



Section C1.1.1.1: South African National Biodiversity Institute

THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI)

Contract No: SANBI: NZG430/2022

**APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT:
AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND
COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH
AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN
IN PRETORIA**

PROCUREMENT DOCUMENT

September 2022

Issued by:

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Name of tenderer:

Address:

Tel no.: **Fax no.:**

The South African National Biodiversity Institute

APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

Contract: **SANBI: NZG430/2022**

Email:

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PART T: TENDER INFORMATION

Part T1: Tendering Procedures

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

Advertising date:	2 September 2022	Closing date:	23 September 2022
Closing time:	11:00	Validity period:	90 days

T1.1 Tender Notice and Invitation to Tender

- It is estimated that tenderers should have a **CIDB contractor grading of 4ME or higher**.
- Tender documents will be available as from 2 September 2022 and will be available **ONLINE ONLY** on the SANBI website www.sanbi.org (click on "Opportunities").
- No briefing session will take place. Bidders are encouraged to direct all technical and bidding procedure enquiries to the email addresses below.

Department: Supply Chain Management
Email: sanbi.tenders@sanbi.org.za
cc: Jamesh@adqengineering.co.za
Cut-off date for enquiries: **12 September 2022**

Any queries regarding the tender document or any related matter prior to submission of tenders must be directed to:

SANBI Representative (Technical Queries Only)	Mr. James Hill Tel: +27 12 030 0355 E-mail: Jamesh@adqengineering.co.za
SANBI Supply Chain Management:	sanbi.tenders@sanbi.org.za

The closing time and date for the receipt of Tenders is **11:00** on **23 September 2022**

The South African National Biodiversity Institute

APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

Contract: **SANBI: NZG430/2022**

The Tenders will **NOT** be opened in public (please note that the two-envelope system is being followed). Requirements for sealing, addressing, delivery, opening, and assessment of Tenders are stated in the Tender Data.

PART T: TENDER INFORMATION

Part T1: Tendering Procedures

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
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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 Engineering and Construction Works Contracts – 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
C.1.1	The Employer is: The South African National Biodiversity Institute Biodiversity Centre 2 Cussonia Avenue Brummeria Pretoria Private Bag X101 Silverton 0184
C.1.2	The Tender Documents issued by the Employer comprise the following documents: PART T: TENDER INFORMATION Part T1: Tendering procedures T1.1 - Tender notice and invitation to tender T1.2 - Tender data Part T2: Returnable documents T2.1 - List of returnable documents T2.2 - Returnable documents/Schedules PART C: THE CONTRACT Part C1: Agreements and Contract data C1.1 - Form of offer and acceptance C1.2 - Contract data C1.3 - Form of Construction Guarantee C1.4 - Occupational Health & Safety Agreement 37(2)

Clause number	Tender Data
	Part C2: Pricing Data C2.1 - Pricing Instructions C2.2 - Bill of Quantities Part C3: Scope of Works C3.1 - Description of the works C3.2 - Design and Construction C3.3 - Drawings Annexure A: Set of Drawings (<i>provided separately</i>) Part C4: Site Information C4.1 - General site information C4.2 - Annexure F: Occupational Health and Safety Specification for Contractors who are on Contract with SANBI C4.3 - Annexure G: General Environmental Specification C4.4 - Annexure H: Geotechnical Information (N/A)
C.1.4	The employer's agent is: ADQ Engineering Projects Unit 17B Eco Fusion Phase 4 300 Witch-Hazel Ave, Highveld, Centurion, 0157 Contact person: JH Hill Tel: +27 12 030 0355 Email: Jamesh@adqengineering.co.za
C.1.6.1	Contract will be awarded to the tenderer who achieved highest number of evaluation points.
C.1.6.2	A competitive negotiation procedure will not be followed.
C.1.6.3	A two stage-system will be followed.
C.2.1	Only those tenderers who score the minimum score in respect of the quality criteria stated in C.3.11.1 of this Tender Data shall be considered responsive and have their tenders evaluated further. (a) CIDB registration Only those tenderers who are registered with the CIDB 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 4ME class of construction work, are eligible to have their tenders evaluated. Joint ventures are eligible to submit tenders provided that: - every member of the joint venture is registered with the CIDB; - the lead partner has a contractor grading designation in the 4ME class of construction work; and 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 4ME class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

Clause number	Tender Data
	(b) National Treasury Central Supplier Database Tenderers who are not registered on the National Treasury Central Supplier Database at close of tender, shall submit a copy of their application of registration, with their tender submission. Tenders received from such tenderers who have not submitted proof of their registration within 21 days after the closing date for tender submissions, will not be considered.
C.2.7	The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender.
C.2.8	The last date for request for clarifications will be on the 12 September 2022.
C.2.12	Replace contents Alternative offers will not be permitted
C.2.13.6	A two-envelope procedure will be followed as described in clause C.2.13.7.
C.2.13.7	Tenderers shall note the specific requirements for packaging of their tender documents and include only the following: - Financial: one (1) original document marked "Original" including Form of Offer and Acceptance, Estimated monthly expenditure and Priced Bills of Quantities; and - Technical: one (1) document pack without any pricing (files in PDF format) on a memory stick Financial or pricing details should ONLY be included in the printed document pack marked 'ORIGINAL', and not in the PDF file(s) of the document(s) on the memory stick. NB: Failure to submit one printed document pack with pricing in one envelope, and a document pack without pricing on a memory stick will lead to your bid being disqualified. INCLUSION OF ANY PRICING INFORMATION ANYWHERE IN THE COPY WILL LEAD TO THE BID BEING DISQUALIFIED. The original document will be placed in one envelope and the one copy will be placed in another envelope. The two envelopes shall be placed together in an outer envelope sealed and bearing the following: - The address as stated in C.2.15.1 below - The identification details as stated in C.2.15.1 below - Name of the Tenderer - The words "Not be opened before the Tender opening" The technical and financial envelopes should also contain the details of the last three bullets on them. The financial envelope must contain the words NOT TO BE OPENED WITH THE TECHNICAL ENVELOPE.
C.2.13.9	Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.
C.2.15.1	The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are: Location of Tender box: Biodiversity Centre, Pretoria National Botanical Garden, 2 Cussonia Ave, Brummeria, Pretoria, Gauteng Province Identification details: Tender number: SANBI: NZG430/2022 Title of Tender: APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR

Clause number	Tender Data
	THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
C.2.15.2	The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.
C.2.16.1	The tender offer validity period is 90 days.
C2.16.3	Where a tenderer, at any time after the opening of his tender offer but prior to entering into a contract based on his tender offer: (1) withdraws his tender; (2) gives notice of his inability to execute the contract in terms of his tender; or (3) fails to comply with a request made in terms of C.2.17 or C.2.18 such tenderer shall be barred from tendering on any of the Employer's future tenders for a period to be determined by the Employer, but not less than six (6) months, from the date of tender closure. The Employer may fully or partly exempt a tenderer from the provisions of this condition if he is of the opinion that the circumstances justify the exemption
C.2.17	Provide clarification of a tender offer to a request to do so from the employer during the evaluation of tender offers.
C.2.18	Any additional information requested under this clause must be provided within 5 working days of the date of request. 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
C.2.22	Tender Documents will not be returned to tenderers
C.2.23	The Tenderer is required to submit with his Tender the following (failure to provide below documentation will result in the Tender being rejected): 1) A copy of the Central Suppliers Database (CSD) registration report or registration number. 2) A printed copy of the Active Contractor's Listing off the CIDB website (www.cidb.org.za). 3) Letter of Good Standing from the Office of the Compensation Commissioner as required by the Compensation for Occupational Injuries and Diseases Act (COIDA). The letter should be issued by the Department of Labour. 4) A valid certified copy or original Broad-Based Black Economic Empowerment (B-BBEE) Status Level 1 certificate or a sworn affidavit. . Note that for this Tender, the following pre-qualification criterion for preferential procurement will be applied: Section 4(1) a Tenderer having a B-BBEE Status Level of Contributor Level 1. 1) Certificates 2) Include in the Tender submission or provide the Employer with any certificates as stated in the Tender Data. 3) In case of a Joint Venture, bidders are required to submit a consolidated B-BBEE certificate or sworn affidavit, as well as a joint venture agreement that clearly outlines each party's percentage involvement or role. 4) In the case of a Joint Venture/Consortium the tax Compliance status Pin must be submitted for each member of the Joint Venture/Consortium."
C.3.1.1	The Employer shall respond to clarifications received up to 7 working days before the tender closing time.
C.3.2	The Employer shall issue addenda until 5 working days before the tender closing time.
C.3.5.1	The two-envelope system will be followed for this Tender.
C.3.7	In the event of disqualification, the Employer may, at his sole discretion, impose a specified period during which tender offers will not be accepted from the offending tenderer and report same to the CIDB and National Treasury.

Clause number	Tender Data
C.3.11.1	The procedure for the evaluation of responsive tenders is stated in Annexure A .
C.3.13	Tender offers will only be accepted if: a) the tenderer submits a copy of the CSD registration report or registration number (refer to T2.1.13); b) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation (refer to T2.1.12); c) the tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; d) the tenderer has not: a. abused the Employer's Supply Chain Management System; or b. failed to perform on any previous contract and has been given a written notice to this effect; e) the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract (refer to T2.1.16); f) the tenderer is registered and in good standing with the compensation fund issued by the Department of Labour (Letter of good standing with COIDA); g) the employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely (refer to T2.1.17). h) A copy of Tax Compliance Status Pin i) A valid certified copy or original Broad-Based Black Economic Empowerment (B-BBEE) Status Level 1 certificate or sworn affidavit. Note that for this Tender, the following pre-qualification criterion for preferential procurement will be applied: Section 4(1) a Tenderer having a B-BBEE Status Level of Contributor Level 1.

Annexure A

This annexure contains all the criteria that the Employer shall use to evaluate tenders. In accordance with clause C.3.11 of the Standard conditions of tender. No other factors, methods or criteria shall be used. The tenderer shall provide all the information requested in the forms included in Part T2.2 – Returnable schedules.

Tenders shall be evaluated in three stages as follows

- Stage 1 – Evaluation of Eligibility and Administrative compliance
- Stage 2 – Evaluation of Functionality
- Stage 3 – Evaluation of Tender Price and Preference

1 Stage 1: Eligibility and Administrative compliance

The first stage will determine whether bids are compliant with all mandatory and disqualifiable submission requirements. Bidders that are deemed compliant will be eligible for further evaluation.

The criteria as identified in Clauses C.2.23 and C.3.13 in the Tender Data will be used to determine the tenders' eligibility.

For administrative compliance, the tenderers must complete all the returnable forms in Part T2.2, the Bill of Quantities and the Offer section in Part C1.1.

2 Stage 2: Functionality

The tenderers who complied with the eligibility and administrative criteria in stage 1 are considered for further evaluation on their capability to execute the project.

In this stage tenderers, will be evaluated on functionality according to the criteria listed below. Tenderers who fail to score a minimum of 70 points out of a possible 100 points on functionality criteria will not be eligible for further consideration.

Scoring quality

The functionality (quality) evaluation criteria are listed below. Maximum points for each criterion are in bold while points for each sub-criterion are indicated in brackets.

FUNCTIONALITY CRITERIA		
ID	CRITERIA	POINTS
1	Implementation method and project plan or programme • Method to be followed in delivering this project • Realistic Implementation Plan with Timeframes	30 (20) (10)
2	Contractor's Experience • List three projects with similar scope of work completed in the last five years, completion certificate attached 1. Each Completion Certificate is equivalent to 5 points • Provide four reference letters on the Client's Letterhead for both past and current projects of similar value or higher. 1. Each positive Reference letter is equivalent to 5 Points	35 (15) (20)

3	Contractor's Capability													
	Proposed personnel:	35												
	1. Site Agent 2. Health and Safety Personnel 3. Construction Manager / Supervisor • Provide CVs for proposed key personnel (as above) indicating: ○ Previous work experience ○ Total number of years' working experience in construction ○ Individual experience of similar work in last five years	(25)												
	<table><tr><th>Sub-Criteria</th><th>Points</th></tr><tr><td>Combined CV experience of less than 5 years</td><td>5</td></tr><tr><td>Combined CV experience of 5 years or more</td><td>10</td></tr><tr><td>Combined CV experience of 10 years or more</td><td>15</td></tr><tr><td>Combined CV experience of 15 years or more</td><td>20</td></tr><tr><td>Combined CV experience of 20 years or more</td><td>25</td></tr></table>	Sub-Criteria	Points	Combined CV experience of less than 5 years	5	Combined CV experience of 5 years or more	10	Combined CV experience of 10 years or more	15	Combined CV experience of 15 years or more	20	Combined CV experience of 20 years or more	25	
	Sub-Criteria	Points												
Combined CV experience of less than 5 years	5													
Combined CV experience of 5 years or more	10													
Combined CV experience of 10 years or more	15													
Combined CV experience of 15 years or more	20													
Combined CV experience of 20 years or more	25													
Note: Each CV with 10 years or more experience will receive a maximum of 10 points.														
○ Qualifications or artisan's certification or other recognised training courses completed ○ Membership of professional bodies or guilds (e.g. SACPCMP / ECSA) (5 Points)	(5)													
Availability of Plant & Equipment														
○ Equipment owned by Contractor (Proof of Registration papers) or ○ Equipment to be rented (if any) (Letter of Intent from the Supplier) – with preferred rental companies	(5)													
TOTAL	100													

Functionality shall be scored by not less than three evaluators in accordance with the following schedules:

Each evaluation criterion will be assessed in terms of five indicators – no response, poor, satisfactory, acceptable, good and very good. Scores ranging from 0 to 5 will be allocated to no response, very poor, poor, acceptable, good and very good responses, respectively. The scores submitted by each of the evaluators will be averaged, weighted and then totalled to obtain the final score for functionality. The prompts for judgment and the associated scores used in the evaluation of quality shall be as follows:

Score	Prompt for judgement
0	Failed to address the question / issue
1	Very poor response: - response / answer / solution lacks convincing evidence of skill / experience sought or medium risk that relevant skills will not be available.

2	Poor response – some elements of the response / answer / solution are present but documentary evidence is mostly lacking in respect of the required information
3	Acceptable response / answer / solution to the particular aspect of the requirements and evidence given of skill / experience sought
4	Above acceptable - response / answer / solution demonstrating real understanding of requirements and evidence of ability to meet it.
5	Excellent - response / answer / solution provides confidence that the tenderer will add real value to the project.

The minimum number of evaluation points for functionality proposal is 70 points in order to progress to stage 3 of the evaluation

3 Stage 3: Tender Price and Preference

The tenderers who complied with the functionality criteria in stage 2 are considered for further evaluation in terms of their Tender Price and Preference points.

3.1 Calculation of score for Tender Price

The score for Tender Price shall be calculated using the following formula:

$$N_F = W_f \times \left[1 - \left(\frac{P_t - P_{min}}{P_{min}} \right) \right]$$

Where:

N_F = the score for Tender Price awarded for the tender under consideration

W_f = the weighting given to financial offer, determined as follows:

- 90 where the Tender Price, inclusive of VAT, of all responsive tender offers received has a value in excess of R50 000 000,00; or
- 80 where the Tender Price, inclusive of VAT, of one or more responsive tender offers has a value that equals or is less than R50 000 000,00.

P_t = Tender Price of the tender under consideration

P_{min} = Tender Price of the lowest responsive tender

In the event that the calculated value of N_F is negative, the allocated score shall be 0

3.2 Calculation of Preference points

Up to 100 minus W_f tender evaluation points will be awarded to tenderers who submit responsive tenders and who are found to be eligible for the preference claimed. Points are based on a tenderer's scorecard measured in terms of the Broad-Based Black Economic Empowerment Act (B-BBEE, Act 53 of 2003) and the Regulations (2017) to the Preferential Procurement Policy Framework Act (PPPFA, Act 5 of 2000).

Points awarded will be according to a tenderer's B-BBEE status level of contributor and summarised in the table below:

B-BBEE Status Level of contributor	Qualification	Number of Points for Contract value up to R50 000 000	Number of Points for Contract Value above R50 000 000
1	≥ 100 points	20	10
2	≥ 85 but < 100 points	18	9
3	≥ 75 but < 85 points	14	6
4	≥ 65 but < 75 points	12	5
5	≥ 55 but < 65 points	8	4
6	≥ 45 but < 55 points	6	3
7	≥ 40 but < 45 points	4	2
8	≥ 30 but < 40 points	2	1
Non-compliant Contributor	< 30 points	0	0

Eligibility for preference points is subject to the following conditions:

- (1) A tenderer's scorecard shall be based on the Construction Sector Codes of Practice promulgated in Government Gazette 32305 of 5 June 2009, only if such certificate has been issued before 17 February 2016, alternatively a B-BBEE Certificate issued in accordance with the revised Notice of Clarification published in Notice 444 of 2015 of Government Gazette No.38799 on 15 May 2015 by the Department of Trade and Industry; and
- (1) The scorecard shall be submitted as a certificate attached to Returnable Schedule Form T2.1.06; and
- (2) The certificate shall:
 - (a) be an original or an original certified copy of the original; and
 - (b) have been issued by a verification agency accredited by the South African National Accreditation System (SANAS); or
 - (c) have been issued by a registered auditor approved by the Independent Regulatory Board of Auditors (IRBA), and
- (3) The Verification Certificate must be valid at the tender closing date; and
- (4) The date of issue of the certificate must be less than 12 (twelve) months prior to the advertised tender closing date (see Tender Data C.2.15.2); and
- (5) Compliance with any other information requested to be attached to Form T2.1.06; and
- (6) If a tenderer claims a preference score without submitting an acceptable verification certificate, a period of 24 hours will be granted to submit an acceptable verification certificate which was valid at date of tender closure; and
- (7) Failure to submit a valid verification certificate will result in the award of 0 (zero) points for preference; and
- (8) In the event of a joint venture (JV), a consolidated B-BBEE verification certificate in the name of the JV shall be submitted.

3.3 Financial and Preference

After calculation of the scores for Tender Price and for Preference, a combined score will be calculated as follows:

$$NT = NF + NP$$

Where:

NT = Total score for tender under consideration

NF = Score for Tender Price

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Contract: **SANBI: NZG430/2022**

NP = Score for Preference

The tender with the highest score should be recommended for appointment.

Annexure B

Standard Conditions of Tender

C.1 General

C.1.1 Actions

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

C.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. 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.*

C.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.

C.1.2 Tender Documents

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

C.1.3 Interpretation

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

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

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

- a) **conflict of interest** means any situation in which:
 - i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially;
 - ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
 - iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.
- b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;
- c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;

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

C.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be 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.

C.1.5 Cancellation and Re-Invitation of Tenders

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

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

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

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

C.1.6 Procurement procedures

C.1.6.1 General

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

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the tender data 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 C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.3.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

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

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

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

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

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

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

C.1.6.3.2 Option 2

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

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

C.2 Tenderer's obligations

C.2.1 Eligibility

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

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

C.2.2 Cost of tendering

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

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

C.2.3 Check documents

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

C.2.4 Confidentiality and copyright of documents

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

C.2.5 Reference documents

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

C.2.6 Acknowledge addenda

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

C.2.7 Clarification meeting

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

C.2.8 Seek clarification

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

C.2.9 Insurance

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

C.2.10 Pricing the tender offer

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

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

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

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

C.2.11 Alterations to documents

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

C.2.12 Alternative tender offers

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

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

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

C.2.13 Submitting a tender offer

C.2.13.1 Submit one tender offer only, either as 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.

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

-
- C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.
- C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.
- C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.
- C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked "financial proposal" and place the remaining returnable documents in an envelope marked "technical proposal". Each envelope shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.
- C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.
- C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.
- C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.
- C.2.14 Information and data to be completed in all respects**
- Accept that tender offers, which do not provide all the data or information requested completely and, in the form required, may be regarded by the employer as non-responsive.
- C.2.15 Closing time**
- C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.
- C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.
- C.2.16 Tender offer validity**
- C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.
- C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.
- C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or 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).
- C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

C.2.17 Clarification of tender offer after submission

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

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

C.2.18 Provide other material

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

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

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

C.2.19 Inspections, tests and analysis

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

C.2.20 Submit securities, bonds and policies

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

C.2.21 Check final draft

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

C.2.22 Return of other tender documents

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

C.2.23 Certificates

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

C.3 The employer's undertakings

C.3.1 Respond to requests from the tenderer

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

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

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

C.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) 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.

C.3.3 Return late tender offers

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

C.3.4 Opening of tender submissions

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

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

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

C.3.5 Two-envelope system

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of 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.

C.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 BBBEE status level.

C.3.6 Non-disclosure

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

C.3.7 Grounds for rejection and disqualification

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

C.3.8 Test for responsiveness

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

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

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

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

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

C.3.9 Arithmetical errors, omissions and discrepancies

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

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

- a) the gross misplacement of the decimal point in any unit rate;
- b) omissions made in completing the pricing schedule or bills of quantities; or
- c) arithmetic errors in:
 - (i) line 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.

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

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

C.3.10 Clarification of a tender offer

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

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are

generic in nature and are made project specific through choices that are made in developing the Tender Data associated with a specific project.

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

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

The activities associated with evaluating tender offers are as follows:

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

C.3.11.1 General

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

C.3.12 Insurance provided by the employer

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

C.3.13 Acceptance of tender offer

Accept 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.

C.3.14 Prepare contract documents

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

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

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

C.3.15 Complete adjudicator's contract

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

C.3.16 Registration of the award

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

C.3.17 Provide copies of the contracts

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

C.3.18 Provide written reasons for actions taken

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

PART T 2: Returnable Documents

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

T2.1 List of Returnable Documents

1. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES

Tender document name	Number of pages issued	Returnable document
Resolution of Board of Directors (T2.1.01)	1 Page	■ Yes □ No
Resolution of Board of Directors to enter into consortia or JV's (T2.1.02) (If Applicable)	2 Pages	■ Yes □ No
Special Resolution of Consortia or JV's (T2.1.03) (If Applicable)	3 Pages	■ Yes □ No
Schedule of proposed sub-contractors (T2.1.04)	1 Page	■ Yes □ No
Capacity of Tenderer (T2.1.05)	3 Pages	■ Yes □ No
Preference Point System (T2.1.06)	6 Pages	■ Yes □ No
Schedule of Key Personnel (T2.1.07)	1 Pages	■ Yes □ No
Compensation of Occupational Injuries and Disease Act (COIDA) (T2.1.09)	1 Page	■ Yes □ No

2. OTHER DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES

Tender document name	Number of pages issued	Returnable document
Declaration of Interest (T2.1.10)	2 Pages	■ Yes □ No
Medical Certificate for the confirmation of permanent disabled status (T2.1.11)	1 Page	■ Yes □ No
Proof of registration with Construction Industry Development Board (T2.1.12)	1 Page	■ Yes □ No
Copy of CSD Registration Certificate (T2.1.13)	1 Pages	■ Yes □ No

3. RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT

Tender document name	Number of pages issued	Returnable document
Record of Addenda to tender documents (T2.1.14)	1 Page	■ Yes ☐ No
Compulsory Enterprise Questionnaire (T2.1.15)	3 Pages	■ Yes ☐ No
Declaration certificate for local production and content for designated sectors (SBD 6.2)	8 Pages	■ Yes ☐ No

4. OTHER DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT

Tender document name	Number of pages issued	Returnable document
Applicable Form of Guarantee	3 Pages	■ Yes ☐ No
Priced Bill of Quantities	15 Pages	■ Yes ☐ No

C1.1 Form of Offer and Acceptance
C1.2 Contract Data
C1.3 Form of Guarantee

RETURNABLE DOCUMENT CHECKLIST

This form has been created as an aid to ensure a tenderer's compliance with the completion of the returnable schedules and subsequent placement in the correct **Technical** and **Financial** envelopes.

A TECHNICAL ENVELOPE (1 COPY)

Reference No	Document Description	Tick if completed
T2.1.01	Resolution of Board of Directors	
T2.1.02	Resolution of Board of Directors to enter into consortia or JV's (If Applicable)	
T2.1.03	Special Resolution of Consortia or JV's (If Applicable)	
T2.1.04	Schedule of proposed sub-contractors	
T2.1.05	Capacity of Tenderer	
T2.1.06	Preference Point System	
T2.1.07	Schedule of Key Personnel	
T2.1.09	Compensation of Occupational Injuries and Disease Act (COIDA)	
T2.1.10	Declaration of Interest	
T2.1.11	Medical Certificate for the confirmation of permanent disabled status	
T2.1.12	Proof of registration with Construction Industry Development Board	
T2.1.13	Copy of CSD Registration Certificate	
T2.1.14	Record of Addenda to tender documents	
T2.1.15	Compulsory Enterprise Questionnaire	

B FINANCIAL ENVELOPE (ORIGINAL DOCUMENT)

The entire original tender document must be submitted in this envelope including the forms as listed below:

Reference No	Document Description	Tick if completed
Form C1.1	Form of Offer and Acceptance	
Form C1.2	Contract Data – Part 1	
Form C2.2	Priced Bill of Quantities	
SBD 6.2	Declaration certificate for local production and content for designated sectors	

PART 2: RETURNABLE DOCUMENTS

The South African National Biodiversity Institute

APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

Contract: **SANBI: NZG430/2022**

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

T2.2 Returnable documents/Schedules

T2.1.01: RESOLUTION OF BOARD OF DIRECTORS

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

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

Held at (place)

On (date)

RESOLVED that:

1. The Enterprise submits a Bid / Tender to the South African National Biodiversity Institute in respect of the following project:

.....
.....
(project description as per Bid / Tender Document)

Bid / Tender Number: (Bid / Tender Number as per Bid / Tender Document)

2. *Mr/Mrs/Ms:

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

and who will sign as follows:

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

	Name	Capacity	Signature
1			
2			
3			
4			

Note:

1. * Delete which is not applicable
2. **NB.** This resolution must be signed by all the Directors / Members / Partners of the Bidding Enterprise.
3. Should the number of Directors / Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

ENTERPRISE STAMP

T2.1.02: RESOLUTION OF BOARD OF DIRECTORS TO ENTER INTO CONSORTIA OR JOINT VENTURES

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

.....

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

Held at (place)

On (date)

RESOLVED that:

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

.....

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

to the South African National Biodiversity Institute in respect of the following project:

.....

.....
(Project description as per Bid /Tender Document)

Bid / Tender Number: (Bid / Tender Number as per Bid / Tender Document)

2. *Mr/Mrs/Ms:

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

and who will sign as follows:

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

3. The Joint Venture formation/arrangement will be in the following proportions:

Name of Contractor	Proportion (%)

The South African National Biodiversity Institute

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

Physical address:

.....
..... (code)

Postal address:

.....
..... (code)

Telephone number: (code)

Fax number: (code)

	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Note:

1. * Delete which is not applicable.
2. **NB.** This resolution must be signed by all the Directors / Members / Partners of the Bidding Enterprise.
3. Should the number of Directors / Members / Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

ENTERPRISE STAMP

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

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T2.1.03: SPECIAL RESOLUTION OF CONSORTIA OR JOINT VENTURES

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

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

Held at (place)

On (date)

RESOLVED that:

- A. The above-mentioned Enterprises submit a Bid in Consortium/Joint Venture to the South African National Biodiversity Institute in respect of the following project:

.....
.....
(Project description as per Bid /Tender Document)

Bid / Tender Number: *(Bid / Tender Number as per Bid / Tender Document)*

*Mr/Mrs/Ms:

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

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

- B. The Enterprises constituting the Consortium/Joint Venture, notwithstanding its composition, shall conduct all business under the name and style of:
- C. The Enterprises to the Consortium/Joint Venture accept joint and several liabilities for the due fulfilment of the obligations of the Consortium/Joint Venture deriving from, and in any way connected with, the Contract entered into with the Employer in respect of the project described under item A above.
- D. Any of the Enterprises to the Consortium/Joint Venture intending to terminate the consortium/joint venture agreement, for whatever reason, shall give the Employer 30 day's written notice of such intention. Notwithstanding such decision to terminate, the Enterprises shall remain jointly and severally liable to the Employer for the due fulfilment of the obligations of the Consortium/Joint Venture as mentioned under item D above.
- E. No Enterprise to the Consortium/Joint Venture shall, without the prior written consent of the other Enterprises to the Consortium/Joint Venture and of the Employer, cede any of its rights or assign any of its obligations under the consortium/joint venture agreement in relation to the Contract with the Employer referred to herein.
- F. The Enterprises choose as the *domicilium citandi et executandi* of the Consortium/Joint Venture for all purposes arising from the consortium/joint venture agreement and the Contract with the Employer in respect of the project under item A above:

Physical address:.....

