spill cleanups. • Conduct spill drills 	3	4	17(H)	
		Incorrect disposal of contaminated waste	Environmental pollution	E	<ul style="list-style-type: none"> • Designated bins for disposal of contaminated waste 	2	4	12(M)	
G. PUBLIC SAFETY									
01	Unauthorized persons entering site	Members of public unknowingly exposed to risks.	Moderate to severe injuries	S	<ul style="list-style-type: none"> • Site must be clearly fenced and closed off. Warning signage must be placed at entrance to prohibit unauthorized entry. 	4	4	21(CR)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

02	Working near the Offices and workstations	Workers unaware of their surroundings	Damage to public passing by	S	<ul style="list-style-type: none"> • Safe work procedures must be in place. • Sufficient signage • 	3	3	13(H)	
			Injuries to third parties	S		4	3	18(H)	
03	Public passing near construction site	Material falling from elevation	Injuries to third parties	S	<ul style="list-style-type: none"> • Construct temporary protective gantries or covered walkways to provide protection when employees are working above areas where the public or other employees need to pass 	4	3	18(H)	
04	Moving motorized and other equipment around	Workers not following procedures when offloading equipment from low loaders	Moderate to severe injuries to third parties	S	<ul style="list-style-type: none"> • Follow procedure for offloading. • Correct positioning of equipment and low loaders 	4	4	21(CR)	

H. Night Work

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

01	Working at night	Reduced visibility for motorists	Accidents	S	<ul style="list-style-type: none"> Temporary lighting set to avoid glare and shadows for motorists, equipment drivers, workers. 	4	4	21(CR)	
		Drivers, pedestrians, workers less alert and more likely to be tired.	Injuries	S	<ul style="list-style-type: none"> Work schedules set up to allow enough sleep. Maintain strict sleep schedule, make sleep a priority. 	3	4	17(H)	
		Workers less visible	Accidents and injuries	S	<ul style="list-style-type: none"> Use of retroreflective high visibility apparel meeting ANSI/ISEA 107-2004-Class 3 to improve visibility. 	4	3	18(H)	
		Decreased visibility on site	Trips, falls, run overs	S	<ul style="list-style-type: none"> Temporary lighting to ensure good visibility 	4	4	21(CR)	

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

RISK ASSESSMENT MATRIX

LOSS TYPE		CONSEQUENCE ©				
		<i>INSIGNIFICANT (1)</i>	<i>MINOR (2)</i>	<i>MODERATE (3)</i>	<i>MAJOR (4)</i>	<i>CATASTROPHIC (5)</i>
Harm to people (Safety / Health) (S/H)		First aid case / Exposure to minor health risk	Medical Treatment case / Exposure to major health risk	Lost time injury / Reversible impact on health	Disabling Injury / Irreversible impact on health	Fatality / Impact on health ultimately fatal
Environmental impact (EI)		Minimal environmental harm – immediate clean-up	Material environmental harm – incident remediable in short term	Serous environmental harm – incident remediable in medium term	Major environmental harm – incident remedial in long terms	Extreme environmental harm – Incident irreversible
LIKELIHOOD (L)		RISK RATING				
5 (Almost certain)	The unwanted event has occurred frequently; and is likely to re-occur within 1 week	11 (M)	16 (H)	20 (H)	23 (CR)	25 (CR)
4 (Likely)	The unwanted event has occurred infrequently; and is likely to re-occur within 1 month	7 (M)	12 (M)	17 (H)	21 (CR)	24 (CR)
3 (Possible)	The unwanted event has happened in the business at some time; or could happen within the next 3 months	4 (L)	8 (M)	13 (H)	18 (H)	22 (CR)
2 (Unlikely)	The unwanted event has happened in the business at some time; or could happen within the next 6 months	2 (L)	5 (L)	9 (M)	14 (H)	19 (H)
1 (Rare)	The unwanted event has never been known to occur in the business; or it is highly unlikely it will occur the next year	1 (L)	3 (L)	6 (M)	10 (M)	15 (H)
RISK RATING		RISK LEVEL		GUIDELINES FOR RISK MATRIX AND MANAGEMENT PRACTICES		

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

21 – 25	(CR) – Critical Risk	Eliminate, avoid, implement specific action plans / procedure to manage and monitor
13 – 20	(H) – High	Pro-actively manage
6 – 12	(M) – Medium	Actively manage
1 – 5	(L) - Low	Monitor and manage as appropriate

RISK ASSESSMENT MATRIX						
LOSS TYPE		CONSEQUENCE ©				
		INSIGNIFICANT (1)	MINOR (2)	MODERATE (3)	MAJOR (4)	CATASTROPHIC (5)
Harm to people (Safety / Health) (S/H)		First aid case / Exposure to minor health risk	Medical Treatment case / Exposure to major health risk	Lost time injury / Reversible impact on health	Disabling Injury / Irreversible impact on health	Fatality / Impact on health ultimately fatal
Environmental impact (EI)		Minimal environmental harm – immediate clean-up	Material environmental harm – incident remediable in short term	Serous environmental harm – incident remediable in medium term	Major environmental harm – incident remedial in long terms	Extreme environmental harm – Incident irreversible
LIKELIHOOD (L)		RISK RATING				
5 (Almost certain)	The unwanted event has occurred frequently; and is likely to re-occur within 1 week	11 (M)	16 (H)	20 (H)	23 (CR)	25 (CR)

PROJECT DESCRIPTION:

**THE REPAIRS AND REFURBISHMENTS OF SITE
8,12 and 21 N DIMBAZA INDUSTRIAL PARK**

4 (Likely)	The unwanted event has occurred infrequently; and is likely to re-occur within 1 month	7 (M)	12 (M)	17 (H)	21 (CR)	24 (CR)
3 (Possible)	The unwanted event has happened in the business at some time; or could happen within the next 3 months	4 (L)	8 (M)	13 (H)	18 (H)	22 (CR)
2 (Unlikely)	The unwanted event has happened in the business at some time; or could happen within the next 6 months	2 (L)	5 (L)	9 (M)	14 (H)	19 (H)
1 (Rare)	The unwanted event has never been known to occur in the business; or it is highly unlikely it will occur the next year	1 (L)	3 (L)	6 (M)	10 (M)	15 (H)

RISK RATING	RISK LEVEL	GUIDELINES FOR RISK MATRIX AND MANAGEMENT PRACTICES
21 – 25	(CR) – Critical Risk	Eliminate, avoid, implement specific action plans / procedure to manage and monitor
13 – 20	(H) – High	Pro-actively manage
6 – 12	(M) – Medium	Actively manage
1 – 5	(L) - Low	Monitor and manage as appropriate

C3.3 ELECTRICAL SPECIFICATION



REPAIRS AND REFURBISHMENTS OF SITE 8, SITE 12 & SITE 21 IN DIMBAZA INDUSTRIAL PARK

VOLUME 3 - ELECTRICAL INSTALLATION

Consisting of:

- Section 1: Technical Specification & Tender Drawings**
- Section 2: Returnable Schedules**
- Section 3: Pricing Instructions**
- Section 4: Pictures**

DOCUMENTS COMPILED BY:

RNA Consulting Engineers
11 Bonza Bay Road, Beacon Bay
East London, 5201

Contact Person: Mr N. Nzuz
Tel: (043) 742 0041
Fax: (043) 742 3883

Section 1 – Technical Specification & Tender Drawings

TECHNICAL SPECIFICATIONS

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ELECTRICAL INSTALLATION DETAILS

1. SCOPE OF WORK

The main contract is for the refurbishment of Site 08, 12 & 21 factories within the Dimbaza Industrial Park in Dimbaza, Eastern Cape.

The work to be carried out by the Electrical Subcontractor under this Contract comprises of, but not limited to, the supply and installation of the following, including commissioning:

- (i) Isolating, disconnecting & removal of the existing electrical installation.
- (ii) Liaising with Buffalo City Metropolitan Municipality (BCMM) Electrical Department, Qonce Offices, for Electrical Supply Connection of the Sites that require new supply connections.
- (iii) Supply and installation of Low Voltage cabling from the BCMM's Minisub-stations outside the site boundaries.
- (iv) Supply and installation of power and data cable sleeves.
- (v) Supply and installation of power and data manholes within the site boundary.
- (vi) Supply and installation of Low Voltage power and data distribution boards.
- (vii) Supply and installation of wireways (power skirting, P2000, N8/1 & P8000 trunking) for lighting, power and data.
- (viii) Supply and installation of luminaires, light switches, occupancy sensors, switched socket outlets and other small power systems.
- (ix) Submission of samples of all luminaires and other materials for vetting and approval as to the Engineer, Client, Principal Agent or any other member of the professional team.
- (x) Supply and installation of Earthing and Bonding of the entire building installations.
- (xi) Attendance to any specialist installers, such as LPS (Lightning Protection System), intruder alarm and data cabling and other related services; if and when required.
- (xii) Performing and submission of test records and certificates.
- (xiii) Balancing of loading and circuits after works completion.
- (xiv) Test completed installations and issue of Certificates of Compliance for both Electrical and the LPS installations.
- (xv) Produce marked As-Built drawings for both Electrical (including DB Schematic Diagrams) and LPS installations to be submitted to the Engineer.

The description of the Works listed above, is not necessarily complete and shall not limit the work to be carried out by the Electrical Subcontractor under this Contract.

2. SPECIFICATIONS & STANDARDS

The works carried out under this Contract shall be governed, but not limited to:

- (i) SANS 10142-1: Wiring Code and/or as amended,
- (ii) SANS 10114-1: Interior Lighting Part 1: Artificial Lighting of Interiors;
- (iii) SANS 10114-2: Part 2: Emergency Lighting;
- (iv) Protection against Lightning – Physical Damage to Structures and Life Hazard: SANS 10313: 2008 and in conjunction with the SANS 62305 series
- (v) The Occupational Health and Safety Act, 1993 (Act 85 of 1993)

3. SYSTEM LOW VOLTAGE

The supply to the Electrical installation shall be 400/230 Volts, 3 phase, 4 wire, 50 Hertz, Earthed Neutral or as directed by the relevant Supply Authority.

4. SCHEDULE OF MATERIALS

In all instances where schedule of materials are attached or included on the drawings, these schedules are to be regarded as forming part of the specification.

All materials and equipment procured by the Electrical Subcontractor must be made in South Africa. Where this is not possible, the Electrical Subcontractor must provide to the Engineer or Engineer's Representative validating evidence that such material and/or equipment is not available South Africa.

5. CONTRACT DRAWINGS

Drawings must be read in conjunction with this Specification and the Bills of Quantities. Any errors, discrepancies or contradictions found between the Drawings, the Specifications and the Bills of Quantities must be brought to the attention of the Engineer or Engineer's Representative **immediately** as they become evident.

The drawings generally show the scope and extent of the proposed work and shall not be construed as showing every minute detail of the work to be executed.

The position of power points, switches and light points that may be influenced by built-in furniture and equipment must be established on site prior to these items being built in.

Drawings will be issued to site accompanied by drawing issue slips. The drawing issue register reflecting the summary of all previously issued drawings with dates and drawing revisions will be issued at site meetings once a month.

6. POWER CABLE SLEEVES

Where cables cross paved, concrete or tarred surfaces and roadways where cables enter buildings, cables shall be run in flexible (corrugated) PVC sleeves. **Any other cable sleeves will not be acceptable.**

The ends of all sleeves shall be sealed with a non-hardening watertight compound after the

installation of cables. All sleeves intended for future use shall likewise be sealed and provided with pulling tape/rope for pulling in future cables. The pulling tape/rope shall be manufactured from unstarched polyester & coated with silicone, have a thickness of 1.0mm (± 0.2 mm) x width 16mm (± 1.0 mm) and have a breaking strain of 800kg, similar or equivalent to Optex Pull Tape.

All sleeves shall be laid in at a minimum depth of 600mm below final levels. Slow bends approved by the Engineer shall be used where sleeves enter buildings.

7. NOTICES AND FEES

The Electrical Subcontractor shall liaise, issue all notices and make the necessary arrangements with the Supply Authority for power connection.

The Electrical Subcontractor shall give all notices required and pay all necessary fees which may be due to the relevant authorities.

8. EXISTING SERVICES

The Electrical Subcontractor shall be held responsible for damage to any existing services shown on the drawings and/or brought to his attention by the relevant authorities, Engineer, Client, Principal Agent or any other member of the professional team. The repairs to such the damaged services will be to the Electrical Subcontractor's account.

To avoid damaging existing services and existing services that cannot be identified and indicated to Electrical Subcontractor, the Electrical Subcontractor shall supply and use detection equipment for the location of existing services.

9. QUALITY OF MATERIALS

Materials are to comply with the relevant South African National Standards (SANS), or to IEC specifications, where no SANS specifications exist. All materials used shall bear the SABS mark of approval as applicable.

All materials must be of South African manufacture unless this is not possible.

10. BALANCING OF LOAD

The Electrical Subcontractor is required to balance the load as **equally** as possible over the multiphase supply during the construction period of the Contract.

The Electrical Subcontractor is, then, to return to site at Final Completion to take current readings from all the distribution boards and balance the loads where necessary. This is to be done with the Engineer or the Engineer's Representative in attendance.

11. SUPERVISION

The work shall, at all times for the duration of the Contract, be carried out under the supervision of a skilled and competent representative of the Electrical Subcontractor, who will be able and be authorised to receive and carry out instructions on behalf of the Electrical Subcontractor. A sufficient number of workmen shall be employed at all times to ensure satisfactory progress of the work.

12. **WORKMANSHIP**

All inferior work shall, on indication by the Engineer, Client, Principal Agent or any other member of the professional team, be **immediately** removed and rectified by and at the expense of Electrical Subcontractor.

13. **SUPPLY OF MATERIAL**

The Client reserves the right to supply material, tools or equipment to the Electrical Subcontractor for installation. The Electrical Subcontractor must arrange for taking delivery of and providing safe storage for such materials, tools or equipment and he/she will be held responsible for any and all damages to or loss of such materials, tools or equipment while they are in custody of the Electrical Subcontractor. The Electrical Subcontractor will submit the installation rate of such materials, tools or equipment to the Engineer or Engineer's Representative if not included in the priced Bills of Quantities.

14. **SAMPLES AND DRAWINGS**

- 14.1 The Electrical Subcontractor is required to submit for vetting, approval, comment or records, samples of materials upon which the Electrical Subcontractor's offer is based prior to installation. Any approvals given or comments made shall be on the generality of the scheme and shall not relieve the Electrical Subcontractor of his responsibility to ensure full compliance with all performance, regulatory criteria and latent defects experienced.
- 14.2 Samples forwarded shall remain in the site stores until completion of the Works. The samples will be the last items to be embodied within the installation.
- 14.3 All expenses in connection with the supply and return of the samples shall be borne by the Electrical Subcontractor.

15. **SWITCHES AND SOCKET OUTLETS (SSO)**

15.1 **General**

Covers shall be of at least 1mm thickness and to be manufactured in accordance with, but not limited SANS 1084 and SANS 164 – 1, 2 & 3 and any other gazetted legislation. The Electrical Subcontractor may submit equivalent alternatives to the Engineer for approval.

Light switches and switched socket outlets plates must be provided with earth studs and all light switch boxes shall be connected to the earth conductor.

For uniformity only one make must be installed.

15.2 **Light Switches and Occupancy Sensors**

Light switches shall be of 250 Volts grade and comply with, but not limited to SANS 1085 as amended and bear SABS mark. Light switches shall be rated at 16 Amperes.

Switches which shall be of the single pole, rocker operated type, flush mounted in 100mm x 50mm x 50mm galvanised boxes.

Light switches exposed to the weather must be of an approved watertight type.

Multi-gang switches are to be used where more than one light switch is indicated on the drawing.

Occupancy Sensors Features:

- o Self-adjusting ultrasonic [US] and passive,
- o Infrared [PIR] sensitivity,
- o Self-adjusting timer,
- o Automatic false-on/false-off corrections,
- o Natural light override range: 100 – 5000 LUX,
- o Casing must be rugged, high impact, injection-moulded,
- o Plastic KJAB ABS Cicolac (UL-954VA) flame class,
- o Rating UV inhibitors, impact resistant lens and
- o 152.4mm long colour-coded leads

15.3 **Socket Outlets**

Switched socket outlets shall comply with SANS 1085 as amended and be rated at 16 Amperes, 250 Volts unless otherwise specified.

Flush mounted standard switched socket outlets shall be of the 16Amp 3-pin shuttered base type, with SANS 164-2 (ZA/Euro plug) 16Amp 3-pin + earth module and bear SABS mark.

Socket outlets indicated on walls shall be existing flush mounted 100mm x 100mm x 50mm galvanised boxes.

All surfaces mounted switched socket outlets to be in 100 x 100 x 50 extension outlet boxes mounted on the wall surfaces; colours of outlet boxes and cover plates to match.

The powerskirting mounted standard switched shall be of the 16Amp 3-pin shuttered base type, with SANS 164-2 IEC 16Amp 3-pin + earth, ~~including the 3Amp USB module~~. All switched socket outlets mounted in powerskirting to have matching cover plates.

Further details of these outlets are listed in the Switch, SSO and Isolator Schedule.

The Electrical Subcontractor will be responsible for the installation of power points to feed equipment such as water heaters, air-conditioners, fans, security equipment, etc. This equipment, if supplied and installed by others, will be connected by the Electrical Subcontractor.

The cover plates to all outlets shall be fixed **AFTER** the final coat of paint has been applied. The Electrical Subcontractor shall allow for this in his programme and pricing of the Works.

15.4 **Labelling**

All light switches and switched socket outlets shall be permanently labelled with a circuit number e.g.:

- Dn/m
- Pn/m
- Ln/m

Where D = Dedicated Power circuit
 P = Power circuit
 L = Light circuit
 n = circuit number (1, 2, 3, etc.)
 m = component number in the circuit

16. **LUMINAIRES AND LAMPS**

All luminaires to be supplied by the Electrical Subcontractor shall have the approval of the Engineer or Engineer’s Representative. Luminaires must be of the type specified in the Schedule of Light Fittings.

16.1 Luminaires

The Electrical Subcontractor shall supply luminaires complete with lamps in separate boxes. All fluorescent and CFL luminaires shall have class A2 electronic ballasts.

All internal and external luminaires shall have LED modules and drivers. All LED luminaire drivers shall conform to SANS/IEC/EN standards.

16.2 Installation

The installation and mounting of luminaires must conform to the manufacture's specification that must be obtained by the Electrical Subcontractor.

The Electrical Subcontractor is to note that in the case of board and acoustic tile ceilings i.e., as opposed to concrete slabs, close co-operation with the Principal Contractor is necessary to ensure that as far as possible luminaires are symmetrically positioned with regard to the ceiling pattern. The lay-out of the luminaires as indicated on the drawings must be adhered to as far as possible, and where this is not possible due to partitioning, etc., the Engineer's, Client's, Principal Agent's or any other member of the professional's decision must be sought.

Fluorescent and/or channel type luminaires installed against concrete ceilings shall be screwed to the outlet boxes and in addition 2 x 6mm expansion or other approved type fixing bolts are to be provided. The bolts are to be 3/4 of the length of the luminaires apart.

Fluorescent and/or channel type luminaires to be mounted on board ceilings shall be fixed onto wooden brandering and where necessary, additional brandering must be provided for this purpose. The fixing screws are to be placed 3/4 of the length of the fitting apart. Earth conductors must be drawn in with the circuit wiring and connected to the earthing terminal of all fluorescent luminaires as well as other luminaires exposed to the weather.

Bulkhead luminaires are to be screwed directly to the concrete and brick work with approved expansion type of fixing plugs and round head screws. Against board ceilings luminaires shall be secured to the brandering or joists by means of two 40mm x No. 8 round head screws.

16.3 Lamps

Lamps to be supplied with luminaires must be from manufacturers listed below. Any other similar lamps may be submitted for approval:

➤ Wotan, Osram, Phillips, GEC and GE

16.4 Electronic Ballasts and L.E.D Drivers

Class A2 electronic ballasts and L.E.D drivers to be supplied with luminaires must be from manufacturers listed below. Any other similar lamps may be submitted for approval:

- Tridonic
- Vossloh Schwabe
- Osram
- Phillips
- Mean Well

NOTE: No-name brands and brands of dubious quality and origin are not acceptable.





17. SCHEDULE OF LIGHT FITTINGS



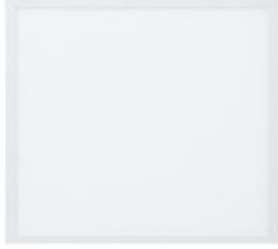

Luminaires and accessories are to be according to this Specification and shall be approved by the Engineer. As a minimum requirement, all luminaires to be installed in this contract shall bear the bear a SABS or IEC mark of quality approval including their components




All luminaires to



- Have Tridonic LED module and driver with dimmable option with 3m cable with 6A plug and 5-year Warranty
- LED luminaires to be 4000K (Neutral White) with Ra of not less than 80
- Life cycle: 60000 hours lifetime @ Tq 25°C minimum and L70 derating, 80 or more colour rendering index (CRI > 80).
- Surge protection device: 5kV/5kA (this will depend on the location, for indoor it is usually between 5kV/5kA and 10kV/10KA and for outdoor is 20kV/20kA)
- Insulation classification: Class 1
- Driver shall comply with IEC 61347-1 & IEC 61347-2-B as applicable and shall be suitable for operation on 230V +/- 10% 50Hz single phase system and it must be insured that harmonics filter is provided as per SANS 61000-3-2. The driver and LED circuitry shall be protected against lightning and power surges. The suitable surge arrestor with 10kA rating shall be provided for indoor installations and 20kA for outdoor installations.
- The driver should be 198 – 277V tolerance.
- Driver – Built-in driver must have 5-year guarantee.
- Luminaires shall be suitable for operation with Mid Power LED's. Note: NO LED TUBES are allowed to be used.
- Power factor capacitors shall be shall be supplied to correct the power factor to at least 0.95 or higher.
- THERMAL: the luminaire must be able to withstand an ambient temperature of 35°C Storage temperature of the luminaire should be able to handle - 40°C <T<60°C. To this end internal electrical and mechanical components shall not be allowed to exceed their maximum temperature ratings of 75°C. Test report from an independent authorized testing facility proving this requirement shall be made available to the client on request.

Noise: Due to the sensitive environment in which the luminaire is used, the noise level emitted from the luminaire shall be kept as low as possible. Drivers/electronic components shall, therefore, comply fully with the requirements of the latest edition of SANS 55015.

Type	Description	Picture of Luminaire
A	41W LED linear channel type luminaire, 1500mm in length, manufactured in black polymethyl methacrylate (PMMA) body, housing CRI:80 4000 Kelvin low voltage LED Samsung Zhaga Boards (6904lm nominal flux), IP44 rated, surface mounted, including mounting clips, onto ceiling with opal diffuser & integrated driver.	
AE	Same as above, but with 1-hour <u>lithium</u> battery back-up.	
B	100W LED linear channel type luminaire, 2800mm in length, manufactured in black polymethyl methacrylate (PMMA) body, housing CRI:80 4000 Kelvin low voltage LED Samsung Zhaga Boards (17622lm nominal flux), IP44 rated, suspended (mounted onto P2000 galvanised trunking) at 4600mm above finished floor level (to include suspension kit) with opal diffuser & integrated driver.	
BE	Same as above, but with 1-hour <u>lithium</u> battery back-up.	
EX	15W LED Surface mounted or ceiling suspended single-sided maintained emergency exit sign with an EXIT decal. With one hour maintained emergency lighting.	
G	100W LED channel type luminaire, 2800mm in length, manufactured in black polymethyl methacrylate (PMMA) body, housing CRI:80 4000 Kelvin low voltage LED Samsung Zhaga Boards (17622lm nominal flux), <u>IP65 rated</u> , suspended (mounted onto P2000 galvanised trunking) under canopy (to include suspension kit) with opal diffuser & integrated driver.	
GE	Same as above, but with 1-hour <u>lithium</u> battery back-up.	

G1	35W LED channel type luminaire, 1150mm in length, manufactured in black polymethyl methacrylate (PMMA) body, housing CRI:80 4000 Kelvin low voltage	
	LED Samsung Zhaga Boards (5609lm nominal flux), <u>IP65 rated</u> , surface mounted, including mounting clips, onto ceiling, with opal diffuser & integrated driver.	
G1E	Same as above, but with 1-hour <u>lithium</u> battery back-up.	
G2	47W LED channel type luminaire, 1150mm in length, manufactured in black polymethyl methacrylate (PMMA) body, housing CRI:80 4000 Kelvin low voltage LED Samsung Zhaga Boards (7145lm nominal flux), <u>IP65 rated</u> , surface mounted, including mounting clip, onto ceiling, with opal diffuser & integrated driver.	
G2E	Same as above, but with 1-hour <u>lithium</u> battery back-up.	
HS	40W LED <u>surface</u> mounted 600mm x 600mm backlit luminaire (4656lm nominal flux), with 1.5kV surge protected driver, body made from matt white epoxy powder coated finish, seamless aluminium extruded frame. High colour rendering index CRI>80, UGR: <22; <19(4Hx8H,8Hx4H), colour temperature 4000k, ambient temperature -20°C - +30°C, opal diffuser & 5Amp plug top.	
HSE	Same as above, but with 1-hour <u>lithium</u> battery back-up.	
JS	40W LED <u>recessed</u> mounted 600mm x 600mm backlit luminaire (4656lm nominal flux), with 1.5kV surge protected driver, body made from matt white epoxy powder coated finish, seamless aluminium extruded frame. High colour rendering index CRI>80, UGR: <22; <19(4Hx8H,8Hx4H), colour temperature 4000k, ambient temperature -20°C - +30°C, opal diffuser & 5Amp plug top.	
JSE	Same as above, but with 1-hour <u>lithium</u> battery back-up.	

L	<p>15W LED outdoor decorative wall mounted bulkhead (2456lm nominal flux), LM6 die cast aluminium base, opal UV stabilised non-discolouring high impact acrylic injection moulded diffuser, captive washers, stainless steel Allen key screws, the diffuser must be permanently sealed to the aluminium base and must be supplied with a 600mm cable supply lead, mains connections must be by means of a suitable screw terminal block with a wire clamping contact, the trim ring casting is manufactured from high-pressure die-cast aluminium and is finished in a special multi-stage epoxy powder surface coating IP65 rating</p>	
LE	<p>Same as above, but with 1-hour <u>lithium</u> battery back-up.</p>	
P	<p>124W LED 48 LED natural white wall mounted luminaire, with 3 compartment design; 1-Optical compartment with LED engine, 2-Gear compartment & 3-A spigot compartment. Both optical & gear compartments are to be rated IP66. Housing to be of marine grade aluminium with high impact glass or polycarbonate. LED engine to consist of the LED light source & the power supply which can be easily replaced or upgraded (Futureproof). The power supply is to automatically disengage when opening the luminaire. Luminaire is to be supplied with an electronic trip connector protector with surge protection 6kV & additional removable inline 10kV surge protection device.</p>	
P1	<p>50W LED slim aluminium floodlight with IP65 rating, captive stainless steel M5 Allen head screws and including an integrated surge protection, to be wall or floor mounted (electrical contractor to price in for constructing a small concrete plinth & stainless-steel cage to protect the floor mounted floodlight).</p>	

R1	15W LED Surface mounted or ceiling suspended one directional and one-sided emergency sign with a RUNNING MAN decal. With one hour <u>lithium</u> battery maintained emergency lighting.	
R2	Same as above, but ceiling suspended, double-sided emergency sign	
ZD	20W LED white recessed slim backlit flicker free downlighter luminaire, powder coated aluminium extruded body, and black anodised aluminium extruded heatsink, opal diffuser (120° beam), small colour tolerance (Mac Adams 3 SDMC) and including an integrated surge protection.	

18. EARTHING AND BONDING

18.1 General

Earthing shall generally be in accordance with, but not limited to:

- (i) SANS 10142-1: Wiring Code,
- (ii) SANS 10198: Part 3 - Earthing System; General Provision
- (iii) Part 12 - Installation of Earthing Systems
- (iv) SANS 1063: Earth Rods Couplers and Clamps
- (v) AMEU Code of Practice for the application of protective multiple earthing to low voltage distribution systems and (vi) The OHS Act 85 of 1993.

18.2 Trench Earthing

- (i) The trench earth shall be laid alongside and not above cables.
- (ii) All connections shall be by means of crimped lugs and bolted connections.

18.3 Earth Terminal

A readily accessible earthing terminal shall be provided, near the trap door in the ceiling, for the bonding of other services such as a telephone, an audio system, a video, and the like, to the building. Such an earthing terminal shall be bonded to the consumer's earth terminal in the main distribution board by a conductor of at least 6mm² copper or equivalent, and shall be identified by the earth symbol.

NOTE: Providers of services other than the electrical power services should not access the distribution board or other parts of the electrical installation.

19 LIGHTNING PROTECTION SYSTEM

The Electrical Subcontractor shall be responsible for the employment of an accredited specialist subcontractor to design, supply and install the lightning protection system (LPS). A provisional sum has been allowed for in the Bill of Quantities for the lightning protection system. The Electrical Subcontractor will be instructed to obtain quotations from specialist LPS subcontractors who will submit their quotation accompanied by the full analysis and design of the LPS system as directed below.

NOTE: No quotes will be considered without this full analysis and design of the LPS system.

This specialist shall conduct a full survey of the buildings to be protected in order to evaluate the type of lightning protection system to be implemented. This survey must be conducted in accordance with the latest following SANS codes of practice:

- (vii) SANS 10313: Protection against lightning – Physical damage to structures & life hazard.
- (viii) SANS 62305-1: General Principals. (ix) SANS 62305-2: Risk management. (x) SANS 62305-3: Physical damage to structures & life hazard.
- (xi) SANS 62305-4: Electrical & electronic systems within structures.
- (xii) SANS 1063: Earth rods, couplers & connections.
- (xiii) SANS 10199: The design & installation of earth electrodes.

The LPS specialist shall provide a risk analysis spread sheet to conclude the buildings classification. The risk analysis shall take into account the following criteria.

- 19.1 **Type of structure:**
- (i) Construction of walls.
 - (ii) Roof construction.
 - (iii) Roof covering.
 - (iv) Equipment on the roof.
- 19.2 **Contents of the structure:** (i)
Risk of panic.
- (ii) Kind of contents.
 - (iii) Value of contents.
 - (iv) Measures for reduction of damage.
- 19.3 **Consequential losses:**
- (i) Danger to the environment.
 - (ii) Loss of services to the public.
 - (iii) Other consequential losses.

Based on the above results and in conjunction with location and accepted annual frequency of lightning flashes the required protection level must be established. The design methodology (Protective Angle, Grid or Rolling Sphere) used for the system must be stated and it must be shown with the use of drawings that the building / structure falls within the shielding offered by the LPS.

The LPS specialist shall also provide drawings to indicate the positions of the air termination system and down conductors. Where applicable the down conductors are to be installed in down pipes. Each down conductor should be bonded to the air termination system and be terminated to a 1 800mm copper earth spike in the ground.

The issue of a Certificate of Compliance for the Lightning Protection Systems is compulsory on completion of the installation.

20 MOUNTING HEIGHTS

Unless indicated differently on drawings all boxes must be mounted as follows: (Measurements to be taken from the finished floor level to underside of a box).

Wall switches, general	: 1 000mm
Switched socket outlets	: 450mm
(") above worktop	: 300mm
Outside wall outlets for luminaires	: 2 200mm (Bulkheads) or 3800mm (Floodlights)
Stove isolators and pushbuttons	: 1 200mm
On-tap hot water dispenser isolators	: 2 000mm

21 WIRING

Lighting and Power wiring in conduit and channel wireways shall comprise 600/1000V single core PVC insulated copper wire sized in accordance with the distribution board schematics.

Conductor outer sheaths shall be of the following colours:-

- Phase Conductors : red, white, blue
- Neutral : black
- Earth : green or yellow/green

Conductors shall not be drawn into conduit until the conduit installation has been completed and all conduit ends are provided with bushes, dried out and cleaned, etc.

The loop-in system shall be followed through out, and no joints of any description will be permitted.

The earth wire must be continuous and can be common in the same conduit.

If cut, the earth wire must be ferruled with a spigot type ferrule.

The following sizes of PVC insulated stranded copper conductors must be used:

- (i) Light fittings : 1,5 or 2,5mm²
- (ii) Socket outlets : 2,5mm²
- (iii) Mechanical equipment isolators : 4mm²
- (iv) Solar water heaters isolators : 4mm²

Bare copper earth continuity conductor must be drawn into wireways with the "live" conductors and connected to the earth pin of the socket outlet and earth terminal block at the respective Switch Board.

22 WIREWAYS

22.1 Wiring Channels

Wiring channels, wherever indicated on the drawings, shall be medium duty and shall be complete with corner pieces, end pieces, junction pieces, supply conduits and cover plates as specified and indicated on the drawings. **Note that Nylon or plastic nuts or fasteners will not be accepted.**

The channels shall be manufactured of rolled sheet steel and hot-dip galvanised to SANS 763.

Channels shall be cold galvanised at all joints, sections that have been cut and at places where the galvanising has been damaged.

22.2 Conduit and Conduit Accessories

Unless indicated differently on the drawings conduit and conduit accessories shall be PVC to SANS 950.

Draw-boxes and bonding trays are to be provided in accordance with the "Wiring Code" and wherever necessary to facilitate easy wiring. Draw boxes are not measured separately in the Bill of Quantities. The Electrical Subcontractor must therefore include the cost of draw boxes and bonding trays in the conduit rates.

22.2.1 Installation

A maximum of 2 plug circuits or 3 light circuits per 20mm diameter conduits will be permitted. Therefore, before conduit installation care must be taken to work out from the construction drawings the number of circuits required in any section.

23 MEASUREMENT OF QUANTITIES

For construction and installations, the Electrical Subcontractor shall take quantities from the latest available revised construction drawings and physically measure cable routes on site before ordering.

Quantities in the Bills of Quantities must not be used for ordering.

24 LV DISTRIBUTION BOARDS

Distribution boards must be manufactured and wired by a specialist distribution board manufacturer who is a member of the Electrical Contractor Association (ECA). Readymade boards purchased from hardware shops and wholesalers and wired by the contractor are not acceptable.

24.1 Distribution Boards Layout

- (i) The layout shall be such that three-phase and single-phase sections are mechanically and electrically separated.
Single phase sections of three phase boards shall be arranged in three horizontal parallel rows, directly above on another and in the phase sequence L1 - L2 - L3 from top to bottom.
- (ii) Lighting and power circuits shall be separated by a dummy space and along the horizontal rows. Extra space for future circuits shall be allowed for at the right-hand side of each lighting and power row, in the ratio of **one** spare space for each **four** lighting or power circuit installed (**30%**). A minimum of **one** space shall be allowed to each lighting and power row. Dummy covers are to be provided over spare spaces. Similar provision for future circuits shall be made on the bus-bars, neutral and earth bars.
- (iii) Any part of the distribution board metal work shall be electrically continuous and a suitable stud shall be provided for the earthing of the enclosure.
- (iv) An earth bar must be provided in the bottom of the distribution boards for the connection of earth conductors for other services.

24.2 Marking and Labelling

- (i) The distribution boards shall be fitted with identification labels engraved with the reference logos indicated on the wiring diagrams. The labels shall be affixed to the front of the panels or in a similar prominent position, by drive screws or other approved method.

DB's label shall indicate the following information:

- **DB name e.g., "SDB-G"**
- **Where it is fed from, the cable and Earthwire sizes e.g., "Fed from MDB-G with 35mm² 4-core SWA ECC cable"**

- (ii) Each individual item of equipment installed in the panels shall be identified by a label engraved with the corresponding diagram reference.

Note: Self-adhesive tape labels, such as Brother™ labelling machines will not be considered suitable for this purpose.

- (iii) Each wiring termination of contactors, timers, shunt trip coils, etc. shall be fitted with a concentric wire marker marked with unique numbers and indicated on the DB as-built schematic diagram. Clip-on and stick-on cable markers will not be considered suitable for this purpose.
- (iv) Where an outgoing terminal block is provided, each individual terminal shall be marked with unique numbers and indicated on the DB as-built schematic diagram.
- (v) Purpose made labels shall describe the various sections or functions of the panels, to facilitate the identification of the equipment and relate it to the diagrams.

24.3 Drawing Pocket

Each distribution board must be provided with **A4 size pockets**, fixed on the inside of the doors to store two A1 size drawings which will be folded into A4 size.

24.4 Equipment

Unless otherwise stated on the drawings, the following minimum specification shall be assumed for equipment to be installed in the panels: -

Moulded Case Breakers (MCB)	SABS Class 15 kA
Miniature Circuit Breaker (mccb)	SABS Class 6 kA

24.5 Shop Drawings

Prior to manufacture the Electrical Contractor will be required to submit to the Engineer for approval, factory shop drawings for each distribution board. **No request for relaxation of this requirement shall be entertained.** The drawings must, at least, indicate the following information:

- Outside distribution dimensions,
- Notes giving detailed description of components and equipment in each board,
- General arrangement of installed equipment,
- Schematic wiring diagrams with fault levels,
- List of equipment to be installed; details to include rating, make and type number,
- Distribution board labels,
- Circuit breaker and isolator label names, as per schematic diagram,
- Project name,
- Drawings number,
- Size of legend card slot.

25 INSTALLATION GUARANTEE

The whole installation shall be guaranteed for the period stated in Contractor Data from the date of Practical Completion.

26 PRATICAL COMPLETION

Practical completion shall take place **only** after the whole installation has been accepted by the Engineer and;

- (a) All damage that may have been done by the Electrical Contractor or any other parties in the process of the installation has been repaired and made good.
- (b) All tests of the general building's electrical installation have been done and tests results have been submitted to the Engineer or Engineer's Representative.
- (c) The completed Certificate of Compliance for Electrical installation have been submitted to the Engineer or Engineer's Representative.

- (d) The completed Certificate of Compliance for Lightning Protection System installation have been submitted to the Engineer or Engineer's Representative.
- (e) All equipment guarantees, if any, have been submitted to the Engineer or Engineer's Representative.
- (f) Correct As-Built drawings have been submitted and accepted by the Engineer or Engineer's Representative.
- (g) The building has been cleared of all debris and electrical waste materials and left in a neat and tidy condition.
- (h) All three phases have been balanced and witnessed by the Engineer or Engineer's Representative. This may require the Electrical Contractor to return to site when the building is occupied to take current measurements and rebalance phases.

27 FINAL COMPLETION

Final Completion shall be taken on expiration of the maintenance period which is stated in the Contract Data calculated from the date of taking the Practical Completion.

The final payment will not be approved without the submission of all the above information under heading 26 and accepted by the Engineer.

28 CABLE TRENCHES

Prior to payment of final retention monies, all cable trenches shall be checked for settling and repaired as necessary.

29 TENDER DRAWINGS

The following tender drawings are attached to this document

Drawing No.	Title	Size
1. 2318-T-E-101-S08	Site 08 – Lighting Layout	A3
2. 2318-T-E-102-S08	Site 08 – Power Layout	A3
3. 2318-T-E-301-S08	MDB-S08 DB Schematic Diagram	A3
4. 2318-T-E-101-S12	Site 12 – Lighting Layout	A3
5. 2318-T-E-102-S12	Site 12 – Power Layout	A3
6. 2318-T-E-301-S12	MDB-S12 & SDB-S12 DB Schematic Diagrams	A3
7. 2318-T-E-101-S21	Site 21 – Lighting Layout	A3
8. 2318-T-E-102-S21	Site 21 – Power Layout	A3
9. 2318-T-E-301-S21	MDB-S21, SDB-S21 & SDB-GH DB Schematic Diagrams	A3
10. 2318-T-E-400	Typical Electrical Details	A3

Section 2 – Returnable Schedules

RETURNABLE SCHEDULES

TABLE OF CONTENTS

ITEM No.	DESCRIPTION
2.1	Registration as an Electrical Contractor
2.2	Details of Installation Electrician
2.3	Schedule of Material & Equipment Offered
2.4	Schedule of Electrical Subcontractor's Testing Equipment

2.1 REGISTRATION AS AN ELECTRICAL CONTRACTOR

The Tenderer must employ an Electrical Subcontractor registered with the Electrical Contracting Board of South Africa and must also be registered with the Workmen's Compensation Commissioner and the Unemployment Insurance Commissioner.

Tenderers must complete the following questionnaire and submit it with this tender.

- a) Has the Electrical Subcontractor been registered with the Electrical Contracting Board of South Africa YES/NO

Registration No:

Date of issue:

- b) Has the Electrical Subcontractor been registered with the Department of Manpower?

- i) Registered for Workmen's Compensation for Occupational Injuries and Diseases Act YES/NO

Registration No:

Date of issue:

- ii) The Unemployment Insurance Commissioner YES/NO

Registration No :

Date of issue:

I/We certify that the above information is correct

Signature:

Name of Signatory:

Name of Firm Represented:

Address:

.....

.....

Date:

NOTE: **IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT ELECTRICAL INSTALLATIONS REGULATIONS FAILURE TO COMPLY WITH THIS CLAUSE OF THE SPECIFICATION MAY RESULT IN DISQUALIFICATION AND REJECTION OF THE TENDER.**

2.2 DETAILS OF INSTALLATION ELECTRICIAN

I/We certify that is a registered installation electrician in terms of the Occupational Health and Safety Act (Act 85 1994) and is permanently employed by my/our company trading as:

.....
.....

I/We further certify that the abovementioned person will be appointed as the responsible person in charge of the installation, which person shall personally supervise the whole of the electrical works as tendered for from inception to completion inclusive of signing all commencement/completion/ cost certificates necessary as part of the Works.

I/We further certify that I/We am/are fully aware of the provisions of the Occupational Health and Safety Act (Act 85 1994), and that my/our company is trading as a registered electrical contracting organisation.

SIGNATURE OF TENDERER	SIGNATURE OF INSTALLATION ELECTRICIAN
REGISTRATION NUMBER OF INSTALLATION ELECTRICIAN	DATE
COMPANY STAMP			

NOTE **It is an offence to employ a registered single-phase installation electrician on a poly-phase installation and it may be necessary to submit a certified copy of the licence of the person to be employed on any poly-phase project.**

2.3 SCHEDULE OF MATERIALS & EQUIPMENT OFFERED – Electrical Installation

The Electrical Subcontractor shall complete the following schedule of materials and equipment offered at tender stage and undertake that the actual materials and equipment installed shall be in accordance with this schedule. Unless the equivalent is no longer available, previously offered equipment shall be binding. Where previously offered equipment or where the equipment specification has changed, the Electrical Subcontractor may indicate an alternative offer that must conform to the specifications.

The Electrical Subcontractor is to take note that if the material offered is not to specification, this may not be accepted by the Engineer. **NB : Only one manufacturer's name to be inserted for each item.**

Col.	1	2	3	4	5	6
Item No.	Item	Make or Trade Name	Model No. or I.D.	Material to Spec? (Give details if not)	SABS Mark Y/N	Country of Origin
1.0	Distribution Boards					
1.1	Switchgear utilised					
2.0	Make of Switches & Accessories					
2.1	Light switches					
2.2	Photocell					
2.3	Switch socket outlets					
2.4	Isolators					
2.5	MCB's					
2.6	Circuit breakers 1P, 2P, 3P					
2.7	On load isolators without trips					
2.8	Contactors 1P, 2P, 3P					

2.9	Earth leakage units					
2.10	Powerskirting					
2.11	Switched Socket Outlets					

Col.	1	2	3	4	5	6
Item No.	Item	Make or Trade Name	Model No. or I.D.	Material to Spec? (Give details if not)	SABS Mark Y/N	Country of Origin
4.0	Wiring Channel					
4.1	Manufacturer					
4.2	Model No.					
5.0	Luminaires					
5.1	Type A					
5.2	Type AE					
5.3	Type B					
5.4	Type BE					
5.5	Type EX					
5.6	Type G					
5.7	Type GE					
5.8	Type G1					
5.9	Type G1E					
5.10	Type G2					
5.11	Type G2E					

5.12	Type HS					
5.13	Type HSE					
5.14	Type JS					
5.15	Type JSE					
5.16	Type L					
5.17	Type LE					
5.18	Type P					
5.19	Type R1					
5.20	Type R2					
Col.	1	2	3	4	5	6
Item No.	Item	Make or Trade Name	Model No. or I.D.	Material to Spec? (Give details if not)	SABS Mark Y/N	Country of Origin
5.21	Type ZD					

NOTE: Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

.....
NAME OF TENDERER

.....
TENDERER'S SIGNATURE

.....
DATE

Section 3 – Pricing Schedules

PRICING SCHEDULES & BILLS OF QUANTITIES

TABLE OF CONTENTS

Clause	DESCRIPTION
3.1	Pricing Instructions

3.1 PRICING INSTRUCTIONS

- 1 These Bills of Quantities contain pages numbered in the consecutive order. The Electrical Subcontractor is required to check the numbers of pages and should any page be found to be missing, or in duplicate, or if any reproduction is indistinct, or if any ambiguity arises as to the meaning of any item or description, or if these Bills of Quantities contain any obvious errors, then the Electrical Subcontractor must immediately inform the Electrical Engineer and have the same rectified or explained, as the case may be. No claim will afterwards be considered where the Electrical Subcontractor has failed to comply with these instructions.
- 2 The units of measurement described in the Bills of Quantities are metric units. Abbreviations used in these Bills of Quantities are as follows:

 % = percent
 h = hour
 km = kilometre
 kW = kilowatt
 mm = millimetre
 m = metre
 m² = square metre
 m³ = cubic metre
 No. = number
 Prov sum = Provisional sum
 R/only = Rate only
 Sum = lump sum
 W/day = Work Day
- 3 Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.
- 4 The prices and rates in these Bills of Quantities are fully inclusive prices for the work described under the items. Such prices and rates cover all costs and expenses that may be required in and for the execution of the work described in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices will be used as a basis for assessment of payment for additional work that may have to be carried out.
- 5 It will be assumed that prices included in these Bills of Quantities 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)
- 6 Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items
- 7 An item against which no price is entered will be considered to be covered by the other prices or rates in the Bills of Quantities. A single lump sum will apply should a number of items be grouped together for pricing purposes.
- 8 The quantities set out in these Bills of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Bills of Quantities.
- 9 Reasonable compensation will be received where no pay item appears in respect of work required in the Bills of Quantities in terms of the Contract and which is not covered in any other pay item.

- 10 The short descriptions of the items of payment given in these Bills of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.
- 11 Those parts of the contract to be constructed using labour-intensive methods have been marked in the Bills of Quantities with the letters LI in a separate column filled in against every item so designated. The works, or parts of the works so designated are to be constructed using labour-intensive methods only. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters LI are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labourintensive specification in the Scope of Works.
- 12 Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labourintensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.
- 13 The responsibility for the accuracy of the Bills of Quantities written into the Bills of quantities remains with the person who prepared the Bills of Quantities. The Electrical Subcontractor shall be relieved of responsibility of measuring quantities at the tender stage, and the Electrical Subcontractor's sum submitted shall be in respect of the quantities set out in the Bills of Quantities, although he will be required to make his assessment of items such as brackets, fixing, etc., from details stated in the Bills of Quantities and shall include in the item prices for such small installation materials as are required for the complete installation in accordance with the Specification.
- 14 The Bills of Quantities are not to be used for ordering purposes. Any orders placed by the Contractor on the basis of these Bills of Quantities shall be at his own risk.

The quantities given in the Bills of Quantities for cables, cable markers, earth wire laid with cable and excavations cannot be regarded as exact and are subject to measurement on site after completion of the service and adjustments will be made according to the unit rates given in the Bills of Quantities.

Notwithstanding the fact that the lengths of cables as given in the Bills of Quantities have been measured from scaled drawings, the contractor shall check such lengths on site before ordering the cable, as he will not be paid for excess cable after the completion of the service. Any allowance for off-cuts shall be made in the unit rates. The final measurements shall be based on the net route length of the cables concerned.

- 15 All items described as "Provisional" shall be measured as executed and paid for according to prices in the Bills of Quantities and any unexpended amounts shall be deducted from the amount of the contract sum. No work for which "Provisional" items are provided shall be commenced without written instructions from the Engineer.
- 16 Materials encountered in the excavations for cable trenches, lighting standard and bollard holes generally shall, unless special provision to the contrary is made hereinafter, be classified as follows:-
 - a) 'Hard rock' shall mean any excavation requiring the use of explosives.
 - b) 'Soft rock' shall mean any excavation which necessitates the use of pneumatic tools.
 - c) 'Ordinary material' shall mean all pickable material.

