SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE

Contract No: SANBI G410/2022

REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN

PROCUREMENT DOCUMENT

JANUARY 2022

Issued by:

South African National Biodiversity Institute
Private Bag X101
Silverton
0184
Gauteng

Prepared by:

Delta Built Environment Consultants (Pty) Ltd
P.O. Box 35703
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Contact:

Supply Chain Management

E-mail: sanbi.tenders@sanbi.org.za

Contact:

Mr N Nana

Tel: 012 368 1850

E-mail: nitesh.nana@deltabec.com

Name of tenderer: ....

Address: ....

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

Email: ....

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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 T: THE TENDER

Part T1: Tendering Procedures

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

Advertising date:	**21 January 2022**	**Closing date:**	**16 February 2022**
Closing time:	**11:00**	**Validity period:**	**90 days**

T1.1 Tender Notice and Invitation to Tender

THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE INVITES TENDERERS FOR THE PROVISION OF: The appointment of a contractor for the design, supply and installation of a carport Solar Photovoltaic Plant for the South African National Biodiversity Institute at the Kirstenbosch National Botanical Garden, Cape Town.

Tender documents will be available as from **21 January 2022** and will be available **ONLINE ONLY** on the SANBI website www.sanbi.org (click on "Opportunities").

SANBI is committed to the health and safety of all bidders and staff members and reducing the spread of COVID-19. As a result, with guidance from regulations published by the National Department of Health, **no briefing session or site inspection will be held**.

Bidders are encouraged to direct all technical and bidding procedure enquiries to the email address below.

Department:	Supply Chain Management
Email:	Sanbi.Tenders@sanbi.org.za
Cc:	nitesh.nana@deltabec.com, A.Hendricks@sanbi.org.za
Cut-off date for enquiries:	11 **February 2022 at 12:00**

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

SANBI Representative (Technical Queries Only)	Delta Built Environment Consultants (Pty) Ltd 012 368 1850 nitesh.nana@deltabec.com
SANBI SCM Representative	sanbi.tenders@sanbi.org.za

The closing time and date for the receipt of tenders is **11:00** on **16 February 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: THE TENDER

Part T1: Tendering Procedures

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

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.1.1.1	The Employer is: South African National Biodiversity Institute (SANBI): The Employer's *domicilium citandi et executandi* (permanent physical business address) is: Pretoria National Botanical Garden 2 Cussonia Avenue Biodiversity Centre Brummeria, Pretoria The Employer's address for communication relating to this project is: Private Bag X101 Silverton 0184
C.1.2	The Tender Documents issued by the Employer comprise the following documents: **PART T: THE TENDER** **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 - 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 - Construction **Part C4: Site Information** C4.1 - Site location **Annexures** Annexure A - Specifications Annexure B - Drawings
C.1.4	The employer's agent is: Delta Built Environment Consultants (Pty) Ltd **Contact Person:** Mr N. Nana **Tel:** 012 368 1850 **E-mail:** nitesh.nana@deltabec.com
C.2.1	Only those tenderers who satisfy the following eligibility criteria are eligible to submit tenders 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 or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a **3 EP** class of construction work, are eligible to have their tenders evaluated. Joint ventures are eligible to submit tenders provided that: 1. every member of the joint venture is registered with the CIDB; 2. the lead partner has a contractor grading designation in the **2 EP** class of construction work; and 3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **3 EP** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations. (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.2.6	Failure to apply instructions contained in addenda may render a tenderer's offer non-responsive in terms of clause C.3.8.
C.2.7	The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list

<table>
<tr><th>Clause number</th><th>Tender Data</th></tr>
<tr><td>C.2.8</td><td>Request clarifications at least 7 working days before the closing time.</td></tr>
<tr><td>C.2.12</td><td>Main tender offers are required to be submitted together with alternative tenders.

If a tenderer wishes to submit an alternative tender offer, the only criteria permitted for such alternative tender offer is that it demonstrably satisfies the Employer’s standards and requirements, the details of which may be obtained from the Employer’s Agent.

Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer’s standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal.

Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer’s standards and requirements.

The modified Pricing Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the Employer’s costs in confirming the acceptability of the detailed design.</td></tr>
<tr><td>C.2.13.6</td><td>A two-envelope procedure will be followed as described in clause C.2.13.7.</td></tr>
<tr><td>C.2.13.7</td><td>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 <u>without any</u> pricing (files in PDF format) on a <u>memory stick</u>

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 ON THE MEMORY STICK WILL LEAD TO THE BID BEING DISQUALIFIED.

The original document will be placed in one envelope and the memory stick 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</td></tr>
<tr><td>C.2.13.9</td><td>Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.</td></tr>
</table>

Clause number	Tender Data
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 **Physical address:** Pretoria National Botanical Garden 2 Cussonia Avenue Brummeria Pretoria **Identification details:** **Tender number: SANBI G410/2022** **Title of Tender:** **REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
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.
C.2.16.3	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, C.2.18 or C.3.9 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.2.18	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 bidders
C.2.23	The tenderer is required to submit with his/her 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) **UIF compliance demonstrated by submission of one of the following:** • **A valid copy of the UIF Letter of Compliance issued by the Department of Labour, or** • **Labour uFiling Employer Statement of Account indicating UIF payments or accruals not older than 12 months, or** • **SARS eFiling Employer Statement of Account indicating UIF payments or accruals not older than 12 months, or** • **Valid proof of exemption for UIF.** 4) **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.**

Clause number	Tender Data
	5) **A valid certified copy or original Broad-Based Black Economic Empowerment (B-BBEE) Status Level 1 certificate. 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. 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.**
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.3.4.1	The tenders will not be opened in public.
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.
C.3.11.1	The procedure for the evaluation of responsive tenders is stated in **Annexure A**.
C.3.13	In addition to the requirements of the Condition of 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 (refer to SBD 8 – T2.1.17); d) the tenderer has not (refer to SBD 8 – T2.1.17): i) abused the Employer's Supply Chain Management System; or ii) failed to perform on any previous contract and has been given a written notice to this effect; e) the tenderer 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. h) UIF compliance demonstrated by submission of one of the following: • A valid copy of the UIF Letter of Compliance issued by the Department of Labour, or • Labour uFiling Employer Statement of Account indicating UIF payments or accruals not older than 12 months, or • SARS eFiling Employer Statement of Account indicating UIF payments or accruals not older than 12 months, or • Valid proof of exemption for UIF. i) A valid certified copy or original Broad-Based Black Economic Empowerment (B-BBEE) Status Level 1 certificate. 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. 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.

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 tender's 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 tenders 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 • Weekly plan/programme with milestones	**25** (15) (10)
2	Contractor's Experience • Three reference letters regarding work of similar scope and scale completed in the last five years	**35** (15)

Sub-Criteria	**Points**
One reference letter	5
Two reference letters	10
Three reference letters or more	15

<table>
<tr><td></td><td>

- List of at least five other similar projects with telephonic references and indicating value of works completed in the last ten years

<table><tr><th>Sub-Criteria</th><th>Points</th></tr>
<tr><td>One Project</td><td>4</td></tr>
<tr><td>Two Projects</td><td>8</td></tr>
<tr><td>Three Projects</td><td>12</td></tr>
<tr><td>Four Projects</td><td>16</td></tr>
<tr><td>Five or more Projects</td><td>20</td></tr></table>
</td><td>(20)</td></tr>
<tr><td>3</td><td>
Contractor's Resources – Personnel and Plant
Proposed personnel:

- CV for proposed key personnel **(at least 3)** indicating:
  - Previous work experience of similar projects
  - Total number of years' working experience in construction
  - Individual experience on similar work in last five years

<table><tr><th>Sub-Criteria</th><th>Points</th></tr>
<tr><td>Combined CV experience of less than 5 years</td><td>6</td></tr>
<tr><td>Combined CV experience of 5 years or more</td><td>12</td></tr>
<tr><td>Combined CV experience of 10 years or more</td><td>18</td></tr>
<tr><td>Combined CV experience of 15 years or more</td><td>24</td></tr>
<tr><td>Combined CV experience of 20 years or more</td><td>30</td></tr></table>

Note: Each CV with 10 years or more experience will receive a maximum of 10 points.

  - Qualifications or artisan's certification or other recognized training courses completed
  - Membership of professional bodies or guilds

Availability of Plant:

- Equipment owned by contractor or to be rented (if any)
</td><td>**40**

(30)

(5)

(5)</td></tr>
<tr><td colspan="2">**TOTAL**</td><td>**100**</td></tr>
</table>

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 of 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 totaled 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 Correction of arithmetical errors

Pursuant to clause C.3.9 of the standard conditions of tender as amended in the Tender Data, correction of arithmetical errors shall be undertaken.

3.2 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

3.3 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
(2) The scorecard shall be submitted as a certificate attached to Returnable Schedule Form T2.1.06; and
(3) 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
(4) The Verification Certificate must be valid at the tender closing date; and
(5) 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
(6) Compliance with any other information requested to be attached to Form T2.1.06; and
(7) 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
(8) Failure to submit a valid verification certificate will result in the award of 0 (zero) points for preference; and
(9) In the event of a joint venture (JV), a consolidated B-BBEE verification certificate in the name of the JV shall be submitted.

3.4 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

NP = Score for Preference

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

Annexure C

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 fulfil his or her duties impartially;

  ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or

  iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.

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

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

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

C.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be 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. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Non-disclosure

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

C.3.7 Grounds for rejection and disqualification

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

C.3.8 Test for responsiveness

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

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

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

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

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

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

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

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

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

C.3.9 Arithmetical errors, omissions and discrepancies

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

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

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

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

c) arithmetic errors in:

(i) line 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: THE TENDER

Part T2: Returnable Documents

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

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
Resources to be employed in terms of organization and staffing (T2.1.07)	2 Pages	■ Yes □ No
Estimated Monthly Expenditure (T2.1.08)	1 Page	■ Yes □ No
Compensation of Occupational Injuries and Disease Act (COIDA) (T2.1.18)	1 Page	■ Yes □ No
Unemployment Insurance Fund (UIF) (T2.1.19)	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 (T2.1.14)	1 Page	■ Yes ◻ No
Financial Reference (T2.1.15)	1 Page	■ Yes ◻ No
Equipment Datasheets (T2.1.20)	1 Page	■ Yes ◻ No
Proof of Liability Insurance (T2.1.22)	1 Page	■ Yes ◻ No
SBD 6.2 Local Content Declaration and Annexures B, C, D & E	7 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 (T2.1.16)	1 Page	■ Yes ◻ No
Compulsory Enterprise Questionnaire (T2.1.17)	3 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	14 Pages	■ Yes ◻ No

C1.1 Offer portion of Form of Offer and Acceptance
C1.2 Contract Data (Part 2)
C1.3 Form of Guarantee

5. OTHER TECHNICAL SCHEDULES AND DOCUMENTS THAT IS REQUIRED FOR TENDER EVALUATION PURPOSES AND WILL BE INCORPORATED INTO THE CONTRACT

Tender document name	Number of pages issued	Returnable document
Technical information to be provided (T2.1.23)	3 Pages	■ Yes □ No
Datasheets (T2.1.24)	14 Pages	■ Yes □ No
Confirmation of anticipated system performance (T2.1.25)		■ Yes □ No
Programme (T2.1.26)		■ Yes □ No
Project execution methodology (T2.1.27)		■ Yes □ No
Alternative Offers (T2.1.28)		■ Yes □ No

The following documents shall be submitted within 14 calendar days of purchase order:

- Final datasheets for each component to be approved by client and engineer
- Shop drawings
- General Layout drawings
- Schematic drawings and single line diagrams
- Spare part list (format to be provided)
- Quality control procedure manual
- Installation manual
- Commissioning manual
- Operation and maintenance manuals.

The following documents shall be submitted after installation and commissioning:

- SANS 10142-1 certificate of compliance for all electrical installations
- Documentation pack as defined in Section C3.5.2

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	Resources to be employed in terms of organization and staffing	
T2.1.07	Estimated Monthly Expenditure	
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 (T2.1.12)	
T2.1.13	Original Valid Tax Clearance Certificate	
T2.1.14	CSD Registration Certificate	
T2.1.15	Financial Reference	
T2.1.16	Record of Addenda to Tender Documents	
T2.1.17	Compulsory Enterprise Questionnaire	
T2.1.18	Compensation of Occupational Injuries and Disease Act (COIDA)	
T2.1.19	Unemployment Insurance Fund (UIF)	
T2.1.22	Proof of Liability Insurance	
T2.1.23	Technical information to be provided	
T2.1.24	Datasheets of system components	
T2.1.25	Confirmation of anticipated system performance	
T2.1.26	Preliminary project programme	
T2.1.27	Project execution methodology	
T2.1.27	Alternative offers	
SBD 8	Declaration of Bidder's Past Supply Chain Management Practices	
SBD 9	Certificate of Independent Quotation Determination	

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	
Form T2.1.08	Estimated Monthly Expenditure	
SBD 6.2	Local Content Declaration and Annexures	

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 (%)

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

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)

	Name	Capacity	Signature
1			
2			
3			
4			
5			

	Name	Capacity	Signature
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.*

T2.1.04: SCHEDULE OF PROPOSED SUBCONTRACTORS

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

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:			

T2.1.05: CAPACITY OF TENDERER

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

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 technicians employed		**Unskilled employees employed**	
Categories of technicians	**Number**	**Categories of employees**	**Number**

1.1. Provide full particulars of:

Machinery	**Equipment**	**Workshops**

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								
9								
10								
11								

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									
9									

Name of Tenderer	**Signature**	**Date**

T2.1.06: PREFERENCE POINT SYSTEM

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

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 of up to R50 000 000 (all applicable taxes included).

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

or

b) Either the 80/20 preference point system will be applicable to this tender

1.2 Points for this bid shall be awarded for:

(a) Price; and

(b) B-BBEE Status Level of Contributor.

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

	POINTS
PRICE	**80**
B-BBEE STATUS LEVEL OF CONTRIBUTOR	**20**
Total points for Price and B-BBEE must not exceed	**100**

1.4 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor 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.

2. DEFINITIONS

(a) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

(b) "**B-BBEE status level of contributor"** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

(c) **"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 goods or services, through price quotations, advertised competitive bidding processes or proposals;

(d) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(e) **"EME"** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(f) **"functionality"** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.

(g) **"prices"** includes all applicable taxes less all unconditional discounts;

(h) **"proof of B-BBEE status level of contributor"** means:

1) B-BBEE Status level certificate issued by an authorized body or person;

2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;

3) Any other requirement prescribed in terms of the B-BBEE Act;

(i) **"QSE"** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

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

3. POINTS AWARDED FOR PRICE

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

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

80/20 **or** **90/10**

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right) \quad \text{or} \quad Ps = 90\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where

Ps = Points scored for price of bid under consideration

Pt = Price of bid under consideration

Pmin = Price of lowest acceptable bid

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR

4.1 In terms of Regulation 6 (2) and 7 (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	6	14
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

5. BID DECLARATION

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

6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1

6.1 B-BBEE Status Level of Contributor: = ………(maximum of 10 or 20 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

7.1 Will any portion of the contract be sub-contracted?

(***Tick applicable box***)

YES		NO	

7.1.1 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 or QSE
(Tick applicable box)

YES		NO	

v) Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations,2017:

Designated Group: An EME or QSE which is at last 51% owned by:	**EME** √	**QSE** √
Black people		
Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
OR		
Any EME		
Any QSE		

8. **DECLARATION WITH REGARD TO COMPANY/FIRM**

8.1 Name of company/firm:……………………………………………………………………………….

8.2 VAT registration number:………………………………………..……………………………………

8.3 Company registration number:……………….……………………….…………………………….

8.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

………
………
………
………………………………………………………………………..

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional service provider
- ☐ Other service providers, e.g. transporter, etc.

[*TICK APPLICABLE BOX*]

8.7 Total number of years the company/firm has been in business:……………………………

8.8 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 contributor indicated in paragraphs 1.4 and 6.1 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 paragraphs 1.4 and 6.1, 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 contributor 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) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury 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	…………………………………… SIGNATURE(S) OF BIDDERS(S)
1. ……………………………………..	DATE: …………………………………..
2. …………………………………….	ADDRESS …………………………………..
	…………………………………..
	…………………………………..

T2.1.07: RESOURCES TO BE EMPLOYED IN TERMS OF ORGANIZATION AND STAFFING

The Tenderer shall list below the key personnel (including first nominee and the second choice alternate), whom he proposes to employ on the Contract should his tender be accepted, both at his headquarters and on the Site, to direct and for the execution of the work, together with their qualifications, experience, positions held and their nationalities.

DESIGNATION	NAME AND NATIONALITY OF: (i) NOMINEE (ii) ALTERNATE	SUMMARY OF QUALIFICATIONS, EXPERIENCE AND PRESENT OCCUPATION
<u>HEADQUARTERS</u> Partner/Director Project manager Other key staff (give designation)		

DESIGNATION	NAME AND NATIONALITY OF: (i) NOMINEE (ii) ALTERNATE	SUMMARY OF QUALIFICATIONS, EXPERIENCE AND PRESENT OCCUPATION
SITE OFFICE Site Agent		
Site Engineer/Technician		
Construction supervisor (give designation)		
Other key staff (give designation)		

T2.1.08: ESTIMATED MONTHLY EXPENDITURE

The Tenderer shall state below the estimated value of work to be completed every month, based on his preliminary programme and his tendered unit rates.

The amounts for contingencies and Contract Price Adjustment must not be included ***OR** the amount for contingencies must not be included.

MONTH	VALUE
1 2 3	R .... R .... R .... COMPLETION OF CONTRACT
TOTAL	R ....

T2.1.10: DECLARATION OF INTEREST

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

Any person, including persons in the employ of the South African National Biodiversity Institute ; or persons acting on behalf of the South African National Biodiversity Institute performing business as a sole proprietor or in partnership; or persons acting in the capacity of a trustee/s of a trust; or any legal entity, including legal entities and trusts, of which the members, directors, shareholders, trustees and/or beneficiaries are in the employ of the South African National Biodiversity Institute or act on behalf of the South African National Biodiversity Institute, may make an offer or offers in terms of this tender invitation.