.....

..... (code)

Postal address:

.....

..... (code)

Telephone number: (code)

Fax number: (code)

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

Note:

1. * Delete which is not applicable.
2. **NB.** This resolution must be signed by all the Duly Authorised Representatives of the Legal Entities to the Consortium Joint Venture submitting this Bid.
3. Should the number of Duly Authorised Representatives of the Legal Entities joining forces in this Bid exceed the space available above, additional names and signatures must be supplied on a separate page.
4. Resolutions, duly completed and signed, from the separate Enterprises who participate in this Consortium/Joint Venture must be attached to the Special Resolution.

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Contract: **SANBI: NZG430/2022**

T2.1.04: SCHEDULE OF PROPOSED SUBCONTRACTORS

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

We notify you that it is our intention to employ the following Subcontractors for work in this contract.

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

	Name and address of proposed Subcontractor	Nature and extent of work	Previous experience with Subcontractor
1			
2			
3			
4			

Name of representative	Signature	Capacity	Date

Name of organisation:	
------------------------------	--

Contract: **SANBI: NZG430/2022**

T2.1.05: CAPACITY OF TENDERER

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

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

Skilled artisans employed		Unskilled employees employed	
Categories of artisans	Number	Categories of employees	Number

1.1. Provide full particulars of:

Machinery	Plant	Workshops

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2. PARTICULARS OF COMMITMENTS WHICH THE TENDERER HAS PREVIOUSLY COMPLETED AND PRESENTLY ENGAGED WITH:

2.1. Current projects:

	Project	Place (town)	Reference / Contact person	Contact Tel. No.	Contract amount	Contract period	Date of commencement	Scheduled date of completion
1								
2								
3								
4								
5								
6								
7								
8								

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9								
10								

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2.2. Previous projects:

Project		Place (town)	Reference / Contact person	Contact Tel. No.	Contract amount	Contract period	Date of commencement	Scheduled date of completion	Actual date of completion
1									
2									
3									
4									
5									
6									
7									
8									
Name of Tenderer		Signature		Date					

T2.1.06: PREFERENCE POINT SYSTEM

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2011

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value equal to or above R30 000 and 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 The value of this bid is estimated to be below R50 000 000.00 (all applicable taxes included) and therefore the 80/20 system shall be applicable.

1.3 Preference points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contribution.

1.3.1 The maximum points for this bid are allocated as follows:

	POINTS
1.3.1.1 PRICE	80
1.3.1.2 B-BBEE STATUS LEVEL OF CONTRIBUTION	20
Total points for Price and B-BBEE must not exceed	100
1.4 Failure on the part of a bidder to fill in and/or to sign this form and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS) or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA) or an Accounting Officer as contemplated in the Close Corporation Act (CCA) together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.	
1.5 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.	

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2. DEFINITIONS

- 2.1.1 “**all applicable taxes**” includes value-added tax, pay as you earn, income tax, unemployment Insurance fund contributions and skills development levies;
- 2.2 “**B-BBEE**” means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- 2.3 “**B-BBEE status level of contributor**” means the B-BBEE status received by a measured entity Based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
- 2.4 “**bid**” means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of services, works or goods, through price quotations, advertised competitive bidding processes or proposals;
- 2.5 “**Broad-Based Black Economic Empowerment Act**” means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- 2.6 “**comparative price**” means the price after the factors of a non-firm price and all unconditional discounts that can be utilized have been taken into consideration;
- 2.7 “**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;
- 2.8 “**contract**” means the agreement that results from the acceptance of a bid by an organ of state;
- 2.9 “**EME**” means any enterprise with annual total revenue of R5 million or less.
- 2.10 “**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;
- 2.11 “**functionality**” means the measurement according to predetermined norms, as set out in the bid documents, of a service or commodity that is designed to be practical and 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 a bidder;
- 2.12 “**non-firm prices**” means all prices other than “firm” prices;
- 2.13 “**person**” includes a juristic person;
- 2.14 “**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;
- 2.15 “**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;
- 2.16 “**total revenue**” bears the same meaning assigned to this expression in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act and promulgated in the *Government Gazette* on 9 February 2007;

2.17 **“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; and

2.18 **“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.

3. ADJUDICATION USING A POINT SYSTEM

3.1 The bidder obtaining the highest number of total points will be awarded the contract.

3.2 Preference points 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;.

3.3 Points scored must be rounded off to the nearest 2 decimal places.

3.4 In the event that two or more bids have scored equal total points, the successful bid must be the one scoring the highest number of preference points for B-BBEE.

3.5 However, when functionality is part of the evaluation process and two or more bids have scored equal points including equal preference points for B-BBEE, the successful bid must be the one scoring the highest score for functionality.

3.6 Should two or more bids be equal in all respects, the award shall be decided by the drawing of lots.

4. POINTS AWARDED FOR PRICE

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

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

80/20 or 90/10

$$P_s = 80 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right) \quad \text{or} \quad P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

P_s = Points scored for comparative price of bid under consideration

P_t = Comparative price of bid under consideration

$P_{\min}$ = Comparative price of lowest acceptable bid

5. Points awarded for B-BBEE Status Level of Contribution

- 5.1 In terms of Regulation 5 (2) and 6 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (90/10 system)	Number of points (80/20 system)
1	10	20
2	9	18
3	8	14
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

- 5.2 Bidders who qualify as EMEs in terms of the B-BBEE Act must submit a certificate issued by an Accounting Officer as contemplated in the CCA or a Verification Agency accredited by SANAS or a Registered Auditor. Registered auditors do not need to meet the prerequisite for IRBA's approval for the purpose of conducting verification and issuing EMEs with B-BBEE Status Level Certificates.
- 5.3 Bidders other than EMEs must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.
- 5.4 A trust, consortium or joint venture, will qualify for points for their B-BBEE status level as a legal entity, provided that the entity submits their B-BBEE status level certificate.
- 5.5 A trust, consortium or joint venture will qualify for points for their B-BBEE status level as an unincorporated entity, provided that the entity submits their consolidated B-BBEE scorecard as if they were a group structure and that such a consolidated B-BBEE scorecard is prepared for every separate bid.
- 5.6 Tertiary institutions and public entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.
- 5.7 A person will not be awarded points for B-BBEE status level if it is indicated in the bid documents that such a bidder intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the points that such a bidder qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.
- 5.8 A person awarded a contract may not sub-contract more than 25% of the value of the contract to any Other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.

6. BID DECLARATION

- 6.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

7. B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF PARAGRAPHS 1.3.1.2 AND 5.1

7.1 B-BBEE Status Level of Contribution: =(maximum of 10 or 20 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 5.1 and must be substantiated by means of a B-BBEE certificate issued by a Verification Agency accredited by SANAS or a Registered Auditor approved by IRBA or an Accounting Officer as contemplated in the CCA).

8 SUB-CONTRACTING

8.1 Will any portion of the contract be sub-contracted? YES / NO (delete which is not applicable)

8.1.1 If yes, indicate:

- (i) what percentage of the contract will be subcontracted?%
- (ii) the name of the sub-contractor?
- (iii) the B-BBEE status level of the sub-contractor?
- (iv) whether the sub-contractor is an EME?..... YES / NO (delete which is not applicable)

9 DECLARATION WITH REGARD TO COMPANY/FIRM

9.1 Name of company/firm :

9.2 VAT registration number :

9.3 Company registration number :

9.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
 - ☐ One person business/sole propriety
 - ☐ Close corporation
 - ☐ Company
 - ☐ (Pty) Limited
- [TICK APPLICABLE BOX]

9.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

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

9.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier

- ☐ Professional service provider
☐ Other service providers, e.g. transporter, etc.
[TICK APPLICABLE BOX]

9.7 Total number of years the company/firm has been in business?

9.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contribution indicated in paragraph 7 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we 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 paragraph 7, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- (iv) If the B-BBEE status level of contribution has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –
 - (a) disqualify the person from the bidding 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) restrict the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, 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

WITNESSES:

1.

SIGNATURE(S) OF BIDDER(S)

.....

2.

DATE:.....

ADDRESS:

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Contract: **SANBI: NZG430/2022**

.....

.....

T2.1.07: SCHEDULE OF KEY PERSONNEL

The Tenderer shall list below the key personnel who will be engaged on the Contract by completing this schedule.

Key Contract Personnel Name	Job Title	Qualifications	Professional Registration	Proposed Project Position

T2.1.09: COMPENSATION OF OCCUPATIONAL INJURIES AND DISEASE ACT (COIDA)

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

The tenderer is registered and in good standing with the compensation fund issued by the Department of Labour (Letter of good standing with COIDA).

T2.1.10: DECLARATION OF INTEREST

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

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

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

2. Bidder's declaration

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

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

Full Name	Identity Number	Name of State institution

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.

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

2.2.1 If so, furnish particulars:

.....
.....

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

2.3.1 If so, furnish particulars:

.....
.....

3 DECLARATION

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

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium² will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
- 3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring 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

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.

restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....
Signature

.....
Date

.....
Position

.....
Name of bidder

T2.1.11: MEDICAL CERTIFICATE FOR THE CONFIRMATION OF PERMANENT DISABLED STATUS

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

I, _____ (surname and name), Identity number, _____ do hereby declare that I am a registered medical practitioner, with my practice number being _____, practicing at _____ (Physical and postal addresses) declare that I have examined Mr/Mrs _____, identity number of _____ and have found the said person to be permanently disabled or having a recurring disability.

“Disability” means, in respect of a person, a permanent impairment of a physical, intellectual, or sensory function, which results in restricted, or lack of, ability to perform an activity in the manner, or within the range, considered normal for a human being.” – As per Preferential Procurement Policy Framework Act: No 5 of 2000 (PPPFA)

The nature of the disability is as follows:

Thus signed at _____ on this _____ day of _____ of _____.

Signature

Date

OFFICIAL STAMP OF
MEDICAL PRACTITIONER

Any reference to words “Bid” or Bidder” herein and/or in any other do words “Tender” or “Tenderer”.

The South African National Biodiversity Institute

APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

Contract: **SANBI: NZG430/2022**

T2.1.12: PROOF OF REGISTRATION WITH CONSTRUCTION INDUSTRY DEVELOPMENT BOARD

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

The Tenderer shall provide a printed copy of the Active Contractor's Listing off the CIDB website. www.cidb.org.za. In the case of a joint venture, a printed copy of the Active Contractor's listing must be provided for each member of the joint venture.

Name of Contractor:

Contractor Grading Designation:

CIDB Contractor Registration Number:

T2.1.13: COPY OF CSD REGISTRATION CERTIFICATE

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

A copy of Central Suppliers Database (CSD) Registration Certificate must be included for evaluation purposes.

T2.1.14: RECORD OF ADDENDA TO TENDER DOCUMENTS

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

I / We confirm that the following communications received from the South African National Biodiversity Institute before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer: *(Attach additional pages if more space is required)*

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

Name of Tenderer	Signature	Date

I / We confirm that no communications were received from the South African National Biodiversity Institute before the submission of this tender offer, amending the tender documents.

Name of Tenderer	Signature	Date

The South African National Biodiversity Institute

APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

Contract: **SANBI: NZG430/2022**

T2.1.15: COMPULSORY ENTERPRISE QUESTIONNAIRE

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

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

Section 1: Name of enterprise:

Section 2: VAT registration number, if any:

Section 3: CIDB registration number, if any:

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

*Complete only if sole proprietor or partnership and attach separate page if more than 3 partners.

Section 5: Particulars of companies and close corporations

Company registration number:

Close corporation number:

Tax reference number:

Section 6: Record in the service of the state

Indicate by marking the relevant boxes with a cross, if any sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently, or has been within the last 12 months, in the service of any of the following:

- | | |
|---|--|
| ☐ a member of any municipal council | ☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No 1 of 1999) |
| ☐ a member of any provincial legislature | |

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- | | |
|--|--|
| ☐ a member of the National Assembly or the National Council of Province | ☐ a member of an accounting authority of any national or provincial public entity |
| ☐ a member of the board of directors of any municipal entity | ☐ an employee of Parliament or a provincial legislature |
| ☐ an official of any municipality or municipal entity | |

If any of the above boxes are marked, disclose the following:

Name of sole proprietor, partner, director, manager, principal shareholder or stakeholder	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

*Insert separate page if necessary.

Section 7: Record of spouses, children and parents in the service of the state

Indicate by marking the relevant boxes with a cross, if any spouse, child or parent or a sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently, or has been within the last 12 months, in the service of any of the following:

- | | |
|--|--|
| ☐ a member of any municipal council | ☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No 1 of 1999) |
| ☐ a member of any provincial legislature | |
| ☐ a member of the National Assembly or the National Council of Province | ☐ a member of an accounting authority of any national or provincial public entity |
| ☐ a member of the board of directors of any municipal entity | ☐ an employee of Parliament or a provincial legislature |
| ☐ an official of any municipality or municipal entity | |

Name of spouse, child or parent	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

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

The South African National Biodiversity Institute

APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

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*Insert separate page if necessary.

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

- (i) authorises the Employer to obtain a tax clearance certificate from the South African Revenue Services that my/our tax matters are in order;
- (ii) confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act, 2004;
- (iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise, has within the last five years been convicted of fraud or corruption;
- (iv) confirms that I/we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the Tenderers or those responsible for compiling the Scope of Work that could cause or be interpreted as a conflict of interest; and
- (v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed: Date:

Name: Position:

Enterprise name:

DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS

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, the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 (Edition 1) 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 C) and E (Local Content Declaration: Supporting Schedule to Annex C)].

1. General Conditions

- 1.1. Preferential Procurement Regulations, 2017 (Regulation 8) 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 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 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) 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:

$$LC = [1 - x / y] * 100$$

Where

x is the imported content in Rand

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 SATS 1286:2011 is accessible on [http://www.thedti.gov.za/industrial development/ip.jsp](http://www.thedti.gov.za/industrial%20development/ip.jsp) at no cost.

- 1.6. 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;
- 2. The stipulated minimum threshold(s) for local production and content (refer to Annex A of SATS 1286:2011) for this bid is/are as follows:**

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Contract: **SANBI: NZG430/2022**

Description of services, works or goods

Stipulated minimum threshold

Steel Value-added Products - Fasteners

100%

3. Does any portion of the goods or services 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 of advertisement of the bid.

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

Indicate the rate(s) of exchange against the appropriate currency in the table below (refer to Annex A of SATS 1286:2011):

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 meeting the stipulated minimum threshold for local content the dti must be informed accordingly in order for the dti to verify and in consultation with the AO/AA provide directives in this regard.

LOCAL CONTENT DECLARATION
(REFER TO ANNEX B OF SATS 1286:2011)

LOCAL CONTENT DECLARATION BY 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

- 1 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.
- 2 Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex 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.** Declarations D and E should be kept by the bidders 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:

- (a) The facts contained herein are within my own personal knowledge.
- (b) I have satisfied myself that:
 - (i) 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
- (c) 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 above and the information contained in Declaration D and E which has been consolidated in Declaration C:

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	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 Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____

DATE: _____

WITNESS No. 1 _____

DATE: _____

WITNESS No. 2 _____

DATE: _____

Contract: **SANBI: NZG430/2022**

Annex D

SATS 1286.2011

Imported Content Declaration - Supporting Schedule to Annex C

(D1)	Tender No.		Note: VAT to be excluded from all calculations
(D2)	Tender description:		
(D3)	Designated Products:		
(D4)	Tender Authority:		
(D5)	Tendering Entity name:		
(D6)	Tender Exchange Rate:	USD EU GBP	

A. Exempted imported content

[illegible]

B. Imported directly by the Tenderer

[illegible]

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SATS 1286.2011

Annex E

Local Content Declaration - Supporting Schedule to Annex C

(E1)	Tender No.	
(E2)	Tender description:	
(E3)	Designated products:	
(E4)	Tender Authority:	
(E5)	Tendering Entity name:	

Note: VAT to be excluded from all calculations

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) R 0

(E11) **Factory overheads** (Rental, depreciation & amortisation, utility costs, consumables etc.) R 0

(E12) **Administration overheads and mark-up** (Marketing, insurance, financing, interest etc.) R 0

(E13) Total local content R 0

This total must correspond with Annex C - C24

Signature of tenderer from Annex B

Date: _____

Contract: **SANBI: NZG430/2022**

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Local Content Declaration - Summary Schedule

Note: VAT to be excluded from all calculations

(C20) Total tender value

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PART C: THE CONTRACT

Part C1: Agreement and Contract Data

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CONTRACT NO:	SANBI: NZG430/2022

C1.1 Form of Offer and Acceptance

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT.

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

The tenderer, identified in the Offer signature block, has examined the draft contract as listed in the Acceptance section and agreed to provide this Offer.

By the representative of the tenderer, deemed to be duly authorised, 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 VAT IS:

(in words) Rand;

R (in figures)

THE OFFERED PRICES ARE AS STATED IN THE PRICING SCHEDULE

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 including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the **Contractor** in the conditions of contract identified in the Contract Data.

Signature(s)

Name(s)

Capacity

**For the
Tenderer:**

.....

The South African National Biodiversity Institute

APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

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Name &
signature of
witness

.....
..... Date
.....

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

Acceptance

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

The terms of the Contract are contained in

Part C1 Agreements and Contract Data *[which includes this Agreement]*

Part C2 Pricing Data

Part C3 Scope of Work

Part C4 Site Information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

Deviations from and amendments to the documents listed in the Tender Data and any Addenda thereto listed in the Tender Schedules, as well as any changes to the terms of the Offer agreed by the Tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from the said documents are valid unless contained in this Schedule, which must be duly signed by the authorised representative(s) of both parties.

The Tenderer shall within the time required to submit documentation in accordance with clause 5.3.2 of the Contract Data (C1.2) after receiving a completed copy of this Agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data at, or just after, the date this Agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now Contractor) within five 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.

Signature(s)

Name(s)

Capacity

For the Employer:

.....

(Insert name and address of organisation)

Name & signature of Date

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

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APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

Contract: **SANBI: NZG430/2022**

witness

.....

Schedule of Deviations

1	Subject
	Details
	
	
	
2	Subject
	Details
	
	
	
3	Subject
	Details
	
	
	
4	Subject
	Details
	
	
	
5	Subject
	Details
	
	
	

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and Addenda thereto as listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

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

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FOR THE TENDERER:

Signature(s)

Name(s)

Capacity

.....
[Name and address of organisation]

Name and
signature of
witness

Date

FOR THE EMPLOYER:

Signature(s)

Name(s)

Capacity

.....
[Name and address of organisation]

Name and
signature of
witness

Date

CONFIRMATION OF RECEIPT

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

The..... *[day]*

of *[month]*

20.....*[year]*

at *[place]*

For the Contractor:

.....
Signature

.....
Name

.....
Capacity

Signature and name of witness:

.....
Signature

.....
Name

PART C: THE CONTRACT

Part C1: Agreement and Contract Data

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C.1.2 Contract Data

C.1.2 Contract Data	
The Conditions of Contract are the <i>General Conditions of Contract for Construction Works (Third Edition, 2nd print, 2015)</i> published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained from the South African Institution of Civil Engineering (Tel: 011-805 5947). Each item of data given below is cross-referenced to the clause in the Conditions of Contract to which it mainly applies.	
Part 1: Data provided by the Employer	
Clause	Data
1.1.1.13	Clause 1.1.1.13: Defects Liability Period The Defects Liability Period is 12 months, measured from the date of the Certificate of Completion
1.1.1.14	Clause 1.1.1.14: Due Completion Date The time for achieving Practical Completion is as follows: 8 Months after the Commencement date
1.1.1.15	The name of the Employer is The South African National Biodiversity Institute, represented by Mr Tanaka Mupudzi and/or such persons or person duly authorised thereto be the Employer in writing.

1.2.1.2	The Employer's address for receipt of communications is: Delivery Address: Attention: Deputy Director: Supply Chain Management Pretoria National Botanical Garden Biodiversity Centre, 2 Cussonia Avenue Brummeria, Pretoria Postal Address: Attention: Deputy Director: Supply Chain Management South African National Biodiversity Institute Private Bag X101 Silverton, Gauteng 0184
1.1.1.16	The name of the Engineer is ADQ ENGINEERING PROJECTS
1.2.1.2	The address of the Engineer is: UNIT 17B ECO FUSION PHASE 4 300 WITCH-HAZELE AVE HIGHVELD CENTURION
1.1.1.26	Clause 1.3.: Pricing Strategy The Pricing Strategy is a re-measurement contract.
3.1.3	Clause 3.1.3: Specific Approval of the Employer Required The Engineer is required to obtain the specific approval of the Employer before executing any of the following functions or duties: 1 Clause 6.3: Variations 2 Clause 5.11.1: Suspension of the Works 3 Clause 5.12: Extension of Time for Practical Completion
3.2.3	Clause 3.2.3: Specific Approval of the Employer Required The Employer's Agent is required to obtain the specific approval of the Employer before executing any of the following functions or duties: 1 Clause 6.3: Variations 2 Clause 5.11.1: Suspension of the Works 3 Clause 5.12: Extension of Time for Practical Completion
5.3.1	Clause 5.3.1: Commencement of the Works The documentation required before commencement with Works execution are: Health and Safety Plan (Refer to Clause 4.3) Initial programme (Refer to Clause 5.6) Security (Refer to Clause 6.2) Insurance (Refer to Clause 8.6) Cash flow projection

5.3.2	Clause 5.3.2: Timeframe to deliver documentation The time to submit the documentation required before commencement with Works execution is twenty-one (21) days.																								
5.3.3	Clause 5.3.3: Time to instruct commencement of the Works <i>Add the following to Clause 5.3.3 after the last sentence:</i> "The Contractor shall not commence working until they have an approved project specific health and safety plan in terms of the Occupational Health and Safety Act, 1993: Construction Regulations, 2014 and complied with the initial requirements thereof."																								
5.4.2	The access and possession of Site shall not be exclusive to the Contractor but as set out in the Site Information.																								
5.8.1	Clause 5.8.1: Non-Working Times The non-working days are Saturdays and Sundays. The special non-working days are: 1. All gazetted public holidays falling outside the year end break. 2. The year-end break																								
5.12.2.	Clause 5.12.2.: Some reasons for extension of time Clause 5.12.2.2: Abnormal climatic conditions. <i>Add the following:</i> Regardless of the cause of any delay an extension of time will only be considered if it can be shown that the activity delayed is on the critical path indicated on the Programme of Works (Clause 5.6.1). No extension of time will be granted in respect of any delays attributed to normal climatic conditions. Normal Climatic Conditions shall be deemed to include normal rainfall and associated wet conditions and materials, strong winds and extremes of temperature. However, in the event that delays to critical activities exceed the number of working days listed below for each month, then abnormal climatic conditions shall be deemed to exist, and an extension of time shall be granted in accordance with the provisions of that Clause. The number of days quoted below shall be regarded as a fair estimate of the delays to be anticipated and allowed for under normal climatic conditions where inclement weather prevents or disrupts work on the critical path. <table><tr><td>January</td><td>3 days</td><td>May</td><td>1 days</td><td>September</td><td>1 days</td></tr><tr><td>February</td><td>6 days</td><td>June</td><td>1 days</td><td>October</td><td>2 days</td></tr><tr><td>March</td><td>7 days</td><td>July</td><td>1 days</td><td>November</td><td>2 days</td></tr><tr><td>April</td><td>5 days</td><td>August</td><td>1 days</td><td>December</td><td>4 days</td></tr></table> Claims for delays for abnormal climatic conditions shall be accompanied by substantiating facts and evidence, which shall be submitted timeously as each day or half-day delay is experienced. Should an extension of time be granted by the Engineer such extension of time will be added to the Time for Completion.	January	3 days	May	1 days	September	1 days	February	6 days	June	1 days	October	2 days	March	7 days	July	1 days	November	2 days	April	5 days	August	1 days	December	4 days
January	3 days	May	1 days	September	1 days																				
February	6 days	June	1 days	October	2 days																				
March	7 days	July	1 days	November	2 days																				
April	5 days	August	1 days	December	4 days																				

	It shall be further noted that where the critical path is not affected, no extension of time for <u>abnormal</u> climatic conditions or for any other reason will be entertained. Rainfall of 10mm or less per day shall be deemed to be normal climatic conditions.
5.13.1	Clause 5.13.1: Penalty for Delay The penalty for failing to complete the Works is R1350 per day.
5.14.1	Clause 5.14.1: Practical completion The requirements for achieving Practical Completion are: Works to reach a state of readiness fit for intended purpose and occupation without danger/undue inconvenience to the Employer/public.
5.14.2	Clause 5.14.2: Issue of Certificate of Practical Completion <i>Replace "the Employer's Agent" in the second and third lines with the following:</i> ", the Contractor shall notify the Employer's Agent, who shall inspect the Works and the Employer's Agent"
5.14.4	Clause 5.14.4: Certificate of Completion <i>Replace "the Employer's Agent" in the third line of the first paragraph with:</i> ", the Contractor shall notify the Employer's Agent, who shall inspect the works and the Employer's Agent"
5.16.3	Clause 5.16.3: Latent defect liability The latent defect period is five (5) years for building works.
6.2	Clause 6.2: Security The Form of Guarantee is to contain the wording of the pro-forma document as per the contract document. The liability of the guarantee shall be for 10% of the Approved Contract Sum.
6.8.2	Clause 6.8.2: Contract Price Adjustment Contract Price Adjustment <u>is not applicable</u>
6.8.3	Clause 6.8.3: Variation in Cost of Special Materials Price adjustments for variations in the costs of special materials are not allowed
6.10.1.5	Clause 6.10.1.5: Interim Payments - Materials on Site No percentage advance on materials on site but not yet built into the Permanent Works is allowed for, or will be paid.
6.10.3	Clause 6.10.3: Retention Money The percentage retention on the amounts due to the Contractor is 10% (ten percent). The limit of retention is 10% of the Contract Sum, including allowances for contingencies. This reduces to 5% upon the issue of the Certificate of Completion. The remaining 5% retention will be released upon the issue of the Final - Approval Certificate upon lapse of the defects liability period. Security plus Retention amount will not exceed 15% of the Contract Sum
6.10.4	Clause 6.10.4: Delivery, dissatisfaction with and payment of payment certificate <i>Replace "28 days" in the second last sentence with "30 days"</i>

6.10.6	Clause 6.10.6: Set-Off and Delayed Payments A guarantee in lieu of retention is not permitted
6.10.6.2	Clause 6.10.6.2: Set-Off and Delayed Payments <i>Replace the words “prime overdraft rate certified by the Contractor’s banker” with the words “interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply”</i>
6.10.8	Clause 6.10.8: Contractor’s completion statement <i>Replace “28 days” in the last sentence with “30 days”</i>
6.10.9	Clause 6.10.9: Final payment certificate <i>Replace “28 days” in the last sentence with “30 days”</i>
6.12	Clause 6.12: Additional <i>Add Clause 6.12 as follows:</i> In respect of any amount owed by the Contractor to the Employer, the Contractor shall pay the Employer interest at the rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply
8.6.1	Clause 8.6.1: Insurance <i>Add the following:</i> Damage to the Works (a) Without in any way limiting the Contractor’s obligations in terms of the Contract, the Contractor shall bear the full risk of damage to and/or destruction of the Works by whatever cause during construction of the Works and hereby indemnifies and holds harmless the Employer against any such damage. The Contractor shall take such precautions and security measures and other steps for the protection and security of the Works, as he may deem necessary. (b) The Contractor shall at all times proceed immediately to remove or dispose of any debris arising from damage to or destruction of the Works and to rebuild, restore, replace and/or repair the Works. (c) The Employer shall carry the risk of damage to or destruction of the Works and material paid for by the Employer that is the result, whether direct or indirect or proximate or remote, of the excepted risks as set out in Clause 8.6.2. (d) Where the Employer bears the risk in terms of this Contract, the Contractor shall, if requested to do so, reinstate any damage or destroyed portions of the Works and the costs of such reinstatement shall be measured and valued in terms of Clause 6.7 hereof.
8.6.1.1.2	Clause 8.6.1.1.2: Insurance The value of the materials supplied by the Employer to be included in the insurance sum is -Nil.
8.6.1.1.3	Clause 8.6.1.1.3: Insurance

	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is -Nil.
8.6.1.3	Clause 8.6.1.3: Insurance The limit of indemnity for liability insurance is R10 000 000.00 for any single claim – the number of claims to be unlimited during the construction.
8.6.1.5	Clause 8.6.1.5: Additional Insurance Additional Insurance is required for the following: a) Where the contract involves manufacturing and/or fabrication of the works or part thereof at premises other than the Site, the Contractor shall satisfy the Employer that all materials and equipment for incorporation in the works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such works during manufacture or fabrication then such interest shall be noted by endorsement to the Contractor's Policies of Insurance.
10.1.5	Clause 10.1.5: Employer's Agent's ruling on Contractor's Claim <i>Add the following to Clause 10.1.5 before the last sentence:</i> "If the Employer's Agent does not respond in accordance with the foregoing procedure and timetable, either Party may consider that the claim has been rejected by the Employer's Agent and either Party may submit the dispute by issuing a Dispute Notice in terms of Clause 10.3.1."
10.3.1	Clause 10.3: Dispute Notice <i>Replace Clause 10.3.1.1 with the following</i> "The dispute arises from any ruling."
10.5, 10.6, 10.7	Clause 10.5, 10.6, 10.7: Dispute Resolution Dispute resolution shall be by Arbitration .
11	Clause 12: Confidentiality The Contractor shall treat the details of the Works comprised in this Contract as private and confidential (save in so far as may be necessary for the purposes hereof) and shall not publish or disclose the same or any particulars thereof in any trade or technical paper elsewhere without prior written consent of the Engineer.
12	Clause 13: Amendments in writing No amendments of this Contract or of any provisions or terms hereof and no waiver or relaxation or suspension of any of the provisions or terms of this Contract shall be of any force or effect unless reduced to writing and signed by both the parties hereto.