In the event of any dispute regarding the classification of material, the Engineer's decision in this connection shall be final.

Should the Contractor consider that any material encountered in the excavations is 'hard rock' or 'soft rock', he shall immediately notify the Electrical Engineer in writing. Failing such notification, the excavation shall be assumed to be in 'ordinary material' and shall be measured and valued accordingly. Wherever practicable all excavation in ground other than 'hard rock' and/or 'soft rock' shall be carried out first after which levels will be taken of the exposed 'hard rock' and/or 'soft rock' and agreed upon by the

Electrical Engineer and the Electrical Subcontractor.

Where the Electrical Subcontractor encounters a combination of 'hard rock' and/or 'soft rock' simultaneously in a section of trench and employs explosives or pneumatic tools to remove all the various types of materials in that section of trench, the use of these methods of removal will in no way influence the Electrical Engineer's classification of the materials.

Section 4 – Pictures



Change or Direction Cable Route Marker Straight Run Cable Route Marker



Outdoor Cable Box



Cable Numbering



Distribution Board type



DB and Kiosk Labelling

C3.4 MECHANICAL SPECIFICATION

SITE 08

VOLUME 2.1 PART 1: FIRE PROTECTION EQUIPMENT - 1 SCOPE OF WORKS

FIRE PROTECTION EQUIPMENT INSTALLATIONS

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.

2. THE CONTRACT

2.1 FIRE PROTECTION EQUIPMENT INSTALLATIONS

The work to be carried out and commissioned by a SAQCC Fire approved installer:

- a. Installation of new hose reel, hydrant and extinguisher equipment, as per SANS 10400 Section T & SANS 10252,
- b. Installation of new galvanised steel water reticulation,
- c. Testing and Commissioning, as per SANS 10400 Section T and SANS 10139,
- d. Manuals, Drawings, OEM Literature,

2.2 Existing

All installations new. Building Existing.

2.3 Order of The Works

As per the building contractors' program of works.

SITE 08

VOLUME 2.1 PART 2: FIRE PROTECTION STANDARD SPECIFICATION

1.0 GENERAL

- 1.1 This standard specification applies to, and is to be read in conjunction with the particular technical specifications.
- 1.2 In so far as the conditions contained herein are at variance with anything contained in the particular specification, the contract shall be interpreted in terms of the particular specification for each particular service.
- 1.3 Equipment, materials and operational methods, shall comply with the relevant South African Bureau of Standards Specification or the British Standard Specification, wherever such specification exists, whether prescribed or not. Preference will be given to the latest issue of the SANS specification where both such specifications exist, unless otherwise prescribed in this or the particular specification.

2.0 OCCUPATIONAL HEALTH AND SAFETY ACT

- 2.1 All equipment supplied and installed under the contract shall meet the requirements of the Occupational Health and Safety Act (Act No 85 of 1994, (as amended) and all other relevant statutory requirements and the Contractor shall comply with the requirements laid down by the Inspector of Machinery under this Act.

3.0 DRAWINGS

- 3.1 The drawings issued with this specification do not purport to show the exact position, size or details of construction of equipment.
 - 3.2 Tenderers must satisfy themselves that the equipment offered by them can be accommodated in the available space and positioned in such a way that access for maintenance, repairs or removal is not obstructed.
 - 3.3 Drawings showing any alternative suggestions differing from the Engineer's design must be submitted with tenders.
 - 3.4 Within four weeks of signing of the contract (or date of order) the successful tenderer shall submit to the Engineer or his duly appointed representative the following working drawings:
 - 3.4.1 Plant room lay-out showing total operating mass of equipment and the positions and sizes of the water and drain connections required.
 - 3.4.2 Construction details of all items manufactured by the air conditioning and/or ventilation Contractor, such as air plenums, duct work, bases etc.
 - 3.4.3 Dimensions and positions of all holes through walls, slabs, etc., and any amendments to the sizes or positions of return grilles, louvred openings, etc., indicated on the Engineer's drawings.
 - 3.5 Approval by the Engineer of drawings submitted by the Contractor shall not relieve him of his liability to carry out the work in accordance with the requirements of the contract documents.
 - 3.6 Positions and sizes of return air grilles, louvred openings, openings through reinforced concrete beams and slabs, etc., as indicated on the drawings shall be adhered to as far as possible. Amendments will only be considered if absolutely unavoidable.
- #### 4.0 MANUFACTURER'S RATINGS
- 4.1 All equipment such as fans, compressors, cooling towers, pumps, etc., shall be operated well within the manufacturer's ratings. Equipment offered for use beyond these limits will not be considered.
 - 4.2 Tenderers must submit manufacturer's ratings of all equipment offered. Ratings shall be given in the SI system.

5.0 POWER, WATER AND DRAIN CONNECTIONS

- 5.1 Power, water and drain points in the plant rooms will be provided to a point by others.
- 5.2 All plumbing between equipment and water and drain points shall form part of the contract.

6.0 NOTICES

- 6.1 The Contractor shall supply and install all notices and warning signs that are required in terms of the Occupational Health and Safety Act, by local by-laws or regulations and by these documents. This includes notices prohibiting entry to un-authorized persons, etc.
- 6.2 A log-book and log-book stand must be provided for each plant room. This must take the form of an A5 size hard cover note book fixed by a light chain through the top left-hand corner to a writing surface.

7.0 WELDING

- 7.1 Welding shall be carried out in accordance with the current edition of SANS 044 Parts 1 to VII where applicable.
- 7.2 All welded fillet or butt joints shall be free from porosity, cavities and entrapped slag. Joints shall be ground smooth if required for aesthetic reasons only. If strength is required, they shall not be ground.
- 7.3 The joints in the weld run, where welding has been recommenced, shall be as smooth as possible and shall show no pronounced hump or crater in the weld surface.
- 7.4 The profile of the weld shall be uniform, of approximately equal leg length and free from overlap at the toe of the weld. Unless otherwise specified the surface shall be either flat or slightly convex in the case of fillet welds and with a reinforcement of not more than 3 mm in the case of butt welds.
- 7.5 The weld face shall be uniform in appearance throughout its length.
- 7.6 Filler metal electrodes shall be of an approved type for the material being used and shall be kept in a dry condition. All electrodes shall conform to SANS 455.
- 7.7 Only welders in possession of a valid approved competence certificate shall be employed.
- 7.8 When pipes are welded, tenderers must allow for pipe joints (where chosen by the Engineer's Representative) to be X-ray tested by the SANS or other approved body for sound welding at the Contractor's expense or for joints to be cut for examination purposes. After the removal of these joints, the piping must be made good by the Contractor. Should any of the welds prove unsatisfactory, the Contractor may be called upon, at his own expense, to have all welds examined by X-ray. The X-ray examination shall be carried out by the South African Bureau of Standards or other approved body.
- 7.9 All welds must show proper fusion.

8.0 GALVANISING

- 8.1 All hot dip galvanizing shall be carried out in accordance with SANS 934 and SANS 763 where applicable.
- 8.2 Mild steel plate and sections shall be of good commercial quality, or higher grades, best suited for galvanizing. The materials shall be free from slag or coarse laminations, fine fissures and rolled-in impurities.
- 8.3 Castings shall be sound, dense and clean, and free from distortion, porosity, carbon and slag enclosures, blow-holes, and other injurious conditions.
- 8.4 Welding flux shall be chipped away and all welds wire brushed before galvanizing.
- 8.5 The surfaces to be galvanised shall be free from paint, oil, grease, and similar impurities.
- 8.6 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanizing.

- 8.7 The Engineer shall have the right to inspect all steel components before galvanizing, and shall have the right to reject or ask for remedial treatment of any material which is considered to be unsuitable. This applies particularly to welds.
- 8.8 The galvanised coating shall be smooth, adherent, continuous and free from black spots or flux stains.
- 8.9 Globular extra-heavy deposits of zinc which interfere with the intended use of the material will not be acceptable. Excessively protuberant lumps and nodules shall be removed by hot wiping or by the skilful application of mechanical means, however, there shall remain a sufficient minimum thickness of unbroken zinc coating. Flaws on small parts and working surfaces shall be repaired only by stripping and re-dipping. The zinc bath shall contain not less than 98.5% pure zinc.
- 8.10 The deposits expected from galvanised coatings shall be as follows: -

MATERIAL THICKNESS	COATING GRAMS PER m2	APPROXIMATE THICKNESS
Bolts and Nuts	275 - 300	0,033 - 0,036 mm
1,25 mm to 2 mm	400	0,056 mm
2 mm to 5 mm	535	0,07 mm
5 mm and over	760	0,108 mm

9.0 COUPLINGS

Couplings shall be aligned by means of a clock gauge and the results entered in the commissioning data included in the Operating and Maintenance manuals.

10.0 BEARINGS

10.1 ANTI-FRICTION

- 10.1.1 Anti-friction bearings shall include all bearings which provide rolling contact between one or more sets of hardened steel balls or rollers and the hardened steel rings or raceways.
- 10.1.2 Anti-friction bearings shall be of approved manufacture.
- 10.1.3 To facilitate maintenance, spares inter-changeability and standardisation, anti-friction bearings of standard design and manufacture shall be employed. All anti-friction bearings shall be provided with greasing facilities in accordance with the manufacturer's requirements.

10.2 BUSHED BEARINGS

- 10.2.1 Only where specifically stated and in cases of low velocities and light loads in moisture free conditions will bushed bearings be accepted. All bushed bearings shall be made of an approved bearing metal composition which has good anti-friction qualities and is capable of withstanding severe usage.
- 10.2.2 All bushed bearings shall be provided with lubrication facilities to ensure adequate lubrication and shall be properly grooved to distribute the lubricant uniformly over the bearing surfaces. Grooves shall not be cut into the journal, but always into the surrounding bush. The edges of all chambers and grooves shall be rounded to avoid sharp corners and to facilitate the introduction of the oil or grease between the journal and the bearing metal.

10.3 SELF-LUBRICATING OR OIL-LESS BEARINGS

- 10.3.1 Self-lubricating or oil-less bearings shall only be used on application of light loads and low velocities in moisture free and low humidity and conditions and where access to bearings is difficult and likely to be neglected during servicing.
- 10.3.2 The type of bearing metal composition used shall have friction and wear resistant properties akin to those of grease lubricated bushed bearings.
- 11.0 GENERAL MACHINERY PROTECTION
- 11.1 COUPLING AND SHAFT GUARDS
- 11.1.1 All high-speed couplings, projecting shaft ends and every dangerous moving part of machinery within normal reach of a person shall be protected by a guard manufactured from not less than 1,5 mm mild steel plate.
- 11.1.2 The guards shall be neatly formed and securely fixed in position.
- 11.2 BELT GUARDS
- 11.2.1 All belt or rope drives shall be adequately protected by a belt guard.
- 11.2.2 The guard shall be manufactured from 25 mm wire mesh or open type expanded metal, securely braced and stiffened with light rolled steel sections and bolted in position. They shall be in accordance with the Occupational Health and Safety Act of 1994 (as amended).
- 11.3 CHAIN DRIVES
- 11.3.1 All chain drives shall be fitted with sheet chain cases and lubrication facilities to the chain manufacturer's recommendations. All joints shall be dust tight and arranged for convenient installation and dismantling.
- 11.3.2 Each chain case shall be fitted with a hinged inspection door, drain hole and plug.
- 12.0 QUALITY OF MATERIALS
- 12.1 Only materials of high quality shall be used throughout and shall be subject to the approval of the Engineer.
- 12.2 All materials, where applicable, shall conform in respect of quality, manufacture, tests and performance, with the requirements of the SANS standards, or, where no such standards exist, they shall conform with the appropriate current specification of the British Standards Institution. Materials manufactured in South Africa shall be used wherever possible.
- 12.3 Imported materials shall comply with the requirements of the relevant SANS or BS Specifications, although these materials need not necessarily bear the SABS mark.
- 12.4 All materials shall be suitable for the site conditions. These conditions shall include weather conditions as well as prevailing conditions during installation and subsequent use.
- 12.5 Should the materials or components not be suitable for use under temporary site conditions the Contractor shall provide at his own cost, suitable protection until these unfavorable site conditions cease to exist.
- 13.0 MAINTENANCE INSTRUCTIONS
- 13.1 As requested in the particular specification the Contractor shall provide operating and maintenance manuals/instructions at the time of hand-over of the installation.
- 13.2 The manuals shall include the following:
- 13.2.1 Maintenance instructions for all components of the plant which shall include maintenance items required over and above those included in the maintenance schedules attached to this specification, troubleshooting guide, part numbers of all replacement items, capacity curves of pumps, fans and compressors, belt sizes, types and lengths, serial numbers of all principal pieces of equipment, etc.

13.2.2 The names, addresses and telephone numbers of manufacturers or their agents.

13.2.3 Receiver test certificates.

13.2.4 A complete set of the "as built" drawings reduced in size to fit the manuals.

13.3 The operating and maintenance instructions specified above shall be obtained from the equipment manufacturer and where no such manuals exist, they shall be compiled by the Contractor to the best of his ability.

13.4 The contract shall be considered incomplete until all tests have been conducted to the satisfaction of the Engineer and all drawings and manuals have been handed over.

14.0 MAINTENANCE, SERVICING AND GUARANTEE

14.1 MAINTENANCE AND SERVICING

14.1.1 The Contractor shall be responsible for all maintenance and servicing of the installation during the 12-month guarantee period in accordance with the service schedules attached to this specification. Such additional items as required by the manufacturer of the equipment shall be included. (See also clause 13.2)

Four (4) services are required during this period on dates to be agreed at the first delivery inspection. The final service shall be carried out approximately 14 days before final delivery and expiry of the guarantee.

The contractor shall complete the service schedules and submit copies thereof together with his invoice for the servicing to the engineer after each service.

14.1.2 During the 12-month guarantee period the Contractor shall make good any defects due to inferior materials and workmanship and maintain all plant and equipment in perfect operating condition.

14.1.3 The Contractor shall maintain the plant log book on site in which he shall record, sign and date all work carried out at each inspection as well as log all temperature and pressure readings.

14.1.4 The Contractor shall allow for all expendable materials necessary for servicing such as lubricating oils, grease, refrigerant, cleaning materials etc.

14.2 GUARANTEE PERIOD

14.2.1 The CONTRACTOR shall unconditionally guarantee all new plant and equipment (machinery) for a minimum period of twelve (12) months from the date of hand over to the Engineer.

If the CONTRACTOR or his supplier has a standard guarantee which exceeds the minimum warranty called for, the remaining portion of such extended warranty must be ceded to the client.

14.2.2 The guarantee shall cover the performance of the WORKS and any defects due to inferior materials and/or workmanship, fair wear and tear excepted, and the CONTRACTOR shall repair any such defects without delay.

This guarantee shall include malfunction, and water, refrigerant gas, oil, or air leaks, and all adjustments.

14.2.3 Should the performance of any part of the complete WORKS become unsatisfactory so as to become detrimental to its functional use, the CONTRACTOR shall replace any such part or the complete WORKS with equipment as prescribed by the Engineer.

14.2.4 If any such defects are not remedied without delay, the Engineer reserves the right to have such defect repaired at the risk and cost of the CONTRACTOR by another CONTRACTOR whom the Engineer deems to be proficient in the WORK. this to be without prejudice to any rights the Engineer has against the installation CONTRACTOR. The Engineer will give written notice to the installation CONTRACTOR of such instances where he appoints another CONTRACTOR to remedy defects in the WORKS.

14.3 PREVENTIVE MAINTENANCE SERVICES.

Preventive maintenance servicing of plant and equipment shall be carried out in accordance with the maintenance schedules and programs to be supplied by the Engineer. Copies must be made as required of these schedules.

15.0 ELECTRICAL EQUIPMENT AND INSTALLATION

- 15.1 Unless otherwise stated in the particular specification tenderers must allow in their price for the complete electrical installation and wiring.
- 15.2 All electrical equipment and wiring shall be in accordance with the current issue of the Standard Wiring Regulations (SANS1 0142) (as amended).
- 15.3 Three phase power will be provided by others in the plant room.
- 15.4 Ammeters and pilot lights shall be provided for electric heaters.
- 14.5 All motors over 5 kW shall be provided with an approved electronic type motor protection unit.
- 15.6 In conventional field assembled plants lighting shall be provided for filter, coil and fan chambers, etc and shall comprise of bulk-head fittings permanently fixed to the walls or ceiling and earthed directly to the main earthing bar of the switchboard by means of a 4 mm² bare copper earth continuity conductor, in addition to being earthed by means of the continuity of the conduit as specified.
- 15.7 A single phase power point will be provided in the plant room by others for this lighting.

16.0 AUTOMATIC CONTROL SYSTEMS

- 16.1 Unless otherwise specified either electric or electronic controls may be offered. All control devices shall perform the functions indicated and operate in the required sequence.
- 16.2 The performance of controllers shall be stable under all conditions and shall be such that an aperiodic recovery of the controlled variable is obtained following a disturbance. Means of adjusting the control loop stability, such as adjustable proportional bands, adjustable reset rates etc., shall be provided on controllers when applicable.

17. DRIVES

- 17.1 Compressors and pumps shall be direct coupled to their driving motors.
- 17.2 The drives between centrifugal fans and motors shall be by means of grooved pulleys and V-belts.
- 17.3 V-belt drives shall be designed in accordance with CKS 332. Motors shall be mounted on slide rails for adequate belt tensioning and replacement.
- 17.4 All drives shall be protected by stout 25 mm wire mesh guards and shall be in accordance with the Occupational Health and Safety Act of 1994 (as amended).

18.0 EQUIPMENT BASES

- 18.1 Bases for centrifugal fans, compressors, air cooled condensers, air compressors, pumps and motors etc., shall consist of reinforced concrete cast into sheet metal formers at least 150 mm deep.
- 18.2 Bases shall be reinforced with at least 13 mm reinforcing bars located at 150 mm centers each way.
- 18.3 The mass ratio between bases and equipment shall be at least 1:1 for fans and 1,5:1 for pumps.
- 18.4 Concrete bases for the pumps shall be large enough to support pipes and fittings between the pumps and flexible connections.
- 18.5 Bases generally shall be large enough to accommodate the motors and driven equipment. Equipment shall be bolted onto the concrete inertia base.
- 18.6 Spring isolators shall be installed between concrete inertia bases and floor plinths and between the cooling towers or evaporative condensers and floor plinths.

- 18.7 Structural steel bases shall be provided for the cooling towers and evaporative condensers if their framework does not permit point support.
- 18.8 Either free standing stable spring or caged spring with snubber may be used. Spring isolators shall be installed with leveling bolts and shall incorporate 6 mm thick ribbed neoprene acoustical pads bonded to the base.
- 18.9 Spring diameters shall be large enough to prevent excessive rocking of equipment during start-up and normal operation.
- 18.10 Isolators shall be chosen to give a static deflection corresponding to a ratio of 3:1 of the lowest disturbing frequency to the natural frequency of the mounting.
- 18.11 Bases and spring isolators shall be arranged to give a clearance of approximately 25 mm between the underside of the bases and floor plinths.
- 18.12 Floor plinths of sufficient height shall be installed under all equipment by the air conditioning contractor. The plinths shall be large enough to accommodate the concrete inertia bases and spring isolators. Floor plinths shall also be provided under items of equipment which do not require concrete inertia bases such as cooling towers, air plenums, etc. The plinths under the air plenum shall be at least 100 mm higher than the finished floor level in the plant room.
- 19.0 RUNNING OF PIPES
- 19.1 Pipes and ducts shall be installed in accordance with the drawings issued with the supplementary specification.
- 19.2 The drawings are schematic and do not purport to show the exact positions of pipes nor the details of construction and installation. All final dimensions must be checked on site before the fabrication of piping sections.
- 19.3 Pipe sleeves with at least 6 mm clearance filled with a resilient material shall be provided where refrigerant tubing or water piping passes through walls or slabs.
- 19.4 Where beams, stanchions or other obstructions interfere with the straight running of pipes or ducts, suitable offsets shall be provided or changes in the section of the duct made, without altering the cross-sectional area.
- 19.5 Tenderers should make themselves conversant with complete drawings of the building in order to determine the number of such offsets or changes in section and the positions in which they will be required. Due allowance for these shall be made in the tendered price.
- 19.6 A complete set of drawings of the building may be inspected at the office of the Architect.
- 20.0 PAINTING
- 20.1 All exposed galvanised sheet metal work in plant rooms, air conditioned and ventilated spaces, basements, corridors etc., shall be painted.
- 20.2 Ducts shall be identified by coloured symbols as specified in clause 6 of SANS 0173-1980.
- 20.3 The temporary white rust preventative compound on new galvanised sheet metal shall be removed by means of washing, brushing and if necessary, abrasion with a special solvent or compound used for this purpose. The surface shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910 or one coat of calcium plumbate primer to SANS 912 followed by one under coat to SANS 681 type II and one coat high gloss enamel paint to SANS 630, Grade I, as top coat, the colour of which will be determined by the Engineer.
- 20.4 The entire air-conditioning unit casing, including galvanised iron eliminators, sumps, drip pans, fans etc., shall be painted internally with two coats of epoxy-tar paint to SANS 801, type II. The white rust preventative compound on galvanised iron shall be removed as specified above before the paint is applied.

Angle iron framework shall be similarly painted with epoxy paint before side covers are fitted.

- 20.5 Ferrous cooling tower and evaporative condenser casings, including galvanised iron eliminators sumps and fans and internal areas of connecting ductwork shall be internally painted as specified above. Externally the casings shall be painted as specified in clause 48.3. Factory painted equipment will also be acceptable.
- 20.6 Exposed hot water piping with canvas covered insulation shall be painted two coats of bitumen aluminium paint to SANS 802.
- 20.7 Exposed uninsulated galvanised piping shall be thoroughly degreased. In case a detergent is used, the surfaces shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910, or one coat of calcium plumbate primer to SANS 912, followed by either one undercoat to SANS 681, type II, and one coat high gloss enamel paint to SANS 630, Grade I, as topcoat or two coats of PVA to SANS 634, Grade I.
- 20.8 Uninsulated black piping, flat-iron, angle-iron and rods for supports, brackets, duct stiffeners, etc., shall be painted on all sides with a zinc chromate primer to SANS 679, Type I followed by two coats of enamel paint to SANS 630, Grade I.
- 20.9 Where specified in the supplementary specification aluminium shall be painted with a wash primer to SANS 723, followed by a zinc chromate primer to SANS 679, Type I, and two coats of enamel paint to SANS 630, Grade I.
- 20.10 Motors, compressors, pumps etc., shall be painted light grey. Belt guards shall be painted bright red.
- 20.11 Before any painting is applied the steel surfaces shall be prepared according to SANS 064, (Code for preparation of steel surfaces for painting.)
- 20.12 Where specified in the particular specification steel surfaces shall be cleaned and then treated by the hot phosphate process to a minimum weight of 1,6 gr/m² coating followed by two coats of baking enamel to SANS 783, Type I.

21.0 GENERAL REQUIREMENTS FOR FIRE INSTALLATIONS

All fire pipe installations shall adhere to the technical and particular specifications of the Employer, and shall include the following general requirements:

- 21.1 Piping shall conform to the requirements of SANS.
- 21.2 Pipes shall be cut accurately to measurements established on site and installed without springing or forcing and properly clear of windows, doors and other openings. All piping shall be reamed after cutting and shall be clean, straight and free of defects.
- 21.3 Drawings are generally diagrammatic and indicative of work to be installed. Routing and arrangement of piping shall be as indicated, subject to site conditions and the appropriate requirements of SANS rules.
- Clashes with other trades shall be avoided and fittings, valves, drain points, etc shall be located so as to ease access, maintenance and operation of the system. Note that required offsets, fittings, valves, drains, etc are not necessarily indicated.
- 21.4 Pipe runs shall be straight and direct as possible, in general forming right angles with or parallel to walls or other piping, and neatly spaced. Piping shall be installed so that there is sufficient clearance between finished coverings of piping, fittings and adjoining work.
Sleeves shall be provided where piping passes through partitions, beams, slabs, etc.
- 21.5 Valved and capped drain points shall be provided at all low points in the piping network.
Unions or flanged connections shall be provided to aid dismantling of the piping should it be required.
- 21.6 No cold springing shall be allowed. Pipe sections shall be fabricated/cut to length accurately in order to avoid cold springing.
- 21.7 Where necessary, adequate temporary supports shall be installed during erection so as not to overstress piping or equipment to which piping is connected.

- 21.8 All supports shall conform to the requirements of SANS, and no perforated straps or strip steel shall be used.
- 21.9 Piping which is subject to vertical movements shall be provided with springs or other suitable supports.
- 21.10 Hangers shall be installed in such a manner that they cannot be disengaged by any pipe or support steel movement.
- 21.11 No pipe shall be suspended from another pipe except if specifically called for on the drawings or in the particular specification (Part 3).
- 21.12 The Contractor shall be responsible for selecting the sizes and types of pipe hangers, supports and support devices not shown on the drawings, but which are necessary for the completion of the installation. Support spacing shall be as specified in paragraph 23.0 The Contractor shall supply details of all calculations to the Engineer for scrutiny together with two marked up prints showing the location and types of all supports/pipe hangers to be installed prior to ordering and commencing installation.

21.13 During construction all pipe ends shall be kept plugged to prevent any ingress of dirt, rubble etc.

22.0 PIPING

- 22.1 Steel piping shall be solid drawn, heavy grade steam quality piping conforming to ASTM/A106 Schedule 40 or to B.S. 1387/1967 (heavy quality) or SANS 62/1971. In all instances the latest editions and amendments to these specifications shall apply.

In plant rooms piping may be welded, prefabricated off-site to aid in installation and connection to pumps, storage tanks, etc. Welding shall be carried out as specified in paragraph 7.0 of this specification.

Generally, pipe sections shall be screwed together using malleable iron threaded fittings, class 150 and 300 in accordance with ASME B 16.3. Only eccentric fittings shall be used at changes in pipe size. No bushing shall be used in lieu of reducing fittings. Screwed joints shall be screwed up tightly using an approved jointing compound such as PTFE tape. Hemp joints will not be accepted.

Pipes joined with grooved fittings (e.g., Klambon or Victaulic) shall be joined by a listed combination of fittings, gaskets, and grooves. Grooves cut or rolled on pipe shall be dimensionally compatible with the fittings and pressure at which the system is to operate.

Where flanges are used, they shall be in accordance with ASME B16.5. Steel slip-on boss flanges for welding shall have a nominal pressure at least 10% in excess of the maximum fluid pressure. Where equipment is supplied complete with flanges not in accordance with the above specification, a matching weld-on flange is to be used for connecting up such equipment. Bolts in flanges are to be high tensile steel and of the correct length such that no more than 1,5 clear threads protrude beyond the nuts after tightening to the correct torque. In flanged joints new gaskets shall be used for every assembly operation unless such an assembly is intended solely for initial fitting. Gasket material shall be fibre composition or similar material suitable for the system operating pressure and temperature.

- 22.2 Underground piping shall be class 16 HDPE piping and weld-on flanges in accordance with SANS 0533-2

Pipes shall be laid on a 100 mm sand-bedding cradle and covered with 300 mm sand before backfilling. The total cover over the piping shall be a minimum of 900mm generally and 1100mm under roadways. All backfilling shall be to the Engineers approval.

Where required thrust blocks shall be cast between the pipe and the undisturbed trench material. At thrust blocks the pipe bend shall be wrapped with a "Densopol 80 HT Tape" (or equal and approved) so that no concrete comes into direct contact with the HDPE piping.

All underground piping shall be pressure tested prior to it being covered.

23.0 PIPE SUPPORTS AND HANGERS

All necessary pipe hangers, brackets, supports, stanchions and anchors shall be designed, supplied and

installed by the Contractor, in accordance with SANS.

23.1 Maximum pipe support spacing shall be as follows:

Pipe Diameter	Max support Spacing
20 mm	3 m
25 mm	3.6 m
32 mm	3.6 m
40 mm	4.5 m
50 mm	4.5 m
65 mm	4.5 m
80 mm	4.5 m
100 mm	4.5 m
150 mm	6 m
200 mm	6 m

The contractor will be required to ensure that the hangers/supports selected are conservatively rated for the carrying capacity required. (Refer to paragraph 21.12).

23.2 There shall be at least one pipe support for each mechanical pipe joint .

23.4 Components of any pipe support shall be securely attached to each other by means of bolts or threaded rod with nuts and washers.

23.5 All components of all pipe supports shall be galvanized.

24 VALVES AND FITTINGS

All valves, check valves, shut-off valves, etc. shall be of a pressure class greater than or equal to pressure class of the piping.

All valves controlling water supplies for fire systems or portions thereof, should be accessible to authorized persons during emergencies. Permanent ladders, chain-operated hand wheels, or other acceptable means should be provided where necessary.

Outside control valves shall be located within a fenced enclosure under the control of the owner, sealed in the open position, and inspected weekly as part of an approved maintenance and safety procedure.

24.1 Valves greater than 50mm diameter shall be of the butterfly type with resilient rubber seats. 100 mm and 150 mm diameter valves shall be equipped with gear operated closing mechanism. Valves shall conform to BS 5155 and shall be KERR fig. no 104A or similar or equal and approved.

24.2 Valves up to and including 50mm diameter shall be of the screwed and socketed type with bronze body and gated with non- rising spindle.

24.3 Valves shall be labelled as follows:

- (a) Main stop valves, control valves, etc shall be labeled by means of rust-free metal tags indicating their purpose and the section they isolate, if isolating valves.
- (b) The tags shall be securely fixed to the valve and shall be clearly legible.
- (c) All letters on labels shall be engraved or punched. No painted or plastic embossed labels will be accepted.

24.4 Strainers shall be of the Y-type with cast iron body, stainless steel or bronze strainer element and shall be equipped with flanged ends. The hole sizes of the strainer element shall be maximum 1 mm Ø and be removable without dismantling of pipe-work. Strainers shall be suitable for a temperature of up to 90°C at a

1 600 kPa pressure rating and installed with the element facing downwards or a maximum of 45° sideways.

- 24.4 Non-return valves shall be of the spring-loaded wafer dual flap plate type fitted between two flanges. They shall be equipped with a cast iron body, aluminium bronze plates, stainless steel springs and neoprene seals on the plates. The valves shall be suitable for working pressures of up to 1 600 kPa.

25 PUMPS

- 26.1 Pump sets shall conform and be installed as detailed in SANS and these specifications. The number and type of pump sets will be detailed in the Particular Specification (Part 3) and will comprise some or all of the following

- (a) Electrical driven jockey pump set
- (b) Electrical driven main sprinkler/fire pump and drive.
- (c) Diesel driven main sprinkler/fire pump and drive.
- (d) Sprinkler/fire pump starting arrangement.
- (e) Electric and Engine drive controllers and ancillary equipment.
- (f) Water flow test devices.
- (g) Fuel storage and piping

The pump sets shall be, installed, tested, commissioned and certified in accordance with SANS and the Local Authority's requirements.

- 26.2 Prior to ordering and installation, the Contractor shall provide a full set of plans and detailed data describing the following for scrutiny and/or approval by the Engineer and Local Authority:

- (a) Pumps
- (b) Pump drivers
- (c) Drive controllers
- (d) Power supply
- (e) Starting arrangements
- (f) Piping and fittings
- (g) Suction and discharge connections
- (h) Water supply and/or storage conditions

Each pump unit shall be provided with certified test curves from the manufacturer showing brake horsepower, flow and head capacities. The Contractor shall provide this information to the Engineer and Local Authorities for approval.

- 26.3 The Contractor shall perform and certify a full field acceptance test on the completed installation in accordance with SANS. This test shall be witnessed by the Engineer and Local Authority.

- 26.4 The following information shall be embossed on a plate fixed to each pump:

- (i) flow capacity (l/sec);
- (ii) pump head (metres water gauge);
- (iii) impeller size;
- (iv) pump speed
- (v) required motor power;
- (vi) make of pump;
- (vii) model;
- (viii) date of purchase.

- 26.5 Pumps shall be of the centrifugal end-suction type listed for fire protection service. It shall be possible to remove the impellers without removing the pump from its mountings.

Pumps shall comply with the following requirements:

- (a) Impellers shall be double entry radial types of bronze or cast iron.
- (b) Casings shall be of cast iron with renewable casing wear rings. The casing wear rings shall be made of cast chrome steel.

- (c) Shaft seals shall be of the mechanical type.
 - (d) Bearings shall be grease lubricated anti friction types.
 - (e) Pump shafts shall be of stainless steel.
 - (f) An auto priming system shall be provided.
 - (g) Pump cooling devices shall be provided to prevent over heating of pumps when operating at closed head.
- 26.6 Characteristic curves showing capacity, head, efficiency NPSH, power required and operating range shall be submitted to the Engineer at tender stage. Prior to installation, a complete set of test certificates shall be submitted for approval to the Engineer and Local Authority indicating all performance characteristics of the pump to be installed.
- 26.7 A pressure gauge must be provided downstream of the pump outlet backpressure valve and on the pump suction side.
- 26.8 An approved flow test device and pipe connection shall be provided in the delivery line downstream of the non-return valve, in order to carry out a running flow/pressure test on the pump at approximately full load when the test valve is fully open. The test pipe shall be piped back to the water tank.
- 26.9 Pumps shall be mounted on mild steel bases, adequately corrosion protected by hot dip galvanizing after manufacture. Pump bases shall be filled in with concrete and properly secured to the floor.
- 27.0 DRIVE MOTORS
- 27.1 Electric drive motors shall be drip proof conforming to BS 2613 and BS 170. Windings shall at least be according IP55 of IEC 144. High temperature permanent sealed bearings shall be used. Motor speeds shall preferably be limited to 1450 rpm but shall not exceed 2950 rpm.
- 27.2 Diesel engines shall be naturally aspirated air cooled types capable of being started without the use of wicks, cartridges, heater plugs or ether, at an engine room temperature of 4°C. They must be capable of accepting full load within 15 seconds from receipt of the signal to start.
- 27.3 Engines shall be capable of operating continuously at full load at the site conditions for a period of 8 hours. The Contractor supplying the pumping set shall supply to the Engineer and Local Authority a statement giving the 8-hour power rating of the engine at speeds of 1000 rpm, 1400 rpm, 1800 rpm, 2200 rpm, 2600 rpm and the maximum speed. Any of the speeds quoted which are in excess of the maximum speed rating of the engine may be omitted and the maximum speed and corresponding rating shall be given.
- 27.4 Speed and Number of Strokes
- The engine must be of the solid injection, compression ignition type, with a running speed for reciprocating engines up to 750 kW not exceeding 1500 rpm. Generally, engines of the four stroke, industrial type, designed for stationary operation are preferred. Two-stroke engines of the pump assisted uniflow scavenged type will be considered if their specific fuel consumption (kg fuel used per kW hour) is equivalent to or better than that of the equivalent four stroke engine.
- 27.5 Fuel Classification
- The engine shall be rated for diesel fuel as normally available in South Africa and in compliance with SABS 342 -1969 or B.S.2869 -1970, Class A1 , (as amended) for diesel fuel with a minimum octane rating of 40 and nett calorific value of 10000 kcal/kg (39600 kJ/kg).
- 27.6 Rating of Plant
- The rating of the engine shall take cognisance of the site conditions, site altitude and include all auxiliary equipment such as radiator and fan, oil pump, water pump, air filter, governor, battery charger (generator) etc. The output stated shall only be the nett available, after the above have been allowed for.
- The engine output must be de-rated in accordance with BS 5514 for the site conditions stated in the particular specification.

- 27.7 Overload Facility
The engine shall be capable of delivering 10% overload for one (1) hour in any 12-hour period of continuous running.
- 27.8 Engine Appearance
The engine shall be of neat appearance and all water, lubricating and diesel oil lines, filters and stop cocks shall be of top quality and completely leak free.
- 27.9 Service Connections
All service connections to the engine shall be flexible to prevent vibration being transmitted between plant and building, and to prevent damage to these lines and connections.
- 27.10 Supporting Framework
The engine and pump shall be mounted on one common steel supporting frame manufactured of channel iron or other equivalent steel work to provide a rigid and solid foundation. The main frame shall be of the "skid" base type. If no "skid" base is provided, suitable for free standing, holding down bolts and vibration eliminators to the generator set manufacturer's specification must be provided. This subframe shall be supported from a main frame by anti-vibration mountings. Duplex anti-vibration mounts shall be used.

The inner frame and its supports shall be of sufficient height above floor level to permit installation of a drip tray and for draining of engine oil.

The drip tray must be sloped and made of mild steel. It must be fixed in the frame beneath the engine and alternator and a drain pipe fitted with a plug must be extended from the lowest point of the drip tray to beyond the frame in an easily accessible position.
- 27.11 Heat Protection
All engine piping, whether flexible or rigid, shall either be of the heat resistant type or adequately protected against damage by radiant heat. This also applies to any wiring attached to the engine.
- 27.12 Crankcase Vent Pipe
The crankcase vent pipe shall be taken to the drip tray to collect oil condensate.
- 27.13 Bearings
Engine bearings for the crankshaft and connecting rods, big and small ends shall be of the bush type, split sleeve type, or roller type. The bearing types and metals shall be suitable for operating in the worst site conditions.
- 27.14 Lubrication
The lubrication shall be by means of a force-fed pressure system supplying circulating oil to all bearings, gear trains and important moving parts. A gear driven oil pump shall be incorporated with an oil cooler if necessary. The oil cooler shall have a thermostatically controlled oil bypass valve to control the oil inlet temperature by proportionate bypassing. 250 hour running time, full flow oil filters with automatic bypass and replaceable elements shall be fitted.
An isolating valve shall be fitted in the oil line from the make up tank to the sump in order to facilitate sump draining without the loss of new oil from the make up tank.
- 27.15 Cooling
- 27.15.1 General
Cooling of engines may be either by air or by water.

27.15.2 Water Cooling

Where radiators are used, they shall be of the heavy-duty industrial air blast type, pressurised and sized for continuous full load operation.

The fan shall be designed and run in a direction such that cool air is drawn across the generator, engine and radiator in that order.

Removable ducting shall be provided between the radiator and the louvre in the wall opening.

Fans must be liberally sized to enable engines to operate well within their maximum temperature limits (but without running too cool) at the ambient site conditions stated in the particular specification or at a plant room temperature of 40 deg C whichever is the higher.

In water cooled engines water circulation shall be pump driven by means of an integral engine mounted centrifugal pump.

If under exceptional circumstances cooling towers are required these will be specified separately in the particular specification. It will be required that they be of stainless steel or fibre glass and that particular attention be paid to plant room ventilation under these circumstances.

27.15.3 Air Cooling

In air cooled engines air ducts shall be provided to positively exhaust hot air and to prevent re-circulation. Integral engine mounted fans are required to ensure air flow across the various components in the order listed above.

Discharge ducting must be taken straight up through the roof of the plant room and must be made with strategically placed flanged joints, etc to enable it to be easily removed for servicing and maintenance purposes (if required), and/or to permit removal of the set without having to remove the ducting. Quick action type lock nuts or screws to enable quick and easy dismantling of ductwork are required. Self tapping screws are unacceptable.

The ducting must be fixed to the roof structure, must be flashed to render the exit point waterproof and must be fitted with an expanded metal bird screen at the discharge end(s).

The ducting must be made in such a way that expansion and contraction of the ducting will be taken up by sliding joints or similar.

The discharge end of the ducting must be fitted with a cover to prevent the ingress of rain water at times when the set is not running. Over and above, a drain point for accumulated moisture must be provided at the lowest point of the ducting. This drain must be piped to just outside the plant room door. Drainage of moisture from the ducting must be such as to prevent the diesel engine from getting wet.

Ducting must be made of 16-gauge galvanised iron suitably cross braced to prevent drumming.

27.16 Speed Control

The engine shall be provided with a suitable governor to control the engine speed to within 10% of its rated speed under any condition of load up to the full load rating. The governor shall be field adjustable.

27.17 Air System

The air system shall consist of two items, viz. the incoming combustion air and the exhaust gas.

27.17.1 Combustion Air

Combustion air filtration shall be by means of dry type, cartridge, high efficiency air filters fitted and sized for 500-hour operation and supplied complete with a service indicator. Oil bath air filters may be fitted and used in existing plant only. Air filters must be of Donaldson manufacture or similar, equal and approved.

27.17.2 Exhaust Gas

Exhaust gas shall be piped, the piping being fitted with expansion joints, silencer and discharged to atmosphere.

The expansion joints shall be of the stainless steel, concertina type, flexible, flanged and bolted to the exhaust manifold or turbo-charger outlet as applicable. Stainless steel bolts and nuts of the appropriate size must be used. Care must be exercised that exhaust pipe and silencer supports at the expansion joints are so positioned that no strain is placed on the manifold joint, turbo-charger, piping or silencer.

The silencer shall be of stainless steel, of the baffle or absorption type of a size and construction such that a sound level of 75 dB absolute is not exceeded within two meters of the exhaust. The exhaust pipe shall be of stainless steel, insulated and of sufficient size to ensure that the back pressure is acceptable within the limits of the engine manufacturer. The exhaust system shall be offset from the centre line of the plant to allow for hoists or cranes to remove the engine.

The piping shall have bends with a minimum radius of 2,5 times the pipe diameter, insulated with 25 mm thick insulating rope and cloth or similar suitable approved insulating material, and be wrapped and sealed in bright polished class 430 stainless steel sheeting.

Stainless steel nuts and bolts must be used in assembling the exhaust system. Flanged joints are required to aid dismantling.

Exhaust piping over 100mm diameter must have a minimum thickness of 1,6mm.

Once the exhaust is external to the building, no insulation is necessary. The entire system shall be supported with flexible hangers, brackets, clamps, etc.

27.18 Engine Fuelling

Engine fuelling shall be by means of an engine mounted pump with the governor-controlled fuel injection pump(s) and injectors all arranged for easy access and maintenance.

A fuel filter with replaceable elements shall be fitted between the lift pump and the injection pump, suitable for the full flow of fuel at full load. The filter must take out particles down to 5 microns in size, or less, and be of Donaldson or similar, equal and approved manufacture.

A primary, heavy-duty filter/water separator shall be fitted before the lift pump in the fuel line from the tank. This water separator shall be of Donaldson or similar, equal and approved manufacture, shall be suitable for 250-hour operation and be easily maintained.

Copper tubing shall be used from the sludge filter to the engine components, but steel tubing may be used on the overflow from the injectors to the fuel tank. Note that galvanised piping is not acceptable. All piping shall be neatly run and securely fixed with saddles and clamps taking cognisance of flexibility to prevent vibration damage as stated in Clause 27.9 .

27.19 Starter Motor

Starting of the plant shall be by means of an engine mounted, electric starter motor on sets up to 500 KVA. Above this size two motors will be required. The starter motor(s) shall be suitably sized to easily spin the plant under "cold start" Winter / Summer conditions without the use of special starting equipment.

Two interlocks shall be incorporated, one electrical and one mechanical, preventing the starter motor engaging unless the engine is at rest.

The starter motor(s) shall be 12- or 24-volts D.C. fitted with an approved device for positive engagement. The starter motor shall be controlled from the plant panel.

27.20 Jacket Water Heaters

Water cooled engines shall be fitted with immersion heaters of a minimum of 1,5 kW up to 5 kW capacity in order to ensure that the jacket water temperature is warm enough for the engine to start easily from cold

and under severe cold conditions. Heaters must be so situated as to promote thermo-syphoning of the water with the piping connections installed in such a manner that the cooling system thermostat does not impede the free flow of this thermosyphoning water. The temperature shall be thermostatically controlled via a relay and the elements fed at 220 volts with M.C.B. protection at the panel.

27.21 Battery

The battery shall consist of a number of cells to form a 12- or 24-volt D.C. supply suitably sized to start the engine. These cells shall be of the lead acid type with flat terminals, rated at 1,5 volts/cell and mounted on a suitable frame with a timber base. The battery shall be as close as is practical to the starter motor, but separate from any vibrating parts of the set.

The battery discharge capacity with full cranking current for 60 seconds at a temperature of 5 deg C shall not fall below a cell voltage of 1,5 volts. This voltage is considered the minimum to satisfactorily operate the 12 or 24 V. D.C. control equipment on the control panel (i.e., after three starting attempts, each of 10 seconds, the panel control voltage shall not be below 20 volts D.C.)

The battery under normal conditions shall be continually trickle charged from the Control Panel charger (reference must be made to clause 28.9).

Under running conditions, the battery shall be charged from an engine driven brushless Alternator/Rectifier complete with auto rate control.

The battery cables must be run clear of all exhaust piping and other hot surfaces and must be fixed in position so as to ensure correct reconnection of the cables in the event of the battery being changed or removed. The cables must be liberally sized in order to minimize the voltage drop to the starter motor.

27.22 Protection Equipment on Engine

The protection of the set is covered under paragraph 28.0 but the following monitoring equipment is required as listed hereunder:

27.22.1 Alarm signal system in wall mounted or floor standing control board for indicating "shut down" of the following items:

- a) Fail to start / starter circuit lockout
- b) High water temperature (sensed on engine side of the thermostat) or high head temperature in the case of air-cooled engines
- c) Low oil pressure
- d) High oil temperature (if required)
- e) Low fuel pressure (if required)
- f) Engine over/under speed

27.22.2 Gauges in the wall mounted or floor standing control panel showing:

- a) Fuel oil pressure (if required)
- b) Lubricating oil pressure
- c) Lubricating oil temperature (if required)
- d) Jacket water temperature

27.22.3 All necessary sensors for alarm circuits.

27.22.4 All necessary fuel cut off solenoids

27.22.5 A manual shut off valve before the lift pump in the fuel line at the day tank.

27.23 Coupling

The engine/pump coupling shall be by means of a flange adaptor ring or bell housing incorporating a shock absorbing coupling. The flexible coupling shall be direct coupled to the engine and alternator with no gears so that the engine and alternator run at 1500 rpm or the regular engine speed compatible with 50Hz power generation.

27.24 Fuel Tanks and Pumps

27.24.1 Day Tank

A combined fuel storage and day service tank shall be supplied with each set. The tank shall be mounted on a self-supporting floor standing steel frame at a minimum height of 400 mm above floor level (to provide a gravity feed to the engine) or integral with the engine/pump support base. This service tank shall be mounted close to the plant, within the plant room, hold a minimum of 150 litres and a maximum of 200 litres. A full height transparent gauge tube shall be fitted to the service tank. The gauge tubing must be similar or equal to that supplied by Lister diesel engines. (Plastic tubing will not be permitted). If called for in the particular specification a dip stick may be supplied and fitted in lieu of the gauge glass.

The service tank shall be so designed and mounted such that water and sludge can collect at the lowest point and be easily drained off by means of a stop cock. The lower gauge tube connection must be fitted with a shut-off valve.

A manual ball type shut off valve between the service tank and the lift pump shall be incorporated in the steel or copper fuel feed pipeline.

27.24.2 Fuel Piping

In principle the fuel lines shall all be medium class steel to SABS 62 or BS 1387 (but not galvanised) with appropriate bends to provide an expansion facility. Copper shall only be used from the primary filter to the engine pumps.

A fusible link mounted directly above the set and connected to a dead weight operated fuel shut-off valve will be required in instances where the day tank is situated in a separate room to the generating set.

27.24.3 Fuel Pumps

One diesel fuel pump suitably sized, shall be fitted adjacent to the service tank.

It shall be a centrifugal pump complete with electric motor, starter, isolator and float switches. Level control and float switches for control of the pump(s) shall be mounted within the service tank.

Float switches shall be "REMEX" level controllers (or similar and equal and approved). Three float switches will be required, one to operate the pump (on/off), one for a low-level alarm and the other for an extra low level engine cut-out. A facility for running the pump manually is required.

It must be possible to mute all alarms but the indicator light(s) must remain on until the tank has been refilled at which time they should cancel automatically.

The float switches shall be of such a type that they can be tested manually without opening the tank. They must further be installed in such a manner that they do not foul each other.

28 CONTROL PANEL

28.1 General

The control system may consist of plug in, low voltage relays of the octal base type or solid-state PC control . The panel shall provide full protection for the diesel pump set.

28.2 Sheet Metal Work

The control panel and components shall be of approved design, manufacture and construction and shall be complete in all respects with all necessary equipment, bars, connections, wiring and accessories. The panel shall be robustly constructed, shall be in accordance with standard accepted practice, comply to the relevant S.A.B.S. Code of Practice and/or BSS 162/1961, and shall have an attractive appearance.