In view of the possible allegations of favouritism, should the resulting tender, or part thereof, be awarded to persons employed by the South African National Biodiversity Institute; or to persons who act on behalf of the South African National Biodiversity; or to persons connected or related to them, the bidder / tenderer or the bidder / tenderer's duly authorized representative shall disclose herein any relationship and/or kinship, including blood relation, which he/she; his/her employer; the bidder / tenderer's management; members; directors; partners; shareholders; trustees; and/or beneficiaries may have with any person or persons in the employ of the South African National Biodiversity Institute and/or with any person or persons acting on behalf of the South African National Biodiversity Institute and who may directly or indirectly be involved in, and/or may be in a position to influence the adjudication and/or evaluation and/or award of this bid / tender.

In order to give effect to the above, the following questionnaire shall be completed and submitted with the tender. Failure to furnish the information requested in the questionnaire below may render the tender submission not to be considered at all.

(In answering the questions below, indicate the applicable answer with a ✔ and cross the other out)

1. Is the bidder / tenderer and/or the duly authorized representative in the employ of the South African National Biodiversity Institute?

   ☐ YES ☐ NO

   If yes, State the full particulars of such person/s, together with their current position held as an employee of the South African National Biodiversity Institute.

   ____

   ____

2. Is the bidder / tenderer and/or the duly authorized representative in the employ of the person/s or legal entity acting on behalf of the South African National Biodiversity Institute, and who may directly or indirectly be involved in, and/or may be in a position to influence, the adjudication and/or evaluation and/or award of this tender?

   ☐ YES ☐ NO

   If yes, State the full particulars of such person/s, together with their current position held as an employee of such person/s or legal entity acting on behalf of the South African National Biodiversity Institute.

   ____

____

3. Does the bidder / tenderer, the bidder's / tenderer's duly authorised representative, and/or any of the bidder's / tenderer's employees, management, partners, members, directors, shareholders, trustees and/or beneficiaries have any relationship (family, friend, business- or financial interest) with a person, or persons in the employ of the South African National Biodiversity Institute and/or in the employ of the person/s or legal entity acting on behalf of the South African National Biodiversity Institute, and who may directly or indirectly be involved in, and/or may be in a position to influence, the adjudication and/or evaluation and/or award of this tender?

   ☐ YES ☐ NO

   If yes, State the full particulars of the persons between whom the relationship exists, the nature of the relationship and the current position/status of such employee/s of the South African National Biodiversity Institute and/or of the person/s and/or legal entity acting on behalf of the South African National Biodiversity Institute herein.

   ____

   ____

I, the undersigned, ____
(name of the person duly authorised to sign the bid / tender documents on behalf of the bidder / tenderer) hereby certify that the information, furnished above, is correct in all respects. I accept and understand that the South African National Biodiversity Institute, may act against me and the bidder / tenderer, jointly and severally, should this declaration prove to be false.

Duly signed at .... on this ....day of................................ (month) of .... (year)

....	....
Full name of signatory	Name of Bidder / Tenderer
....	....
Capacity of Signatory	Signature

COMMISSIONER OF OATHS

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

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

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

OFFICIAL STAMP OF MEDICAL PRACTITIONER

....
Signature

....
Date

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

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

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: ....

T2.1.14: COPY OF CSD REGISTRATION CERTIFICATE

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

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

T2.1.15: FINANCIAL REFERENCES

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

Notes to tenderer:

1. The tenderer shall attach to this form a letter from the bank in which it is declared how he conducts his account. The contents of the bank's letter must state the credit rating that the bank, in addition to the information required below, accords to the tenderer for the business envisaged by this tender. Failure to provide the required letter with the tender submission may render the tenderer's offer unresponsive in terms of tender condition C3.8.

2. The tenderer's banking details as they appear below shall be completed.

3. In the event that the tenderer is a joint venture enterprise, details of all the members of the joint venture shall be similarly provided and attached to this form.

Details of Company's Bank

DESCRIPTION OF BANK DETAIL	BANK DETAILS APPLICABLE TO TENDERER'S HEAD OFFICE
Name of bank	
Branch name	
Branch code	
Street address	
Postal address	
Name of manager	
Telephone number	
Fax number	
Account number	

T2.1.16: RECORD OF ADDENDA TO TENDER DOCUMENTS

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

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

T2.1.17: COMPULSORY ENTERPRISE QUESTIONNAIRE

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

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

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

*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: ....

T2.1.18: COMPENSATION OF OCCUPATIONAL INJURIES AND DISEASE ACT (COIDA)

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

Letter of Good Standing from the office of the Compensation Commissioner as required by the Compensation for Occupational Injuries and Diseases Act (COIDA) must be included for evaluation purposes. The letter should be issued by the Department of Labour.

T2.1.19: UNEMPLOYMENT INSURANCE FUND (UIF)

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

UIF compliance should be demonstrated by submission of one of the following:

- A valid copy of the UIF Letter of Compliance issued by the Department of Labour, or
- Labour uFiling Employer Statement of Account indicating UIF payments or accruals not older than 12 months, or
- SARS eFiling Employer Statement of Account indicating UIF payments or accruals not older than 12 months, or
- Valid proof of exemption for UIF.

T2.1.22: PROOF OF LIABILITY INSURANCE

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

The tender shall append their Proof of Liability Insurance behind this page.

T2.1.23: TECHNICAL INFORMATION TO BE PROVIDED

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

The table below lists all technical information that must be included in the bidder's submission. This information can be contained in datasheets and does not need to be completed in the table below.
Should the bidder include an alternative offer as part of their submission, the alternative offer must also include all technical information required by the table below.

Table 3.2	Technical information to be provided		
No.	Item	Unit	Minimum Requirement
PV MODULES			
1	Dimensions	mm	
2	Nominal power output	kWp	
3	Weight per module	kg	
4	Overall load on rooftop	kg/m²	Maximum 20
5	Solar cell efficiency	%	Minimum 13.0
6	Solar cell type (e.g. mono, poly, etc.)	-	
7	Solar cell grade (A, B, C or D)	-	Only grade A allowed
8	Manufacturer & model no.	-	
9	Country of origin	-	
10	Warranty/guarantee (product)	years	Minimum 10 years
11	Warranty/guarantee (performance)	years	Min. 90% at 10 years, Min. 80% at 20 years
12	Manufacturer quality assurance programme	-	
MATERIAL SPECIFICATION			
13	Are all mounting frames and structures rated for a lifespan of 25 years? YES/NO. PROVIDE DETAILS		
HAIL PROTECTION OF PV MODULES			
14	Degree of hail protection	-	
15	Maximum hailstone diameter	mm	
16	Maximum hailstone velocity	km/h	
PROPOSED FIXING METHOD (PV MODULES)			
17		-	
INVERTERS			

Table 3.2	Technical information to be provided		
No.	Item	Unit	Minimum Requirement
18	Type (e.g. string)	-	
19	Size	kW	
20	Efficiency	%	
21	Noise level	dB(A)	
22	Single-phase or three-phase	-	
23	Manufacturer & model no.	-	
24	Country of origin	-	
25	Warranty/guarantee (product)	years	Minimum 10 years
26	Manufacturer quality assurance programme	-	
ISLANDING DETECTION			
27	Details of islanding detection system	-	
CABLING			
28	DC Cable Construction (materials)	-	
29	AC Cable Construction (materials)	-	
30	Communication Cable Construction (materials)	-	
31	DC Cable UV rating	-	
32	AC Cable UV rating	-	
33	Communication Cable UV rating		
MONITORING AND CONTROL SYSTEM			
34	Full list of features to be provided	-	
35	Full list of annual and once-off licenses that are required, including cost breakdown	-	
36	Full list of compatibility with proprietary and open communication standards to be provided	-	
RECOMMENDED SPARE PARTS			
37	A list of recommended spare parts must accompany tender submission	-	
MAINTENANCE			
38	Maintenance activities and frequency	-	
39	Tender submission must include the contractor’s proposed SLA, including options, terms and costs.	-	

T2.1.24: DATA SHEETS TO BE PROVIDED

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

The following technical datasheets shall be appended to the inside back cover of this procurement document. A separate datasheet shall be provided for each model if more than one model of the same equipment type will be supplied under this contract.

No.	**Document**	**Attached?**	
		Yes	No
1	PV Modules		
2	Inverters		
3	DC Cables		
4	AC Cables		
5	Mounting frames and support structure		
7	Monitoring software		
8	DC fuses		
9	AC switchgear		

T2.1.25: CONFIRMATION OF ANTICIPATED SYSTEM PERFORMANCE

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

ITEM	ANTICIPATED NAMEPLATE POWER (kWp)	ANTICIPATED ANNUAL OUTPUT (MWH/year)	PERCENTAGE OF EMPLOYER'S ESTIMATE. PROVIDE REASON IF LESS THAN 80% OR GREATER THAN 120%
Kirstenbosch Carport Employer's estimate: 77.3 **MWh/year**			

Should the tenderer wish to include simulation reports with their tender submission, such reports may be appended to the inside back cover of this procurement document.

T2.1.26: PROGRAMME

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

The tenderer shall provide anticipated lead times (in weeks) for procurement, installation and commissioning in the table below.

Site	Procurement	Installation	Commissioning	Total: appointment to handover
Kirstenbosch Carport				

Additionally, the tenderer shall attach a proposed schedule to the inside back cover of this procurement document, generated using Microsoft Project or equivalent software, with at least the following dates.

a) Purchase order date (i.e. start of project)
b) Submission of design drawings, datasheets and specifications
c) Comments on design drawings, datasheets, specifications (allow 5 work days)
d) Resubmit final design drawings, datasheets and specifications
e) Approval of design drawings, datasheets and specifications (allow 5 work days)
f) Ordering of components and materials start/finish
g) Enabling and preparation works start/finish
h) Installation start/finish (for each building)
i) Commissioning of PV plant (for each building)
j) End-user training.

T2.1.27: PROJECT EXECUTION METHODOLOGY

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

The tender shall append a project execution methodology. The methodology will be used by the tender evaluation team to gauge the tenderer's understanding of the scope of works.

T2.1.28: ALTERNATIVE OFFERS

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

Alternative offers may be proposed by the bidder. Alternative offers will be considered only if the main offer (original tender) is also fully priced, and the price of the alternative offer is lower than the main offer.
If an alternative proposal is suggested, it will be evaluated for technical detail using the same point-scoring system as outlined above. The bidder will also be expected to supply detailed reasons why an alternative solution was proposed.

ALTERNATIVE OFFERS

Additional sheets may be attached to the inside back cover of this procurement document, if required.

SBD 6.2

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 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:

Description of services, works or goods	**Stipulated minimum threshold**
IBR Roof Sheeting	**100%**
Structural Steel	**100%**
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 is 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): **SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE (SANBI).**
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:** ___________

ANNEXURE C	**SATS 1286.2011**
Local Content Declaration – Summary Schedule	

NOTE: VAT to be excluded from all calculations

***(C1)* Tender No.**	G410/2022			
***(C2)* Tender Description**	Request for bids for the appointment of a contractor for the design, installation and supply of a carport solar photovoltaic plant for the South African National Biodiversity Institute at the Kirstenbosch National Botanical Garden, Cape Town			
***(C3)* Designated product(s)**	Roof Sheeting			
***(C4)* Tender Authority**	SANBI			
***(C5)* Name of Tendering Entity**				
***(C6)* Tender Exchange Rate**	**Currency**		**Rate**	
***(C7)* Specified local content %**	100%			

		Calculation of local content						Tender summary			
Tender Item No's	***List of Items***	***Tender Price – each***	***Exempted imported value***	***Tender value net of exempted imported content***	***Imported value***	***Local value***	***Local content % (per item)***	***Tender Quantity***	***Total tender value***	***Total exempted imported content***	***Total imported content***
(C8)	***(C9)***	***(C10)***	***(C11)***	***(C12)***	***(C13)***	***(C14)***	***(C15)***	***(C16)***	***(C17)***	***(C18)***	***(C19)***
Schedule No.2	Roofs										
200,01,02	0,8mm thick galvanised IBR or equivalent approved sheeting with chromadek silicone polyester finish										
201,01,02	200 x 100 x 4mm x 4.53kg/m Round hollow section										

201,03,01.01	200 x 75 x 20mm x 2.5 x 7.29kg/m - Cold formed lipped channel										
201,03,01.02	Connector and end plates bolted to steel										
206,01,01,01,01	M12 holding down bolts 350mm long including 13mm ID and 24mm OD x 2,4mm thick washer										
206,01,01,01,02	M16 holding down bolts 350mm long including 17mm ID and 30mm OD x 3,0mm thick washer										

(C20) **Total tender value**	
(C21) **Total Exempt imported content**	
(C22) Total Tender value net of exempt imported content	
(C23) **Total Imported content**	
(C24) **Total local content**	
(C25) **Average local content % of tender**	

SIGNATURE OF TENDERER AS PER LOCAL CONTENT DECLARATION

DATE

ANNEXURE D	**SATS 1286.2011**
Imported Content Declaration – Supporting Schedule to Annexure C	

(D1)	**Tender No.**	G410/2022
(D2)	**Tender Description**	Request for bids for the appointment of a contractor for the design, installation and supply of a carport solar photovoltaic plant for the South African National Biodiversity Institute at the Kirstenbosch National Botanical Garden, Cape Town
(D3)	**Designated product(s)**	

NOTE: VAT to be excluded from all calculations

(D4)	**Tender Authority**	SANBI			
(D5)	**Tendering Entity's Name**				
(D6)	**Tender Exchange Rate**	**Currency**		**Rate**	

A. Exempted imported content				**Calculation of imported content**						**Summary**	
Tender item no's	**Description of imported content**	**Local supplier**	**Overseas supplier**	**Foreign currency value as per Commercial Invoice**	**Tender Exchange Rate**	**Local value of imports**	**Freight costs to port of entry**	**All locally incurred landing costs & duties**	**Total landed cost**	**Tender Quantity**	**Exempted imported value**
(D7)	***(D8)***	***(D9)***	***(D10)***	***(D11)***	***(D12)***	***(D13)***	***(D14)***	***(D15)***	***(D16)***	***(D17)***	***(D18)***
										***(D19)* Total exempt imported value**	

B. Imported directly by the Tenderer				**Calculation of imported content**						**Summary**	
Tender item no's	**Description of imported content**	**Unit of measure**	**Overseas supplier**	**Foreign currency value as per Commercial Invoice**	**Tender Exchange Rate**	**Local value of imports**	**Freight costs to port of entry**	**All locally incurred landing costs & duties**	**Total landed cost**	**Tender Quantity**	**Total imported value**
(D20)	***(D21)***	***(D22)***	***(D23)***	***(D24)***	***(D25)***	***(D26)***	***(D27)***	***(D28)***	***(D29)***	***(D30)***	***(D31)***
										***(D32)* Total imported value by tenderer**	

ANNEX E	**SATS 1286.2011**
Local content Declaration – Summary Schedule	

***(E1)* Tender No.**	G410/2022	**NOTE: VAT to be excluded from all calculations**
***(E2)* Tender Description**	Request for bids for the appointment of a contractor for the design, installation and supply of a carport solar photovoltaic plant for the South African National Biodiversity Institute at the Kirstenbosch National Botanical Garden, Cape Town	
***(E3)* Designated product(s)**		
***(E4)* Tender Authority**	SANBI	
***(E5)* Tendering Entity's Name**		

LOCAL PRODUCTS (Goods, Services and Works)		
Description of items purchased	**Local suppliers**	**Value**
(E6)	***(E7)***	***(E8)***
0,8mm thick galvanised IBR or equivalent approved sheeting with chromadek silicone polyester finish		
200 x 100 x 4mm x 4.53kg/m Round hollow section		
200 x 75 x 20mm x 2.5 x 7.29kg/m - Cold formed lipped channel		
Connector and end plates bolted to steel		
M12 holding down bolts 350mm long including 13mm ID and 24mm OD x 2,4mm thick washer		
M16 holding down bolts 350mm long including 17mm ID and 30mm OD x 3,0mm thick washer		

***(E9)* Total local products (Goods, service and works)**	
***(E10)* Manpower costs** (Tenderer's own manpower cost)	
***(E11)* Factory overheads** (Rental, depreciation & amortization, utility costs, consumables, etc.)	
***(E12)* Administration overheads and mark-up** (Marketing, insurance, financing interest, etc.)	
(E13) Total local content	
	This total must correspond with Annex C – C24

SIGNATURE OF TENDERER AS PER LOCAL CONTENT DECLARATION

DATE

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1 This Standard Bidding Document must form part of all bids invited.

2 It serves as a declaration to be used by institutions in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3 The bid of any bidder may be disregarded if that bidder, or any of its directors have-

a. abused the institution's supply chain management system;

b. committed fraud or any other improper conduct in relation to such system; or

c. failed to perform on any previous contract.

4 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's database as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this database were informed in writing of this restriction by the National Treasury after the *audi alteram partem* rule was applied).	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? **To access this Register enter the National Treasury's website, www.treasury.gov.za, click on the icon "Register for Tender Defaulters" or submit your written request for a hard copy of the Register to facsimile number (012) 3265445.**	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐
4.3.1	If so, furnish particulars:		
4.4	Was any contract between the bidder and any organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		

SBD 8

CERTIFICATION

**I, THE UNDERSIGNED (FULL NAME) …………………………………………………
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS TRUE AND CORRECT.**

I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

………………………………………………… ………………………………………
Signature Date

…………………………………………………. ………………………………………
Position Name of Bidder

SBD 9

CERTIFICATE OF INDEPENDENT QUOTATION DETERMINATION

1 This Standard Bidding Document (SBD) must form part of all quotations[1] invited.

2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3 Treasury Regulation 16A9 prescribes that accounting officers and accounting authorities must take all reasonable steps to prevent abuse of the supply chain management system and authorizes accounting officers and accounting authorities to:

a. disregard the bid of any bidder if that bidder, or any of its directors have abused the institution's supply chain management system and or committed fraud or any other improper conduct in relation to such system.

b. cancel a contract awarded to a supplier of goods and services if the supplier committed any corrupt or fraudulent act during the bidding process or the execution of that contract.

4 This SBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.

5 In order to give effect to the above, the attached Certificate of Bid Determination (SBD 9) must be completed and submitted with the bid:

[1] Includes price quotations, advertised competitive bids, limited bids and proposals.