PART 2: DATA PROVIDED BY THE CONTRACTOR

Clause

1.1.1.9 The Contractor is

1.2.1.2 The Contractor's address for receipt of communications is:

Physical address:

Postal address:

The South African National Biodiversity Institute

APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

Contract: **SANBI: NZG430/2022**

.....	
.....	
.....	
.....	
Telephone:	
Fax:	
Email:	

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

PART C: THE CONTRACT

Part C1: Agreement and Contract Data

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C1.3 FORM OF CONSTRUCTION GUARANTEE

C1.3.1 PRO FORMA PERFORMANCE GUARANTEE

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means:

Physical address:

"Employer" means:

"Contractor" means:

"Engineer" means:

"Works" means:

"Site" means:

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

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

Amount in words:

"Guaranteed Sum" means: The maximum aggregate amount of R

Amount in words:

"Expire Date" means:

CONTRACT DETAILS

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

PERFORMANCE GUARANTEE

- 1 The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
- 2 The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.
- 3 The Guarantor hereby acknowledge that:
 - 3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;
 - 3.2 its obligation under this Performance Guarantee is restricted to the payment of money.
- 4 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
 - 4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;
 - 4.2 A first written demand issued by the Employer to the guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;
 - 4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.
- 5 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
 - 5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or
 - 5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and
 - 5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
- 6 It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.

- 7 Where the Guarantor has made payment in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.
- 8 Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
- 9 Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.
- 10 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
- 11 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
- 12 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
- 13 This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
- 14 Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at

Date

Guarantor's signatory: (1)

Capacity

Guarantor's signatory: (2)

PART C: THE CONTRACT

Part C1: Agreement and Contract Data

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C1.4 Occupational Health and Safety Agreement 37(2)

AGREEMENT MADE AND ENTERED INTO BETWEEN THE

.....
(Hereinafter called the “**EMPLOYER**”)

.....
(Contractor / Mandatary / Company / CC Name)

IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, ACT NO. 85 OF 1993 AS AMENDED

I,, representing

....., as an Employer in its own right, do hereby undertake to ensure, as far as is reasonably practicable, that all work will be performed, and all equipment, machinery or plant used in such a manner as to comply with the provisions of the Occupational Health and Safety Act (OHSA) and the Regulations promulgated there under.

I furthermore confirm that I am / we are registered with the Compensation Commissioner and that all registration and assessment monies due to the Compensation Commissioner have been fully paid or that I / we are insured with an approved licensed compensation insurer.

COID ACT Registration Number:

Or Compensation Insurer: Policy No.:

I undertake to appoint, where required, suitable competent persons, in writing, in terms of the requirements of OHSA and the Regulations and to charge him / them with the duty of ensuring that the provisions of OHSA and Regulations as well as the Council's Special Conditions of Contract, Way Leave, Lock-Out and Work Permit Procedures are adhered to as far as reasonably practicable.

I further undertake to ensure that any Sub-contractors employed by me will enter into an Occupational Health and Safety Agreement separately, and that such Sub-contractors comply with the conditions set.

I hereby declare that I have read and understand the appended Occupational Health and Safety Conditions and undertake to comply therewith at all times.

I hereby also undertake to comply with the Occupational Health and Safety Specification and Plan.

Signed at this day of 20

.....
WITNESS

.....
MANDATORY

Signed at this day of 20

.....
WITNESS

.....
FOR AND ON BEHALF OF THE EMPLOYER

OCCUPATIONAL HEALTH AND SAFETY CONDITIONS

1. The Chief Executive Officer of the Contractor shall assume the responsibility in terms of Section 16(1) of the Occupational Health and Safety Act (as amended). Should the Contractor assign any duty in terms of Section 16(2), a copy of such assignment shall immediately be provided to the representative of the Employer as defined in the Contract.
2. All work performed on the Employer's premises shall be performed under the supervision of the construction supervisor who understand the hazards associated with any work that the Contractor performs on the site in terms of Construction Regulations 2003.
3. The Contractor shall appoint a Competent Person who shall be trained on any occupational health and safety aspect pertaining to them or to the work that is to be performed.
4. The Contractor shall ensure that he familiarises himself with the requirements of the Occupational Health and Safety Act and that he, his employees, and any sub-contractors, comply with them.
5. Discipline in the interests of occupational health and safety shall be strictly enforced.
6. Personal protective equipment shall be issued by the Contractor as required and shall be worn at all times where necessary.
7. Written safe work procedures and appropriate precautionary measures shall be available and enforced, and all employees shall be made conversant with the contents of these practices.
8. No substandard equipment/machinery/articles or substances shall be used on the site.

9. All incidents referred to in terms of Section 24 of the Occupational Health and Safety Act shall be reported by the Contractor to the Department of Labour and the Employer.
10. The Employer hereby obtains an interest in the issue of any formal inquiry conducted in terms of Section 32 of the Occupational Health and Safety Act and into any incident involving a Contractor and/or his employees and/or his Sub-Contractor/s.
11. No use shall be made of any of the Employer's machinery / plant / equipment / substance / personal protective equipment or any other article without prior arrangement and written approval.
12. No alcohol or any other intoxicating substance shall be allowed on the site. Any person suspected of being under the influence of alcohol or any other intoxicating substance shall not be permitted access to, or allowed to remain on the site.
13. Prior to commencement of any work, verified copies of all documents mentioned in the agreement, must be presented to the Employer.

PART C: THE CONTRACT

Part C2: Pricing Data

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C2.1 Notes to Tenderer

C2.2 Bill of Quantities (Annexure C)

PART C: THE CONTRACT

Part C2: Pricing Data

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C2.1 Notes to Tenderer

C2.1.1 Project Description

The scope of works includes but is not limited to the following:

1. Aquarium
 - Centrifugal Pumps to be removed and returned to client, installation of new Centrifugal pumps as set out in the detailed technical specification and bill of quantities.
 - Removal of existing ventilation air system and installation of new ventilation system as set out in the detailed technical specification and bill of quantities.
2. Duku Duku Restaurant
 - Replacement of existing HVAC system as set out in the detailed technical specification and bill of quantities.
 - Replacement of freezer room condenser and blower coil units as set out in the detailed technical specification and bill of quantities.
3. Flamingo Restaurant
 - Replacement of existing HVAC system as set out in the detailed technical specification and bill of quantities.
 - Replacement of freezer room condenser and blower coil units as set out in the detailed technical specification and bill of quantities.

C2.1.2. General Notes

2.1 The tenderer's attention is drawn to, inter alia, the following as contained in this document:

2.1.1 The agreement is to be the JBCC® Principal Building Agreement (May 2018 Edition 6.2) prepared by the Joint Building Contracts Committee ® - NPC shall be the applicable building agreement, amended as hereinafter described, together with the associated documentation as prepared by the Joint Building Contracts Committee (JBCC)

2.1.2 The Bills of Quantities have been drawn up in accordance with the "Standard System of Measuring Building Work Seventh Edition (Revised 2015)" published by the Association of South African Quantity Surveyors

2.1.3 The General Preambles for Trades (2017 edition), as published by the Association of South African Quantity Surveyors, shall be deemed to be incorporated in the bills of quantities and no claims arising from brevity of description of items, fully described in the said General Preambles, will be entertained

2.1.4 "Supplementary Preambles" are incorporated in the bills of quantities to satisfy the requirements of the project and shall take precedence over the provisions of the said General Preambles

2.1.5 Descriptions in the Bills of Quantities are abbreviated and comply generally with those in the said General Preambles

2.1.6 The units of measurement described in the Bills of Quantities are metric units. Abbreviations which may be used in the Bills of Quantities are as follows:

mm	=	millimetre	m	=	linear metre
m ²	=	square metre	m ³	=	cubic metre
km	=	kilometre	ha	=	hectare
h	=	hour	kg	=	kilogram
t	=	ton	L	=	litre
kl	=	kilolitre	kN	=	kiloweton
MN	=	meganewton	MPa	=	megapascal
kW	=	kilowatt	%	=	percent
No	=	number	sum	=	lump sum
PC Sum	=	Prime Cost Sum			
Prov Sum	=	Provisional Sum			

PART C: THE CONTRACT

Part C2: Pricing Data

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C2.2 Bills of Quantities

PART C: THE CONTRACT

Part C3: Scope of Work

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
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Status

Should any requirement or provision in the parts of the Scope of Work conflict with any requirement of any Standardised Specification, Particular Specification or any drawings, the order of precedence, unless otherwise specified, is:

Drawings

Scope of Work

Standardised Specifications

PART C: THE CONTRACT

Part C3: Scope of Work

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C 3.1. Description of the Works

C3.1.1 Background

“The National Zoological Garden of South Africa is an 80-hectare zoo located in Pretoria, South Africa. It is the national zoo of South Africa and was founded by J. W. B. Gunning in 1899. Pretoria Zoo is one of the eight largest zoos in the world and one of the most highly rated” – source Wikipedia

The Zoo operated as an independent entity until it was absorbed into SANBI (the South African National Biodiversity Institute) and this umbrella body allowed for the creation of a much-needed budgetary allocation for the execution of many projects that were sorely needed by the NZG (National Zoological Gardens). The NZG is not only considered a national heritage resource, it is also considered by many as a World Heritage Resource.

ADQ Engineering Projects were appointed by SANBI for the ASSESSMENT, DESIGN AND CONSTRUCTION MONITORING FOR THE UPGRADES TO THE AQUARIUM AND RESTAURANTS at the NZG in Pretoria.

C3.1.2 Scope of Works

The scope of works per phase includes, but is not necessarily limited to, the following:

Note: All works to be carried out according to SANS standards

1. Aquarium
 - Centrifugal Pumps to be removed and returned to client, installation of new Centrifugal pumps as set out in the detailed technical specification and bill of quantities.
 - Removal of existing ventilation air system and installation of new ventilation system as set out in the detailed technical specification and bill of quantities.
2. Duku Duku Restaurant
 - Replacement of existing HVAC system as set out in the detailed technical specification and bill of quantities.
 - Replacement of freezer room condenser and blower coil units as set out in the detailed technical specification and bill of quantities.
3. Flamingo Restaurant
 - Replacement of existing HVAC system as set out in the detailed technical specification and bill of quantities.
 - Replacement of freezer room condenser and blower coil units as set out in the detailed technical specification and bill of quantities.

The South African National Biodiversity Institute

APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA

Contract: **SANBI: NZG430/2022**

C3.1.3 Location of the Works

The project is located at the National Zoological Garden in Pretoria, Gauteng.

Part C3: Scope of Work

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C3.2. Design & Construction

This project is for the APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA.

All designs have been completed and attached to this tender document to enable a calculation of an overall price for this project.

C3.2.1 Initial Basic Structural Information: (To be provided)

All structural designs and relevant documentations are provided for in this tender document.

C3.2.2 Site Camp

No major site camp is envisioned for this project, and should there be a need, the area must be kept to an absolute minimum. There are open areas around the Zoo which may be used for a small site camp. No large containers will be allowed for offices or storage. Water and electricity area available on site. Security of the site and materials is the sole responsibility of the Contractor.

C3.2.3 Equipment / Plant

No large plant is envisioned for the project. The majority of work should be labour intensive with hand operated tools. Should there be a need to bring large machinery on to the work site, it should be as per the arrangement with the Employer or Employer's representative. Any damage or disturbance of the site/infrastructure by large machinery will have to be remediated at the cost of the Contractor.

C3.2.4 Applicable Project Specifications

Refer to the both the Scope of Work and the attached Designs

PART C: THE CONTRACT

Part C3: Scope of Work

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C3.3. DRAWINGS

C3.3.1 Drawings List:

ENGINEERING

P21065-PD-MEC-010-REV0A	PUMP DETAIL
P21065-PD-MEC-099-REV0B	AQUARIUM PUMP LAYOUT
P21065-PD-MEC-100-REV0A	DUKU DUKU HVAC LAYOUT
P21065-PD-MEC-101-REV0A	FLAMINGO HVAC LAYOUT
P21065-PD-MEC-102-REV0A	AQUARIUM HVAC LAYOUT

The drawings are contained in Annexure A provided separately.

PART C: THE CONTRACT

Part C4: Site Information

PROJECT TITLE:	APPOINTMENT OF A CONTRACTOR FOR THE UPGRADE OF THE FOLLOWING EQUIPMENT: AQUARIUM PUMP AND FILTRATION SYSTEMS, DUKU DUKU RESTAURANT HVAC AND COLD ROOMS AND FLAMINGO RESTAURANT HVAC AND COLD ROOMS FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE NATIONAL ZOOLOGICAL GARDEN IN PRETORIA
CONTRACT NO:	SANBI: NZG430/2022

C4.1. General Site Information

The proposed construction is to take place within the National Zoological Garden in Pretoria.

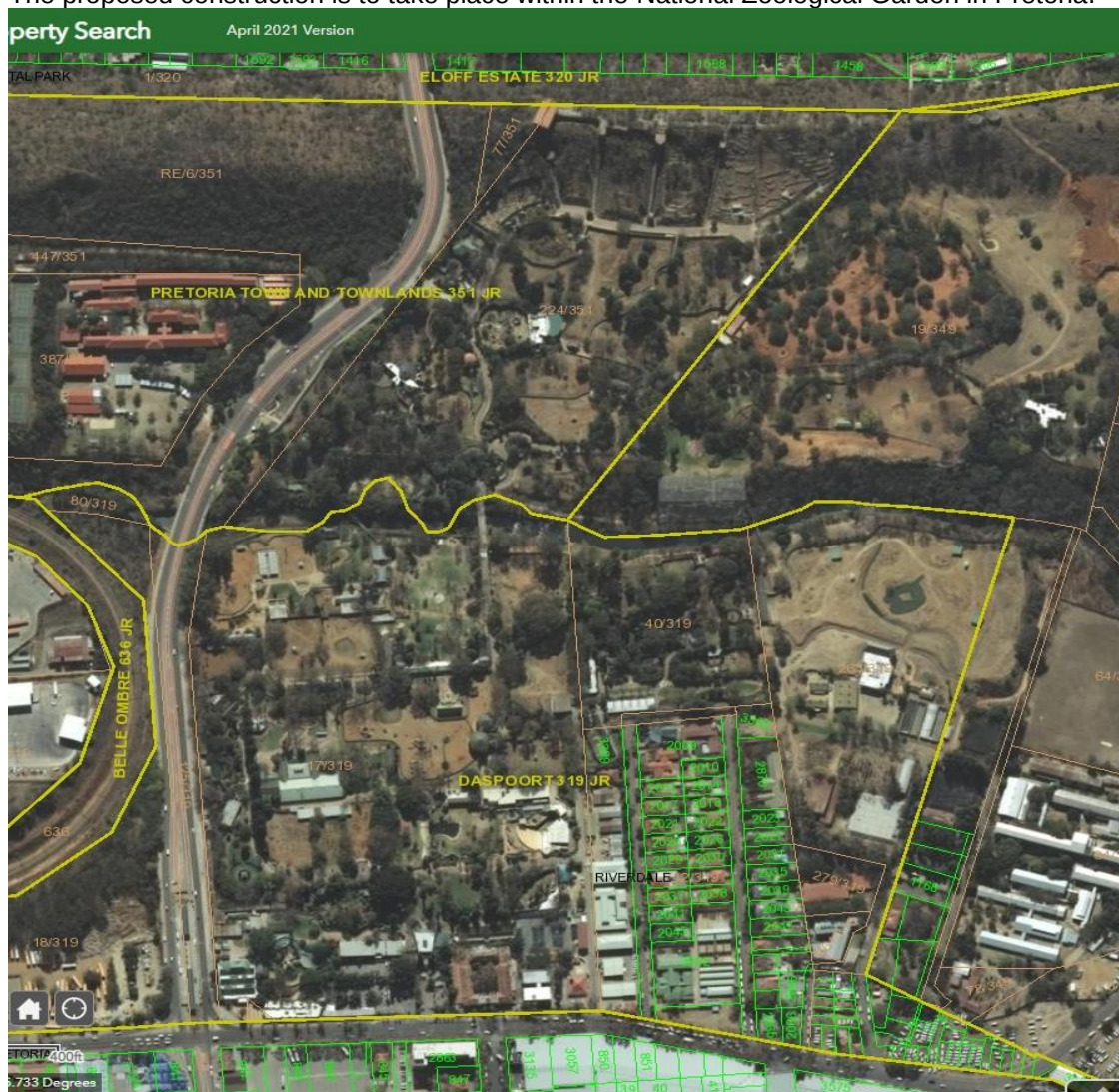


FIGURE 1: SITE LOCALITY PLAN - AERIAL PHOTO FROM CSG SHOWING CADASTRAL LAYOUT OF THE NZG

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Contract: **SANBI: NZG430/2022**



FIGURE 2: NATIONAL ZOOLOGICAL GARDENS (NZG) OVERALL LAYOUT WITH AFFECTED AREAS

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

C4.2. Annexure F

OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION FOR CONTRACTORS WHO ARE ON CONTRACT WITH SANBI

C4.2.1 Scope

This specification establishes general requirements to enable SANBI and the Contractors to satisfy the requirements of Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the Construction Regulations, 2014 as amended.

The Construction Regulations, 2014, require an Employer to stop any Contractor from executing construction work which is not in accordance with the Contractor's health and safety plan for the site or which poses to be a threat to the health and safety of persons.

This specification establishes generic health and safety requirements for health and safety as stated in the scope of work associated with a contract and

- provides the overarching framework within which the Contractor is required to demonstrate compliance with certain requirements for occupation health and safety established by the Occupational Health and Safety Act of 1993;
- establishes the manner in which the Contractor is to manage the risk of health and safety incidents in the execution of the contract; and
- establishes the manner in which the Employer's health and safety agent will interact with the Contractor.

C4.2.2 Requirements

C4.2.2.1 General requirement

The Contractor shall:

- create and maintain a safe and healthy work environment,
- execute the works in a manner that complies with all the requirements of the Act and all its associated regulations, and in so doing, minimize the risk of incidents occurring; and
- respond to the notices issued by the SANBI's Health and Safety Agent as follows:
 - Improvement Notice: improve health and safety performance over time so that repeat notices are not issued;
 - Contravention Notice: rectify contravention as soon as possible;
 - Prohibition Notice: terminate affected activities with immediate effect and only recommence activities when it is safe to do so.

Any incident occurring as a result of the contractors' negligence which may affect SANBI employees will be claimed against the contractor.

C4.2.3 Administration

C4.2.3.1 Application and Notification of intention to commence construction work

C4.2.3.1.1 Application for construction work permit

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:

- exceed 180 days;
- will involve more than 1800 person days of construction work; or
- the works contract is of a value equal to or exceeding thirteen million rand or Construction Industry Development Board (CIDB) grading level 6.

An application must be done in a form similar to Annexure 1 in the Regulation and a site-specific number assigned by the Provincial Director must be displayed on site.

C4.2.3.1.2 Notification of construction work

A contractor who intends to carry out any construction work other than work contemplated in regulation 3(1), must at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 if the intended construction work will:

- include excavation work;
- include working at a height where there is risk of falling;
- include the demolition of a structure; or
- include the use of explosives to perform construction work.

The Contractor shall ensure that no work commences on an electrical installation which requires a new supply or an increase in electricity supply before the person who supplies or contracts or agrees to supply electricity to that electrical installation has been notified of such work.

The Contractor shall ensure that no asbestos work is carried out before the Provincial Director of the Department of Labour has been notified in writing.

C4.2.3.2 Copy of the Act

The Contractor shall ensure that a copy of the Act and relevant regulations is available on site for inspection by any person engaged in any activity on the site.

Good standing with the compensation fund or a licensed compensation insurer

The Contractor shall, before commencing with any works on the site, provide the SANBI with proof of good standing with the compensation fund or with a licensed compensation insurer.

C4.2.3.3 Emergency procedures

The Contractor shall submit for acceptance to the SANBI 's Health and Safety Agent an emergency procedure which include but are not limited to fire, spills, accidents to employees, exposure to hazardous substances, which:

- identifies the key personnel who are to be notified of any emergency;
- sets out details including contact particulars of available emergency services; and
- the actions or steps which are to be taken during an emergency.

The Contractor shall within 24 hours of an emergency taking place notify the SANBI's Health and Safety Agent in writing of the emergency and briefly outline what happened and how it was dealt with.

C4.2.3.4 Health and safety file

The Contractor shall maintain on site a health and safety file which contains copies of the following;

C4.2.3.4.1 Documents required before the contractor commences with construction activities

- the Contractor's health and safety policy, signed by the chief executive officer, which outlines the Contractor's objectives and how they will be achieved and implemented by the Contractor
- the notification made to the Provincial Director of Labour, and if relevant, the notification of the person who supplies or contracts or agrees to supply electricity to that electrical installation;
- the letters of appointment, as relevant, of the construction supervisor for the site in respect of construction works covered by the Construction Regulations and the registered person responsible for the electrical installation covered by the Electrical Installations Regulations;
- a copy of the certificate of registration of the registered person responsible for the electrical installation covered by the Electrical Installations Regulations where applicable;
- the approval of the design of the part of an electrical installation which has a voltage in excess of 1 kV by a person deemed competent in terms of the Electrical Installations Regulations;
- proof of registration of the electrical contractor who undertakes the electrical installation in terms of the Electrical Installations Regulations where applicable;
- the preliminary hazard identification undertaken by a competent person;
- the organogram which outlines the roles and responsibilities of the construction supervisor's assistants and safety officers; and
- the contractor's health and safety plan;
- the emergency procedures;
- the procedure for the replacement of lost, stolen, worn or damaged personal protective clothing and
- proof that the contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer;

C4.2.3.4.2 Documents required after construction activities have commenced

- the letters of appointments, if relevant, of:
 - persons who are required to assist the construction supervisor;
 - safety officers;
 - health and safety representatives;
 - replacement construction supervisor, and
 - assistants of construction supervisor.
- any revisions to the organogram which outlines the roles and responsibilities of the construction supervisor's assistants and safety officers;
- each and every subcontract agreement;
- proof that every subcontractor is registered and in good standing with the compensation fund or with a licensed compensation insurer;
- proof of all subcontractor's induction training whenever it is conducted;

-
- copies of the minutes of the Contractor's sub-contractors health and safety meetings;
 - copies of each of the Contractor's subcontractors' health and safety policy, signed by the Chief executive officer, which outlines the Contractor's objectives and how they will be achieved and implemented by the Contractor;
 - the health and safety plans of all the Contractor's subcontractors who are required to provide such plans;
 - a comprehensive and updated list of all the subcontractors employed on site by the contractor, indicating the type of work being performed by such sub-contractors;
 - the outcomes of the monthly audits for compliance with the approved health and safety plan of each and every sub-contractor working on the site;
 - any report made to an inspector by the health and safety committee;
 - the minutes of all health and safety meetings and any recommendations made to the Contractor by the health and safety committee;
 - the findings of all audit reports made regarding the implementation of the Contractor's or a subcontractor's health and safety plan;
 - the inputs of the safety officer, if any, into the health and safety plan;
 - details of induction training conducted whenever it is conducted including the list of attendees;
 - proof of the following where suspended platforms are used:
 - a certificate of system design issued by a professional engineer, professional certificated engineer or a professional engineering technologist;
 - proof of competency of erectors;
 - proof of compliance of operational design calculations with requirements of the system design certificate;
 - proof of performance test results;
 - sketches indicating the completed system with the operational loading capacity of the platform;
 - procedures for and records of inspections having been carried out;
 - procedures for and records of maintenance work having been carried out;
 - proof that the prescribed documentation has been forwarded to the provincial director;
 - letters of appointments for competent persons to supervise the activities which law requires to be so supervised;
 - A copy of risk assessments made by competent person;
 - records of the register of inspections made by a competent person immediately before and during the placement of concrete or any other load on formwork;
 - the names of the first aiders on site and copies of the first aid certificates of competency;
 - the names of the persons who are in possession of valid certificate of competency in first aid and copies of such certificates;
 - details of all incidents together with the Contractor's report on such incident; and
 - the record of inspections carried out by the designers of structures to ensure compliance with designs.

The health and safety file shall be made available for inspection by any inspector, subcontractor, the Project Manager, the SANBI's Health and Safety Agent or employee of the Contractor upon the request of such persons.

The Contractor shall hand over the health and safety file to the SANBI's Health and Safety Agent upon completion of the contract and if relevant, a certificate of compliance accompanied by a test report for the electrical installation in accordance with the provisions of the Electrical Installation Regulations.

C4.2.3.5 Health and safety committee

The Contractor shall convene health and safety meetings whenever more than two health and safety representatives have been appointed for the site. These meetings shall be attended by all health and safety representatives and persons nominated by the Contractor. Such meetings shall be convened at least once every month to:

- make recommendations to the Contractor regarding any matter affecting the health or safety of persons on the site; and
- discuss any incident on the site in which or in consequence of which any person was injured, became ill or died.

The Contractor shall consult with the health and safety committee on the development, monitoring and review of the risk assessment.

The Contractor shall ensure that minutes of the health and safety committee meetings are kept.