The panel shall be totally enclosed, dust and moisture proof as well as rodent and insect proof with full gland plates fitted at appropriate heights. The panel shall be floor standing and have a steel plinth. Doors shall be of folded and welded construction, with suitable bracing to eliminate buckling, and all doors and cover plates shall have rubber seals and grommets.

A construction of angle iron and loose sheets will not be acceptable, neither will pop-rivets or self tapping screws.

All steel work shall be thoroughly de-rusted. Millscale shall be removed by shot blast or other approved means and the steel work then degreased, followed by bonderising or similar phosphoric inhibitive treatment. A zinc chromate primer shall be applied, followed by two coats of best quality white enamel inside and three coats of enamel (Electric Orange) on the outside, sprayed and baked on. Bolt heads or thumb screws securing the panels shall be chromium plated. The latches securing the doors shall have positive locking devices and no spring-loaded ball latches or similar will be accepted.

28.3 Approvals

Before commencement of manufacture of the panel, full working drawings must be submitted for approval by the Engineer. When the panel is under construction, and again upon completion but prior to delivery to site, the manufacturer must notify the Engineer so that the panel can be inspected and approved.

28.4 Components

All components where possible shall bear the SABS mark or if not available the equivalent B.S. or DIN mark.

All components shall be entirely suitable for their application and the switchgear shall be suitable for the site and location. Space shall be provided for the incoming and outgoing cable circuits.

All cut edges and drilled holes of Bakelite or similar insulation board must be treated with electrical varnish. All equipment, levers, handles, keys, etc. required for operation of the panel must be included together with suitable clips or trays to store these when not in use.

28.5 Guarantee

The whole of the panel and components shall be guaranteed for a period of 12 months from the date of hand-over to the Owner

28.6 Equipment

The following equipment shall be included on the panel:

- (a) 1 meter (220 V AC) to indicate the total running hours the plant has been in operation.
- (b) 1 voltmeter (as per BS 89), approximately 125 mm scale to read 0 to 415 volts.
- (c) Control relays, start relays, three crank start relays, start failure relay, fuel supply relay (solenoid), continually rated alarm relay, oil pressure relay, oil temperature relay, overspeed relay, water overheat relay, jacket water heater relay, alarm relay, low fuel relay.
- (d) Illuminated resettable fault indicators, coupled to a common continuously rated hooter or low current electronic type yodel alarm for: low oil pressure, high oil temperature, high water temperature, engine overspeed, failure to start, pump overload, low fuel level, extra low fuel level engine trip

- (e) Auto/Test/Manual/ off selector key switch
- (f) Battery charger
- (g) MCB's for:- Battery Charger, Jacket water heater, fuel pump
- (h) Lamp and alarm test facility.

28.7 Sequence of Operation

The control panel shall be so designed to provide the following:

28.7.1 A water pressure sensing relay which in the event of a fall in pressure the timing sequence shall be :

28.7.1.1 An immediate command to the engine to start.

28.7.1.2 Once the command to start has been given, three start attempts shall be allowed each of 10 seconds with a 10 second delay between each attempt. In the event of failure to start within these 3 initial attempts, the starting system shall switch off and a L.V. alarm shall be initiated. Any further start attempts may only be carried out when the plant is in the "manual" position.

28.7.1.3 Fault reset after identification and rectification of same shall be by switching the selector to the "off" position and then back to the desired mode.

28.8 Protection of Plant

The panel shall automatically provide the following protection with the alarm circuiting and tripping devices operating off the 12- or 24-volt D.C. Battery as applicable.

	Hooter or Siren	Visual Light Indicator	Lock out	Fuel Solenoid off
Overspeed	X	X	X	X
Under speed or overload	X	X	X	X
High Temperature	X	X	X	X
Low Oil Pressure	X	X	X	X
3 Starts Failure	X	X	X	X
Low Fuel Alarm	X	X		
Battery Charger Failure	X	X		
Extra Low Fuel Cut-out	X	X	X	

All the above shall have the necessary re-set buttons.

28.9 Battery Charger

28.9.1 The charger module shall be a mains (220 V) operated unit to continuously trickle charge the engine starter battery.

It must be of the modulating type similar or equal to those supplied by Messrs Vaal, Romberg, Semi-Conductor Services, or P & S Power Products or be as further specified here.

28.9.2 A "loss of charge" alarm relay shall be provided to indicate failure of the charger. This should be a current monitor.

28.9.3 The output voltage (27,6 volts D.C. or 13,8 volts if applicable) shall be via full wave rectification and be kept within 1% of the float charge voltage.

28.9.4 The 220-volt input voltage may vary between 200/240 volts and the equipment, (transformer etc) must be capable of handling this discrepancy.

28.9.5 During the "cranking/start" period and during running of the diesel engine the battery charger shall be disconnected via a relay. Charging of the battery shall then be by means of an engine mounted alternator.

28.9.6 The charger shall be equipped with:

- (a) Overload protection on the 24 (12) volt side
- (b) One 72 x 72 mm shielded type ammeter showing the charging rate
- (c) One 72 x 72 mm shielded type voltmeter with a spring return, normally open, push-button switch for indicating battery voltage
- (d) Relays for "failure alarms" and "running/start"
- (e) Transformer and full wave solid state rectifier complete with capacitors where applicable.
- (f) HRC fuses or fast acting MCB's on the secondary side

28.9.7 The battery charger shall be fully incorporated into the main control panel and be built to the same general specification (see paragraph 28.1) Relays shall preferably be of the "Octal" base type or equal and approved.

28.9.8 Ventilation.

The position of the battery charger shall allow for good ventilation and not be below any of the other switch gear or relays.

28.10 Log Book

A plastic covered log book shall be supplied for each plant room.

28.11 Emergency Lighting

A 24 (12) Volt emergency light must be incorporated into the top section of the control panel in order to provide sufficient illumination for the safe operation and checking of the control panel. This light must switch on automatically in the event of a mains failure.

29.0 COMMISSIONING OF PLANT & EQUIPMENT

29.1 All instruments used shall be provided by the Contractor and shall be accurately calibrated and maintained in good working order.

29.2 Testing and balancing shall not begin until the system has been completed and is in full working order.

29.3 Tests shall be conducted by the Contractor in the presence of a Representative of the Engineer.

29.4 Two copies of the complete test reports shall be submitted to the Engineer prior to the first delivery of the project. Reports shall cover test and balance analysis for all air distribution and hydraulic systems. Sound tests for room type air conditioning equipment and all diffusers in occupied areas shall be included in the report. Reports shall be neatly typed

SITE 08

VOLUME 2.1 PART 3 FIRE PROTECTION TECHNICAL SPECIFICATION

1.0 Introduction and General

This detail specification complements and qualifies the foregoing standard specifications of material & workmanship. The standard specification should be regarded as a basis and guideline, with this detailed specification taking preference where any ambiguity is concerned.

In the event of any further technical ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority (unless stated elsewhere in Conditions of Contract).

- Schedule of quantities
- Detailed specification
- Drawings
- Standard specification

2.0 Scope of Work

This subcontract calls for the supply, installation, testing and commissioning of the specified Fire Protection Installation for the refurbishment of Site 08 Dimbaza Factories.

2.1 The following sections of work are included:

- a. Supply and Installation of complete:
 - Fire protection installation, complete with all pipework, holderbats, isolating valves, hose reels, hydrants (where indicated) and the connection of the reticulation to the underground civil fire mains connection, either within a valve box or a saddle.
 - Handheld fire extinguishers.
 - Signage.
 - All installed by SAQCC approved installer.
- b. Testing and certification:
 - Performing and submission of test records (as per SANS requirement) and certificates.
 - Issuing of SAQCC Fire Certificate of Compliance
 - Supply of Operators and Maintenance Manuals
 - Basic maintenance training for building maintenance staff
 - Provision of a twelve-month guarantee for the installation including a full service prior to expiry.
 - All other materials and labour necessary to complete the Works in full accordance with the specification and design contained or referred to in this document.

2.2 The following sections of work are excluded:

- Builder's work e.g., cut-outs in walls to Tenderer's specifications, including chasing and making good of walls.

3.0 Site Conditions

3.1 General

The equipment specified herein shall be designed to operate at the environmental parameters particular to Dimbaza, and surrounds.

4.0 Fire Mains Service Connection

4.1 New Fire mains bulk supply line to be installed by specialist SAQCC certified contractor.

5.0 **Pipe Locations, Materials and Specifications**

For steel piping of 75 mm diameter and larger (i.e. flanged) the hot dip galvanising to SANS 763, 1977 (when required) shall be after fabrication.

6.0 **Pipe Jointing and Fittings**

Mild Steel Piping and/or Galvanised:

- 6.1 Mild steel piping shall be joined by means of screwed sockets, navy unions or flanges. Red lead jointing or other approved jointing compounds may be used sparingly and exposed threads shall be painted with zinc chromate primer or equivalent paint to prevent rusting.
- 6.2 Where it is required to remove sections of pipe or where pipe joints will need to be tightened after installation and testing, unions or flanges must be provided to facilitate the work,
- 6.3 Welding construction is only permitted for pipes of 50 mm diameter or larger and then only when prefabricated and welded in the workshop of the installing engineers whose welding procedures, pre-approved by the Insurance Council of South Africa.

NO WELDING OR HEAT CUTTING IS PERMITTED ON ANY SITE OF ERECTION

The edges of pipe to be welded shall be machine bevelled wherever possible. Gas cuts shall be true and free of all burned material. Before welding the surfaces shall be thoroughly cleaned and degreased. Piping shall be carefully aligned. No metal shall project within the pipe. Mitred joints will not be allowed.

Only welded fittings prefabricated by recognised manufacturers will be permitted. No other prefabricated welding fittings will be permitted without the express approval of the Engineer.

For branch piping sixty five millimetres (65 minimum) in size or larger, use welding tees, with flanged outlet. For piping 200 mm and larger use shaped spigots and welding neck flanges. Cracks, pinholes, excessive undercutting etc. shall be removed and the joints rewelded. Welders and welding processes shall meet the requirements of the SANS Code for welders.

- 6.4 Jointing of mild steel and galvanised piping using grooved pipe fittings and couplings may be used provided they have been approved by SANS. Proper gaskets, designed for the applications shall always be used. Approval by the consulting Engineers must in all cases be obtained prior to the utilisation of such fittings.

7.0 **INSTALLATION OF PIPING**

All piping shall be installed in an approved manner to meet structural and architectural requirements, to avoid interference with the work of other trades and be finished in a neat and workmanlike manner with true alignments and grades. Piping shall be run to ensure sufficient access for inspection, testing, servicing, etc.

7.1 Storage

Deliver and store to Suppliers recommendations with plugged ends. Clean pipes thoroughly. In addition it is required that pipes are stored off the ground and under cover.

Keep the ends closed during erection with temporary caps. Before any pipe is installed it shall be upended and pounded to remove any foreign matters present.

7.2 Installation

Slope of Pipes

In order to prevent air being lodged, the pipe lines shall have a proper inclination throughout the work.

Also the sloping shall be such that the system can be thoroughly drained.

7.3 Underground Piping

- a) Unless otherwise specified, the Contractor shall not be responsible for the digging and backfilling of pipe trenches for underground piping in his contract. He is however to ensure that the excavations and laying of piping is in accordance with SANS 1 200 06, LD and LD, and that this specification is adhered to so that his installation can be correctly installed.
- b) The trenches shall be of such depth that when properly laid at least 750 mm of soil shall cover the top of the pipe.
- c) The pipes shall be laid on a clean, soft soil bed not less than 750 mm deep. When backfilling the trench, it shall firstly be filled to approximately 150 mm above the pipe again with clean soft soil and then compacted after which the final filling is to be made and again compacted (care shall be taken to ensure that no large stones or debris occur in the filling material).
- d) In the case of cement and uPVC piping the Contractor must ensure that the trenches are recessed where couplings or fittings are positioned such that the pipe lies flat on the bed. This is to prevent the fittings supporting the length of pipe. The Contractor is also to allow for any pipe movements, such as thrust at bends etc. Concrete blocks in accordance with manufacturer's specifications shall be provided at these points. Where asbestos cement piping cross roads etc., the pipe shall be protected by casting into concrete not less than 100 mm over the top of the pipe.
- e) Where steel or uPVC pipes are to cross roadways, under connecting corridors, etc., the Contractor shall provide PVC sleeves through which the pipes will pass. It shall be at a depth of not less than 750 mm below the surface and shall be encased in concrete not less than 150 mm all round. These sleeves are to be two pipe sizes above the size of the water pipe to permit the removal and the replacement of the pipe should the need arise.

7.4 Internal Pipe Runs

All piping shall be installed parallel to, or at right angles with building walls and partitions.

In general, all pipes shall be supported from the building structure in a neat and workmanlike manner, and whenever possible, parallel runs of piping shall be grouped together.

- a) Where pipes pass through walls, floors, ceilings, etc., they shall be sleeved. The sleeves shall be of PVC material and allow for pipe thermal reactions.
- c) Where pipe sizes are reduced, proper reducing fittings shall be used. On no account will bushes be accepted.
- d) Horizontal take-offs from vertical pipes shall be long enough before the next fixing to take up any movements or shall have an expansion loop to provide this facility.
- e) Every tube section shall be installed to have the possibility of expansion and contraction without restriction. It shall be anticipated that no deflection acts on very short tube section. Expansion loops or expansion joints and anchors shall be fitted in order to reduce the displacement of individual line elements and to deflect them to the points where they can act without damage.

7.5 Concealment of Pipework

Pipework must not be embedded in the concrete floors of a building, nor should it be concealed in any other situation where difficulty or undue expense would be involved in making alterations or additions which may subsequently be necessary. Concealment of pipework is particularly to be deprecated in the case of buildings in multiple tenure where erection of partitions to suit tenants may impair the effective distribution of water from the sprinklers and necessitate alterations in the positioning of sprinklers.

7.6 Pipe Hangers and Supports

- a) All pipes shall be supported from the building structure in a neat and workmanlike manner and, wherever possible, parallel runs of horizontal piping shall be grouped together on trapeze hangers.
- b) Vertical risers shall be supported at each floor line with pipe clamps. The use of wire, perforated metal straps, nails and so forth, to support pipes will not be permitted. Hanging of pipes from other pipes will also not be permitted.

- c) Vertical runs shall be secured by means of rustless holderbats or other clamps. Duckfoot supports shall be provided at the bottom of a vertical section of large piping (100 mm and above) to support the weight of the pipe and the water.

Under no circumstances shall a vertical pipe be supported from its highest point. Should any fittings be installed in the vertical sections, care shall be taken to ensure that these fittings are not in a state of tension through the combined weight of the pipe and the water.

- d) Horizontal pipes shall be supported by means of galvanised hangers at close enough centres to prevent sagging. The minimum recommended spacings for supports and hanger rod size shall be set out below:
- e) The hangers shall be protected against rust and adjustable in height. They shall be manufactured from rods of the diameter as specified above, one end threaded and bolted to an angle iron cleat or Unistrut section suitably secured to the structure. The other end shall be formed into an eye and bolted to the pipe clamp.

7.7 Changes in Material

Where piping material changes occur (i.e. copper to steel etc.) dielectric unions must be furnished and installed.

7.8 Threaded Pipe

The pipe connection shall be cut square and full threaded with clean cut tapering threads and shall be reamed after threading. All threaded connections shall be made with approved thread compound applied to male threads only, and shall be so made up that not more than two (2) threads will be exposed.

7.9 Testing of Water Piping

All piping installed on the project shall be hydraulically tested as specified herein. The Contractor shall provide all equipment required to make these tests.

Piping may be tested a section at a time in order to facilitate the construction programme.

The Contractor shall fill the section of the pipe to be tested with water and bring the section up to test pressure with a positive displacement type test pump. The tests shall be conducted by the Contractor in the presence of the Engineer or his representative. Gauges used in the tests shall have been recently calibrated with a dead weight tester.

All tests shall have full test pressure applied to the piping for a minimum of twenty-four (24) hours

The test pressure at any section of the system shall not be less than one and a half times the system working pressure or 1 500 kPa (Maximum) unless otherwise stated under Part Four of the specification.

When the test pressure has fallen over 6 percent (%) during the twenty-four (24) hour test period, the point of leakage shall be found, repaired and the test repeated. This procedure shall be followed until the piping system has been proven absolutely tight.

The use of chemicals or so-called "stop-leak" compounds will not be permitted at any time.

When instruments or gauges are installed in the piping system, they shall be removed during the tests if subject to damage from shock or excessive pressure. This does not apply to control valves.

Leaks shall not be repaired by mastic or other temporary means. All leaks shall be repaired by removal of the section that is leaking and reinstalling new material with joints as specified herein before.

7.10 Flushing of System Pipework

There must be a 50 mm diam. flushing connection fitted on the incoming main below each installation control valve. These flushing points must be plugged to prevent misuse.

7.11 Terminal Drain Valve

25 mm drain valves must be fitted at the extremity of the distribution pipe at each level of protection. This is to indicate that there is water at this point and that no blank flanges are left in the installation. The valve should be positioned at hand level and must be normally strapped closed.

8.0 **Fittings**

8.1 All fittings, including safety devices are to be placed and sized.

9.0 **Safety Devices**

9.1 Where applicable.

10.0 **Handling And Storage Of Materials, Fittings And Components**

10.1 Pipes, fittings and components shall be handled carefully to obviate damage

10.2 Manufactures' advice shall be followed as to how their products should be loaded, transported, unloaded and sorted

11.0 **Identification**

11.1 Colour Coding

11.1.1 General

All equipment shall be colour-coded in accordance with standards recognised, and where possible to comply with relevant SANS colour codes unless specified otherwise.

11.1.2 Colour Coding of Pipes

Identification of the contents of pipes shall either be by painting a 100 mm wide primary colour band or by using self-adhesive PVC coloured tape. The colour of the paint or tape shall comply with SANS 0140 Identification Colour Marking, Part III, Contents of Pipelines, as detailed below.

The colour names referred to in the table s are specified in SANS 1091.

TABLE OF COLOUR CODING FOR PIPELINES AS PER SANS 0140 PART III - 1978

CONTENTS OF PIPE PRIMARY COLOUR BANDS

FIRE FIGHTING

- All Pipes Signal Red

12.0 **Sterilization**

12.1 N/A

13.0 **Builders Work**

13.1 The Engineer will prepare details showing where all sleeves are to be positioned before any structural concrete is cast.

13.2 The Engineer's approval, in writing, must be obtained before any holes or chases are cut in any structural component i.e. brickwork, concrete, steel or timber.

13.3 The Contractor shall be responsible for cutting chases and holes in walls and slabs to accommodate his services which must be coordinated in liaison with the Main Contractor who will be responsible for making good.

14.0 **Excavation**

14.1 General:

Tenderers are to note that excavation shall be carried out by the main contractor.

15.0 **Operating And Maintenance Details**

15.1 Two complete sets of operating manuals complete with spares schedules, as-fitted layout drawings, schematic diagrams and operating and general maintenance information, bound in hardcover ring binders shall be prepared by the Contractor and delivered to the Engineer 14 days prior to practical completion for approval, at or before final handover.

15.2 A full "RECORD" set of drawings shall also be submitted to the engineer for record purposes.

16.0 **Schedules Of Information**

16.1 The schedules of information contained in this document consists of 2 sections :

- a. Information supplied by the Engineer (schedules of drawings, sleeves etc. as applicable.)
- b. Information to be supplied by the Contractor at tender stage

(tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable.)

16.2 Tenderers are required to enter, at the time of tendering, in the "Schedule of Equipment and Material Offered", sufficient details to enable the equipment concerned to be identified without ambiguity.

16.3 It is not sufficient for a tender to state "as specified" in the schedules.

16.4 Failure to complete these schedules (if applicable) may render a tender invalid.

17.0 **Samples And Alternatives**

17.1 Tenderers may be required to submit for approval, comment or records samples of materials, apparatus or components, and also drawings, schematic diagrams or technical details, including calculations, upon which their design and/or offer is based before any contract is awarded. Such details may also be called for during the course of the Contract prior to installation. Any approvals given or comments made shall be on the generality of the scheme and shall not relieve the Contractor of his responsibility to ensure the full compliance with all performance and regulatory criteria.

NOTE : A request for submission of samples or drawings does not imply that the Tenderer's quotation will necessarily be accepted.

17.2 Any particular make or model of equipment referred to in the Documentation is for guidance purposes only in setting standards / types / performances required; equipment that is equal or superior in all respects, and to the approval of the Engineer, may be offered by Tenderers. No reference to any particular make of any equipment shall be construed as that equipment having been selected by the Engineer or Client and the Contractor shall be fully responsible for the guarantee and performance of such equipment.

18.0 **Certification On Completion Of Guarantee And Maintenance Period**

19.1 In the month prior to the expiry of the guarantee and first twelve months maintenance period the Engineer shall inspect and, if necessary, retest the installation so as to be able to provide the Tenant with a certificate, within fourteen days of the guarantee expiry date, to confirm that the guarantee has been honoured and that the installation has been properly serviced at required regular intervals by the sub-contractor.

18.2 The cylinders shall be guaranteed from date of take over for a period of three years on the tank, insulation and outer casing and for one year on the electrical components

19.0 **Supervision Of Workmanship And Details**

19.1 The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the subcontractor, who must be able and authorized to receive and execute instructions on behalf of the Mechanical Subcontractor.

19.2 In the event that inferior materials or bad workmanship, on the part of the subcontractor, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the Subcontractor

These costs will be based on the SAACE hourly rates and will be deducted from claims due or claims which will become due to the Contractor.

20.0 **Making Good**

20.1 The subcontractor will carry out in all instances any work to be made good such as damage to, or disturbances of the building installations caused by himself or his employees during the execution of the contract, at his own cost.

21.0 **Test And Inspections - Pressure Testing And Quality Control**

21.1 The Contractor shall, at no extra cost to the contract, provide all the necessary equipment and facilities to conduct all tests as directed by the Engineer and or Supply Authorities.

22.0 **Commissioning And Testing**

22.1 Commissioning:

A documented method shall be followed whereby the mechanical subcontractor shall ensure that his installation is correctly constructed in accordance with the manufacturers' specifications, consultant's specification, consultant's design and all codes of practice and international design codes.

The commissioning procedure must allow for signing off of the major items of equipment by a qualified person in terms of the codes. These signed off documents will form part of the record drawings.

22.2 Performance Tests:

The mechanical subcontractor shall be responsible for the physical testing, in the manufacturing works, or on site, of the items of plant or systems as required by the Engineer. These tests shall be performed by the mechanical subcontractor or supplier of the equipment, and where called for, the Engineer shall witness such tests. The Engineer may also only witness a representative sample of the equipment tests. In any event, the mechanical subcontractor will supply documentary proof of full performance tests of all relevant equipment.

22.3 Acceptance Tests:

All brass fittings and valves shall be certified by the manufacturers to be free

From de-zincification and will be subjected to check tests as set out in the Detailed Specification

Acceptance tests will be performed on site of the working system or sub system, to show that the works, as installed, is functioning according to the specifications and design. The onus for the correct functioning of

the systems is still on the mechanical subcontractor irrespective of whether the Engineer has witnessed the acceptance tests or not. Prior to the system being connected, a test certificate must be issued by / given to the local electricity supply authorities.

23.0 **Compliance With Regulations, Standards And Codes**

23.1 The subcontractor will arrange for all inspections and testing of the installation after completion, including the issuing of the Certificate of Compliance. All notices, fees, including inspection and re-inspection are the responsibility of the subcontractor and all the relevant costs shall be borne by him.

23.2 The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

23.3 The Works will be executed in strict accordance with the following:-

- a. All relevant by-laws and regulations of local authorities.
- b. All relevant SANS, BS and other international standards of the latest revision, where applicable.
- c. The Occupational Health and Safety Act of 1993 as amended.

24.0 **Monthly Certificates**

24.1 Pro forma claim forms are available from the Engineer. These are available in a blank copied format or as a computer file in Excel. This is the preferred method of submitting payment claims. Should the subcontractor have developed his own method of claiming, this may be submitted to the Engineer for consideration.

25.0 **Programme**

25.1 The subcontractor must conform to the programme as submitted by the principal Contractor. The estimated period for completion, as tendered, is as per the builders programme. The cost of overtime, additional labour and plant for the completion of the works, in accordance with the programme, must be included in the Tenderer's price for the project. The cost of any work outside the requirements of the programme or necessary under exceptional circumstances will be for the Employers' account only if covered under a variation order.

25.0 **Drawings**

25.1 Tender Drawings

All drawings, those supplied loose, as well as those bound in, form part of this enquiry and are listed below:

- 2318-T-M-101 FP S08 RevA Fire Protection Equipment
- 2318-T-M-101 FS S08 RevA Fire Escape Sigange

It is the Tenderer's responsibility to inform the Engineer as to the absence of any of these drawings.

26.0 **Sufficiency Of Tender**

26.1 The Tenderer's offer shall be for the supply, delivery, installation and commissioning of the complete installation as detailed, described or implied in this document and on the accompanying drawings.

26.2 The Tenderer's offer shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and that the rates and prices he has entered in the schedules shall cover all his obligations under the contract for the proper completion of the Works.

27.0 **Measurement**

27.1 The Tenderer shall not make any assumption regarding the installation. If there is any doubt or ambiguity, the Engineer must be consulted. The Tenderer shall take cognisance of the fact that the schedule of quantities is re-measurable and the quantities may be adjusted at the end of the contract.

27.2 All measurements are nett, unless otherwise stated, and Tenderers must allow in the rate for wastage.

SITE 08

VOLUME 2.1 PART 5 SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : **Only one manufacturer's name to be inserted for each item.**

Item	Material	Make or trade name	Country of Origin
1.	Gavanised steel pipe		
2.	Non-Return Valves		
3.	Isolating valves		
4.	Strainers		
5.	Angle valves		
6.	Manholes		
7.	30m Hose Reels		
8.	Hand Held Fire Extinguishers		
9.	Pressure Gauges		
10.	Hydrant Connections		

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

SITE 08

VOLUME 2.2 PART 1: DOMESTIC WATER & HEATING EQUIPMENT INSTALLATION - 1 SCOPE OF WORKS

DOMESTIC WATER INSTALLATION

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.

2. THE CONTRACT

2.1 EARLY WARNING SMOKE DETECTION & SUPPRESSION INSTALLATIONS

The work to be carried out and commissioned by a PIRB / IOPSA approved plumber:

- a. Installation of new domestic water reticulation and heating equipment, as per SANS 10252,
- b. Testing and Commissioning, as per SANS 10252,
- c. Manuals, Drawings, OEM Literature,

2.2 Existing

All installations new. Building Existing.

2.3 Order of The Works

As per the building contractors' program of works.

SITE 08

VOLUME 2.2 PART 2: DOMESTIC WATER & HEATING EQUIPMENT TECHNICAL SPECIFICATION

1.0 GENERAL REQUIREMENTS

1.1 Project Specification

1.1.1 This specification applies to, and is to be read in conjunction with the drawings for the hot and cold-water reticulation to the building. Furthermore, this specification covers only the piping within the buildings. The requirements pertaining to the sections of piping from the ring mains to the buildings are covered by the civil engineer's specifications. Similarly, all tap fittings, shower fittings shall be to the architect's specification as detailed elsewhere.

1.1.2 In so far as the conditions contained herein are at variance with anything contained in the drawings, clarification shall be sought from the Engineer though generally the contract shall be interpreted in terms of the information contained on the drawings.

1.2 Occupational Health and Safety Act

1.2.1 All equipment supplied and installed under the contract shall meet the requirements of the Occupational Health and Safety Act (Act No 85 of 1994, (as amended) and all other relevant statutory requirements and the Contractor shall comply with the requirements laid down by the Inspector of Machinery under this Act.

1.3 Notices

1.3.1 The Contractor shall supply and install all notices and warning signs that are required in terms of the Occupational Health and Safety Act, by local by-laws or regulations and by these documents.

This includes notices prohibiting entry to un-authorized persons, etc.

1.4 Drawings

1.4.1 The drawings issued with this specification do not purport to show the exact position, size or details of construction of equipment.

1.4.2 Tenderers must satisfy themselves that the equipment offered by them can be accommodated in the available space and positioned in such a way that access for maintenance, repairs or removal is not obstructed.

1.4.3 Drawings showing any alternative suggestions differing from the Engineer's design must be submitted with tenders.

1.4.5 Approval by the Engineer of drawings submitted by the Contractor shall not relieve him of his liability to carry out the work in accordance with the requirements of the contract documents.

1.4.6 Project Drawings

The following drawings form part of this specification and must be read in conjunction with it:

- 2318-T-M-101 DW S08 RevA

1.5 Quality of Materials

1.5.1 Only materials of high quality shall be used throughout and shall be subject to the approval of the Engineer.

1.5.2 All materials, where applicable, shall conform in respect of quality, manufacture, tests and performance, with the requirements of the SABS / SANS standards, or, where no such standards exist, they shall conform to the appropriate current specification of the British Standards Institution. Materials manufactured in South Africa shall be used wherever possible.

- 1.5.3 Imported materials shall comply with the requirements of the relevant SABS / SANS or BS Specifications.
- 1.5.4 All materials shall be suitable for the site conditions. These conditions shall include weather conditions as well as prevailing conditions during installation and subsequent use.
- 1.5.5 Should the materials or components not be suitable for use under temporary site conditions the Contractor shall provide at his own cost, suitable protection until these unfavorable site conditions cease to exist.

1.6 **Tests and Inspections - Pressure Testing and Quality Control**

The Contractor shall, at no extra cost to the contract, provide all the necessary equipment and facilities to conduct all tests as directed by the Engineer and or Supply Authorities.

1.7 **Builder's Work**

- 1.7.1 The Structural Engineer's approval, in writing, must be obtained before any holes or chases are cut in any structural component i.e. brickwork, concrete, steel or timber.
- 1.7.2 The Contractor shall be responsible for cutting chases and holes in walls and slabs to accommodate his services which must be coordinated in liaison with the Main Contractor who will be responsible for making good.

1.8 **Protection of Equipment**

It shall be the responsibility of the Contractor to protect all reticulation work and fittings that have been tested and accepted by the Engineer in writing during the currency of the contract.

2.0 **SUMMARY OF SCOPE OF WORK**

This specification is for the supply, delivery, installation, testing and commissioning of fully functional internal water reticulation and hot water generating systems as well as any ancillary equipment as described below:

- 2.1 Hot and cold-water reticulation systems,
- 2.2 Solar water heating system consisting of 1x 100 L storage vessel, with 2 kW electrical output. Included in the installation are:
- All SANS required safety equipment, operating valves, strainers, etc.
 - Circulating pumps between solar collector and storage vessel, as specified or as per recommended minimum by heat pump manufacturer,
 - Control Panel,
 - Thermosatic mixing valves,
 - Insulation,
 - Bracketing, supports, drip trays, overflows,
 - Standby electrical heating elements, temperature controllers and sensors etc.
- 2.3 All piping, fittings, piping supports, valves, etc.
- 2.4 The heat pump frames shall be equipped with fastening points etc.
- 2.5 Maintenance and operating manuals, parts lists, manufacturer's data sheets, as built pipe diagrams showing valve locations, maintenance schedules and list of recommended spares for all equipment.
- 2.6 Pressure testing of all piping to a pressure of 600kPa, pressure testing of solar panels and geysers after installation to a pressure not exceeding the max. Allowable operating pressure as specified by the manufacturer, operational testing and commissioning of the installation and training of staff in the use, care and maintenance of the equipment. All pressure testing must be witnessed and signed off by engineer.
- 2.7 All test certificates, electrical compliance certificates and local authority approvals.
- 2.8 Full maintenance during the 5year guarantee period and full documentation to enable the end user to implement the 5-year guarantee on the solar equipment as specified.
- 2.9 All other items and requirements, whether specifically mentioned or not, for complete, functional and safe heat pump water heating systems complying with all the relevant codes and specifications.
- 2.10 All safety notices, safety plan and safety equipment.

3.0 PIPING SPECIFICATIONS

3.1 Copper Piping

Copper piping for domestic water services shall in all cases comply with the requirements of SABS 460 Class 2 and 3. For applications below ground class 3 shall be used, wrapped with Denso tape or similar.

Piping above ground shall be of class 2 and be jointed with capillary soldered fittings. Provision must however be made for union couplings in strategic places.

Pipes shall be firmly and neatly chased in or fixed to walls, as directed by the Principal Agent. Holder bats, saddles or brackets shall be of copper, bronze or brass. Holder batts, clips, etc shall be fixed to timber roof trusses or walls with brass screws. Piping chased into walls shall be wrapped with two layers of brown paper (Kraft) and covered with 3:1 cement mortar mix. Note that wrapping piping with old cement bags is **not** acceptable.

Hot water piping shall be of thin wall hard drawn copper.

3.2 Capillary Soldered Jointing of Copper Piping

- 3.2.1 Unless otherwise specified, all copper pipes shall be jointed with approved capillary solder type fittings, each joint being formed by cutting the pipe-ends square with a pipe cutter. If the tube end to be soldered is dirty due to cement, bitumen or tape-gum, it shall be mechanically cleaned with steel wool or abrasive paper prior to soldering.
- 3.2.2 The area to be soldered should then be thinly coated with a self-cleaning flux. To the fitting apply a flame using a LPG Gas blow lamp, (or an electric resistance machine) to the assembly to heat the tube and fitting for not longer than about 10 seconds. Then remove the flame completely and test the temperature of the joint by placing the wire solder at the mouth of the fitting. If the solder does not melt, remove the solder and heat again with the flame for a few seconds more. Test again with the solder. If the solder melts freely, hold the solder at about 45o to the mouth of the fitting, allowing it to melt and with steady pressure the solder will be drawn into the joint. DO NOT overheat the assembly and never hold the solder in the flame. Allow only the heat of the assembly to melt the solder.
- 3.2.3 Unless otherwise specified use only 2- or 3-mm solid core wire solder, type 97/3 (97% tin and 3% copper.) A careful check should be made to ensure that a ring of solder is visible around the mouth of the fitting.
- 3.2.4 Solders containing lead are not acceptable and not allowed.
- 3.2.5 No resin core or acid core solders are acceptable.
- 3.2.6 Fittings and pipes must be wiped clean with a damp cloth after jointing. Joints that have been fluxed should be soldered within one hour.
- 3.2.7 Copper pipes specified to be jointed with compression fittings shall be jointed with approved brass metal fittings with coupling nuts and rotary sleeve pieces.
- 3.2.8 All necessary couplings, connectors, elbows, tees and other fittings as may be required, shall be provided.
- 3.2.9 Copper pipes to be specified to be jointed with flared type fittings, shall be jointed with approved brass metal fittings with coupling nuts and cone.
- 3.2.9 N.B. Capillary, compression and flared type fittings used in jointing copper pipes must be of such a bore as will correctly fit the pipes, to ensure satisfactory jointing.
- 3.2.10 Compression ring or flared cone fittings shall always be used when making mechanical connections - see Clause 2.7 and Appendix A.
- 3.2.11 Note that compression type fittings may **NOT** be used with Class 0 copper piping.

3.3 Brazing of Copper Piping

3.3.1 If piping is to be brazed self fluxing copper/phosphorous with 2% minimum silver similar to Silbralloy shall be used.

3.4 Labour Bends

All labour bends shall be made with an approved bending machine in conjunction with a bending spring to give a uniform and even radius without ripple. Such bends shall be substantially undistorted.

3.5 Services Chased in to Walls

3.5.1 Hot water pipes buried in walls and floors shall be wrapped in two layers of stiff brown paper before being built in to aid thermal expansion of the pipes. It is **not** acceptable to use old cement bags for this purpose.

All copper water pipes chased into walls or cast into concrete slabs or columns shall be jointed using **capillary fittings only**.

3.6 Connections to Wash Hand Basins, Baths, Sinks, etc

Connection to all fittings (viz. taps, cisterns, machines, etc.) shall be mechanically made and not brazed or hard soldered. In this respect take note of clause 2.2.11 - it will be required that a suitable section of class 1 copper piping be joined to class 0 piping (where this has been used for the reticulation) and that the requisite compression fittings then be fixed to the class 1 copper piping. Jointing compounds (Teflon Pipe Sealer by Loctite or other approved and/or P.T.F.E. tape) shall be lead free and sparingly used.

Small diameter connections off the ring mains may be made using approved saddle connectors in conjunction with "Ball Valves" in accordance with the manufacturer's recommendations.

3.7 De-Zincification

All brass fittings and valves shall be certified by the manufacturers to be free from de-zincification and will be subjected to check tests as set out in Appendix A.

3.8 Pipe Supports and Support Spacing

All pipe work both vertical and horizontal shall be supported along its length with brackets capable of carrying the combined mass of the pipe and water and shall be spaced at the following maximum centres:

Diameter of c/c Brackets/ hangers/ holderbats (mm)	15 - 22	28 - 35	42 - 54	76 -108	Pipe (mm)
	1200	2000	2500	3000	

Unistrut: Type P1000 - 3300 (hot dip galvanised)
Brackets: P1108 - P1126 (see standard drawing)

All copper pipes shall be electrically insulated from holder batts, etc with P.V.C. tape wound around the piping.

Other support systems shall be subject to approval by the Engineer or his duly appointed representative.

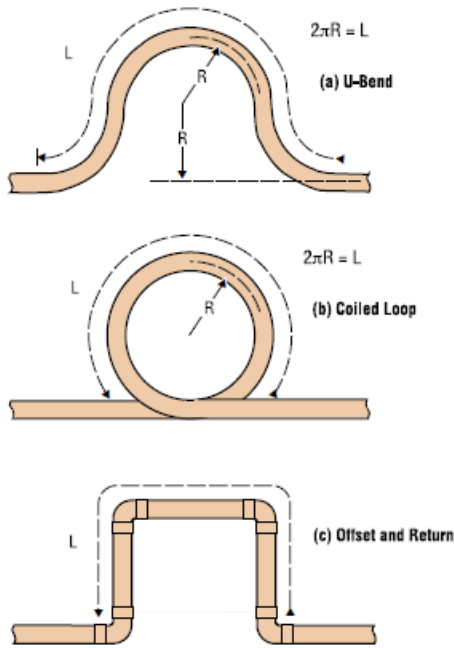
3.9 Pipe Gradients

Hot water pipes shall be laid to a minimum gradient of 1 in 200 with auto air release valves positioned at the highest points and vented to the outside.

3.10 Allowance for Expansion of Piping

All straight long runs in copper tubing shall be interrupted every 15 m with an offset or an expansion loop.

Expansion loops shall be provided as per standard practice for copper piping. The loop dimensions shall be as a minimum as follows:



Expected expansion in mm		LOOP LENGTH L AND RADIUS R FOR DIFFERENT PIPE ϕ		
		15mm ϕ	22mm ϕ	25mm ϕ
12	L	1250	1500	1700
	R	200	230	280
25	L	1700	2000	2400
	R	270	320	380
38	L	2200	2500	3000
	R	350	400	500

3.10 Pipe Gradients

Hot water pipes shall be laid to a minimum gradient of 1 in 200 with auto air release valves positioned at the highest points and vented to the outside.

4.0 VALVES AND FITTINGS

4.1 Isolating Valves

All toilets, kitchen areas etc. shall have a main isolating valve surface mounted inside those areas to aid maintenance.

Isolating valves are not allowed in the roof areas except for connections to geysers as shown on the drawings

Isolating valves on the cold water line shall be of the stop cock pattern up to 42 mm diameter and of sluice or gate valve pattern above 42 mm dia.

Where the static pressure is below 200 kPa all isolating valves on the hot and cold water system shall be of the sluice or gate valve pattern.

"Stop-cocks" or "Ball-valves" shall precede all individual fittings i.e. toilet cisterns, hot water geysers, washing machines etc. All "Ball-valves" shall have hard chrome plated balls seated on Teflon seats.

4.2 **Non-Return Valves**

All non-return valves shall be of the lift type pattern.

4.3 **Automatic Air Release Valves**

Automatic air release valves shall be installed at all high points in the reticulation system where air locks can occur or as detailed by the Engineer.

Air release valves shall be preceded by an isolating valve and vented to the outside.

5.0 **Insulation Materials**

5.1 All hot water piping must be insulated throughout with high density polystyrene R value of not less than 1 m².KW insulation.

5.2 Exterior hot water insulation must be protected with a protective membrane UV-resistant water and weather-resistant, pre-fabricated, self-adhering, sheet-type membrane. Should Tenderers wish to offer any other insulating material in lieu of the above full details must be submitted with tenders. Such alternative insulating materials may only be used if approved by the Engineer or his duly appointed representative.

5.3 The following minimum thicknesses of insulation are required:

Pipe Size	Thickness of Preformed Sections
Up to 40 mm diameter	25 mm
50 mm to 80 mm diameter	40 mm
100 mm diameter and over	50 mm

These minimum thicknesses are given as a guide. Tenderers are required to ensure that the insulation applied to piping is sufficient to ensure that the outside surface temperature of the insulated areas does not exceed 45 Deg C at an ambient air temperature of 20 Deg C.

5.4 Preformed insulation sections must be fixed in place by means of 15 mm wide bands of aluminium or similar non-corroding material applied at the rate of at least two per metre length on insulation.

Pre-formed insulation sections must be ordered specifically for steel or for copper piping. Pre-formed sections made to copper pipe sizes may under no circumstances be used for steel piping and vice-versa.

5.6 Valves and fittings must be left un-insulated. Pipe insulation adjacent to such fittings must be neatly chamfered off and finished off with sheet metal covers.

No more than 50 mm and no less than 40 mm of piping adjacent to fittings may be left un-insulated.

5.7 Where joints are cut out and repaired, the Contractor must re-paint the new welds prior to the application of insulation.

6.0 SOLAR WATER HEATING EQUIPMENT

6.1 the following codes are applicable but not limited to:

- SANS 10142: The Wiring of Premises Part 1: Low Voltage Installations
- SANS 10252-1:2012: Water supply and drainage for buildings Part 1: Water supply installations for buildings.
- SANS 1307: Domestic solar water heaters
- SANS 10106: The installation, maintenance, repair and replacement of domestic solar water heating systems.
- SANS 10254: The installation, maintenance, replacement and repair of electric storage water heating systems.
- Plumbing code of practice as prepared by Copper Tubing Africa and The Copper Development Association Africa.

6.2 Solar water heating system consisting of 1 solar panel with effective area of 2m², 1 of 100 litre indirect solar geysers and one of glycol expansion tank with minimum capacity of 10 liters. 1 of circulating pump with a minimum flow of 0.02 litre/second against a 5-meter head (min), insulated class 2 copper pipe system.

6.3 All piping, fittings, piping supports, valves, indirect solar geyser, double skin indirect solar heating coils, flat panel solar heating panels, bracketing, supports, safety devices, drip trays, overflows, standby electrical heating elements, temperature controllers and sensors, circulating pumps, expansion tanks, thermostatically controlled mixing valves and initial fill with 30 % propylene glycol solution.

6.4 Maintenance and operating manuals, parts lists, manufacturer's data sheets, as built pipe diagrams showing valve locations, maintenance schedules and list of recommended spares for all equipment.

6.5 Pressure testing of all piping to a pressure of 600kPa, pressure testing of solar panels and geysers after installation to a pressure not exceeding the max. Allowable operating pressure as specified by the manufacturer, operational testing and commissioning of the installation and training of staff in the use, care and maintenance of the equipment. All pressure testing must be witnessed and signed of by DRPW works inspector.

6.6 All test certificates, electrical compliance certificates and local authority approvals.

6.7 Full maintenance during the 5-year guarantee period and full documentation to enable the user/DRPW to implement the 5 year guarantee on the solar equipment as specified.

6.8 All other items and requirements, whether specifically mentioned or not, for complete, functional and safe solar water heating systems complying with all the relevant codes and specifications.

6.9 All safety notices, safety plan and safety equipment.

6.10 The flat panel solar water heating panels shall heat a 30% propylene glycol solution. The glycol solution shall be circulated to indirect solar geyser. The compulsory requirement for the system is that the glycol expansion tank will be placed inside the roof space at a position higher than the flat solar panel. The solar geyser shall be fitted with a double jacket heat exchanger through which the propylene glycol is circulated. The solar geyser shall also be fitted with a 2kW standby electrical element.

6.11 The glycol circulating pump shall be controlled by an electronic differential temperature controller. The temperature controller shall be adjustable, use Pt100 temperature sensing elements mounted in the top outlet of the solar panel header and in the return line of the circulating glycol system. The circulating pump will switch off if the return glycol temperature is higher than the glycol temperature in the solar panel.

6.12 The 2 kW standby electrical element in the solar geyser shall also be controlled by an adjustable temperature controller and interfacing relay. The standby electrical element shall only switch on when the temperature in the geyser is below 45 deg C and shall switch off when the temperature is above 55 deg C. These settings shall however be adjustable.

6.13 The solar panels shall each be of the flat plate type with a nominal area of 2 m².

- 6.14 The panel design shall be such that the average solar conversion is at least 65%. The absorption material shall be copper with a minimum of 8 risers and two headers. The size of the risers shall be at least 10 mm diameter and the headers shall be 22 mm diameter.
- 6.15 The collector case material shall be from aluminium with a minimum wall thickness of 1.3 mm. The glass cover shall as a minimum be from 4 mm low iron tempered glass and shall be hail resistant according to the requirements of SANS 1307. The panel shall be insulated with 45 mm thick glass wool with minimum density of 50kg/m³. The collector shall be sealed with a full profile EPDM seal. Aluminium and copper shall be galvanically insulated.
- 6.16 The allowable working pressure of the collectors shall be at least 1200 kPa and the units shall be frost resistant with a 30% glycol solution and shall be capable of withstanding a temperature of 300°C.
- 6.17 The panel shall be secured to the roof using corrosion proof proprietary roof brackets and support rails suitable for the roofing material specified by the architect. The panel shall be mounted onto mounting rails. The rails shall consist of at least three lengths extruded aluminium box sections spanning the full width of the panel(s) plus at least 50 mm beyond the end. The rails shall be spaced one at the bottom, one centre and one at the top. The maximum vertical spacing of the rails shall be 800 mm. The number of mounting points shall comply with the manufacturer's recommendations as well as the wind loading based on a wind speed of 42m/s as per SANS-10160. The roof structure shall be certified to carry the panel and geyser loads.
- 6.18 Each group of panels or single panel shall be fitted with a vent valve and vacuum breaker at the top outlet point.
- 6.21 The standby heater is required with a heat pump application the standby heater shall be switched on automatically on heat pump failure with heating called for.
- 6.24 Easily detachable/ openable panels of rigid construction giving access to all working parts of the unit shall be provided.
- 6.25 All valves, fittings, etc for a complete operational system are not indicated, but must be included in the price.
- 6.26 Set of temperature gauges included on the send and return pipes.
- 6.27 All spare parts for the heat pumps should be available from local South African suppliers that keep stock of these items with no lead times for supplying.
- 7.0 HOT WATER STORAGE VESSEL**
- 7.1 The storage vessel shall be manufactured from at least 2.5 mm thick steel. The geyser shall be internally coated with vitreous enamel capable of withstanding thermal shock and temperatures up to 130°C. Each geyser shall be guaranteed for a period of five years and shall be supplied complete with sacrificial anode suitable for use in water.
- 7.2 A minimum of 60mm high density polyurethane insulation shall be used between the inner tank and outer cover. The minimum R value of the insulation shall be 2.00m².°K/W.
- 7.3 The solar geysers shall be complete with full jacketed heat exchanger coil radially covering at least 97% of the storage cylinder.
- 7.4 The cold-water inlet shall be fitted with a sparge pipe to reduce the turbulence and forces on the standby electrical element.
- 7.5 All pipe connections shall be for diameter of pipe indicated on drawings.
- 7.6 The standby electrical heating element shall be from Incoloy 825 with a watt density below 8W/cm². The element tubes shall be marked with the manufacturers batch number with traceable reference to the material of manufacture that must be Incoloy 825. The element heating capacity shall be stamped on the element boss.