[2] Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

SBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

G410/2022: REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, INSTALLATION AND SUPPLY OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN
(Bid Number and Description)

in response to the invitation for the quote made by:

SANBI (Name of Institution)

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of: ____that:

(Name of Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word “competitor” shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
   (a) has been requested to submit a bid in response to this bid invitation;
   (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
   (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. 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 consortium[3] will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
   (a) prices;
   (b) geographical area where product or service will be rendered (market allocation)
   (c) methods, factors or formulas used to calculate prices;
   (d) the intention or decision to submit or not to submit, a bid;

(e) the submission of a bid which does not meet the specifications and conditions of the bid; or

(f) bidding with the intention not to win the bid.

8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.

[3] 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.

9. 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.

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

………………………………………………… ………………………………

Signature Date

………………………………………………… ………………………………

Position Name of Bidder

PART C: THE CONTRACT

Part C1: Agreement and Contract Data

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

C1.1 Form of Offer and Acceptance

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

REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN

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: ....

....

(Insert name and address of organisation)

Name & signature of witness .... Date ....

....

[Failure of a Tenderer to complete and sign this form will invalidate the tender]

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 witness .... Date ....

....

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.

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:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**G410/2022**

C1.2 Contract Data

The Conditions of Contract are The FIDIC Conditions of Contract for Plant Design-Build for Electrical and Mechanical Plant, Designed by the Contractor, First Edition, 1999, published by the International Federation of Consulting Engineers, (short title “FIDIC Plant and Design-Build” or ”FIDIC Yellow Book”) published by the International Federation of Consulting Engineers.

The Contract Data (including variations and additions) shall amplify, modify or supersede, as the case may be, the FIDIC Yellow Book to the extent specified below, and shall take precedence and shall govern. Each item of data given below is cross-referenced to the clause in the FIDIC Yellow Book to which it mainly applies.

Section C1.2.1: Contract Data: Employer to Contractor (EC)

Employer Addendum Code 2101-EC

For information purposes only. To be signed on appointment.

Introduction

This addendum contains all variables referred to in the **Principal Building Agreement** that are the responsibility of the Contractor to provide the appropriate information that is necessary for the Contractor to complete his tender. The Addendum must be completed in full and included in the tender documents. The Addendums "Contract Data – EC", "Contract Data – CE", "Contract Data – ES" and "Contract Data – SE" form part of the contract between the parties.

Definitions

The definitions used in this document and the interpretation thereof are as listed in the Principal Building Agreement. The work or phrase of a definition is in bold text and shall bear the meaning assigned to it in the Principal Building Agreement. Where such word or phrase is not highlighted it shall bear the meaning consistent with the context of its use. The listed defined word or phrase does not quality as a definition where information required to be stated in the contract data has not been provided.

Provision of Contract Data

Spaces requiring information must be filled in, shown as "not applicable" or deleted and not left blank. Where choices are offered, the non-applicable items are to be clearly struck out. Where insufficient space is provided the additional information should be annexed hereto and cross referenced to the applicable clause of the contract data.

Reference Clauses

Where relevant the Principal Building Agreement clause applicable to the required information is printed in italics under the Contract Data clause number i.e. [27.4.2]

Contract Specific Data

Clause 1.1.2.2 & 1.3:

1.1

Employer:	South African National Biodiversity Institute		
Postal Address:	Private Bag X101, Silverton, Gauteng	**Code:**	0184
Physical Address:	Pretoria National Botanical Garden 2 Cussonia Avenue, Brummeria, Gauteng	**Code:**	0184
Tel no.:	012 843 5000	**Fax no.:**	012 843 5205
VAT no.			
E-mail:			

Clause 1.1.2.4:

1.2

Engineer:	Delta Built Environment Consultants	**Person:**	Mr Nitesh Nana
Postal Address:	P.O. Box 35703, Menlo Park	**Code:**	0102
Tel no.:	012 368 1850	**Fax no.:**	012 348 4738
E-mail:	nitesh.nana@deltabec.com		

Clause 1.1.3.3:
The estimated Time for Completion of the Works is **4 months** after date of site handover.

Clause 1.1.3.7:
The Defects Notification Period is three hundred and sixty-five (**365) calendar days.**

Contractor warrants that the new equipment supplied will be free of defects in Materials or workmanship. The term of this warranty is 12 months from date of beneficial use by the client, or 18 months from date of shipping, whichever is soonest. The warranty shall not apply to any of the existing equipment that is being reused.

Clause 1.4:
The Governing Law shall be that of **South Africa**. Ruling Language as well as language of communication shall be **English**.

Clause 2.1:
The Time for access to site will be **10 days** after the Commencement Date of the **construction period** provided that the contractor complied with all required deliverables.
The access and possession of Site shall not be exclusive to the Contractor. The Building Contractor shall be responsible for the Site in terms of:

- Site security
- Site access control
- Overall health and safety
- Coordination of works.

The Contractor shall negotiate access as to the site as well as access to the locations where the Contractor is to perform the Works. The Building Contractor shall be contractually obliged to assist the Contractor to give reasonable access.

Clause 4.2:
Performance Security **Contract Sum Plus 20%** in the currencies and proportions in which the Contract Price shall be provided by the Contractor.

Performance security shall be in form of a bank guarantee issued by a bank in South Africa to the value of 10% of the contract sum. The format of the bank guarantee will be in accordance with the FIDIC document.

Form of the security shall be agreed with the Employer.

Clause 4.6:
The erection of the building structure shall be executed by the successful contractor and this work shall form part of this Contract.

The Contractor is obliged under this Contract to co-ordinate and co-operate fully with the Building Contractor and the Building Engineering and Architect Team.

The Employer shall ensure that the Building Contractor shall also undertake all steps to co-ordinate and co-operate fully with the Contractor.

Clause 5.1:
Period for notification of unforeseeable errors, faults and defects in the Employer's Requirements is **7 days**.

Clause 5.3.1:
The documentation required from the Contractor before commencement with Works execution are:

- **Health and Safety Plan**
- **Initial program**
- **Security**
- **Insurance.**

Clause 6.5:
Normal working hours are defined as 4:00 to 22:00. Non-working days are Saturdays and Sundays. Special non-working days are all statutory holidays as declared by National or Regional Government.

Clause 8.4:
The Contractor shall include in his program the effects of rain on the access to and execution of work on site. No extension of time shall be given as a result of the inability to work as a result of rain.

Clause 8.7 & 14.15(b):
The penalty (per Day) for failing to complete the Works is **R2700.00 per calendar day**.

Clause 13.8:
Adjustment for Changes in Cost is **None.**

Clause 14.2:
Total advance payment is of Accepted Contract Amount to be confirmed with Client before contractor appointment. The currencies and proportions shall be as per the Contractor's Offer.

Clause 14.3:
No payment cash retentions shall be applied. Contractor shall provide Retention Money security for **5%** of the contract sum in form of a bank guarantee issued by a bank in South Africa. The format of the bank guarantee will be in accordance with the FIDIC document.

Clause 18.1:
Periods for the submission of insurance is **30 days.**

Clause 18.2 (d):
Insurance Affected by the Employer.
Notwithstanding anything elsewhere contained in the Contract and without limiting the obligations liabilities or responsibilities of the Contractor in any way whatsoever (including but not limited to any requirement for the

provision by the Contractor of any other insurances) the Employer shall effect and maintain as appropriate in the joint names of the Employer , Contractors and Sub-Contractors, Consultants and Sub-Consultants the following insurances which are subject to the terms, limits, exceptions and conditions of the Policy:

- CONTRACT WORKS Insurance____
  Which will provide cover against accidental physical loss of or damage to the Works including Temporary Works, Plant and Materials intended to form part of the Permanent Works.
- PUBLIC LIABILITY Insurance____
  Which will provide indemnity against the insured parties legal liability in the event of accidental death of or injury to third party persons and/or accidental loss of or damage to third party property arising directly from the execution of the contract with a limit of indemnity of not less than R5 million in respect of all claims arising from any one occurrence or series of occurrences consequent on or attributable to one source or original cause.
- SASRIA SPECIAL RISKS Insurance ____
  In respect of Riot, Strike and associated risks for damage to the Works, including Temporary Works, Plant and Materials intended to form part of the Permanent Works.

The Employer shall pay any premium due in connection with the insurance affected by the Employer.

Any further clarification of the scope of cover provided by the Policies arranged by the Employer should be obtained from the Employer.

The Contractor shall not include any premium charges for this insurance except to the extent that he may deem necessary in his own interests to effect supplementary insurance to the insurance effected by the Employer. The Employer reserves the right to call for full information regarding insurance costs included by the Contractor.

Any further clarification of the scope of cover provided by the Policies arranged by the Employer should be obtained from the Employer

In the event of any occurrence which is likely to or could give rise to a claim under the insurances arranged by the Employer the Contractor shall:

- in addition to any statutory requirement or other requirements contained in the Contract immediately notify the Employer's Insurance Broker or the Insurers by telephone or telefax giving the circumstances nature and an estimate of the loss or damage or liability
- complete a Claims Advice Form available from the Insurance Brokers to whom the form must be returned without delay
- negotiate the settlement of claims with the Insurers through the Employer's Insurance Brokers and shall when required to do so obtain the Employer's approval of such settlement.

The Employer and Insurers shall have the right to make all and any enquiries to the site of the Works or elsewhere as to the cause and results of any such occurrence and the Contractor shall co-operate in the carrying out of such enquiries.

The Contractor will be liable for the amount of the Deductible (First Amount Payable in respect of any claim made by or against the Contractor or Sub-Contractors under the insurances effected by the Employer.

Where more than one Contractor is involved in the same claim the Deductible will be borne in pro-rata amounts by each Contractor in proportion to the extent of each Contractor's admitted claim.

The Deductible (First Amount Payable) for which the Contractors are responsible and which are applicable in respect of each and every occurrence or series of occurrences attributable to one source or original case giving rise to a loss or damage or liability indemnifiable as stated in Annexure A.

Any amount which becomes payable to the Contractor or any of his Sub-Contractors as a result of a claim under the Contact Works Insurance shall if required by the Employer be paid net of the Deductible to the Employer who shall pay the Contractor from the proceeds of such payment upon rectification repair or reinstatement of the loss or damage but this provision shall not in any way affect the Contractor's obligations liabilities or responsibilities in terms of the Contract.

In respect of any amount which becomes payable as a result of a claim under any Public Liability Insurance the Contractor or his Sub-Contractors shall be required to pay the amount of the Deductible to the Insurer to facilitate settlement of such claim.

Insurance Affected by the Contractor.
Without in any way detracting from any requirements contained elsewhere in this contract the Contractor and Sub-Contractors shall where applicable, provide as a minimum the following:

- Insurance of contractor's equipment (including tools offices and other temporary structures and contents) and other things (except those intended for incorporation into the Works) brought onto the Site for a sum sufficient to provide for their replacement.
- Insurance in terms of the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as may be amended or in terms of any similar Workers Compensation and Unemployment Insurance enactments in the Suppliers' or Sub Supplier's operational, manufacturing or assembly locations.
- Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger Liability indemnity.
- Where the Contact involves manufacturing and/or fabrication of the Works or parts thereof at premises other than at the site the Supplier shall satisfy the Employer that all Plant and Materials for incorporation in the Works are adequately insured during manufacture, fabrication and shipping to site. 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 relevant Policies of Insurance.
- Imported equipment or component parts or materials to be supplied in terms of this Contract which require any process of assembly or finishing in South Africa prior to delivery to the Site are to be insured by the Contractor up to the commencement of transit to Site of the assembled or finished equipment component parts or materials unless special arrangements are made by the Employer.

The insurances to be provided by the Contractor and his Sub-Contractors shall:

- be affected with Insurers and on terms approved by the Employer.
- be maintained in force for whatever period the perils to be insured by the Contractor are at risk (including any defects liability period during which the Contractor is responsible for the care of the Works).
- submit to the Employer the relevant Policy or Policies of Insurance or evidence acceptable to the Employer that such insurances have been affected.

In the event that the Contractor or his Sub-Contractor receives any notice of cancellation or restrictive modification to the insurance provided to them they shall immediately notify the Employer in writing of such cancellation or restriction and shall advise what action the Contractor or his Sub-Contractor will take to remedy such action.

If the Contractor fails to effect and keep in force the insurances referred to then the Employer may affect and keep in force any such insurances and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount paid by the Employer from any monies due or which may become due to the Contractor or recover same as a debt from the Contractor.

Sub-Contractors
The Contractor shall ensure that all potential and appointed Sub-Contractors are aware of the whole contents of this clause, and enforce the compliance by Sub-Contractors with this clause where applicable.

INSURANCE DEDUCTIBLES:

Contract Works Insurance
R20 000.00 all Civil Work and Earthworks
R20 000.00 all Other Claims

Public Liability.
R20 000.00 property damage.
R25 000.00 damage to services.

Clause 20.2
The DAB shall comprise **3 (three)** members.

Part C1.2.2 – Data provided by the Contractor

Data
Clause 1.1.2.3:

Contractor:		**Person:**	
Postal Address:		**Code:**	
Tel no.:		**Fax no.:**	
E-mail:			

Part C1.3 – Occupational Health and Safety agreement between Employer and Contractor

THIS AGREEMENT between
South African National Biodiversity Institute
(hereinafter called "the Employer") on the one part,
herein represented by: Christopher Willis
in his capacity as Chief Director.
and
………………………………………………
(hereinafter called "the Contractor") on the other part
herein represented by …………………………………………………………...
in his capacity as ………………………………………………………………………………….
WHEREAS the Employer has accepted an offer by the Contractor for the construction, completion and maintenance of such works and whereas the Employer and the Contractor have agreed to certain arrangements and procedures to be followed in order to ensure compliance by the Contractor with the provisions of the Occupational Health and Safety Act 1993 (Act 85 of 1993).
NOW THEREFORE THIS AGREEMENT WITNESSED AS FOLLOWS:

- The Contractor shall execute the work in accordance with the contract documents pertaining to this contract.
- This Agreement shall hold good for the duration of construction, commencing from the handover of the site up to the end of the defects liability period.
- Should the contract be terminated for any reason this agreement shall lapse upon the date of termination.
- The Contractor declares himself to be conversant with the following:
    - All the requirements, regulations and standards of the Occupational Health and Safety Act (Act 85 of 1993), hereinafter referred to as "the Act", together with its amendments thereto.
    - All the requirements of the Construction Regulations hereinafter referred to as the "Regulations", together with any amendments thereto.
    - The Health and Safety Specification of the Employer as pertaining to the Contractor and to all his subcontractors.
- In addition to the requirements of the contract, the Contractor agrees to execute all the works forming part of this contract and to operate and utilise all machinery, plant and equipment in accordance with the Act and the Regulations.
- The Contractor is responsible for the compliance with the Act and the Regulations by all his subcontractors, whether or not selected or nominated and/or approved by the Employer.
- The Contractor warrants that all his and his subcontractors' workmen are covered in terms of the Compensation for Occupational Injuries and Diseases Act 1993 which cover shall remain in force whilst any such workmen are present on site. A letter of good standing from the Compensation Commissioner to this effect must be produced to the Employer upon signature of the agreement.
- The Contractor undertakes to ensure that he and/or his subcontractors and/or their respective employees will at all times comply with the following conditions:
    - The Contractor undertakes to comply with all provisions of the Act and its Regulations.
    - The Contractor will be obliged to report to the Employer on a regular basis regarding compliance by the Contractor with the Act and its Regulations.
    - All incidents referred to in the Occupational Health and Safety Act (Act 85 of 1993) shall be reported by the Contractor to the Department of Labour as well as to the Employer. The Employer will further be provided with copies of all written documentation relating to any incident.
    - The Employer hereby records an interest in the issue of any formal enquiry conducted in terms of Section 32 of the Occupational Health and Safety Act (Act 85 of 1993) into any incident involving the Contractor and/or his employees and/or his subcontractors.

In witness, thereof the parties hereto have set their signatures hereon in the presence of the subscribing witnesses:

for and on behalf of the Contractor who warrants to be duly authorised to do so

Signature: ………………………………………………………………………………………..

Name: ………………………………………………………………………………………………

Designation: ………………………………………………………………………………………

As Witness: ………………………………………………………………………………………..

…………………………………………………………………………..…………………………………

for and on behalf of the Employer who warrants to be duly authorised to do so

Signature: ………………………………………………………………………………………..

Name: ………………………………………………………………………………………………

Designation: ………………………………………………………………………………………

As Witness: ………………………………………………………………………………………..

PART C: THE CONTRACT

Part C2: Pricing Data and Bill of Quantities

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

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PART C: THE CONTRACT

Part C2: Pricing Instruction and Bill of Quantities

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

C2.1 Pricing Instructions

1. The Contractor shall provide a fixed price for the Solar Photovoltaic systems.
   The quoted price shall be inclusive of all costs including:
   - review of the Engineer's reference design
   - planning
   - design
   - manufacture
   - shipping
   - all import duties, customs clearance
   - installation and commissioning
   - insurance
   - rate of exchange fluctuations
   - preliminaries
   - all regulatory obligations including compliance with
     - Occupational Health and Safety requirements
     - South African National Building Codes
     - South African National Codes of Practice.
2. The contractor shall provide a breakdown of the price into the items identified in the bill of quantities (Section **Error! Reference source not found.**) as described in the Scope of Work (Section **Error! Reference source not found.**).
3. The Bill comprises items covering the Contractor's profit and costs of general liabilities and of the Upgrading of Temporary and Permanent Works.
   Although the Tenderer is at liberty to insert a rate of their own choosing for each item in the Bill, the Tenderer should note the fact that the Contractor is entitled, under various circumstances, to payment for additional work carried out and that the Engineer is obliged to base their assessment of the rates to be paid for such additional work on the rates the Contractor inserted in the Bill.
4. Descriptions in the Bill of Quantities are abbreviated and may differ from those in the Standardized and Project Specifications. No consideration will be given to any claim by the Contractor submitted on such a basis. Should any requirement of the measurement and payment clause of the appropriate Standardized or Project Specification(s) be contrary to the terms of the Bill, the requirement of the appropriate Standardized, Project, or Particular Specification as the case may be, shall prevail.
5. Unless stated to the contrary, items are measured in accordance with the Drawings without any allowance having been made for waste.
6. The amounts and rates to be inserted in the Bill of Quantities shall be the full inclusive amounts to the Employer for the work described under the several items. Such amounts shall cover all the costs and expenses that may be required in and for the upgrading of the work described, and shall cover the costs of all general risks, profits, taxes (but excluding value-added tax), liabilities and obligations set forth or implied in the documents on which the Tender is based.
7. An amount or rate shall be entered against each item in the Bill of Quantities, whether or not quantities are stated. An item against which no amount or rate is entered will be considered to be covered by the other amounts or rates in the Bill.