SANBI Health and Safety Agent shall be invited to attend such meetings as an observer.

C4.2.3.6 Inspections, formal enquires and incidents

The Contractor shall inform the relevant safety representative:

- beforehand of inspections, investigations or formal inquiries of which he has been notified by an inspector and
- as soon as reasonably practicable of the occurrence of an incident on the site.

The Contractor shall record all incidents and notify the SANBI's Health and Safety Agent of any incident, except in the case of a traffic accident on a public road, as soon as possible after it has occurred and reports such incidence to an inspector.

The Contractor shall investigate all incidents and issue the SANBI's Health and Safety Agent with copies of such investigations.

C4.2.3.7 Personal protective equipment and clothing

The Contractor shall ensure that:

- all workers are issued with the necessary personal protective clothing;
- all workers are identifiable at all times by having the company for which they work for printed on the back or front of their overalls; and

- clear procedures are in place for the replacement of lost, stolen, worn or damage personal protective clothing.

C4.2.4 Appointments

C4.2.4.1 Health and safety representatives

The Contractor shall appoint in writing one health and safety representative for every 50 employees working on the site, whenever there are more than 20 employees on the site, to:

- review the effectiveness of health and safety measures;
- identify potential hazards and potential major incidents;
- in collaboration with his employer, examine the causes of incidents;
- investigate complaints by any employee of the Contractor relating to that employee's health or safety on the site;
- make representations to the Contractor on matters arising from a), b), c) or d) or on general matters affecting the health or safety of the employees at the workplace;
- inspect the site with a view to, the health and safety of employees, at regular intervals;
- participate in consultations with inspectors at the workplace and accompany inspectors on inspections of the workplace; and
- participate in any internal health or safety audit.

The Contractor shall provide the health and safety representatives with the necessary assistance, facilities and training to carry out the functions established in 4.3.1

C4.2.4.2 Appointment of construction supervisor and safety officers

The Contractor shall, prior to commencing the work, appoint a full-time competent employee in writing as the construction supervisor for the site, with the duty of supervising the performance of the work falling within the scope of the contract and may appoint one or more competent employees to assist the appointed construction supervisor.

The Contractor may, having considered the size of the project, the degree of dangers likely to be encountered or the accumulation of hazards or risks on the site, appoint a full time or part-time construction safety officer in writing, who has in the Contractor's opinion the necessary competencies and resources, to assist the Contractor in the control of all safety related aspects on the site.

The Contractor shall compile and maintain an organogram which outlines the roles and responsibilities of the construction supervisor's assistants and safety officers.

C4.2.4.3 Competent persons

The Contractor shall appoint in writing competent persons to supervise or inspect, as relevant, any of the following:

- formwork and support work operations;
- excavation work;
- demolition work;
- scaffolding work operations;

- suspended platform work operations;
- material hoists;
- operation of batch plants;
- explosive power tools;
- vehicles and mobile equipment;
- fire equipment; and
- the stacking and storage of articles on the site.

The Contractor shall appoint in writing competent persons to:

- induct employees in health and safety; and
- prepare a fall protection plan.

C4.2.5 Creating and maintaining a safe and healthy work environment

C4.2.5.1 General

The Contractor shall with respect to the site and the construction works that are contemplated:

- cause a preliminary hazard identification to be performed by a competent person before commencing any physical construction activity;
- evaluate the risks associated with such work constituting a hazard to the health and safety of such employees and the steps that need to be taken to comply with the Act; and as far as is reasonably practicable, prevent the exposure of such employees to the hazards concerned or, where prevention is not reasonably practicable, minimize such exposure.

The Contractor shall ensure that:

- all reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work;
- no structure or part of a structure is loaded in a manner which would render it unsafe; and
- account of information, if any, provided by the designer of the structure is taken into account in the risk assessment;

Note: The information provided by the designer should outline known or anticipated dangers or hazards relating to the works and make available all information required for the safe execution of the work. It should provide as relevant, geotechnical information (or make reference to reports provided in the site information), the loading the structure is designed to withstand, the methods and sequence of construction.

The Contractor shall carry out regular inspections and audits to ensure that the works are being performed in accordance with the requirements of this specification

C4.2.5.2 Risk assessment

The Contractor shall before the commencement of any work on site and during construction work, cause a risk assessment to be performed by a competent person appointed in writing. Such an assessment shall as a minimum:

- identify the risks and hazards to which persons may be exposed to;

- analyse and evaluate the identified risks and hazards;
- document a plan of safe work procedures, including the use of any personal protective equipment or clothing and the undertaking of periodic “toolbox talks” or inductions before undertaking hazardous work, to mitigate, reduce or control the risks and hazards that have been identified;
- provide a monitoring plan; and
- provide a review plan.

C4.2.5.3 Health and safety plans

The Contractor shall prior to commencing the works to which this specification applies, submit to SANBI’s Health and Safety Agent for approval a suitable and sufficiently documented health and safety plan, based on this specification and the risk assessment that is conducted.

The health and safety plan must be specific to the current project and shall as a minimum provide:

- the information about hazards associated with the task to be performed; and
- an outline of the manner in which the Contractor intends complying with the requirements of this specification.
- The arrangements to ensure the safety of all SANBI staff affected by the activities of the project/work.
- The manner in which hazards will be communicated to all staff/including SANBI employees.

C4.2.5.4 Responsibilities towards employees and visitors

The Contractor shall as far as is reasonably practicable, cause every employee to be made conversant with the hazards to his health and safety attached to any work which he has to perform, any article or substance which he has to produce, process, use, handle, store or transport and any plant or machinery which he is required or permitted to use, as well as with the precautionary measures which should be taken and observed with respect to those hazards or safe work procedures. Safety for SANBI employees must be considered throughout the project life cycle.

The Contractor shall provide suitable on-site signage to alert workers and visitors to health and safety requirements. Such signage shall include but not be limited to:

- unauthorized entrance prohibited;
- signage to indicate what personal protective equipment is to be worn; and
- activity related signs.

The Contractor shall not permit any person who is or who appears to be under the influence of intoxicating liquor or drugs, to enter or remain at a workplace.

C4.2.6 Subcontractors

The Contractor may only subcontract work in terms of a written subcontract and shall only appoint a subcontractor should he be reasonably satisfied that such a subcontractor has the necessary competencies and resources to safely perform the work falling within the scope of the contract.

The Contractor shall provide any sub-contractor who is submitting a tender or appointed to perform a sub-contract falling within the scope of the contract, with the relevant sections of this specification and any work specific information which might be pertinent to the sub-contract.

C4.2.7 First aid, emergency equipment and procedures

The Contractor shall where more than five employees are employed at a workplace, provide a first aid box or boxes at or near the workplace which shall be available and accessible for the treatment of injured persons at that workplace. Such first aid boxes shall contain suitable first aid equipment.

The Contractor shall ensure that where there are more than 10 employees employed on the site that for every group of up to 50 employees at that workplace, at least one person is readily available during normal working hours, who is in possession of a valid certificate of competency in first aid.

C4.2.8 Facilities for workers

The Contractor shall provide and keep clean and fit for use at or within reasonable access of the site:

- at least one shower facility for every 15 workers
- at least one sanitary facility for every 30 workers;
- changing facilities for each sex; and
- sheltered eating areas.

2.5.4.2 A contractor shall provide reasonable and suitable living accommodation for the workers at construction sites which are remote from their homes and where adequate transportation between the site and their homes, or other suitable living accommodation, is not available

C4.2.9 Waste management

Construction will result in waste generation although in different scales depending on the nature and size of the project.

The goal for construction waste management is primarily the reduction of waste generated. Waste reduction is the responsibility of all on site, as it relates to materials procurement, handling, storage and use. Waste generated during construction will be reused, recycled or disposed to landfill.

Waste collection during building works will be appropriately managed through the staged nature of construction and the use of known quantities of materials. The majority of recyclable material that could be recovered during construction is likely to be off cuts and discards of concrete reinforcement (steel), metal off cuts, drainage pipes, telecommunication and electrical cabling, plastics, paint and timber.

No uncontrolled hazardous materials or dangerous goods will be stored on site.

Principal contractor will be required to provide waste management plan before construction work commences.

C4.2.10 Points to remember - Legal

C4.2.10.1 Requirements

- Application for construction work permit
- Notice of construction work
- Letter of good standing from the Department of Labour/ Insurance
- Risk assessment and safe working procedures
- Appointment letter of Principal contractor and other legal appointments

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- Health and safety plan
- Valid medical certificates of fitness for employees
- Fall protection plan
- Health and safety inductions.
- Notice boards and display of site-specific number assigned to the project.
- Management of plant & Noise
- Management of premises
- Management of Plant, labour & materials on site
- Management of safety file

C4.3. Annexure G

GENERAL ENVIRONMENTAL SPECIFICATIONS

Index to Environmental Specifications

<u>Clause</u>	<u>Description</u>
E1	Location of camp and depot
E2	Demarcation of the site
E3	Refuse
E4	Protection of fauna and flora
E5	Defacement of natural features
E6	Protection of archaeological and palaeontological Sites
E7	Effluent and storm-water management
E8	Run off from construction camps
E9	Discharge of construction water
E10	Servicing/fuelling of construction equipment
E11	Fuels and chemicals
E12	Dust control
E13	Noise control
E14	Materials use, handling, storage and transport
E15	Use of cement/concrete
E16	Fuel storage and use
E17	Hazardous materials
E18	Transport of materials outside the site
E19	Fire
E20	Removal of topsoil
E21	Stabilisation of steep slopes
E22	Site Rehabilitation
E23	Landscaping and preparation for re-vegetation

E1 Location of camp and depot

The Contractor's Camp and Materials Storage Area shall be located at a position approved by the Responsible Person. No site staff other than security personnel shall be housed on site. The Contractor's Camp and Materials Storage Area shall be kept neat and tidy and free of litter.

E2 Demarcation of the site

It is important that activities are conducted within a limited area to facilitate control and to minimise the impact on the existing natural environment, existing tenants and other construction activities in the vicinity and public thoroughfares.

The Contractor shall demarcate the boundaries of the site in order to restrict his construction activities to the site. The method of demarcation and the location of the demarcated area shall be determined by the Contractor and approved by the Responsible Person before any work being undertaken. The Contractor shall ensure that all plant, labour and materials remain within the boundaries of the site. Failure to do so may result in the Contractor being required to fence the boundaries of the site at his/her own expense to the satisfaction of the Responsible Person.

If additional areas (e.g. for lay down, rest areas) are required, these must be approved in writing by the Responsible Person. The Contractor is advised that it may take approximately one week to obtain such permission from the Responsible Person.

Suitable temporary fencing may need to be erected during construction to minimise the risk of injury to the public, and animals.

E3 Refuse

Refuse refers to all solid waste, including construction debris (e.g. wrapping materials, timber, cans etc.) waste and surplus food, food packaging etc.

The Contractor shall institute an on-site waste management system that is acceptable to the Responsible Person to prevent the spread of refuse within and beyond the site. The Contractor is reminded that wind velocities on the construction site can be high.

All waste shall be collected and contained immediately. The Contractor shall institute a weekly cleanup of the site if so instructed by the Responsible Person. This daily/weekly clean up shall be for the Contractor's account.

The Contractor shall not dispose of any waste and/or construction debris by burning or burying. The use of waste bins and skips is recommended. The bins shall be provided with lids and an external closing mechanism to prevent their contents from blowing out. The Contractor shall ensure that all waste is deposited by his employees in the waste bins for removal by the Contractor. Bins shall not be used for any purposes other than waste collection and shall be emptied on a regular basis. All waste shall be disposed of offsite at approved landfill sites.

Hazardous waste, including waste oil and other chemicals (e.g. paints, solvents) shall be stored in (an) enclosed area(s), and shall be clearly marked. If deemed necessary by the Responsible Person, the Contractor shall obtain the advice of a specialist waste expert concerning the storage of hazardous waste. Such waste shall be disposed of offsite by a specialist waste contractor, at a permitted hazardous waste disposal site.

E4 Protection of fauna and flora

All fauna within and around the site shall be protected. Birds and animals shall not be caught or killed by any means, including poisoning, trapping, shooting or setting of snares. Offenders may be prosecuted in terms of the Animals Protection Act 71 of 1962.

E5 Defacement of natural features

Defacement of any features outside of the construction site shall not occur without the prior written permission of the Responsible Person. Any features defaced by the Contractor shall be restored to the satisfaction of the Responsible Person.

E6 Protection of archaeological and palaeontological Sites

If any possible palaeontological /archaeological material is found during excavations, the Contractor shall stop work immediately and inform the Responsible Person. The Responsible person will inform the South African Heritage Resource Agency (SAHRA) and arrange for a palaeontologist/archaeologist to inspect, and if necessary, excavate the material, subject to acquiring the requisite permits from the National Monuments Council. Costs incurred will be for the Employer's account.

E7 Effluent and storm-water management

The Contractor must ensure that pollution of the ground or surface water does not occur as a result of site activities. Pollution could result from the accidental release of contaminated run-off from construction camps, discharge of contaminated construction water, chemicals, oils, fuels, sewage, run-off from stockpiles, solid waste, litter, etc.

E8 Run off from construction camps

The Contractor shall ensure that polluted run-off (excluding silt "pollution"), such as run-off from construction camps where equipment is cleaned and/or serviced, fuel stores, workshops, etc. is not discharged overland. The Contractor shall erect an earth/brick berm 0,5 m high around such areas and shall collect all run-off from these areas and store it in a conservancy tank for removal from the site. The Contractor shall ensure that silt-laden water is not discharged directly into any surface watercourses (i.e. vleis, etc.), and shall take suitable measures to prevent this.

Natural run-off shall be diverted away from any camps towards the stormwater drains where these are available. Special care must be taken in areas susceptible to erosion, e.g. steep slopes. The Contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter the stormwater drain system, or any surface watercourse. The Contractor shall take appropriate measures, e.g. the erection of silt traps, or drainage retention areas, to prevent silt and sand entering drainage or watercourses. Any partial or complete blockage of the storm-water drainage system shall be cleared by the Contractor at his / her own expense.

E9 Discharge of construction water

Construction water refers to all water dirtied as a result of construction activities.

The Contractor may discharge silt laden water overland and allow this water to filter into the ground. However, s/he shall ensure that he does not cause erosion as a result of any overland discharge.

The Contractor may not discharge cement-laden water overland, i.e. washings from trowels, wheelbarrows and the like.

Trucks delivering concrete shall not wash the trucks or the chutes on the site. All washing operations shall take place off site at a location where wastewater can be disposed of in the correct manner.

E10 Servicing/fuelling of construction equipment

Servicing and fuelling should preferably occur off site.

However, if these activities occur on site, the Contractor shall ensure that all servicing of vehicles and equipment takes place in designated areas agreed upon by the Responsible Person. All waste shall be collected and disposed of offsite at an appropriately licensed landfill site. All equipment that leaks onto the ground shall be repaired immediately or removed.

Similarly, no vehicles or machines shall be refuelled on site except at designated refuelling locations, unless otherwise agreed with the Responsible Person. The Contractor shall not change oil or lubricants anywhere on site except at designated locations, except if there is a breakdown or an emergency repair. In such instances, the Contractor shall ensure that he has Drizit pads (or equivalent) and/or drip trays available to collect any oil, fluid, etc.

E11 Fuels and chemicals

The Contractor shall take all reasonable precautions to prevent the pollution of the ground and/or water resources by fuels and chemicals as a result of his activities.

The Contractor shall keep the necessary materials and equipment on site to deal with ground spills of any of the materials used or stored on site.

The Contractor shall ensure that no oil, petrol, diesel, etc. is discharged onto the ground. Pumps and other machinery requiring oil, diesel, which is intended to remain in one position for longer than two days shall be placed on drip trays. The drip trays shall be emptied regularly, and the contaminated water disposed of offsite at a facility capable of handling such wastewater. Drip trays shall be cleaned before any possible rain events that may result in the drip trays overflowing, and before long weekends and holidays.

The Contractor shall remove all oil-, petrol-, and diesel-soaked sand immediately and shall dispose of it as hazardous waste.

Should the Responsible Person/ECO and/or the relevant authorities deem it necessary to institute a programme for the removal of contaminated ground resulting from the non-compliance of the controls detailed above, these costs will be for the Contractor's account. Remedial action shall be approved by the ECO and relevant authorities, if appropriate.

E12 Dust control

The Contractor shall be responsible for the continued control of dust arising from his/her operations, through measures including, but not limited to, spraying of water on bare areas, rotovating straw bales into the soil surface and the scheduling of dust-generating activities to times when wind velocity is low. Overhead sprayers shall not be used in windy conditions, due to water loss through evaporation. The use of water carts is preferred.

The Contractor shall inform the Responsible Person 48 hours in advance of anticipated "unavoidable" dust-generating activities. The Responsible Person and/or ECO may inform adjacent land users, tenants and communities about the possibility of dust pollution, and the approximate duration of the problem.

E13 Noise control

The Contractor shall take all reasonable precautions to minimise noise generated on site as a result of his operations, especially when working in areas or on activities that may impact on neighbouring land users.

The Contractor shall comply with the applicable regulations with regard to noise.

The Contractor shall inform the Responsible Person 48-hours in advance of anticipated "unavoidable" noise-generating activities. The Responsible Person and/or Environmental Officer may inform adjacent land users, tenants and communities about the possibility of noise pollution and the approximate duration of the problem.

E14 Materials use, handling, storage and transport

Procedure for material handling must be discussed with and approved by the Responsible Person prior to commencement of this activity.

E15 Use of cement/concrete

The Contractor is advised that cement and concrete are regarded as highly hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. Therefore, the Contractor shall ensure that:

- concrete is mixed on mortar boards, and not directly on the ground;
- visible remains of concrete, either solid, or from washings, are physically removed immediately and disposed of as waste. Washing visible signs into the ground is not acceptable; and
- all aggregate is also removed.

E16 Fuel storage and use

Tanks containing fuels shall have lids and shall remain firmly shut. Only clean, empty tanks may be stored on the bare ground. Fuel stores shall be placed on a bunded sealed base - the bunds shall have a volume of 110% of the volume of the largest tank in the storage area. Any wastewater or spilled fuel collected within the bund shall be disposed of as hazardous waste.

The Contractor shall take all the necessary precautions to prevent fires or spills. No smoking shall be allowed in the vicinity of the fuel stores. Failure to adhere to this specification shall be cause for a spot fine being imposed on the offender.

The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel stores.

E17 Hazardous materials

The Contractor shall comply with all relevant national, regional and local legislation with regard to the transport, use and disposal of hazardous materials. If necessary, the Contractor shall obtain the advice of the manufacturer with regard to the safe handling of hazardous materials. Any claims against the Contractor shall be for his/her account.

The Contractor shall provide the Responsible Person with a list of hazardous substances on site, together with storage procedures for these materials.

The Contractor shall ensure that there is an emergency procedure to deal with accidents and incidents (e.g. spills) arising from hazardous substances. The Contractor shall report major incidents (spills in excess of 50 litres) to the Responsible Person immediately.

The Contractor shall maintain a register of spills or incidents involving hazardous materials, as well as measures taken.

The Contractor shall ensure that information on all hazardous substances is available to all personnel on site. The Contractor shall furthermore be responsible for the training of all personnel on site who will be handling the material about its proper use, handling and disposal.

E18 Transport of materials outside the site

The Contractor shall comply with all the applicable local, regional and national by-laws with regard to road safety and the transport of materials, especially hazardous and/or toxic materials. Any claims against the Contractor shall be for his account.

The Responsible Person shall provide the Environmental Officer with a schedule of the proposed transportation of significant quantities of hazardous material onto the site, before commencing work on site. The Environmental Officer may request further details or notifications of specific material movements if considered necessary.

E19 Fire

The Contractor shall take all the necessary precautions to ensure that fires are not started as a result of his/her activities on site and shall also comply with the requirements of the Occupational Health and Safety Act 85 of 1993.

No open fires shall be permitted on or off site. Closed fires or stoves shall only be permitted at designated safe sites in the construction camps. Fires shall also not be permitted near any potential sources of combustion, such as fuel stores, stockpiles of plant material etc.

The Contractor is advised that sparks generated during welding, cutting of metal or gas cutting can cause fires. Every possible precaution shall therefore be taken when working with this equipment near potential sources of combustion. Such precautions include having an approved fire extinguisher immediately available at the site of any such activities.

The Contractor shall be liable for any expenses incurred by any organisations called to assist with fighting fires, and for any costs relating to the rehabilitation of burnt areas.

E20 Removal of topsoil

Following removal of vegetation from the site, all topsoil shall be removed (up to a maximum of 30-cm depth) and stock-piled for re-use in subsequent rehabilitation and landscaping activities. The stockpiles shall not be higher than 2-m in order to minimise composting. The stockpiles of topsoil shall be located in an area agreed with the Responsible Person.

E21 Stabilisation of steep slopes

The disturbance of steep slopes, for example by the removal of vegetation, may result in slope instability and erosion by rain and surface run off. The Contractor shall ensure that slopes that are disturbed during construction are stabilised to prevent erosion occurring. Where re-vegetation of slopes is undertaken, this shall be in accordance with the specification provided in EP6.

Slopes that are susceptible to accidental damage during construction shall be protected to reduce the risk of disturbance.

Any erosion that does occur must be reinstated at the Contractor's cost.

E22 Site Rehabilitation

The Contractor shall be responsible for rehabilitating any areas cleared or disturbed for construction purposes that are to be incorporated into open space or buffer zones. The Contractor shall re-vegetate such areas in accordance with the specification provided below.

The Contractor shall stabilise, by straw rot ovation or other means, any areas that are cleared or disturbed for construction purposes which are not going to be incorporated into open space or buffer zones (i.e. areas that will be subsequently developed by another party).

All construction equipment and excess aggregate, gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work. No discarded materials of whatsoever nature shall be buried on the site or on any other land not owned by ACSA.

E23 Landscaping and preparation for re-vegetation

Areas that require reshaping shall be cut, filled and compacted so as to follow the contours of the surrounding landscape. Topsoil removed from the area initially shall be replaced. Care must be taken not to mix the topsoil with the subsoil during shaping operations. Should a crust form on the soil before re-vegetation is commenced, the Contractor shall, at his own cost, loosen the crust by scarifying to a depth of 150-mm.

C4.4. Annexure H

GEOTECHNICAL INFORMATION (N/A)

C4.4. Annexure H

GEOTECHNICAL INFORMATION (N/A)

DETAILED SPECIFICATIONS

TECHNICAL SPECIFICATION FOR CONSTRUCTION WORKS PART 1 – GENERAL

1.1 MODEL PREAMBLES FOR TRADES

1. The 'Model Preambles for Trades' applicable to this contract are those recommended and published by the Association of South African Quantity Surveyors (2008 Edition – Unaltered) and are deemed to be incorporated herein.
2. Tenderers are advised to study the 'Model Preambles of Trades' in detail and to read them in conjunction with the technical specification, any supplementary preambles and all Bills. No claim whatsoever will be allowed in respect of errors in pricing due to brevity of descriptions which are fully described when read in conjunction with the relevant specification and preambles.

1.2 JOINT BUILDINGS CONTRACT COMMITTEE

All works are to be carried out in accordance with the South African National Standards, JBCC - MARCH 2014, this Specification, and the Drawings and are all to be carried out to the satisfaction of the Engineers.

1.3 INTERPRETATION OF DOCUMENTS

If there is any inconsistency between the wording of the clauses in this Specification and the JBCC - MARCH 2014, the clauses in this Specification are to take precedence over clauses in the JBCC - MARCH 2014. Notes and details on the Drawings are to take precedence over this Specification.

1.4 STANDARDS

1.4.1 South African National Standards

Wherever reference to a South African National Standard is stated it is to include a reference to the latest issue of the particular South African National Standard applicable at the commencement date of the contract.

1.4.2 Standard Drawings

The standard drawings referred to in the specification shall be those as issued by the Council.

1.5 ENDORSED DRAWINGS

The Drawings referred to in this Specification are those issued/endorsed by the Engineer.

The Drawings must not be varied without the written approval of the Engineer.

1.6 ENGINEER

In this Specification the term "Engineer" is the Engineer, or the Engineer's representative, employed by ADQ Engineering Projects cc.

The Engineer will inspect the work to ensure compliance with the Contract.

The Engineer may appoint a representative to act as Clerk of Works and the Engineer or his representative has the right to inspect all stages of the work.

1.7 CONTRACTOR

In this Specification, the term "Contractor" shall refer to the person, partnership, company or firm responsible for the installation, testing, commissioning and maintenance of the installations specified within this and any other related documents. In the case of the installations being a sub-contract, nominated in terms of the main contract or otherwise, the word "Contractor" refer to the "Sub Contractor" in terms of the Subcontract conditions for these specific installations and the Main Contractor shall be referred to as the "Principal Contractor", as dictated by the context.

1.8 TENDER

In this Specification, the term "tender" shall refer to an offer to carry out the works required for the completion of the installations as described within this and other related documents. The term "Tenderer" shall then refer to the potential contractor offering the services and expertise required to carry out the required works.

1.9 NOTICE OF COMMENCEMENT OR RESUMPTION OF WORK

The Engineer is to be notified in writing on the approved form at least two (2) working days before the commencement, or resumption of work, where the work has ceased for six (6) or more working days.

1.10 HOURS OF WORK

No works to be carried out pursuant to this contract is to proceed outside the hours of 7.00 a.m. to 5.30 p.m. Monday to Friday or on public holidays without the prior approval of the Engineer and such other approvals as may be required. The Contractor must pay the costs of any additional inspections made necessary by work outside the times specified above.

1.11 CONSTRUCTION PROGRAM

Prior to commencement of work on site the Contractor is to provide the Principal Contractor and Engineer with two (2) copies of the proposed construction program. This is to be in an acceptable bar chart form showing planned weekly progress and is to have provision for entering comparative actual progress.

The Engineer must be notified in writing of any changes to the programme.

1.12 ACCESS

Access over abutting properties is not permitted unless agreed to in writing by the owners and occupiers. Access to existing properties is to be maintained at all times.

1.13 INSPECTIONS

The Contractor must give notice of all inspections in accordance with this Specification and inform the Engineer about all that was discussed with the Contractor.

The Engineer may require the Principal Contractor to uncover any works that have not been inspected by the Engineer and require remedial works to be carried out at the Contractor's expense.

1.14 MAINTENANCE

Upon completion of the work, the Engineer will arrange an inspection to certify that the works are completed.

Subject to the approval of the Engineer the works are to be maintained for a period of twelve (12) months or as otherwise required by the Engineer. The maintenance period shall commence on the date of Practical Completion.

At the end of the Maintenance period the Engineer will arrange a final inspection. Subject to the approval of the Engineer the works may be taken over by the Client.

1.15 WORKING DRAWINGS AND TECHNICAL INFORMATION

1.15.1 GENERAL

Only the main equipment and devices have been shown on the drawings and specific wiring or cabling between equipment has not been shown and is the *Contractor's* responsibility to determine and price.

It shall be the responsibility of the *Contractor* to ensure that the method of installing wiring or cabling, and the wiring used, between the equipment shall optimise the use of such equipment and that the optimum parameters specified can be obtained.

1.15.1.1 Submittals during tender period

All Tenderers shall submit the following information with their tenders:

- a. Any information that may have a direct effect on the architectural or structural features of the building, which features may upon the proposal of the *Contractor*, is subject to modification.
- b. Brochures and specifications of all equipment offered for the execution of the contract.
- c. Brochures and specifications of any software offered for the execution of the contract.
- d. Full details regarding the proposed training to be given on the hardware, software and the operation and maintenance of the systems.

- e. A letter of compliance also indicating which of the items offered does not comply with this specification and what the differences are and the implications thereof.

1.15.1.2 Submittals during contract period

The *Contractor* shall submit complete documentation showing the type, size, rate, style, catalogue number, manufacturer's names, photos, and/or catalogue data sheets for all items offered enabling the *Engineer* to ensure compliance of the equipment with this specification.