- 7.7 Each Cylinder shall as a minimum be supplied and installed with the following:
- Earth stud bonded to the earth system as well as earth bonding straps between the hot and cold-water pipes and any metallic cover etc.
 - Two vacuum breakers-one on the cold-water supply and one on the hot water outlet. The vacuum breakers must be mounted at least 300mm above the geyser and must be directly over the drip tray.
 - Pressure and temperature safety valve complete with independent 22 mm copper piping to a safe position outside the building.
 - Drain point and drain valve all mounted above the drip tray.
 - 400kPa combination pressure control, expansion and isolating valve with strainer.
 - Sacrificial anode.
 - Safety thermostat.
 - 4x 3 kW Incoloy 825 heating element.
 - Electrical isolating switch 1m from geyser complete with glands and flexible wire way to carry wiring to geyser element.
 - Bronze ball valves with stainless steel balls and handles to shut off the hot- and cold-water during maintenance.
- 7.8 The hot water cylinders shall be of a Vertical configuration as appropriate and be capable of accepting an add on heating system which may comprise of solar units, heat pumps or other fuel saving systems.
- 7.9 Pressure reducing valves shall be S.A.B.S. approved and factory set to maintain a pressure of 100 +/- 10 kPa at the cylinder outlet. The pressure reducing unit shall have as an integral part of that unit:
- (a) A pressure release valve with drain connection to protect the cylinder against thermal expansion of the water.
 - (b) A built-in strainer.
 - (c) A built-in non-return valve associated with the reducing valve.
 - (d) Isolating valves fitted to the inlet and outlet sides of the reducing valves.
 - (e) Combined Temperature, Pressure and Vacuum release valves fitted into the delivery side of the cylinder. The T.P. valve shall have a drain connection built into it and shall be fitted so that the probe is in the cylinder. The drain from the reducing valve and T.P.V. valve shall be laid to a fall of 1:60 minimum and discharge over a gully. The drain pipe shall be a minimum of 22 mm diameter.
 - (f) Pressure reducing valves shall be installed in accordance with the manufacturer's recommendations and **MUST BE POSITIONED FOR EASY MAINTENANCE.**
- 7.10 Certificates are required from the manufacturer of the hot water cylinders confirming at they have been pressure tested to 2,5 times the normal working pressure of 400 kPa gauge.

The hot water cylinders shall be guaranteed from date of practical completion of the installation for a period of three years on the tank, insulation and outer casing and for one year on the electrical components.

8.0 CIRCULATING PUMPS

- 8.1 The circulating pump shall be mounted with screwed unions so that the pump can be easily removed for servicing.
- 8.2 The pump body shall be from coated cast iron. The motor shaft, impeller, seal rings, jacket and shaft bushes/bearings shall be from non-corroding material. The motor body shall be from die cast aluminium. Seals and thrust rings shall be from ceramic capable of operating at the specified temperature (110°C) in a 30% propylene glycol solution.
- 8.3 The pump motor shall be capable of operating at 220/230V AC in an ambient temperature of at least 40°C. The motor insulation shall be at least class H according to NEMA. The protection rating shall be at least to IP44.
- 8.4 The pumps shall be controlled by a differential temperature controller as described under the section **BASIC OPERATION OF THE SYSTEM.**

9.0 ELECTRICAL WORK AND CONTROL PANELS

- 9.1 All electrical work must conform to SANS 1082 and a certificate of conformance (COC) must be issued for the installation. All cables must be secured to galvanised cable baskets. Wiring shall be done inside conduit.
- 9.2 All conduit, cable baskets and general items must be installed square, vertical and horizontal within the accuracy of a builder's level.
- 9.3 The main isolator and main circuit breaker shall be double pole for single phase units and triple pole for three phase units. The complete system shall be earthed and the COC shall cover all equipment associated with the installation.
- 9.4 The electrical supply from the nearest DB shall be done as part of this contract. Cable shall be fixed with saddles at maximum 400 mm intervals or be placed on galvanised cable baskets. All entry and exit points shall be fitted with bushes to prevent wire damage caused by sharp ends. Cable/wire sizes shall conform to the requirements of SANS 1082. All cable and wire loading shall include for all the electrical items plus an additional allowance of at least 20%.
- 9.5 The temperature controller shall be of the digital electronic type with at least two PT100 temperature sensor inputs. All the control parameters such as differential temperature, dead band and hysteresis shall be adjustable. The PT100 sensors shall be installed into the solar panel inlet and outlet pipes using pocketed temperature sensor wells with sealing glands. The temperature sensor leads shall be at least the three-wire type specifically made for PT100 sensors.
- 9.6 The controller output shall switch an interfacing relay to control the circulating pump. The pump shall not run if the glycol return temperature is higher than the solar panel outlet temperature.
- 9.7 The controller shall be placed in an easily accessible position without undue long leads.
- 9.9 The following equipment should be installed on the control panel as standard equipment for the installation:
- a) a main isolating switch;
 - b) circuit-breaker protection;
 - c) contactors;
 - d) thermal overcurrent protection;
 - e) surge breakers when the installation is exposed to the weather;
 - f) undervoltage and overvoltage protection in accordance with the relevant standards;
 - g) phase-failure and rotation protection (three-phase motors);
 - h) low water level protection;
 - i) short-circuit protection.

The size and characteristics of the equipment given above shall be determined by the following factors:

- a) the electrical fault level of installation;
- b) the starting current of pumps;
- c) the running current of pumps; and
- d) the supply voltage to the installation

10.0 HYDRAULIC TESTING OF WATER PIPES

All water piping shall be hydraulically tested to a pressure equal to 3 times the working pressure but not less than 1000 kPa held for 60 minutes or as long as it takes to inspect every joint in the section being tested, whichever is the greater. The test shall take place in the presence of the Engineer or his duly appointed representative with the results being recorded for inclusion in the practical completion documentation and certification

Under no conditions shall "leak cure chemicals" be introduced into the reticulation system.

All leaks shall be made good, so that the quality of the original components is not altered and so that the repairs are to the satisfaction of the Engineer or his duly appointed representative.

The Contractor shall provide all the necessary equipment required to carry out the tests on the pipes. Piping shall be tested in sections as the work progresses and before being covered in trenches or wall or floor chases. The completed pipe line shall also be pressure tested just prior to practical completion of the installation.

Failure to comply with the above will result in the contractor being required to expose the piping in question **at his own expense** in order for the pressure tests to be carried out.

11.0 PAINTING

All exposed and visible reticulation lines shall be painted by the Contractor. All piping shall be colour coded in accordance with the requirements of the SABS colour code. Identification of the contents of a pipe line shall be by means of painting a colour code on the pipes as required by the SABS colour code and these bands shall be painted on by the Contractor.

The colour coding shall consist of a primary colour only or of primary and secondary colour and shall generally consist of 300mm long primary colour bands painted around the pipe. Where applicable a central 100mm secondary colour band shall be added. Where short lengths of pipes run through occupied areas and in plant rooms the primary colour shall be applied to their entire length.

Where only bands can be applied they shall be at intervals of not more than 6m apart and adjacent to each side of a bend, valve, etc.

Where pipe runs are hidden, i.e. within ducts, false ceilings, etc colour coding bands shall be provided opposite each access panel or similar.

Arrows indicating the direction of flow of the contents of the pipe shall be applied as per colour coding bands.

21.0 LABELLING OF VALVES, ETC.

All main stop valves, control valves, etc. shall be labelled by means of rustless metal tags indicating their purpose and the section they isolate, if isolating valves. The tags shall be securely fixed to the valves, and shall be clearly legible.

Letters on labels shall be punched. No painted labels or plastic embossed labels will be accepted.

Alternatively 12 mm wide stainless steel tape embossed labels may be used fixed with copper wire to the relevant valves.

13.0 WARRANTY

The contractor is to guarantee all the systems and workmanship for a period of twelve (12) months against any defects (latent or obvious), non-conformance and/or failure from date of first delivery. The glycol expansion tanks, indirect solar geysers, solar panels and brackets shall carry a guarantee of 5 years. Documentation to support such a guarantee on the equipment shall be provided for safe keeping by DRPW. Any defects and/or failure that may occur or become evident during the guarantee period shall be rectified within twenty four (24) hours after being notified of the occurrence of the defect. In the event that such failure and/or defect constitute a threat to the health and safety of the user and/or occupants, the contractor shall take immediate steps to rectify the fault. Any faulty item that becomes evident during the guarantee period shall be replaced with new and not repaired. The contractor shall also submit to the Department of Public Works AND school management a full report describing the nature of failure, cause of failure and possible methods to prevent future failure.

In the event that the contractor does not attend to such defects after being notified, the Department of Public Works and/or user reserve the right to effect the rectification of the defect and recover the costs thus incurred from the contractor.

14.0 MAINTENANCE

Immediately after each interim or final practical completion inspection all defects noted shall be rectified. Latent defects appearing within three (3) months or as specified, shall be rectified by the Contractor at no charge to the client.

SITE 08

VOLUME 2.2 PART 2: SCHEDULE OF MATERIALS OFFERED

DOMESTIC WATER & HEATING EQUIPMENT INSTALLATION

SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : **Only one manufacturer's name to be inserted for each item.**

Item	Material	Make or trade name	Country of Origin
1.	Copper Piping		
2.	Isolating Valves		
3.	Strainers		
4.	Non-Return Valves		
5.	Safety Valves		
6.	Vacuum Breakers		
7.	Balancing Valves		
8.	Pressure Reducing Valves		
9.	Solar Vacuum Tube Collectors		
10.	Pipe Insulation		
11.	Hangars		
12.	Heat Pump		
13.	Storage Cylinder		
14.	Thermostatic Mixing Valves		
15.			

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.
Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

SITE 08

VOLUME 2.3 PART 1: HVAC - SCOPE OF WORKS

HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

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.

2. THE CONTRACT

2.1 HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

The work to be carried out and commissioned by a SAQCC gas approved installer:

- a. Fresh air and extraction ventilation systems,
- b. Testing and Commissioning, as per SANS 10400 Section T & W and SANS 10252,
- c. Manuals, Drawings, OEM Literature,

2.2 Existing

All installations new. Building is Existing.

2.3 Order of The Works

As per the building contractors' program of works.

SITE 08

VOLUME 2.3 PART 2: HVAC - STANDARD SPECIFICATION

1.0 GENERAL

The scope of Work is as stated in 1.0

The system shall offer the best possible compromise between the initial expenditure and the long term interest and redemption charges and running/operating costs.

The design and installation shall comply with the codes of practice and standards promulgated by recognized authorities in the fields of air-conditioning, refrigeration, ventilation, piping, electrical technology and all other branches of engineering science applicable, such as the S.A.N.S., B.S.S., A.S.H.R.A.E., SMACNA and A.S.M.E.

All workmanship and materials used in the execution of the works shall conform to modern practice and the entire installation shall comply fully with all relevant requirements of governmental and the Local Authority whose jurisdiction embraces the location of the site.

2.0 BIDS

2.1 Conditions of bid

The attention of bidders is drawn to the conditions of bid as indicated on the official bid form.

2.2 Modifications

Bidders are at liberty to submit modifications based on their standard practice and such modifications, with reasons therefore, shall be clearly stated in the bid. The price for this shall not be included in the net bid price but shall be stated separately as an extra or an omission.

2.3 Checking of bid documents

On receipt of the bid documents, the bidder must, prior to submitting his bid, check all the bid documents and should any difference or discrepancy between or in the Drawings and Specification be detected by the bidder, he shall seek in writing a decision also in writing of the Representative/Agent on the true intent and meaning of the bid documents as the East London Industrial Development Zone cannot be held liable for the additional cost of extra work that may be caused as a result thereof.

2.4 Scope of bid price

The bid price and all prices and/or rates which are inserted into the price schedules in the Specification and transferred to the bid form, must be for the execution and completion of the Works in accordance with the Drawings, Specifications and Conditions of Contract, as well as for the provision of all labour, materials, workmanship, machinery, plant and everything that is or may become necessary.

If there are or may be any exemptions from levies, customs duties, tax, etc applicable on materials, goods or work, the bidder must make his own arrangements therefore, as the bid price shall be regarded as comprehensive.

2.5 Value Added Tax

The bid price shall include Value Added Tax payable in terms of the Value Added Tax act, 1991 (Act 89 of 1991).

2.6 Information required with bids

Bidders shall supply with their bids a full specification where necessary, including dimensioned drawings or sketches of the plant, and a complete wiring diagram of any automatic controls.

Particulars shall be given as set out in the schedule concerned which shall be filled in by the bidder. Failure to comply with these requirements may render the bid liable to disqualification.

2.7 Proof that materials are available

A bidder may be required, before acceptance of his bid, to furnish proof to the satisfaction of the Representative/Agent that he is in a position to secure all the materials required to complete the Contract within the contract period stated in the contract documents.

2.8 Bid documents and ownership thereof

The bid documents consisting of the official bid form, the specifications and the drawings (if any) scheduled in the Specification, and which have been made available to bidders, are the property of the East London Industrial Development Zone and shall be returned to the East London Industrial Development Zone, whether or not a bid is submitted.

3.0 THE SITE

3.1 Definition of Site

<u>Location:</u>	Dimbaza, Eastern Cape		
<u>External:</u>	Summer Max. Average		: 26°C
	Winter Min. Average		: 6°C

3.2 Inspection of Site

Bidders shall visit the Site before bidding and satisfy themselves as to the local conditions, the accessibility of the Site, the full extent and nature of the work to be done and the conditions affecting the execution of the Contract generally. Claims on the grounds of lack of knowledge in such respects or otherwise will not be entertained.

3.3 The Site

The Site to be occupied by the Contractor will be clearly defined on the site plan, or will be pointed out to him by the Representative/Agent. The Contractor will on no account be allowed to extend his operations beyond the boundaries of the Site.

3.4 Procedure of work (Site in occupation)

If the site will be in occupation during the course of the Contract, the Works shall be carried out at such times and in such manner as will cause the least inconvenience to the occupants, and still allow the work to be proceeded with expeditiously. The instruction of the Representative/Agent shall be complied with in regard to the carrying out of any portion of the works which in his opinion requires to be expedited and priority shall be given to such work as and when directed.

(Site not in occupation)

If the Site will not be in occupation during the course of the Contract, the Works shall be proceeded with expeditiously. Priority shall be given to any portion of the Works as indicated in the Specification.

3.5 Existing services

If the Contractor encounters any existing services such as cables, pipes or sewers during the execution of the works, he must immediately notify the Representative/Agent, halting all work in the vicinity thereof, until instructions to proceed have been given by the Representative/Agent. Electric wires, telephone wires, pipes, etc., shall not be interfered with during the course of the Contract, but should it be necessary to disconnect or cut any such wires or pipes the Representative/Agent shall be advised thereof and his instructions awaited.

3.6 Protection of trees, shrubs and plants

The Contractor will be held responsible for any damage to trees, shrubs and plants on the Site and shall make good such damage at his own expense.

Trees, shrubs and plants may only be removed as indicated on the Drawings. The remaining trees, shrubs and plants may not be removed, cut back or disturbed in any way without the written consent of the Representative/Agent.

3.7 Water for the Works

The contractor shall provide all water he may require for the execution of the Works at his own expense.

3.8 Electricity for the Works

The Contractor shall provide all electricity for the execution of the Works at his own expense.

3.9 Recoverable materials property of Contractor

Items specified to be removed, taken out, demolished or dismantled and which are not specified for re-use, or for handing over to the Representative/Agent or others, become the property of the Contractor and must be removed from the Site immediately.

4.0 **ADMISSION TO SITE**

4.1 Permission for admission to and establishment on Site

Before the Site is visited by bidders or before the successful bidder (Contractor) establishes himself on the Site, the Representative/Agent's prior approval must be obtained. The Representative/Agent will, in the case of a Site located in defence or other security areas, make arrangements with the unit commander, or in the case of other Government sites, with the officer-in-charge, for permits for inspection of the Site for bidding purposes.

5.0 **PAINTING**

Painting shall only be necessary to those items which would normally be visible or visible when serviced, all mild steel or other components which would otherwise suffer corrosion if unpainted, however, shall be painted with two coats of rust-proof paint whether such components are normally visible or not.

Items which are factory-painted need not be repainted other than any making good which may be necessary. All plants requiring painting shall be correctly prepared and painted. No untreated metal surfaces shall be permitted on the project.

Items which are not galvanized or similarly protected against rust and corrosion shall be painted, as later detailed herein. No equipment, hanger brackets, etc., shall be permitted to be delivered on site in unprotected form; they shall be factory-coated with an approved zinc-rich prime coat before dispatch from their place of manufacture.

Painting shall comprise the following consecutive processes. First thoroughly clean, descale and degrease all surfaces, in accordance with acknowledged good practice, follow with a good coating of approved zinc-rich primer and finish with two coats of quality high-gloss enamel of an acceptable make. Final finish shall be to the full approval of the Engineer.

With the exception of ducting and piping, items with a galvanized finish, such as cable trays, need not be painted but shall be properly cleaned with a suitable proprietary galvanized iron cleaning fluid.

Particular care shall be taken that appropriate primers be used as a basis for painting and that paint be of high quality manufacture, all to provide a completely satisfactory finish to the approval of the Engineer. It shall be noted that galvanized surfaces are to be treated to ensure proper bonding of paint.

Whereas it would not be necessary to paint any ductwork conduits or pipe work installed in roof voids, shafts masonry ducts, etc., or where not normally visible, it is a requirement that such equipment be properly cleaned, treated with two coats of rust proofing paint if not galvanized or not metal subject otherwise to rust.

All equipment on the project shall be colour-coded in accordance with standards recognized in the Republic of South Africa and, where possible, to comply with relevant South African National Standard Colour Codes. (SANS. 01091-1975).

6.0 PIPEWORK

Refrigeration pipe work shall be carried out in seamless refrigeration quality copper tubing, suitable provision being made that the piping is not subjected to any stresses by vibration from the compressors.

7.0 EQUIPMENT SUPPORTS

Where equipment supports, stands, platforms and suspension brackets are indicated, specified or necessary for ductwork, pipe work, etc., the Sub-contractor shall provide supporting structures capable of carrying the load without distortion, affixed to the building structure in such a manner as not to subject it to undue stress.

Supporting of any rotating equipment shall incorporate vibration mountings of the type and selection specified in the applicable clauses referring to equipment bases herein.

All methods of suspension or supports shall be submitted to the Engineer for approval and for reference to the Structural Engineer where necessary prior to manufacture or installation.

Generally, supports shall preferably be proprietary products such as Unistrut or failing this, shall be of mild steel sections, purpose fabricated for their application. Under no circumstances whatever will sheet metal straps or plastic tie-wraps be accepted as a supporting method.

All supports shall cradle the item to be supported; shall not be riveted or welded to the equipment to be carried except in exceptional circumstances approved by the Engineer. Rod hangers shall not exceed one meter in length and be of minimum diameter 12 mm. For longer suspensions use mild steel angles. Angel iron supports shall be of 25 mm x 3 mm minimum. All supporting structures for equipment shall be dip galvanized.

Fastening methods shall employ REDHEAD or RAMSET anchor bolts or their equivalent for fixing supports to the building structure, it not being permissible to utilize gunpowder shot-driven bolts for this purpose unless prior approval be obtained.

Pipe work supporting holder bats shall be the product of a recognized manufacturer of such equipment, shop-fabricated saddles or similar devices being unacceptable unless limited space available necessitates their use. On insulated pipe work, hardwood inserts consisting of two-round machine cut pieces of timber shall be clamped around the pipe, insulation being cut away at such points, to allow proper support fitting. Wooden inserts shall be of the same thickness as adjoining insulation and 50 mm longer than the width of the holder bat support, to permit correct finishing of the insulation of vapour sealing to them.

Cable and flexible pipes shall be supported on Unistrut or equivalent perforated galvanized cable trays, manufactured by specialists, shop-fabricated trays or racks not being acceptable. The cable tray shall be suspended or bracketed using suitable mild steel angles.

8.0 DRAINS

The sub-contractor to provide all necessary drain piping laid to suitable falls from every item requiring such drainage. Such drains shall be run to the adjacent relevant drain points shown on the Drawings.

Drainage pipe work shall be adequately sized and carried out generally in medium grade galvanized piping and secured to wall (where applicable), all connections to equipment being effected with conical faced unions or flanged.

Drainage pipe work of longer than 4,5m run shall be provided with cleaning eyes on all bends to facilitate maintenance.

All condensate drainage is to terminate to the nearest drain.

9.0 ASSEMBLY OF COMPONENTS

- 9.1 It is essential that all mating components such as couplings, taper lock bushes, machined faces, etc., be thoroughly cleaned with a suitable solvent before assembly. All surfaces must be free from burrs or irregularities, which may prevent the correct mating of the surfaces.
- 9.2 A molybdenum-disulphide lubricant similar or equivalent to Mobil-grease Super shall be used on the threads of all bolts and between the mating surfaces of all parts closely fitted together, such as shafts and couplings, keys and base plates. PTFE tape shall be used in all screwed pipe connections.

10.0 WELDING

- 10.1 Welding shall be carried out in accordance with the current edition of SANS 044 Parts I to VII where applicable.
- 10.2 All welded filler or butt joints shall be free from porosity, cavities and entrapped slag. Joints shall be ground smooth, if required for aesthetic reasons only, without effecting weld strength.
- 10.3 The joints in the weld run, where welding has been recommended, shall be as smooth as possible and shall show no pronounced hump or crater in the weld surface.
- 10.4 The profile of the weld shall be uniform, of approximately equal leg length and free from overlap at the toe of the weld. Unless otherwise specified the surface shall be either flat or slightly convex in the case of fillet welds and with reinforcement of not more than 3mm in the case of butt welds. The weld face shall be uniform in appearance throughout its length.
- 10.5 Filler metal electrodes shall be of an approved type for the material being used and shall be kept in a dry condition. All electrodes shall conform to SANS 0455.
- 10.6 Only welders in possession of a valid approved competence certificate shall be employed.
- 10.7 All welds must show proper fusion.
- 10.8 Where welding is contemplated in pipe work systems, Tenderers shall allow for the removal and testing by an approved body of 5% of the welded joints in the system. These will be removed at random as indicated by the Engineer and tested. Should faulty welding be discovered, all other joints shall be X-ray tested by the SANS or an approved body, all at the expense of the Contractor.

11.0 GALVANISING

- 11.1 Unless otherwise specified in the Detailed Specification the following items shall always be galvanised:
- a) Fabricated mild steel sections exposed to the weather.
 - b) Steel grilles and louvers exposed to the weather.
- 11.2 Where hot dip galvanising is called for, items to be galvanised shall be entirely pre-fabricated and then dismantled in sections for galvanising. No cutting of threads or welding will be accepted after galvanising.
- 11.3 All hot dip galvanising shall be carried out in accordance with SANS 0934 and SANS 0763 where applicable, including preparation for galvanising.
- 11.4 Mild steel plate and sections shall be of good commercial quality, or higher grades, best suited for galvanising. The materials shall be free from slag or coarse laminations, fine fissures and rolled-in impurities.
- 11.5 Castings shall be sound, dense and clean, and free from distortion, porosity, carbon and slag enclosures, blowholes, and other injurious conditions.
- 11.6 Welding flux shall be chipped away and all welds wire brushed before galvanising.
- 11.7 The surface to be galvanised shall be free from paint, oil, grease and similar impurities.

- 11.8 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanising.
- 11.9 The Engineer reserves the right to inspect all steel components before galvanising, and shall have the right to reject or ask for remedial treatment of any material which is considered to be unsuitable. This applies particularly to welds.
- 11.10 The galvanising coating shall be smooth, adherent, continuous and free from black spots or flux stains.
- 11.11 Globular extra-heavy deposits of zinc, which interfere with the intended use of the material, will not be acceptable. Excessively protuberant lumps and nodules shall be removed by hot wiping or by the skilful application of mechanical means, however there shall remain a sufficient minimum thickness of unbroken zinc coating. Flaws on small parts and working surfaces shall be repaired only by stripping and re-dipping.
- 11.12 Repairs to galvanised coatings will not be accepted. Items damaged will need to be re-galvanised.
- 11.13 Coating thickness shall be as per table 1 of SANS 0763 unless otherwise specified in the Detailed Specification.
- 11.14 The SANS requirement for uniformity shall apply.
- 11.15 Galvanised surfaces specified with paint finishing shall not be passivated.

12.0 BEARINGS

12.1 Anti-friction

Anti-friction bearings shall include all bearings, which provide rolling contact between one or more sets of hardened steel balls or rollers and hardened steel rings or raceways.

Anti-friction bearings shall be of approved manufacture and available throughout South Africa.

To facilitate maintenance, spares interchangeability and standardisation, anti-friction bearings of standard design and manufacture shall be employed. All anti-friction bearings shall be provided with greasing facilities in accordance with manufacturer's requirements.

12.2 Bushed Bearings

Only where specifically stated in the Detailed Specification and in the case of low velocities and light loads in moisture free conditions will bushed bearings be accepted. All bushed bearings shall be made of an approved bearing metal composition, which has good anti-friction qualities and is capable of withstanding severe usage in the specific application.

All bushed bearings shall be provided with lubrication facilities to ensure adequate lubrication and shall be properly grooved to distribute the lubricant uniformly over the bearing surfaces. Grooves shall not be cut into the journal, but always into the surrounding bush. The edges of all chambers and grooves shall be rounded to avoid sharp corners and to facilitate the introduction of the oil or grease between the journal and the bearing metal.

12.3 Self-lubricating or oil less bearings

Self-lubricating or oil less bearings shall only be used on application of light and low velocities in moisture free and low humidity conditions and where access to bearings is difficult and likely to be neglected during servicing.

The type of bearing metal composition used shall have frictional and wear resistant properties akin to those of grease lubricated bushed bearings.

13.0 NOISE AND VIBRATION CONTROL

13.1 General

Unless otherwise specified in the Detailed Specification the design,

Manufacture and installation of all the mechanical and electrical equipment shall be such as to ensure compliance with the relevant sections of SANS 0103 of 1983 "The Measurement and Rating of Environmental Noise with Respect to Annoyance and Speech Communications", as amended.

Any installation where the measured residual sound level exceeds the maximum desired residual sound level as per SANS 0103 shall be rectified to comply with SANS 0103 at the Contractor's own expense.

In all plant room applications where airborne noise cannot be limited or comply with the set standards, provision shall be made for acoustical treatment of the equipment involved or, alternatively, total enclosure thereof with acoustical panelling to comply with requirements laid down in this specification.

Such provisions shall be included in the tender price and no claims for payment to comply with this requirement will be entertained.

13.2 Vibration Isolation

Proper provisions shall be made in the foundations and mountings of all equipment capable of transmitting vibration forces to its environment, whether local or remote, (As is the case with pipes) for vibration isolation.

14.0 DAMPING

14.1 Where static deflections in excess of 8mm are indicated, steel springs shall be employed incorporating acoustic sound pads in series with the spring.

The horizontal stiffness of the springs shall not exceed that in the vertical, in particular for systems mounted at vertical frequencies below 5Hz.

Low frequency mounts shall incorporate rubber snubbers to accommodate extreme horizontal or vertical motions such as can occur near resonance during start up.

The snubbers shall however not be relied upon to provide the necessary horizontal stability of the machine in normal operational conditions.

Spring layouts and inertia blocks shall be employed to avoid this situation.

For static deflections below 8mm, rubber in shear mounts may be used provided the frequency is above 6Hz.

For small static deflections less than 4mm and particularly for high-speed machines and general acoustic isolation, ribbed rubber neoprene composite pads may be employed subject to the specified requirements.

No equipment shall be installed in critical areas without correct and approved vibration isolation. Sufficient stability and damping shall be incorporated in the mountings to minimise the movement of the machine during start up or changes in the operating conditions.

The selection of mounts shall take proper cognisance of unequal distribution of the mounting weight of equipment and rotational and/or pressure forces acting thereon.

15 PUMPS

Where condensate pumps are required, the pumps shall be totally enclosed in the corner of the surface mounted trunking, and shall be specified to pump the maximum condensate generated by the unit.

16.0 FANS

16.1 Centrifugal Fans

No centrifugal fan shall be selected in a class range other than Class 1 or 2 and the rotating speed of the fan at duty point shall not exceed 1 440 r/min.

Centrifugal fans in critical areas and fans above 7,5kW shall in all cases be mounted together with the drive motor on anti-vibration mountings together with the correct inertia mass.

16.2 Propeller Fans

Propeller fans shall comply with the criteria already laid down and shall be carefully selected for the highest possible efficiency with due regard for the noise criteria.

Propeller fans in excess of 0,5kW and of rotational speed higher than 800 r/min shall, in addition to the requirements already laid down, be mounted on correctly selected and installed anti-vibration mountings to reduce possible vibration transmission to surrounding structures.

16.3 Axial Flow Fans

Axial flow fans shall be selected for the highest possible efficiency and comply with the noise criteria specified. In critical areas no fan shall be installed without attenuators on inlet and outlet sides.

In addition it will be required that the fan as a whole be mounted on anti-vibration mountings and where specified in the Detailed specification, it may be required for the fan to be enclosed in acoustic panelling.

No axial flow fan may be installed without anti-vibration mountings to match the fan characteristics and in critical areas it may be required for the axial fan to be provided with inertia mass to match.

Fan rotational speeds specified in the Detailed Specification shall not be exceeded.

17.0 **PIPING**

17.1 General

Under no circumstances may any piping be directly connected to noise generating equipment such as pumps, chillers, cooling towers etc.

Connections to such equipment shall be made with correctly selected flexible rubber type connectors of the spherical type.

In critical areas double spherical rubber type isolators immediately adjacent to the noise generating machine will be required.

17.2 Pipe Penetrations Through Walls

Under no circumstances will pipe penetrations through walls be permitted where the pipe comes in direct contact with the surrounding wall or structure.

At such penetrations it is required that a sleeve of 25mm thick soft neoprene, or other approved material, be provided around the piping at the penetration and, where plastering is applied, plastering shall be cut back to the outer edge of this sleeve.

Rubber links similar to the LINK-SEAL bolted type are preferred.

17.3 Pipe Supports

In all critical applications and within the first ten meters of all equipment, it is required that pipe supports shall be of the flexible type, correctly selected for the application and with the correct static deflection.

Any other areas and applications at risk of noise or vibration transmission to the surrounding structure similarly require pipe mountings isolated from the structure.

Pipe supports fixed to sensitive building elements will not be permitted.

17.4 Refrigerant Piping

Refrigerant piping in critical applications shall similarly be supported on anti-vibration mountings and in addition, delivery and suction piping at compressors and air handling units shall be provided with at least two braided flexible connections installed at 90° to each other and in close proximity of each other.

18.0 SOUND ATTENUATORS

- 18.1 Where required, in order to comply with the noise and vibration criteria already laid down, or where specified in the Detailed specification, sound attenuators shall be provided for ventilation, air conditioning and all other plant (Duct mounted and/or as applicable).

Primary sound attenuators shall be installed near or in the plant room.

The attenuators selected shall match the specific fan or plant characteristics to ensure the correct insertion loss to meet the sound criteria laid down.

Unless otherwise specified, sound attenuators shall be installed with flexible connections at the inlet and outlet connections.

The sound attenuators shall in addition be selected to produce the minimum pressure loss across the attenuator coupled to the least re-generated noise level produced by the flow through the attenuator.

- 18.2 Unless otherwise specified, air path sound attenuators shall be manufactured from galvanised sheet steel with the sound absorption material moisture repellent and erosion resistant up to 20 m/s air speed, and preferably flange connected.

Wherever possible attenuators shall be proprietary type supplied by the same manufacturer as the plant manufacturer to ensure complete compatibility.

Where not clearly indicated on the drawings, attenuators shall in all cases be provided at points where supply and return air ducting leaves the plant room and shall be installed to prevent noise breakout from the plant room via the ductwork.

Where specified in the Detailed Specification and indicated on the drawings, additional cross talk attenuators shall be installed in the air conditioning or ventilation ductwork.

The internal free area of sound absorbers shall be not less than the cross sectional area of the connecting duct as indicated on the drawings.

- 18.3 Field fabricated type sound absorbers shall be made as follows:-

All sides of rectangular ducting shall be double walled with the inner walls perforated with 10mm holes at 25mm centres. The space between the two sidewalls shall be divided into 3 unequal sections by means of 25mm thick cement fibre panel strips and filled with glass wool. The lining thickness shall be at least 80mm.

Circular

ducts shall be lined as specified above except that the lining thickness shall not be less than 100mm.

19.0 AIR FILTERS

- 19.1 General

Filters of the type, size and quantity as specified in the Detailed Specification shall be provided.

Filter efficiency and arrestance shall be in accordance with ASHRAE Test Standard 52-76.

Filters and filter holding frames shall be of approved manufacture with standardised dimensions to enable replacement with equivalent filters of all recognised manufacturers.

Construction and manufacture of all components shall be such that under no circumstances any unfiltered air can by-pass filters or filter banks.

Sufficient space shall be allowed in front or behind filters, as applicable, to enable inspection and servicing.

Proper access doors shall be fitted to filter service areas.

Filters installed close to exposed air inlets shall be weather protected with weather louvers and a wire mesh screen.

Tubes for the measuring of the pressure drop across each filter bank shall be fitted as standard to enable connecting a manometer or other instrument as specified.

All filters and filter banks, including two-stage high efficiency and final filters shall be fitted with inclined pressure differential manometer gauges, clearly marked with filters clean (green) and filters dirty (red) indicators of a permanent type.

A separate manometer shall be fitted for each filter stage.

Fan and system selection shall allow for expected final filter resistance to ensure a supply air quantity in excess of 90% of design air quantity immediately prior to filter replacement.

Unless otherwise specified in the Detailed Specification only dry media filters are required. Where specified, pressure monitoring across a filter bank or banks shall be fitted for alarm purposes using differential pressure switches to activate the warning alarm or indicator required.

Where air filters of the washable type are specified in the Detailed Specification a suitable filter wash tank and stand complete with a drying rack shall be provided in each plant room.

The wash tank and stand shall be manufactured from galvanised steel and epoxy powder coated. The wash tank shall be connected to mains water and a suitable overflow and drain piped to the building drain fitted. The drying rack shall hold at least 20 filters. Where washable filters are specified one complete set of spare filters shall be provided.

19.2 Panel Filters

Panel filters shall be of the pleated type and not less than 50mm thick.

The filter shall be washable or disposable as specified.

Synthetic media shall be used bounded together with galvanised wire for reinforcing and bonded in the frame ensuring no air bypass.

The frame shall be galvanised steel or a distortion and corrosion free moulding.

Initial synthetic dust arrestance shall be not less than 70% with dust holding capacity needed in excess of 300g per square meter nominal face area.

Initial dust spot efficiency shall be not less than 20%.

Nominal filter face velocity shall not exceed 1,5m/s with initial clean filter resistance 60Pa or less and recommended resistance at specified arrestance not more than 250Pa.

19.3 Pad Type Panel Filters

Pad type panel filters shall make use of disposable replacement media of thickness as specified, but generally not less than 25mm thick.

Disposable media supplied and the filter in general shall comply with 24.1 above, unless otherwise specified.

The media shall be held in galvanised steel frames with galvanised steel screen supports on both sides. The downstream screen shall be fixed in the frame with the upstream screen removable.

19.4 Extended Surface Intermediate Efficiency Filters

Filter media shall be self-supporting, leak-free and stable under all airflow conditions.

Front frames shall be of aluminium, galvanised steel or reinforced high-density hard polyurethane foam with a continuous foam rubber gasket.

"Slide-in" type of arrangements will not be accepted for filters in this class.

Filter depths less than 150mm will not be accepted.

Galvanised protection screens shall be fitted to match the airflow arrangement.

Initial synthetic dust arrestance shall be not less than 85% with dust holding capacity not less than 1500g per square meter nominal face area.

Nominal filter face velocity shall not exceed 2,5m/s with initial clean filter resistance 60Pa or less and recommended resistance at specified arrestance not more than 250Pa.

19.5 High Efficiency Particulate Air Filters (HEPA)

Filter media shall be self-supporting leak-free and stable under all airflow conditions.

The media shall be bonded in to a pressed and sealed particle board housing.

Unless otherwise specified in the Detailed Specification filters shall be provided with silicone filled channel seals.

"Slide-in" type of arrangements will not be accepted for filters in this class.

Filters shall be arranged in two or three stage configuration with the primary filters complying with clauses above as specified in the Detailed Specification.

Filter depths less than 300mm will not be accepted and effective filter media surface area shall exceed 50m per square meter nominal face area.

Each filter shall be individually tested in the factory for leakage with a DOP aerosol and supplied to site in completely sealed protection containers.

Corrugated media separators shall be of aluminium or Kraft paper.

Filter efficiency shall be not less than 99,9% when tested with 0,3 micrometer Dioctylphthalate smoke.

Dust holding capacity shall not be less than 2 000g per square meter nominal face area.

Nominal filter face velocity shall not exceed 1,5m/s with initial clean filter resistance to be 250Pa or less and final resistance not to exceed 500Pa.

Pressure monitoring across the HEPA filters is required with warning light and/or alarm as specified.

19.6 Filter Holding Frames

Filter holding frames shall be the manufacturer's standard product installed and used in accordance with his recommendations.

Holding frames shall be manufactured from at least 16 gauge galvanised or epoxy powder coated steel. Holding frames may be bolted or riveted together and shall be suitably reinforced in larger arrangements to withstand all possible operating conditions.

Fasteners shall be positive sealing type and a minimum of four fasteners per filter is required. Fasteners shall match the particular filter, filter arrangement and frame.

20.0 **MEASUREMENT OF COMPLETED WORK**

The attached Bills of Quantities is provisional, which means that the Bill does not represent the exact scope of work to be performed and completed and that every piece of completed work will be measured and agreed with the Contractor before payment is processed.

21.0 **UNAUTHORISED EXPENDITURE**

Although the Engineer has conducted the audit of the buildings installations other items may have degraded in the intervening period up to site handover. It is therefore very imperative for the Contractor to bring to the Engineer's attention as soon as he / she realises that the work measured in the Bill of Quantities may be appreciably exceeded. Failure to observe this procedure where the Contractor proceeds with excessive additional work without authorisation will be tantamount to unauthorised expenditure which may lead to non-payment for unauthorised work.

22.0 **SPECIFICATIONS & STANDARDS**

The works carried out under this Contract shall be governed by the:

- (i) The latest issue of SANS 10142: "Code of Practice for the Wiring of Premises"
- (ii) The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended

23.0 SCHEDULE OF MATERIALS

In all instances where schedule of materials are attached or included on the drawings, these schedules are to be regarded as forming part of the specification.

24.0 QUALITY OF MATERIALS

Materials are to comply with the relevant South African National Standards (SANS), or to IEC specifications, where no SANS specifications exist. All materials used shall bear the SANS mark of approval as applicable.

25.0 PROGRAMME AND PLANNING

The sequence, in which the work must be carried out, must be established in consultation with the Main Contractors construction programme, Sub-contractors and their respective Domestic contractors. The Engineer must be kept informed on the progress all the time.

26.0 SUPERVISION

The work shall, at all times be carried out under the supervision of a skilled and competent representative of the Contractor, who will be able and be authorised to receive and carry out instructions on behalf of the Contractor.

27.0 WORKMANSHIP

All inferior work shall, on indication by the Engineer, immediately be removed and rectified by and at the expense of the Contractor.

28.0 SUPPLY OF MATERIAL

The Employer reserves the right to supply any items of material or equipment to the Contractor for installation. The Contractor must arrange for taking delivery of and providing safe storage for these materials and he will be held responsible for all damages to or loss of such materials while they are in his custody.

29.0 COMPLETION

Completion shall take place only after the whole installation has been accepted by the Engineer and

- (a) All damage that may have been done by the Contractor in the process of the installation has been repaired and made good
- (b) All tests of the Mechanical installation has been done and tests results have been submitted to the Engineer,
- (c) The completed Certificate of Compliance as specified has been submitted to the Engineer,
- (d) All equipment guarantees, if any have been submitted to the Engineer,
- (e) The work site has been cleared of all debris and waste materials and left in a neat and tidy condition.

SITE 08

VOLUME 2.2 PART 3: HVAC - DETAILED SPECIFICATIONS

1.0 INTRODUCTION & GENERAL

This Detail Specification complements & qualifies the foregoing standard specifications of material & workmanship. The Standard Specification should be regarded as a basis and guideline, with this Detailed Specification taking preference where any ambiguity is concerned.

In the event of any further technical ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority:

- a) Schedule of quantities
- b) Project specification
- c) Drawings (loose and bound-in)
- d) Standard specification

2.0 SITE CONDITIONS

Location: Dimbaza, Eastern Cape

3.0 SCOPE OF WORK

General

The standard specification shall apply unless otherwise indicated in this section.

The drawings issued herewith and listed in the relevant section are to be read in conjunction with the specification and all items mentioned, together with all ancillary equipment necessary for the correct installation, operation and full compliance with the Standards and codes must be provided, notwithstanding the fact that they may not have been included in detail in these documents.

The bidder shall, at the time of bidding, draw the Engineer's attention to any omissions or discrepancy between the specification and the drawings and request from him clarification of details or responsibilities.

If a limited allowance or special conditions are made for the Bid Sum for the supply or erection of any item of the installation, the limit or special conditions shall be defined at the time of bidding.

It is the sole responsibility of the bidder to ensure that all quotations obtained from manufactures and suppliers are complete in their entirety and must include all equipment and accessories necessary for compliance with current practice and the efficient and proper functioning of the installation.

If any such items of equipment, brackets and accessories, etc., have been omitted from a supplier's quotation, or incidental work is necessary, the bidder must include for all such items and work in the bid.

The whole installation shall be in accordance with the latest edition of the Occupational Health and Safety Act: No. 85 of 1993. All regulations framed therein, shall be carried out to the satisfaction of the Engineer.

All equipment offered by the bidder shall be to the approval of the duly appointed Engineer, prior to installation. This standard specification and the supplementary specification with drawings shall be carefully adhered to by the bidder. Equipment installed without the approval of the Engineer will have to be removed at the Contractor's expense and be replaced with officially approved listed items.

The successful bidder will be required to prove to the Engineer that he has qualified personnel on his staff establishment as well as recognised test equipment for the successful completion of a safe working installation.

The contractor shall employ only skilled artisans and technicians approved by the Engineer who are competent in this type of work. The work shall be carried out in accordance with the standards laid down by

the Engineer.

The contracting firm shall be recognised contractor specialising in this field and approved by the Engineer. The work performed shall comprise the supply, delivery, off-loading, interim storage, installation, testing, commissioning and leaving in good working order of the complete electric access goods only lift installation inclusive of all guarantees as specified herein and the supply of 'AS IS' installation record drawings, Maintenance and Operating Manuals for:

Heating Ventilation and Air Conditioning Systems Overview:

- Ducted in line air ventilation systems,
 - Aluminium weather louvers,
 - Galvanised ducting, transfers, bends etc.
 - Filter boxes + filters & differential pressure measuring equipment,
 - Various In line silent fans plug fans,
 - Sound attenuators,
 - Diffusers,
 - Wired on off controllers,

The liaison with a Building/Principal Contractor, Electrical Subcontractor, and their Domestic Subcontractors if and when required

Testing and commissioning of all air-conditioning and ventilation system equipment in conjunction with the Fire Detection and Alarm Evacuation Systems Sub-contractor.

This Sub Contract also includes all electrical work for the installations but excludes the power supply to the isolator provided by others.

Notwithstanding any omission in this specification the installations shall be complete in all respects. This condition shall be recognised in the preparation of all working drawings submitted for approval. Further, despite any approval of working drawings given by and on behalf of the Main Contractor the responsibility for correct functioning of the plant during tests, inspection and the maintenance period shall rest entirely with the successful bidder.

The installation shall be strictly in accordance with the approved drawings or such further drawings, modifications, or instructions as may be given by the Engineer concerned, or that are found to be necessary, and such modifications or instructions shall be deemed to be within the specification for the purpose of the bid, and shall not vitiate the contract.

Payment for such modifications will only be made on certification by the Engineer to the effect that such modifications have involved additional expense to the Sub-Contractor.

4.0 PROGRAM

The Sub Contractor shall complete the installation within the time stipulated. The Sub Contractor will be required to report to the Principal Contractor, generally on a weekly basis (or more often if required by the Principal Contractor), progress of work and any difficulties arising, to enable the Principal Contractor to update the programme or forward plan any changes.

The sequence in which the work is to be carried out shall be decided upon in consultation with the Principal Contractor. The Sub Contractor shall thereafter submit an adequately detailed Sub Contractor's installation programme for approval within two (2) weeks of the Sub Contract being awarded unless otherwise indicated herein after.

This programme must be periodically updated as the work progresses and as may be necessary to meet changing site conditions and alterations to the overall installation programme.

Programmes shall take the form of bar charts, network diagrams and schedules as may be required by the Main Contractor or as applicable, and shall reflect quantities of work as required for supervision purposes and measurements.

As a minimum the programme shall reflect:

- sequence and timing of installation activities.
- sequence and latest event times of major equipment ordering, manufacture and delivery dates.
- sequence and dates for the submission of drawings and samples for approval.
- sequence and dates for factory and site inspections and tests.
- target and achieved work quantities on a weekly, fortnightly and monthly basis.

In preference all work is to be undertaken by staff in the full time employ of the bidder.

All work which is to be undertaken by "Domestic Sub Contractors" of the Sub Contractor will be clearly identified in the bid submission and the Sub Contractors to be used subject to prior approval of the Client and/or Engineer and/or Principal Contractor; failure to comply with this requirement may result in the "Domestic Sub Contractors" being removed from site.

All costs in replacing the undesirable "Domestic Sub Contractor" or any delays incurred as a consequence of this will be entirely for the Sub Contractor's account.

5.0 DESIGN CONDITIONS

Indoor: 24°C 50% RH

Outdoor: 31°C DB; 22.8 °C DB

6.0 VENTILATION SYSTEM DESCRIPTION

6.1 General

The bidder shall allow for programming the work in such a manner as to not disrupt the Main Contractor's programme. Sequence of work to suit the Sub Contractor's requirements will not be guaranteed nor accepted.

Claims from Sub Contractors arising out of broken work sequences or agreed programmes changed due to contingent requirements, will not be considered unless full motivations for the extra costs are submitted; the motivation for extra costs must justify costs in terms of the accepted programme and any unforeseen and justifiable additional staffing levels required to meet targets revised with insufficient notice. Reallocation of staff and/or acceleration of work will not be reason enough to claim for extra costs unless the Sub Contractor can prove that he has indeed had to pay for staff's idle time which was not or could not be envisaged at the time of bidding and/or drawing up the installation programme and sequence. When claiming for extra cost all out of town cost will be disallowed as it is assumed that the Sub Contractor has fully staffed premises in the vicinity of the site.

The Subcontractor must also assume that work may be required to continue uninterrupted outside of normal working hours and/or for an extended and/or unbroken period of time.

6.2 EQUIPMENT SPECIFICATION

6.2.1 All standard off the shelf ventilation equipment will be natural annodised aluminium unless otherwise specified.

6.2.2 DESIGN CONSTRAINTS

Refer to the drawings provided with this specification for:

Heating, Air Conditioning & Ventilation:

- 2318-T-M-101 HVAC S08

7.0 ELECTRICAL

Overloads shall be adjustable to approximately 25% higher than the relevant motor overload current.

Wiring in panels shall be neatly run in vertical or horizontal lines and each terminal shall be numbered to accord with the relevant wiring and control diagram. Circuit breakers, timers, relays, etc. shall be labelled in accordance with the wiring diagram and the item of plant served.

8.0 OPERATING AND MAINTENANCE MANUALS

8.1 Operating Manuals

Three complete sets of operating manuals shall be supplied by the Contractor, two sets to the Engineer for onward forwarding to the Employer and one for the User Department's use.

Manuals must be compiled in layman's language.

At least one month before commissioning, one draft copy shall be submitted to the Department/Engineer for comments and approval.

Operating manuals shall give a clear description of and the purpose of the installation.

- (a) Paper copies of all approved drawings and diagrams.
- (b) Detailed description of the different components used in the installation.
- (c) On- and off switching procedures.
- (d) Guidelines for routine-test to be carried out by the User Department inclusive of the periods during which tests are to be undertaken.
- (e) Detailed instructions for procedures to be followed during a fault

The following drawings are required:

- Layout drawings
- Wiring drawings showing wire colour codes and numbers as well as all connections onto terminal strips (markers to be approved by the Engineer) of all plant new and existing.

The following documents are required:

- Full description of the system.
- Operating instructions.
- Installation instructions.
- Commissioning instructions.
- Maintenance instructions, maintenance schedule and trouble shooting guide.