The Tenderer shall also fill in a rate against the items where the words "rate only" appear in the amount column. Although no work is foreseen under these items and no quantities are consequently given in the quantity column, the tendered rates shall apply should work under these items actually be required.

8. The **"Occupational Health and Safety Act No 85 of 1993"** Construction Regulations are as follows:
   A payment item in the schedule of Quantities/Bill of Quantities must allow the tenderers to price for compliance with OHSA and the Construction Regulations. This payment item must include for the erection of Visitors Indemnity Signs and for ensuring that visitors receive instructions and sign an indemnity declaration.
9. It shall be expressly noted that the award of the operations and maintenance portion of the contract is at the sole discretion of the Employer. The Employer reserves the right to omit the Operations and Maintenance portion from the contract.

1. GENERAL INFORMATION

a. Bills of Quantities
The **bills of quantities** forms part of and must be read and priced in conjunction with all the other documents forming part of the **contract documents**, the Standard Conditions of Tender, Conditions of Contract, Specifications, Drawings and all other relevant documentation.

b. Value Added Tax
The **contract sum** must include for Value Added Tax (VAT). All rates, provisional sums, etc. in the **bills of quantities** must however be net (exclusive of VAT) with VAT calculated and added to the total value thereof in the Final Summary.

c. Fixed Price Contract
Tenderers are to take note that contract price adjustments are not applicable to this contract. Tenderers should therefore make provision in the **contract sum**, schedule of rates, etc., for possible price increases during the contract period, as no claims in this regard shall be entertained.

2. PRICING INFORMATION

1. These schedules of quantities contain sequentially numbered pages as indicated in the contents list. Tenderers are required to check that the pages in their schedules of quantities are complete. If any pages are duplicated or omitted, or if any quantity or typing is unclear or if the schedules of quantities contain any obvious errors, the tenderer shall immediately notify the engineer so that the problem may be rectified. No responsibility for any errors arising from any of the above shall be accepted by the engineer.

2. The schedules of quantities form part of and shall be read in conjunction with the specification, which contains full description of the work required to be performed and the materials and equipment to be supplied and used in the execution of the works. Tenderers shall refer to the specification for the full meaning and description of work to be executed and materials and equipment to be supplied or used in the execution of the work.

3. Tenders shall be submitted with schedules of quantities completed in full. Non or partial completion of the schedules of quantities shall render tenders liable for disqualification.

4. The total tender price as carried forward to the tender form, after correction for arithmetic extension errors, etc. shall be the contract price as awarded to the successful tenderer. Tenderers are requested to check multiplication and addition of the schedules of quantities. The rate submitted shall be regarded as the price offered per item.

5. No changes, additions or omissions to the contents of the schedules of quantities shall be permitted. If any changes, additions or omissions are made these shall not be recognised and the original wording of the schedules of quantities shall apply.
6. The priced schedules of quantities of tender shall be checked by the principal agent. The principal agent reserves the right to request adjustments to one or more individual tender prices and to

rectify contradictions and thereby alter the total tender price as submitted. The acceptance of this tender does not preclude the principal agent from querying or requesting of the contractor to adjust the rates at any stage during the contract period or any extension thereto.

7. The responsibility of the accuracy of the quantities included in the schedules, remains with the person who prepared the schedules. The tenderer is relieved from the responsibility of the measurement of quantities at tender stage and the tender amounts shall be for the quantities as listed in the schedules. It is however expected from the tenderer to include for minor construction items such as would be required for the complete execution of works in accordance with the specification.

8. The quantities in these schedules of quantities shall not be used for the ordering of materials.

9. Changes in the scope of works included in the schedule of quantities shall be permitted and shall be measured and priced at the tariffs as included in the schedules of quantities and shall form an addition to or omission from the total of the schedule of quantities. Any changes not covered by any rates in the schedules of quantities shall be agreed and priced as non-schedule items in accordance with the conditions of contract.

10. The extent and value of variations shall be in accordance with the conditions of contract. Variations to the works prior to the execution thereof shall be priced as above. Variations to work already executed shall not necessarily be priced in accordance with the schedule of quantities and shall be judged individually on merit.

11. Except where the separate rate for the material and labour components of any item is specifically called for, the unit price of such item shall be deemed to include the supply and installation of that item.

    The description of any items shall, except where otherwise specified, allow for the purchase, delivery, off-loading, storage, packing, lifting, placing, positioning and fixing in position, cutting and wastage, dies and patterns, models and equipment, temporary work, return of packing material, fixing costs, profit or other obligations of the contract arising out of the conditions of contract. All items' prices shall exclude VAT but include any other tax or levy as applicable.

    All items are measured to the net final quantity as indicated on the drawings with the completed work in the position as indicated on the drawing. All prices and rates shall allow for wastage for whatever reason, irrespective of any other standard measurement which may be currently used elsewhere.

12. Should the contractor identify any additional issues or items which in his opinion are necessary for the complete and proper execution of the works, he shall identify such items in a covering letter attached to his tender and submit rates for these items. Mistakes in the physical measurement of items in the schedules of quantities shall be rectified but no claim shall be considered for the non-measurement of doubtful or minor items or claims resulting of criticism of method of measurement used or descriptions given. The priced schedule of quantities shall not be adjusted on the grounds of the items which in the opinion of the tenderer should have been brought into account unless so detailed in the accompanying letter.

13. The schedule of quantities shall be adjusted to reflect the quantities of materials used on completion of whole or part of the works as a result of remeasurement, qualification or variations. The remeasured quantities shall form the basis for the calculation of payment certificates. The schedules of quantities are not intended for the ordering of materials, etc. and the contractor is advised to extract the quantities for the ordering of materials directly from the drawings and specification. Any order placed directly from the schedules of quantities shall be solely at the contractor's risk.

14. The unit rates as entered in the schedule of quantities with the exclusion of dayworks items shall in all cases include any present and applicable sales tax or similar statutory duties.

PART C: THE CONTRACT

Part C2: Pricing Data and Bill of Quantities

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

C2.2 Bill of Quantities

The Bill of Quantities can be found in the Appendices.

PART C: THE CONTRACT

Part C3: Scope of Work

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

GENERAL NOTE

These specifications and all appendices attached thereto shall form part of the contract documentation, including drawings and bills of quantities.

In the event of a discrepancy between these specifications, the drawings and/or the bill of quantities, the discrepancy shall be resolved by the Employer or the Employer's representative in accordance with the contract before the execution of the work under the relevant item.

PART C: THE CONTRACT

Part C3: Scope of Work

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

C3.1. Description of the Works

C3.1.1 Background

SANBI is considering the possibility of installing solar photovoltaic (PV) systems at the Kirstenbosch National Botanical Garden in order to promote renewable energy, reduce municipal electricity bills and improve the sustainability of the Kirstenbosch National Botanical Garden.

C3.1.2 Employer's Objectives

The Employer's objectives are to:

- Install an alternative source of energy at Kirstenbosch NBG to generate revenue by reducing electricity purchases from the City of Cape Town.
- If excess energy is produced, have the option to sell the energy to the City of Cape Town.

C3.1.3 Terms and Abbreviations

TERM	EXPLANATION
CAD	Computer aided design
kVA	Kilovolt-ampere, a measurement of apparent electrical power (1000 VA).
kW	Kilowatt, a measurement of electrical power (1,000 Watt).
kWp	Kilowatt-peak, normally used in the context of solar PV systems.
MW	Megawatt, a measurement of electrical power (1,000,000 Watt).
MWp	Megawatt-peak, normally used in the context of solar PV systems.
NERSA	National Energy Regulator of South Africa.
PV	Photovoltaic (with reference to photovoltaic solar panels).
SANS	South African National Standards.
SCADA	Supervisory Control and Data Acquisition, an industrial control computer system.
SLA	Service level agreement
Utilizable Area	A portion of rooftop area(s) that are minimally or unaffected by shading and have thus been identified to be suitable for the installation of solar photovoltaic modules.
VA	Volt-ampere, a measurement of apparent electrical power.
W	Watt, a measurement of electrical power (1,000 Watt).

TERM	EXPLANATION
Wp	Watt-peak, normally used in the context of solar PV systems.

C3.1.4 Description of Works

This contract comprises the planning, detailed design, supply, installation, commissioning and 2-year operation and maintenance of a carport rooftop solar PV system plus all electrical, control and instrumentation equipment at SANBI Kirstenbosch NBG, and includes the works described below.

Regulatory approvals

- Assist SANBI in obtaining regulatory approvals from the City of Cape Town for the carport PV installations.

Installation of the new equipment, which currently does not exist:

- Solar modules
- Inverters
- New cabling, trenching and cable ladders between PV modules and inverter / main LV panel
- Roof safety harness systems
- Lightning protection system
- New carport structures to accommodate solar PV modules

Provision of design documentation:
In order to comply with MFMA regulations, the design contained within these specifications is a reference design which is sufficiently generic such that tenderers are free to propose any equipment that complies with all aspects of these specifications.

Therefore, the reference design described in these specifications does not include detailed drawings, PV module layouts, mounting structure designs, wiring schematics, hook-up drawings, cable schedules or termination schedules. The successful contractor will be required to create this design documentation for approval by the Employer or their representative.

C3.1.5 Phasing of the works

The works will not be phased.

C3.1.6 Extent of the Works

The works are limited to the Kirstenbosch National Botanical Garden on Rhodes Drive, Cape Town.
The Contractor is responsible for the surveying, planning, detailed design, procurement and supply of all materials and labour, manufacture, delivery to site, offloading, construction, erection, installation, factory acceptance testing (FAT), on-site testing, commissioning, performance testing, provision of samples, preparation of all detail design drawings, shop drawings, as-built record drawings, maintenance manuals, instructions for the works and end-user training, in accordance with the general requirements and performance requirements as detailed in this document.
The scope of works includes, but is not limited to, the following:

- Detailed design of the new solar PV system, based on the performance specifications and reference design provided in this document, as well as the bills of quantities and reference design drawings.
- Submission of design documents and samples to the employer or the employer’s representative for approval prior to commencement of equipment procurement.
- Liaison with all relevant regulatory and municipal bodies, including all applications that may be relevant to this installation. See exclusions below.

- Procurement of all equipment required for a successful installation, including PV modules, inverters, cables, wireways, trenching, fixing structures, switchgear, enclosures, lightning and surge protection equipment, data acquisition equipment, monitoring and control system, safety harness systems, new carport structures and associated civil works, and all other peripheral equipment required for the successful installation and integration of the PV plant.
- Transportation of all equipment to site.
- Establishment of the contractor's office on site.
- Storage of materials on site.
- Provision of private security to protect the materials on site, if deemed necessary by the contractor.
- All signage as may be required in terms of the OHS Act.
- All civil work that may be required by the installation.
- Installation of all equipment as per scope of works and specifications.
- Installation of new wireways (existing wireways to be reused wherever possible).
- Integration of the PV system with existing electrical network, in accordance with all applicable standards and the national grid code.
- Commissioning and start-up of PV plant.
- Waterproofing, including all penetration points of the solar PV system, and repair of all waterproofing that was damaged because of the installation. See exclusions below.
- Preparation of acceptance test procedures.
- Submission of test procedure to the engineer for approval prior to commencement of acceptance tests.
- Conducting acceptance tests (to be witnessed by the engineer).
- Submission of documentation as prescribed in employer's requirements.
- Training of the employer's staff relating to the operation and maintenance of the PV installations.
- Delivery of spares and special test equipment.
- Finishing the site (removal of all hoarding, unused installation material, building rubble).

The following items comprise the extent of the 24-month Operations and Maintenance portion of this contract:

- Preventive maintenance in accordance with the predefined schedule and SLA.
- Corrective maintenance in accordance with the SLA.

The following items are excluded from the works:

- The employer shall ensure that all rooftop areas are adequately cleaned, waterproofed and prepared before the installation commences.
- All fees relating to municipal or regulatory applications are the responsibility of the employer. However, the contractor shall advise the employer on the approval requirements and shall assist the employer by facilitating those approvals.
- The employer shall provide clean 230 V power at all points of installation.
- The employer shall provide SIM cards and data contracts for remote GSM/3G access to the inverters.

C3.1.7 Location of the Works

The site is located at the Kirstenbosch National Botanical Garden (KNBG), Rhodes Drive, Newlands, Cape Town.

C3.1.8 Description of Site and Access

Kirstenbosch National Botanical Garden lies in the heart of the Cape Floristic Region, also known as the Cape Floral Kingdom. It is the first botanic garden in the world to be included within a natural World Heritage Site.

The 36-hectare garden is part of a 528-hectare estate that contains protected mountainside supporting natural forest and fynbos along with a variety of animals and birds. The Kirstenbosch Estate borders the Table Mountain National Park, and the Garden merges seamlessly with the natural fynbos and forest of the mountain.

Kirstenbosch displays a wide variety of the unique plant life of the Cape Flora. Plants from all the diverse regions and biomes of southern Africa are also grown at Kirstenbosch. There are over 7 000 species in cultivation at Kirstenbosch, including many rare and threatened species.

The garden is accessible via Rhodes Drive, Newlands.

C3.1.9 Temporary Works

All design and construction of any temporary works must be approved by the Principal Agent.

C3.1.10 Documentation to be Provided

The successful contractor will be required to provide the following documentation based on their proposed models for the PV models and inverters to be used.

<u>Design drawings</u>

- Equipment layout, wireways, sleeves and cable routes
- Wiring schematics
- Single line diagrams for all AC and DC systems

<u>Design report</u>

- Design assumptions
- Shadow assumptions
- Tree removal recommendations
- Power calculations
- Yield Calculations
- Verification of structural integrity of the car port fixing

<u>Datasheets</u>

- PV modules, power optimisers (if applicable), roof attachment clamp systems
- Inverters and any additional modules (e.g. TCP/IP, GSM, data loggers, etc.)
- Weather monitoring stations

<u>Shop drawings</u>

- Pre-manufactured distribution boards, panels and DC combiner boxes.
- Pre-fabricated PV module mounting structures
- New carport structures

<u>Schedules</u>

- Cable schedules (AC and DC)
- Termination schedules

<u>Test procedures</u>

- Site acceptance test procedures for all equipment

<u>Handover documentation</u>

- All documentation and files specified elsewhere in these specifications, including as-built drawings, manuals, training material, license keys, usernames and passwords, equipment lists, vendor lists, etc.

PART C: THE CONTRACT

Part C3: Scope of Work

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
CONTRACT NO:	**SANBI G410/2022**

C3.2 Standard Specifications

C3.2.1 National and International Standards

All codes and standards applicable in South Africa to the scope of supply shall be strictly adhered to. Included in the codes and standards applicable to the scope of supply are the various codes and standards mentioned in this document.

In the event of conflicting codes, the more stringent shall apply. All materials and workmanship shall unless otherwise specified be in accordance with the latest SANS Standards, and in the absence thereof, the latest British Standard Code of Practice.

The Contractor may, subject to the Engineer and Employer’s approval, substitute a material or product complying with another equivalent or better international standard.

The following specific codes of practice shall apply:

- Occupational Health and Safety Act, 1993 (Act No 85 of 1993) and the regulations promulgated in terms of the Act.
- SANS 10142-1: The wiring of premises Part 1: Low voltage installations
- NRS 097-2-1: Grid interconnection of embedded generation
- SANS 10400: The application of the National Building Regulations
- SANS 62305-1: Protection against lightning Part 1: General principles
- SANS 10104: Handrailing and balustrading (safety aspects)
- SANS 10021: The waterproofing of buildings (including damp-proofing and vapour barrier installation)
- NERSA: Grid connection code for renewable power plants (RPPs) connected to the electricity transmission system (TS) or the distribution system (DS) in South Africa
- NERSA: The South African Grid Code
- The local Fire Department Regulations.
- The relevant SANS, NRS, BS and IEC and ISO supporting specifications referred to in the standard specifications.
- Municipal, supply authority and regulatory standards and bylaws.

All losses, costs or expenditures which may arise as a result of negligence to comply with any regulation applicable to this service as specified above, shall be for the account of the Contractor.

PART C: THE CONTRACT

Part C3: Scope of Work

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
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C3.3 Performance Specifications

These performance specifications define the minimum requirements for the various systems and equipment forming part of this project. The contractor's detailed design shall comply with every aspect of these specifications.

C3.3.1 Climatic Information

All equipment shall conform to the following common requirements:

Indoor:	Temperature	0 °C to 40 °C
	Relative humidity	0 % to 100 %
Outdoor:	Temperature	-5 °C to 45 °C
	Relative humidity	0 % to 100 %

Altitude: Between 0 and 400 metres above sea level.

All equipment shall be rated for a 25-year lifespan, including PV modules, enclosures, fasteners, racks, wireways and switchgear. Inverters shall have an OEM-backed warranty of at least 10 years.
All enclosures, wireways, fasteners, brackets, locks, handles and covers shall be corrosion resistant. Materials shall be selected to prevent galvanic corrosion between different metals.

C3.3.2 Defective Equipment

Defective equipment will not be accepted under any circumstances. Any equipment or components found to be defective must be replaced at the expense of the contractor. The defect liability period is defined by the contract governing the installation.

C3.3.3 Vandal Resistance

The installation will be subject to a high risk of theft and vandalism. The contractor shall ensure that all equipment is installed such that vandalism is reduced. No cables or bare copper earth conductors shall be visible or accessible externally from the ground level of the buildings. For carports, all cables and conductors should be installed in galvanised conduit as far as practically possible.
Solar PV modules shall be fastened in a manner that they are difficult to remove, particularly on carports.

C3.3.4 System Capacity

Table 0-1 provides a summary of anticipated system performance for the sites under this contract.

Table 0-1: Anticipated System Capacity

Site	Nameplate power output	Annual Energy Yield	Maximum permitted load of overall installation
	kWp	**MWh / year**	**kg / m²**
SANBI Kirstenbosch	52.5	77.3	20
TOTAL	**52.5**	**77.3**	

C3.3.5 Integration with Existing Electrical Infrastructure

The contractor will be responsible for all integration with existing electrical infrastructure. If the need arises to appoint a certified electrical subcontractor or specialist to assist with the integration, the costs for this specialist will be borne by the main contractor unless otherwise agreed with the employer.