This information shall be submitted to the *Engineer* within fourteen (14) calendar days after award of this contract and shall be subject to his approval.

Equipment must not be ordered without this approval.

Furthermore, the *Contractor* shall submit for approval the complete shop drawings and layout of the entire system, showing wiring and all equipment.

All equipment proposed as equal to that specified herein, shall conform to the standards herein.

For equipment other than specified, the *Contractor* shall supply proof that such substitute equipment does in fact equal or exceed the features, functions, performance and quality of the specified equipment. However, the *Engineer* shall have the final decision of acceptance and his decision shall be final.

1.15.1.3 Submittals on completion of the installation

Detail "as-built" electronic AutoCAD drawings of each part of the complete installation shall be submitted to the *Engineer* on completion of the installation.

Such detail drawings shall include complete and fully dimensional drawings of the equipment, full schematic diagrams of all circuits, terminal numbers, resistance values, capacities of all equipment, supply voltages, component characteristics and values, block diagrams and line diagrams, etc.

Three user manuals as specified in this specification, bound in hard cover ring binders, shall be submitted to the *Engineer* on completion of the installation.

1.15.1.4 Approval of drawings

The approval of drawings shall not relieve the *Contractor* of his responsibility to supply the installation according to the requirements of this specification or to obtain the highest quality of craftsmanship possible.

1.16 SITE AMENITIES

The *Contractor* shall provide and maintain temporary sheds and offices for site accommodation and storage facilities and should allow for all costs in this tender, including the storage and safe keeping of materials, as well as insurance against loss or damage. These sheds must be removed on completion of the contract. The *Contractor* will be responsible for removal of all own waste and rubbish, etc. during the scope of the contract.

1.17 CONTRACT MANAGEMENT

The *Contractor* shall provide adequate contract management and supervision during the installation, implementation and training period. The contract management shall at least include:

- a) The provision of a part time contract manager for the management of employees during the complete installation, implementation and training period.
- b) Supervision over the implementation of the systems.
- c) Daily onsite support until the system is operating effectively.
- d) Weekly progress reports including reports on items and incidents that may affect the implementation of the systems.
- e) Arrangements for and the training of the *Employer's* personnel.

1.18 QUALITY CONTROL OF MATERIAL

All materials shall be the best of their respective kinds described in the specification and shall in every way be suitable for the purpose for which they are intended to be used.

All materials and equipment supplied shall fully comply with the requirements laid down in this specification and the latest editions of the relevant SANS, BS, EIA, ISO and DIN specifications or as otherwise specified.

Any item not complying with the following shall be substituted with an approved new component at no cost to the *Employer*, the acceptance or rejection of such work being determined by the *Engineer*.

The *Contractor* shall maintain adequate and effective quality control standards while manufacturing or installing the specified equipment.

The *Engineer* shall have the prerogative of inspecting the equipment in the *Contractor's* factory or on site, or to call for manufacturer's test certificates of such equipment at any reasonable time. The *Engineer* shall ensure accuracy of dimensions, completeness, configuration, quality of workmanship, correct identification, proper use of and type of materials, equipment used and finishes to equipment.

Samples of all equipment must be submitted for approval before installation is commenced.

Such approval shall not relieve the *Contractor* of his responsibility for design, detail and dimension and shall in no way exonerate him from his liability to carry out the work in accordance with the terms of the contract and specification.

All such samples may be retained until completion of the contract. All such samples must have labels securely attached thereto designating the contract by name and number, the name of the *Contractor* and any further relevant information.

1.19 STANDARDS SPECIFICATIONS

All plant and equipment shall be SABS approved (or other recognized international standard/specification as specified).

In addition, the plant shall comply with the relevant portion of this project specification (this specification) and the General Specifications for Mechanical installations included elsewhere in this document. The terms particular and standard/general specifications are used interchangeably. In the event of conflict, this project specification shall take precedence over standard or general requirements.

1.19.1 GENERAL STANDARD SPECIFICATIONS, REGULATIONS AND CODES

The latest edition, including all amendments up to date of tender, of the following specifications, publications and codes of practice shall be read in conjunction with this specification and shall be deemed to form part thereof:

- The Occupational Health and Safety Act, Act No. 85 of 1993.
- Local municipal regulations, by-laws and ordinances.
- Local fire department regulations.
- SANS 10400: The application of the National Building Regulations.
- Local electrical supply authority regulations.
- The wiring of premises Part1: Low-voltage installations, SANS 10142-1 as amended.

1.19.2 OCCUPATIONAL HEALTH AND SAFETY ACT OF 1993

All regulations and statutory requirements as laid down in the latest edition of the South African, Occupational Health and Safety Act, 1993 (Act no 85 of 1993).

1.19.3 MANUFACTURERS' SPECIFICATIONS, CODES OF PRACTICE AND INSTALLATION INSTRUCTIONS

All equipment and materials shall be installed, serviced and repaired strictly in accordance with the manufacturers' specifications, instructions and codes of practice.

1.19.4 MUNICIPAL REGULATIONS, LAWS AND BY-LAWS

All municipal regulations laws, by-laws and special requirements of the Local Authority shall be adhered to unless otherwise specified.

1.20 MINIMUM REQUIREMENT

The conditions and/or specifications in this section shall be regarded as the absolute minimum requirement.

1.21 PROPRIETARY MATERIALS

Where the term "or other approved" is used in connection with proprietary materials or articles, it is to be understood that approval shall be at the discretion of the Employer.

Where brand or trade names are referred to in the Specification and Bills of Materials, these shall indicate the quality and type of material or equipment required and substitution of materials so specified will only be permitted where the authority of the Engineer has been obtained in writing before tender closing or with the submission and acceptance of alternatives as part of the tender submission.

Alternative equipment may only be offered if the specified equipment has been offered and priced as well. No substitution will be allowed once the contract is awarded.

1.22 STANDARD TYPE AND MAKE OF EQUIPMENT

Once installation has commenced with the appropriate approvals for using any type and make of article or equipment, the same type and make of article or equipment shall be used throughout the project for that specific application unless otherwise specified.

1.23 STANDARD OF WORKMANSHIP

The workmanship under this contract shall be of a high standard and to the satisfaction of the Engineer.

1.24 STANDARD OF MATERIALS

All materials and equipment supplied and/or installed under this contract shall be new and the best of their respective kinds and shall comply with the requirements laid down in the latest editions of the relevant SANS or BS and their amendments and with the requirements of this specification.

1.25 MATERIAL, TRANSPORT, OFF-LOADING AND STORAGE

Tenderers must make due allowance in their tenders for the transport, off-loading of materials and the storage and safe custody thereof according to manufacturers' specifications on or off site until such can be accommodated or is required on site.

1.26 INSPECTION OF LOCALLY MANUFACTURED SUPPLIES

Where locally manufactured plant or materials are offered, the Employer reserves the right to inspect such plant or goods during manufacture and to reject items that do not conform to the owner's requirements. Where a number of units are ordered by the owner the contractor shall notify the representative of the Employer when one unit has been completed so that the representative of the Employer may inspect and approve it.

ALLOWANCE SHALL BE MADE TO BRING THE ENGINEER TO THE FACTORY FOR TWO VISITS TO INSPECT AND APPROVE EQUIPMENT.

1.27 ORDERING MATERIALS

The contractor is warned to place all orders for materials or special articles as early as possible as he will be held solely responsible for any delay in the delivery of such goods.

1.28 PACKING

The contractor will be held responsible for packing all plant and other goods in such a manner as to ensure freedom from any loss or damage in transit. Unless otherwise specifically agreed upon, receptacles will not be returned or paid for, and no additional charges will be allowed for packing or packing materials.

1.29 COMMISSIONING AND TESTING

The Contractor shall commission and test the entire installation at his own expense, including provision of all test equipment, the cost of all water and power consumed during the commissioning and all other consumables, labour and plant necessary for the commissioning of the equipment. Such testing is to be done in the presence of the principal agent who shall have been notified of the dates and approximate duration of the tests sufficiently early to allow them to witness tests if necessary.

The Contractor shall properly test and call for inspection by the principal agent, any work which is to be covered, concealed, built-in, otherwise closed up or rendered inaccessible, before such closing up takes place. The Principal agent may require any work of this nature which they have not been called to inspect before closing up, to be uncovered or made accessible to its inspectors entirely at the Contractor's expense, including making good.

The Contractor shall keep full and proper written records of all tests conducted and commissioning information, such records to be properly indexed and submitted to the principal agent for his records.

The principal agent reserves the right to inspect any item of equipment during manufacture or before delivery to Site. The Contractor shall make available any item for such inspection. The principal agent shall also be furnished with manufacturer's test certificates whenever these are required by law or called for by the principal agent.

The Contractor shall commission the complete installation prior to inviting the principal agent to accept it.

1.30 SUBMISSIONS FOR APPROVAL

The Contractor shall submit engineering and other applicable details of all the equipment offered for approval prior to ordering.

- a. The successful tenderer shall prepare detailed shop drawings and builder's work details of the proposed installation and shall submit these for approval to the Engineer.
- b. All construction drawings prepared by or on behalf of the Contractor shall be submitted to the Engineer for approval and shall have been thoroughly checked, corrected where necessary and signed as approved by the Contractor, prior to such submission.

The Engineer's approval of any drawings will cover the arrangement, type and operational suitability of the equipment in general only. Such approval will not release the Contractor from his responsibility for the proper operation of the installation or for its full compliance with the specification, drawings, local authority and statutory requirements, or for ensuring that the equipment can be physically accommodated within the space and via

the access provided.

- c. The contractor shall be held responsible for costs to replace unapproved, pre- ordered equipment as a result of non-compliance with these requirements.
- d. Any deviations from the specifications proposed by the Contractor should be sent to the Engineer for approval prior to any commencement of works.

1.31 BUILDER'S WORK AND REMOVAL OF EQUIPMENT

The following work shall be carried out by the Contractor:

- Drilling and cutting of necessary holes in the concrete, brickwork, ceilings and wooden doors, including making good to match finish.
- Concrete plinths for installation of equipment.
- Waterproofing of roof penetrations and plinths.
- Provide drain points where required.
- Electrical installation as required
- Removal and reinstatement of ceilings
- Filling and painting of bulkheads and ceilings were required

1.32 SCOPE OF WORK

The specification covers the following:

The supply, delivery, installation and commissioning of:

- DX Split AC Installations
- Fresh air ventilation
- Centrifugal Pump Installation

PART 2: AC INSTALLATION

DESIGN CRITERIA

DESIGN DATA	
Outdoor summer temperatures	31 C° Db/19.5 C° Wb
Outdoor winter temperatures	3.3 °C Db/-0.1 °C Wb
Indoor conditions	22 °C Db/ 50 % RH
Indoor Noise Levels (NC)	35
Altitude above sea level	1400 m
Condenser Coil Selection Temperature	35 °C Db

1.1 APPLICABLE STANDARDS

The air conditioning units and installation in general shall be in accordance with:

- SANS 1125: Room air conditioners and heat pumps
- SABS 0147: Refrigerating systems including plants associated with air-conditioning systems
- SANS 60335-2-40: Household and similar electrical appliances – Safety.
- Part 2 – 40: Particular requirements for electrical heat pumps, air conditioners and dehumidifiers
- SANS 10142-1-2003: The wiring of premises Part 1: Low-voltage installations
- SABS 1453: Copper tubes for medical gas and vacuum services
- SABS 1424-1987: Filters for use in air-conditioning and general ventilation
- SABS 1238-2005: Air-conditioning ductwork
- SABS 10173-2003: The installation, testing and balancing of air-conditioning ductwork

1.2 DX AC SYSTEM

1.2.1 General

The DX AC units shall be of the inverter heat Pump type. The air conditioning system shall comprise a single outdoor unit and single indoor units capable of operating continuously at ambient temperatures between -5°C and 40°C .

All air conditioning indoor and outdoor units shall be standard factory assembled, piped wired and charged with refrigerant. The units shall be thoroughly tested for all operating conditions. Spares shall be freely available in South Africa. On request, the Contractor shall provide the Engineer with performance test certificates.

The air conditioning units and the installation of the system shall generally be in accordance with the system supplier's recommendations. Any discrepancies between this specification and the supplier's recommendations that may influence the unit's performance or guarantee shall be clarified with the Engineer during tender stage.

The electrical power requirements to all indoor and outdoor units shall be:

- Single phase when the cooling capacity of the unit is less than 10 kW.
- Three phase when the cooling capacity of the unit is more or equal to 10 kW.

The indoor and outdoor units shall be interconnected with refrigerant piping, control cabling and the relevant joints and headers. The pipe and cable connections shall be made in accordance with the unit supplier's recommendations. The refrigerant shall be of the R410A type.

All indoor and outdoor units shall be of Samsung manufacture or equally approved.

1.2.2 Indoor units

All indoor units shall be of the heat pump type.

All indoor units shall have electronic control valves that shall control refrigerant flow in response to the load requirements. All fans installed in the indoor units shall be statically and dynamically balanced to ensure low noise and vibration.

Remote controls for each indoor unit shall be of the type as specified in the relevant specification of the indoor units in the sections to follow. Where wireless remote controllers are used, the signal receiver shall be installed in the following indoor units: cassette, ceiling suspended, high wall and floor standing units.

Where hide-away units such as ceiling-mounted duct-type and ceiling mounted built-in type require wireless remote controllers, a separate signal receiver unit shall be installed either in the ceiling void or at the location were indicated on the project drawings.

All units are to include condensate pumps as required.

1.2.2.1 Ducted ceiling hide-away type

The ducted ceiling hide-away type units shall be of the Samsung manufacture or equally approved.

The ceiling-mounted duct-type units shall have factory fitted, electrically operated condensate pumps with a drainpipe connection. Integral safety switches shall be provided to prevent the pump from running dry, and to prevent the Hide away unit from operating when the condensate pump has failed.

The Contractor shall install inspection panels below ceiling-mounted duct-type units to allow access for maintenance where applicable.

All ceiling-mounted duct-type units shall be provided with an individual zone controller. The zone controller shall be of the wired remote controller type.

1.2.3 Outdoor units

Outdoor units shall be of the Samsung manufacture or equally approved. Outdoor units shall be of the heat recovery type.

The outdoor units shall have sufficient capacity to meet the cooling requirements of the indoor units. The outdoor unit shall be equipped with inverter control capable of changing the speed of the compressors in accordance with the cooling or heating load requirements. The outdoor unit shall be equipped with a drain pan kit for operation in the reverse (heat pump) cycle.

1.2.4 Performance Specifications

Cooling and heating capacities are room conditions, and all equipment shall be de-rated to meet these requirements.

De-rating shall be done to compensate for the following:

- Altitude above sea level.
- Refrigerant pipe lengths.
- Design conditions specified.

All units shall be capable of meeting total and sensible cooling requirements. Tenderers shall provide proof of de-rated capacities with their tender. All capacities specified are to be achievable at medium evaporator fan speed.

UNIT DESCRIPTION	REFERENCE NUMBER	TOTAL COOLING (NOMINAL CAPACITY IN KW)
Ducted ceiling hide-away	HA3	16.0 kW
Mid Wall Unit	MW-1	3.6kW
Mid Wall Unit	MW-2	7.1kW

1.2.5 Noise Criteria

All indoor and outdoor units shall have noise levels that comply with all industry levels and standards.

1.2.6 Electrical

The power to the indoor and outdoor units shall be provided by the Contractor with a isolator mounted within 1 m from the air conditioning unit. The isolator provided at the outdoor units shall be of the weatherproof type. The Mechanical Contractor shall be responsible for the entire electrical installation including the isolator to the outdoor and the indoor units.

Where the Electrical Contractor provides a cable only to a distribution board that serves a group of air conditioning units, the Mechanical Contractor shall provide the distribution board, connect the incoming power cable and shall do all the electrical wiring from the distribution board to the outdoor and the indoor units.

In all instances the Mechanical Contractor shall provide isolators as required. All electrical and control cables shall be neatly strapped with the refrigeration piping in a galvanised cable tray.

The entire electrical installation shall comply with:

- SANS 10142-1-2003: The wiring of premises Part 1: Low-voltage installations

On completion, the Contractor shall issue a compliance certificate for the entire electrical installation.

Electrical and control cables mounted between indoor and outdoor units shall be installed without joints in the cable and shall be of the UV protected type.

1.2.7 Controls

The system's configuration and wiring shall be as indicated on the project drawings. All wall-mounted control units (e.g., centralised remote controller, scheduled timer etc.) shall be flush-mounted in accordance with the same installation requirements as set out for individual wired zone controllers.

1.2.8 Refrigerant circuits

Refrigerant piping shall be in accordance with the following standards:

- SABS 1453: Copper tubes for medical gas and vacuum services
- SABS 0147: Refrigerating systems including plants associated with air conditioning systems

The refrigeration piping system shall be of the Samsung manufacture or approved equal. The main refrigerant supply from the outdoor units shall be branched to indoor units with the appropriate joints and headers located where indicated on the project drawings.

Fittings shall be copper based capillary solder fittings in accordance with SABS 1067. All soldered joints on proprietary manufactured units shall be carefully checked and remade if found damaged in transit.

Pipe size selections shall be to the supplier's recommendation and shall be such as to produce moderately low velocities whilst:

- Ensuring proper oil return to the compressor and minimizing lubricating oil being trapped in the system.
- Ensuring practical lines without excessive pressure drops and with proper feed to evaporators.
- Preventing liquid refrigerant from entering the compressor during operation and at shutdown.

Refrigerant piping shall be sized and fitted with the necessary oil traps strictly in accordance with the unit manufacturer's requirements.

Suction and liquid pipelines shall be insulated separately and joints on insulation shall be glued with the insulation manufacturer's recommended adhesive to create a vapour barrier.

The installation of trunking and trays shall form part of this mechanical contract.

1.3 INSTALLATION REQUIREMENTS

1.3.1 Installation of indoor and outdoor units

During installation, care shall be taken to ensure that no vibrations are carried over to structures to which the indoor and outdoor units are fixed.

Outdoor condensing units shall be installed on wall-mounted brackets and/or a concrete slab as indicated on the project drawings.

Where installed on a concrete slab, the condensing unit shall be fitted on top of neoprene vibration isolating pads and 450 mm square concrete paving slabs.

1.3.2 Installation of controls

Where it is required that a wired controller or signal-receiver unit is to be installed against a wall, the controller or signal-receiver unit shall be mounted over a flush-mounted 100 mm x 50 mm electrical box. Control wiring shall be installed in a 20 mm electrical conduit from the controller/signal-receiver-unit to the air conditioning unit. The conduit and outlet box shall be chased into the wall by the Electrical Contractor. The Electrical Contractor shall install the conduit from the outlet box to 100 mm above ceiling level, directly above the controller.

Wireless remote controllers shall fit in a wall-mounted holder neatly mounted next to the room light switch.

Control wiring (F1) to individual unit controllers shall be different in colour to the colour of the control wiring (P) that interconnects air conditioning units and the central system controller.

1.3.3 Installation of condensate drainpipes

A galvanised drain tray with suitable drainpipe connection shall be mounted beneath the outdoor units. Drainpipes that run from the drain tray to the nearest wastewater gully shall be installed to ensure positive drainage of condensate.

Condensate drainpipes from indoor units shall always run together with refrigerant pipes and shall always be installed in the same trunking and on the same cable trays for as far as the installation permits. Deviation from this shall only be allowed where condensate drainpipes run in a different direction to either a service duct, wastewater pipe or any other location as indicated on the project drawings.

Drainpipes shall run and connect to wastewater pipes as indicated on the project drawings. The connection between the drainpipe and wastewater pipe shall be an airtight sealed connection that allows positive drainage of condensate.

The condensate drainpipes shall be medium pressure uPVC tubing complete with matching (standard) fittings. Main and secondary condensate lines (as indicated on drawings) shall be 50 mm and 25 mm in diameter respectively. All condensate pipes running from indoor units shall be fitted with a U-trap or HEPVO self-sealing waste valve before its connection to the wastewater pipe as indicated on the project drawings. Drainpipes shall be sized to the supplier's recommendation and shall be adequate in size to allow positive drainage. The first 5 m of drain piping shall be insulated with Armaflex-type, lightweight, elastomeric nitrile rubber tube insulation. Insulation thickness shall be 13 mm.

In ceiling voids, drainpipes shall be installed in galvanized cable trays. Where drain piping does not run with refrigeration piping in the same cable trays, a 76 mm galvanised 'Cab strut' light duty cable tray shall be used. Drain piping shall be fixed to the cable tray with suitably sized cable ties installed at 500 mm intervals.

Horizontal-mounted drainpipes shall be installed at a slope of 20 mm per 1000 mm, ensuring positive drainage.

Surface-mounted drain piping shall be secured to the wall by means of galvanised steel saddles at no more than 1 m intervals.

Where drainage piping or control cabling is required to be installed flush-mounted, positioning and chasing shall be done in good time to meet construction programmes.

1.3.4 Installation of refrigerant piping

Refrigeration piping shall be of seamless copper tubing. Where soft drawn material is used, bends shall be with a long radius formed with the proper tools. Where hard drawn material is used, only long radius brazed bends shall be used. All refrigerant piping shall be properly sealed against moisture and dirt at all times.

Refrigerant piping shall be arranged so that normal inspection and servicing of the compressor and other equipment is not hindered. Locations where copper tubing will be exposed to mechanical damage shall be avoided. Hangers and supports where piping go through walls shall be installed to prevent transmission of vibration to the building.

All refrigeration pipes shall be sized to the supplier's method. The refrigerant charge shall be accurately calculated by the same method. The Contractor shall adhere to the recommended maximum pipe lengths as set out by the manufacturer.

All joints installed horizontally shall be mounted with branch piping in a horizontal plane.

Only synthetic oil compatible with the refrigerant shall be used to lubricate any cutting, reaming and flaring tools.

Only phosphor copper brazing rods shall be used without any flux on the piping joints. The pipework shall be continuously purged with low-pressure nitrogen during all brazing operations.

Simple purging of the refrigerant pipes between the indoor and outdoor units shall not be acceptable. Refrigerant pipes shall be correctly pressure tested with nitrogen and a small amount of refrigerant to 3.8 MPa for R410A and left for 24 hours to ensure that the pressure does not drop. A vacuum pump shall then be used to purge the piping for longer than 2 hours to -100 kPa. The system shall be capable of holding this vacuum for 1 hour or to the satisfaction of the Engineer.

The system shall then be charged in the liquid state with the calculated amount of additional refrigerant by using an accurate charging scale (charging cylinder shall not be used). Only once the system is correctly charged shall the refrigerant valves on the outdoor units be opened.

The Contractor shall make use of colour coding (insulation type straps) to differentiate between refrigerant pipes running from refrigerant risers to different thermal zones.

Refrigerant pipes for multiple outdoor units shall be correctly arranged to meet the manufacturer's requirements. Where multiple outdoor units are used, an insulated oil equalisation line shall be installed between the units.

The Contractor shall apply the 'Armaflex' insulation in such a manner as not to cause leaking. The wall thickness of the insulation shall be to the following table:

Table 4-1 Insulation Wall Thicknesses

REFRIGERANT PIPE DIAMETER (MM)	WALL THICKNESS (MM)
6.34	9
9.53	9
13.7	13
15.88	13
19.05	19

Refrigerant piping in ceiling voids and mounted internally against walls shall be installed in galvanised steel Cab strut light duty cable trays of adequate size to cope with the pipe load. Pipes shall be strapped over insulation to cable trays at 500 mm intervals with suitably sized cable ties. Where drainpipes run together with refrigerant pipes, cable trays shall be to a size of 30% excess capacity of the condensate and refrigerant piping the tray carries.

Externally mounted refrigeration pipes and drainpipes shall be mounted in Cab strut P-series cable trunking to a size as to be confirmed. Cable trunking shall be complete with clip-on covers. Pipes and cables shall be strapped together every 500 mm with suitably sized cable ties and loosely fitted in the trunking. The trunking shall be manufactured from galvanised steel and epoxy powder coated to a colour as specified by the Engineer.

Any insulation material not covered by the trunking and exposed to the elements shall be neatly strapped with cable ties to minimise the possibility of dirt and water entering between the insulation and refrigeration pipes.

1.3.5 Preliminary Testing

The equipment manufacturer's authorised representative shall perform preliminary commissioning on the DX system.

The Contractor shall switch the electrical power on to all indoor and outdoor units after the system has been charged with refrigerant. Power shall be supplied to all units for duration of 9 hours before initial testing shall commence.

The equipment test sequence shall be run, and the errors displayed on the controller shall be rectified.

The system, as well as individual equipment shall be adjusted to give the specified performance. Control systems shall be adjusted and placed in operation.

1.4 AIR TERMINALS AND DAMPERS

1.4.1 General

Where selected by the Contractor, air diffusion equipment shall be selected in accordance with the manufacturer's recommendations and should be capable of passing the specified air quantity at the appropriate throw without creating excessive resistance, noise or local draughts. All air diffusing equipment shall be capable of meeting the industry standard NC level requirements, for the space environment where the equipment is installed.

In all instances where spigot boxes (plenums) are used for the connection of air diffusion equipment, the inside surfaces shall be painted black to prevent visibility of the internal surface from ground level.

During commissioning of the system, each grille, diffuser, valve etc. shall be set to deliver the specified air quantity. It is the Contractor's responsibility to check regenerated noise levels of grilles offered against the overall acoustic performance of the system required. Noisy grilles that exceed the NC level requirements of the given space shall be replaced at the Contractor's expense with more suitable types.

1.4.2 Supply air diffusers and supply air grilles

Where Europair type SD or DD grilles are specified on the project drawings, the supply air grilles shall be manufactured of extruded type 50S anodising grade aluminium and shall be provided with opposed blade volume control dampers, unless specified otherwise on the project drawings. Volume control dampers fitted with supply air grilles shall conform to SANS 1238, section 6.5 requirements. The blades shall be adjustable from the front of the grille.

Where Europair type CD ceiling diffusers are specified on the project drawings, diffusers shall be manufactured from extruded type 50S aluminium, naturally anodised or epoxy powder coated to a colour as specified by the Engineer. Europair type CD ceiling diffusers shall be complete with an opposed blade damper, plenum box with spigot and ceiling plate. CD type diffusers shall have a standard flat frame with blade spacing and distribution pattern as indicated on the standard drawings.

Where Europair type FGR diffusers are specified on the project drawings, diffusers shall be manufactured from fibre glass matt and approved SABS fire retardant resin painted to a colour as approved by the Engineer. The face plate shall be adjustable for air balancing

Where Europair type CVD and CCVD diffusers are specified on the project drawings, diffusers shall be manufactured from steel and be powder coated to a colour as specified by the Engineer. Diffusers shall be equipped with a locking bracket to lock the adjustable radial disc once the system has been balanced.

Where Rickard type CCD, CSD, CRD and CSW diffusers are specified on the project drawings, diffusers shall be manufactured from steel and finished in a chip resistant baked epoxy powder coating to a colour as specified by the Engineer. The control disc shall be adjustable to vary airflow for balancing purposes. The diffuser shall be equipped with a locknut on the control shaft to lock the volume control disc in position after the system has been balanced.

Where Rickard diffusers with electrical reheaters are specified on the project drawings, the electrical elements shall be of the incoloy black heat type, installed in the neck of the diffuser. The reheater elements shall have overheated protection. The Rickard type ESU-3 temperature controller shall be used to control the temperature of the reheaters. The temperature controller shall provide a proportional-integral signal that will vary the reheater output capacity with a pulse width modulation action, i.e., switching the heaters on and off via a triac switching set. The zone temperature setpoint shall be adjustable with a Rickard type DXC digital remote controller, neatly mounted next to the light switch. The capacity of the reheaters shall be as indicated on the project drawings. The Electrical Contractor shall provide either a lockable isolator or 16 A switch socket outlet next to the diffuser (not further than 1 m from the diffuser), whichever is specified on the project drawings.