8.2 Maintenance Manuals

Two complete sets of maintenance manuals (Technical) prepared in English, shall be supplied by the Contractor.

At least one month before commissioning a draft copy shall be submitted to the Department/Engineer for comments and approval.

Maintenance manuals shall consist of the following:

- (a) A general description of the system.

- (b) A general description of the controls.
- (c) Schedule of equipment, model numbers, optional extras, modifications, electrical power requirements, etc.
- (d) Detailed monthly, quarterly, semi annually and annual preventative maintenance procedures.
- (e) Manufacturer's catalogues clearly indicating type, size and model of equipment supplied.
- (f) Tabulated commissioning data of all equipment and the system, indicating- as measured and according to specification - requirements.
- (g) List of suppliers, addresses and telephone numbers.
- (h) List of spare parts for all equipment.
- (i) Fault tracing/finding procedures.

The following drawings are required:

- Layout drawings
- Wiring drawings showing wire colour codes and numbers as well as all connections onto terminal strips (markers to be approved by the Engineer) of all plant new and existing.

The following documents are required:

- Full description of the system.
- Operating instructions.
- Installation instructions.
- Commissioning instructions.
- Maintenance instructions, maintenance schedule and trouble shooting guide.

Manuals shall be bound in a firm hard cover.

The information shall be clear and readable and supplied with an index.

The above-mentioned manuals shall be available at first delivery. Delivery of the installation will not be accepted without the manuals.

9.0 TRAINING OF STAFF

The bidder shall allow for sufficient time for instructing the User's appointed responsible persons in the correct operation of all plant and equipment, procedures to be followed in the event of faults etc.

Two sets of instruction manuals shall be provided. Each manual shall comprise of the following sections, bound in a vinyl plastic covered folder with the name of the project typewritten on a card inserted into a clear plastic covered cardholder on the front cover and spine and shall be handed to the Main Contractor on completion of the installation:

- Table of Contents
- Functional Description of Plant (as installed)
- Operation of Plant (as installed – step by step instructions for setting temperatures, etc.)
- Plant and Equipment (a scheduled list of all major plant to include description, make, model number and supplier's name and address).
- Performance Testing Procedures including Test Report

- Maintenance Instructions (in schedule form setting out each item of plant, the description and frequency of maintenance operations required).
- Spare Parts (list of spare parts that shall be required, with detailed description of each part, make, model or part number and supplier's name and address).
- Descriptive Literature (for all items of plant and equipment).
- Record Drawings (of plant as installed to include plant layout drawings showing component location, control and wiring diagrams and schematic piping diagrams).

10.0 GUARANTEE

The entire air-conditioning and ventilation / extraction installation shall be fully guaranteed for twelve calendar months from date of acceptance by the Engineer and contract practical completion date.

During the guarantee period, the Tenderer shall be responsible for the making good of any defects reported by the Tenant. The guarantee shall be ceded to the Superintendent following acceptance of the installation.

11.0 MAINTENANCE

The air-conditioning Tenderer shall be responsible for the maintenance of the entire plant during the guarantee period, as specified in this document. During this period the plant shall be serviced quarterly including filter cleaning and the Superintendent undertakes to provide access to the plant at suitable times during trading hours. Record of all services shall be kept and copies signed by the Superintendent.

12.0 CERTIFICATION ON COMPLETION OF GUARANTEE & MAINTENANCE PERIOD

Included in the pricing for the installation of the package plant is a 12 month quarterly service plan.

In the month prior to the expiry of the guarantee / first twelve months maintenance period, the Engineer shall inspect and, if necessary, retest the installation so as to be able to provide the Superintendent with a certificate, within fourteen days of the guarantee expiry date. This is to confirm that the guarantee has been honoured and that the installation has been properly serviced at required regular intervals by the air-conditioning Tenderer.

13.0 SAMPLES & ALTERNATIVES

Samples (within reason) will be requested by the Engineer and are to be made available on-site for inspection / approval.

The tender prices shall be based on the equipment as specified and not on any alternatives. Should the Tenderer wish to submit prices for alternatives, he shall do so separately, in a letter or similar correspondence, attached to the tender. The use of any alternative equipment, if any, will be evaluated and decided on after tender award, when the costs, etc. will be negotiated with the successful Tenderer.

The Engineer reserves the right to call for prices on alternative equipment subsequent to tender submission.

14.0 SCHEDULES OF INFORMATION

The schedules of information contained in this document consists of 2 sections:

Information supplied by the Engineer (schedules of drawings, etc. as applicable).

Information to be supplied by the Tenderer at tender stage (tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable).

Tenderers must provide, at the time of tendering, in the "Schedule of Material Offered", sufficient details to enable the equipment concerned to be identified without ambiguity.

It is not sufficient for a Tenderer to state "as specified" in the schedules.

Failure to complete these schedules may render a tender invalid.

15.0 DRAWINGS

15.1 General

Generally, the term “detail” shall mean that the drawing is exact in all aspects to what shall be provided. Where the term “illustration” is used, however, it shall be construed that the drawing is to be regarded as a proposal or guideline as to what is to be provided, manufactured or supplied.

15.2 Tender Drawings

Refer to the tender drawing as provided with this document.

15.3 Construction / Workshop Drawings

The successful Tenderer shall submit construction drawings (or detailed catalogues) of the manufactured equipment, such as mounting details, etc., for consideration by the Engineer prior to manufacture/supply thereof.

The Engineer's approval of construction or workmanship drawings does not relieve the Tenderer of his responsibility with regards to any of the deviations from the requirements of this contract unless the Engineer has been clearly informed, in writing, of such deviations at the time of submission and the Engineer subsequently gives written approval for the specific deviation. Similarly, the Engineer's approval shall not relieve the Tenderer of responsibility for errors or omissions in the construction / workmanship drawings.

15.4 Record Drawings

The Tenderer must prepare record drawings of the completed installation as constructed, indicating cable runs, equipment mounting details, circuiting & distribution board details, sleeve pipe positions, etc.

The contract shall not be deemed as complete until these drawings have been submitted.

16.0 **SUPERVISION, WORKMANSHIP AND DELAYS**

The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the Tenderer, who must be able and authorized to receive and execute instructions on behalf of the Tenderer. This person must be a registered and accredited person, as described by the OHS Act. It must be noted that the staff complement of the Tenderer shall remain similar throughout the duration of the contract, for all sections of the Works.

In the event that inferior materials or bad workmanship, on the part of the Tenderer, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the Tenderer.

Similarly, should delays in the contract be caused by poor performance on the part of the Tenderer causing the engineer to spend extraordinary time on the project, the extra costs incurred shall be borne by the Tenderer.

These costs will be based on the CESA hourly rate and will be deducted from claims due to from claims which will become due to the Tenderer.

17.0 **COMPLIANCE WITH REGULATIONS, STANDARDS AND CODES**

The Tenderer shall arrange for all inspections and testing of the installation as required. All notices, fees, including inspection and re-inspection, are the responsibility of the Tenderer and all the relevant costs shall be borne by him.

The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

The Works will be executed in strict accordance with the following:

- All relevant by-laws and regulations of local authorities.
- All relevant SANS, BS and other international standards.
- The Occupational Health and Safety Act of 1993.

18.0 COMMISSIONING AND TESTING

18.1 General

Upon practical completion of this Sub Contract the Sub Contractor shall allow for providing the Engineer with a complete commissioning schedule indicating the actual test results and measurement of all the design or specified data/variables.

Tests to demonstrate the capacity specified and general operating characteristics of all plant shall be made under the direction of the Engineer at any time before the practical completion inspection under conditions imposed by him.

The Sub Contractor shall be responsible for supplying test equipment which is to the Engineer's satisfaction; any costs incurred by the Sub Contractor in supplying adequate instrumentation will be entirely for his account. Test instruments shall be tested for accuracy by an approved laboratory or by the manufacturer and certificates showing the degree of accuracy shall be furnished to the Engineer if required.

On satisfactory completion of all tests and after the completed installation has been inspected and passed as satisfactory by the Engineer, the installation will be accepted as being practically complete and be handed over to the Employer.

The Sub-Contractor shall be responsible for supplying an itemised set of test results for the Engineer's approval; the Engineer may at his discretion request the Sub-Contractor to re run at the Sub Contractor's expense any test which he has not witnessed or with which he feels not satisfied.

The following shall be recorded/measured for each separate installation as specified and installed under this contract:

Description of installation tested;

Date and time of test;

Ambient temperature conditions (measured in the shade):

- (a) Dry bulb temperature
- (b) Wet bulb temperature
- (c) % RH

19.0 BUILDER'S WORK

The onus is on the Tenderer to point out and check the requirements for and positioning and correctness of all builder's work for his services.

20.0 MAKING GOOD

The builder is to be made aware of all works, timeously, relating to the impact of this installation(s). The Tenderer will carry out, in all instances any work to be made good such as damage to, or disturbance of the building installations caused by himself or his employees during the execution of the contract at his own cost.

21.0 SITE MEETINGS

The Tenderer's representative shall be expected to attend an official site meeting at the onset of the project including scheduled technical and site meetings during the contract period. For meetings termed as "technical or site", a site representative for the nominated Tenderer is required to attend and this person must be competent and able to interpret and receive and act on instructions on behalf of the Tenderer.

The Tenderer shall price all relevant P & G costs, overheads, travelling, etc. for these meetings.

VOLUME 2.2 PART 5: HVAC - SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : Only one manufacturer's name to be inserted for each item.

Item	Material	Make or trade name	Country of Origin
1.	Weather Louvers		
2.	Motorised Dampers		
3.	Axial Air Fans		
4.	Silent Type Air Fans		
5.	Sound Attenuators		
6.	Swirl Diffusers		
7.	Ceiling Disc Diffusers		
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

SITE 12

VOLUME 2.1 PART 1: FIRE PROTECTION EQUIPMENT - 1 SCOPE OF WORKS

FIRE PROTECTION EQUIPMENT INSTALLATIONS

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.

2. **THE CONTRACT**

2.1 **FIRE PROTECTION EQUIPMENT INSTALLATIONS**

The work to be carried out and commissioned by a SAQCC Fire approved installer:

- a. Installation of new hose reel, hydrant and extinguisher equipment, as per SANS 10400 Section T & SANS 10252,
- b. Installation of new galvanised steel water reticulation,
- c. Testing and Commissioning, as per SANS 10400 Section T and SANS 10139,
- d. Manuals, Drawings, OEM Literature,

2.2 **Existing**

All installations new. Building Existing.

2.3 **Order of The Works**

As per the building contractors' program of works.

SITE 12

VOLUME 2.1 PART 2: FIRE PROTECTION STANDARD SPECIFICATION

1.0 GENERAL

- 1.1 This standard specification applies to, and is to be read in conjunction with the particular technical specifications.
- 1.2 In so far as the conditions contained herein are at variance with anything contained in the particular specification, the contract shall be interpreted in terms of the particular specification for each particular service.
- 1.3 Equipment, materials and operational methods, shall comply with the relevant South African Bureau of Standards Specification or the British Standard Specification, wherever such specification exists, whether prescribed or not. Preference will be given to the latest issue of the SANS specification where both such specifications exist, unless otherwise prescribed in this or the particular specification.

2.0 OCCUPATIONAL HEALTH AND SAFETY ACT

- 2.1 All equipment supplied and installed under the contract shall meet the requirements of the Occupational Health and Safety Act (Act No 85 of 1994, (as amended) and all other relevant statutory requirements and the Contractor shall comply with the requirements laid down by the Inspector of Machinery under this Act.

3.0 DRAWINGS

- 3.1 The drawings issued with this specification do not purport to show the exact position, size or details of construction of equipment.
- 3.2 Tenderers must satisfy themselves that the equipment offered by them can be accommodated in the available space and positioned in such a way that access for maintenance, repairs or removal is not obstructed.
- 3.3 Drawings showing any alternative suggestions differing from the Engineer's design must be submitted with tenders.
- 3.4 Within four weeks of signing of the contract (or date of order) the successful tenderer shall submit to the Engineer or his duly appointed representative the following working drawings:
 - 3.4.1 Plant room lay-out showing total operating mass of equipment and the positions and sizes of the water and drain connections required.
 - 3.4.2 Construction details of all items manufactured by the air conditioning and/or ventilation Contractor, such as air plenums, duct work, bases etc.
 - 3.4.3 Dimensions and positions of all holes through walls, slabs, etc., and any amendments to the sizes or positions of return grilles, louvred openings, etc., indicated on the Engineer's drawings.
- 3.5 Approval by the Engineer of drawings submitted by the Contractor shall not relieve him of his liability to carry out the work in accordance with the requirements of the contract documents.
- 3.6 Positions and sizes of return air grilles, louvred openings, openings through reinforced concrete beams and slabs, etc., as indicated on the drawings shall be adhered to as far as possible. Amendments will only be considered if absolutely unavoidable.

4.0 MANUFACTURER'S RATINGS

- 4.1 All equipment such as fans, compressors, cooling towers, pumps, etc., shall be operated well within the manufacturer's ratings. Equipment offered for use beyond these limits will not be considered.
- 4.2 Tenderers must submit manufacturer's ratings of all equipment offered. Ratings shall be given in the SI system.

5.0 POWER, WATER AND DRAIN CONNECTIONS

- 5.1 Power, water and drain points in the plant rooms will be provided to a point by others.
- 5.2 All plumbing between equipment and water and drain points shall form part of the contract.

6.0 NOTICES

- 6.1 The Contractor shall supply and install all notices and warning signs that are required in terms of the Occupational Health and Safety Act, by local by-laws or regulations and by these documents. This includes notices prohibiting entry to un-authorized persons, etc.
- 6.2 A log-book and log-book stand must be provided for each plant room. This must take the form of an A5 size hard cover note book fixed by a light chain through the top left-hand corner to a writing surface.

7.0 WELDING

- 7.1 Welding shall be carried out in accordance with the current edition of SANS 044 Parts 1 to VII where applicable.
- 7.2 All welded fillet or butt joints shall be free from porosity, cavities and entrapped slag. Joints shall be ground smooth if required for aesthetic reasons only. If strength is required, they shall not be ground.
- 7.3 The joints in the weld run, where welding has been recommenced, shall be as smooth as possible and shall show no pronounced hump or crater in the weld surface.
- 7.4 The profile of the weld shall be uniform, of approximately equal leg length and free from overlap at the toe of the weld. Unless otherwise specified the surface shall be either flat or slightly convex in the case of fillet welds and with a reinforcement of not more than 3 mm in the case of butt welds.
- 7.5 The weld face shall be uniform in appearance throughout its length.
- 7.6 Filler metal electrodes shall be of an approved type for the material being used and shall be kept in a dry condition. All electrodes shall conform to SANS 455.
- 7.7 Only welders in possession of a valid approved competence certificate shall be employed.
- 7.8 When pipes are welded, tenderers must allow for pipe joints (where chosen by the Engineer's Representative) to be X-ray tested by the SANS or other approved body for sound welding at the Contractor's expense or for joints to be cut for examination purposes. After the removal of these joints, the piping must be made good by the Contractor. Should any of the welds prove unsatisfactory, the Contractor may be called upon, at his own expense, to have all welds examined by X-ray. The X-ray examination shall be carried out by the South African Bureau of Standards or other approved body.
- 7.9 All welds must show proper fusion.

8.0 GALVANISING

- 8.1 All hot dip galvanizing shall be carried out in accordance with SANS 934 and SANS 763 where applicable.
- 8.2 Mild steel plate and sections shall be of good commercial quality, or higher grades, best suited for galvanizing. The materials shall be free from slag or coarse laminations, fine fissures and rolled-in impurities.
- 8.3 Castings shall be sound, dense and clean, and free from distortion, porosity, carbon and slag enclosures, blow-holes, and other injurious conditions.
- 8.4 Welding flux shall be chipped away and all welds wire brushed before galvanizing.
- 8.5 The surfaces to be galvanised shall be free from paint, oil, grease, and similar impurities.

- 8.6 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanizing.
- 8.7 The Engineer shall have the right to inspect all steel components before galvanizing, and shall have the right to reject or ask for remedial treatment of any material which is considered to be unsuitable. This applies particularly to welds.
- 8.8 The galvanised coating shall be smooth, adherent, continuous and free from black spots or flux stains.
- 8.9 Globular extra-heavy deposits of zinc which interfere with the intended use of the material will not be acceptable. Excessively protuberant lumps and nodules shall be removed by hot wiping or by the skilful application of mechanical means, however, there shall remain a sufficient minimum thickness of unbroken zinc coating. Flaws on small parts and working surfaces shall be repaired only by stripping and re-dipping. The zinc bath shall contain not less than 98.5% pure zinc.
- 8.10 The deposits expected from galvanised coatings shall be as follows: -

MATERIAL THICKNESS	COATING GRAMS PER m2	APPROXIMATE THICKNESS
Bolts and Nuts	275 - 300	0,033 - 0,036 mm
1,25 mm to 2 mm	400	0,056 mm
2 mm to 5 mm	535	0,07 mm
5 mm and over	760	0,108 mm

9.0 COUPLINGS

Couplings shall be aligned by means of a clock gauge and the results entered in the commissioning data included in the Operating and Maintenance manuals.

10.0 BEARINGS

10.1 ANTI-FRICTION

10.1.1 Anti-friction bearings shall include all bearings which provide rolling contact between one or more sets of hardened steel balls or rollers and the hardened steel rings or raceways.

10.1.2 Anti-friction bearings shall be of approved manufacture.

10.1.3 To facilitate maintenance, spares inter-changeability and standardisation, anti-friction bearings of standard design and manufacture shall be employed. All anti-friction bearings shall be provided with greasing facilities in accordance with the manufacturer's requirements.

10.2 BUSHED BEARINGS

10.2.1 Only where specifically stated and in cases of low velocities and light loads in moisture free conditions will bushed bearings be accepted. All bushed bearings shall be made of an approved bearing metal composition which has good anti-friction qualities and is capable of withstanding severe usage.

10.2.2 All bushed bearings shall be provided with lubrication facilities to ensure adequate lubrication and shall be properly grooved to distribute the lubricant uniformly over the bearing surfaces. Grooves shall not be cut into the journal, but always into the surrounding bush. The edges of all chambers and grooves shall be rounded to avoid sharp corners and to facilitate the introduction of the oil or grease between the journal and the bearing metal.

10.3 SELF-LUBRICATING OR OIL-LESS BEARINGS

- 10.3.1 Self-lubricating or oil-less bearings shall only be used on application of light loads and low velocities in moisture free and low humidity and conditions and where access to bearings is difficult and likely to be neglected during servicing.
- 10.3.2 The type of bearing metal composition used shall have friction and wear resistant properties akin to those of grease lubricated bushed bearings.
- 11.0 GENERAL MACHINERY PROTECTION
- 11.1 COUPLING AND SHAFT GUARDS
- 11.1.1 All high-speed couplings, projecting shaft ends and every dangerous moving part of machinery within normal reach of a person shall be protected by a guard manufactured from not less than 1,5 mm mild steel plate.
- 11.1.2 The guards shall be neatly formed and securely fixed in position.
- 11.2 BELT GUARDS
- 11.2.1 All belt or rope drives shall be adequately protected by a belt guard.
- 11.2.2 The guard shall be manufactured from 25 mm wire mesh or open type expanded metal, securely braced and stiffened with light rolled steel sections and bolted in position. They shall be in accordance with the Occupational Health and Safety Act of 1994 (as amended).
- 11.3 CHAIN DRIVES
- 11.3.1 All chain drives shall be fitted with sheet chain cases and lubrication facilities to the chain manufacturer's recommendations. All joints shall be dust tight and arranged for convenient installation and dismantling.
- 11.3.2 Each chain case shall be fitted with a hinged inspection door, drain hole and plug.
- 12.0 QUALITY OF MATERIALS
- 12.1 Only materials of high quality shall be used throughout and shall be subject to the approval of the Engineer.
- 12.2 All materials, where applicable, shall conform in respect of quality, manufacture, tests and performance, with the requirements of the SANS standards, or, where no such standards exist, they shall conform with the appropriate current specification of the British Standards Institution. Materials manufactured in South Africa shall be used wherever possible.
- 12.3 Imported materials shall comply with the requirements of the relevant SANS or BS Specifications, although these materials need not necessarily bear the SABS mark.
- 12.4 All materials shall be suitable for the site conditions. These conditions shall include weather conditions as well as prevailing conditions during installation and subsequent use.
- 12.5 Should the materials or components not be suitable for use under temporary site conditions the Contractor shall provide at his own cost, suitable protection until these unfavorable site conditions cease to exist.
- 13.0 MAINTENANCE INSTRUCTIONS
- 13.1 As requested in the particular specification the Contractor shall provide operating and maintenance manuals/instructions at the time of hand-over of the installation.
- 13.2 The manuals shall include the following:
- 13.2.1 Maintenance instructions for all components of the plant which shall include maintenance items required over and above those included in the maintenance schedules attached to this specification, troubleshooting guide, part numbers of all replacement items, capacity curves of pumps, fans and compressors, belt sizes, types and lengths, serial numbers of all principal pieces of equipment, etc.

13.2.2 The names, addresses and telephone numbers of manufacturers or their agents.

13.2.3 Receiver test certificates.

13.2.4 A complete set of the "as built" drawings reduced in size to fit the manuals.

13.3 The operating and maintenance instructions specified above shall be obtained from the equipment manufacturer and where no such manuals exist, they shall be compiled by the Contractor to the best of his ability.

13.4 The contract shall be considered incomplete until all tests have been conducted to the satisfaction of the Engineer and all drawings and manuals have been handed over.

14.0 MAINTENANCE, SERVICING AND GUARANTEE

14.1 MAINTENANCE AND SERVICING

14.1.1 The Contractor shall be responsible for all maintenance and servicing of the installation during the 12-month guarantee period in accordance with the service schedules attached to this specification. Such additional items as required by the manufacturer of the equipment shall be included. (See also clause 13.2)

Four (4) services are required during this period on dates to be agreed at the first delivery inspection. The final service shall be carried out approximately 14 days before final delivery and expiry of the guarantee.

The contractor shall complete the service schedules and submit copies thereof together with his invoice for the servicing to the engineer after each service.

14.1.2 During the 12-month guarantee period the Contractor shall make good any defects due to inferior materials and workmanship and maintain all plant and equipment in perfect operating condition.

14.1.3 The Contractor shall maintain the plant log book on site in which he shall record, sign and date all work carried out at each inspection as well as log all temperature and pressure readings.

14.1.4 The Contractor shall allow for all expendable materials necessary for servicing such as lubricating oils, grease, refrigerant, cleaning materials etc.

14.2 GUARANTEE PERIOD

14.2.1 The CONTRACTOR shall unconditionally guarantee all new plant and equipment (machinery) for a minimum period of twelve (12) months from the date of hand over to the Engineer.

If the CONTRACTOR or his supplier has a standard guarantee which exceeds the minimum warranty called for, the remaining portion of such extended warranty must be ceded to the client.

14.2.2 The guarantee shall cover the performance of the WORKS and any defects due to inferior materials and/or workmanship, fair wear and tear excepted, and the CONTRACTOR shall repair any such defects without delay.

This guarantee shall include malfunction, and water, refrigerant gas, oil, or air leaks, and all adjustments.

14.2.3 Should the performance of any part of the complete WORKS become unsatisfactory so as to become detrimental to its functional use, the CONTRACTOR shall replace any such part or the complete WORKS with equipment as prescribed by the Engineer.

14.2.4 If any such defects are not remedied without delay, the Engineer reserves the right to have such defect repaired at the risk and cost of the CONTRACTOR by another CONTRACTOR whom the Engineer deems to be proficient in the WORK. this to be without prejudice to any rights the Engineer has against the installation CONTRACTOR. The Engineer will give written notice to the installation CONTRACTOR of such instances where he appoints another CONTRACTOR to remedy defects in the WORKS.

14.3 PREVENTIVE MAINTENANCE SERVICES.

Preventive maintenance servicing of plant and equipment shall be carried out in accordance with the maintenance schedules and programs to be supplied by the Engineer. Copies must be made as required of these schedules.

15.0 ELECTRICAL EQUIPMENT AND INSTALLATION

- 15.1 Unless otherwise stated in the particular specification tenderers must allow in their price for the complete electrical installation and wiring.
- 15.2 All electrical equipment and wiring shall be in accordance with the current issue of the Standard Wiring Regulations (SANS1 0142) (as amended).
- 15.3 Three phase power will be provided by others in the plant room.
- 15.4 Ammeters and pilot lights shall be provided for electric heaters.
- 14.5 All motors over 5 kW shall be provided with an approved electronic type motor protection unit.
- 15.6 In conventional field assembled plants lighting shall be provided for filter, coil and fan chambers, etc and shall comprise of bulk-head fittings permanently fixed to the walls or ceiling and earthed directly to the main earthing bar of the switchboard by means of a 4 mm² bare copper earth continuity conductor, in addition to being earthed by means of the continuity of the conduit as specified.
- 15.7 A single phase power point will be provided in the plant room by others for this lighting.

16.0 AUTOMATIC CONTROL SYSTEMS

- 16.1 Unless otherwise specified either electric or electronic controls may be offered. All control devices shall perform the functions indicated and operate in the required sequence.
- 16.2 The performance of controllers shall be stable under all conditions and shall be such that an aperiodic recovery of the controlled variable is obtained following a disturbance. Means of adjusting the control loop stability, such as adjustable proportional bands, adjustable reset rates etc., shall be provided on controllers when applicable.

17. DRIVES

- 17.1 Compressors and pumps shall be direct coupled to their driving motors.
- 17.2 The drives between centrifugal fans and motors shall be by means of grooved pulleys and V-belts.
- 17.3 V-belt drives shall be designed in accordance with CKS 332. Motors shall be mounted on slide rails for adequate belt tensioning and replacement.
- 17.4 All drives shall be protected by stout 25 mm wire mesh guards and shall be in accordance with the Occupational Health and Safety Act of 1994 (as amended).

18.0 EQUIPMENT BASES

- 18.1 Bases for centrifugal fans, compressors, air cooled condensers, air compressors, pumps and motors etc., shall consist of reinforced concrete cast into sheet metal formers at least 150 mm deep.
- 18.2 Bases shall be reinforced with at least 13 mm reinforcing bars located at 150 mm centers each way.
- 18.3 The mass ratio between bases and equipment shall be at least 1:1 for fans and 1,5:1 for pumps.
- 18.4 Concrete bases for the pumps shall be large enough to support pipes and fittings between the pumps and flexible connections.
- 18.5 Bases generally shall be large enough to accommodate the motors and driven equipment. Equipment shall be bolted onto the concrete inertia base.
- 18.6 Spring isolators shall be installed between concrete inertia bases and floor plinths and between the cooling towers or evaporative condensers and floor plinths.

- 18.7 Structural steel bases shall be provided for the cooling towers and evaporative condensers if their framework does not permit point support.
- 18.8 Either free standing stable spring or caged spring with snubber may be used. Spring isolators shall be installed with leveling bolts and shall incorporate 6 mm thick ribbed neoprene acoustical pads bonded to the base.
- 18.9 Spring diameters shall be large enough to prevent excessive rocking of equipment during start-up and normal operation.
- 18.10 Isolators shall be chosen to give a static deflection corresponding to a ratio of 3:1 of the lowest disturbing frequency to the natural frequency of the mounting.
- 18.11 Bases and spring isolators shall be arranged to give a clearance of approximately 25 mm between the underside of the bases and floor plinths.
- 18.12 Floor plinths of sufficient height shall be installed under all equipment by the air conditioning contractor. The plinths shall be large enough to accommodate the concrete inertia bases and spring isolators. Floor plinths shall also be provided under items of equipment which do not require concrete inertia bases such as cooling towers, air plenums, etc. The plinths under the air plenum shall be at least 100 mm higher than the finished floor level in the plant room.
- 19.0 RUNNING OF PIPES
- 19.1 Pipes and ducts shall be installed in accordance with the drawings issued with the supplementary specification.
- 19.2 The drawings are schematic and do not purport to show the exact positions of pipes nor the details of construction and installation. All final dimensions must be checked on site before the fabrication of piping sections.
- 19.3 Pipe sleeves with at least 6 mm clearance filled with a resilient material shall be provided where refrigerant tubing or water piping passes through walls or slabs.
- 19.4 Where beams, stanchions or other obstructions interfere with the straight running of pipes or ducts, suitable offsets shall be provided or changes in the section of the duct made, without altering the cross-sectional area.
- 19.5 Tenderers should make themselves conversant with complete drawings of the building in order to determine the number of such offsets or changes in section and the positions in which they will be required. Due allowance for these shall be made in the tendered price.
- 19.6 A complete set of drawings of the building may be inspected at the office of the Architect.
- 20.0 PAINTING
- 20.1 All exposed galvanised sheet metal work in plant rooms, air conditioned and ventilated spaces, basements, corridors etc., shall be painted.
- 20.2 Ducts shall be identified by coloured symbols as specified in clause 6 of SANS 0173-1980.
- 20.3 The temporary white rust preventative compound on new galvanised sheet metal shall be removed by means of washing, brushing and if necessary, abrasion with a special solvent or compound used for this purpose. The surface shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910 or one coat of calcium plumbate primer to SANS 912 followed by one under coat to SANS 681 type II and one coat high gloss enamel paint to SANS 630, Grade I, as top coat, the colour of which will be determined by the Engineer.
- 20.4 The entire air-conditioning unit casing, including galvanised iron eliminators, sumps, drip pans, fans etc., shall be painted internally with two coats of epoxy-tar paint to SANS 801, type II. The white rust preventative compound on galvanised iron shall be removed as specified above before the paint is applied. Angle iron framework shall be similarly painted with epoxy paint before side covers are fitted.

- 20.5 Ferrous cooling tower and evaporative condenser casings, including galvanised iron eliminators sumps and fans and internal areas of connecting ductwork shall be internally painted as specified above. Externally the casings shall be painted as specified in clause 48.3. Factory painted equipment will also be acceptable.
- 20.6 Exposed hot water piping with canvas covered insulation shall be painted two coats of bitumen aluminium paint to SANS 802.
- 20.7 Exposed uninsulated galvanised piping shall be thoroughly degreased. In case a detergent is used, the surfaces shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910, or one coat of calcium plumbate primer to SANS 912, followed by either one undercoat to SANS 681, type II, and one coat high gloss enamel paint to SANS 630, Grade I, as topcoat or two coats of PVA to SANS 634, Grade I.
- 20.8 Uninsulated black piping, flat-iron, angle-iron and rods for supports, brackets, duct stiffeners, etc., shall be painted on all sides with a zinc chromate primer to SANS 679, Type I followed by two coats of enamel paint to SANS 630, Grade I.
- 20.9 Where specified in the supplementary specification aluminium shall be painted with a wash primer to SANS 723, followed by a zinc chromate primer to SANS 679, Type I, and two coats of enamel paint to SANS 630, Grade I.
- 20.10 Motors, compressors, pumps etc., shall be painted light grey. Belt guards shall be painted bright red.
- 20.11 Before any painting is applied the steel surfaces shall be prepared according to SANS 064, (Code for preparation of steel surfaces for painting.)
- 20.12 Where specified in the particular specification steel surfaces shall be cleaned and then treated by the hot phosphate process to a minimum weight of 1,6 gr/m² coating followed by two coats of baking enamel to SANS 783, Type I.

24.0 GENERAL REQUIREMENTS FOR FIRE INSTALLATIONS

All fire pipe installations shall adhere to the technical and particular specifications of the Employer, and shall include the following general requirements:

- 21.1 Piping shall conform to the requirements of SANS.
- 21.2 Pipes shall be cut accurately to measurements established on site and installed without springing or forcing and properly clear of windows, doors and other openings. All piping shall be reamed after cutting and shall be clean, straight and free of defects.
- 21.3 Drawings are generally diagrammatic and indicative of work to be installed. Routing and arrangement of piping shall be as indicated, subject to site conditions and the appropriate requirements of SANS rules.
- Clashes with other trades shall be avoided and fittings, valves, drain points, etc shall be located so as to ease access, maintenance and operation of the system. Note that required offsets, fittings, valves, drains, etc are not necessarily indicated.
- 21.4 Pipe runs shall be straight and direct as possible, in general forming right angles with or parallel to walls or other piping, and neatly spaced. Piping shall be installed so that there is sufficient clearance between finished coverings of piping, fittings and adjoining work.
Sleeves shall be provided where piping passes through partitions, beams, slabs, etc.
- 21.5 Valved and capped drain points shall be provided at all low points in the piping network.
Unions or flanged connections shall be provided to aid dismantling of the piping should it be required.
- 21.6 No cold springing shall be allowed. Pipe sections shall be fabricated/cut to length accurately in order to avoid cold springing.
- 21.7 Where necessary, adequate temporary supports shall be installed during erection so as not to overstress piping or equipment to which piping is connected.

- 21.8 All supports shall conform to the requirements of SANS, and no perforated straps or strip steel shall be used.
- 21.9 Piping which is subject to vertical movements shall be provided with springs or other suitable supports.
- 21.10 Hangers shall be installed in such a manner that they cannot be disengaged by any pipe or support steel movement.
- 21.11 No pipe shall be suspended from another pipe except if specifically called for on the drawings or in the particular specification (Part 3).
- 21.12 The Contractor shall be responsible for selecting the sizes and types of pipe hangers, supports and support devices not shown on the drawings, but which are necessary for the completion of the installation. Support spacing shall be as specified in paragraph 23.0 The Contractor shall supply details of all calculations to the Engineer for scrutiny together with two marked up prints showing the location and types of all supports/pipe hangers to be installed prior to ordering and commencing installation.
- 21.13 During construction all pipe ends shall be kept plugged to prevent any ingress of dirt, rubble etc.

25.0 PIPING

- 22.1 Steel piping shall be solid drawn, heavy grade steam quality piping conforming to ASTM/A106 Schedule 40 or to B.S. 1387/1967 (heavy quality) or SANS 62/1971. In all instances the latest editions and amendments to these specifications shall apply.

In plant rooms piping may be welded, prefabricated off-site to aid in installation and connection to pumps, storage tanks, etc. Welding shall be carried out as specified in paragraph 7.0 of this specification.

Generally, pipe sections shall be screwed together using malleable iron threaded fittings, class 150 and 300 in accordance with ASME B 16.3. Only eccentric fittings shall be used at changes in pipe size. No bushing shall be used in lieu of reducing fittings. Screwed joints shall be screwed up tightly using an approved jointing compound such as PTFE tape. Hemp joints will not be accepted.

Pipes joined with grooved fittings (e.g., Klambon or Victaulic) shall be joined by a listed combination of fittings, gaskets, and grooves. Grooves cut or rolled on pipe shall be dimensionally compatible with the fittings and pressure at which the system is to operate.

Where flanges are used, they shall be in accordance with ASME B16.5. Steel slip-on boss flanges for welding shall have a nominal pressure at least 10% in excess of the maximum fluid pressure. Where equipment is supplied complete with flanges not in accordance with the above specification, a matching weld-on flange is to be used for connecting up such equipment. Bolts in flanges are to be high tensile steel and of the correct length such that no more than 1,5 clear threads protrude beyond the nuts after tightening to the correct torque. In flanged joints new gaskets shall be used for every assembly operation unless such an assembly is intended solely for initial fitting. Gasket material shall be fibre composition or similar material suitable for the system operating pressure and temperature.

- 22.2 Underground piping shall be class 16 HDPE piping and weld-on flanges in accordance with SANS 0533-2

Pipes shall be laid on a 100 mm sand-bedding cradle and covered with 300 mm sand before backfilling. The total cover over the piping shall be a minimum of 900mm generally and 1100mm under roadways. All backfilling shall be to the Engineers approval.

Where required thrust blocks shall be cast between the pipe and the undisturbed trench material. At thrust blocks the pipe bend shall be wrapped with a "Densopol 80 HT Tape" (or equal and approved) so that no concrete comes into direct contact with the HDPE piping.

All underground piping shall be pressure tested prior to it being covered.

26.0 PIPE SUPPORTS AND HANGERS

All necessary pipe hangers, brackets, supports, stanchions and anchors shall be designed, supplied and

installed by the Contractor, in accordance with SANS.

23.1 Maximum pipe support spacing shall be as follows:

Pipe Diameter	Max support Spacing
20 mm	3 m
25 mm	3.6 m
32 mm	3.6 m
40 mm	4.5 m
50 mm	4.5 m
65 mm	4.5 m
80 mm	4.5 m
100 mm	4.5 m
150 mm	6 m
200 mm	6 m

The contractor will be required to ensure that the hangers/supports selected are conservatively rated for the carrying capacity required. (Refer to paragraph 21.12).

23.2 There shall be at least one pipe support for each mechanical pipe joint .

23.4 Components of any pipe support shall be securely attached to each other by means of bolts or threaded rod with nuts and washers.

25.5 All components of all pipe supports shall be galvanized.

26 VALVES AND FITTINGS

All valves, check valves, shut-off valves, etc. shall be of a pressure class greater than or equal to pressure class of the piping.

All valves controlling water supplies for fire systems or portions thereof, should be accessible to authorized persons during emergencies. Permanent ladders, chain-operated hand wheels, or other acceptable means should be provided where necessary.

Outside control valves shall be located within a fenced enclosure under the control of the owner, sealed in the open position, and inspected weekly as part of an approved maintenance and safety procedure.

24.1 Valves greater than 50mm diameter shall be of the butterfly type with resilient rubber seats. 100 mm and 150 mm diameter valves shall be equipped with gear operated closing mechanism. Valves shall conform to BS 5155 and shall be KERR fig. no 104A or similar or equal and approved.

24.2 Valves up to and including 50mm diameter shall be of the screwed and socketed type with bronze body and gated with non- rising spindle.

24.5 Valves shall be labelled as follows:

- (d) Main stop valves, control valves, etc shall be labeled by means of rust-free metal tags indicating their purpose and the section they isolate, if isolating valves.
- (e) The tags shall be securely fixed to the valve and shall be clearly legible.
- (f) All letters on labels shall be engraved or punched. No painted or plastic embossed labels will be accepted.

24.4 Strainers shall be of the Y-type with cast iron body, stainless steel or bronze strainer element and shall be equipped with flanged ends. The hole sizes of the strainer element shall be maximum 1 mm Ø and be removable without dismantling of pipe-work. Strainers shall be suitable for a temperature of up to 90°C at a 1 600 kPa pressure rating and installed with the element facing downwards or a maximum of 45° sideways.

- 24.6 Non-return valves shall be of the spring-loaded wafer dual flap plate type fitted between two flanges. They shall be equipped with a cast iron body, aluminium bronze plates, stainless steel springs and neoprene seals on the plates. The valves shall be suitable for working pressures of up to 1 600 kPa.

27 PUMPS

- 26.1 Pump sets shall conform and be installed as detailed in SANS and these specifications. The number and type of pump sets will be detailed in the Particular Specification (Part 3) and will comprise some or all of the following

- (a) Electrical driven jockey pump set
- (b) Electrical driven main sprinkler/fire pump and drive.
- (c) Diesel driven main sprinkler/fire pump and drive.
- (d) Sprinkler/fire pump starting arrangement.
- (e) Electric and Engine drive controllers and ancillary equipment.
- (f) Water flow test devices.
- (g) Fuel storage and piping

The pump sets shall be, installed, tested, commissioned and certified in accordance with SANS and the Local Authority's requirements.

- 26.2 Prior to ordering and installation, the Contractor shall provide a full set of plans and detailed data describing the following for scrutiny and/or approval by the Engineer and Local Authority:

- (a) Pumps
- (b) Pump drivers
- (c) Drive controllers
- (d) Power supply
- (e) Starting arrangements
- (f) Piping and fittings
- (g) Suction and discharge connections
- (h) Water supply and/or storage conditions

Each pump unit shall be provided with certified test curves from the manufacturer showing brake horsepower, flow and head capacities. The Contractor shall provide this information to the Engineer and Local Authorities for approval.

- 26.3 The Contractor shall perform and certify a full field acceptance test on the completed installation in accordance with SANS. This test shall be witnessed by the Engineer and Local Authority.

- 26.4 The following information shall be embossed on a plate fixed to each pump:

- (i) flow capacity (l/sec);
- (ii) pump head (metres water gauge);
- (iii) impeller size;
- (iv) pump speed
- (v) required motor power;
- (vi) make of pump;
- (vii) model;
- (viii) date of purchase.

- 26.5 Pumps shall be of the centrifugal end-suction type listed for fire protection service. It shall be possible to remove the impellers without removing the pump from its mountings.

Pumps shall comply with the following requirements:

- (b) Impellers shall be double entry radial types of bronze or cast iron.
- (b) Casings shall be of cast iron with renewable casing wear rings. The casing wear rings shall be made of cast chrome steel.
- (c) Shaft seals shall be of the mechanical type.
- (d) Bearings shall be grease lubricated anti friction types.

- (e) Pump shafts shall be of stainless steel.
 - (f) An auto priming system shall be provided.
 - (g) Pump cooling devices shall be provided to prevent over heating of pumps when operating at closed head.
- 26.6 Characteristic curves showing capacity, head, efficiency NPSH, power required and operating range shall be submitted to the Engineer at tender stage. Prior to installation, a complete set of test certificates shall be submitted for approval to the Engineer and Local Authority indicating all performance characteristics of the pump to be installed.
- 26.7 A pressure gauge must be provided downstream of the pump outlet backpressure valve and on the pump suction side.
- 26.8 An approved flow test device and pipe connection shall be provided in the delivery line downstream of the non-return valve, in order to carry out a running flow/pressure test on the pump at approximately full load when the test valve is fully open. The test pipe shall be piped back to the water tank.
- 26.10 Pumps shall be mounted on mild steel bases, adequately corrosion protected by hot dip galvanizing after manufacture. Pump bases shall be filled in with concrete and properly secured to the floor.
- 27.0 DRIVE MOTORS
- 27.1 Electric drive motors shall be drip proof conforming to BS 2613 and BS 170. Windings shall at least be according IP55 of IEC 144. High temperature permanent sealed bearings shall be used. Motor speeds shall preferably be limited to 1450 rpm but shall not exceed 2950 rpm.
- 27.2 Diesel engines shall be naturally aspirated air cooled types capable of being started without the use of wicks, cartridges, heater plugs or ether, at an engine room temperature of 4°C. They must be capable of accepting full load within 15 seconds from receipt of the signal to start.
- 27.3 Engines shall be capable of operating continuously at full load at the site conditions for a period of 8 hours. The Contractor supplying the pumping set shall supply to the Engineer and Local Authority a statement giving the 8-hour power rating of the engine at speeds of 1000 rpm, 1400 rpm, 1800 rpm, 2 200 rpm, 2600 rpm and the maximum speed. Any of the speeds quoted which are in excess of the maximum speed rating of the engine may be omitted and the maximum speed and corresponding rating shall be given.
- 27.4 Speed and Number of Strokes
- The engine must be of the solid injection, compression ignition type, with a running speed for reciprocating engines up to 750 kW not exceeding 1500 rpm. Generally, engines of the four stroke, industrial type, designed for stationary operation are preferred. Two-stroke engines of the pump assisted uniflow scavenged type will be considered if their specific fuel consumption (kg fuel used per kW hour) is equivalent to or better than that of the equivalent four stroke engine.
- 27.5 Fuel Classification
- The engine shall be rated for diesel fuel as normally available in South Africa and in compliance with SABS 342 -1969 or B.S.2869 -1970, Class A1 , (as amended) for diesel fuel with a minimum octane rating of 40 and nett calorific value of 10000 kcal/kg (39600 kJ/kg).
- 27.6 Rating of Plant
- The rating of the engine shall take cognisance of the site conditions, site altitude and include all auxiliary equipment such as radiator and fan, oil pump, water pump, air filter, governor, battery charger (generator) etc. The output stated shall only be the nett available, after the above have been allowed for.
- The engine output must be de-rated in accordance with BS 5514 for the site conditions stated in the particular specification.
- 27.7 Overload Facility

The engine shall be capable of delivering 10% overload for one (1) hour in any 12-hour period of continuous running.

27.8 Engine Appearance

The engine shall be of neat appearance and all water, lubricating and diesel oil lines, filters and stop cocks shall be of top quality and completely leak free.

27.9 Service Connections

All service connections to the engine shall be flexible to prevent vibration being transmitted between plant and building, and to prevent damage to these lines and connections.

27.10 Supporting Framework

The engine and pump shall be mounted on one common steel supporting frame manufactured of channel iron or other equivalent steel work to provide a rigid and solid foundation. The main frame shall be of the "skid" base type. If no "skid" base is provided, suitable for free standing, holding down bolts and vibration eliminators to the generator set manufacturer's specification must be provided. This subframe shall be supported from a main frame by anti-vibration mountings. Duplex anti-vibration mounts shall be used.

The inner frame and its supports shall be of sufficient height above floor level to permit installation of a drip tray and for draining of engine oil.

The drip tray must be sloped and made of mild steel. It must be fixed in the frame beneath the engine and alternator and a drain pipe fitted with a plug must be extended from the lowest point of the drip tray to beyond the frame in an easily accessible position.

27.11 Heat Protection

All engine piping, whether flexible or rigid, shall either be of the heat resistant type or adequately protected against damage by radiant heat. This also applies to any wiring attached to the engine.

27.12 Crankcase Vent Pipe

The crankcase vent pipe shall be taken to the drip tray to collect oil condensate.

27.13 Bearings

Engine bearings for the crankshaft and connecting rods, big and small ends shall be of the bush type, split sleeve type, or roller type. The bearing types and metals shall be suitable for operating in the worst site conditions.

27.14 Lubrication

The lubrication shall be by means of a force-fed pressure system supplying circulating oil to all bearings, gear trains and important moving parts. A gear driven oil pump shall be incorporated with an oil cooler if necessary. The oil cooler shall have a thermostatically controlled oil bypass valve to control the oil inlet temperature by proportionate bypassing. 250 hour running time, full flow oil filters with automatic bypass and replaceable elements shall be fitted.

An isolating valve shall be fitted in the oil line from the make up tank to the sump in order to facilitate sump draining without the loss of new oil from the make up tank.

27.15 Cooling

27.15.1 General

Cooling of engines may be either by air or by water.

27.15.2 Water Cooling

Where radiators are used, they shall be of the heavy-duty industrial air blast type, pressurised and sized for continuous full load operation.

The fan shall be designed and run in a direction such that cool air is drawn across the generator, engine and radiator in that order.

Removable ducting shall be provided between the radiator and the louvre in the wall opening.

Fans must be liberally sized to enable engines to operate well within their maximum temperature limits (but without running too cool) at the ambient site conditions stated in the particular specification or at a plant room temperature of 40 deg C whichever is the higher.

In water cooled engines water circulation shall be pump driven by means of an integral engine mounted centrifugal pump.

If under exceptional circumstances cooling towers are required these will be specified separately in the particular specification. It will be required that they be of stainless steel or fibre glass and that particular attention be paid to plant room ventilation under these circumstances.

27.15.3 Air Cooling

In air cooled engines air ducts shall be provided to positively exhaust hot air and to prevent re-circulation. Integral engine mounted fans are required to ensure air flow across the various components in the order listed above.

Discharge ducting must be taken straight up through the roof of the plant room and must be made with strategically placed flanged joints, etc to enable it to be easily removed for servicing and maintenance purposes (if required), and/or to permit removal of the set without having to remove the ducting. Quick action type lock nuts or screws to enable quick and easy dismantling of ductwork are required. Self tapping screws are unacceptable.

The ducting must be fixed to the roof structure, must be flashed to render the exit point waterproof and must be fitted with an expanded metal bird screen at the discharge end(s).

The ducting must be made in such a way that expansion and contraction of the ducting will be taken up by sliding joints or similar.

The discharge end of the ducting must be fitted with a cover to prevent the ingress of rain water at times when the set is not running. Over and above, a drain point for accumulated moisture must be provided at the lowest point of the ducting. This drain must be piped to just outside the plant room door. Drainage of moisture from the ducting must be such as to prevent the diesel engine from getting wet.

Ducting must be made of 16-gauge galvanised iron suitably cross braced to prevent drumming.

27.16 Speed Control

The engine shall be provided with a suitable governor to control the engine speed to within 10% of its rated speed under any condition of load up to the full load rating. The governor shall be field adjustable.

27.17 Air System

The air system shall consist of two items, viz. the incoming combustion air and the exhaust gas.