C3.3.6 Photovoltaic Modules

Polycrystalline Grade A modules must be installed. The modules must be certified to conform to the following standards:

- ISO 9001
- IEC/EN 61215 and IEC/EN 61730.

It is preferable that the PV module manufacturer is well established and has a large balance sheet with sufficient warranty insurance.
If the bidder believes an alternative module type may be better suited for this installation, this may be provided as an alternative solution if the original tender document is also fully priced.

C3.3.7 Fixing Method (PV Modules)

To minimise loading on the various buildings and structures, the mass of the entire installation may not exceed 20 kg/m² for each building.
The contractor shall ensure that the all-new roof penetration points are adequately waterproofed.
If the contractor proposes a non-penetrating mounting structure, it must be certified to withstand the prevailing wind forces at each building. Manufacturer datasheets must be provided by the contractor and approved by the employer in this regard.
All fasteners, frames and mounting structures shall be rated for a 25-year lifespan. All components shall be selected such that galvanic corrosion is minimized.

C3.3.8 Inverters

The size, quantity, configuration or exact location of the grid-tie inverters is not prescribed. However, the inverters must conform to the following minimum specifications:

- Certified conformance to NRS 097-2-1:2010
- Surge protection (DEHNguard or equal/better, preferably built-in)
- Overcurrent and fault current protection
- String inverters

Power optimisers are permitted but not compulsory.
To minimize voltage, drop losses, it is recommended that the inverters be installed as close as possible to the connection point to the local LV grid.

If the inverters are installed outdoors, they must be installed in such a way that the performance or lifetime of the inverters is not compromised through exposure to the elements. Therefore, inverters should be protected from direct sunlight, rain and lightning strikes.
If the bidder believes an alternative inverter type may be better suited for this installation (e.g. micro inverters), this may be provided as an alternative solution if the original tender is fully priced.

C3.3.9 Cable Management System

Once appointed, the contractor shall provide detail design drawings of all cable management systems, including fixing and attachment methods. Although it is likely that the cable management system will require drilling into some rooftops, the contractor will be encouraged to find alternative fixing methods that do not require any drilling. This will further reduce waterproofing issues.
Existing wireways and cable ladders should be used wherever possible.

C3.3.10 Cables and Connectors

DC cabling should be specifically rated for outdoor solar PV installations and should be double insulated, UV resistant and weather resistant. Positive and negative cables shall be laid separately to prevent short circuit faults. All connectors must have an ingress protection rating of IP 67.

C3.3.11 Earthing

All equipment and cabling shall be earthed in accordance with all relevant codes and regulations and shall be suitably protected against lightning strikes and surges.

C3.3.12 Monitoring and Control

A monitoring and control system shall be built into the inverters and shall be accessible via a GSM/3G module that is either built into the inverter, or enabled through an add-on module. The SIM cards and data contracts will be provided by the employer.
The system should have the following functionality. This is a generic list of specifications and may not be possible to achieve by all manufacturers. Solutions proposed by bidders must meet the majority of the following specifications and any specification that cannot be met must be highlighted by bidders in their proposal.
<u>Monitoring and Control Requirements:</u>

- Data acquisition
    - Individual string performance
    - Inverter performance
    - AC panel status
    - Load (four-quadrant energy meter)
    - AC grid status
    - Generator status (if applicable).
- Trends
    - Historical
    - Real-time.
- Alarm Manager
    - String performance
    - Device failure
    - Visual diagrams to indicate location of alarm or fault

    - Email/SMS notification.
- Protection
    - Automatic disconnection when common faults are detected (e.g. over/under voltage, frequency, temperature)
- Energy export
    - Ability to implement energy export limitation in future by monitoring power flow through four-quadrant meters and reducing the amount of PV such that no energy is exported to the municipal grid.
- Control
    - Remote isolation of fault-affected components.

- Reporting
    - Yield Reports
    - Financial Reports.
- Architecture
    - Scalable, support for future expansion.
- Licensing
    - A once-off license is preferable to recurring license fees.
- Maintenance Calendars
    - Support for maintenance activity calendar and alerts
    - Lifecycle status of all elements in PV plant.
- User access rights (administrator plus at least one operator level).
- Import/export functionality of data and configuration settings.
- Web interface for remote access.

The control and monitoring system must be scalable to accommodate future expansion, including PV installations on other surrounding buildings. Its architecture must be open and modular to accommodate data acquisition equipment from several manufacturers.

C3.3.13 Energy Metering

A four-quadrant, three-phase net metering system shall be installed, by the contractor, at all points where the PV system connects to the local grid and will be integrated with the aforementioned monitoring and control system.

C3.3.14 Active Islanding Detection

An active islanding detection must be incorporated into the system in accordance with applicable standards and regulations.

C3.3.15 Lightning Protection

The solar PV plant shall be equipped with a lightning protection system in the form of air terminals/lightning rods. As part of their tender submissions, bidders must include information about the type of lightning protection system that will be installed. Once appointed, the contractor shall then provide a detail design and specifications for the proposed lightning protection system.
Surge arrestors shall be installed to protect the installation from transient voltage spikes.

C3.3.16 Waterproofing

The contractor will take full responsibility for the waterproofing of each structure upon completion of the project. All points where the solar PV plant penetrates the roof shall be waterproofed in accordance with SANS 10021.

C3.3.17 Safety Harness System

To improve safety for maintenance staff working on the roof, the contractor shall install a new safety harness system on all rooftops that are to receive PV modules.

C3.3.18 Structural Alterations and Modifications

Existing carports must be replaced with new structures before any PV modules can be installed on those carports. The contractor will be responsible for the installation of new carports for the solar PV installation.

C3.3.19 Maintenance

The contractor shall be required to provide maintenance schedules and requirements, including ancillary works to facilitate maintenance activities. This could include the provision of one or more water taps to the rooftop to facilitate cleaning of the PV modules (if the employer chooses to install taps on the rooftops, this will be done by others under a separate contract).
The panel positioning should also be determined with maintenance requirements in mind. For example, it must be possible to access every panel for cleaning purposes.
As part of their tender submission, tenderers shall include information about their standard SLA offerings, including options, terms and costs.

C3.3.20 Weather Stations

No weather stations will be required under this contract. However, the contractor shall provide a rate for a weather station display should the employer choose to add this to the project at a later stage for performance benchmarking purposes. The weather station shall be suitable for rooftop installation and shall have the following sensors as a minimum:

- Ambient Air Temperature
- PV Panel Temperature
- Pyranometer
- Anemometer (speed and direction).

The weather station output data shall be logged at 1-minute intervals. Logging intervals shall be configurable. Pricing shall include all hardware, software, cabling, network interfaces, mounting brackets and electrical connections required for a complete and functional system.

C3.3.21 Operations and Maintenance

It shall be expressly noted that the award of the operations and maintenance portion of the contract is at the sole discretion of the Employer. The Employer reserves the right to omit the Operations and Maintenance portion from the contract.

C3.3.22 General

The Contractor, in general, shall be responsible for the followings during O&M periods:

a) The Contractor shall maintain the PV plant and operate the PV plant (including the complete solar PV plant, the Switchgear, Interconnection, and the Support Facilities), in good condition and perform the agreed O&M services in good faith, in accordance with the best industry practice.
b) The Contractor shall perform periodic inspection and testing of PV plant and each component and report on the status of modules, cablings, structures, inverters, monitoring system, etc.
c) The Contractor shall maintain and repair (if necessary) the civil construction of the PV Facility.
d) The Contractor shall repair any defect or replace any item, equipment and component.
e) The Contractor shall perform maintenance activities as minimum as defined under preventive maintenance and corrective maintenance.
f) The Contractor shall supply all required tools, equipment and facilities (including water for module cleaning) which are necessary for carrying out the operation and maintenance of the PV plant.
g) The Contractor shall guarantee at all times the on-site availability of minimum spare parts.
h) The Contractor shall guarantee the plant performance and operate the plant accordingly to meet the guaranteed level.
i) The Contractor shall maintain and ensure the compliance of the plant in respect to safety laws and regulations in respect of the safety of the workers and performing the services.
j) The Contractor shall follow the maintenance manuals provided by the Contractor under the Design Build Contract, for entire plant monitoring including the operational manual of specific components and safety instructions.
k) The Contractor shall protect any plant warranties and support Employer on negotiation of any warranty or the claims available to Employer for material or equipment supply and for the performance work associated with the plant.
l) The Contractor shall respond in the shortest possible of time to any alarm generated in PV plant and take the necessary actions (repair or replacement) and shall report to Employer.
m) The Contractor shall operate and provide the maintenance of surveillance and control system, communications, security and meteorological stations.
n) The Contractor shall report periodically regarding the status of the plant, maintenance work and the performance evaluation of the pant according to the reporting schedule defined in this document.
o) The Contractor must provide O&M training to Employer and Employer’s representative along with all required material in hard copy and in electronic copy.
p) The Contractor shall co-operate and co-ordinate with the Employer, Employer’s representatives and Building Facility Managers in a best way to ensure the operation and maintenance activities are performed respecting all Employers’ requirement and not effecting the regular Building Facility’s (site) normal operation and maintenance.
q) The Contractor shall commence Operation and Maintenance activities respecting all legal, environmental and administrative requirements.
r) The Contractor shall co-operate with third parties (upon request from the Employer) and with the respective municipality (electricity provider to the building) for verification of their requirement during project installation, commissioning and operation.

C3.3.23 Preventative Maintenance

a) Preventive maintenance of the plant shall include all necessary measures to be done by the Operator as indicated in the maintenance manuals provided by the Contractor under the Design

Build Contract, and in the preliminary maintenance plans provided to avoid or anticipate possible or future malfunctions of the plant.

b) The Contractor shall define the preventive maintenance plan for the PV system including the frequency and scheduling of each maintenance activity. The frequency of preventive maintenance depends upon the level of impact on energy production that it would produce if the component stops functioning. In this regard, the preventive maintenance of the inverter shall receive the greatest focus among all. The Contractor shall pay high level of attention to such components in its O&M plan. Preventive inverter maintenance shall include at least:
   1) the inspection and tightening of connections
   2) ensuring water and dust tightness
   3) cleaning and replacing filters, lubricating moving parts like fan, handles and disconnects
   4) running electronic diagnostics.

c) Preventive maintenance also involves module cleaning, inverter servicing, mounting structure maintenance and balance of system inspection. The inspection on balance of system includes but is not limited to the inspection of junction box, conduit runs, combiner box, communication equipment, monitoring equipment, etc.

d) A general overview is provided as guidelines of preventive maintenance of the main components. The maintenance type and frequency of maintenance may depend upon the specific component type and local grid requirements. Therefore, the Contractor shall provide the detailed preventive maintenance plan of each equipment, configuration, and systems considered in the plant.

e) It is expected that the Contractor propose a suitable cleaning method as well as frequency for the PV plant design proposed, but at least according to the requirements as mentioned below.

C3.3.24 Corrective Maintenance

a) Corrective maintenance shall include at all times and in all cases attending to and repairing breakdowns and failures of the components of the plant caused by wear and tear and/or breakage under normal operating conditions to ensure that the plant operates normally throughout the duration of the O&M Period.

b) Corrective maintenance shall be carried out during the preventive maintenance visits (if the faults/failures do not affect energy production) or when the remote monitoring system registers an operational problem. In case of corrective maintenance, the Contractor shall perform:
   1) A problem diagnosis, performance notification and which parts needs to be replaced
   2) Supplying the component parts needed to replace in the event of breakdown or anomaly
   3) Repairing or Replacing, when necessary, the affected component/equipment from inventory and brining the plant back in working condition
   4) Purchasing and transporting the replaced component and keeping the inventory always in the same level as defined by the contractor during the installation.

c) Where market conditions prevent the supply of parts identical to those already installed, the Contractor shall purchase the available parts of similar technical specifications and equal or higher warranty periods and terms, which do not result in a reduction below the rated output, or efficiency of the plant.

d) The Contractor shall repair or replace the affected item immediately or, under all circumstances, within 48 hours following the identification of failure (alarms) where this occurs on a working day or within 72 hours following the failure (alarms) where this occurs on a non-working day. The Contractor shall be responsible for maintaining the plant in accordance with the laws in force at any given time.

e) In case an immediate repair/replacement is not possible (due to the lack of sufficient availability of components in inventory), the Contractor shall be entitled to put in place a temporary technical solution allowing partial if not complete resumption of production and/or minimize production losses to a maximum. If beforehand unavailable component has been received, the Contractor shall repair or replace the affected item within 48 hours.

C3.3.25 Operations and Maintenance Training

a) O&M Training shall be provided to the Employer and Employers' representatives within three months after the issuance of substantial completion certificate. The Training shall be both based on Classroom and Onsite Training. The Contractor shall provide formal classroom training of the operations, maintenance prior to final hand-over of the plant (Final Acceptance Test) to ensure Employer's representatives have a sound understanding of the plant layout and functionality.

a) Training material for classroom training shall be based on O&M manual content (O&M Manual requirement is presented in in this document) and contain evaluation criteria on each section of the plant covered in order to establish the level of Employer's representatives' understanding.
b) The Contractor shall provide formal on-site training of the operations, maintenance prior to final hand-over (Final Acceptance Test) of the plant is essential to ensure Employer's representatives' have a sound understanding of the plant functionality and O&M requirements.
c) Training material for on-site training shall be based on O&M manual (requirement of O&M Manual is presented in this document) in addition to detailed operating and maintenance plans and procedures.
d) Training shall be focused on the following areas:
    1) Operation and Maintenance of the Facility
    2) Inverter Technician Training: specification, functioning and safe operation following Manufacturers O&M Manual (troubleshooting for error codes, repair, software for inverter, Fault finding on the DC Plant) and
    3) Data Acquisition System and PLC Training.
e) The Contractor shall provide all training materials in hard copy and electronic copy to the trainees prior to the actual commencement of O&M training.

C3.3.26 Spare Parts

The Contractor shall provide and ensure that such minimum levels are always available in inventory during the plant operation according to the recommended spare parts list to be supplied by the Contractor upon appointment.

PART C: THE CONTRACT

Part C3: Scope of Work

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
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C3.4 General Project Specifications

C3.4.1 Approvals

Datasheets and/or shop drawings for the following equipment must be submitted to the Engineer for formal, written approval before it may be procured by the contractor:

- PV Modules
- Inverters
- DC Cables
- AC Cables
- Distribution boards, enclosures and combiner boxes
- Mounting frames and support structures
- Carports
- Roof-penetrating attachments
- Monitoring software
- DC fuses
- AC switchgear

C3.4.2 Materials and Handling

All materials must be new, complete, in good condition, and unused. Materials are to be visually inspected for damage on site and before use.
Additionally, all installations must conform to the vendors' instructions, best-practices and standards for the product(s) used.
Cable must not be pulled under excessive load, and all cables must be free of kinks, snags, and twists during and after installation. Wherever possible, cables should be placed in pathways rather than pulled under tension.
Cables must not be installed in areas exposed to direct sunlight or temperatures that might exceed the manufacturer's specifications, unless those cables are specifically rated and certified for such conditions.

C3.4.3 Use of Reasonable Skill and Care

In executing this project, the Contractor shall exercise all the reasonable skill, care and diligence to be expected of an appropriately qualified and competent contractor experienced in carrying out equivalent installations for projects of a similar size, scope, complexity, value and purpose to the Development.

C3.4.4 Construction in Confined Areas

The contractor shall note that construction in confined areas may be required.

C3.4.5 Ownership of Recovered Materials

No materials recovered during the execution of the contract shall be removed from the site without written authorisation from the employer, and the contractor shall be liable for the replacement value of any recovered materials removed without such approval.
All materials recovered during the construction operations shall be delivered to the employer at designated areas, which will be within the boundaries of each site.

C3.4.6 Insurance

The Contractor shall be required to take out adequate insurance to cover their obligations in terms of the Contract and to keep them current for the duration of the Contract.

C3.4.7 Labour-Intensive Works

No requirements for labour intensive construction methods are specified.

C3.4.8 Regulatory Authority Approval

The contractor will be required comply with all local and national regulations regarding regulatory approval, including an application to City of Cape Town or NERSA for a generating licence. The employer will be liable for all costs associated with the application, but the contractor will be required to advise the employer on the application process and assist the employer by facilitating the application process.

PART C: THE CONTRACT

Part C3: Scope of Work

PROJECT TITLE:	**REQUEST FOR BIDS FOR THE APPOINTMENT OF A CONTRACTOR FOR THE DESIGN, SUPPLY AND INSTALLATION OF A CARPORT SOLAR PHOTOVOLTAIC PLANT FOR THE SOUTH AFRICAN NATIONAL BIODIVERSITY INSTITUTE AT THE KIRSTENBOSCH NATIONAL BOTANICAL GARDEN, CAPE TOWN**
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C3.5 Commissioning and Handover

C3.5.1 Testing and Availability

All live testing for the purposes of handover shall be based on the Acceptance Test Criteria described below.

C3.5.1.1 <u>Acceptance test criteria</u>

Acceptance test procedures are to be prepared by the contractor and must be approved by the engineer before any acceptance tests are conducted.

C3.5.1.2 <u>Availability</u>

Availability of the system shall be **99.5 %.**

C3.5.1.3 <u>System up-time</u>

Downtime caused by external power failures, data connectivity problems due to unpaid SIM card contracts by the employer, incorrect usage of the equipment, preventative maintenance, routine maintenance, etc. shall not be part of the equation to calculate system up time. However, downtime caused by system failure and unresponsiveness will form part of the equation, including failure of GSM/3G communication modules through incorrect configuration by the contractor.

C3.5.1.4 <u>Confidence trials</u>

These trials shall last for a minimum period of five calendar days starting on the day that the system is in full operational use. A day is defined as 24 hours. Confidence trials shall be completed once the following accumulative system up time has been measured by the contractor over a period of five consecutive days and is proven to the engineer:

- Solar photovoltaic plant and associated systems: 99.5% collectively.

C3.5.1.5 <u>Software application for programming Confidence trials</u>

Microsoft Project, ProjectLibre or equivalent project programming software shall be used by the contractor for the compilation of all programmes.