Where Krantz type DD-N-DN twist outlet diffusers are specified on the project drawings, diffusers shall be manufactured from aluminium. Krantz type RA-N-DN radial outlet diffusers shall comprise sheet steel radial outlet elements, circular outlet jacket, moulded visible outlet surface and central fastening screw. Krantz type DD-M-DN radial diffusers shall comprise a twisted outlet with sheet steel fixed twist vanes, shaped round visible surface and manually adjustable control disc. The installation method and diffuser sizes shall be as specified on the project drawings. Installation shall either be with an aluminium

reducer and galvanised steel L-suspension, or galvanised steel connection box complete with volume control butterfly damper. The connection box shall be of the flat design with connecting spigots and shall include flange boreholes for suspension and fasten diffusers centrally. Diffusers shall be to a colour as specified by the Engineer.

Where Krantz type RA-V-DN adjustable radial outlet diffusers are specified on the project drawings, diffusers shall comprise low outer air outlet casing, shaped visible surface, built-in sheet steel radial vanes, built-in diaphragm and fastening screw. The discharge direction shall be adjusted by the rotation of a vertically movable guide ring. The guide ring shall be adjusted with two opposite cams on the inner ring. The shaped visible surface shall either be square or circular as specified on the project drawings. Krantz type DD-VZ-DN type variable twist outlet diffusers shall comprise an outer cylinder with round exit, fixed diaphragm, swirl cylinder with core chamber and static twist vanes. The latter diffuser types shall be manually adjustable. The diffuser shall connect to round ducting with a round tube and sleeve and to rectangular ducting with a suitably sized spigot. A connection box shall be used for installation if so, specified on the project drawings. All diffusers shall be to a colour as specified by the Engineer.

Where Linear Slot Diffusers are specified on the project drawings, the diffuser shall be Swegon FlowBar High-Capacity Slot Diffusers or similar approved. Designed to combine a high air handling capacity with maximum flexibility and shall be suitable for either ceiling or sidewall applications. The diffusers shall be manufactured from aluminium.

Diffusers shall be installed at the locations were indicated on the project drawings. The Contractor shall install insulated flexible ducting of length not exceeding 1.5 m and of the same diameter as the diffuser, extending from the supply duct to the diffuser. Spigots shall be attached to the ducting and sealed with silicon sealer around the outer perimeter of the joint. Flexible ducting shall be strapped to the diffuser and spigots with steel straps to form an airtight connection.

Alternatively, where indicated on the project drawings, diffusers shall be 'hard' connected to ducting with rivets or taper screws and sealed with silicone sealer to form an airtight connection. All diffusers shall be capable of meeting the discharge pattern and throw requirement as set out on the project drawings.

1.4.3 Return, transfer, and door grilles

Return air grilles shall be manufactured from extruded type 50S anodised aluminium, naturally anodised or epoxy powder coated to a colour as specified by the Engineer and shall be of the hinged type. Return air grilles shall in all instances have fixed blades with a curved blade profile. Return air grilles shall have a fixed outer frame and a hinged inner frame with grille section, handle and securing clips. A wire mesh with clips shall be located behind the hinged inner frame to allow the insertion of filter media. The design of the return air grille shall be such as not to allow the bypass of any unfiltered air.

Return air grilles shall be capable of meeting the airflow requirements, as set out on the project drawings, with a face velocity not exceeding 2 m/s.

Transfer air grilles shall be complete with fixed curved blades and an outer frame on both sides of the wall or partition. Transfer air grilles shall be of aluminium extruded type, naturally anodised or epoxy powder coated to a colour as specified by the Engineer. Openings in walls where transfer grilles are to be installed shall be provided by the Building Contractor.

Door air grilles shall be installed in wooden doors only. In cases where steel and glass doors are used, transfer grilles or transfer ducting as an alternative shall be installed. Door air grilles shall be of the chevron-blade type. Door air grilles shall be manufactured from extruded type 50S anodised aluminium, naturally anodised or epoxy powder coated to a colour as specified by the Engineer.

Transfer ducting shall comprise galvanised sheet metal ducting and aluminium curved blade intake and outlet transfer grilles. Flexible ducting shall not be used as transfer ducting.

Return, transfer and door air grilles shall be provided where indicated on the project drawings and shall be installed to the supplier's recommendation.

Return air grilles shall be installed directly on the ducting where indicated on the project drawings unless specified otherwise. The connection between return air grilles and ducting shall be airtight and sufficiently strong to handle the duct pressure.

1.4.4 Weather louvers

Weather louvers shall be of the Europair, WL type with standard blade spacing of 50 mm.

Weather louvers shall be manufactured of extruded aluminium, naturally anodised or epoxy powder-coated to a colour as specified by the Engineer. Weather louvers shall be constructed with drip edges to blades and rigid frames to enable building in. The top and bottom blade of each weather louver shall be fitted flush with the frame and shall be smooth without grooves, channels or recesses where dirt or water can accumulate. Weather louvers shall be watertight and shall prevent the entrainment of raindrops at a face velocity of up to 3 m/s. Plastic bird mesh screens shall be fitted behind the blades. Galvanized expanded metal or wire mesh screens with 12 mm opening sizes shall also be accepted.

All weather louvers are to include fresh air filtration.

Weather louvers smaller than 450 x 300 mm shall be of the Europair RA type with RB blades, and with 19 mm spacing between the blades. Europair RARB grilles shall be installed horizontally at the location where indicated on the project drawings.

1.4.5 Volume control dampers

Volume control dampers shall be of the opposed multi-blade damper (OBD) type or alternatively be of the butterfly-valve type suitable for use in circular ducting.

Volume control dampers shall be installed in ducting where indicated on the project drawings. The Contractor shall balance the ducting system after installation and set the required flow rates to the various air terminals as specified on the project drawings. The Contractor shall test, balance and adjust the duct system to the requirements of SANS 10173: 2003, Section 8.

All dampers, whether it is an OBD or a butterfly valve, shall in all cases comply with requirements of SANS 1238, Section 6.5. The damper frames and blades shall be constructed of galvanised mild steel, assembled with galvanised bolts, nuts and washers. Extruded aluminium blades shall also be acceptable. Blades shall have a mill, anodized or epoxy powder finish. All volume control dampers shall have manually quadrant operation. Dampers shall be gear operated.

Dampers creating unacceptable vibrations and noise levels will be rejected and will need to be replaced at the Contractor's expense. Volume control dampers shall be of the Europair type or other approved. 'Other Approved' means approved by the Engineer.

1.4.6 Fire Dampers

Fire dampers shall be installed according to the manufacturers and SABS requirements and recommendations. Fire dampers shall be located where indicated on the project drawings.

Fire/smoke control dampers shall in all instances comply with the requirements of SABS 193 as amended and shall bear the SABS mark with proven low leakage in the closed position. Each fire damper shall be clearly marked as per Clause 5 of SABS 193. Fire dampers shall have at least a 2-hour resistance rating when tested in accordance with SABS 193.

Fire dampers shall be flanged both sides, and an access panel shall be provided in the ducting at each fire damper, preferably on the upstream side of the damper. The open or

closed status of the damper shall be clearly indicated outside the casing for inspection purposes.

Fire dampers shall be actuated by means of an electrical solenoid (power on damper closes), when specified. A fusible link shall always be incorporated in the assembly to provide normal closure in the event of increasing temperature within the duct. Actuation by means of electro-magnets (power off: damper closes), will not be accepted. Solenoids and electrical actuators shall be provided within an enclosure. Open electrical connections shall not be accepted.

Each fire damper shall be wired to the switchboard with a LED signal to show if the damper has been closed. Alternatively, a red LED shall be installed in the ceiling below each fire damper to indicate closure of damper. All fire dampers shall be clearly identified on a synoptic drawing at the control board as to indicate the installed position of each fire damper in the controlled area. Labels shall be installed on the ceiling grid below all fire dampers indicating their positions and reading: 'Fire damper above'.

Dampers shall be sized so that the nominal free air area when in the open position is not less than the connected duct free air area.

Fire dampers shall be installed to form part of a continuous barrier to the passage of fire when in a closed position. Where a fire damper cannot be fitted immediately adjacent to the fire wall, the section of ducting between the damper and the wall shall be of at least the same metal thickness and fire rating as the damper casing.

Dampers shall be self-supporting in case of duct destruction due to heat. Care shall be exercised that the supporting frame be installed so that the closing device is accessible.

Sheet metal sleeves shall be provided for housing the fire dampers where fire dampers are mounted in walls. These sleeves shall be built into the walls by the Building Contractor. Retaining angles shall be installed on the four sides of the fire damper sleeve on both sides of the wall. The angles shall be fastened to the sleeves only, and not to the wall. The retaining angles shall lap the masonry by a minimum of 25 mm around the entire opening.

Recommended minimum angle sizes are:

LARGEST DIMENSION OF FIRE DAMPER	ANGLES
Up to 1 200 mm	38 x 38 x 3.2 mm
1 200 mm to 1800 mm	44 x 44 x 3.2 mm
Over 1 800 mm	51 x 51 x 4.8 mm

Clearance shall be provided between the sleeve and the masonry opening on the top and at the sides of the fire damper to allow for expansion. Allow a gap of 1 mm for each 100 mm of sleeve width or depth, but the gap shall not exceed 15 mm.

All fixing and installation materials, i.e., bolts and nuts, rawl-bolts and mortar works shall be as per fire damper manufacturer's specification and shall not affect the fire rating of the fire damper installation. Combustible materials such as plastic or similar rawl-bolts and plugs are not permitted.

1.4.7 Filters

Washable filter media shall be fitted behind hinged return air grilles were indicated on the project drawings. The filter media shall be of the Peter McLeod PM 100 type, 100 grams/m² density and 5 mm thick. The filter media shall be of the synthetic type and shall be capable of arresting lint of the return air. The filter media shall fit and extend past the outer perimeter of the wire mesh in the return air grille such that the bypass of unfiltered air is avoided. The filter media shall be fireproof. Glass fibre filter media type shall not be acceptable

1.4.8 Sound attenuators

If sizes are not specified, sound attenuators shall be selected to comply with the industry standard noise levels for specific areas.

PART 3: VENTILATION SYSTEM

3.1 SCOPE

The following installations shall be specified under this section of the project specification:

- Fresh air supply
- Extraction System

3.2 DESIGN CRITERIA

DESIGN DATA	
Outdoor summer temperatures	31 C° Db/19.5 C° Wb
Outdoor winter temperatures	3.3 C° Db/-0.1 C° Wb
Indoor conditions	22 C° Db/ 50 % RH
Indoor Noise Levels (NC)	40
Altitude above sea level	1400m

3.3 APPLICABLE STANDARDS

The air conditioning units and installation in general shall be in accordance with:

- SANS 1424-1987: Filters for use in air-conditioning and general ventilation
- SANS 1238:2005: Air-conditioning ductwork
- SANS 10173:2003: The installation, testing and balancing of air-conditioning ductwork
- SANS 60335-2-80: Household and similar electrical appliances – Safety Part 2-80: Particular requirements for fans
- SANS 10108: The classification of hazardous locations and the selection of apparatus for use in such locations

3.4 VENTILATION FANS

3.4.1 General

The combination of fans and attenuators shall be such that the specified noise levels are achieved.

Where no pressure requirements are indicated, the Contractor shall estimate the fan static pressure requirements for the system layout and tender accordingly. Where filters are included in the system, the static pressure losses through filters shall be estimated at 180 Pa throughout each stage of filtration.

Ventilation and extraction fan duties as specified on the tender drawings shall be checked against the respective system's design resistance once all information on the selected system is available. Where fan duties are found inadequate, the Contractor shall notify the Engineer before ordering the equipment.

Fans shall be selected to operate at or as close to maximum efficiency as possible and for a maximum speed of 1440 rpm (4 pole motors).

Attenuators shall be mounted directly onto the fan casing with flexible connections between the ducts and attenuators.

Fans shall be fitted with the manufacturer's nameplates permanently fixed to the casing in a prominent position, clearly indicating manufacturer, model number, size, speed, maximum operating speed, maximum power absorbed, and serial number.

Fan air in/outlets not connected to ducting or equipment shall be protected with easily removable safety wire mesh screens.

Fans situated outside and exhausting air vertically shall be complete with non-return, weatherproof cowls as per the drawings.

Indicating arrows for both direction of rotation and direction of airflow shall be provided on fan casings.

All fans shall be installed in accordance with the manufacturer's requirements and recommendations.

All fans shall be mounted on anti-vibration mountings or supported from anti-vibration hangers.

Bearings shall be of the ball or roller type and shall be quiet in operation. They shall be sized to give a long life (not less than 100 000 hours) at the loads imposed by the application.

Belt guards shall be arranged to permit lubrication and use of speed counters with the guards in position. Belt guards shall have adequate ventilation for belt cooling.

The construction and design of electrical apparatus for ventilation equipment in hazardous environments shall comply with the relevant SANS specification, e.g., SANS 10108. The electrical installation shall comply with SANS 60335-2-80: Household and similar electrical appliances – Safety Part 2-80 Particular requirements for fans.

3.4.2 In-line axial flow fans

Axial flow fans shall be of the non-overloading, aerofoil type with peak power requirements occurring at normal operating pressure range. The fan motor shall have a rating exceeding this requirement. Axial flow fans shall operate at the highest possible efficiency at the lowest possible blade tip speed.

Impeller blades shall be manufactured from a die-cast aluminium alloy clamped in a split steel or aluminium cast hub. Hubs on larger fans shall be manufactured from hot dip galvanised steel. The blade pitch shall be adjustable at the hub. Cast steel hubs shall be electro-coated.

Axial flow fan casings shall be manufactured from hot dipped galvanised mild steel with predrilled flanges on both ends of the fan. An access panel of ample size shall be provided in the casing. All fasteners shall be zinc plated.

Fan motors shall be totally enclosed and shall be of the squirrel-cage induction type with protection to IP 55 standard. An external weatherproof terminal box forming part of the casing shall be included in the design for motor connections. Where belt driven fans are used, belts shall be of the V-belt type with grooved pulleys. Belts shall be oil resistant, non-sparking and non-static. Belt drives shall comply with OHSWA requirements.

Axial flow fans shall be statically and dynamically balanced in accordance with ISO 1940 – 1973 within grade G6.3.

Axial flow fans shall always be resiliently mounted on anti-vibration mountings to prevent carry-over of vibration to the structure to which the unit is fixed.

Fans shall be installed with sound attenuators to comply with noise levels.

FAN REFERENCE NUMBER	FAN DUTY (l/s)
EAFO1	150 l/s
EAFO2	200 l/s
EAFO3	5500 l/s
FA01	40 l/s
FA02	450 l/s
Air blower	2100l/mi

In-line axial flow fans shall be of the AMS manufacture, or equally approved.

3.5 DUCTING

3.5.1 General

Sheet metal ductwork shall be manufactured in accordance with SANS 1238 and installed balanced and tested as set out in SANS 10173. The installation and manufacture of ductwork shall strictly be in accordance with SANS standard specifications with specific attention given to the following:

- Changes in size and shape of ducting: refer to SANS 1238, Section 6.3.
- Access openings, doors and covers refer to SANS 1238, Section 5.3.
- Sealant requirements: refer to SANS 1238, Section 5.6.
- External ducting insulation: refer to SANS 10173, Section 5.4.
- Material thickness and duct stiffening for low pressure ductwork: refer to SANS 1238, Section 6 for rectangular ductwork and SANS 1238, Section 7 for circular ductwork.
- Radius and square bends as well as turning vanes: refer to SANS 1238, section 6.4.

Unless the sheet-metal ductwork is inherently corrosion protected, all sheet-metal shall be protected against corrosion as outlined in SANS 1238, Section 8.

It shall be the responsibility of the installing contractor to ensure proper assembly and sealing of sheet-metal ductwork and insulation strictly in accordance with SANS specifications.

The air duct system shall be of the low-pressure type and the ductwork shall be manufactured of galvanised mild steel with general material requirements as set in Section 5.1 and 5.2 of SANS 1238. The ductwork shall either be circular or rectangular in cross-section as indicated on the project drawings.

The first dimension given on the drawings for rectangular ductwork shall be read as the width-on plan and the depth- on section, and the second dimension shall be read as the depth-on plan and the width-on section.

The duct dimensions shown on the drawings are sheet metal dimensions. All final dimensions shall be checked on site or verified by means of architect's working drawings and structural drawings, before the fabrication of the ducting.

Sealing membranes and adhesives for affixing insulation shall meet the indexes for surface spread of flame, heat contribution and smoke production as set out in Section 4 of SANS 1238.

The inner surfaces of ducting shall be smooth, and no internal insulation shall be used. Dampers, sound attenuators, duct splitters and turning vanes shall be installed where indicated on the drawings.

Flexible connections shall be provided between all fans, sound attenuators and ducting. Flexible connections exposed to weather shall be provided with protecting galvanised sheet steel cover strips. The material used for flexible joints shall comply with the requirements as set out in SANS 1238, Section 5.5. Flexible connections shall be provided on both sides of the equipment.

Ducting shall always be installed in such a way, that, especially in plant rooms, maximum height between the floor and the underside of ducting is achieved.

The installation and testing of hangers shall comply with the requirements as set out in SANS 10173. All hangers shall be treated against corrosion and shall be painted.

Reinforcement, duct stiffening and fastening accessories shall be galvanised and installed where required. Only duct accessories manufactured from compatible materials, which comply with SANS 10173, shall be installed with the ductwork. Tie rods shall be manufactured from galvanised steel. Rivets, screws, bolts and other fastening equipment shall be corrosion proof.

3.5.2 Longitudinal seams and transverse joints

Pieces of ductwork shall be joined with the necessary sealants, as applicable, as set out in SANS 10173, Section 5.

3.5.2.1 Rectangular Ductwork

Longitudinal seams and transverse joints for rectangular ductwork shall be in accordance with SANS 1238, Section 6.

As an alternative to transverse joints specified in SANS 1238, other flanged joints such as MEZ-flanges will also be considered provided that they meet the SANS requirements. MEZ-flanges or equivalent products shall be manufactured from cold rolled steel and hot dip galvanised after manufacture.

3.5.2.2 Circular Ductwork

Longitudinal seams and transverse joints for circular ductwork shall be according to SANS 1238, Section 7.

3.5.3 The hanging and supporting of ductwork

Hangers and supports for rectangular and circular ductwork with no insulation shall comply with SANS 10173, Section 5.3 Ductwork with no vapour barrier. The hanger and support types used for ducting with insulation may be used.

3.5.4 Flexible ducting

Flexible ducting shall comply with the requirements as set out in SANS 10173, Section 5.7. Flexible ducting shall be proprietary manufactured with a fire rating to SABS 0177 Part 3 Class 1. The flexible ducting shall have an adequate working pressure and temperature range to suit the application of the installation.

Flexible ducting shall at all times be kept to a length not exceeding 1.5 m. Flexible ducting shall not have more than the equivalent of one 90o bend and bends shall be of maximum possible radius. Flexible ducting shall be supported with sufficient and correct brackets that will ensure maintenance of shape.

Flexible ducting shall be provided between air terminals, diffusers and all locations as indicated on the project drawings.

The inner core shall be of aluminium laminate with a heavy-duty steel helix core.

3.5.5 Testing of ductwork

All ducting shall be leak tested in accordance with SANS 10173, Section 4.3. No ducting shall have leakage rates in excess of 5 % of the required air flow rate in any section of ductwork or in excess of the SANS permissible leakage rates, whichever is the smallest.

3.5.6 Air terminals and dampers

3.5.6.1 General

Where selected by the Contractor, air diffusion equipment shall be selected in accordance with the manufacturer's recommendations, capable of passing the specified air quantity at the appropriate throw without creating excessive resistance, noise or local draughts. All air diffusing equipment shall be capable of meeting the NC level requirements, as specified in Section 2, for the space environment where the equipment is installed.

In all instances where spigot boxes (plenums) are used for the connection of air diffusion equipment, the inside surfaces shall be painted black to prevent visibility of the internal surface from ground level.

During commissioning of the system, each grille, diffuser, valve etc. shall be set to deliver the specified air quantity. It is the Contractor's responsibility to check regenerated noise levels of grilles offered against the overall acoustic performance of the system required. Noisy grilles that exceed the NC level requirements of the given space shall be replaced at the Contractor's expense with more suitable types.

3.5.6.2 Door and transfer grilles

Transfer air grilles shall be complete with fixed curved blades and outer frame on both sides of the wall or partition. Transfer air grilles shall be of aluminium extruded type, naturally anodised or epoxy powder coated to a colour as specified by the Engineer. Openings in walls where transfer grilles are to be installed shall be provided by the Building Contractor.

Door air grilles shall be installed in wooden doors only. In cases where steel and glass doors are used, transfer grilles or transfer ducting as an alternative shall be installed. Door air grilles shall be of the chevron-blade type. Door air grilles shall be manufactured from extruded type 505 anodised aluminium, naturally anodised or epoxy powder coated to a colour as specified by the Engineer.

Transfer ducting shall comprise galvanised sheet metal ducting and aluminium curved blade intake and outlet transfer grilles. Flexible ducting shall not be used as transfer ducting.

3.5.6.3 Weather louvers

Weather louvers shall be manufactured from extruded aluminium sections and finished in a colour as approved by the Engineer. Louvers shall be of the Europair type WL or other approved.

Weather louvers shall be constructed with drip edges to blades and rigid frames to enable building in.

Weather louvers shall be watertight and shall prevent the entrainment of raindrops at a face velocity of up to 3 m/s.

Galvanized expanded metal or wire mesh screens with 12 mm opening sizes shall be fitted behind the blades of each weather louver.

Top and bottom blades shall be fitted flush with the frame and be smooth without grooves, channels or recess where dirt or water can collect.

The free area through the louver available for airflow shall be a minimum of 65 % of the nominal area of the louver.

3.5.6.4 Supply air grilles and diffusers

Where Europair type SD or DD grilles are specified on the project drawings, the supply air grilles shall be manufactured of extruded type 50S anodising grade aluminium and shall be provided with opposed blade volume control dampers, unless specified otherwise on the project drawings. Volume control dampers fitted with supply air grilles shall conform to SANS 1238, section 6.5 requirements. The blades shall be adjustable from the front of the grille.

Where Europair type CD ceiling diffusers are specified on the project drawings, diffusers shall be manufactured from extruded type 50S aluminium, naturally anodised or epoxy powder coated to a colour as specified by the engineer. Europair type CD ceiling diffusers shall be complete with an opposed blade damper, plenum box with spigot and ceiling plate. CD type diffusers shall have a standard flat frame with blade spacing and distribution pattern as indicated on the standard drawings.

Where Europair type FGR diffusers are specified on the project drawings, diffusers shall be manufactured from fibre glass matt and approved SABS fire retardant resin painted to a colour as approved by the Engineer. The face plate shall be adjustable for air balancing

Where Europair type CVD and CCVD diffusers are specified on the project drawings, diffusers shall be manufactured from steel and powder coated to a colour as specified by the Engineer. Diffusers shall be equipped with a locking bracket to lock the adjustable radial disc once the system has been balanced.

Diffusers shall be installed at the locations were indicated on the project drawings. The Contractor shall install insulated flexible ducting of length not exceeding 1.5 m and of the same diameter as the diffuser, extending from the supply duct to the diffuser. Spigots shall be attached to the ducting and sealed with silicon sealer around the outer perimeter of the joint. Flexible ducting shall be strapped to the diffuser and spigots with steel straps to form an airtight connection.

Alternatively, where indicated on the project drawings, diffusers shall be 'hard' connected to ducting with rivets or taper screws and sealed with silicone sealer to form an airtight connection. All diffusers shall be capable of meeting the discharge pattern and throw requirement as set out on the project drawings.

3.5.6.5 Exhaust disc valves

Disc valves shall be supplied and installed in the ceilings of the ablution areas and connected to the extract ducts by means of sheet metal spigots and flexible ducting.

The disc valves shall consist of a ring and central disc, which when rotated shall adjust the volume through the outlet. During commissioning of the system, each disc valve shall be set to exhaust the specified air quantity.

Disc valves in ceilings shall be of the polypropylene type, in a finish to match the ceiling colour. The valves shall be of the Europair DVK type or other approved.

3.5.6.6 Volume control dampers

Volume control dampers shall be installed in branch ducting to ensure a balanced air flow to all duct sections.

Damper blades, links and damper frames shall be of rigid construction and manufactured from galvanised steel. Dampers shall comply with SANS 1238.

Dampers for positive volume control purposes shall be manual or electric actuator driven as specified. Dampers shall be of the link or gear type.

A manually adjustable damper shall be fitted with an external adjusting lever in an accessible position. The lever shall be mounted on a square shaft and fitted with a locking mechanism that clearly indicates the current position of the blade. 'OPEN', 'CLOSED' and 'OPERATING POSITION' shall also be clearly marked on each damper.

The inside cross-sectional area of the damper shall be equal to that of the connecting ductwork and shall conform to the same standards of airtightness as the rest of the ductwork system. The damper shall be fitted to the ducting in which it is installed by means of a flanged connection.

Dampers creating unacceptable vibrations and noise levels will be rejected and will need to be replaced at the Contractor's expense.

Multi-vane control dampers shall be of the opposed blade type.

3.5.6.7 Fire dampers

Fire dampers shall be installed where indicated on the drawings.

Fire/smoke control dampers shall comply with SABS 193 as amended and shall be SABS marked with proven low leakage in the closed position.

Fire dampers shall be flanged both sides, and an access panel shall be provided in ducting at each fire damper, preferably on the upstream side of the damper.

Fire damper markings shall be as follows:

- a) Manufacturer's name or trade name or trademark.
- b) Fire resistance rating, in hours.
- c) Vital instructions regarding installation, direction of airflow, mounting position.

The open or closed status of the damper shall be clearly indicated outside the casing for inspection purposes.

Fire dampers shall have at least a two-hour resistance rating when tested in accordance with SABS 193.

Fire dampers shall be fusible link operated.

Labels shall be installed on the ceiling grid below all fire dampers indicated their positions and reading: 'Fire damper above'.

Dampers shall be sized so that the nominal free air area when in the open position is not less than the connected duct free air area.

Fire dampers shall be installed according to the manufacturers and SABS requirements and recommendations.

Fire dampers shall be installed so as to form part of a continuous barrier to passage of fire when in a closed position. Where a fire damper cannot be fitted immediately adjacent to the fire wall, the section of ducting between the damper and the wall shall be of at least the same metal thickness and fire rating as the damper casing.

Dampers shall be self-supporting in case of duct destruction due to heat. Care shall be exercised that the supporting frame be installed so that the closing device is accessible.

Sheet metal sleeves shall be provided for housing the fire dampers where fire dampers are mounted in walls. These sleeves shall be built into the walls by the building contractor. Retaining angles shall be installed on the four sides of the fire damper sleeve on both sides of the wall. The angles shall be fastened to the sleeves only, and not to the wall. The retaining angles shall lap the masonry by a minimum of 25 mm around the entire opening. Recommended minimum angle sizes are:

LARGEST DIMENSION OF FIRE DAMPER	ANGLES
Up to 1 200 mm	38 x 38 x 3.2 mm
1 200 mm to 1 800 mm	44 x 44 x 2 mm
Over 1 800 mm	51 x 51 x 4.8 mm

Clearance shall be provided between the sleeve and the masonry opening on the top and at the sides of the fire damper to allow for expansion. Allow a gap of 1 mm for each 100 mm of sleeve width or depth, but the gap shall not exceed 15 mm.

All fixing and installation materials, i.e., bolts and nuts, rawl-bolts and mortar works shall be as per fire damper manufacturer's specification and shall not affect the fire rating of the fire damper installation. Combustible materials such as plastic or similar rawl-bolts and plugs are not permitted.