27.17.1 Combustion Air

Combustion air filtration shall be by means of dry type, cartridge, high efficiency air filters fitted and sized for 500-hour operation and supplied complete with a service indicator. Oil bath air filters may be fitted and used in existing plant only. Air filters must be of Donaldson manufacture or similar, equal and approved.

27.17.2 Exhaust Gas

Exhaust gas shall be piped, the piping being fitted with expansion joints, silencer and discharged to atmosphere.

The expansion joints shall be of the stainless steel, concertina type, flexible, flanged and bolted to the exhaust manifold or turbo-charger outlet as applicable. Stainless steel bolts and nuts of the appropriate size must be used. Care must be exercised that exhaust pipe and silencer supports at the expansion joints are so positioned that no strain is placed on the manifold joint, turbo-charger, piping or silencer.

The silencer shall be of stainless steel, of the baffle or absorption type of a size and construction such that a sound level of 75 dB absolute is not exceeded within two meters of the exhaust. The exhaust pipe shall be of stainless steel, insulated and of sufficient size to ensure that the back pressure is acceptable within the limits of the engine manufacturer. The exhaust system shall be offset from the centre line of the plant to allow for hoists or cranes to remove the engine.

The piping shall have bends with a minimum radius of 2,5 times the pipe diameter, insulated with 25 mm thick insulating rope and cloth or similar suitable approved insulating material, and be wrapped and sealed in bright polished class 430 stainless steel sheeting.

Stainless steel nuts and bolts must be used in assembling the exhaust system. Flanged joints are required to aid dismantling.

Exhaust piping over 100mm diameter must have a minimum thickness of 1,6mm.

Once the exhaust is external to the building, no insulation is necessary. The entire system shall be supported with flexible hangers, brackets, clamps, etc.

27.18 Engine Fuelling

Engine fuelling shall be by means of an engine mounted pump with the governor-controlled fuel injection pump(s) and injectors all arranged for easy access and maintenance.

A fuel filter with replaceable elements shall be fitted between the lift pump and the injection pump, suitable for the full flow of fuel at full load. The filter must take out particles down to 5 microns in size, or less, and be of Donaldson or similar, equal and approved manufacture.

A primary, heavy-duty filter/water separator shall be fitted before the lift pump in the fuel line from the tank. This water separator shall be of Donaldson or similar, equal and approved manufacture, shall be suitable for 250-hour operation and be easily maintained.

Copper tubing shall be used from the sludge filter to the engine components, but steel tubing may be used on the overflow from the injectors to the fuel tank. Note that galvanised piping is not acceptable. All piping shall be neatly run and securely fixed with saddles and clamps taking cognisance of flexibility to prevent vibration damage as stated in Clause 27.9 .

27.19 Starter Motor

Starting of the plant shall be by means of an engine mounted, electric starter motor on sets up to 500 KVA. Above this size two motors will be required. The starter motor(s) shall be suitably sized to easily spin the plant under "cold start" Winter / Summer conditions without the use of special starting equipment.

Two interlocks shall be incorporated, one electrical and one mechanical, preventing the starter motor engaging unless the engine is at rest.

The starter motor(s) shall be 12- or 24-volts D.C. fitted with an approved device for positive engagement. The starter motor shall be controlled from the plant panel.

27.20 Jacket Water Heaters

Water cooled engines shall be fitted with immersion heaters of a minimum of 1,5 kW up to 5 kW capacity in order to ensure that the jacket water temperature is warm enough for the engine to start easily from cold and under severe cold conditions. Heaters must be so situated as to promote thermo-syphoning of the

water with the piping connections installed in such a manner that the cooling system thermostat does not impede the free flow of this thermosyphoning water. The temperature shall be thermostatically controlled via a relay and the elements fed at 220 volts with M.C.B. protection at the panel.

27.21 Battery

The battery shall consist of a number of cells to form a 12- or 24-volt D.C. supply suitably sized to start the engine. These cells shall be of the lead acid type with flat terminals, rated at 1,5 volts/cell and mounted on a suitable frame with a timber base. The battery shall be as close as is practical to the starter motor, but separate from any vibrating parts of the set.

The battery discharge capacity with full cranking current for 60 seconds at a temperature of 5 deg C shall not fall below a cell voltage of 1,5 volts. This voltage is considered the minimum to satisfactorily operate the 12 or 24 V. D.C. control equipment on the control panel (i.e., after three starting attempts, each of 10 seconds, the panel control voltage shall not be below 20 volts D.C.)

The battery under normal conditions shall be continually trickle charged from the Control Panel charger (reference must be made to clause 28.9).

Under running conditions, the battery shall be charged from an engine driven brushless Alternator/Rectifier complete with auto rate control.

The battery cables must be run clear of all exhaust piping and other hot surfaces and must be fixed in position so as to ensure correct reconnection of the cables in the event of the battery being changed or removed. The cables must be liberally sized in order to minimize the voltage drop to the starter motor.

27.22 Protection Equipment on Engine

The protection of the set is covered under paragraph 28.0 but the following monitoring equipment is required as listed hereunder:

27.22.1 Alarm signal system in wall mounted or floor standing control board for indicating "shut down" of the following items:

- a) Fail to start / starter circuit lockout
- b) High water temperature (sensed on engine side of the thermostat) or high head temperature in the case of air-cooled engines
- c) Low oil pressure
- d) High oil temperature (if required)
- e) Low fuel pressure (if required)
- f) Engine over/under speed

27.22.2 Gauges in the wall mounted or floor standing control panel showing:

- a) Fuel oil pressure (if required)
- b) Lubricating oil pressure
- c) Lubricating oil temperature (if required)
- d) Jacket water temperature

27.22.3 All necessary sensors for alarm circuits.

27.22.4 All necessary fuel cut off solenoids

27.22.5 A manual shut off valve before the lift pump in the fuel line at the day tank.

27.23 Coupling

The engine/pump coupling shall be by means of a flange adaptor ring or bell housing incorporating a shock absorbing coupling. The flexible coupling shall be direct coupled to the engine and alternator with no gears so that the engine and alternator run at 1500 rpm or the regular engine speed compatible with 50Hz power generation.

27.24 Fuel Tanks and Pumps

27.24.1 Day Tank

A combined fuel storage and day service tank shall be supplied with each set. The tank shall be mounted on a self-supporting floor standing steel frame at a minimum height of 400 mm above floor level (to provide a gravity feed to the engine) or integral with the engine/pump support base. This service tank shall be mounted close to the plant, within the plant room, hold a minimum of 150 litres and a maximum of 200 litres. A full height transparent gauge tube shall be fitted to the service tank. The gauge tubing must be similar or equal to that supplied by Lister diesel engines. (Plastic tubing will not be permitted). If called for in the particular specification a dip stick may be supplied and fitted in lieu of the gauge glass.

The service tank shall be so designed and mounted such that water and sludge can collect at the lowest point and be easily drained off by means of a stop cock. The lower gauge tube connection must be fitted with a shut-off valve.

A manual ball type shut off valve between the service tank and the lift pump shall be incorporated in the steel or copper fuel feed pipeline.

27.24.2 Fuel Piping

In principle the fuel lines shall all be medium class steel to SABS 62 or BS 1387 (but not galvanised) with appropriate bends to provide an expansion facility. Copper shall only be used from the primary filter to the engine pumps.

A fusible link mounted directly above the set and connected to a dead weight operated fuel shut-off valve will be required in instances where the day tank is situated in a separate room to the generating set.

27.24.3 Fuel Pumps

One diesel fuel pump suitably sized, shall be fitted adjacent to the service tank.

It shall be a centrifugal pump complete with electric motor, starter, isolator and float switches. Level control and float switches for control of the pump(s) shall be mounted within the service tank.

Float switches shall be "REMEX" level controllers (or similar and equal and approved). Three float switches will be required, one to operate the pump (on/off), one for a low-level alarm and the other for an extra low level engine cut-out. A facility for running the pump manually is required.

It must be possible to mute all alarms but the indicator light(s) must remain on until the tank has been refilled at which time they should cancel automatically.

The float switches shall be of such a type that they can be tested manually without opening the tank. They must further be installed in such a manner that they do not foul each other.

28 CONTROL PANEL

28.1 General

The control system may consist of plug in, low voltage relays of the octal base type or solid-state PC control . The panel shall provide full protection for the diesel pump set.

28.2 Sheet Metal Work

The control panel and components shall be of approved design, manufacture and construction and shall be complete in all respects with all necessary equipment, bars, connections, wiring and accessories. The panel shall be robustly constructed, shall be in accordance with standard accepted practice, comply to the relevant S.A.B.S. Code of Practice and/or BSS 162/1961, and shall have an attractive appearance.

The panel shall be totally enclosed, dust and moisture proof as well as rodent and insect proof with full gland plates fitted at appropriate heights. The panel shall be floor standing and have a steel plinth. Doors shall be of folded and welded construction, with suitable bracing to eliminate buckling, and all doors and cover plates shall have rubber seals and grommets.

A construction of angle iron and loose sheets will not be acceptable, neither will pop-rivets or self tapping screws.

All steel work shall be thoroughly de-rusted. Millscale shall be removed by shot blast or other approved means and the steel work then degreased, followed by bonderising or similar phosphoric inhibitive treatment. A zinc chromate primer shall be applied, followed by two coats of best quality white enamel inside and three coats of enamel (Electric Orange) on the outside, sprayed and baked on. Bolt heads or thumb screws securing the panels shall be chromium plated. The latches securing the doors shall have positive locking devices and no spring-loaded ball latches or similar will be accepted.

28.3 Approvals

Before commencement of manufacture of the panel, full working drawings must be submitted for approval by the Engineer. When the panel is under construction, and again upon completion but prior to delivery to site, the manufacturer must notify the Engineer so that the panel can be inspected and approved.

28.4 Components

All components where possible shall bear the SABS mark or if not available the equivalent B.S. or DIN mark.

All components shall be entirely suitable for their application and the switchgear shall be suitable for the site and location. Space shall be provided for the incoming and outgoing cable circuits.

All cut edges and drilled holes of Bakelite or similar insulation board must be treated with electrical varnish. All equipment, levers, handles, keys, etc. required for operation of the panel must be included together with suitable clips or trays to store these when not in use.

28.5 Guarantee

The whole of the panel and components shall be guaranteed for a period of 12 months from the date of hand-over to the Owner

28.6 Equipment

The following equipment shall be included on the panel:

- (a) 1 meter (220 V AC) to indicate the total running hours the plant has been in operation.
- (b) 1 voltmeter (as per BS 89), approximately 125 mm scale to read 0 to 415 volts.
- (c) Control relays, start relays, three crank start relays, start failure relay, fuel supply relay (solenoid), continually rated alarm relay, oil pressure relay, oil temperature relay, overspeed relay, water overheat relay, jacket water heater relay, alarm relay, low fuel relay.
- (d) Illuminated resettable fault indicators, coupled to a common continuously rated hooter or low current electronic type yodel alarm for: low oil pressure, high oil temperature, high water temperature, engine overspeed, failure to start, pump overload, low fuel level, extra low fuel level engine trip
- (e) Auto/Test/Manual/ off selector key switch

- (f) Battery charger
- (g) MCB's for:- Battery Charger, Jacket water heater, fuel pump
- (h) Lamp and alarm test facility.

28.7 Sequence of Operation

The control panel shall be so designed to provide the following:

28.7.1 A water pressure sensing relay which in the event of a fall in pressure the timing sequence shall be :

28.7.1.1 An immediate command to the engine to start.

28.7.1.2 Once the command to start has been given, three start attempts shall be allowed each of 10 seconds with a 10 second delay between each attempt. In the event of failure to start within these 3 initial attempts, the starting system shall switch off and a L.V. alarm shall be initiated. Any further start attempts may only be carried out when the plant is in the "manual" position.

28.7.1.3 Fault reset after identification and rectification of same shall be by switching the selector to the "off" position and then back to the desired mode.

28.8 Protection of Plant

The panel shall automatically provide the following protection with the alarm circuiting and tripping devices operating off the 12- or 24-volt D.C. Battery as applicable.

	Hooter or Siren	Visual Light Indicator	Lock out	Fuel Solenoid off
Overspeed	X	X	X	X
Under speed or overload	X	X	X	X
High Temperature	X	X	X	X
Low Oil Pressure	X	X	X	X
3 Starts Failure	X	X	X	X
Low Fuel Alarm	X	X		
Battery Charger Failure	X	X		
Extra Low Fuel Cut-out	X	X	X	

All the above shall have the necessary re-set buttons.

28.9 Battery Charger

28.9.1 The charger module shall be a mains (220 V) operated unit to continuously trickle charge the engine starter battery.

It must be of the modulating type similar or equal to those supplied by Messrs Vaal, Romberg, Semi-Conductor Services, or P & S Power Products or be as further specified here.

28.9.2 A "loss of charge" alarm relay shall be provided to indicate failure of the charger. This should be a current monitor.

28.9.3 The output voltage (27,6 volts D.C. or 13,8 volts if applicable) shall be via full wave rectification and be kept within 1% of the float charge voltage.

28.9.4 The 220-volt input voltage may vary between 200/240 volts and the equipment, (transformer etc) must be capable of handling this discrepancy.

28.9.5 During the "cranking/start" period and during running of the diesel engine the battery charger shall be disconnected via a relay. Charging of the battery shall then be by means of an engine mounted alternator.

28.9.6 The charger shall be equipped with:

- (a) Overload protection on the 24 (12) volt side
- (b) One 72 x 72 mm shielded type ammeter showing the charging rate
- (c) One 72 x 72 mm shielded type voltmeter with a spring return, normally open, push-button switch for indicating battery voltage
- (d) Relays for "failure alarms" and "running/start"
- (e) Transformer and full wave solid state rectifier complete with capacitors where applicable.
- (f) HRC fuses or fast acting MCB's on the secondary side

28.9.7 The battery charger shall be fully incorporated into the main control panel and be built to the same general specification (see paragraph 28.1) Relays shall preferably be of the "Octal" base type or equal and approved.

28.9.8 Ventilation.

The position of the battery charger shall allow for good ventilation and not be below any of the other switch gear or relays.

28.10 Log Book

A plastic covered log book shall be supplied for each plant room.

28.11 Emergency Lighting

A 24 (12) Volt emergency light must be incorporated into the top section of the control panel in order to provide sufficient illumination for the safe operation and checking of the control panel. This light must switch on automatically in the event of a mains failure.

29.0 COMMISSIONING OF PLANT & EQUIPMENT

29.1 All instruments used shall be provided by the Contractor and shall be accurately calibrated and maintained in good working order.

29.2 Testing and balancing shall not begin until the system has been completed and is in full working order.

29.3 Tests shall be conducted by the Contractor in the presence of a Representative of the Engineer.

29.4 Two copies of the complete test reports shall be submitted to the Engineer prior to the first delivery of the project. Reports shall cover test and balance analysis for all air distribution and hydraulic systems. Sound tests for room type air conditioning equipment and all diffusers in occupied areas shall be included in the report. Reports shall be neatly typed.

SITE 12
VOLUME 2.1 PART 3 FIRE PROTECTION TECHNICAL SPECIFICATION

1.0 Introduction and General

This detail specification complements and qualifies the foregoing standard specifications of material & workmanship. The standard specification should be regarded as a basis and guideline, with this detailed specification taking preference where any ambiguity is concerned.

In the event of any further technical ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority (unless stated elsewhere in Conditions of Contract).

- Schedule of quantities
- Detailed specification
- Drawings
- Standard specification

2.0 Scope of Work

This subcontract calls for the supply, installation, testing and commissioning of the specified Fire Protection Installation for the refurbishment of Site 12 Dimbaza Factories.

2.1 The following sections of work are included:

- a. Supply and Installation of complete:
- Fire protection installation, complete with all pipework, holderbats, isolating valves, hose reels, hydrants (where indicated) and the connection of the reticulation to the underground civil fire mains connection, either within a valve box or a saddle.
 - Handheld fire extinguishers.
 - Signage.
 - All installed by SAQCC approved installer.
- b. Testing and certification:
- Performing and submission of test records (as per SANS requirement) and certificates.
 - Issuing of SAQCC Fire Certificate of Compliance
 - Supply of Operators and Maintenance Manuals
 - Basic maintenance training for building maintenance staff
 - Provision of a twelve-month guarantee for the installation including a full service prior to expiry.
 - All other materials and labour necessary to complete the Works in full accordance with the specification and design contained or referred to in this document.

2.2 The following sections of work are excluded:

- Builder's work e.g., cut-outs in walls to Tenderer's specifications, including chasing and making good of walls.

3.0 Site Conditions

3.1 General

The equipment specified herein shall be designed to operate at the environmental parameters particular to Dimbaza, and surrounds.

4.0 Fire Mains Service Connection

4.1 New Fire mains bulk supply line to be installed by specialist SAQCC certified contractor.

5.0 Pipe Locations, Materials and Specifications

For steel piping of 75 mm diameter and larger (i.e. flanged) the hot dip galvanising to SANS 763, 1977 (when required) shall be after fabrication.

6.0 **Pipe Jointing and Fittings**

Mild Steel Piping and/or Galvanised:

- 6.1 Mild steel piping shall be joined by means of screwed sockets, navy unions or flanges. Red lead jointing or other approved jointing compounds may be used sparingly and exposed threads shall be painted with zinc chromate primer or equivalent paint to prevent rusting.
- 6.2 Where it is required to remove sections of pipe or where pipe joints will need to be tightened after installation and testing, unions or flanges must be provided to facilitate the work,
- 6.3 Welding construction is only permitted for pipes of 50 mm diameter or larger and then only when prefabricated and welded in the workshop of the installing engineers whose welding procedures, pre-approved by the Insurance Council of South Africa.

NO WELDING OR HEAT CUTTING IS PERMITTED ON ANY SITE OF ERECTION

The edges of pipe to be welded shall be machine bevelled wherever possible. Gas cuts shall be true and free of all burned material. Before welding the surfaces shall be thoroughly cleaned and degreased. Piping shall be carefully aligned. No metal shall project within the pipe. Mitred joints will not be allowed.

Only welded fittings prefabricated by recognised manufacturers will be permitted. No other prefabricated welding fittings will be permitted without the express approval of the Engineer.

For branch piping sixty five millimetres (65 minimum) in size or larger, use welding tees, with flanged outlet. For piping 200 mm and larger use shaped spigots and welding neck flanges. Cracks, pinholes, excessive undercutting etc. shall be removed and the joints rewelded. Welders and welding processes shall meet the requirements of the SANS Code for welders.

- 6.4 Jointing of mild steel and galvanised piping using grooved pipe fittings and couplings may be used provided they have been approved by SANS. Proper gaskets, designed for the applications shall always be used. Approval by the consulting Engineers must in all cases be obtained prior to the utilisation of such fittings.

7.0 **INSTALLATION OF PIPING**

All piping shall be installed in an approved manner to meet structural and architectural requirements, to avoid interference with the work of other trades and be finished in a neat and workmanlike manner with true alignments and grades. Piping shall be run to ensure sufficient access for inspection, testing, servicing, etc.

7.1 Storage

Deliver and store to Suppliers recommendations with plugged ends. Clean pipes thoroughly. In addition it is required that pipes are stored off the ground and under cover.

Keep the ends closed during erection with temporary caps. Before any pipe is installed it shall be upended and pounded to remove any foreign matters present.

7.2 Installation

Slope of Pipes

In order to prevent air being lodged, the pipe lines shall have a proper inclination throughout the work.

Also the sloping shall be such that the system can be thoroughly drained.

7.3 Underground Piping

- a) Unless otherwise specified, the Contractor shall not be responsible for the digging and backfilling of pipe trenches for underground piping in his contract. He is however to ensure that the excavations and laying of piping is in accordance with SANS 1 200 06, LD and LD, and that this specification is adhered to so that his installation can be correctly installed.

- b) The trenches shall be of such depth that when properly laid at least 750 mm of soil shall cover the top of the pipe.
- c) The pipes shall be laid on a clean, soft soil bed not less than 750 mm deep. When backfilling the trench, it shall firstly be filled to approximately 150 mm above the pipe again with clean soft soil and then compacted after which the final filling is to be made and again compacted (care shall be taken to ensure that no large stones or debris occur in the filling material).
- d) In the case of cement and uPVC piping the Contractor must ensure that the trenches are recessed where couplings or fittings are positioned such that the pipe lies flat on the bed. This is to prevent the fittings supporting the length of pipe. The Contractor is also to allow for any pipe movements, such as thrust at bends etc. Concrete blocks in accordance with manufacturer's specifications shall be provided at these points. Where asbestos cement piping cross roads etc., the pipe shall be protected by casting into concrete not less than 100 mm over the top of the pipe.
- e) Where steel or uPVC pipes are to cross roadways, under connecting corridors, etc., the Contractor shall provide PVC sleeves through which the pipes will pass. It shall be at a depth of not less than 750 mm below the surface and shall be encased in concrete not less than 150 mm all round. These sleeves are to be two pipe sizes above the size of the water pipe to permit the removal and the replacement of the pipe should the need arise.

7.4 Internal Pipe Runs

All piping shall be installed parallel to, or at right angles with building walls and partitions.

In general, all pipes shall be supported from the building structure in a neat and workmanlike manner, and whenever possible, parallel runs of piping shall be grouped together.

- a) Where pipes pass through walls, floors, ceilings, etc., they shall be sleeved. The sleeves shall be of PVC material and allow for pipe thermal reactions.
- c) Where pipe sizes are reduced, proper reducing fittings shall be used. On no account will bushes be accepted.
- d) Horizontal take-offs from vertical pipes shall be long enough before the next fixing to take up any movements or shall have an expansion loop to provide this facility.
- e) Every tube section shall be installed to have the possibility of expansion and contraction without restriction. It shall be anticipated that no deflection acts on very short tube section. Expansion loops or expansion joints and anchors shall be fitted in order to reduce the displacement of individual line elements and to deflect them to the points where they can act without damage.

7.5 Concealment of Pipework

Pipework must not be embedded in the concrete floors of a building, nor should it be concealed in any other situation where difficulty or undue expense would be involved in making alterations or additions which may subsequently be necessary. Concealment of pipework is particularly to be deprecated in the case of buildings in multiple tenure where erection of partitions to suit tenants may impair the effective distribution of water from the sprinklers and necessitate alterations in the positioning of sprinklers.

7.6 Pipe Hangers and Supports

- a) All pipes shall be supported from the building structure in a neat and workmanlike manner and, wherever possible, parallel runs of horizontal piping shall be grouped together on trapeze hangers.
- b) Vertical risers shall be supported at each floor line with pipe clamps. The use of wire, perforated metal straps, nails and so forth, to support pipes will not be permitted. Hanging of pipes from other pipes will also not be permitted.
- c) Vertical runs shall be secured by means of rustless holderbats or other clamps. Duckfoot supports shall be provided at the bottom of a vertical section of large piping (100 mm and above) to support the weight of the pipe and the water.

Under no circumstances shall a vertical pipe be supported from its highest point. Should any fittings be installed in the vertical sections, care shall be taken to ensure that these fittings are not in a state of tension through the combined weight of the pipe and the water.

- d) Horizontal pipes shall be supported by means of galvanised hangers at close enough centres to prevent sagging. The minimum recommended spacings for supports and hanger rod size shall be set out below:
- e) The hangers shall be protected against rust and adjustable in height. They shall be manufactured from rods of the diameter as specified above, one end threaded and bolted to an angle iron cleat or Unistrut section suitably secured to the structure. The other end shall be formed into an eye and bolted to the pipe clamp.

7.7 Changes in Material

Where piping material changes occur (i.e. copper to steel etc.) dielectric unions must be furnished and installed.

7.9 Threaded Pipe

The pipe connection shall be cut square and full threaded with clean cut tapering threads and shall be reamed after threading. All threaded connections shall be made with approved thread compound applied to male threads only, and shall be so made up that not more than two (2) threads will be exposed.

7.9 Testing of Water Piping

All piping installed on the project shall be hydraulically tested as specified herein. The Contractor shall provide all equipment required to make these tests.

Piping may be tested a section at a time in order to facilitate the construction programme.

The Contractor shall fill the section of the pipe to be tested with water and bring the section up to test pressure with a positive displacement type test pump. The tests shall be conducted by the Contractor in the presence of the Engineer or his representative. Gauges used in the tests shall have been recently calibrated with a dead weight tester.

All tests shall have full test pressure applied to the piping for a minimum of twenty-four (24) hours

The test pressure at any section of the system shall not be less than one and a half times the system working pressure or 1 500 kPa (Maximum) unless otherwise stated under Part Four of the specification. When the test pressure has fallen over 6 percent (%) during the twenty-four (24) hour test period, the point of leakage shall be found, repaired and the test repeated. This procedure shall be followed until the piping system has been proven absolutely tight.

The use of chemicals or so-called "stop-leak" compounds will not be permitted at any time.

When instruments or gauges are installed in the piping system, they shall be removed during the tests if subject to damage from shock or excessive pressure. This does not apply to control valves.

Leaks shall not be repaired by mastic or other temporary means. All leaks shall be repaired by removal of the section that is leaking and reinstalling new material with joints as specified herein before.

7.10 Flushing of System Pipework

There must be a 50 mm diam. flushing connection fitted on the incoming main below each installation control valve. These flushing points must be plugged to prevent misuse.

7.11 Terminal Drain Valve

25 mm drain valves must be fitted at the extremity of the distribution pipe at each level of protection. This is to indicate that there is water at this point and that no blank flanges are left in the installation. The valve should be positioned at hand level and must be normally strapped closed.

8.0 **Fittings**

8.1 All fittings, including safety devices are to be placed and sized.

9.0 **Safety Devices**

9.1 Where applicable.

10.0 **Handling And Storage Of Materials, Fittings And Components**

10.1 Pipes, fittings and components shall be handled carefully to obviate damage

10.2 Manufactures' advice shall be followed as to how their products should be loaded, transported, unloaded and sorted

11.0 **Identification**

11.1 Colour Coding

11.1.1 General

All equipment shall be colour-coded in accordance with standards recognised, and where possible to comply with relevant SANS colour codes unless specified otherwise.

11.1.2 Colour Coding of Pipes

Identification of the contents of pipes shall either be by painting a 100 mm wide primary colour band or by using self-adhesive PVC coloured tape. The colour of the paint or tape shall comply with SANS 0140 Identification Colour Marking, Part III, Contents of Pipelines, as detailed below.

The colour names referred to in the tables are specified in SANS 1091.

TABLE OF COLOUR CODING FOR PIPELINES AS PER SANS 0140 PART III - 1978

CONTENTS OF PIPE PRIMARY COLOUR BANDS

FIRE FIGHTING

- All Pipes Signal Red

12.0 **Sterilization**

12.1 N/A

13.0 **Builders Work**

13.1 The Engineer will prepare details showing where all sleeves are to be positioned before any structural concrete is cast.

13.2 The Engineer's approval, in writing, must be obtained before any holes or chases are cut in any structural component i.e. brickwork, concrete, steel or timber.

13.3 The Contractor shall be responsible for cutting chases and holes in walls and slabs to accommodate his services which must be coordinated in liaison with the Main Contractor who will be responsible for making good.

14.0 **Excavation**

14.1 General:
Tenderers are to note that excavation shall be carried out by the main contractor.

15.0 **Operating And Maintenance Details**

- 15.1 Two complete sets of operating manuals complete with spares schedules, as-fitted layout drawings, schematic diagrams and operating and general maintenance information, bound in hardcover ring binders shall be prepared by the Contractor and delivered to the Engineer 14 days prior to practical completion for approval, at or before final handover.
- 15.2 A full "RECORD" set of drawings shall also be submitted to the engineer for record purposes.

16.0 **Schedules Of Information**

- 16.1 The schedules of information contained in this document consists of 2 sections :
- a. Information supplied by the Engineer (schedules of drawings, sleeves etc. as applicable.)
 - b. Information to be supplied by the Contractor at tender stage
- (tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable.)
- 16.2 Tenderers are required to enter, at the time of tendering, in the "Schedule of Equipment and Material Offered", sufficient details to enable the equipment concerned to be identified without ambiguity.
- 16.3 It is not sufficient for a tender to state "as specified" in the schedules.
- 16.4 Failure to complete these schedules (if applicable) may render a tender invalid.

17.0 **Samples And Alternatives**

- 17.1 Tenderers may be required to submit for approval, comment or records samples of materials, apparatus or components, and also drawings, schematic diagrams or technical details, including calculations, upon which their design and/or offer is based before any contract is awarded. Such details may also be called for during the course of the Contract prior to installation. Any approvals given or comments made shall be on the generality of the scheme and shall not relieve the Contractor of his responsibility to ensure the full compliance with all performance and regulatory criteria.

NOTE : A request for submission of samples or drawings does not imply that the Tenderer's quotation will necessarily be accepted.

- 17.2 Any particular make or model of equipment referred to in the Documentation is for guidance purposes only in setting standards / types / performances required; equipment that is equal or superior in all respects, and to the approval of the Engineer, may be offered by Tenderers. No reference to any particular make of any equipment shall be construed as that equipment having been selected by the Engineer or Client and the Contractor shall be fully responsible for the guarantee and performance of such equipment.

18.0 **Certification On Completion Of Guarantee And Maintenance Period**

- 19.1 In the month prior to the expiry of the guarantee and first twelve months maintenance period the Engineer shall inspect and, if necessary, retest the installation so as to be able to provide the Tenant with a certificate, within fourteen days of the guarantee expiry date, to confirm that the guarantee has been honoured and that the installation has been properly serviced at required regular intervals by the sub-contractor.
- 18.2 The cylinders shall be guaranteed from date of take over for a period of three years on the tank, insulation and outer casing and for one year on the electrical components

19.0 **Supervision Of Workmanship And Details**

- 19.1 The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the subcontractor, who must be able and authorized to receive and execute instructions on behalf of the Mechanical Subcontractor.

19.2 In the event that inferior materials or bad workmanship, on the part of the subcontractor, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the Subcontractor.

19.3 Similarly, should delays in the contract be caused by poor performance on the part of the Contractor causing the Engineer to spend extraordinary time on the project, the extra costs incurred shall be borne by the Contractor.

These costs will be based on the SAACE hourly rates and will be deducted from claims due or claims which will become due to the Contractor.

20.0 **Making Good**

20.1 The subcontractor will carry out in all instances any work to be made good such as damage to, or disturbances of the building installations caused by himself or his employees during the execution of the contract, at his own cost.

21.0 **Test And Inspections - Pressure Testing And Quality Control**

21.1 The Contractor shall, at no extra cost to the contract, provide all the necessary equipment and facilities to conduct all tests as directed by the Engineer and or Supply Authorities.

22.0 **Commissioning And Testing**

22.1 Commissioning:

A documented method shall be followed whereby the mechanical subcontractor shall ensure that his installation is correctly constructed in accordance with the manufacturers' specifications, consultant's specification, consultant's design and all codes of practice and international design codes.

The commissioning procedure must allow for signing off of the major items of equipment by a qualified person in terms of the codes. These signed off documents will form part of the record drawings.

22.2 Performance Tests:

The mechanical subcontractor shall be responsible for the physical testing, in the manufacturing works, or on site, of the items of plant or systems as required by the Engineer. These tests shall be performed by the mechanical subcontractor or supplier of the equipment, and where called for, the Engineer shall witness such tests. The Engineer may also only witness a representative sample of the equipment tests. In any event, the mechanical subcontractor will supply documentary proof of full performance tests of all relevant equipment.

22.3 Acceptance Tests:

All brass fittings and valves shall be certified by the manufacturers to be free from de-zincification and will be subjected to check tests as set out in the Detailed Specification

Acceptance tests will be performed on site of the working system or sub system, to show that the works, as installed, is functioning according to the specifications and design. The onus for the correct functioning of the systems is still on the mechanical subcontractor irrespective of whether the Engineer has witnessed the acceptance tests or not. Prior to the system being connected, a test certificate must be issued by / given to the local electricity supply authorities.

23.0 **Compliance With Regulations, Standards And Codes**

23.1 The subcontractor will arrange for all inspections and testing of the installation after completion, including the issuing of the Certificate of Compliance. All notices, fees, including inspection and re-inspection are the responsibility of the subcontractor and all the relevant costs shall be borne by him.

23.2 The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

23.3 The Works will be executed in strict accordance with the following:-

- a. All relevant by-laws and regulations of local authorities.
- b. All relevant SANS, BS and other international standards of the latest revision, where applicable.
- c. The Occupational Health and Safety Act of 1993 as amended.

24.0 **Monthly Certificates**

24.1 Pro forma claim forms are available from the Engineer. These are available in a blank copied format or as a computer file in Excel. This is the preferred method of submitting payment claims. Should the subcontractor have developed his own method of claiming, this may be submitted to the Engineer for consideration.

25.0 **Programme**

25.1 The subcontractor must conform to the programme as submitted by the principal Contractor. The estimated period for completion, as tendered, is as per the builders programme. The cost of overtime, additional labour and plant for the completion of the works, in accordance with the programme, must be included in the Tenderer's price for the project. The cost of any work outside the requirements of the programme or necessary under exceptional circumstances will be for the Employers' account only if covered under a variation order.

25.0 **Drawings**

25.1 Tender Drawings

All drawings, those supplied loose, as well as those bound in, form part of this enquiry and are listed below:

- 2318-T-M-101 FP S12 RevA Fire Protection Equipment
- 2318-T-M-101 FS S12 RevA Fire Escape Signage

It is the Tenderer's responsibility to inform the Engineer as to the absence of any of these drawings.

26.0 **Sufficiency Of Tender**

26.1 The Tenderer's offer shall be for the supply, delivery, installation and commissioning of the complete installation as detailed, described or implied in this document and on the accompanying drawings.

26.2 The Tenderer's offer shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and that the rates and prices he has entered in the schedules shall cover all his obligations under the contract for the proper completion of the Works.

27.0 **Measurement**

27.1 The Tenderer shall not make any assumption regarding the installation. If there is any doubt or ambiguity, the Engineer must be consulted. The Tenderer shall take cognisance of the fact that the schedule of quantities is re-measurable and the quantities may be adjusted at the end of the contract.

27.2 All measurements are nett, unless otherwise stated, and Tenderers must allow in the rate for wastage.

SITE 12

VOLUME 2.1 PART 5 SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : Only one manufacturer's name to be inserted for each item.

Item	Material	Make or trade name	Country of Origin
1.	Gavanised steel pipe		
2.	Non-Return Valves		
3.	Isolating valves		
4.	Strainers		
5.	Angle valves		
6.	Manholes		
7.	30m Hose Reels		
8.	Hand Held Fire Extinguishers		
9.	Pressure Gauges		
10.	Hydrant Connections		

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

SITE 12

VOLUME 2.2 PART 1: DOMESTIC WATER & HEATING EQUIPMENT INSTALLATION - 1 SCOPE OF WORKS

DOMESTIC WATER INSTALLATION

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.

2. THE CONTRACT

2.1 EARLY WARNING SMOKE DETECTION & SUPPRESSION INSTALLATIONS

The work to be carried out and commissioned by a PIRB / IOPSA approved plumber:

- a. Installation of new domestic water reticulation and heating equipment, as per SANS 10252,
- b. Testing and Commissioning, as per SANS 10252,
- c. Manuals, Drawings, OEM Literature,

2.2 Existing

All installations new. Building Existing.

2.3 Order of The Works

As per the building contractors' program of works.

SITE 12

VOLUME 2.2 PART 2: DOMESTIC WATER & HEATING EQUIPMENT TECHNICAL SPECIFICATION

1.0 GENERAL REQUIREMENTS

1.1 Project Specification

1.1.1 This specification applies to, and is to be read in conjunction with the drawings for the hot and cold-water reticulation to the building. Furthermore, this specification covers only the piping within the buildings. The requirements pertaining to the sections of piping from the ring mains to the buildings are covered by the civil engineer's specifications. Similarly, all tap fittings, shower fittings shall be to the architect's specification as detailed elsewhere.

1.1.2 In so far as the conditions contained herein are at variance with anything contained in the drawings, clarification shall be sought from the Engineer though generally the contract shall be interpreted in terms of the information contained on the drawings.

1.2 Occupational Health and Safety Act

1.2.1 All equipment supplied and installed under the contract shall meet the requirements of the Occupational Health and Safety Act (Act No 85 of 1994, (as amended) and all other relevant statutory requirements and the Contractor shall comply with the requirements laid down by the Inspector of Machinery under this Act.

1.3 Notices

1.3.1 The Contractor shall supply and install all notices and warning signs that are required in terms of the Occupational Health and Safety Act, by local by-laws or regulations and by these documents.

This includes notices prohibiting entry to un-authorized persons, etc.

1.4 Drawings

1.4.1 The drawings issued with this specification do not purport to show the exact position, size or details of construction of equipment.

1.4.2 Tenderers must satisfy themselves that the equipment offered by them can be accommodated in the available space and positioned in such a way that access for maintenance, repairs or removal is not obstructed.

1.4.3 Drawings showing any alternative suggestions differing from the Engineer's design must be submitted with tenders.

1.4.5 Approval by the Engineer of drawings submitted by the Contractor shall not relieve him of his liability to carry out the work in accordance with the requirements of the contract documents.

1.4.6 Project Drawings

The following drawings form part of this specification and must be read in conjunction with it:

- 2318-T-M-101 DW S12 RevA

1.5 Quality of Materials

1.5.1 Only materials of high quality shall be used throughout and shall be subject to the approval of the Engineer.

1.5.2 All materials, where applicable, shall conform in respect of quality, manufacture, tests and performance, with the requirements of the SABS / SANS standards, or, where no such standards exist, they shall conform to the appropriate current specification of the British Standards Institution. Materials manufactured in South Africa shall be used wherever possible.

- 1.5.3 Imported materials shall comply with the requirements of the relevant SABS / SANS or BS Specifications.
- 1.5.4 All materials shall be suitable for the site conditions. These conditions shall include weather conditions as well as prevailing conditions during installation and subsequent use.
- 1.5.5 Should the materials or components not be suitable for use under temporary site conditions the Contractor shall provide at his own cost, suitable protection until these unfavorable site conditions cease to exist.

1.6 **Tests and Inspections - Pressure Testing and Quality Control**

The Contractor shall, at no extra cost to the contract, provide all the necessary equipment and facilities to conduct all tests as directed by the Engineer and or Supply Authorities.

1.7 **Builder's Work**

- 1.7.1 The Structural Engineer's approval, in writing, must be obtained before any holes or chases are cut in any structural component i.e. brickwork, concrete, steel or timber.
- 1.7.2 The Contractor shall be responsible for cutting chases and holes in walls and slabs to accommodate his services which must be coordinated in liaison with the Main Contractor who will be responsible for making good.

1.8 **Protection of Equipment**

It shall be the responsibility of the Contractor to protect all reticulation work and fittings that have been tested and accepted by the Engineer in writing during the currency of the contract.

2.0 **SUMMARY OF SCOPE OF WORK**

This specification is for the supply, delivery, installation, testing and commissioning of fully functional internal water reticulation and hot water generating systems as well as any ancillary equipment as described below:

- 2.1 Hot and cold-water reticulation systems,
- 2.2 Solar water heating system consisting of 2x 200 L storage vessel, with 4 kW electrical output. Included in the installation are:
- All SANS required safety equipment, operating valves, strainers, etc.
 - Circulating pumps between solar collector and storage vessel, as specified or as per recommended minimum by heat pump manufacturer,
 - Control Panel,
 - Thermostatic mixing valves,
 - Insulation,
 - Bracketing, supports, drip trays, overflows,
 - Standby electrical heating elements, temperature controllers and sensors etc.
- 2.3 All piping, fittings, piping supports, valves, etc.
- 2.4 The heat pump frames shall be equipped with fastening points etc.
- 2.5 Maintenance and operating manuals, parts lists, manufacturer's data sheets, as built pipe diagrams showing valve locations, maintenance schedules and list of recommended spares for all equipment.
- 2.6 Pressure testing of all piping to a pressure of 600kPa, pressure testing of solar panels and geysers after installation to a pressure not exceeding the max. Allowable operating pressure as specified by the manufacturer, operational testing and commissioning of the installation and training of staff in the use, care and maintenance of the equipment. All pressure testing must be witnessed and signed off by engineer.
- 2.7 All test certificates, electrical compliance certificates and local authority approvals.
- 2.8 Full maintenance during the 5year guarantee period and full documentation to enable the end user to implement the 5-year guarantee on the solar equipment as specified.
- 2.9 All other items and requirements, whether specifically mentioned or not, for complete, functional and safe heat pump water heating systems complying with all the relevant codes and specifications.
- 2.10 All safety notices, safety plan and safety equipment.

3.0 PIPING SPECIFICATIONS

3.1 Copper Piping

Copper piping for domestic water services shall in all cases comply with the requirements of SABS 460 Class 2 and 3. For applications below ground class 3 shall be used, wrapped with Denso tape or similar.

Piping above ground shall be of class 2 and be jointed with capillary soldered fittings. Provision must however be made for union couplings in strategic places.

Pipes shall be firmly and neatly chased in or fixed to walls, as directed by the Principal Agent. Holder bats, saddles or brackets shall be of copper, bronze or brass. Holder batts, clips, etc shall be fixed to timber roof trusses or walls with brass screws. Piping chased into walls shall be wrapped with two layers of brown paper (Kraft) and covered with 3:1 cement mortar mix. Note that wrapping piping with old cement bags is **not** acceptable.

Hot water piping shall be of thin wall hard drawn copper.

3.2 Capillary Soldered Jointing of Copper Piping

- 3.2.1 Unless otherwise specified, all copper pipes shall be jointed with approved capillary solder type fittings, each joint being formed by cutting the pipe-ends square with a pipe cutter. If the tube end to be soldered is dirty due to cement, bitumen or tape-gum, it shall be mechanically cleaned with steel wool or abrasive paper prior to soldering.
- 3.2.2 The area to be soldered should then be thinly coated with a self-cleaning flux. To the fitting apply a flame using a LPG Gas blow lamp, (or an electric resistance machine) to the assembly to heat the tube and fitting for not longer than about 10 seconds. Then remove the flame completely and test the temperature of the joint by placing the wire solder at the mouth of the fitting. If the solder does not melt, remove the solder and heat again with the flame for a few seconds more. Test again with the solder. If the solder melts freely, hold the solder at about 45o to the mouth of the fitting, allowing it to melt and with steady pressure the solder will be drawn into the joint. DO NOT overheat the assembly and never hold the solder in the flame. Allow only the heat of the assembly to melt the solder.
- 3.2.3 Unless otherwise specified use only 2- or 3-mm solid core wire solder, type 97/3 (97% tin and 3% copper.) A careful check should be made to ensure that a ring of solder is visible around the mouth of the fitting.
- 3.2.4 Solders containing lead are not acceptable and not allowed.
- 3.2.5 No resin core or acid core solders are acceptable.
- 3.2.6 Fittings and pipes must be wiped clean with a damp cloth after jointing. Joints that have been fluxed should be soldered within one hour.
- 3.2.7 Copper pipes specified to be jointed with compression fittings shall be jointed with approved brass metal fittings with coupling nuts and rotary sleeve pieces.
- 3.2.8 All necessary couplings, connectors, elbows, tees and other fittings as may be required, shall be provided.
- 3.2.9 Copper pipes to be specified to be jointed with flared type fittings, shall be jointed with approved brass metal fittings with coupling nuts and cone.
- 3.2.9 N.B. Capillary, compression and flared type fittings used in jointing copper pipes must be of such a bore as will correctly fit the pipes, to ensure satisfactory jointing.
- 3.2.10 Compression ring or flared cone fittings shall always be used when making mechanical connections - see Clause 2.7 and Appendix A.
- 3.2.11 Note that compression type fittings may **NOT** be used with Class 0 copper piping.

3.3 Brazing of Copper Piping

- 3.3.1 If piping is to be brazed self fluxing copper/phosphorous with 2% minimum silver similar to Silbralloy shall be used.

3.4 Labour Bends

All labour bends shall be made with an approved bending machine in conjunction with a bending spring to give a uniform and even radius without ripple. Such bends shall be substantially undistorted.

3.6 Services Chased in to Walls

3.5.1 Hot water pipes buried in walls and floors shall be wrapped in two layers of stiff brown paper before being built in to aid thermal expansion of the pipes. It is **not** acceptable to use old cement bags for this purpose.

All copper water pipes chased into walls or cast into concrete slabs or columns shall be jointed using **capillary fittings only**.

3.6 Connections to Wash Hand Basins, Baths, Sinks, etc

Connection to all fittings (viz. taps, cisterns, machines, etc.) shall be mechanically made and not brazed or hard soldered. In this respect take note of clause 2.2.11 - it will be required that a suitable section of class 1 copper piping be joined to class 0 piping (where this has been used for the reticulation) and that the requisite compression fittings then be fixed to the class 1 copper piping. Jointing compounds (Teflon Pipe Sealer by Loctite or other approved and/or P.T.F.E. tape) shall be lead free and sparingly used.

Small diameter connections off the ring mains may be made using approved saddle connectors in conjunction with "Ball Valves" in accordance with the manufacturer's recommendations.

3.7 De-Zincification

All brass fittings and valves shall be certified by the manufacturers to be free from de-zincification and will be subjected to check tests as set out in Appendix A.

3.8 Pipe Supports and Support Spacing

All pipe work both vertical and horizontal shall be supported along its length with brackets capable of carrying the combined mass of the pipe and water and shall be spaced at the following maximum centres:

Diameter of c/c Brackets/ hangers/ holderbats (mm)	15 - 22	28 - 35	42 - 54	76 -108	Pipe (mm)
	1200	2000	2500	3000	

Unistrut: Type P1000 - 3300 (hot dip galvanised)
Brackets: P1108 - P1126 (see standard drawing)

All copper pipes shall be electrically insulated from holder batts, etc with P.V.C. tape wound around the piping.

Other support systems shall be subject to approval by the Engineer or his duly appointed representative.

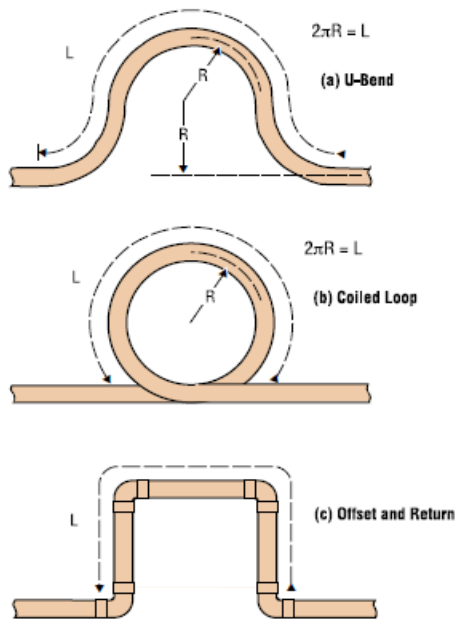
3.9 Pipe Gradients

Hot water pipes shall be laid to a minimum gradient of 1 in 200 with auto air release valves positioned at the highest points and vented to the outside.

3.10 Allowance for Expansion of Piping

All straight long runs in copper tubing shall be interrupted every 15 m with an offset or an expansion loop.

Expansion loops shall be provided as per standard practice for copper piping. The loop dimensions shall be as a minimum as follows:



Expected expansion in mm		LOOP LENGTH L AND RADIUS R FOR DIFFERENT PIPE Ø		
		15mm Ø	22mm Ø	25mm Ø
12	L	1250	1500	1700
	R	200	230	280
25	L	1700	2000	2400
	R	270	320	380
38	L	2200	2500	3000
	R	350	400	500

3.10 Pipe Gradients

Hot water pipes shall be laid to a minimum gradient of 1 in 200 with auto air release valves positioned at the highest points and vented to the outside.

4.0 VALVES AND FITTINGS

4.1 Isolating Valves

All toilets, kitchen areas etc. shall have a main isolating valve surface mounted inside those areas to aid maintenance.

Isolating valves are not allowed in the roof areas except for connections to geysers as shown on the drawings

Isolating valves on the cold water line shall be of the stop cock pattern up to 42 mm diameter and of sluice or gate valve pattern above 42 mm dia.

Where the static pressure is below 200 kPa all isolating valves on the hot and cold water system shall be of the sluice or gate valve pattern.

"Stop-cocks" or "Ball-valves" shall precede all individual fittings i.e. toilet cisterns, hot water geysers, washing machines etc. All "Ball-valves" shall have hard chrome plated balls seated on Teflon seats.

4.2 Non-Return Valves

All non-return valves shall be of the lift type pattern.