C3.5.2 DRAWINGS AND DOCUMENTATION

C3.5.2.1 Drawings

Drawings shall be produced according to ISO standards. All drawings shall be made available via auditable cloud-based file transfer system. As a minimum, the following drawings must be submitted for approval:

- Design drawings
- As-built drawings
- Documentation drawings for maintenance manuals.

Drawings shall be prepared specifically for this contract using CAD software and shall not be marked-up drawings.

C3.5.2.2 Documentation

Upon completion of the project, the contractor shall hand over the following documentation:

- Set of installation drawings (for approval)
  - Layout drawings showing numbering of every PV module, string and inverter
  - Electrical single line diagrams (AC and DC)
  - Block diagram (communication network, data logging modules, etc).
- Equipment documentation
  - Datasheets
  - User manuals
  - Factory test reports
  - Warranty/guarantee certificates.
- Manuals (for approval)
  - Operator Manual
  - Maintenance Manual, including
    - Spares lists
    - Scheduled and unscheduled maintenance tasks
    - Maintenance procedures and instructions
- Training documentation, including training aids and course notes
- Software
  - If applicable, full source code for any system that was custom-developed for this project. **Note:** custom-developed systems are not recommended.
  - Full system backups, including configuration settings, from all inverters and other equipment that is able to produce backups of configuration settings.
  - Software installation files and discs
  - License keys or dongles.
- Certificate of Compliance for electrical installation work
- Acceptance test procedures and acceptance test result sheets (for approval)
- Final certificate of completion (for approval).

C3.5.2.3 Operating and Maintenance Manuals Drawings

These manuals shall provide sufficient information for the operation of the system and shall include the following as a minimum:

- Description of all parts and operations
- Description of all software and control functions
- Emergency and/or alternate procedures in the case of power failures, etc.
- Fault finding.

Maintenance manuals shall have all the information to ensure that the system will be properly maintained. It shall be comprehensive to the extent that a technician can service the system. Fault diagnostics shall also be included so that faults can be traced, and components are exchanged with a minimum of difficulty. Sections covering the following aspects shall be included as a minimum:

- Troubleshooting and fault finding
- A list of all components and non-standard tools required
- A recommended list of spare components that must be kept in stock as well as minimum spare stock levels.

C3.5.2.4 Spare Parts

The Employer will determine the final list of spare parts to be supplied for each site in consultation with the Contractor and Engineer. These spare parts will be held by the Employer and may be used during the defect liability period. Spare parts used during the defect liability period will be replaced, so that the Employer spares holding at the end of the defect liability period will be as originally supplied.
In addition, the Contractor shall stock spare parts for the duration of the defect liability period to ensure a 48-hour turnaround time to replenish any Employer spare parts used during the defect liability period. A detailed list of spare parts as well as prices must accompany the Tender submission proprietary equipment and components to be flagged accordingly. This parts list must be upgraded to form part of the final documentation and must then include a full inventory of replacement parts, parts descriptions, identification, quantities, name of suppliers and part numbers. Please note that spare parts required for commissioning and testing purposes shall not be a measurable item.

Spare parts to be priced separately.

C3.5.2.5 Progress meetings

The progress meeting schedule will be agreed and finalised with the contractor upon contract award.

PART C: THE CONTRACT

Part C3: Scope of Work

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3.6 Construction

C3.6.1 Construction Standards

The “Model Preambles for Trades (2008 Edition)” recommended and published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in the Bills of Quantities, with amendments as follows: References to “Architect” in the Model Preambles are to be read as “Principal Agent” shall apply to this contract.

This publication is available from The Association of South African Quantity Surveyors, P.O. Box 3527, Halfway House, 1685 - telephone (011) 315-4140, before a Tender is submitted.

The SANS 1200 Standardised Specification for Civil Engineering Construction prepared by Standards South Africa and specific amendments and additions to the SANS 1200 Standardized Specifications shall apply to this contract.

The SANS 1200 Standardised Specification publications are available from Standard south Africa, Private Bag X 191, Pretoria, 0001.

C3.6.2 Plant and Materials

C3.6.2.1 Plant and Materials Supplied by the Employer

None

C3.6.2.2 Materials, Samples and Shop Drawings

All materials are to be SANS approved as directed by the Engineer.

C3.6.3 Construction Equipment

C3.6.3.1 Requirements for Equipment

The Contractor is required to use plant and equipment that is sufficient for the contract.

C3.6.3.2 Equipment Provided by the Employer

None

C3.6.4 Existing Services

C3.6.4.1 Known Services

None

C3.6.4.2 Treatment of Existing Services

Contractor to use caution.

C3.6.4.3 Use of Detection Equipment for the Location of Underground Services

There are no ground services expected to be disturbed during construction.

C3.6.4.4 Damage to Services

It is the responsibility of the Contractor to ensure that no services are damaged during the construction process. In case the known services are damaged, the main Contractor shall be responsible for the repair of the services to the original state before it was damaged, as well as all cost associated with the damaged service.

C3.6.5 Site Establishment

C3.6.5.1 Services and Facilities Provided by the Employer

None.

C3.6.5.2 Facilities Provided by the Contractor

The onus lies with the main Contractor to find a suitable camp site, approved by the Employer.

C3.6.5.3 Storage

No requirements are specified.

C3.6.5.4 Other Facilities and Services

No requirements are specified.

C3.6.5.5 Vehicles and Equipment

No requirements are specified.

C3.6.5.6 Advertising Rights

It is the main Contractor’s responsibility that no suppliers advertise on site. Any advertisement from suppliers shall be removed at the cost of the main Contractor.

C3.6.5.7 Notice Boards

The main Contractor is allowed to place a Notice board on site. The maximum allowed size of this board should be 2 x 3m.

C3.6.6 Site Usage

The Contractors are not allowed to work outside the allowed working hours, as agreed with the Engineer. The disturbance to the residence should be kept at a minimum.

PART C: THE CONTRACT

Part C3: Scope of Work

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C3.7. Management

C3.7.1 Planning and Programming

C3.7.1.1 General

This clause describes the requirements for the preparation, submission, updating and revision of the programme for the works.

The programme shall be used by the contractor to plan and execute the works. The programme shall also be used by the Engineer to monitor progress and be the sole basis for the assessment of revisions of the date for Practical Completion.

C3.7.1.2 Submission of Programme

Within 10 (Ten) working days of been given possession of the site the Contractor shall submit to the Principal Agent for his review and acceptance a programme for the whole of the works showing the order in which the contractor proposes to execute the works. This programme becomes the baseline programme upon acceptance by the Principal Agent. The baseline programme shall have regard to the contract completion dates, any other milestones and any restraints set out in the contract. Thereafter, if the actual progress does not conform with the baseline programme, the Principal Agent is entitled to require the Contractor to submit a revised programme showing the order of activities necessary to ensure completion of the works by the contract completion dates.

The Contractor shall supply the Principal Agent with an electronic copy of each programme, together with a print-out bar chart or tabular report in a pre-agreed format. All programmes shall be prepared and submitted using Microsoft Project software.

Within 10 (Ten) working days of the contractor submitting a programme complete with all the information required by this clause to the principal agent for acceptance, the principal agent will accept the programme or state reasons for not accepting the programme. If such reasons are given, the contractor shall take account of the reasons and resubmit the programme within 5 (five) working days.

If the Principal Agent fails to act the programme is deemed to be rejected.

C3.7.1.3 Default in submission of programs

Should the contractor fail to submit a programme for acceptance as the baseline programme or not update the programme as described above, the principal agent shall be entitled to withhold 25% of the amount due to the contractor in interim payment certificates until the contractor has complied with its obligations in this regard.

C3.7.2 Health and Safety

C3.7.2.1 Health and Safety specification

In terms of the Occupational Health and Safety Act (Act 85 of 1993) (OHSA) and the Construction Regulation 2014, the Client must provide the Contractor with a Health and Safety Specification to which the Contractor must respond with a Health and Safety Plan for approval by the Client.

The purpose of this Specification is to ensure that Principal Contractors entering into a contract with the Employer maintain an acceptable level of performance with regard to health and safety issues during the performance of the contract. In this regard the OHSA Specification form an integral part of the Contract and the Principal Contractor shall ensure that their contractors and/or suppliers comply with the requirements of this Specification.

PART C: THE CONTRACT

Part C4: Site Information

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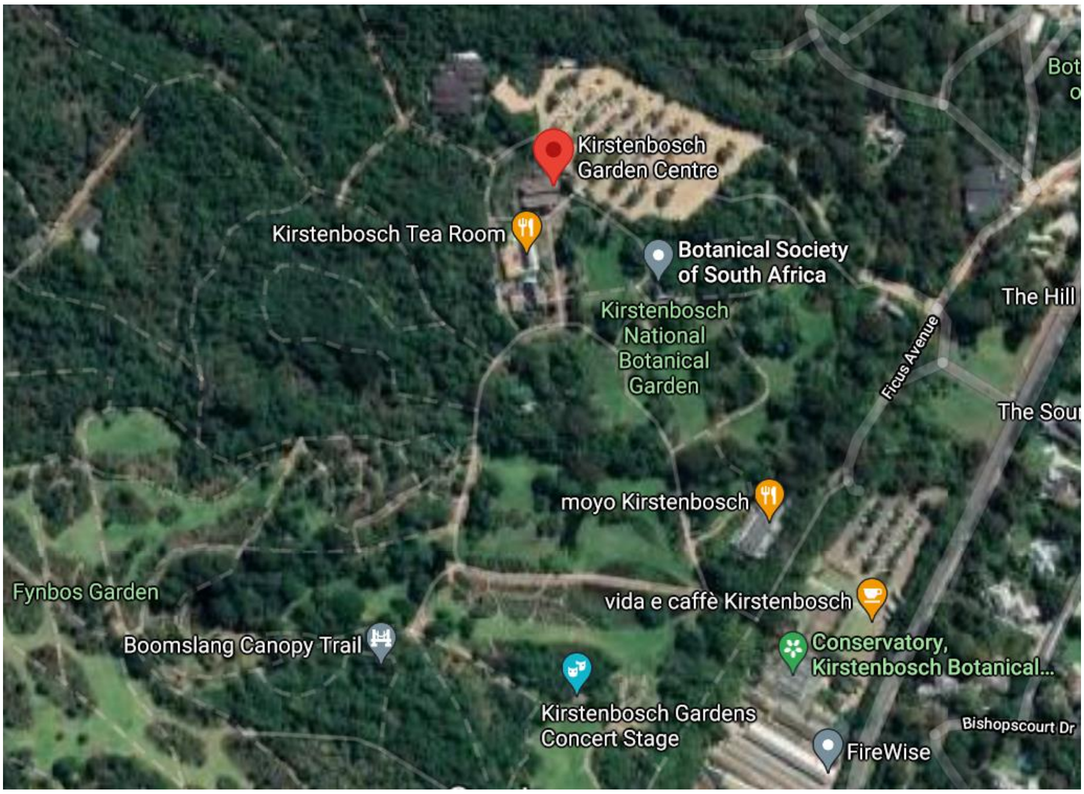
C3.8 Site Information

C3.8.1 Site Location

The site is located at the Kirstenbosch National Botanical Garden, Rhodes Drive, Newlands, Cape Town. The specific parking lot in question is the parking area situated next to the Kirstenbosch Garden Centre.

SITE	GPS COORDINATES	GOOGLE MAPS LINK
Carpark	-33.98620016130115, 18.43240753331826	https://goo.gl/maps/5tpT1FsYkSAx4Y5p7



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APPENDICES

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Appendix A – General Electrical Specifications

STANDARD

ELECTRICAL SPECIFICATIONS

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SECTION B: INSTALLATION SPECIFICATIONS

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SECTION A

A.1 PREAMBLE TO STANDARD SPECIFICATION FOR ELECTRICAL INSTALLATIONS

GENERAL

1. INTRODUCTION

(a) These Standard Specifications cover the general technical requirements for the equipment, materials, installation, testing, commissioning and maintenance of electrical installations for the Employer. These requirements shall be read in conjunction with the Documents as specified below.

(b) "Document" shall mean the complete set of contract documents, including the Employer's Tender Conditions, Tender Qualifications, the Standard Specification and the Detail Technical Specification including all drawings and variation orders issued in terms of the contract.

(c) "Contractor" shall mean the person, partnership, company or firm appointed for the supply, installation, testing, commissioning and maintenance of the Electrical Installation. In the case of the Electrical Installation being a sub-contract, nominated in terms of the Main Contract or otherwise, the word "Contractor" shall also mean "Sub-Contractor" in terms of the Sub-Contract Conditions for the specific installation. Where applicable the Builder or Principal Contractor shall be referred to as "Main Contractor".

2. INSTALLATION WORK

(a) The complete installation shall comply with the requirements of this Specification. Should any discrepancies or contradictions exist between this specification and the Detail Technical Specification for the specific installation, then the latter shall take precedence.

In the event of discrepancies between the drawings, specifications and bill of quantities the Engineer shall decide whether the work as executed shall be remeasured on site or whether remeasurement shall be effected from the working drawings only.

(b) The Employer's authorised representative will inspect the installation from time to time during the progress of the work. Discrepancies will be pointed out to the Contractor and these shall be remedied at the Contractor's expense. Under no circumstances shall these inspections relieve the Contractor of his obligations in terms of the Documents.

(c) The Contractor shall notify the Engineer timeously when the installation reaches important stages of completion (e.g. before closing cable trenches, before casting concrete, etc.) so that the Employer’s authorised representative may schedule his inspections in the best interest of all parties concerned.

3. REGULATIONS

(a) The installation shall be erected and tested in accordance with all relevant SANS standards.

(b) The Contractor shall issue all notices and pay all of the required fees in respect of the installation to the authorities, and shall exempt the Employer and Employer’s Representatives from all losses, claims, costs or expenditures which may arise as a result of the Contractor's negligence in complying with the requirements of the regulations.

(c) It shall be assumed that the Contractor is conversant with the above-mentioned requirements. Should any requirement, by-law or regulation, which contradicts the requirements of this Document, apply or become applicable during erection of the Installation, such requirement, by-law or regulation shall overrule this Document and the Contractor shall immediately inform the Engineer of such a contradiction. Under no circumstances shall the Contractor carry out any variations to the installation in terms of such contradictions without obtaining the written permission to do so from the Engineer.

4. SITE CONDITIONS

Tenderers are advised to visit the site and acquaint themselves with all local conditions pertaining to the execution of the installation before tender closing date. No claims from the Contractor which may arise from insufficient knowledge of site access, type of site, labour conditions, establishment space, transport and loading/unloading facilities, power and water supply, etc. will be considered after submission of tenders.

For services where prior permission is required before contractors can visit the site, a visit will be arranged for all interested parties.

5. ARRANGEMENTS WITH THE SUPPLY AUTHORITY

(a) The contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority unless specified to the contrary.

(b) It shall be the responsibility of the Contractor to make the necessary arrangements with the local Supply Authority at his own cost and to supply the labour, equipment and means to inspect, test and commission the installation to the satisfaction of the Local and Supply Authorities.

(c) The Contractor shall supply and install all notices and warning signs that are required by the relevant laws, regulations and/or the Documents.

6. MATERIAL AND EQUIPMENT

(a) All material and equipment shall conform in respect of quality, manufacture, tests and performance, with the requirements of the South African Bureau of Standards or where no such standards exist, with the relevant current Specification of the British Standards Institution.

(b) All material and equipment shall be of high quality and suitable for the conditions on site. These conditions shall include weather conditions as well as conditions under which materials are installed, stored and used. Should the materials not be suitable for use under temporary site conditions then the Contractor shall at his own cost provide suitable protection until these unfavourable site conditions cease to exist.

(c) The Contractor shall, where requested to do so, submit samples of equipment and material to the Engineer for approval prior to installation. Samples may be retained in the Engineer's possession until the contract is completed after which they will be returned.

7. CONNECTIONS INVOLVING ALUMINIUM (CABLES AND TRANSFORMERS)

As a result of the fact that aluminium flows when subjected to pressure and electrical connections based on this principle thus loses proper contact during the course of time, it should be noted that bolted connections between aluminium and copper or any other metal is not acceptable.

8. CODES OF PRACTICE OR STANDARD SPECIFICATION

Where reference is made to any Code of Practice or Standard Specification in this document the latest edition or amendment shall be applicable, except where specified to the contrary.

A.2 STANDARD SPECIFICATIONS

STANDARD ELECTRICAL SPECIFICATIONS APPLICABLE TO THIS CONTRACT

The latest editions of the following standards shall apply to this contract:

- SANS 10400: The application of the National Building Regulations
- SANS 10142: The wiring of premises
- All municipal regulations pertaining to building codes, health and safety requirements;
- South African Health and Safety Regulations (OSHACT)

SECTION B.1

B.1 INSTALLATION AND TERMINATION OF CONDUITS AND CONDUIT ACCESSORIES

1. GENERAL

1.1 SCOPE

1.1.1 This section covers the installation of conduits and conduit accessories in buildings and other structures under normal environmental conditions and for system voltages up to 600 V.

1.1.2 The following types of conduit installations are included:

(a) Screwed metallic conduit - black enamelled and galvanised.

(b) Plain-end metallic conduit - black enamelled and galvanised.

(c) Non-metallic conduit.

(d) Flexible conduit.

1.1.3 Conduits may be installed as follows:

(a) In open roof spaces.

(b) Cast in concrete.

(c) Surface mounted against walls, concrete slabs, etc.

(d) In wall chases.

1.1.4 Where conduits are to be installed in concrete, this shall be undertaken while the building work is still in progress. Conduits may only be surface mounted where specified or where the Engineer has given written consent.

1.1.5 Under no circumstances will conduit having a wall thickness of less than 1.6mm be allowed in screeding laid on top of concrete slabs.

1.1.6 Bending and setting of conduit must be done with special bending apparatus manufactured for the purpose and which are obtainable from the manufacturers of the conduit systems. Damage to conduit resulting from the use of incorrect bending apparatus or methods applied must on indication by the Engineer, be completely removed and rectified and any wiring already drawn into such damaged conduits must be completely renewed at the contractor's expense.

1.1.7 Tenderers must ensure that general approval of the proposed conduit system to be used is obtained from the local electricity supply authority prior to the submission of their tender. Under no circumstances will consideration be given by the Engineer to any claim submitted by the contractor, which may result from a lack of knowledge in regard to the supply authority's requirements.