3.5.6.8 Fume extraction arms

Fume extraction arms specifically designed for working environments with fumes, vapours or non-explosive dust shall be installed as indicated on the drawings.

Arms shall be fitted with dampers in their hoods as standard to control the air flow and must be able to completely shut off the air flow when in the closed position.

The fume extraction arms shall have the following features:

- 360° rotation of the arm
- Flexibility in all directions to ensure easy positioning of the hood
- Hood that can be tilted in all directions
- 3 m reach.

Where indicated on the drawings, the fume extraction arms shall be connected to a central ducting system. Arms shall be appropriately mounted 2400 AFFL to connect to the central duct while allowing for enough space to swivel and move the arm about. Installation of these arms shall be strictly according to manufacturer's requirements.

Fume extraction arms shall be Original Niederman Extraction arms or approved equal.

3.5.6.9 Sliding gate valves

Where indicated on the drawings at the dust extraction system, sliding gate valves will be installed at the connection to each extraction point on the wood working machinery.

Valves shall be of the industrial type specifically for use with wood dust extraction systems.

3.5.6.10 Non-return Dampers

Non-return damper-type cowls shall be installed where indicated on the drawings, NRD1 and NRD2.

Cowls shall close under gravity when fans are switched off and will keep water from entering the building.

3.6 AIR FILTERS

3.6.1 General

Air filters of the make, type and size as specified on the drawings shall be installed.

Filters installed close to exposed air inlets, shall be protected by means of weather louvers and wire mesh screens.

Filter holding frames shall be of approved manufacturer with standardized dimensions to enable replacement with equivalent filters of all recognized manufacturers.

Construction and manufacture of all components shall be such that under no circumstances any un-filtered air can by-pass filters or filter banks.

Sufficient space shall be allowed in front or behind filters, to enable inspection and servicing.

3.6.2 Filter media

Washable filter media shall be fitted behind hinged return air grilles were indicated on the project drawings. The filter media shall be of the Peter McLeod PM 100 type, 100 grams/m² density and 5 mm thick. The filter media shall be of the synthetic type and shall be capable of arresting lint of the return air. The filter media shall fit and extend past the outer perimeter of the wire mesh in the return air grille such that the bypass of unfiltered air is avoided. The filter media shall be fireproof. Glass fibre filter media type shall not be acceptable.

3.6.3 Primary pleated filter

Primary filters shall be of the 50 mm pleated washable panel type and of the Peter McLeod Manufacture or approved equal. The media shall be synthetic and shall be of the self-supporting type. The media shall fit into and extend to seal all round in the panel frame to ensure that no air bypasses the media. The filter outer panel frame shall be of galvanised steel.

All filter accessories, including the channel filter holding frames and clips, shall be standard products of the filter manufacturer. Filter holding frames shall be manufactured from galvanised steel. Filter holding frames shall be bolted or riveted together, where necessary, and shall be suitably reinforced in larger arrangements to withstand all possible operating conditions. An airtight seal shall be provided where filter holding frames are joined together. All metal parts shall be sufficiently protected against corrosion.

Primary filter panels shall fit into channel holding frames with sealing gaskets located between filter panel and channel holding frame. Where the channel holding frames are located on the downstream side of the filter, at least two spring loaded clips shall be used to ensure a positive seal against the edge gaskets and to keep filter panel in place. Where the channel holding frames are located at the upstream side of the filter, at least four spring loaded clips shall be used. All clips shall be from stainless steel.

The primary filter shall be of filtration class G3 and have an average ASHRAE arrestance of 90 %, SABS tested. The dust holding capacity shall not be less than 150 g per square metre. The initial (clean) and final (dirty) resistance of the filter shall be 65 Pa and 250 Pa respectively. The above-mentioned features shall be based on a rated face velocity of 2.5 m/s.

3.7 SOUND ATTENUATORS

All fans shall be fitted with attenuators such that room noise levels comply with industry standards.

Where attenuators are selected by the Contractor, the attenuator shall be selected such that the pressure drop on both suction, and discharge attenuators are minimized whilst meeting the noise level attenuation performance levels as required.

Where in-line mixed-flow fans are installed, Donkin Sonex tubular sound attenuators shall be used or equally approved. These attenuators shall comprise tubular liner manufactured

from galvanised mesh, a thick layer of mineral wool sound absorbing material and galvanised sheet steel casing with end plates.

Where in-line centrifugal Donkin VFC fans are installed, proprietary manufactured rectangular attenuators shall be used. Where Nicotra fans are used, Donkin series PGL attenuators shall be used or equally approved. Attenuator sizes shall be such that the combined pressure loss of both suction and discharge attenuators do not exceed 60 Pa.

Where in-line axial flow Donkin Majax-2 fans are used, Donkin Silax or Silax-P cylindrical attenuators shall be used or equally approved. These attenuators shall have casings constructed from pre-galvanised steel sheet, glass fibre absorbing material and a 1.6 mm thick pre-galvanised wire mesh to retain the acoustic material. Where Silax-P attenuators are used, actuators shall have an acoustic pod constructed from pre-galvanised wire mesh and filled with fibre glass acoustic material. The acoustic material shall meet BS 476: Part 7, Class 1 spread of flame requirements.

3.8 ELECTRICAL

The Contractor shall provide an isolator within 1 m from the ventilation fans. The Mechanical Contractor shall do the entire electrical installation including from the isolator to the fans.

Where ventilation fans are required to be interlocked with air conditioning units, the Mechanical Contractor shall provide a control DB-board as indicated on the project drawings. The Electrical Contractor shall do all wiring to the control DB-board. The Mechanical Contractor shall do the entire electrical installation from control DB-board to the corresponding AC units and ventilation fans.

3.9 CONTROL

Generally, ventilation fans shall be supplied with a 24-hour, 7-day timer or shall be switched on/off with the light switch, whichever the case; the mechanical contractor shall be responsible for the supply and wiring of the necessary equipment.

Where fans are required to be interlocked with air conditioning units, the mechanical contractor shall provide the control DB with the necessary relays and control equipment. The ventilation fan shall switch on and off with the corresponding air conditioning unit. The control panel shall be labelled as indicated on the project drawing.

Fans serving the fume extraction arms, EAF6, shall have a main switch, that is clearly marked, at the area served fitted 1550 AFFL on the inside of the wall closest to the fan located outside.

Smoke extraction fans shall be interconnected with the smoke detection system, (by others) allowing start-up when smoke is detected.

3.10 OPERATION IN THE EVENT OF A FIRE

All ventilation fans shall, upon receiving a signal from the fire detection system, switch-off. In the event of a fire, the smoke extraction fans, SEF01 and SEF02, will upon receiving a signal from the smoke extraction system, switch on.

The Mechanical Contractor shall allow for this function in the interlocking control DB boards

PART 4: CENTRIFUGAL PUMPS

1.1 uPVC PIPES

All uPVC pipes will be in accordance with SABS 966 of 1976, as amended. All rubber sealing rings will be in accordance with SABS 974 of 1976, as amended.

The class of the pipes will be as indicated in the schedules. Where a specified class is not available the next higher class must be used.

All the pipework will be complete with all the necessary bends and couplings. All pipes and bends will be solid, crack free and without any weak spots, distortions and damaged ends. Furthermore, the pipes will be free of foreign substances and will be in a clean condition for immediate use.

1.2 Pipe Connections

All recirculation uPVC pipework and uPVC pipework conveying water chlorinated at the swimming pool, shall be solvent-welded to the following specification.

The pipes shall be laid in the trench well before jointing takes place to allow the pipes to conform to the ambient temperature in the trench.

The joints shall be thoroughly cleaned internally and externally where after the mating surfaces are lightly abraded with fine emery paper.

The surfaces are then again cleaned and thereafter thoroughly degreased with MEK or equivalent cleaning fluid.

A coat of Suprador Solvent Cement or other adhesive approved by the supplier of the uPVC pipes is then spread liberally and evenly over the spigot end of the pipe AND inside the socket, using a CLEAN BRUSH.

The socket and spigot joint shall be assembled as quickly as possible after the commencement of the application of the adhesive, but well within 60 seconds.

The assembly shall be held together for not less than 5 minutes. The joint shall thereafter not be disturbed for at least 30 minutes and the line shall not be tested before 24 hours after the last joint has been made.

Pipes in trenches, shall be positioned centrally to allow for FREE movement due to expansion and contraction of the pipe while exposed to the sun.

The pipes shall not be backfilled until they have cooled down. If necessary, the pipes may be filled with tap water to cool them down.

Jointing shall be carried out under shade to prevent too early setting of the applied adhesive.

All joints shall remain exposed until the pressure testing has been completed while the balance of the pipework is backfilled as specified above.

All artisans to be employed in the jointing of uPVC pipes, shall supply proof of previous experience in the solvent-welded jointing of pipes larger than 110mm diameter.

1.3 PUMPS

1.3.1 GENERAL

All installed pumps will comply with the general project specification supplied in this document. If any alternative designs or types are used the Contractor will provide the Engineer with a full breakdown and performance characteristics for approval by the Engineer. All pumps shall be of the Eartheco brand or equal and approved alternative.

1.3.2 FILTRATION PUMPS

The Contractor will supply and install new pumps to service the filtration system. The pumps will each match the requirements stated and will conform to the standard project specification included in this document.

1.3.3 REQUIREMENTS

The minimum requirements for each of the filtration pumps are as follows:

PUMP REFERENCE NUMBER	PUMP SIZE
CIRC01	150 l/s
CIRC02	200 l/s
CIRC03	5500 l/s

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	<u>BILL NO. 1</u>				
	<u>PRELIMINARY ITEMS</u>				
	Allow for all preliminary and general items for this project, but excluding items priced elsewhere in these Bills (These amounts will be paid <i>pro rata</i> to the rest of the amounts claimed by the contractor, relative to the tender amount)				
1.	<u>CONTRACTUAL REQUIREMENTS</u>				
	Tenderers to allow for compliance with all the conditions of contract (Refer to main contract)	Item	Sum		
2.	<u>JOINT TRADES</u>				
	Tenderers to allow for all costs which may be required in order to co-ordinate and liaise with the other Trade Contractors required, especially with the electrical contractor	Item	Sum		
3.	<u>SUPERVISOR</u>				
	Tenderers to allow for a full time working supervisor during the duration of the contract, who shall have the delegated authority to receive instructions and make decisions regarding this contract	Item	Sum		
4.	<u>SITE ESTABLISHMENT</u>				
	Tenderers to allow for all costs which may be required in order to place the necessary facilities on site for safe storage and orderly management purposes for the duration of the contract	Item	Sum		
5.	<u>REMOVAL OF WASTE</u>				
	Tenderers to allow for all costs associated with cleaning the site of all rubbish and waste caused by this contract	Item	Sum		
6	<u>GENERAL ITEMS</u>				
	Any additional items that the Tenderer deems necessary for the successful and total completion of the portion of the work required for this Bill. Specify:				
(a)	Transport	Item	Sum		
(b)	Compliance with Health and Safety Requirements	Item	Sum		
(c)	Project Management	Item	Sum		
TOTAL FOR BILL NO.1: Preliminaries (Carried forward to Summary)					

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	BILL NO. 1				
	AIR CONDITIONING INSTALLATION DUKU DUKU				
	For the complete supply, delivery, installation, testing, commissioning and handing over of the following in terms of the air-conditioning specification				
1.	SPLIT UNITS				
1.1	Supply and delivery in accordance with the detailed specification incl installation, electrical connections, drain piping, drain pumps, brackets, condenser and commissioning of the following inverter split R410a equipment:				
1.2	Samsung or equal and approved CEILING CONCEALED MSP HIDEAWAY UNIT HEAT PUMP, Cooling Capacity 16kW	No	3		
2	REFRIGERANT PIPING				
2.1	For the supply, delivery to site, installation and connection of the following insulated copper <u>refrigeration piping</u> , measured in pairs (liquid pipe size / gas pipe size), including supports, sockets and bends: installed on cable trays				
	ø9.52mm	m	30		
	ø19.05mm	m	30		
4.	DRAIN PIPING				
4.1	For the supply, delivery to site, installation following <u>uPVC class 6</u> condensate drain piping, installed on galvanized wired mesh light duty cable tray including all tees and elbows:				
	Piping				
	25mm	m	15		
	32mm	m	10		
	50mm	m	10		
4.2	For the supply, delivery to site, installation and connection of the following equipment for condensate drains:				
	Connection to drain socket with 'p-traps'	No	3		
	Insulation for each unit	No	3		
5	TRUNKING:				
5.1	For the supply, delivery to site and complete installation of <u>galvanized wired mesh light duty cable trays</u> according to the specification, including hangers and brackets, complete with tees and bends:				
	Cable Trays	m	15		
5.2	For the supply, delivery to site and complete installation of <u>galvanized sheet metal trunking</u> , etched and primed for painting, including hangers and brackets, complete with tees and bends:				
	Cable Trays	m	15		
6	For the Supply, Delivery to Site and Complete Installation and Connection of all Wiring installed on light duty cable trays:				
	Control Wiring	Sum	1		
	Power Wiring	Sum	1		
	Amount carried forward				

Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	Amount brought forward				
7	For the Supply, Delivery to Site, Installation and Connection of the following Remote Controllers				
	Simple Wired Touch Controller	No	3		
8	For the Complete Pressure Testing, Purging and Charging with refrigerant of the following Split Systems:				
	Samsung or equal and approved CEILING CONCEALED MSP HIDEAWAY UNIT HEAT PUMP, Cooling Capacity 16kW	No	3		
TOTAL FOR BILL NO.2: Air Conditioning Installation DUKU DUKU (Carried forward to Summary)					

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	BILL NO. 3				
	DUKU DUKU DUCTING				
	DUCTWORK FOR HIDEAWAY & VENTILATION SYSTEMS DUKU DUKU				
	For the complete supply, delivery, installation, testing, commissioning and handing over of the following in terms of the air-conditioning specification				
1	For the supply, delivery to site, complete installation, commissioning and balancing of the following INTERNALLY <u>insulated</u> ducting, complete with all brackets, mountings connections and fastners.				
1.1	SUPPLY AIR DUCTING				
	ROUND SPIRAL DUCTING				
	250ø	m	36		
	350ø	m	12		
	400ø	m	12		
	450ø	m	6		
	SUPPLY AIR DUCT FITTINGS				
	Plenum Box				
	TO SUIT CEILING CONCEALED MSP HIDEAWAY UNIT HEAT PUMP, Cooling Capacity 16kW	No	3		
	END CAP - ROUND				
	350ø	No	3		
	Round Galvanised Spigot				
	350ø-250ø	No	6		
	400ø-250ø	No	6		
	450ø-250ø	No	6		
	Round Transition Piece				
	400ø-350ø	No	3		
	450ø-400ø	No	3		
	DUCT ACCESSORIES SCHEDULE				
	HAND LOCKABLE DAMPER				
	ø250	No	18		
	AIR TERMINALS INCL 1.5M FLEX DUCTING				
	ROUND FLOW SWIRL DIFFUSERS				
	Ø600 (Ø200 SPIGOT)	No	18		
	RETURN AIR DUCTING				
	RETURN AIR DUCT FITTINGS				
	Plenum Box				
	TO SUIT CEILING CONCEALED MSP HIDEAWAY UNIT HEAT PUMP, Cooling Capacity 16kW (RETURN & FRESH AIR)	No	3		
	DUCT ACCESSORIES SCHEDULE				
	AIR TERMINALS INCL 1.5M FLEX DUCTING				
	Return Air Egg Crate Grille				
	1200x600 (2Xø250 SPIGOT)	No	3		
	For the complete supply, delivery, installation, testing, commissioning and handing over of the following in terms of the air-conditioning specification				
	For the supply, delivery to site, complete installation, commissioning and balancing of the following Uninsulated ducting, complete with all brackets, mountings connections and fastners.				
	FRESH AIR SUPPLY AIR DUCTING				
	ROUND SPIRAL DUCTING				
	250ø	m	24		
	350ø	m	12		
	400ø	m	5		
	Amount carried forward				

Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	Amount brought forward				
	RETANGULAR FLANGED DUCTING				
	500X350	m	3		
	SUPPLY AIR DUCT FITTINGS				
	END CAP - ROUND				
	250ø	No	1		
	Rectangular-to-Round Piece				
	500X350-400ø	No	1		
	Round Bend				
	250ø-250ø	No	2		
	Round Galvanised Spigot				
	250ø-250ø	No	1		
	350ø-250ø	No	1		
	400ø-250ø	No	1		
	Round Transition Piece				
	350ø-250ø	No	1		
	400ø-350ø	No	1		
	DUCT ACCESSORIES SCHEDULE				
	HAND LOCKABLE DAMPER				
	ø250	No	3		
	WEATHER LOUVRE INCL VERMIN SCREEN				
	500X350	No	1		
	Supply, delivery in accordance with the detailed specification incl installation, Filters, electrical connections, attenuators, brackets and commissioning of the following axial Fans:				
	FRESH AIR VENTILLATION FANS incl FA FILTERS AND PLENUM				
	ø400 450l/s @ 250pa 1440rpm	No	1		
	EXTRACTION AIR DUCTING				
	ROUND SPIRAL DUCTING				
	100ø	m	15		
	150ø	m	4		
	200ø	m	4		
	300ø	m	3		
	EXTRACTION AIR DUCT FITTINGS				
	Round Bend				
	100ø-100ø	No	1		
	Round Galvanised Spigot				
	100ø-100ø	No	3		
	150ø-100ø	No	2		
	200ø-100ø	No	2		
	200ø-150ø	No	1		
	300ø-150ø	No	1		
	300ø-100ø	No	1		
	Round Transition Piece				
	150ø-100ø	No	2		
	300ø-200ø	No	1		
	Amount carried forward				

Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	Amount brought forward				
	DUCT ACCESSORIES SCHEDULE				
	AIR TERMINALS INCL 1.5M FLEX DUCTING				
	EXTRACTION DISC VALVE				
	Ø150 (Ø150 SPIGOT)	No	8		
	WEATHER LOUVRE INCL VERMIN SCREEN				
	250X250	No	1		
	Supply, delivery in accordance with the detailed specification icnl installation, Filters, electrical connections,attenuators, brackets and commissioning of the following axial Fans:				
	EXTRACTION VENTILLATION FAN				
	ø250 200l/s @ 150pa 1440rpm	No	1		
TOTAL FOR BILL NO.3: Ducting DUKU DUKU (Carried forward to Summary)					

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	BILL NO. 4				
	DUKU DUKU REFRIGERATION INSTALLATION				
	For the complete supply, delivery, installation, testing, commissioning and handing over of the following				
1	REFRIGERATION SYSTEM				
1.1	Blower Coil Units				
	For the Supply, delivery to site and installation of the following Blower Coil units complete with electrical heaters, motorized valves, condensate pumps,including all piping, hangers, brackets and electrical connections balancing testing and commissioning of the following Blower Coil units:				
	Heating Centre HSe302-1CNN0A 4.3kWR or equal and approved: Design Room Temperature:5°C	No	1		
1.2	Condenser Units				
	For the Supply, delivery to site and installation of the following Condenser units, including all piping, hangers, brackets, Thermal Expansion Valves, Solenoid, P-Trap and electrical connections balancing testing and commissioning of the following Condenser units:				
	Heating Centre HCHD_ZB19_2A40_T 4.3kWR or equal and approved: Design Room Temperature:5°C	No	1		
1.3	Electrical Enclosure Incl Switchgear and thermostats for the above	Sum	1		
1.4	Insulated Refrigerant Pipework measured in pairs to suit	m	30		
1.5	TRUNKING:				
	For the supply, delivery to site and complete installation of <u>galvanized wired mesh light duty cable trays</u> , including hangers and brackets:				
	Cable Trays	m	30		
	Bends	No	10		
	Tees	No	5		
1.6	For the Supply, Delivery to Site and Complete Installation and Connection of all Control Wiring installed on light duty cable trays:				
	Wiring	m	30		
1.7	For the Supply, Delivery to Site, Installation and Connection of the following Remote Controllers				
	Wired Controller or Similar Approved	No	1		
TOTAL FOR BILL NO.4: Duku Duku Refrigeration Installation (Carried forward to Summary)					

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	BILL NO. 5				
	AIR CONDITIONING INSTALLATION FLAMMINGO				
	For the complete supply, delivery, installation, testing, commissioning and handing over of the following in terms of the air-conditioning specification				
1.	SPLIT UNITS				
1.1	Supply and delivery in accordance with the detailed specification incl installation, electrical connections, drain piping, drain pumps, brackets, condensner and commissioning of the following inverter split R410a equipment:				
1.2	Samsung or equal and approved DX Split Mid Wall Unit, Cooling Capacity 3.6kW	No	2		
	Samsung or equal and approved DX Split Mid Wall Unit, Cooling Capacity 7.1kW	No	1		
2	REFRIGERANT PIPING				
2.1	For the supply, delivery to site, installation and connection of the following insulated copper <u>refrigeration piping</u> , measured in pairs (liquid pipe size / gas pipe size), including supports, sockets and bends: installed on cable trays				
	ø6.00mm	m	24		
	ø9.52mm	m	16		
	ø16.00mm	m	8		
4.	DRAIN PIPING				
4.1	For the supply, delivery to site, installation following uPVC class 6 condensate drain piping, installed on galvanized wired mesh light duty cable tray including all tees and elbows:				
	Piping 25mm	m	25		
4.2	For the supply, delivery to site, installation and connection of the following equipment for condensate drains:				
	Connection to drain socket with 'p-traps'	No	3		
	Insulation for each unit	No	3		
5	TRUNKING:				
5.1	For the supply, delivery to site and complete installation of <u>galvanized wired mesh light duty cable trays</u> according to the specification, including hangers and brackets, complete with tees and bends:				
	Cable Trays	m	24		
5.2	For the supply, delivery to site and complete installation of <u>galvanized sheet metal trunking</u> ,etched and primed for painting. including hangers and brackets, complete with tees and bends:				
	Cable Trays	m	15		
6	For the Supply, Delivery to Site and Complete Installation and Connection of all Wiring installed on light duty cable trays:				
	Control Wiring	Sum	1		
	Power Wiring	Sum	1		
7	For the Supply, Delivery to Site, Installation and Connection of the following Remote Controllers				
	Simple Wired Touch Controller	No	3		
8	For the Complete Pressure Testing, Purging and Charging with refrigerant of the following Split Systems:				
	Samsung or equal and approved DX Split Mid Wall Unit, Cooling Capacity 3.6kW	No	2		
	Samsung or equal and approved DX Split Mid Wall Unit, Cooling Capacity 7.1kW	No	1		
TOTAL FOR BILL NO.5: Flammigo Air Conditioning Installation(Carried forward to Summary)					

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	BILL NO. 6				
	FLAMMINGO DUCTING				
	DUCTWORK FOR HIDEAWAY & VENTILATION SYSTEMS DUKU DUKU				
	For the complete supply, delivery, installation, testing, commissioning and handing over of the following in terms of the air-conditioning specification				
	For the supply, delivery to site, complete installation, commissioning and balancing of the following INTERNALLY <u>insulated</u> ducting, complete with all brackets, mountings connections and fastners.				
	FRESH AIR SUPPLY AIR DUCTING				
	ROUND SPIRAL DUCTING				
	100ø	m	6		
	150ø	m	8		
	SUPPLY AIR DUCT FITTINGS				
	Round Bend				
	150ø-150ø	No	1		
	Round Galvanised Spigot				
	150ø-100ø	No	1		
	Round Transition Piece				
	150ø-100ø	No	1		
	DUCT ACCESSORIES SCHEDULE				
	AIR TERMINALS INCL 1.5M FLEX DUCTING				
	FRESH AIR DISC VALVE				
	Ø150 (Ø100 SPIGOT)	No	2		
	WEATHER LOUVRE INCL VERMIN SCREEN				
	150X150	No	1		
	Supply, delivery in accordance with the detailed specification icnl installation, Filters, electrical connections,attenuators, brackets and commissioning of the following axial Fans:				
	FRESH AIR VENTILLATION FANS incl FA FILTERS AND PLENUM				
	ø150 40l/s @ 250pa 1440rpm	No	1		
	EXTRACTION AIR DUCTING				
	ROUND SPIRAL DUCTING				
	100ø	m	18		
	150ø	m	8		
	200ø	m	4		
	250ø	m	6		
	EXTRACTION AIR DUCT FITTINGS				
	Round Galvanised Spigot				
	100ø-100ø	No	3		
	150ø-100ø	No	2		
	200ø-100ø	No	1		
	250ø-200ø	No	1		
	Round Transition Piece				
	150ø-100ø	No	2		
	200ø-150ø	No	1		
	250ø-150ø	No	1		
	DUCT ACCESSORIES SCHEDULE				
	AIR TERMINALS INCL 1.5M FLEX DUCTING				
	EXTRACTION DISC VALVE				
	Ø150 (Ø150 SPIGOT)	No	6		
	WEATHER LOUVRE INCL VERMIN SCREEN				
	250X250	No	1		
	Supply, delivery in accordance with the detailed specification icnl installation, Filters, electrical connections,attenuators, brackets and commissioning of the following axial Fans:				
	EXTRACTION VENTILLATION FAN				
	ø250 150l/s @ 150pa 1440rpm	No	1		
TOTAL FOR BILL NO.6: Ducting Flammingo (Carried forward to Summary)					

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	BILL NO. 7				
	FLAMMINGO REFRIGERATION INSTALLATION				
	For the complete supply, delivery, installation, testing, commissioning and handing over of the following				
1	REFRIGERATION SYSTEM				
1.1	Blower Coil Units				
	For the Supply, delivery to site and installation of the following Blower Coil units complete with electrical heaters, motorized valves, condensate pumps, including all piping, hangers, brackets and electrical connections balancing testing and commissioning of the following Blower Coil units:				
	Heating Centre HSe302-1DNN0A 5.7kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	No	1		
	Heating Centre HSe302-1ENN0A 6.4kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	No	1		
	Heating Centre HSe302-1DNN0A 5.8kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	No	1		
	Heating Centre HSe303-1DWE0A 6.8kW or equal and approved: Design Room Temperature:-18°C (Or Equal & Approved)	No	1		
	Heating Centre HSe302-1EWE0A 4.6kW or equal and approved: Design Room Temperature:-18°C (Or Equal & Approved)	No	1		
1.2	Condenser Units				
	For the Supply, delivery to site and installation of the following Condenser units, including all piping, hangers, brackets, Thermal Expansion Valves, Solenoid, P-Trap and electrical connections balancing testing and commissioning of the following Condenser units:				
	Heating Centre HCHD_ZB21_2A40_T 5.7kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	No	1		
	Heating Centre HCHD_ZB26_2A50_T 6.4kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	No	1		
	Heating Centre HCHD_ZB21_2A40_T 5.8kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	No	1		
	Heating Centre HCHD_ZF25_3A50_T 6.8kW or equal and approved: Design Room Temperature:-18°C (Or Equal & Approved)	No	1		
	Heating Centre HCHD_TAG2525Z_2A50_T 4.6kW or equal and approved: Design Room Temperature:-18°C (Or Equal & Approved)	No	1		
1.3	Electrical Enclosure Incl Switchgear and thermostats				
	Heating Centre HCHD_ZB21_2A40_T 5.7kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	No	1		
	Heating Centre HCHD_ZB26_2A50_T 6.4kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	No	1		
	Heating Centre HCHD_ZB21_2A40_T 5.8kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	No	1		
	Heating Centre HCHD_ZF25_3A50_T 6.8kW or equal and approved: Design Room Temperature:-18°C (Or Equal & Approved)	No	1		
	Heating Centre HCHD_TAG2525Z_2A50_T 4.6kW or equal and approved: Design Room Temperature:-18°C (Or Equal & Approved)	No	1		
1.4	Insulated Refrigerant Pipework measured in pairs to suit				
	Heating Centre HCHD_ZB21_2A40_T 5.7kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	m	25		
	Heating Centre HCHD_ZB26_2A50_T 6.4kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	m	25		
	Heating Centre HCHD_ZB21_2A40_T 5.8kW or equal and approved: Design Room Temperature:5°C (Or Equal & Approved)	m	25		
	Heating Centre HCHD_ZF25_3A50_T 6.8kW or equal and approved: Design Room Temperature:-18°C (Or Equal & Approved)	m	25		
	Heating Centre HCHD_TAG2525Z_2A50_T 4.6kW or equal and approved: Design Room Temperature:-18°C (Or Equal & Approved)	m	25		
	Amount carried forward				

Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	Amount brought forward				
1.5	TRUNKING:				
	For the supply, delivery to site and complete installation of <u>galvanized wired mesh light duty cable trays</u> , including hangers and brackets:				
	Cable Trays	m	125		
	Bends	No	65		
	Tees	No	25		
1.6	For the Supply, Delivery to Site and Complete Installation and Connection of all Control Wiring installed on light duty cable trays:				
	Wiring	Sum	1		
1.7	For the Supply, Delivery to Site, Installation and Connection of the following Remote Controllers				
	Wired Controller or Similar Approved	No	5		
TOTAL FOR BILL NO.7: Flamingo Refrigeration Installation (Carried forward to Summary)					

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	BILL NO. 8 Aquarium Ventilation				
	For the complete supply, delivery, installation, testing, commissioning and handing over of the following in terms of the air-conditioning specification				
	For the supply, delivery to site, complete installation, commissioning and balancing of the following Un-insulated ducting, complete with all brackets, mountings connections and fastners.				
	EXTRACTION AIR DUCTING				
	Rectangular Duct Work				
	850x500	m	10		
	Rectangular Bends				
	850x500	No	1		
	DUCT ACCESSORIES SCHEDULE				
	AIR TERMINALS INCL 1.5M FLEX DUCTING				
	EXTRACTION DISC VALVE				
	Ø150 (Ø150 SPIGOT)	No	6		
	WEATHER LOUVRE INCL VERMIN SCREEN				
	3000x500	No	2		
	Supply, delivery in accordance with the detailed specification icnl installation, Filters, electrical connections,attenuators, brackets and commissioning of the following axial Fans:				
	EXTRACTION VENTILLATION FAN				
	11kW 5500l/s @ 200pa	No	1		
TOTAL FOR BILL NO.8 : Aquarium Ventilation (Carried forward to Summary)					

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	BILL NO. 9 Aquarium Centrifugal Water Pumps				
	Supply, delivery in accordance with the detailed specification incl installation, electrical connections, brackets and commissioning of the following Centrifugal Water Pumps: as per the pump detail drawing.(Salt Water Compatible)				
	Eartheco 1.1kW or Equal & Approved	No	34		
	Eartheco 1.5kW or Equal & Approved	No	2		
	Eartheco 2.2kW or Equal & Approved	No	7		
	Supply, delivery in accordance with the detailed specification incl installation, electrical connections, brackets and commissioning of the following Air Blowers.				
	Heilea Vortex Blower 2200G (2100l/min) Or Equal and Approved	No	2		
TOTAL FOR BILL NO.9: Aquarium Pumps(Carried forward to Summary)					

BILL OF QUANTITIES - MECHANICAL HVAC					
Item No	Description	Unit	Quantity	Per Unit Rate	Amount
	BILL NO. 10				
	GENERAL				
1	Preparation and issue of O and M Manuals	No	3		
2	Allowance for 24 month guarantee period	Item	1		
3	Allowance for 24 month maintenance and service period	Item	1		
4	Allow for training in the operation of all plants	Item	1		
5	For the coding and labeling of plants	Item	1		
6	Commissioning and testing	Item	1		
7	Builder's Work as required	Item	1		
TOTAL FOR BILL NO.10: General (Carried forward to Summary)					

BILL OF QUANTITIES - FINAL SUMMARY**SUMMARY OF TENDER BILLS**

ITEM	BILL DESCRIPTION	AMOUNT
1	BILL No. 1: PRELIMINARIES	
2	BILL No. 2: AIR CONDITIONING DUKU DUKU	
3	BILL No. 3: DUCTING DUKU DUKU	
4	BILL No. 4: REFRIGERATION DUKU DUKU	
5	BILL No. 5: AIR CONDITIONING FLAMMINGO	
6	BILL No. 6: DUCTING FLAMMINGO	
7	BILL No. 7: REFRIGERATION FLAMMINGO	
8	BILL No. 8: Aquarium Ventilation	
9	Bill No.9: Aquarium Pumps	
10	Bill No.10: General	
5	SUB TOTAL	
6	Add 15% VAT	
7	TOTAL FIXED AND FIRM PRICE	

TENDER :

NAME :

ADDRESS :

.....

TELEPHONE No :

.....

.....
DATE.....
SIGNATURE

APPROVED	NAME	SIGNATURE
PR. NO.	DATE	
LEGEND		

CONSTRUCTION			
REV	DATE	DESCRIPTION	BY
0A	2021-12-14	ISSUED FOR INFORMATION	RN
CLIENT			



SANBI
Biodiversity for Life
South African National Biodiversity Institute

CONSULTANT

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Tel: 012 601 1055

www.adepengineering.co.za

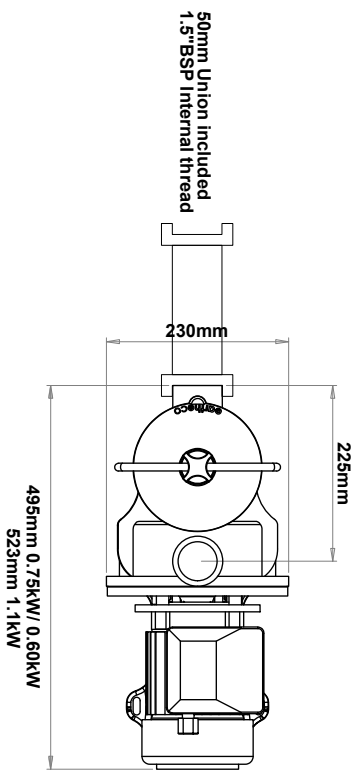
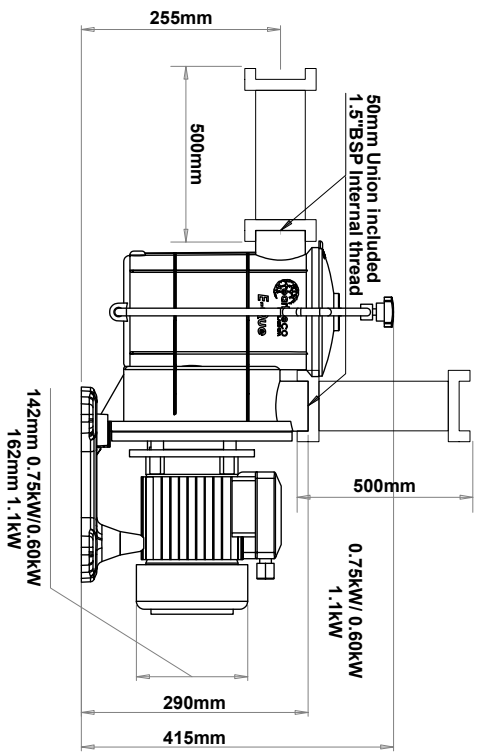


ADQA
AFFIRMED QUALITY
IN ENGINEERING PROJECTS

PROJECT DESCRIPTION

MECHANICAL EQUIPMENT AT THE
NATIONAL ZOOLOGICAL GARDENS

DRAWING TITLE	
PUMP DETAIL	
DATE	DRAWN BY
2021-12-14	R NIEMANN
CHECKED BY	DESIGNED BY
J HILL	J HILL
DRAWING SIZE	SCALE
A1	AS SHOWN
DRAWING NUMBER	REV
P21065-PD-MEC-010	0A



APPROVED _____ NAME _____ SIGNATURE _____
 PR. NO. _____ DATE _____

NOTES

INSTALLATION NOTE

- ALL HIDDEN DUCT SPLT UNITS TO HAVE 25mm INSULATION AROUND SUPPLY DUCTWORK.
- ALL EXPOSED DUCTWORK SHOULD BE PAINTED TO ARCHITECTS FINISH DETAILS.
- ALL EXPOSED DUCTWORK SHOULD BE SPIRAL DUCTING AND NOT RALLY INSULATED.
- CEILING LAYOUT TO BE CONFIRMED AND CO-ORDINATED BETWEEN SERVICES.
- NO PVC OR SILICONE CONTAINING PRODUCTS TO BE USED ON SITE. ALL PRODUCTS INCLUDING GLASS, WIRING AND SEALANT TO BE TESTED AT LABORATORIES FOR CONFORMANCE.

LEGEND



DUCTWORK NOTES:

1. ALL BUCK WORK TO BE MANUFACTURED TO THE LATEST S.M.A. CANADIAN STANDARDS WITH THE REQUIRED AMPERAGE CAPACITY AND TENSILE STRENGTH TO BE PROVIDED TO THE DESIGNER AND SAC POINTS ON SMALLER DUCTS.
2. ALL A.C. DUCTING TO BE INTERNALLY INSULATED WITH 25mm SOME INSULATION UNLESS OTHERWISE SHOWN.
3. ALL VENTILATION DUCTING TO BE UNINSULATED.
4. ALL FLEXIBLE DUCTING TO BE FACTORY PRE-INSULATED WITH 25mm SOME INSULATION AND TO BE SECURED WITH RUBBER CLAMPS AND STAPLED WITH DUCT TAPE.
5. SPOUTS TO BE INTERNALLY INSULATED WITH 25mm FOIL FACED FIBREGLASS.
6. ALL HANGERS AND BRACKETS TO BE GALV. INSTEAD.
7. ALL BUCKWORK TO BE HUNG ON 90x50x1.6 G.S.M. CHANNEL. TRAMZE HANGERS WITH THIN ROIDS.
8. FLEXIBLE CONNECTIONS TO BE FITTED TO ALL DUCTING BETWEEN BRANCHED IN AND PACKAGE UNIT, FANS, ETC.
9. ALL TRAMZE HANGERS TO HAVE 5-8 LIGHTENING VENTS.

PRELIMINARY

[illegible]

CLIENT



CONSULTANT



PROJECT DESCRIPTION

UPGRADE OF THE MECHANICAL
EQUIPMENT AT THE NATIONAL
ZOOLOGICAL GARDENS

DRAWING TITLE

DUKU DUKU HVAC LAYOUT

DATE	2022-03-28	DRAWN BY	R NIEMANN
CHECKED BY	J. HILL / D DE WIT	DESIGNED BY	J. HILL / D DE WIT
DRAWING SIZE	A1	SCALE	As indicated
DRAWING NUMBER		REV	
P21055-PD-MEC-100		0A	

[illegible]

00-DUKU DUKU-MECHANICAL INDOOR UNITS SCHEDULE

TAG	REFERENCE	TYPE	SIZE (MW)	ELEC. MWPS	QTY
BC11/26	143	SLURFCONC. LIFT	4.3 MW	2.6 EA	1
BC12/26	143	MS ² ELECTROFUSE AWAY LIFT	10.0 MW	9.3A	1
HA11/26	143	MS ² ELECTROFUSE AWAY LIFT	9.3A	9.3A	1
HA12/26	143	MS ² ELECTROFUSE AWAY LIFT	10.0 MW	9.3A	1

00-DUKU DUKU-AIR TERMINALS

REFERENCE	TYPE	PHYSICAL SIZE	SPOT SIZE	QTY
0001	EXTRACTOR DISC VALVE	0100	160	8
0002	RETURN AIR GRILLE	1000x600	250	3
0003	ROUND FLOW VAVEL, OFF FLOWERS	0100	200	18
0004	WASHED LOUVER WITH REMAIN SCREEN	2100x1200		1
0005	WASHED LOUVER WITH REMAIN SCREEN	0100x100		1

00-DUKU DUKU-DUCT ACCESSORIES SCHEDULE

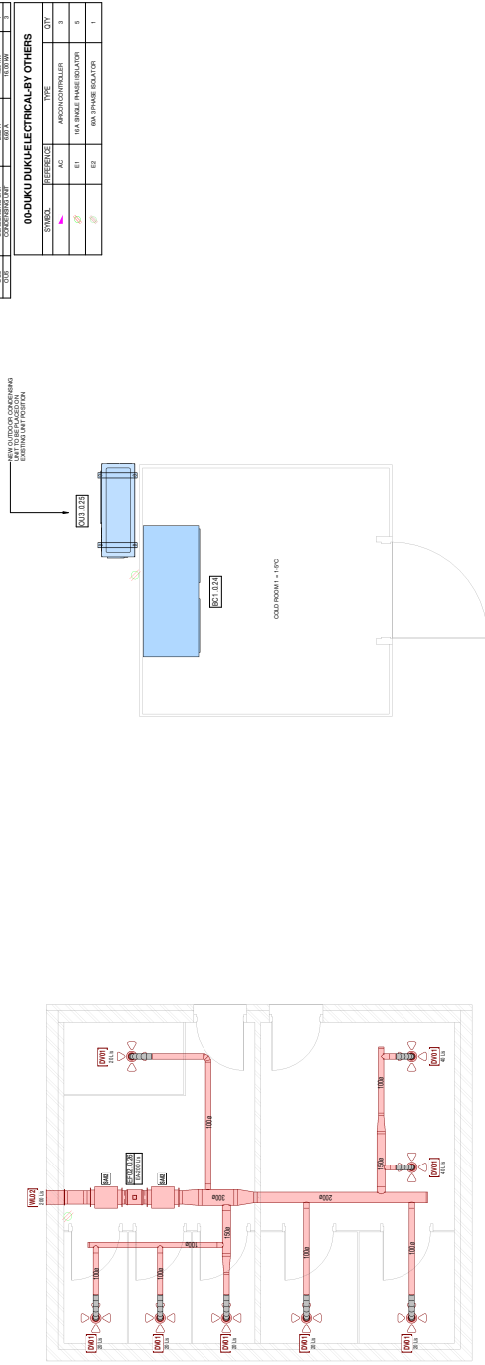
REFERENCE	TYPE	SIZE	QTY
B001	HAND LOCKABLE DAMPER	6250	18
B001	HAND LOCKABLE DAMPER	6250	3
FF02	FLAT IR PANEL	TO SLIT	
SA02	SOLID ALUMINUM	6250	2
SA03	SOLID ALUMINUM	6000	2

DUKU DUKU-MECHANICAL OUTDOOR UNIT SCHEDULE

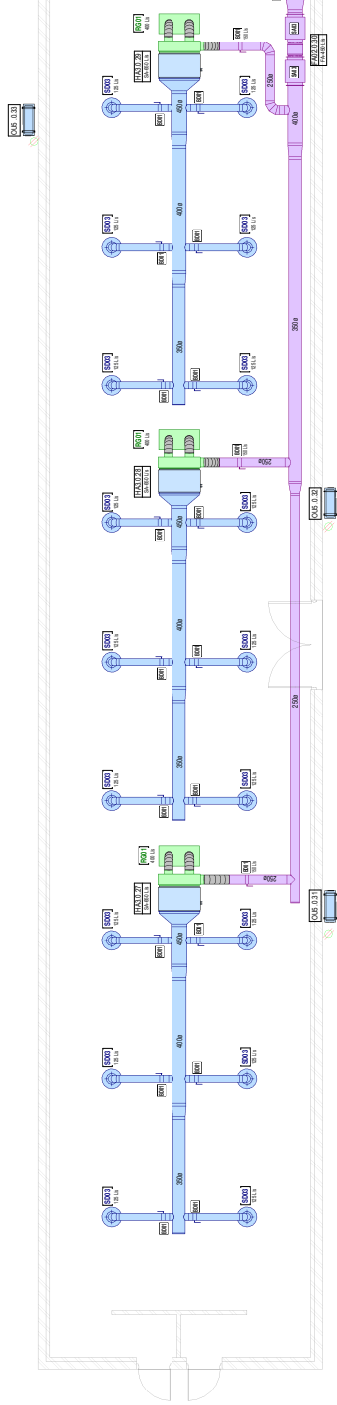
REFERENCE	TYPE	RUNNING CURRENT	ACTUAL COOLING	CITY
0.05	CONDENSING UNIT	282 A	4.30 kW	1
0.06	CONDENSING UNIT	600 A	16.00 kW	3

00-DUKU DUKU-ELECTRICAL-BY OTHERS

SYMBOL	REFERENCE	TYPE	QTY
	AC	AMPLIFIER CONTROLLER	3
	E1	16A SINGLE PHASE ISOLATOR	5
	E2	60A 3PHASE ISOLATOR	1



3 HVAC DUKU DUKU COLD ROOM
1 : 25



PRELIMINARY

APPROVED

NAME

SIGNATURE

PR. NO.

DATE

NOTES

INSTALLATION NOTE

DUCTWORK NOTES

LEGEND

HVAC LEGEND

01-FLAMINGO-MECHANICAL FANS SCHEDULE

01-FLAMINGO-MECHANICAL INDOOR UNITS SCHEDULE

01-FLAMINGO-CAIR TERMINALS

01-FLAMINGO-DUCT ACCESSORIES SCHEDULE

01-FLAMINGO-MECHANICAL OUTDOOR UNITS SCHEDULE

01-FLAMINGO-ELECTRICAL BY OTHERS

DUCTWORK NOTES

LEGEND

01-FLAMINGO OFFICE

01-FLAMINGO COLD ROOM 1

01-FLAMINGO COLD ROOM 2

01-FLAMINGO COLD ROOM 3

01-FLAMINGO TUCKSHOP

01-FLAMINGO BATHROOMS

01-FLAMINGO FREEZER ROOM 1

01-FLAMINGO FREEZER ROOM 2

01-FLAMINGO OFFICE

01-FLAMINGO COLD ROOM 1

01-FLAMINGO COLD ROOM 2

01-FLAMINGO COLD ROOM 3

01-FLAMINGO TUCKSHOP

01-FLAMINGO BATHROOMS

01-FLAMINGO FREEZER ROOM 1

01-FLAMINGO FREEZER ROOM 2

CLIENT

SANBI Biodiversity for Life

South African National Biodiversity Institute

CONSULTANT

AFRICAN DYNAMIC QUALITY

PROJECT DESCRIPTION

DRAWING TITLE

DATE

2022-03-28

CHECKED BY

J. HILL / D DE WIT

DRAWING SIZE

A1

DRAWING NUMBER

P21065-PD-MEC-101

REV

0A

APPROVED

NAME

SIGNATURE

PR. NO.

DATE

NOTES

INSTALLATION NOTE

DUCTWORK NOTES

LEGEND

HVAC LEGEND

01-FLAMINGO-MECHANICAL FANS SCHEDULE

01-FLAMINGO-MECHANICAL INDOOR UNITS SCHEDULE

01-FLAMINGO-CAIR TERMINALS

01-FLAMINGO-DUCT ACCESSORIES SCHEDULE

01-FLAMINGO-MECHANICAL OUTDOOR UNITS SCHEDULE

01-FLAMINGO-ELECTRICAL BY OTHERS

DUCTWORK NOTES

LEGEND

CLIENT

SANBI Biodiversity for Life

South African National Biodiversity Institute

CONSULTANT

AFRICAN DYNAMIC QUALITY

PROJECT DESCRIPTION

DRAWING TITLE

DATE

2022-03-28

CHECKED BY

J. HILL / D DE WIT

DRAWING SIZE

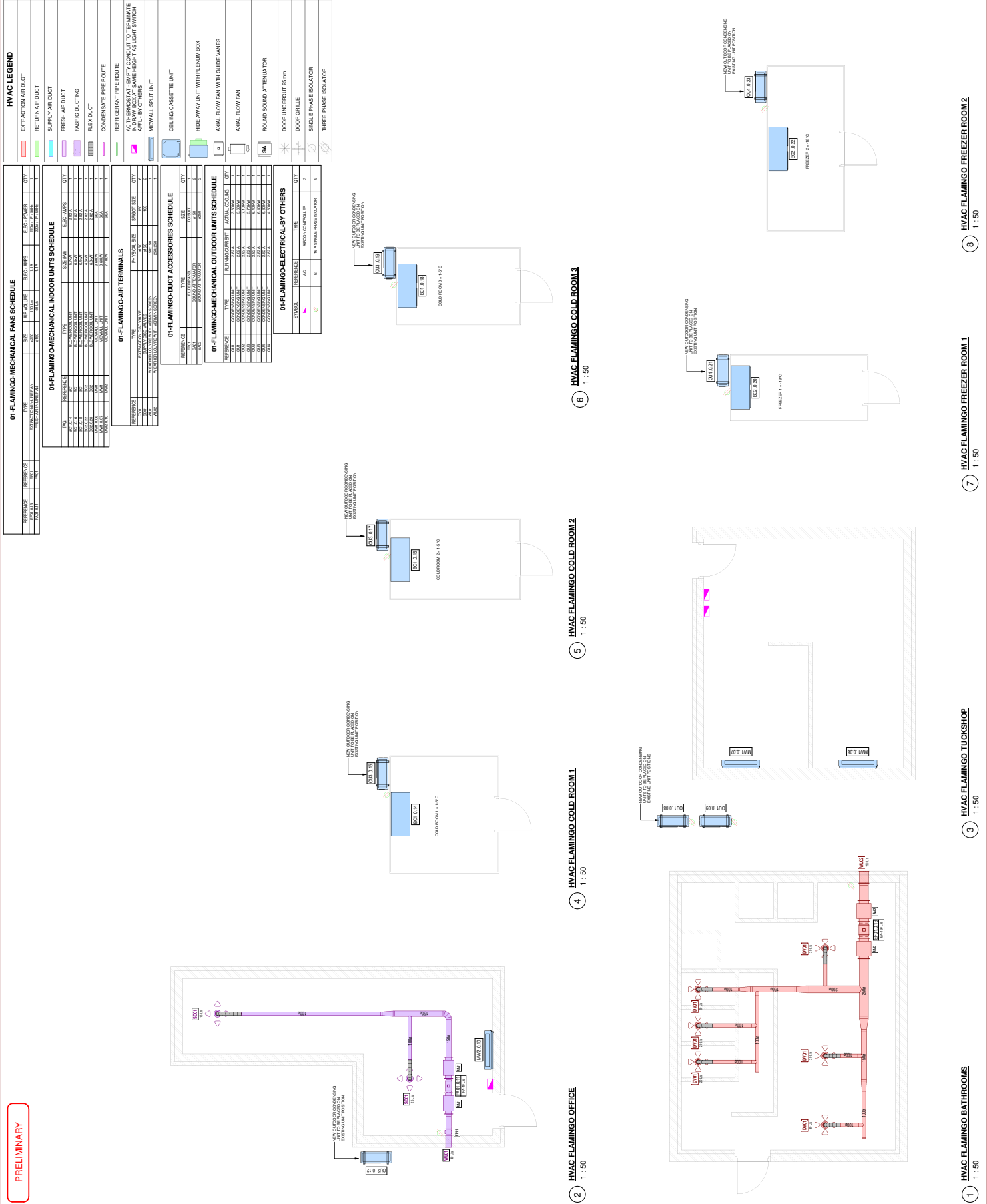
A1

DRAWING NUMBER

P21065-PD-MEC-101

REV

0A



02-AQUARIUM-MECHANICAL AND SCHEDULE						
REFERENCE NUMBER	REFERENCE LIST	TYPE	DESCRIPTION	SIZE	AIR VOLUME CUBIC FEET PER HOUR	PRESSURE PSI PER FOOT
						QTY

02-AQUARIUM-AIR TERMINALS					
REFERENCE NUMBER	TYPE	REF. PART NUMBER SEE TYPICAL EXCEPT	PHYSICAL SIZE NOMINAL	SPEED SIZE NOMINAL	QTY
					Z

02-AQUARIUM-ELECTRICAL-BY OTHERS			
REFERENCE	SYMBOL	TYPE	QTY
		GWA OR GUARANTEE	1

HVAC LEGEND	
	EXTRACTION AIR DUCT
	RETURN AIR DUCT
	SUPPLY AIR DUCT
	FRESH AIR DUCT
	PRESSURE DUCT
	FABRIC DUCTING
	FLEX DUCT
	CONDENSATE PIPE ROUTE
	REFRIGERANT PIPE ROUTE
	A/C THERMOSTAT - RAMPY CONDUIT TO TERMINATE AT PL. TO INDICATE RESIST TO LIGHT SWITCH
	APPL. TO OTHERS
	MINI WALL SPLIT UNIT
	CEILING CASSETTE UNIT
	HIDE AWAY UNIT WITH PL EXAM BOX
	AXIAL FLOW FAN WITH GUIDE LINES
	AXIAL FLOW FAN
	ROUND SOUND ATTENUATOR
	DOOR UNDERCUT 25mm
	DOOR GRILLE
	SINGLE PHASE ISOLATOR
	THREE PHASE ISOLATOR

APPROVED _____
 NAME _____ SIGNATURE _____
 PR. NO. _____ DATE _____

NOTES

- ALL HIDDEN DUCTED SPELT UNITS TO HAVE 25mm INSULATION AROUND SUPPLY DUCTWORK
- ALL EXPOSED DUCTWORK SHOULD BE PAINTED TO ARCHITECTS FINISH
- DETAIL
- ALL EXPOSED DUCTWORK SHOULD BE SPIRAL DUCTING AND INTERNALLY INSULATED.
- CEILING LAYOUT TO BE CONFIRMED AND CO-ORDINATED BETWEEN
- NO SILICONE OR SILICONE CONTAINING PRODUCTS TO BE USED ON SITE. ALL PRODUCTS INCLUDING GASSETS, WRAP AND SEALANT TO BE TESTED AT LABORATORIES FOR CONFORMANCE.

LEGEND



DUCTWORK NOTES:

1. ALL DUCT WORK TO BE MANUFACTURED TO THE LATEST MANUFACTURER'S SPECIFICATIONS AND CONFORM TO ALL APPLICABLE CODES AND STANDARDS. ALL DUCTS EXCEEDING 18" IN DIAMETER SHALL BE INSULATED WITH 2" MIN. INSULATION UNLESS OTHERWISE SHOWN.
2. ALL A.C. DUCTING TO BE INTERNALLY INSULATED WITH 2" MIN. INSULATION UNLESS OTHERWISE SHOWN.
3. ALL VENTILATION DUCTING TO BE UNINSULATED.
4. ALL FLEXIBLE DUCTING TO BE FACTORY PRE-INSULATED. ALL FLEXIBLE DUCTING SHALL BE INSTALLED WITH THREE CLAMPS AND STRAPPED WITH DUCT TAPE.
5. SPOUTS TO BE EXTERNALLY INSULATED WITH 2" MIN. FOIL FACED FIBERGLASS.
6. ALL HANGERS AND BRACKETS TO BE GALVANIZED.
7. ALL DUCTWORK TO BE HUNG ON 96"x61" 6.6 LBS. M. CHANNEL TRAPEZE HANGERS WITH 80 BOUNDS.
8. FLEXIBLE CONNECTIONS TO BE FITTED TO ALL DUCTING BETWEEN BRANCHED AND PACKAGED UNITS. PACK IT OUT WITH 2" MIN. INSULATION.
9. ALL DUCTS TO BE HUNG TO HANGERS TO HANG STRAIGHT VANCES AS SET FORTH.

PRELIMINARY

[illegible]

CLIENT



CONSULTANT



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PROJECT DESCRIPTION

UPGRADE OF THE MECHANICAL
EQUIPMENT AT THE NATIONAL
ZOOLOGICAL GARDENS

DRAWING TITLE

AQUARIUM HVAC LAYOUT

DATE	2022-03-28	DRAWN BY	R NIEMANN
CHECKED BY	J. HILL / D DE WIT	DESIGNED BY	J. HILL / D DE WIT
DRAWING SIZE	A1	SCALE	As indicated
DRAWING NUMBER		REV	
P21055-PD-MEC-102		0A	