4.3 Automatic Air Release Valves

Automatic air release valves shall be installed at all high points in the reticulation system where air locks can occur or as detailed by the Engineer.

Air release valves shall be preceded by an isolating valve and vented to the outside.

5.0 Insulation Materials

5.1 All hot water piping must be insulated throughout with high density polystyrene R value of not less than 1 m².KW insulation.

5.2 Exterior hot water insulation must be protected with a protective membrane UV-resistant water and weather-resistant, pre-fabricated, self-adhering, sheet-type membrane. Should Tenderers wish to offer any other insulating material in lieu of the above full details must be submitted with tenders. Such alternative insulating materials may only be used if approved by the Engineer or his duly appointed representative.

5.3 The following minimum thicknesses of insulation are required:

Pipe Size	Thickness of Preformed Sections
Up to 40 mm diameter	25 mm
50 mm to 80 mm diameter	40 mm
100 mm diameter and over	50 mm

These minimum thicknesses are given as a guide. Tenderers are required to ensure that the insulation applied to piping is sufficient to ensure that the outside surface temperature of the insulated areas does not exceed 45 Deg C at an ambient air temperature of 20 Deg C.

5.4 Preformed insulation sections must be fixed in place by means of 15 mm wide bands of aluminium or similar non-corroding material applied at the rate of at least two per metre length on insulation.

Pre-formed insulation sections must be ordered specifically for steel or for copper piping. Pre-formed sections made to copper pipe sizes may under no circumstances be used for steel piping and vice-versa.

5.5 Prior to insulation, the piping must be rubbed down where the original primer coat is damaged and all loose rust and scale removed. Thereafter the piping must be touched up with new primer and one coat heat resistant aluminium paint.

5.6 Valves and fittings must be left un-insulated. Pipe insulation adjacent to such fittings must be neatly chamfered off and finished off with sheet metal covers.

No more than 50 mm and no less than 40 mm of piping adjacent to fittings may be left un-insulated.

5.7 Where joints are cut out and repaired, the Contractor must re-paint the new welds prior to the application of insulation.

6.0 SOLAR WATER HEATING EQUIPMENT

6.1 the following codes are applicable but not limited to:

- SANS 10142: The Wiring of Premises Part 1: Low Voltage Installations
- SANS 10252-1:2012: Water supply and drainage for buildings Part 1: Water supply installations for buildings.
- SANS 1307: Domestic solar water heaters
- SANS 10106: The installation, maintenance, repair and replacement of domestic solar water heating systems.
- SANS 10254: The installation, maintenance, replacement and repair of electric storage water heating systems.
- Plumbing code of practice as prepared by Copper Tubing Africa and The Copper Development Association Africa.

- 6.2 Solar water heating system consisting of 2 solar panels with effective area of 2m², 2 of 200 litre indirect solar geysers and one of glycol expansion tank with minimum capacity of 10 liters. 1 of circulating pump with a minimum flow of 0.02 litre/second against a 5-meter head (min), insulated class 2 copper pipe system.
- 6.3 All piping, fittings, piping supports, valves, indirect solar geyser, double skin indirect solar heating coils, flat panel solar heating panels, bracketing, supports, safety devices, drip trays, overflows, standby electrical heating elements, temperature controllers and sensors, circulating pumps, expansion tanks, thermostatically controlled mixing valves and initial fill with 30 % propylene glycol solution.
- 6.4 Maintenance and operating manuals, parts lists, manufacturer's data sheets, as built pipe diagrams showing valve locations, maintenance schedules and list of recommended spares for all equipment.
- 6.5 Pressure testing of all piping to a pressure of 600kPa, pressure testing of solar panels and geysers after installation to a pressure not exceeding the max. Allowable operating pressure as specified by the manufacturer, operational testing and commissioning of the installation and training of staff in the use, care and maintenance of the equipment. All pressure testing must be witnessed and signed of by DRPW works inspector.
- 6.6 All test certificates, electrical compliance certificates and local authority approvals.
- 6.7 Full maintenance during the 5-year guarantee period and full documentation to enable the user/DRPW to implement the 5 year guarantee on the solar equipment as specified.
- 6.8 All other items and requirements, whether specifically mentioned or not, for complete, functional and safe solar water heating systems complying with all the relevant codes and specifications.
- 6.9 All safety notices, safety plan and safety equipment.
- 6.10 The flat panel solar water heating panels shall heat a 30% propylene glycol solution. The glycol solution shall be circulated to indirect solar geyser. The compulsory requirement for the system is that the glycol expansion tank will be placed inside the roof space at a position higher than the flat solar panel. The solar geyser shall be fitted with a double jacket heat exchanger through which the propylene glycol is circulated. The solar geyser shall also be fitted with a 2kW standby electrical element.
- 6.11 The glycol circulating pump shall be controlled by an electronic differential temperature controller. The temperature controller shall be adjustable, use Pt100 temperature sensing elements mounted in the top outlet of the solar panel header and in the return line of the circulating glycol system. The circulating pump will switch off if the return glycol temperature is higher than the glycol temperature in the solar panel.
- 6.12 The 2 kW standby electrical element in the solar geyser shall also be controlled by an adjustable temperature controller and interfacing relay. The standby electrical element shall only switch on when the temperature in the geyser is below 45 deg C and shall switch off when the temperature is above 55 deg C. These settings shall however be adjustable.

- 6.13 The solar panels shall each be of the flat plate type with a nominal area of 2 m².
- 6.14 The panel design shall be such that the average solar conversion is at least 65%. The absorption material shall be copper with a minimum of 8 risers and two headers. The size of the risers shall be at least 10 mm diameter and the headers shall be 22 mm diameter.
- 6.15 The collector case material shall be from aluminium with a minimum wall thickness of 1.3 mm. The glass cover shall as a minimum be from 4 mm low iron tempered glass and shall be hail resistant according to the requirements of SANS 1307. The panel shall be insulated with 45 mm thick glass wool with minimum density of 50kg/m³. The collector shall be sealed with a full profile EPDM seal. Aluminium and copper shall be galvanically insulated.
- 6.16 The allowable working pressure of the collectors shall be at least 1200 kPa and the units shall be frost resistant with a 30% glycol solution and shall be capable of withstanding a temperature of 300°C.
- 6.17 The panel shall be secured to the roof using corrosion proof proprietary roof brackets and support rails suitable for the roofing material specified by the architect. The panel shall be mounted onto mounting rails. The rails shall consist of at least three lengths extruded aluminium box sections spanning the full width of the panel(s) plus at least 50 mm beyond the end. The rails shall be spaced one at the bottom, one centre and one at the top. The maximum vertical spacing of the rails shall be 800 mm. The number of mounting points shall comply with the manufacturer's recommendations as well as the wind loading based on a wind speed of 42m/s as per SANS-10160. The roof structure shall be certified to carry the panel and geyser loads.
- 6.18 Each group of panels or single panel shall be fitted with a vent valve and vacuum breaker at the top outlet point.
- 6.21 The standby heater is required with a heat pump application the standby heater shall be switched on automatically on heat pump failure with heating called for.
- 6.24 Easily detachable/ openable panels of rigid construction giving access to all working parts of the unit shall be provided.
- 6.25 All valves, fittings, etc for a complete operational system are not indicated, but must be included in the price.
- 6.26 Set of temperature gauges included on the send and return pipes.
- 6.27 All spare parts for the heat pumps should be available from local South African suppliers that keep stock of these items with no lead times for supplying.
- 7.0 HOT WATER STORAGE VESSEL**
- 7.1 The storage vessel shall be manufactured from at least 2.5 mm thick steel. The geyser shall be internally coated with vitreous enamel capable of withstanding thermal shock and temperatures up to 130°C. Each geyser shall be guaranteed for a period of five years and shall be supplied complete with sacrificial anode suitable for use in water.
- 7.2 A minimum of 60mm high density polyurethane insulation shall be used between the inner tank and outer cover. The minimum R value of the insulation shall be 2.00m².°K/W.
- 7.3 The solar geysers shall be complete with full jacketed heat exchanger coil radially covering at least 97% of the storage cylinder.
- 7.4 The cold-water inlet shall be fitted with a sparge pipe to reduce the turbulence and forces on the standby electrical element.
- 7.5 All pipe connections shall be for diameter of pipe indicated on drawings.
- 7.6 The standby electrical heating element shall be from Incoloy 825 with a watt density below 8W/cm². The element tubes shall be marked with the manufacturers batch number with traceable reference to the

material of manufacture that must be Incoloy 825. The element heating capacity shall be stamped on the element boss.

- 7.7 Each Cylinder shall as a minimum be supplied and installed with the following:
- Earth stud bonded to the earth system as well as earth bonding straps between the hot and cold-water pipes and any metallic cover etc.
 - Two vacuum breakers-one on the cold-water supply and one on the hot water outlet. The vacuum breakers must be mounted at least 300mm above the geyser and must be directly over the drip tray.
 - Pressure and temperature safety valve complete with independent 22 mm copper piping to a safe position outside the building.
 - Drain point and drain valve all mounted above the drip tray.
 - 400kPa combination pressure control, expansion and isolating valve with strainer.
 - Sacrificial anode.
 - Safety thermostat.
 - 4x 3 kW Incoloy 825 heating element.
 - Electrical isolating switch 1m from geyser complete with glands and flexible wire way to carry wiring to geyser element.
 - Bronze ball valves with stainless steel balls and handles to shut off the hot- and cold-water during maintenance.
- 7.8 The hot water cylinders shall be of a Vertical configuration as appropriate and be capable of accepting an add on heating system which may comprise of solar units, heat pumps or other fuel saving systems.
- 7.9 Pressure reducing valves shall be S.A.B.S. approved and factory set to maintain a pressure of 100 +/- 10 kPa at the cylinder outlet. The pressure reducing unit shall have as an integral part of that unit:
- (a) A pressure release valve with drain connection to protect the cylinder against thermal expansion of the water.
 - (b) A built-in strainer.
 - (c) A built-in non-return valve associated with the reducing valve.
 - (d) Isolating valves fitted to the inlet and outlet sides of the reducing valves.
 - (e) Combined Temperature, Pressure and Vacuum release valves fitted into the delivery side of the cylinder. The T.P. valve shall have a drain connection built into it and shall be fitted so that the probe is in the cylinder. The drain from the reducing valve and T.P.V. valve shall be laid to a fall of 1:60 minimum and discharge over a gully. The drain pipe shall be a minimum of 22 mm diameter.
 - (f) Pressure reducing valves shall be installed in accordance with the manufacturer's recommendations and **MUST BE POSITIONED FOR EASY MAINTENANCE.**
- 7.10 Certificates are required from the manufacturer of the hot water cylinders confirming at they have been pressure tested to 2,5 times the normal working pressure of 400 kPa gauge.
- The hot water cylinders shall be guaranteed from date of practical completion of the installation for a period of three years on the tank, insulation and outer casing and for one year on the electrical components.
- 8.0 **CIRCULATING PUMPS**
- 8.1 The circulating pump shall be mounted with screwed unions so that the pump can be easily removed for servicing.
- 8.2 The pump body shall be from coated cast iron. The motor shaft, impeller, seal rings, jacket and shaft bushes/bearings shall be from non-corroding material. The motor body shall be from die cast aluminium. Seals and thrust rings shall be from ceramic capable of operating at the specified temperature (110°C) in a 30% propylene glycol solution.

- 8.3 The pump motor shall be capable of operating at 220/230V AC in an ambient temperature of at least 40°C. The motor insulation shall be at least class H according to NEMA. The protection rating shall be at least to IP44.
- 8.4 The pumps shall be controlled by a differential temperature controller as described under the section ***BASIC OPERATION OF THE SYSTEM.***

9.0 ELECTRICAL WORK AND CONTROL PANELS

- 9.1 All electrical work must conform to SANS 1082 and a certificate of conformance (COC) must be issued for the installation. All cables must be secured to galvanised cable baskets. Wiring shall be done inside conduit.
- 9.2 All conduit, cable baskets and general items must be installed square, vertical and horizontal within the accuracy of a builder's level.
- 9.3 The main isolator and main circuit breaker shall be double pole for single phase units and triple pole for three phase units. The complete system shall be earthed and the COC shall cover all equipment associated with the installation.
- 9.4 The electrical supply from the nearest DB shall be done as part of this contract. Cable shall be fixed with saddles at maximum 400 mm intervals or be placed on galvanised cable baskets. All entry and exit points shall be fitted with bushes to prevent wire damage caused by sharp ends. Cable/wire sizes shall conform to the requirements of SANS 1082. All cable and wire loading shall include for all the electrical items plus an additional allowance of at least 20%.
- 9.5 The temperature controller shall be of the digital electronic type with at least two PT100 temperature sensor inputs. All the control parameters such as differential temperature, dead band and hysteresis shall be adjustable. The PT100 sensors shall be installed into the solar panel inlet and outlet pipes using pocketed temperature sensor wells with sealing glands. The temperature sensor leads shall be at least the three-wire type specifically made for PT100 sensors.
- 9.6 The controller output shall switch an interfacing relay to control the circulating pump. The pump shall not run if the glycol return temperature is higher than the solar panel outlet temperature.
- 9.7 The controller shall be placed in an easily accessible position without undue long leads.
- 9.9 The following equipment should be installed on the control panel as standard equipment for the installation:
- a) a main isolating switch;
 - b) circuit-breaker protection;
 - c) contactors;
 - d) thermal overcurrent protection;
 - e) surge breakers when the installation is exposed to the weather;
 - f) undervoltage and overvoltage protection in accordance with the relevant standards;
 - g) phase-failure and rotation protection (three-phase motors);
 - h) low water level protection;
 - i) short-circuit protection.

The size and characteristics of the equipment given above shall be determined by the following factors:

- a) the electrical fault level of installation;
- b) the starting current of pumps;
- c) the running current of pumps; and
- d) the supply voltage to the installation

10.0 HYDRAULIC TESTING OF WATER PIPES

All water piping shall be hydraulically tested to a pressure equal to 3 times the working pressure but not less than 1000 kPa held for 60 minutes or as long as it takes to inspect every joint in the section being tested, whichever is the greater. The test shall take place in the presence of the Engineer or his duly appointed representative with the results being recorded for inclusion in the practical completion documentation and certification.

Under no conditions shall "leak cure chemicals" be introduced into the reticulation system.

All leaks shall be made good, so that the quality of the original components is not altered and so that the repairs are to the satisfaction of the Engineer or his duly appointed representative.

The Contractor shall provide all the necessary equipment required to carry out the tests on the pipes. Piping shall be tested in sections as the work progresses and before being covered in trenches or wall or floor chases. The completed pipe line shall also be pressure tested just prior to practical completion of the installation.

Failure to comply with the above will result in the contractor being required to expose the piping in question **at his own expense** in order for the pressure tests to be carried out.

11.0 PAINTING

All exposed and visible reticulation lines shall be painted by the Contractor. All piping shall be colour coded in accordance with the requirements of the SABS colour code. Identification of the contents of a pipe line shall be by means of painting a colour code on the pipes as required by the SABS colour code and these bands shall be painted on by the Contractor.

The colour coding shall consist of a primary colour only or of primary and secondary colour and shall generally consist of 300mm long primary colour bands painted around the pipe. Where applicable a central 100mm secondary colour band shall be added. Where short lengths of pipes run through occupied areas and in plant rooms the primary colour shall be applied to their entire length.

Where only bands can be applied they shall be at intervals of not more than 6m apart and adjacent to each side of a bend, valve, etc.

Where pipe runs are hidden, i.e. within ducts, false ceilings, etc colour coding bands shall be provided opposite each access panel or similar.

Arrows indicating the direction of flow of the contents of the pipe shall be applied as per colour coding bands.

21.0 LABELLING OF VALVES, ETC.

All main stop valves, control valves, etc. shall be labelled by means of rustless metal tags indicating their purpose and the section they isolate, if isolating valves. The tags shall be securely fixed to the valves, and shall be clearly legible.

Letters on labels shall be punched. No painted labels or plastic embossed labels will be accepted.

Alternatively 12 mm wide stainless steel tape embossed labels may be used fixed with copper wire to the relevant valves.

13.0 WARRANTY

The contractor is to guarantee all the systems and workmanship for a period of twelve (12) months against any defects (latent or obvious), non-conformance and/or failure from date of first delivery. The glycol expansion tanks, indirect solar geysers, solar panels and brackets shall carry a guarantee of 5 years. Documentation to support such a guarantee on the equipment shall be provided for safe keeping by DRPW. Any defects and/or failure that may occur or become evident during the guarantee period shall be rectified within twenty four (24) hours after being notified of the occurrence of the defect. In the event that such failure and/or defect constitute a threat to the health and safety of the user and/or occupants, the contractor shall take immediate steps to rectify the fault. Any faulty item that becomes evident during the guarantee period shall be replaced with new and not repaired. The contractor shall also submit to the Department of

Public Works AND school management a full report describing the nature of failure, cause of failure and possible methods to prevent future failure.

In the event that the contractor does not attend to such defects after being notified, the Department of Public Works and/or user reserve the right to effect the rectification of the defect and recover the costs thus incurred from the contractor.

14.0 **MAINTENANCE**

Immediately after each interim or final practical completion inspection all defects noted shall be rectified. Latent defects appearing within three (3) months or as specified, shall be rectified by the Contractor at no charge to the client.

SITE 12

VOLUME 2.2 PART 2: SCHEDULE OF MATERIALS OFFERED

DOMESTIC WATER & HEATING EQUIPMENT INSTALLATION

SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : Only one manufacturer's name to be inserted for each item.

Item	Material	Make or trade name	Country of Origin
1.	Copper Piping		
2.	Isolating Valves		
3.	Strainers		
4.	Non-Return Valves		
5.	Safety Valves		
6.	Vacuum Breakers		
7.	Balancing Valves		
8.	Pressure Reducing Valves		
9.	Solar Vacuum Tube Collectors		
10.	Pipe Insulation		
11.	Hangars		
12.	Heat Pump		
13.	Storage Cylinder		
14.	Thermostatic Mixing Valves		
15.			

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

SITE 21

VOLUME 2.1 PART 1: FIRE PROTECTION EQUIPMENT - 1 SCOPE OF WORKS

FIRE PROTECTION EQUIPMENT INSTALLATIONS

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.

2. THE CONTRACT

2.1 FIRE PROTECTION EQUIPMENT INSTALLATIONS

The work to be carried out and commissioned by a SAQCC Fire approved installer:

- a. Installation of new hose reel, hydrant and extinguisher equipment, as per SANS 10400 Section T & SANS 10252,
- b. Installation of new galvanised steel water reticulation,
- c. Testing and Commissioning, as per SANS 10400 Section T and SANS 10139,
- d. Manuals, Drawings, OEM Literature,

2.2 Existing

All installations new. Building Existing.

2.3 Order of The Works

As per the building contractors' program of works.

SITE 21

VOLUME 2.1 PART 2: FIRE PROTECTION STANDARD SPECIFICATION

1.0 GENERAL

- 1.1 This standard specification applies to, and is to be read in conjunction with the particular technical specifications.
- 1.2 In so far as the conditions contained herein are at variance with anything contained in the particular specification, the contract shall be interpreted in terms of the particular specification for each particular service.
- 1.3 Equipment, materials and operational methods, shall comply with the relevant South African Bureau of Standards Specification or the British Standard Specification, wherever such specification exists, whether prescribed or not. Preference will be given to the latest issue of the SANS specification where both such specifications exist, unless otherwise prescribed in this or the particular specification.

2.0 OCCUPATIONAL HEALTH AND SAFETY ACT

- 2.1 All equipment supplied and installed under the contract shall meet the requirements of the Occupational Health and Safety Act (Act No 85 of 1994, (as amended) and all other relevant statutory requirements and the Contractor shall comply with the requirements laid down by the Inspector of Machinery under this Act.

3.0 DRAWINGS

- 3.1 The drawings issued with this specification do not purport to show the exact position, size or details of construction of equipment.
 - 3.2 Tenderers must satisfy themselves that the equipment offered by them can be accommodated in the available space and positioned in such a way that access for maintenance, repairs or removal is not obstructed.
 - 3.3 Drawings showing any alternative suggestions differing from the Engineer's design must be submitted with tenders.
 - 3.4 Within four weeks of signing of the contract (or date of order) the successful tenderer shall submit to the Engineer or his duly appointed representative the following working drawings:
 - 3.4.1 Plant room lay-out showing total operating mass of equipment and the positions and sizes of the water and drain connections required.
 - 3.4.2 Construction details of all items manufactured by the air conditioning and/or ventilation Contractor, such as air plenums, duct work, bases etc.
 - 3.4.3 Dimensions and positions of all holes through walls, slabs, etc., and any amendments to the sizes or positions of return grilles, louvred openings, etc., indicated on the Engineer's drawings.
 - 3.5 Approval by the Engineer of drawings submitted by the Contractor shall not relieve him of his liability to carry out the work in accordance with the requirements of the contract documents.
 - 3.6 Positions and sizes of return air grilles, louvred openings, openings through reinforced concrete beams and slabs, etc., as indicated on the drawings shall be adhered to as far as possible. Amendments will only be considered if absolutely unavoidable.
- #### 4.0 MANUFACTURER'S RATINGS
- 4.1 All equipment such as fans, compressors, cooling towers, pumps, etc., shall be operated well within the manufacturer's ratings. Equipment offered for use beyond these limits will not be considered.

- 4.2 Tenderers must submit manufacturer's ratings of all equipment offered. Ratings shall be given in the SI system.
- 5.0 POWER, WATER AND DRAIN CONNECTIONS
- 5.1 Power, water and drain points in the plant rooms will be provided to a point by others.
- 5.2 All plumbing between equipment and water and drain points shall form part of the contract.
- 6.0 NOTICES
- 6.1 The Contractor shall supply and install all notices and warning signs that are required in terms of the Occupational Health and Safety Act, by local by-laws or regulations and by these documents. This includes notices prohibiting entry to un-authorized persons, etc.
- 6.2 A log-book and log-book stand must be provided for each plant room. This must take the form of an A5 size hard cover note book fixed by a light chain through the top left-hand corner to a writing surface.
- 7.0 WELDING
- 7.1 Welding shall be carried out in accordance with the current edition of SANS 044 Parts 1 to VII where applicable.
- 7.2 All welded fillet or butt joints shall be free from porosity, cavities and entrapped slag. Joints shall be ground smooth if required for aesthetic reasons only. If strength is required, they shall not be ground.
- 7.3 The joints in the weld run, where welding has been recommenced, shall be as smooth as possible and shall show no pronounced hump or crater in the weld surface.
- 7.4 The profile of the weld shall be uniform, of approximately equal leg length and free from overlap at the toe of the weld. Unless otherwise specified the surface shall be either flat or slightly convex in the case of fillet welds and with a reinforcement of not more than 3 mm in the case of butt welds.
- 7.5 The weld face shall be uniform in appearance throughout its length.
- 7.6 Filler metal electrodes shall be of an approved type for the material being used and shall be kept in a dry condition. All electrodes shall conform to SANS 455.
- 7.7 Only welders in possession of a valid approved competence certificate shall be employed.
- 7.8 When pipes are welded, tenderers must allow for pipe joints (where chosen by the Engineer's Representative) to be X-ray tested by the SANS or other approved body for sound welding at the Contractor's expense or for joints to be cut for examination purposes. After the removal of these joints, the piping must be made good by the Contractor. Should any of the welds prove unsatisfactory, the Contractor may be called upon, at his own expense, to have all welds examined by X-ray. The X-ray examination shall be carried out by the South African Bureau of Standards or other approved body.
- 7.9 All welds must show proper fusion.
- 8.0 GALVANISING
- 8.1 All hot dip galvanizing shall be carried out in accordance with SANS 934 and SANS 763 where applicable.
- 8.2 Mild steel plate and sections shall be of good commercial quality, or higher grades, best suited for galvanizing. The materials shall be free from slag or coarse laminations, fine fissures and rolled-in impurities.
- 8.3 Castings shall be sound, dense and clean, and free from distortion, porosity, carbon and slag enclosures, blow-holes, and other injurious conditions.
- 8.4 Welding flux shall be chipped away and all welds wire brushed before galvanizing.

- 8.5 The surfaces to be galvanised shall be free from paint, oil, grease, and similar impurities.
- 8.6 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanizing.
- 8.7 The Engineer shall have the right to inspect all steel components before galvanizing, and shall have the right to reject or ask for remedial treatment of any material which is considered to be unsuitable. This applies particularly to welds.
- 8.8 The galvanised coating shall be smooth, adherent, continuous and free from black spots or flux stains.
- 8.9 Globular extra-heavy deposits of zinc which interfere with the intended use of the material will not be acceptable. Excessively protuberant lumps and nodules shall be removed by hot wiping or by the skilful application of mechanical means, however, there shall remain a sufficient minimum thickness of unbroken zinc coating. Flaws on small parts and working surfaces shall be repaired only by stripping and re-dipping. The zinc bath shall contain not less than 98.5% pure zinc.
- 8.10 The deposits expected from galvanised coatings shall be as follows: -

MATERIAL THICKNESS	COATING GRAMS PER m ²	APPROXIMATE THICKNESS
Bolts and Nuts	275 - 300	0,033 - 0,036 mm
1,25 mm to 2 mm	400	0,056 mm
2 mm to 5 mm	535	0,07 mm
5 mm and over	760	0,108 mm

9.0 COUPLINGS

Couplings shall be aligned by means of a clock gauge and the results entered in the commissioning data included in the Operating and Maintenance manuals.

10.0 BEARINGS

10.1 ANTI-FRICTION

10.1.1 Anti-friction bearings shall include all bearings which provide rolling contact between one or more sets of hardened steel balls or rollers and the hardened steel rings or raceways.

10.1.2 Anti-friction bearings shall be of approved manufacture.

10.1.3 To facilitate maintenance, spares inter-changeability and standardisation, anti-friction bearings of standard design and manufacture shall be employed. All anti-friction bearings shall be provided with greasing facilities in accordance with the manufacturer's requirements.

10.2 BUSHED BEARINGS

10.2.1 Only where specifically stated and in cases of low velocities and light loads in moisture free conditions will bushed bearings be accepted. All bushed bearings shall be made of an approved bearing metal composition which has good anti-friction qualities and is capable of withstanding severe usage.

10.2.2 All bushed bearings shall be provided with lubrication facilities to ensure adequate lubrication and shall be properly grooved to distribute the lubricant uniformly over the bearing surfaces. Grooves shall not be cut into the journal, but always into the surrounding bush. The edges of all chambers and grooves shall be rounded to avoid sharp corners and to facilitate the introduction of the oil or grease between the journal and the bearing metal.

10.3 SELF-LUBRICATING OR OIL-LESS BEARINGS

- 10.3.1 Self-lubricating or oil-less bearings shall only be used on application of light loads and low velocities in moisture free and low humidity and conditions and where access to bearings is difficult and likely to be neglected during servicing.
- 10.3.2 The type of bearing metal composition used shall have friction and wear resistant properties akin to those of grease lubricated bushed bearings.

11.0 GENERAL MACHINERY PROTECTION

11.1 COUPLING AND SHAFT GUARDS

- 11.1.1 All high-speed couplings, projecting shaft ends and every dangerous moving part of machinery within normal reach of a person shall be protected by a guard manufactured from not less than 1,5 mm mild steel plate.
- 11.1.2 The guards shall be neatly formed and securely fixed in position.

11.2 BELT GUARDS

- 11.2.1 All belt or rope drives shall be adequately protected by a belt guard.
- 11.2.2 The guard shall be manufactured from 25 mm wire mesh or open type expanded metal, securely braced and stiffened with light rolled steel sections and bolted in position. They shall be in accordance with the Occupational Health and Safety Act of 1994 (as amended).

11.3 CHAIN DRIVES

- 11.3.1 All chain drives shall be fitted with sheet chain cases and lubrication facilities to the chain manufacturer's recommendations. All joints shall be dust tight and arranged for convenient installation and dismantling.
- 11.3.2 Each chain case shall be fitted with a hinged inspection door, drain hole and plug.

12.0 QUALITY OF MATERIALS

- 12.1 Only materials of high quality shall be used throughout and shall be subject to the approval of the Engineer.
- 12.2 All materials, where applicable, shall conform in respect of quality, manufacture, tests and performance, with the requirements of the SANS standards, or, where no such standards exist, they shall conform with the appropriate current specification of the British Standards Institution. Materials manufactured in South Africa shall be used wherever possible.
- 12.3 Imported materials shall comply with the requirements of the relevant SANS or BS Specifications, although these materials need not necessarily bear the SABS mark.
- 12.4 All materials shall be suitable for the site conditions. These conditions shall include weather conditions as well as prevailing conditions during installation and subsequent use.
- 12.5 Should the materials or components not be suitable for use under temporary site conditions the Contractor shall provide at his own cost, suitable protection until these unfavorable site conditions cease to exist.

13.0 MAINTENANCE INSTRUCTIONS

- 13.1 As requested in the particular specification the Contractor shall provide operating and maintenance manuals/instructions at the time of hand-over of the installation.
- 13.2 The manuals shall include the following:
 - 13.2.1 Maintenance instructions for all components of the plant which shall include maintenance items required over and above those included in the maintenance schedules attached to this specification, troubleshooting guide, part numbers of all replacement items, capacity curves of pumps, fans and compressors, belt sizes,

types and lengths, serial numbers of all principal pieces of equipment, etc.

13.2.2 The names, addresses and telephone numbers of manufacturers or their agents.

13.2.3 Receiver test certificates.

13.2.4 A complete set of the "as built" drawings reduced in size to fit the manuals.

13.3 The operating and maintenance instructions specified above shall be obtained from the equipment manufacturer and where no such manuals exist, they shall be compiled by the Contractor to the best of his ability.

13.4 The contract shall be considered incomplete until all tests have been conducted to the satisfaction of the Engineer and all drawings and manuals have been handed over.

14.0 MAINTENANCE, SERVICING AND GUARANTEE

14.1 MAINTENANCE AND SERVICING

14.1.1 The Contractor shall be responsible for all maintenance and servicing of the installation during the 12-month guarantee period in accordance with the service schedules attached to this specification. Such additional items as required by the manufacturer of the equipment shall be included. (See also clause 13.2)

Four (4) services are required during this period on dates to be agreed at the first delivery inspection. The final service shall be carried out approximately 14 days before final delivery and expiry of the guarantee.

The contractor shall complete the service schedules and submit copies thereof together with his invoice for the servicing to the engineer after each service.

14.1.2 During the 12-month guarantee period the Contractor shall make good any defects due to inferior materials and workmanship and maintain all plant and equipment in perfect operating condition.

14.1.3 The Contractor shall maintain the plant log book on site in which he shall record, sign and date all work carried out at each inspection as well as log all temperature and pressure readings.

14.1.4 The Contractor shall allow for all expendable materials necessary for servicing such as lubricating oils, grease, refrigerant, cleaning materials etc.

14.2 GUARANTEE PERIOD

14.2.1 The CONTRACTOR shall unconditionally guarantee all new plant and equipment (machinery) for a minimum period of twelve (12) months from the date of hand over to the Engineer.

If the CONTRACTOR or his supplier has a standard guarantee which exceeds the minimum warranty called for, the remaining portion of such extended warranty must be ceded to the client.

14.2.2 The guarantee shall cover the performance of the WORKS and any defects due to inferior materials and/or workmanship, fair wear and tear excepted, and the CONTRACTOR shall repair any such defects without delay.

This guarantee shall include malfunction, and water, refrigerant gas, oil, or air leaks, and all adjustments.

14.2.3 Should the performance of any part of the complete WORKS become unsatisfactory so as to become detrimental to its functional use, the CONTRACTOR shall replace any such part or the complete WORKS with equipment as prescribed by the Engineer.

14.2.4 If any such defects are not remedied without delay, the Engineer reserves the right to have such defect repaired at the risk and cost of the CONTRACTOR by another CONTRACTOR whom the Engineer deems to be proficient in the WORK. this to be without prejudice to any rights the Engineer has against the installation CONTRACTOR. The Engineer will give written notice to the installation CONTRACTOR of such instances where he appoints another CONTRACTOR to remedy defects in the WORKS.

14.3 PREVENTIVE MAINTENANCE SERVICES.

Preventive maintenance servicing of plant and equipment shall be carried out in accordance with the maintenance schedules and programs to be supplied by the Engineer. Copies must be made as required of these schedules.

15.0 ELECTRICAL EQUIPMENT AND INSTALLATION

15.1 Unless otherwise stated in the particular specification tenderers must allow in their price for the complete electrical installation and wiring.

15.2 All electrical equipment and wiring shall be in accordance with the current issue of the Standard Wiring Regulations (SANS1 0142) (as amended).

15.3 Three phase power will be provided by others in the plant room.

15.4 Ammeters and pilot lights shall be provided for electric heaters.

14.5 All motors over 5 kW shall be provided with an approved electronic type motor protection unit.

15.6 In conventional field assembled plants lighting shall be provided for filter, coil and fan chambers, etc and shall comprise of bulk-head fittings permanently fixed to the walls or ceiling and earthed directly to the main earthing bar of the switchboard by means of a 4 mm² bare copper earth continuity conductor, in addition to being earthed by means of the continuity of the conduit as specified.

15.7 A single phase power point will be provided in the plant room by others for this lighting.

16.0 AUTOMATIC CONTROL SYSTEMS

16.1 Unless otherwise specified either electric or electronic controls may be offered. All control devices shall perform the functions indicated and operate in the required sequence.

16.2 The performance of controllers shall be stable under all conditions and shall be such that an aperiodic recovery of the controlled variable is obtained following a disturbance. Means of adjusting the control loop stability, such as adjustable proportional bands, adjustable reset rates etc., shall be provided on controllers when applicable.

17. DRIVES

17.1 Compressors and pumps shall be direct coupled to their driving motors.

17.2 The drives between centrifugal fans and motors shall be by means of grooved pulleys and V-belts.

17.3 V-belt drives shall be designed in accordance with CKS 332. Motors shall be mounted on slide rails for adequate belt tensioning and replacement.

17.4 All drives shall be protected by stout 25 mm wire mesh guards and shall be in accordance with the Occupational Health and Safety Act of 1994 (as amended).

18.0 EQUIPMENT BASES

18.1 Bases for centrifugal fans, compressors, air cooled condensers, air compressors, pumps and motors etc., shall consist of reinforced concrete cast into sheet metal formers at least 150 mm deep.

18.2 Bases shall be reinforced with at least 13 mm reinforcing bars located at 150 mm centers each way.

18.3 The mass ratio between bases and equipment shall be at least 1:1 for fans and 1,5:1 for pumps.

18.4 Concrete bases for the pumps shall be large enough to support pipes and fittings between the pumps and flexible connections.

18.5 Bases generally shall be large enough to accommodate the motors and driven equipment. Equipment shall be bolted onto the concrete inertia base.

- 18.6 Spring isolators shall be installed between concrete inertia bases and floor plinths and between the cooling towers or evaporative condensers and floor plinths.
- 18.7 Structural steel bases shall be provided for the cooling towers and evaporative condensers if their framework does not permit point support.
- 18.8 Either free standing stable spring or caged spring with snubber may be used. Spring isolators shall be installed with leveling bolts and shall incorporate 6 mm thick ribbed neoprene acoustical pads bonded to the base.
- 18.9 Spring diameters shall be large enough to prevent excessive rocking of equipment during start-up and normal operation.
- 18.10 Isolators shall be chosen to give a static deflection corresponding to a ratio of 3:1 of the lowest disturbing frequency to the natural frequency of the mounting.
- 18.11 Bases and spring isolators shall be arranged to give a clearance of approximately 25 mm between the underside of the bases and floor plinths.
- 18.12 Floor plinths of sufficient height shall be installed under all equipment by the air conditioning contractor. The plinths shall be large enough to accommodate the concrete inertia bases and spring isolators. Floor plinths shall also be provided under items of equipment which do not require concrete inertia bases such as cooling towers, air plenums, etc. The plinths under the air plenum shall be at least 100 mm higher than the finished floor level in the plant room.
- 19.0 RUNNING OF PIPES
- 19.1 Pipes and ducts shall be installed in accordance with the drawings issued with the supplementary specification.
- 19.2 The drawings are schematic and do not purport to show the exact positions of pipes nor the details of construction and installation. All final dimensions must be checked on site before the fabrication of piping sections.
- 19.3 Pipe sleeves with at least 6 mm clearance filled with a resilient material shall be provided where refrigerant tubing or water piping passes through walls or slabs.
- 19.4 Where beams, stanchions or other obstructions interfere with the straight running of pipes or ducts, suitable offsets shall be provided or changes in the section of the duct made, without altering the cross-sectional area.
- 19.5 Tenderers should make themselves conversant with complete drawings of the building in order to determine the number of such offsets or changes in section and the positions in which they will be required. Due allowance for these shall be made in the tendered price.
- 19.6 A complete set of drawings of the building may be inspected at the office of the Architect.
- 20.0 PAINTING
- 20.1 All exposed galvanised sheet metal work in plant rooms, air conditioned and ventilated spaces, basements, corridors etc., shall be painted.
- 20.2 Ducts shall be identified by coloured symbols as specified in clause 6 of SANS 0173-1980.
- 20.3 The temporary white rust preventative compound on new galvanised sheet metal shall be removed by means of washing, brushing and if necessary, abrasion with a special solvent or compound used for this purpose. The surface shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910 or one coat of calcium plumbate primer to SANS 912 followed by one under coat to SANS 681 type II and one coat high gloss enamel paint to SANS 630, Grade I, as top coat, the colour of which will be determined by the Engineer.
- 20.4 The entire air-conditioning unit casing, including galvanised iron eliminators, sumps, drip pans, fans etc., shall be painted internally with two coats of epoxy-tar paint to SANS 801, type II. The white rust preventative compound on galvanised iron shall be removed as specified above before the paint is applied.

Angle iron framework shall be similarly painted with epoxy paint before side covers are fitted.

- 20.5 Ferrous cooling tower and evaporative condenser casings, including galvanised iron eliminators sumps and fans and internal areas of connecting ductwork shall be internally painted as specified above. Externally the casings shall be painted as specified in clause 48.3. Factory painted equipment will also be acceptable.
- 20.6 Exposed hot water piping with canvas covered insulation shall be painted two coats of bitumen aluminium paint to SANS 802.
- 20.7 Exposed uninsulated galvanised piping shall be thoroughly degreased. In case a detergent is used, the surfaces shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910, or one coat of calcium plumbate primer to SANS 912, followed by either one undercoat to SANS 681, type II, and one coat high gloss enamel paint to SANS 630, Grade I, as topcoat or two coats of PVA to SANS 634, Grade I.
- 20.8 Uninsulated black piping, flat-iron, angle-iron and rods for supports, brackets, duct stiffeners, etc., shall be painted on all sides with a zinc chromate primer to SANS 679, Type I followed by two coats of enamel paint to SANS 630, Grade I.
- 20.9 Where specified in the supplementary specification aluminium shall be painted with a wash primer to SANS 723, followed by a zinc chromate primer to SANS 679, Type I, and two coats of enamel paint to SANS 630, Grade I.
- 20.10 Motors, compressors, pumps etc., shall be painted light grey. Belt guards shall be painted bright red.
- 20.11 Before any painting is applied the steel surfaces shall be prepared according to SANS 064, (Code for preparation of steel surfaces for painting.)
- 20.12 Where specified in the particular specification steel surfaces shall be cleaned and then treated by the hot phosphate process to a minimum weight of 1,6 gr/m² coating followed by two coats of baking enamel to SANS 783, Type I.

27.0 GENERAL REQUIREMENTS FOR FIRE INSTALLATIONS

All fire pipe installations shall adhere to the technical and particular specifications of the Employer, and shall include the following general requirements:

- 21.1 Piping shall conform to the requirements of SANS.
- 21.2 Pipes shall be cut accurately to measurements established on site and installed without springing or forcing and properly clear of windows, doors and other openings. All piping shall be reamed after cutting and shall be clean, straight and free of defects.
- 21.3 Drawings are generally diagrammatic and indicative of work to be installed. Routing and arrangement of piping shall be as indicated, subject to site conditions and the appropriate requirements of SANS rules.
- Clashes with other trades shall be avoided and fittings, valves, drain points, etc shall be located so as to ease access, maintenance and operation of the system. Note that required offsets, fittings, valves, drains, etc are not necessarily indicated.
- 21.4 Pipe runs shall be straight and direct as possible, in general forming right angles with or parallel to walls or other piping, and neatly spaced. Piping shall be installed so that there is sufficient clearance between finished coverings of piping, fittings and adjoining work.
Sleeves shall be provided where piping passes through partitions, beams, slabs, etc.
- 21.5 Valved and capped drain points shall be provided at all low points in the piping network.
Unions or flanged connections shall be provided to aid dismantling of the piping should it be required.
- 21.6 No cold springing shall be allowed. Pipe sections shall be fabricated/cut to length accurately in order to avoid cold springing.
- 21.7 Where necessary, adequate temporary supports shall be installed during erection so as not to overstress piping or equipment to which piping is connected.

- 21.8 All supports shall conform to the requirements of SANS, and no perforated straps or strip steel shall be used.
- 21.9 Piping which is subject to vertical movements shall be provided with springs or other suitable supports.
- 21.10 Hangers shall be installed in such a manner that they cannot be disengaged by any pipe or support steel movement.
- 21.11 No pipe shall be suspended from another pipe except if specifically called for on the drawings or in the particular specification (Part 3).
- 21.12 The Contractor shall be responsible for selecting the sizes and types of pipe hangers, supports and support devices not shown on the drawings, but which are necessary for the completion of the installation. Support spacing shall be as specified in paragraph 23.0 The Contractor shall supply details of all calculations to the Engineer for scrutiny together with two marked up prints showing the location and types of all supports/pipe hangers to be installed prior to ordering and commencing installation.

21.13 During construction all pipe ends shall be kept plugged to prevent any ingress of dirt, rubble etc.

28.0 PIPING

- 22.1 Steel piping shall be solid drawn, heavy grade steam quality piping conforming to ASTM/A106 Schedule 40 or to B.S. 1387/1967 (heavy quality) or SANS 62/1971. In all instances the latest editions and amendments to these specifications shall apply.

In plant rooms piping may be welded, prefabricated off-site to aid in installation and connection to pumps, storage tanks, etc. Welding shall be carried out as specified in paragraph 7.0 of this specification.

Generally, pipe sections shall be screwed together using malleable iron threaded fittings, class 150 and 300 in accordance with ASME B 16.3. Only eccentric fittings shall be used at changes in pipe size. No bushing shall be used in lieu of reducing fittings. Screwed joints shall be screwed up tightly using an approved jointing compound such as PTFE tape. Hemp joints will not be accepted.

Pipes joined with grooved fittings (e.g., Klambon or Victaulic) shall be joined by a listed combination of fittings, gaskets, and grooves. Grooves cut or rolled on pipe shall be dimensionally compatible with the fittings and pressure at which the system is to operate.

Where flanges are used, they shall be in accordance with ASME B16.5. Steel slip-on boss flanges for welding shall have a nominal pressure at least 10% in excess of the maximum fluid pressure. Where equipment is supplied complete with flanges not in accordance with the above specification, a matching weld-on flange is to be used for connecting up such equipment. Bolts in flanges are to be high tensile steel and of the correct length such that no more than 1,5 clear threads protrude beyond the nuts after tightening to the correct torque. In flanged joints new gaskets shall be used for every assembly operation unless such an assembly is intended solely for initial fitting. Gasket material shall be fibre composition or similar material suitable for the system operating pressure and temperature.

- 22.2 Underground piping shall be class 16 HDPE piping and weld-on flanges in accordance with SANS 0533-2

Pipes shall be laid on a 100 mm sand-bedding cradle and covered with 300 mm sand before backfilling. The total cover over the piping shall be a minimum of 900mm generally and 1100mm under roadways. All backfilling shall be to the Engineers approval.

Where required thrust blocks shall be cast between the pipe and the undisturbed trench material. At thrust blocks the pipe bend shall be wrapped with a "Densopol 80 HT Tape" (or equal and approved) so that no concrete comes into direct contact with the HDPE piping.

All underground piping shall be pressure tested prior to it being covered.

29.0 PIPE SUPPORTS AND HANGERS

All necessary pipe hangers, brackets, supports, stanchions and anchors shall be designed, supplied and installed by the Contractor, in accordance with SANS.

23.1 Maximum pipe support spacing shall be as follows:

Pipe Diameter	Max support Spacing
20 mm	3 m
25 mm	3.6 m
32 mm	3.6 m
40 mm	4.5 m
50 mm	4.5 m
65 mm	4.5 m
80 mm	4.5 m
100 mm	4.5 m
150 mm	6 m
200 mm	6 m

The contractor will be required to ensure that the hangers/supports selected are conservatively rated for the carrying capacity required. (Refer to paragraph 21.12).

23.2 There shall be at least one pipe support for each mechanical pipe joint .

23.4 Components of any pipe support shall be securely attached to each other by means of bolts or threaded rod with nuts and washers.

27.5 All components of all pipe supports shall be galvanized.

28 VALVES AND FITTINGS

All valves, check valves, shut-off valves, etc. shall be of a pressure class greater than or equal to pressure class of the piping.

All valves controlling water supplies for fire systems or portions thereof, should be accessible to authorized persons during emergencies. Permanent ladders, chain-operated hand wheels, or other acceptable means should be provided where necessary.

Outside control valves shall be located within a fenced enclosure under the control of the owner, sealed in the open position, and inspected weekly as part of an approved maintenance and safety procedure.

24.1 Valves greater than 50mm diameter shall be of the butterfly type with resilient rubber seats. 100 mm and 150 mm diameter valves shall be equipped with gear operated closing mechanism. Valves shall conform to BS 5155 and shall be KERR fig. no 104A or similar or equal and approved.

24.2 Valves up to and including 50mm diameter shall be of the screwed and socketed type with bronze body and gated with non- rising spindle.

24.7 Valves shall be labelled as follows:

- (g) Main stop valves, control valves, etc shall be labeled by means of rust-free metal tags indicating their purpose and the section they isolate, if isolating valves.
- (h) The tags shall be securely fixed to the valve and shall be clearly legible.
- (i) All letters on labels shall be engraved or punched. No painted or plastic embossed labels will be accepted.

24.4 Strainers shall be of the Y-type with cast iron body, stainless steel or bronze strainer element and shall be equipped with flanged ends. The hole sizes of the strainer element shall be maximum 1 mm Ø and be removable without dismantling of pipe-work. Strainers shall be suitable for a temperature of up to 90°C at a 1 600 kPa pressure rating and installed with the element facing downwards or a maximum of 45° sideways.

- 24.8 Non-return valves shall be of the spring-loaded wafer dual flap plate type fitted between two flanges. They shall be equipped with a cast iron body, aluminium bronze plates, stainless steel springs and neoprene seals on the plates. The valves shall be suitable for working pressures of up to 1 600 kPa.

29 PUMPS

- 26.1 Pump sets shall conform and be installed as detailed in SANS and these specifications. The number and type of pump sets will be detailed in the Particular Specification (Part 3) and will comprise some or all of the following

- (a) Electrical driven jockey pump set
- (b) Electrical driven main sprinkler/fire pump and drive.
- (c) Diesel driven main sprinkler/fire pump and drive.
- (d) Sprinkler/fire pump starting arrangement.
- (e) Electric and Engine drive controllers and ancillary equipment.
- (f) Water flow test devices.
- (g) Fuel storage and piping

The pump sets shall be, installed, tested, commissioned and certified in accordance with SANS and the Local Authority's requirements.

- 26.2 Prior to ordering and installation, the Contractor shall provide a full set of plans and detailed data describing the following for scrutiny and/or approval by the Engineer and Local Authority:

- (a) Pumps
- (b) Pump drivers
- (c) Drive controllers
- (d) Power supply
- (e) Starting arrangements
- (f) Piping and fittings
- (g) Suction and discharge connections
- (h) Water supply and/or storage conditions

Each pump unit shall be provided with certified test curves from the manufacturer showing brake horsepower, flow and head capacities. The Contractor shall provide this information to the Engineer and Local Authorities for approval.

- 26.3 The Contractor shall perform and certify a full field acceptance test on the completed installation in accordance with SANS. This test shall be witnessed by the Engineer and Local Authority.

- 26.4 The following information shall be embossed on a plate fixed to each pump:

- (i) flow capacity (l/sec);
- (ii) pump head (metres water gauge);
- (iii) impeller size;
- (iv) pump speed
- (v) required motor power;
- (vi) make of pump;
- (vii) model;
- (viii) date of purchase.