1.1.8 For light and socket outlet circuits, the conduit used shall have an external diameter of 20mm. In all other instances the sizes of conduit shall be in accordance with the "Wiring Code" for the specified number and size of conductors, unless otherwise directed in part 2 of this specification or indicated on the drawings.

1.2 OTHER SERVICES

Conduits may not be installed closer than 150 mm to pipes containing gas, steam, hot water or other materials, which may damage the conduits or conductors. Conduits may not touch pipes of other service installations in order to prevent electrolytic corrosion. Where this is unavoidable, cathodic protection shall be provided.

Conduit and conduit accessories used for flame-proof or explosion proof installations and for the suspension of luminaries as well as all load bearing conduit shall in all instances be of the metallic screwed type.

2. SCREWED METALLIC CONDUIT

2.1 GENERAL

2.1.1 In general, screwed steel conduit shall be used in the wiring of buildings.

2.1.2 The installation shall comply with SANS 10142.

2.2 GALVANISED CONDUIT

Galvanised conduit and accessories shall be used in the following:

(a) In damp areas.
(b) In areas exposed to the weather.
(c) For all installations within 50 km of the coast.
(d) In plenum chambers containing humidifying equipment.
(e) For surface mounted conduit installations in kitchens and boiler rooms.
(f) In screeds resting directly on soil.
(g) For connection points to future installations.
(h) For underground conduit containing earthing conductors.
(I) In buildings where animals are housed such as cattle, sheep, dogs, etc.

2.3 TERMINATIONS

2.3.1 Spouted Connections.

Conduits shall be connected directly to draw-boxes with spouted connections. Conduits shall be screwed tightly home and no threads shall be visible.

2.3.2 Switchboards, Power skirting, etc.

Conduits shall be terminated by means of a brass female bush and two locknuts in pressed steel switchboards and distribution boxes, cable ducts, power skirting, etc. The conduit end shall only project far enough through the entry hole to accommodate the bush and locknut. Alternatively the method detailed in 2.3.3 may be used.

2.3.3 Draw-boxes.

A female bush and two locknuts shall be used to terminate conduits at draw-boxes and outlet boxes without spouts, should there be sufficient room in the box. Where there is insufficient room, a coupling, brass male bush and locknut may be used with sufficient allowance for the reduction of the internal diameter by the male bush.

2.3.4 Holes.

Holes to accommodate brass bushes shall be large enough to accommodate the bush with a minimum of clearance.

2.3.5 Bush-nuts.

Bush-nuts for the connection of earth conductors to conduits are not acceptable.

2.4 SCREWS, BOLTS AND NUTS

Steel locknuts of thick gauge steel with milled sides shall be used in all cases. Cadmium-plated bolts and nuts shall be used except where the installation is exposed to the weather in which case brass bolts and nuts shall be used. Screws shall be installed in all tapped holes in fittings and accessories to prevent damage to the screw thread by concrete or plaster. The screws shall be screwed completely down to prevent damage to the thread on the screw.

2.5 CONDUIT ENDS

Conduit ends shall be cut at right angles to ensure that ends butt squarely at joints. Threads shall not be visible at joints and connections except at running joints. The total length of the thread on the two conduit ends shall not exceed the length of the coupling.

2.6 JOINTS

All conduit ends shall be reamed and all joints tightly screwed. Only approved couplings shall be used. Running joints with long threads shall be kept to a minimum and locknuts shall be provided to ensure a strong mechanical and a continuous electrical joint. Running joints in screwed conduit are to be avoided as far as possible and all conduit systems shall be set or bent to the required angles. The use of normal bends must be kept to a minimum with exception of larger diameter conduits where the use of such bends is essential.

2.7 FINISH

All joints shall be painted with red lead to prevent them from rusting in damp areas, areas within 50 km of the coast and in cases where the installation is exposed to the weather for any length of time. Where the galvanising or black paint has been damaged, the area shall first be cleaned and a coat of zinc base paint applied subsequently. Additional coats of paint shall only be applied after the undercoat has completely dried. All surface mounted non-galvanised metallic conduit must be painted. (Refer to par. 8.8 of Section B1).

2.8 CONTINUITY

Mechanical and electrical continuity shall be maintained throughout the conduit installation.

3. PLAIN-END METALLIC CONDUIT

As an alternative to the screwed conduit, plain-end conduit complying with the relevant SANS codes may be installed subject to the following additional conditions:

3.1 Bending and setting of plain-end conduit must be done with special benders and apparatus manufactured for this purpose and which are obtainable from the suppliers of the system. Damaged conduit resulting from the use of incorrect bending apparatus shall be completely removed and any wiring already drawn into such damaged conduits shall be completely renewed at the Contractor's expense.

3.2 Screwed conduit must be used in the following instances:

(a) In flameproof installations.
(b) Load bearing conduit.
(c) For the suspension of luminaries.
(d) Surface mounted conduit.

3.3 Plain-end conduit and associated accessories shall be manufactured of mild steel having a minimum thickness of 1.2 mm and shall comply with SANS 1065. Conduit manufactured of lighter gauge material, i.e. 0.97 mm, will not be permitted.

3.4 All conduit and accessories used in areas within 50 km of the coast shall be hot-dip galvanised to SANS 32 & 121. In inland areas Electro-galvanised or cadmium-plated accessories will be accepted.

4. NON-METALLIC CONDUIT

4.1 INSTALLATION CONDITIONS

Where specified for a particular service, non-metallic conduit may be installed under the following conditions:

4.1.1 All non-metallic conduit shall comply fully with SANS 950 and shall be installed in accordance with Appendix C of the same specification as well as SANS 10142.

4.1.2 Insulated heat-resistant boxes shall be used for outlets of totally enclosed luminaries and other fittings where excessive temperatures are likely to occur.

4.1.3 Luminaries and other fittings shall not be supported by non-metallic conduit or conduit boxes. These fittings shall be secured to the surrounding structure in a way that is acceptable to the Engineer. Refer to the specification for "INSTALLATION OF LUMINAIRES", Section B9.

4.1.4 The conduit shall be supported and fixed with saddles with a maximum spacing of 1 m, even in roof spaces. (Refer to SANS 10142.) The Contractor shall supply and install all additional supporting timbers required.

4.1.5 It shall be possible to rewire the completed installation in the future without undue difficulty.

4.1.6 Non-metallic conduit and fittings shall not be used under the following conditions:

(a) Outside a building (unless protected, or sheltered under eaves).

(b) For mechanical load bearing.

(c) Where they may be subjected to temperatures below -10°C or above 70°C for prolonged periods.

(d) As primary electrical insulation.

(e) In areas where they may be subject to mechanical damage.

(f) For applications other than those for which they are designed.

(g) In concrete slab unless specified to the contrary.

4.2 PAINTING OF CONDUITS

Exposed conduit may be painted with normal oil or PVA paints, but care must be taken to ensure that the paint used does not contain any component that will soften or have any other detrimental effect on the materials from which the conduit and fittings are manufactured.

4.3 CONNECTING OF CONDUIT TO METAL EQUIPMENT/COMPONENTS

When any part of a non-metallic conduit system has to be connected to metal equipment or components (e.g. switchboard, surface socket-outlet or switch box, existing metallic conduit system, etc.) fittings and joints manufactured specifically for this purpose must be used. Non-metallic conduit must not be threaded to fit metallic connectors.

4.4 BENDS

In conduit of nominal size not exceeding 25 mm, bends may be made in accordance with par. 4.5. In all other cases bends must be achieved by the use of accessories that are introduced into the conduit run. Bends shall comply with SANS 10142.

4.5 BENDING

Conduit of nominal size up to and including 25mm may be cold bent by hand provided that the radius of the bend is greater than six times the nominal size of the conduit, and that the external angle of the bend does not exceed 90°. The procedure (which involves the use of a bending spring) should be as follows:

(a) Determine the angle through which the conduit is to be bent.

(b) Warm the cold conduit over the length to be bent by rubbing with hands.

(c) Select a bending spring which matches the conduit size and insert in to the conduit at the point where the bend is required.

(d) Bend the conduit slowly with one motion (either with the hands alone approximately 1 m apart, or across the knee) to double the required angle, release the conduit and, when its position is stable, withdraw the bending spring (turning it in an anti-clockwise direction to reduce its diameter) and gently correct the angle.

(e) Install and secure the conduit immediately following bending.

4.6 ADHESIVE JOINTS

All adhesive joints must be made in a clean dry area. The surfaces of all components to be bonded must be dry and clean.

The insertion depth should be marked on the conduit end and the adhesive applied (by means of a soft clean brush) as quickly as possible to the surfaces to be bonded by brushing lengthwise along the conduit, ensuring that a thin coating of uniform thickness is formed. The joint must be made immediately after the application of the adhesive by pushing the prepared parts squarely together with a twisting motion to the full insertion depth. Care must be taken to avoid squeezing adhesive into the cableway and all excess adhesive must be wiped off.

NOTE: Solvent adhesives contain highly volatile liquids and their containers should not be left open.

4.7 Cutting

A fine-tooth hacksaw should be used to cut conduit to the required length. Each cut end should be square and free from swarf, burrs and loose material. When determining the length of conduit to be cut, allowance must be made for the length of couplings or accessories attached to the conduit. Incorrect determination will cause bulging of the conduit or insufficient joint length.

5. FLEXIBLE CONDUIT

5.1 In installations where the equipment has to be moved frequently to enable adjustment during normal operation, for the connection of motors or any other vibrating equipment, for the connection of thermostats and sensors on equipment, for stove connections and where otherwise required by the Engineer, flexible conduit shall be used for the final connection to the equipment.

5.2 The installation shall comply with SANS 10142.

5.3 Flexible conduit shall preferably be connected to the remainder of the installation by means of a draw-box. The flexible conduit may be connected directly to the end of a conduit if an existing draw-box is available within 2 m of the junction and if the flexible conduit can easily be rewired.

5.4 Flexible conduit shall consist of metal-reinforced plastic conduit or PVC-covered metal conduit with an internal diameter of at least 15mm, unless approved to the contrary. In false ceiling voids, flexible conduit of galvanised steel construction may be used. Connectors for coupling to the flexible conduit shall be of the gland or screw-in type, manufactured of either brass or mild steel plated with either zinc or cadmium.

6. INSTALLATION REQUIREMENTS

6.1 POSITIONS OF OUTLETS

All accessories such as boxes for socket-outlets, switches, lights, etc. shall be accurately positioned. It is the responsibility of the Contractor to ensure that all outlets are installed level and square, at the correct height from the floor, ceiling or roof level and in the correct position relative to building lines and equipment positions as specified. It shall be the responsibility of the Contractor to determine the correct final floor, ceiling and roof levels in conjunction with the Main Contractor. Draw-boxes shall not be installed in positions where they will be inaccessible after completion of the installation. Draw-boxes shall be installed in inconspicuous positions to the approval of the Engineer and shall be indicated on the "as built" drawings.

6.2 COVER PLATES

All draw-boxes and outlets shall be fitted with cover plates, either as part of the switch or socket assembly or with blank cover plates if unused. Blank cover plates shall match other cover plates in the same area. Flush mounted cover plates in both ceilings and walls shall overlap the draw-box and edges of the recess. If the fixing lugs are substantially deeper than the finished wall surfaces, suitable coiled steel wire or tubes shall be used as spacers.

6.3 DRAW-WIRES

Galvanised steel draw-wires shall be installed in all unwired conduits e.g. conduits for future extensions, telephone installations and other services.

6.4 BENDS

A maximum of two 90 bends or the equivalent displacement will be allowed between outlets and/or boxes.

Draw-boxes shall be installed at maximum intervals of 15 m in straight runs. All bends shall be made without heating the conduit or without reducing the diameter of the conduit. The inside radius of a bend shall not be less than five times the outside diameter of the conduit. (Refer to SANS 10142,

6.5 WALL SOCKET-OUTLETS

Where more than one socket-outlet is connected to the same circuit, the conduit shall be looped from one outlet box to the following on the same circuit. Where a metal channel is used, the conduit may be installed from the channel directly to the outlet box on condition that the conductors can be looped from one outlet to the next without making any joints in the wires.

6.6 LUMINAIRES

Where the conduit end is used to support luminaries, a ball-and socket type lid shall be fitted to the pendant box in all cases where the conduit is longer than 500 mm. In all other cases a dome lid may be used. Where luminaries are specified which are fixed directly to the pendant box, the pendant box shall be fixed independently of the conduit installation except where the pendant box is cast into concrete.

6.7 FLUSH MOUNTED OUTLET BOXES

The edges of flush mounted outlet boxes shall not be deeper than 10 mm from the final surface. Spacer springs shall be used under screws where necessary.

6.8 EXCESS HOLES

All excess holes in draw-boxes or other conduit accessories shall be securely blanked off by means of brass plugs to render the installation vermin proof.

6.9 DEBRIS

Care shall be taken to prevent debris or moisture from entering conduits during and after installation. Conduit ends shall be sealed by means of a solid plug which shall be screwed to the conduit end. Conduits shall be cleaned and swabbed to remove oil, moisture or other debris that may be present before conductors are installed. Swabs shall not be attached to the conductors.

6.10 <u>Defects</u>

Each length of conduit shall be inspected for defects and all burrs shall be removed. All conduits that are split, dented or otherwise damaged or any conduits with sharp internal edges shall be removed from site. The Contractor shall ensure that conduits are not blocked.

6.11 WITHDRAWAL OF CONDUCTORS

To ensure that all electrical conductors are easily withdrawable from conduits and to ensure that there are no joints in the conductors, the Engineer will have the right to have the conductors of any circuit removed at his discretion. If the conductors are found to be in a satisfactory condition after having been withdrawn, the Employer shall bear the cost of withdrawing and re-installing such conductors. If the conductors are found to have been damaged during installation or removal or if joints are found, they shall be replaced and the cost shall be borne by the Contractor.

7. INSTALLATION IN CONCRETE

7.1 TIMEOUS INSTALLATION

In order not to delay building operations, the Contractor shall ensure that all conduits and accessories which are to be cast in concrete are placed in position in good time. The Contractor or his representative shall be in attendance when the concrete is cast.

7.2 DRAW-BOXES

Draw-boxes, expansion joints and round ceiling boxes shall be installed where required and shall be neatly finished to match the finished slab and wall surfaces. Ceiling draw-boxes shall be of the deep type. In hollow block slabs, rear-entry draw-boxes shall be used. In columns where flush mounted draw-boxes are installed, the conduits shall be offset from the surface of the column immediately after leaving the draw-box.

7.3 ELBOWS

Elbows for conduits of 32mm dia. and smaller and sharp bends will not be allowed in concrete slabs.

7.4 COVER PLATES

Draw-boxes and/or inspection boxes shall, where possible, be grouped together under a common approved cover plate, and must preferably installed in passages or male toilets. The cover plate shall be secured by means of screws.

7.5 NEUTRAL AXIS

All conduits shall be installed as close as possible to the neutral axis of concrete beams, slabs and columns. The conduits shall be rigidly secured to the reinforcing to prevent movement towards the surface of the concrete.

7.6 FIXING TO THE SHUTTERING

All conduits, draw-boxes etc. shall be securely fixed to the shuttering to prevent displacement when concrete is cast. Draw-boxes and outlet boxes shall preferably be secured by means of a bolt and nut installed from the back of the box through the shuttering. Fixing lugs may also be used to screw the boxes to the shuttering. Wire will not be accepted for securing boxes to the shuttering where off-shutter finishes are required. Where fibreglass shuttering is used by the Builder, the equipment shall be fixed to the steel only and no holes shall be drilled or made in shuttering. All draw-boxes and outlet boxes shall be plugged with wet paper before they are secured to the shuttering.

Before any concrete slabs are cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

7.7 CONCRETE FLOOR SLABS

Conduits will not be allowed in concrete floor slabs of boiler rooms (or boiler houses), laundries or other damp areas. All socket outlets and three phase outlets in damp areas shall be supplied from above with galvanised conduit and accessories.

7.8 EXPANSION JOINTS

As far as possible, conduits shall not be installed across expansion joints. Where this is unavoidable a conduit expansion joint shall be provided. (Refer to par. 10)

7.9 SCREEDS

The installation of conduits in floor screeds shall be kept to a minimum. Where conduits are installed in screeds, the top of the conduit shall be at least 20 mm below the surface of the screed. Where the screed is laid directly on the ground, galvanised conduits shall be used. This ruling will always be applicable to the lowest floor of a building. A minimum distance of twice the outside diameter of the conduit shall be left free between adjoining conduits. Conduits shall be secured to the concrete slab at intervals not exceeding 2 m. The Contractor shall ensure that conduits are not visible above the screed where the conduits leave the screed.

7.10 INSPECTION

All draw-boxes, conduits, etc. which are installed in concrete shall be cleaned with compressed air and provided with draw-wires two days after removal of the shuttering. Errors that occurred during the installation of the conduits, or any lost draw-boxes, or blocked conduits shall be immediately reported to the Engineer by telephone and confirmed in writing in order that an alternative route can be planned and approved by the Engineer before the additional concrete is cast. Any additional cost shall be for the Contractor's account.

8. SURFACE INSTALLATIONS AND INSTALLATIONS IN ROOF SPACES

Wherever possible, the conduit installation is to be concealed in the building work; however, where unavoidable or otherwise specified, conduit installed on the surface must be plumbed or levelled and only straight lengths shall be used.

8.1 APPEARANCE

(a) All conduits shall be installed horizontally or vertically as determined by the route and the Contractor shall take all measures to ensure a neat installation.

(b) Where conduits are to be installed directly alongside door frames, beams, etc. that are not true, conduits shall be installed parallel to the frames, beams, etc.

(c) All labels shall be removed from surface mounted conduit.

8.2 SADDLES

Conduits shall be firmly secured by means of saddles and screws and in accordance with SANS 10142. Where saddles are used to secure vertical lengths of conduit connected to surface mounted switch boxes or socket outlet boxes, the saddles shall be spaced so that the intervals between the box and the first saddle, between any two successive saddles and between the last saddle and the ceiling or roof are equidistant. Conduits shall be secured within 150 mm before and after each 90° bend and within 100mm of each outlet box.