- 26.5 Pumps shall be of the centrifugal end-suction type listed for fire protection service. It shall be possible to remove the impellers without removing the pump from its mountings.

Pumps shall comply with the following requirements:

- (c) Impellers shall be double entry radial types of bronze or cast iron.
- (b) Casings shall be of cast iron with renewable casing wear rings. The casing wear rings shall be made of cast chrome steel.
- (c) Shaft seals shall be of the mechanical type.
- (d) Bearings shall be grease lubricated anti friction types.

- (e) Pump shafts shall be of stainless steel.
 - (f) An auto priming system shall be provided.
 - (g) Pump cooling devices shall be provided to prevent over heating of pumps when operating at closed head.
- 26.6 Characteristic curves showing capacity, head, efficiency NPSH, power required and operating range shall be submitted to the Engineer at tender stage. Prior to installation, a complete set of test certificates shall be submitted for approval to the Engineer and Local Authority indicating all performance characteristics of the pump to be installed.
- 26.7 A pressure gauge must be provided downstream of the pump outlet backpressure valve and on the pump suction side.
- 26.8 An approved flow test device and pipe connection shall be provided in the delivery line downstream of the non-return valve, in order to carry out a running flow/pressure test on the pump at approximately full load when the test valve is fully open. The test pipe shall be piped back to the water tank.
- 26.11 Pumps shall be mounted on mild steel bases, adequately corrosion protected by hot dip galvanizing after manufacture. Pump bases shall be filled in with concrete and properly secured to the floor.
- 27.0 DRIVE MOTORS
- 27.1 Electric drive motors shall be drip proof conforming to BS 2613 and BS 170. Windings shall at least be according IP55 of IEC 144. High temperature permanent sealed bearings shall be used. Motor speeds shall preferably be limited to 1450 rpm but shall not exceed 2950 rpm.
- 27.2 Diesel engines shall be naturally aspirated air cooled types capable of being started without the use of wicks, cartridges, heater plugs or ether, at an engine room temperature of 4°C. They must be capable of accepting full load within 15 seconds from receipt of the signal to start.
- 27.3 Engines shall be capable of operating continuously at full load at the site conditions for a period of 8 hours. The Contractor supplying the pumping set shall supply to the Engineer and Local Authority a statement giving the 8-hour power rating of the engine at speeds of 1000 rpm, 1400 rpm, 1800 rpm, 2200 rpm, 2600 rpm and the maximum speed. Any of the speeds quoted which are in excess of the maximum speed rating of the engine may be omitted and the maximum speed and corresponding rating shall be given.
- 27.4 Speed and Number of Strokes
- The engine must be of the solid injection, compression ignition type, with a running speed for reciprocating engines up to 750 kW not exceeding 1500 rpm. Generally, engines of the four stroke, industrial type, designed for stationary operation are preferred. Two-stroke engines of the pump assisted uniflow scavenged type will be considered if their specific fuel consumption (kg fuel used per kW hour) is equivalent to or better than that of the equivalent four stroke engine.
- 27.5 Fuel Classification
- The engine shall be rated for diesel fuel as normally available in South Africa and in compliance with SABS 342 -1969 or B.S.2869 -1970, Class A1 , (as amended) for diesel fuel with a minimum octane rating of 40 and nett calorific value of 10000 kcal/kg (39600 kJ/kg).
- 27.6 Rating of Plant
- The rating of the engine shall take cognisance of the site conditions, site altitude and include all auxiliary equipment such as radiator and fan, oil pump, water pump, air filter, governor, battery charger (generator) etc. The output stated shall only be the nett available, after the above have been allowed for.
- The engine output must be de-rated in accordance with BS 5514 for the site conditions stated in the particular specification.
- 27.7 Overload Facility
- The engine shall be capable of delivering 10% overload for one (1) hour in any 12-hour period of continuous running.

27.8 Engine Appearance

The engine shall be of neat appearance and all water, lubricating and diesel oil lines, filters and stop cocks shall be of top quality and completely leak free.

27.9 Service Connections

All service connections to the engine shall be flexible to prevent vibration being transmitted between plant and building, and to prevent damage to these lines and connections.

27.10 Supporting Framework

The engine and pump shall be mounted on one common steel supporting frame manufactured of channel iron or other equivalent steel work to provide a rigid and solid foundation. The main frame shall be of the "skid" base type. If no "skid" base is provided, suitable for free standing, holding down bolts and vibration eliminators to the generator set manufacturer's specification must be provided. This subframe shall be supported from a main frame by anti-vibration mountings. Duplex anti-vibration mounts shall be used.

The inner frame and its supports shall be of sufficient height above floor level to permit installation of a drip tray and for draining of engine oil.

The drip tray must be sloped and made of mild steel. It must be fixed in the frame beneath the engine and alternator and a drain pipe fitted with a plug must be extended from the lowest point of the drip tray to beyond the frame in an easily accessible position.

27.11 Heat Protection

All engine piping, whether flexible or rigid, shall either be of the heat resistant type or adequately protected against damage by radiant heat. This also applies to any wiring attached to the engine.

27.12 Crankcase Vent Pipe

The crankcase vent pipe shall be taken to the drip tray to collect oil condensate.

27.13 Bearings

Engine bearings for the crankshaft and connecting rods, big and small ends shall be of the bush type, split sleeve type, or roller type. The bearing types and metals shall be suitable for operating in the worst site conditions.

27.14 Lubrication

The lubrication shall be by means of a force-fed pressure system supplying circulating oil to all bearings, gear trains and important moving parts. A gear driven oil pump shall be incorporated with an oil cooler if necessary. The oil cooler shall have a thermostatically controlled oil bypass valve to control the oil inlet temperature by proportionate bypassing. 250 hour running time, full flow oil filters with automatic bypass and replaceable elements shall be fitted.

An isolating valve shall be fitted in the oil line from the make up tank to the sump in order to facilitate sump draining without the loss of new oil from the make up tank.

27.15 Cooling

27.15.1 General

Cooling of engines may be either by air or by water.

27.15.2 Water Cooling

Where radiators are used, they shall be of the heavy-duty industrial air blast type, pressurised and sized for continuous full load operation.

The fan shall be designed and run in a direction such that cool air is drawn across the generator, engine and radiator in that order.

Removable ducting shall be provided between the radiator and the louvre in the wall opening.

Fans must be liberally sized to enable engines to operate well within their maximum temperature limits (but without running too cool) at the ambient site conditions stated in the particular specification or at a plant room temperature of 40 deg C whichever is the higher.

In water cooled engines water circulation shall be pump driven by means of an integral engine mounted centrifugal pump.

If under exceptional circumstances cooling towers are required these will be specified separately in the particular specification. It will be required that they be of stainless steel or fibre glass and that particular attention be paid to plant room ventilation under these circumstances.

27.15.3 Air Cooling

In air cooled engines air ducts shall be provided to positively exhaust hot air and to prevent re-circulation. Integral engine mounted fans are required to ensure air flow across the various components in the order listed above.

Discharge ducting must be taken straight up through the roof of the plant room and must be made with strategically placed flanged joints, etc to enable it to be easily removed for servicing and maintenance purposes (if required), and/or to permit removal of the set without having to remove the ducting. Quick action type lock nuts or screws to enable quick and easy dismantling of ductwork are required. Self tapping screws are unacceptable.

The ducting must be fixed to the roof structure, must be flashed to render the exit point waterproof and must be fitted with an expanded metal bird screen at the discharge end(s).

The ducting must be made in such a way that expansion and contraction of the ducting will be taken up by sliding joints or similar.

The discharge end of the ducting must be fitted with a cover to prevent the ingress of rain water at times when the set is not running. Over and above, a drain point for accumulated moisture must be provided at the lowest point of the ducting. This drain must be piped to just outside the plant room door. Drainage of moisture from the ducting must be such as to prevent the diesel engine from getting wet.

Ducting must be made of 16-gauge galvanised iron suitably cross braced to prevent drumming.

27.16 Speed Control

The engine shall be provided with a suitable governor to control the engine speed to within 10% of its rated speed under any condition of load up to the full load rating. The governor shall be field adjustable.

27.17 Air System

The air system shall consist of two items, viz. the incoming combustion air and the exhaust gas.

27.17.1 Combustion Air

Combustion air filtration shall be by means of dry type, cartridge, high efficiency air filters fitted and sized for 500-hour operation and supplied complete with a service indicator. Oil bath air filters may be fitted and used in existing plant only. Air filters must be of Donaldson manufacture or similar, equal and approved.

27.17.2 Exhaust Gas

Exhaust gas shall be piped, the piping being fitted with expansion joints, silencer and discharged to atmosphere.

The expansion joints shall be of the stainless steel, concertina type, flexible, flanged and bolted to the exhaust manifold or turbo-charger outlet as applicable. Stainless steel bolts and nuts of the appropriate size must be used. Care must be exercised that exhaust pipe and silencer supports at the expansion joints are so positioned that no strain is placed on the manifold joint, turbo-charger, piping or silencer.

The silencer shall be of stainless steel, of the baffle or absorption type of a size and construction such that a sound level of 75 dB absolute is not exceeded within two meters of the exhaust. The exhaust pipe shall be of stainless steel, insulated and of sufficient size to ensure that the back pressure is acceptable within the limits of the engine manufacturer. The exhaust system shall be offset from the centre line of the plant to allow for hoists or cranes to remove the engine.

The piping shall have bends with a minimum radius of 2,5 times the pipe diameter, insulated with 25 mm thick insulating rope and cloth or similar suitable approved insulating material, and be wrapped and sealed in bright polished class 430 stainless steel sheeting.

Stainless steel nuts and bolts must be used in assembling the exhaust system. Flanged joints are required to aid dismantling.

Exhaust piping over 100mm diameter must have a minimum thickness of 1,6mm.

Once the exhaust is external to the building, no insulation is necessary. The entire system shall be supported with flexible hangers, brackets, clamps, etc.

27.18 Engine Fuelling

Engine fuelling shall be by means of an engine mounted pump with the governor-controlled fuel injection pump(s) and injectors all arranged for easy access and maintenance.

A fuel filter with replaceable elements shall be fitted between the lift pump and the injection pump, suitable for the full flow of fuel at full load. The filter must take out particles down to 5 microns in size, or less, and be of Donaldson or similar, equal and approved manufacture.

A primary, heavy-duty filter/water separator shall be fitted before the lift pump in the fuel line from the tank. This water separator shall be of Donaldson or similar, equal and approved manufacture, shall be suitable for 250-hour operation and be easily maintained.

Copper tubing shall be used from the sludge filter to the engine components, but steel tubing may be used on the overflow from the injectors to the fuel tank. Note that galvanised piping is not acceptable. All piping shall be neatly run and securely fixed with saddles and clamps taking cognisance of flexibility to prevent vibration damage as stated in Clause 27.9 .

27.19 Starter Motor

Starting of the plant shall be by means of an engine mounted, electric starter motor on sets up to 500 KVA. Above this size two motors will be required. The starter motor(s) shall be suitably sized to easily spin the plant under "cold start" Winter / Summer conditions without the use of special starting equipment.

Two interlocks shall be incorporated, one electrical and one mechanical, preventing the starter motor engaging unless the engine is at rest.

The starter motor(s) shall be 12- or 24-volts D.C. fitted with an approved device for positive engagement. The starter motor shall be controlled from the plant panel.

27.20 Jacket Water Heaters

Water cooled engines shall be fitted with immersion heaters of a minimum of 1,5 kW up to 5 kW capacity in order to ensure that the jacket water temperature is warm enough for the engine to start easily from cold

and under severe cold conditions. Heaters must be so situated as to promote thermo-syphoning of the water with the piping connections installed in such a manner that the cooling system thermostat does not impede the free flow of this thermosyphoning water. The temperature shall be thermostatically controlled via a relay and the elements fed at 220 volts with M.C.B. protection at the panel.

27.21 Battery

The battery shall consist of a number of cells to form a 12- or 24-volt D.C. supply suitably sized to start the engine. These cells shall be of the lead acid type with flat terminals, rated at 1,5 volts/cell and mounted on a suitable frame with a timber base. The battery shall be as close as is practical to the starter motor, but separate from any vibrating parts of the set.

The battery discharge capacity with full cranking current for 60 seconds at a temperature of 5 deg C shall not fall below a cell voltage of 1,5 volts. This voltage is considered the minimum to satisfactorily operate the 12 or 24 V. D.C. control equipment on the control panel (i.e., after three starting attempts, each of 10 seconds, the panel control voltage shall not be below 20 volts D.C.)

The battery under normal conditions shall be continually trickle charged from the Control Panel charger (reference must be made to clause 28.9).

Under running conditions, the battery shall be charged from an engine driven brushless Alternator/Rectifier complete with auto rate control.

The battery cables must be run clear of all exhaust piping and other hot surfaces and must be fixed in position so as to ensure correct reconnection of the cables in the event of the battery being changed or removed. The cables must be liberally sized in order to minimize the voltage drop to the starter motor.

27.22 Protection Equipment on Engine

The protection of the set is covered under paragraph 28.0 but the following monitoring equipment is required as listed hereunder:

27.22.1 Alarm signal system in wall mounted or floor standing control board for indicating "shut down" of the following items:

- a) Fail to start / starter circuit lockout
- b) High water temperature (sensed on engine side of the thermostat) or high head temperature in the case of air-cooled engines
- c) Low oil pressure
- d) High oil temperature (if required)
- e) Low fuel pressure (if required)
- f) Engine over/under speed

27.22.2 Gauges in the wall mounted or floor standing control panel showing:

- a) Fuel oil pressure (if required)
- b) Lubricating oil pressure
- c) Lubricating oil temperature (if required)
- d) Jacket water temperature

27.22.3 All necessary sensors for alarm circuits.

27.22.4 All necessary fuel cut off solenoids

27.22.5 A manual shut off valve before the lift pump in the fuel line at the day tank.

27.23 Coupling

The engine/pump coupling shall be by means of a flange adaptor ring or bell housing incorporating a shock absorbing coupling. The flexible coupling shall be direct coupled to the engine and alternator with no gears so that the engine and alternator run at 1500 rpm or the regular engine speed compatible with 50Hz power generation.

27.24 Fuel Tanks and Pumps

27.24.1 Day Tank

A combined fuel storage and day service tank shall be supplied with each set. The tank shall be mounted on a self-supporting floor standing steel frame at a minimum height of 400 mm above floor level (to provide a gravity feed to the engine) or integral with the engine/pump support base. This service tank shall be mounted close to the plant, within the plant room, hold a minimum of 150 litres and a maximum of 200 litres. A full height transparent gauge tube shall be fitted to the service tank. The gauge tubing must be similar or equal to that supplied by Lister diesel engines. (Plastic tubing will not be permitted). If called for in the particular specification a dip stick may be supplied and fitted in lieu of the gauge glass.

The service tank shall be so designed and mounted such that water and sludge can collect at the lowest point and be easily drained off by means of a stop cock. The lower gauge tube connection must be fitted with a shut-off valve.

A manual ball type shut off valve between the service tank and the lift pump shall be incorporated in the steel or copper fuel feed pipeline.

27.24.2 Fuel Piping

In principle the fuel lines shall all be medium class steel to SABS 62 or BS 1387 (but not galvanised) with appropriate bends to provide an expansion facility. Copper shall only be used from the primary filter to the engine pumps.

A fusible link mounted directly above the set and connected to a dead weight operated fuel shut-off valve will be required in instances where the day tank is situated in a separate room to the generating set.

27.24.3 Fuel Pumps

One diesel fuel pump suitably sized, shall be fitted adjacent to the service tank.

It shall be a centrifugal pump complete with electric motor, starter, isolator and float switches. Level control and float switches for control of the pump(s) shall be mounted within the service tank.

Float switches shall be "REMEX" level controllers (or similar and equal and approved). Three float switches will be required, one to operate the pump (on/off), one for a low-level alarm and the other for an extra low level engine cut-out. A facility for running the pump manually is required.

It must be possible to mute all alarms but the indicator light(s) must remain on until the tank has been refilled at which time they should cancel automatically.

The float switches shall be of such a type that they can be tested manually without opening the tank. They must further be installed in such a manner that they do not foul each other.

28 CONTROL PANEL

28.1 General

The control system may consist of plug in, low voltage relays of the octal base type or solid-state PC control . The panel shall provide full protection for the diesel pump set.

28.2 Sheet Metal Work

The control panel and components shall be of approved design, manufacture and construction and shall be complete in all respects with all necessary equipment, bars, connections, wiring and accessories. The panel shall be robustly constructed, shall be in accordance with standard accepted practice, comply to the relevant S.A.B.S. Code of Practice and/or BSS 162/1961, and shall have an attractive appearance.

The panel shall be totally enclosed, dust and moisture proof as well as rodent and insect proof with full gland plates fitted at appropriate heights. The panel shall be floor standing and have a steel plinth. Doors shall be of folded and welded construction, with suitable bracing to eliminate buckling, and all doors and cover plates shall have rubber seals and grommets.

A construction of angle iron and loose sheets will not be acceptable, neither will pop-rivets or self tapping screws.

All steel work shall be thoroughly de-rusted. Millscale shall be removed by shot blast or other approved means and the steel work then degreased, followed by bonderising or similar phosphoric inhibitive treatment. A zinc chromate primer shall be applied, followed by two coats of best quality white enamel inside and three coats of enamel (Electric Orange) on the outside, sprayed and baked on. Bolt heads or thumb screws securing the panels shall be chromium plated. The latches securing the doors shall have positive locking devices and no spring-loaded ball latches or similar will be accepted.

28.3 Approvals

Before commencement of manufacture of the panel, full working drawings must be submitted for approval by the Engineer. When the panel is under construction, and again upon completion but prior to delivery to site, the manufacturer must notify the Engineer so that the panel can be inspected and approved.

28.4 Components

All components where possible shall bear the SABS mark or if not available the equivalent B.S. or DIN mark.

All components shall be entirely suitable for their application and the switchgear shall be suitable for the site and location. Space shall be provided for the incoming and outgoing cable circuits.

All cut edges and drilled holes of Bakelite or similar insulation board must be treated with electrical varnish. All equipment, levers, handles, keys, etc. required for operation of the panel must be included together with suitable clips or trays to store these when not in use.

28.5 Guarantee

The whole of the panel and components shall be guaranteed for a period of 12 months from the date of hand-over to the Owner

28.6 Equipment

The following equipment shall be included on the panel:

- (a) 1 meter (220 V AC) to indicate the total running hours the plant has been in operation.
- (b) 1 voltmeter (as per BS 89), approximately 125 mm scale to read 0 to 415 volts.
- (c) Control relays, start relays, three crank start relays, start failure relay, fuel supply relay (solenoid), continually rated alarm relay, oil pressure relay, oil temperature relay, overspeed relay, water overheat relay, jacket water heater relay, alarm relay, low fuel relay.
- (d) Illuminated resettable fault indicators, coupled to a common continuously rated hooter or low current electronic type yodel alarm for: low oil pressure, high oil temperature, high water temperature, engine overspeed, failure to start, pump overload, low fuel level, extra low fuel level engine trip

- (e) Auto/Test/Manual/ off selector key switch
- (f) Battery charger
- (g) MCB's for:- Battery Charger, Jacket water heater, fuel pump
- (h) Lamp and alarm test facility.

28.7 Sequence of Operation

The control panel shall be so designed to provide the following:

28.7.1 A water pressure sensing relay which in the event of a fall in pressure the timing sequence shall be :

28.7.1.1 An immediate command to the engine to start.

28.7.1.2 Once the command to start has been given, three start attempts shall be allowed each of 10 seconds with a 10 second delay between each attempt. In the event of failure to start within these 3 initial attempts, the starting system shall switch off and a L.V. alarm shall be initiated. Any further start attempts may only be carried out when the plant is in the "manual" position.

28.7.1.3 Fault reset after identification and rectification of same shall be by switching the selector to the "off" position and then back to the desired mode.

28.8 Protection of Plant

The panel shall automatically provide the following protection with the alarm circuiting and tripping devices operating off the 12- or 24-volt D.C. Battery as applicable.

	Hooter or Siren	Visual Light Indicator	Lock out	Fuel Solenoid off
Overspeed	X	X	X	X
Under speed or overload	X	X	X	X
High Temperature	X	X	X	X
Low Oil Pressure	X	X	X	X
3 Starts Failure	X	X	X	X
Low Fuel Alarm	X	X		
Battery Charger Failure	X	X		
Extra Low Fuel Cut-out	X	X	X	

All the above shall have the necessary re-set buttons.

28.9 Battery Charger

28.9.1 The charger module shall be a mains (220 V) operated unit to continuously trickle charge the engine starter battery.

It must be of the modulating type similar or equal to those supplied by Messrs Vaal, Romberg, Semi-Conductor Services, or P & S Power Products or be as further specified here.

28.9.2 A "loss of charge" alarm relay shall be provided to indicate failure of the charger. This should be a current monitor.

28.9.3 The output voltage (27,6 volts D.C. or 13,8 volts if applicable) shall be via full wave rectification and be kept within 1% of the float charge voltage.

- 28.9.4 The 220-volt input voltage may vary between 200/240 volts and the equipment, (transformer etc) must be capable of handling this discrepancy.
- 28.9.5 During the "cranking/start" period and during running of the diesel engine the battery charger shall be disconnected via a relay. Charging of the battery shall then be by means of an engine mounted alternator.
- 28.9.6 The charger shall be equipped with:
- (a) Overload protection on the 24 (12) volt side
 - (b) One 72 x 72 mm shielded type ammeter showing the charging rate
 - (c) One 72 x 72 mm shielded type voltmeter with a spring return, normally open, push-button switch for indicating battery voltage
 - (d) Relays for "failure alarms" and "running/start"
 - (e) Transformer and full wave solid state rectifier complete with capacitors where applicable.
 - (f) HRC fuses or fast acting MCB's on the secondary side
- 28.9.7 The battery charger shall be fully incorporated into the main control panel and be built to the same general specification (see paragraph 28.1) Relays shall preferably be of the "Octal" base type or equal and approved.
- 28.9.8 Ventilation.
- The position of the battery charger shall allow for good ventilation and not be below any of the other switch gear or relays.
- 28.10 Log Book
- A plastic covered log book shall be supplied for each plant room.
- 28.11 Emergency Lighting
- A 24 (12) Volt emergency light must be incorporated into the top section of the control panel in order to provide sufficient illumination for the safe operation and checking of the control panel. This light must switch on automatically in the event of a mains failure.
- 29.0 COMMISSIONING OF PLANT & EQUIPMENT
- 29.1 All instruments used shall be provided by the Contractor and shall be accurately calibrated and maintained in good working order.
- 29.2 Testing and balancing shall not begin until the system has been completed and is in full working order.
- 29.3 Tests shall be conducted by the Contractor in the presence of a Representative of the Engineer.
- 29.4 Two copies of the complete test reports shall be submitted to the Engineer prior to the first delivery of the project. Reports shall cover test and balance analysis for all air distribution and hydraulic systems. Sound tests for room type air conditioning equipment and all diffusers in occupied areas shall be included in the report. Reports shall be neatly typed.

SITE 21

VOLUME 2.1 PART 3 FIRE PROTECTION TECHNICAL SPECIFICATION

1.0 Introduction and General

This detail specification complements and qualifies the foregoing standard specifications of material & workmanship. The standard specification should be regarded as a basis and guideline, with this detailed specification taking preference where any ambiguity is concerned.

In the event of any further technical ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority (unless stated elsewhere in Conditions of Contract).

- Schedule of quantities
- Detailed specification
- Drawings
- Standard specification

2.0 Scope of Work

This subcontract calls for the supply, installation, testing and commissioning of the specified Fire Protection Installation for the refurbishment of Site 21 Dimbaza Factories.

2.1 The following sections of work are included:

- a. Supply and Installation of complete:
 - Fire protection installation, complete with all pipework, holderbats, isolating valves, hose reels, hydrants (where indicated) and the connection of the reticulation to the underground civil fire mains connection, either within a valve box or a saddle.
 - Handheld fire extinguishers.
 - Signage.
 - All installed by SAQCC approved installer.
- b. Testing and certification:
 - Performing and submission of test records (as per SANS requirement) and certificates.
 - Issuing of SAQCC Fire Certificate of Compliance
 - Supply of Operators and Maintenance Manuals
 - Basic maintenance training for building maintenance staff
 - Provision of a twelve-month guarantee for the installation including a full service prior to expiry.
 - All other materials and labour necessary to complete the Works in full accordance with the specification and design contained or referred to in this document.

2.2 The following sections of work are excluded:

- Builder's work e.g., cut-outs in walls to Tenderer's specifications, including chasing and making good of walls.

3.0 Site Conditions

3.1 General

The equipment specified herein shall be designed to operate at the environmental parameters particular to Dimbaza, and surrounds.

4.0 Fire Mains Service Connection

4.1 New Fire mains bulk supply line to be installed by specialist SAQCC certified contractor.

5.0 Pipe Locations, Materials and Specifications

For steel piping of 75 mm diameter and larger (i.e. flanged) the hot dip galvanising to SANS 763, 1977 (when required) shall be after fabrication.

6.0 **Pipe Jointing and Fittings**

Mild Steel Piping and/or Galvanised:

- 6.1 Mild steel piping shall be joined by means of screwed sockets, navy unions or flanges. Red lead jointing or other approved jointing compounds may be used sparingly and exposed threads shall be painted with zinc chromate primer or equivalent paint to prevent rusting.
- 6.2 Where it is required to remove sections of pipe or where pipe joints will need to be tightened after installation and testing, unions or flanges must be provided to facilitate the work,
- 6.3 Welding construction is only permitted for pipes of 50 mm diameter or larger and then only when prefabricated and welded in the workshop of the installing engineers whose welding procedures, pre-approved by the Insurance Council of South Africa.

NO WELDING OR HEAT CUTTING IS PERMITTED ON ANY SITE OF ERECTION

The edges of pipe to be welded shall be machine bevelled wherever possible. Gas cuts shall be true and free of all burned material. Before welding the surfaces shall be thoroughly cleaned and degreased. Piping shall be carefully aligned. No metal shall project within the pipe. Mitred joints will not be allowed.

Only welded fittings prefabricated by recognised manufacturers will be permitted. No other prefabricated welding fittings will be permitted without the express approval of the Engineer.

For branch piping sixty five millimetres (65 minimum) in size or larger, use welding tees, with flanged outlet. For piping 200 mm and larger use shaped spigots and welding neck flanges. Cracks, pinholes, excessive undercutting etc. shall be removed and the joints rewelded. Welders and welding processes shall meet the requirements of the SANS Code for welders.

- 6.4 Jointing of mild steel and galvanised piping using grooved pipe fittings and couplings may be used provided they have been approved by SANS. Proper gaskets, designed for the applications shall always be used. Approval by the consulting Engineers must in all cases be obtained prior to the utilisation of such fittings.

7.0 **INSTALLATION OF PIPING**

All piping shall be installed in an approved manner to meet structural and architectural requirements, to avoid interference with the work of other trades and be finished in a neat and workmanlike manner with true alignments and grades. Piping shall be run to ensure sufficient access for inspection, testing, servicing, etc.

7.1 Storage

Deliver and store to Suppliers recommendations with plugged ends. Clean pipes thoroughly. In addition it is required that pipes are stored off the ground and under cover.

Keep the ends closed during erection with temporary caps. Before any pipe is installed it shall be upended and pounded to remove any foreign matters present.

7.2 Installation

Slope of Pipes

In order to prevent air being lodged, the pipe lines shall have a proper inclination throughout the work.

Also the sloping shall be such that the system can be thoroughly drained.

7.3 Underground Piping

- a) Unless otherwise specified, the Contractor shall not be responsible for the digging and backfilling of pipe trenches for underground piping in his contract. He is however to ensure that the excavations and laying of piping is in accordance with SANS 1 200 06, LD and LD, and that this specification is adhered to so that his installation can be correctly installed.

- b) The trenches shall be of such depth that when properly laid at least 750 mm of soil shall cover the top of the pipe.
- c) The pipes shall be laid on a clean, soft soil bed not less than 750 mm deep. When backfilling the trench, it shall firstly be filled to approximately 150 mm above the pipe again with clean soft soil and then compacted after which the final filling is to be made and again compacted (care shall be taken to ensure that no large stones or debris occur in the filling material).
- d) In the case of cement and uPVC piping the Contractor must ensure that the trenches are recessed where couplings or fittings are positioned such that the pipe lies flat on the bed. This is to prevent the fittings supporting the length of pipe. The Contractor is also to allow for any pipe movements, such as thrust at bends etc. Concrete blocks in accordance with manufacturer's specifications shall be provided at these points. Where asbestos cement piping cross roads etc., the pipe shall be protected by casting into concrete not less than 100 mm over the top of the pipe.
- e) Where steel or uPVC pipes are to cross roadways, under connecting corridors, etc., the Contractor shall provide PVC sleeves through which the pipes will pass. It shall be at a depth of not less than 750 mm below the surface and shall be encased in concrete not less than 150 mm all round. These sleeves are to be two pipe sizes above the size of the water pipe to permit the removal and the replacement of the pipe should the need arise.

7.4 Internal Pipe Runs

All piping shall be installed parallel to, or at right angles with building walls and partitions.

In general, all pipes shall be supported from the building structure in a neat and workmanlike manner, and whenever possible, parallel runs of piping shall be grouped together.

- a) Where pipes pass through walls, floors, ceilings, etc., they shall be sleeved. The sleeves shall be of PVC material and allow for pipe thermal reactions.
- c) Where pipe sizes are reduced, proper reducing fittings shall be used. On no account will bushes be accepted.
- d) Horizontal take-offs from vertical pipes shall be long enough before the next fixing to take up any movements or shall have an expansion loop to provide this facility.
- e) Every tube section shall be installed to have the possibility of expansion and contraction without restriction. It shall be anticipated that no deflection acts on very short tube section. Expansion loops or expansion joints and anchors shall be fitted in order to reduce the displacement of individual line elements and to deflect them to the points where they can act without damage.

7.5 Concealment of Pipework

Pipework must not be embedded in the concrete floors of a building, nor should it be concealed in any other situation where difficulty or undue expense would be involved in making alterations or additions which may subsequently be necessary. Concealment of pipework is particularly to be deprecated in the case of buildings in multiple tenure where erection of partitions to suit tenants may impair the effective distribution of water from the sprinklers and necessitate alterations in the positioning of sprinklers.

7.6 Pipe Hangers and Supports

- a) All pipes shall be supported from the building structure in a neat and workmanlike manner and, wherever possible, parallel runs of horizontal piping shall be grouped together on trapeze hangers.
- b) Vertical risers shall be supported at each floor line with pipe clamps. The use of wire, perforated metal straps, nails and so forth, to support pipes will not be permitted. Hanging of pipes from other pipes will also not be permitted.
- c) Vertical runs shall be secured by means of rustless holderbats or other clamps. Duckfoot supports shall be provided at the bottom of a vertical section of large piping (100 mm and above) to support the weight of the pipe and the water.

Under no circumstances shall a vertical pipe be supported from its highest point. Should any fittings be installed in the vertical sections, care shall be taken to ensure that these fittings are not in a state of tension through the combined weight of the pipe and the water.

- d) Horizontal pipes shall be supported by means of galvanised hangers at close enough centres to prevent sagging. The minimum recommended spacings for supports and hanger rod size shall be set out below:
- e) The hangers shall be protected against rust and adjustable in height. They shall be manufactured from rods of the diameter as specified above, one end threaded and bolted to an angle iron cleat or Unistrut section suitably secured to the structure. The other end shall be formed into an eye and bolted to the pipe clamp.

7.7 Changes in Material

Where piping material changes occur (i.e. copper to steel etc.) dielectric unions must be furnished and installed.

7.10 Threaded Pipe

The pipe connection shall be cut square and full threaded with clean cut tapering threads and shall be reamed after threading. All threaded connections shall be made with approved thread compound applied to male threads only, and shall be so made up that not more than two (2) threads will be exposed.

7.9 Testing of Water Piping

All piping installed on the project shall be hydraulically tested as specified herein. The Contractor shall provide all equipment required to make these tests.

Piping may be tested a section at a time in order to facilitate the construction programme.

The Contractor shall fill the section of the pipe to be tested with water and bring the section up to test pressure with a positive displacement type test pump. The tests shall be conducted by the Contractor in the presence of the Engineer or his representative. Gauges used in the tests shall have been recently calibrated with a dead weight tester.

All tests shall have full test pressure applied to the piping for a minimum of twenty-four (24) hours

The test pressure at any section of the system shall not be less than one and a half times the system working pressure or 1 500 kPa (Maximum) unless otherwise stated under Part Four of the specification. When the test pressure has fallen over 6 percent (%) during the twenty-four (24) hour test period, the point of leakage shall be found, repaired and the test repeated. This procedure shall be followed until the piping system has been proven absolutely tight.

The use of chemicals or so-called "stop-leak" compounds will not be permitted at any time.

When instruments or gauges are installed in the piping system, they shall be removed during the tests if subject to damage from shock or excessive pressure. This does not apply to control valves.

Leaks shall not be repaired by mastic or other temporary means. All leaks shall be repaired by removal of the section that is leaking and reinstalling new material with joints as specified herein before.

7.10 Flushing of System Pipework

There must be a 50 mm diam. flushing connection fitted on the incoming main below each installation control valve. These flushing points must be plugged to prevent misuse.

7.11 Terminal Drain Valve

25 mm drain valves must be fitted at the extremity of the distribution pipe at each level of protection. This is to indicate that there is water at this point and that no blank flanges are left in the installation. The valve should be positioned at hand level and must be normally strapped closed.

8.0 **Fittings**

8.1 All fittings, including safety devices are to be placed and sized.

9.0 **Safety Devices**

9.1 Where applicable.

10.0 **Handling And Storage Of Materials, Fittings And Components**

10.1 Pipes, fittings and components shall be handled carefully to obviate damage

10.2 Manufactures' advice shall be followed as to how their products should be loaded, transported, unloaded and sorted

11.0 **Identification**

11.1 Colour Coding

11.1.1 General

All equipment shall be colour-coded in accordance with standards recognised, and where possible to comply with relevant SANS colour codes unless specified otherwise.

11.1.2 Colour Coding of Pipes

Identification of the contents of pipes shall either be by painting a 100 mm wide primary colour band or by using self-adhesive PVC coloured tape. The colour of the paint or tape shall comply with SANS 0140 Identification Colour Marking, Part III, Contents of Pipelines, as detailed below.

The colour names referred to in the table s are specified in SANS 1091.

TABLE OF COLOUR CODING FOR PIPELINES AS PER SANS 0140 PART III - 1978

CONTENTS OF PIPE PRIMARY COLOUR BANDS

FIRE FIGHTING

- All Pipes Signal Red

12.0 **Sterilization**

12.1 N/A

13.0 **Builders Work**

13.1 The Engineer will prepare details showing where all sleeves are to be positioned before any structural concrete is cast.

13.2 The Engineer's approval, in writing, must be obtained before any holes or chases are cut in any structural component i.e. brickwork, concrete, steel or timber.

13.3 The Contractor shall be responsible for cutting chases and holes in walls and slabs to accommodate his services which must be coordinated in liaison with the Main Contractor who will be responsible for making good.

14.0 **Excavation**

14.1 General:

Tenderers are to note that excavation shall be carried out by the main contractor.

15.0 **Operating And Maintenance Details**

15.1 Two complete sets of operating manuals complete with spares schedules, as-fitted layout drawings, schematic diagrams and operating and general maintenance information, bound in hardcover ring binders shall be prepared by the Contractor and delivered to the Engineer 14 days prior to practical completion for approval, at or before final handover.

15.2 A full "RECORD" set of drawings shall also be submitted to the engineer for record purposes.

16.0 **Schedules Of Information**

16.1 The schedules of information contained in this document consists of 2 sections :

- a. Information supplied by the Engineer (schedules of drawings, sleeves etc. as applicable.)
- b. Information to be supplied by the Contractor at tender stage

(tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable.)

16.2 Tenderers are required to enter, at the time of tendering, in the "Schedule of Equipment and Material Offered", sufficient details to enable the equipment concerned to be identified without ambiguity.

16.3 It is not sufficient for a tender to state "as specified" in the schedules.

16.4 Failure to complete these schedules (if applicable) may render a tender invalid.

17.0 **Samples And Alternatives**

17.1 Tenderers may be required to submit for approval, comment or records samples of materials, apparatus or components, and also drawings, schematic diagrams or technical details, including calculations, upon which their design and/or offer is based before any contract is awarded. Such details may also be called for during the course of the Contract prior to installation. Any approvals given or comments made shall be on the generality of the scheme and shall not relieve the Contractor of his responsibility to ensure the full compliance with all performance and regulatory criteria.

NOTE : A request for submission of samples or drawings does not imply that the Tenderer's quotation will necessarily be accepted.

17.2 Any particular make or model of equipment referred to in the Documentation is for guidance purposes only in setting standards / types / performances required; equipment that is equal or superior in all respects, and to the approval of the Engineer, may be offered by Tenderers. No reference to any particular make of any equipment shall be construed as that equipment having been selected by the Engineer or Client and the Contractor shall be fully responsible for the guarantee and performance of such equipment.

18.0 **Certification On Completion Of Guarantee And Maintenance Period**

19.1 In the month prior to the expiry of the guarantee and first twelve months maintenance period the Engineer shall inspect and, if necessary, retest the installation so as to be able to provide the Tenant with a certificate, within fourteen days of the guarantee expiry date, to confirm that the guarantee has been honoured and that the installation has been properly serviced at required regular intervals by the sub-contractor.

18.2 The cylinders shall be guaranteed from date of take over for a period of three years on the tank, insulation and outer casing and for one year on the electrical components

19.0 **Supervision Of Workmanship And Details**

19.1 The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the subcontractor, who must be able and authorized to receive and execute instructions on behalf of the Mechanical Subcontractor.

19.2 In the event that inferior materials or bad workmanship, on the part of the subcontractor, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the Subcontractor.

19.3 Similarly, should delays in the contract be caused by poor performance on the part of the Contractor causing the Engineer to spend extraordinary time on the project, the extra costs incurred shall be borne by the Contractor.

These costs will be based on the SAACE hourly rates and will be deducted from claims due or claims which will become due to the Contractor.

20.0 **Making Good**

20.1 The subcontractor will carry out in all instances any work to be made good such as damage to, or disturbances of the building installations caused by himself or his employees during the execution of the contract, at his own cost.

21.0 **Test And Inspections - Pressure Testing And Quality Control**

21.1 The Contractor shall, at no extra cost to the contract, provide all the necessary equipment and facilities to conduct all tests as directed by the Engineer and or Supply Authorities.

22.0 **Commissioning And Testing**

22.1 Commissioning:

A documented method shall be followed whereby the mechanical subcontractor shall ensure that his installation is correctly constructed in accordance with the manufacturers' specifications, consultant's specification, consultant's design and all codes of practice and international design codes.

The commissioning procedure must allow for signing off of the major items of equipment by a qualified person in terms of the codes. These signed off documents will form part of the record drawings.

22.2 Performance Tests:

The mechanical subcontractor shall be responsible for the physical testing, in the manufacturing works, or on site, of the items of plant or systems as required by the Engineer. These tests shall be performed by the mechanical subcontractor or supplier of the equipment, and where called for, the Engineer shall witness such tests. The Engineer may also only witness a representative sample of the equipment tests. In any event, the mechanical subcontractor will supply documentary proof of full performance tests of all relevant equipment.

22.3 Acceptance Tests:

All brass fittings and valves shall be certified by the manufacturers to be free from de-zincification and will be subjected to check tests as set out in the Detailed Specification

Acceptance tests will be performed on site of the working system or sub system, to show that the works, as installed, is functioning according to the specifications and design. The onus for the correct functioning of the systems is still on the mechanical subcontractor irrespective of whether the Engineer has witnessed the acceptance tests or not. Prior to the system being connected, a test certificate must be issued by / given to the local electricity supply authorities.

23.0 **Compliance With Regulations, Standards And Codes**

23.1 The subcontractor will arrange for all inspections and testing of the installation after completion, including the issuing of the Certificate of Compliance. All notices, fees, including inspection and re-inspection are the responsibility of the subcontractor and all the relevant costs shall be borne by him.

23.2 The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

23.3 The Works will be executed in strict accordance with the following:-

- a. All relevant by-laws and regulations of local authorities.
- b. All relevant SANS, BS and other international standards of the latest revision, where applicable.
- c. The Occupational Health and Safety Act of 1993 as amended.

24.0 **Monthly Certificates**

24.1 Pro forma claim forms are available from the Engineer. These are available in a blank copied format or as a computer file in Excel. This is the preferred method of submitting payment claims. Should the subcontractor have developed his own method of claiming, this may be submitted to the Engineer for consideration.

25.0 **Programme**

25.1 The subcontractor must conform to the programme as submitted by the principal Contractor. The estimated period for completion, as tendered, is as per the builders programme. The cost of overtime, additional labour and plant for the completion of the works, in accordance with the programme, must be included in the Tenderer's price for the project. The cost of any work outside the requirements of the programme or necessary under exceptional circumstances will be for the Employers' account only if covered under a variation order.

25.0 **Drawings**

25.1 Tender Drawings

All drawings, those supplied loose, as well as those bound in, form part of this enquiry and are listed below:

- 2318-T-M-101 FP S21 RevA Fire Protection Equipment
- 2318-T-M-101 FS S21 RevA Fire Escape Signage

It is the Tenderer's responsibility to inform the Engineer as to the absence of any of these drawings.

26.0 **Sufficiency Of Tender**

26.1 The Tenderer's offer shall be for the supply, delivery, installation and commissioning of the complete installation as detailed, described or implied in this document and on the accompanying drawings.

26.2 The Tenderer's offer shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and that the rates and prices he has entered in the schedules shall cover all his obligations under the contract for the proper completion of the Works.

27.0 **Measurement**

27.1 The Tenderer shall not make any assumption regarding the installation. If there is any doubt or ambiguity, the Engineer must be consulted. The Tenderer shall take cognisance of the fact that the schedule of quantities is re-measurable and the quantities may be adjusted at the end of the contract.

27.2 All measurements are nett, unless otherwise stated, and Tenderers must allow in the rate for wastage.

SITE 21

VOLUME 2.1 PART 5 SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : Only one manufacturer's name to be inserted for each item.

Item	Material	Make or trade name	Country of Origin
1.	Gavanised steel pipe		
2.	Non-Return Valves		
3.	Isolating valves		
4.	Strainers		
5.	Angle valves		
6.	Manholes		
7.	30m Hose Reels		
8.	Hand Held Fire Extinguishers		
9.	Pressure Gauges		
10.	Hydrant Connections		

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

PART C4 – LIST OF DRAWINGS

Repairs & Refurbishment of Existing Buildings

Sites - 08, 12 & 21 - Dimbaza Industrial Area

Architectural Drawings - For Tender

08/11/2023



SITE 08

Drawing No.	Description	Status
230017-08-AR-100	Locality Plan	Tender
230017-08-AR-200	Existing & Proposed Refurbishment Floor Plans, Area Plan & Section	Tender
230017-08-AR-201	Existing Plan, Area Plan & Site Plan	Tender
230017-08-AR-300	Proposed Refurbishment - Elevations & Sections	Tender
230017-08-AR-401	Door & Window Schedule	Tender
230017-08-AR-600	Proposed Refurbishment - 3D View	Tender
230017-08-AR-601	Proposed Refurbishment - 3D Sectional Plan View	Tender

SITE 12

Drawing No.	Description	Status
230017-12-AR-100	Locality Plan	Tender
230017-12-AR-102	Site Plan	Tender
230017-12-AR-200	Existing Plan & Area Plan	Tender
230017-12-AR-201	Proposed Refurbishment Plan & Area Plan	Tender
230017-12-AR-202	Proposed Demolition Plan	Tender
230017-12-AR-300	Proposed Refurbishment - Elevations	Tender
230017-12-AR-301	Proposed Refurbishment - Sections	Tender
230017-12-AR-401	Door Schedule	Tender
230017-12-AR-402	Window Schedule	Tender
230017-12-AR-600	Proposed Refurbishment - 3D View	Tender
230017-12-AR-601	Proposed Refurbishment - 3D Sectional Plan View	Tender

SITE 21

Drawing No.	Description	Status
230017-21-AR-100	Locality Plan	Tender
230017-21-AR-102	Site Plan	Tender
230017-21-AR-200	Existing Plan & Area Plan	Tender
230017-21-AR-201	Proposed Refurbishment Plan & Gatehouse Details	Tender
230017-21-AR-202	Proposed Demolition Plan	Tender
230017-21-AR-300	Proposed Refurbishment - Elevations	Tender
230017-21-AR-301	Proposed Refurbishment - Sections & Elevation	Tender
230017-21-AR-401	Door Schedule	Tender
230017-21-AR-402	Window Schedule	Tender
230017-21-AR-600	Proposed Refurbishment - 3D View	Tender
230017-21-AR-601	Proposed Refurbishment - 3D Sectional Plan View	Tender

Repairs & Refurbishment of Existing Buildings

Sites - 08, 12 & 21 - Dimbaza Industrial Area

Civil & Structural Drawings - For Tender

08/11/2023

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SITE 08

Drawing No.	Description	Status
1748-S-GEN-001	Civil Site Layout	Tender
1748-01-S-101	Ground Floor Plan & Sections	Tender

SITE 12

Drawing No.	Description	Status
1748-02-S-101	Plan, Sections & Elevations	Tender
1748-02-S-102	Roof Plan & Details	Tender
1748-02-S-103	Canopy Sections & Details	Tender

SITE 21

Drawing No.	Description	Status
1748-03-S-001	Plan, Sections & Details	Tender
1748-03-S-002	Roof Layout, Sections & Details	Tender
1748-03-S-003	Canopy Sections & Details	Tender

Repairs & Refurbishment of Existing Buildings

Sites - 08, 12 & 21 - Dimbaza Industrial Area

MEPF Drawings - For Tender

08/11/2023



SITE 08

Drawing No.	Description	Status
2318-T-E-101-S08	ECDC Dimbaza Factories - Site 08 - Lighting Layout	Tender
2318-T-E-102-S08	ECDC Dimbaza Factories - Site 08 - Power Layout	Tender
2318-T-E-301-S08	ECDC Dimbaza Factories - Site 08 - MDB-S08 DB Schematic Diagrams	Tender
2318-T-E-400-S08	ECDC Dimbaza Factories - Typical Electrical Details	Tender
2318-T-M-101 FP S08	Fire Protection	Tender
2318-T-M-101 FS S08	Fire Escape Signage	Tender
2318-T-M-101 DW S08	Domestic Water	Tender
2318-T-M-101 HVAC S08	Ventilation	Tender

SITE 12

Drawing No.	Description	Status
2318-T-E-101-S12	ECDC Dimbaza Factories - Site 12 - Lighting Layout	Tender
2318-T-E-102-S12	ECDC Dimbaza Factories - Site 12 - Power Layout	Tender
2318-T-E-301-S12	ECDC Dimbaza Factories - Site 12 - MDB-S12 & SDB-S12 DB Schematic Diagrams	Tender
2318-T-E-400-S12	ECDC Dimbaza Factories - Typical Electrical Details	Tender
2318-T-M-101 FP S12	Fire Protection	Tender
2318-T-M-101 FSign S12	Fire Escape Signage	Tender
2318-T-M-101 SV S12	Smoke Ventilation	Tender
2318-T-M-101 DW S12	Domestic Water	Tender
2318-T-M-101 HVAC S12	Ventilation	Tender

SITE 21

Drawing No.	Description	Status
2318-T-E-101-S21	ECDC Dimbaza Factories - Site 21 - Lighting Layout	Tender
2318-T-E-102-S21	ECDC Dimbaza Factories - Site 21 - Power Layout	Tender
2318-T-E-301-S21	ECDC Dimbaza Factories - Site 21 - MDB-S21, SDB-S21 & SDB-GH DB Schematic Diagrams	Tender
2318-T-E-400-S21	ECDC Dimbaza Factories - Typical Electrical Details	Tender
2318-T-M-101 FP S21	Fire Protection	Tender
2318-T-M-101 FSign S21	Fire Escape Signage	Tender
2318-T-M-101 SV S21	Smoke Ventilation	Tender
2318-T-M-101 DW S21	Domestic Water	Tender
2318-T-M-101 HVAC S21	Ventilation	Tender