8.3 JOINTS

Joints will only be allowed in surface conduit lengths exceeding 3.5 m. Threads shall not be visible at joints of completed installations, except where running joints are used. Running joints will be allowed only when absolutely necessary. All running joints shall be provided with locknuts and shall be painted with red lead immediately after installation.

8.4 ACCESSORIES

Inspection bends or tee pieces shall not be used. Non-inspection type bends may be used in the case of 32mm or 50 mm diameter conduits. All draw-boxes supporting luminaries or other equipment shall be fixed independently of the conduit installation.

8.5 OFFSETS

Where an offset is required at conduit terminations or crossovers, the conduit shall be saddled at the offset.

8.6 CROSS-OVER

Conduit routes shall be carefully planned to avoid crossovers. Where a crossover is inevitable, one conduit only shall be offset to cross the other. Crossovers shall be as short as possible and shall be uniform. Alternatively, crossovers shall be installed in purpose-made boxes. This method shall be employed on face brick walls and in other circumstances where required by the Engineer.

8.7 PARALLEL CONDUIT

Parallel conduit runs shall be equidistant and saddles shall be installed in line. Alternatively, a special clamp may be used to secure all conduits in unison. In the case of conduits of different diameters, the latter method shall only be used if a purpose-made clamp designed to accommodate the various conduit sizes, is provided.

8.8 PAINTING OF CONDUIT

All surface mounted conduits and accessories shall be painted with two coats of high quality enamel paint or as otherwise specified. The colour shall comply with the colour code specified for the installation or where no code has been specified, shall match the colour of the surrounding finishes.

8.9 CONDUIT IN ROOF SPACES

8.9.1 In open roof spaces (no ceiling) conduits shall run along the wall plates and the rafters. The installation of conduits suspended between the rafters is not acceptable.

8.9.2 Conduit in roof spaces shall be installed parallel or at right angles to the roof members and shall be secured at intervals not exceeding 1.5 m by means of saddles screwed to the roof timbers for metallic conduit and 1m for non-metallic conduit.

8.9.3 Nails or crampets will not be allowed.

8.9.4 Under flat roofs in false ceilings or where there is less than 900 mm clearance, or in instances where the ceilings are insulated with glass-wool or other insulating material impeding access, the conduit shall be installed in a manner which allows for wiring from below the ceilings.

8.9.5 Conduit runs from switchboards shall terminate in fabricated sheet steel draw-boxes installed directly above or in close proximity to the boards. Refer to the specification for “CONNECTIONS TO SWITCHBOARDS”, par. 2 of section B10.

8.9.6 Spare conduits covering the total number of spare ways on switchboards, shall be provided between the boards and the roof draw-box.

8.9.7 Where non metallic conduit has been specified for a particular service, the conduit shall be supported and fixed with saddles with a maximum spacing of 450mm throughout the installation. The contractor shall supply and install all additional supporting timbers in the roof space as required.

8.10 FIXING TO WALLS

Only approved plugging materials such as aluminium inserts, fibre plugs or plastic plugs, etc., and round-head screws shall be used when fixing saddles, switches, plugs etc. to walls. Wood plugs are not acceptable nor should plugs be installed in joints in brick walls.

9. FUTURE EXTENSIONS

9.1 OPEN ROOF SPACES

Conduits intended for future switches and socket outlets, shall terminate 40 mm above the tie beams in roof spaces with more than 900 mm free space. The conduit ends shall be threaded and fitted with a coupling and brass plug.

9.2 CONCRETE SLABS

Conduit ends shall protrude 150 mm from the concrete to facilitate the installation of future extensions above, below or to the side of the concrete slabs. All these conduits shall be connected to a draw-box, which is cast into the concrete within 2 m of the end of the concrete. Conduit ends shall be threaded and fitted with a coupling and brass plug. In cases where holes cannot be drilled through the shuttering to accommodate the conduit end, a deep draw-box with rear entry may be placed over the conduit end.

9.3 COVER PLATES

Unused boxes for switches and socket-outlets shall be covered with metal cover plates. Unused boxes for luminaries shall be covered with round galvanised metal cover plates, which fit tightly against the finished surface. The cover plate shall overlap the outlet box and recess.

9.4 GALVANISED CONDUIT

Galvanised conduit shall be installed at all free ends intended for future extensions. The conduit shall be treated with a paint, which will prevent corrosion and white rust.

10. EXPANSION JOINTS

10.1 Where conduits cross expansion joints in the structure, approved draw-boxes which provide a flexible connection in the conduit installation shall be installed.

10.2 The draw-box shall be installed adjacent to the expansion joint of the structure and a conduit sleeve, one size larger than that specified for the circuit, shall be provided on the side of the draw-box nearest the joint. The one end of the sleeve shall terminate at the edge of the joint and the other shall be secured to the draw-box by means of locknuts.

10.3 The circuit conduit passing through the sleeve shall be terminated 40 mm inside the draw-box and in the case of metallic conduit; the conduit end shall be fitted with a brass bush. The gap between the sleeve and the conduit at the joint shall be sealed with 'Pratley Tic-Tac' or equal sealing compound, to prevent the ingress of wet cement. In the case of metallic conduit, an earth clip shall be fitted to the conduit projection inside the draw-box and the conduit bonded to the box by means of 2.5mm2 bare copper earth wire and a brass bolt and nut.

10.4 The end of the other circuit conduit shall be secured to the draw-box by means of locknuts and a brass bush in the case of screwed metallic conduit or a standard bushed adaptor for other conduit types.

10.5 In the case of metallic conduit, a 2.5mm^2 bare copper wire shall be installed between the first conduit boxes on either side of the joint, in addition to an earth wire, which may be specified for the circuit. The conduit boxes shall be drilled and tapped and the earth wire shall be bonded to the boxes by means of lugs and brass screws.

10.6 Suitable steel cover plates shall be screwed to draw-boxes installed along the expansion joint. The cover plates shall be installed before the ceilings are painted.

10.7 Where a number of conduits are installed in parallel they shall cross the expansion joint of the structure via a single draw-box. A number of draw-boxes adjacent to each other will not be allowed.

11. CHASES AND BUILDER'S WORK

11.1 Except where otherwise specified the Builder or Main Contractor shall be responsible for the builder's work related to the installation of conduits, outlet boxes, switchboard trays, bonding trays and other wall outlet boxes and will undertake the necessary chasing and cutting of walls and the provision of openings in ceilings and floors for luminaries and other electrical outlets. The Contractor shall notify the Builder or Main Contractor of his requirements and the responsibility lies with the Contractor to ensure that all builders' work is clearly indicated or marked in accordance with his requirements.

11.2 Electrical materials to be built in must be supplied, placed and fixed in position by the Contractor when required to do so by the Builder or Main Contractor. The Contractor shall also ensure that these materials are installed in the correct positions.

11.3 Where no Builder or Main Contractor is available, the Contractor must provide all chases and is required to cover conduits installed in chases by a layer of 4:1 mixture of coarse sand and cement, finished 6 mm below the face of the plaster and roughened. Chases shall be deep enough to ensure that the top of conduits are at least 12 mm below the finished surface of the plaster.

11.4 Where the Contractor is responsible for the cutting of chases or the building in of conduits and other equipment, he will be held responsible for all damage as a result of this work and will be required to make good to the satisfaction of the Engineer.

This ruling is particularly applicable but not exclusively to the rewiring and renewal of existing installations. Chases shall be made by means of a cutting machine.

11.5 Under no circumstances shall face brick walls or finished surfaces be chased or cut without the written permission of the Engineer. Where it is necessary to cut or drill holes in the concrete structure, the prior permission of the Engineer shall be obtained.

SECTION B2

B2. INSTALLATION OF WIRING CHANNELS, UNDERFLOOR DUCTING AND POWER SKIRTING

1. RESPONSIBILITY OF THE CONTRACTOR

The Contractor shall supply and install all wiring channels, underfloor ducting and power skirting as specified or as required for the cable, socket outlet and wiring installation including the necessary supports, hangers, fixing materials, bends, angles, junctions, T-pieces, etc. He shall further liaise with the Main contractor to verify the position of holes and access routes through the structure and finishes.

2. WIRING CHANNELS

2.1 FIXING

The Contractor shall supply and install all hangers, supports or fixings for the channels. Channels up to and including 76 x 76 mm shall be supported at maximum intervals of 600 mm and larger channels at maximum intervals of 1 m. Channel runs shall be carefully planned to avoid clashes with other services and to ensure that all covers can be removed after completion of the entire installation. Purpose made clamps, hangers, etc. shall be used as required. Where it is not possible to support the channels at the specified intervals, they shall be supported in a sound manner to the satisfaction of the Engineer.

2.2 INSTALLATION IN CONCRETE

Where channels are cast into concrete, the insert type shall be used. Additional spacer blocks shall be used where necessary to prevent ducts from being deformed while the concrete is cast. Channels shall be filled with polystyrene or other suitable fillers to prevent the ingress of concrete and shall be securely fixed in position to the shuttering.

2.3 COVER PLATES

All channels up to and including 127mm width shall have snap-in cover plates of metal or PVC. Cover plates for wider channels shall be of metal and shall be fixed by means of screws at suitable intervals to prevent warping. Cover plates shall be installed over the full length of the channels. Flush mounted wiring channels shall be fitted with overlapping metal cover plates with plastic edge trim to cover irregularities in the wall recess.

2.4 JOINTS

Adjoining lengths shall be aligned and securely joined by means of fishplates fixed by mushroom bolts, washers and nuts or connection pieces that are pop-riveted to both adjoining sections. All adjoining sections shall be rectangular and shall butt tightly. Covers shall fit tightly across the joints.

Where channels cross expansion joints in the structure, suitable expansion joints shall be provided in the channels by means of fishplates pop-riveted or screwed to the channel on one side of the expansion joint and floating freely in the channel on the other side of the expansion joint.

2.5 SUPPORT FOR CONDUCTORS

All conductors in inverted cable channels shall be retained by means of metal clips or metal spacer bars at not more than 1m centres. Where vertical duct lengths exceed 5m, conductors installed in the channels shall be secured at intervals not exceeding 5m to support the weight of the conductors. Clamps shall be provided in suitable draw-boxes for this purpose.

2.6 CONDUIT CONNECTIONS

Conduit connections shall be terminated by means of two locknuts and a brass female bush. Where the channel is wide enough, conduit connections may be made by means of a conduit box and hole through the back or side of the channel. All holes through which conductors pass shall be fitted with bushes or grommets or shall be sleeved.

2.7 INTERNAL FINISHES

Bends and T-joints shall be constructed to ensure compliance with the allowable bending radii specified in SANS 10142, Appendix D in the case of PVC-insulated cables and conductors and shall comply with the relevant specification in the case of other cables. Burrs and sharp edges shall be removed and the inside edges of the joints shall be lined with rubber cement or other suitable rubberised or plastic compound to prevent laceration of the conductor insulation.

2.8 VERMIN PROOFING

All cable channels shall be vermin proofed after installation. Holes shall be covered by means of screwed metal plugs or by means of metal strips, which are bolted, or pop-riveted to the channel. Wooden or other plugs which are driven into holes or other temporary plugs or covers are not acceptable.

2.9 SERVICES

Multiple duct runs or internal metal partitions shall be used where conductors for power, control, communication and other services are present.

3. UNDERFLOOR DUCTING

3.1 GENERAL

3.1.1 Two or three compartment underfloor ducting as specified shall be supplied and installed in the positions and according to the layouts indicated on the drawings.

3.1.2 Three compartment ducting shall have a cross-section of approximately 200 x 32mm, subdivided into three approximately equal compartments, of which the centre compartment shall be used for electrical power distribution with the two outer compartments for telephone and other light current services respectively.

3.1.3 Unless specified to the contrary in the Detail Technical Specification or on the drawings, each compartment shall be provided with openings (occurring in line) at 1.5 m centres to permit installation of pedestals or recessed outlets in accordance with the design of the system. The openings shall have removable, flush, cover plates and shall have prepared fixing holes for future installation of pedestals or recessed outlets. The centre of the openings shall be offset a distance of 200 mm from the building nodule lines.

3.2 JUNCTIONS

The underfloor ducting installation shall be provided with flush cross-over, T-junction and right angle bend draw-boxes installed in the runs of ducting, generally as indicated on the drawings. The junction boxes shall be complete with cross-over of services. The junction boxes shall have nominal 300 x 300mm removable cover plates secured by means of four countersunk screws.

3.3 PEDESTAL UNITS

Where the system accommodates floor pedestal units, these shall consist of pressed steel or die cast aluminium units, suitable for either two or three services, as specified in the Detail Technical Specification. Where the pedestals are installed on vinyl tiled or similar floors which will be subject to washing, a matching waterproofing gasket shall be supplied below each pedestal to render the junction waterproof.

3.4 INSTALLATION

The underfloor ducting, junction boxes, pedestals, outlets and other accessories shall be installed strictly in accordance with the manufacturer's instructions and according to the following procedure:

a) The underfloor ducting shall be installed on a mortar bed, provided by the Plasterer for purposes of levelling the channel to the final floor screed level. The Contractor shall assist the Plasterer in marking out the layout of the ducting to enable the mortar bed to be laid. Final height of the underfloor ducting shall be determined in close liaison with the Builder.

b) After installation of the mortar bed, the components of the underfloor ducting shall be assembled and installed by the Contractor, following which the screeding will be completed.

3.5 TERMINATIONS

Up bends manufactured by the supplier of the underfloor ducting shall be supplied and installed wherever the ducting is terminated at a switchboard, telephone duct or telephone distribution box or where the ducting terminates behind power skirting.

3.6 WIRING

3.6.1 Power circuit wiring shall be installed in the centre compartment of the underfloor ducting. Sufficient slack shall be provided to allow for the installation of a floor pedestal outlet at each opening in the ducting, whether an outlet is specified at that position or not. This provision shall take the form of loops in the wiring, including the earth wire, wherever the openings occur. The loops shall be pushed back into the channel and the cover plates replaced. In the instances where pedestals/outlets are not installed, these provisions shall of necessity only be made for the area covered by the circuit and not for the run from the switchboard.

3.6.2 The entire underfloor ducting installation shall be effectively earthed and bonded together.

3.6.3 Galvanised draw-wires shall be supplied and installed along the entire length of the telephone and light current service compartments of the underfloor ducting. The draw-wires shall be interrupted at the junction boxes, with enough slack left coiled up to facilitate the drawing in of cables by others.

3.7 EXPANSION JOINTS

Where expansion joints in the buildings are crossed by underfloor ducting, expansion joints shall be provided as detailed in par. 2.4 of this section.

4. POWER SKIRTING

4.1 GENERAL

4.1.1 Two or three compartment power skirting as specified shall be supplied and installed in the positions and according to the layouts indicated on the drawings.

4.1.2 The top compartment shall be used for power wiring and switched socket outlets, whilst the bottom compartments shall be for telephone and other light current services.

4.2 MODULE

4.2.1 The power skirting shall be manufactured from 1mm (minimum) thick sheet steel or aluminium (as specified) in approximately 2.5m lengths.

4.2.2 The covers shall be manufactured in modular lengths, as specified in the Detail Technical Specification or otherwise in 1 m lengths and shall be secured to the wall channel by means of toggle or swivel nuts. Snap-in covers are also acceptable.

4.2.3 At the building module lines, covers of specified length or otherwise in 250 mm lengths shall be installed, against which partition walls may be installed, thereby trapping these covers. The removable modular covers shall be installed between these "fixed" covers.

4.2.4 <u>Each</u> modular cover associated with the power compartment shall be punched and prepared for the installation of either a 13A or a 16A, 3-pin standard flush switched socket outlet, whether any is specified or indicated for that module or not. Where socket outlets are not installed, the punched holes shall be blanked off with a metal blanking plate, painted the same colour as the power skirting and installed at the back of the covers. These blanking plates shall be easily removable to permit future installation of socket outlets.

4.2.5 Unless otherwise specified, no provision shall be made on the covers of the telephone or light current services compartments for the installation of sockets.

4.2.6 Factory-made end covers shall be installed at the ends of all runs of power skirting. All internal and external bends or offsets shall be factory-made and shall be installed to provide a neat and workmanlike appearance.

4.3 PAINTING

The power skirting shall be painted in a colour as specified in the Detail Technical Specification. The painting of steel power skirting shall comply with the relevant SANS codes. Aluminium power skirting shall be anodised. The power skirting channels and covers shall be individually wrapped or packed to protect them against damage in transit and before installation.

4.4 SOCKET-OUTLETS

4.4.1 Standard 13 A or 16 A, 3-pin flush switched socket outlets (100 x 50 mm nominal size) shall be supplied and installed in the positions indicated on the drawings and as specified in the Detail Technical Specification.

4.4.2 The switched socket outlets shall be secured to the channel by means of suitable brackets.

4.4.3 After installation of the modular front covers, they shall be screwed to the socket outlets to ensure proper alignment between the two components. Separate standard covers need not be provided for the socket outlets.

4.5 CONDUIT FEEDERS

4.5.1 Conduits for the circuit wiring to the power skirting shall be installed in the floor slab and shall terminate in flush conduit or boxes, behind the power skirting and installed to match the height of the power, telephone and light current services compartments of the skirting.

4.5.2 The wiring/cables shall pass through large diameter holes cut in the rear of the power skirting. The holes shall be suitably bushed or trimmed to prevent damage to the wiring or cables.

4.5.3 Alternatively conduits feeding to the telephone compartment may be terminated in boxes facing upwards in the floor slab immediately below the power skirting, with suitable bushed or trimmed openings being provided through the bottom of the power skirting duct for the cables to pass through. (Applicable only where the power skirting occurs at floor level).

4.6 POWER SKIRTING AT DOORWAYS

Where a section of power skirting is interrupted by a doorway, bridging conduits shall be installed to interconnect the power skirting sections. Where conduits are not specifically indicated, a minimum of 1 x 32mm bridging conduit shall be installed for each of the power, light current and telephone compartments.

4.7 CLEANING

Prior to fitting front covers, the power skirting shall be thoroughly cleaned to remove all dust and rubble and damage to paintwork where this has occurred, shall be repaired.

SECTION B3

B.3 INSTALLATION OF CABLE TRAYS AND LADDERS

1. GENERAL

Cable trays and cable ladders complying with the relevant SANS codes shall be supplied and installed where specified and/or where generally suitable for cable distribution.

2. RESPONSIBILITY OF THE CONTRACTOR

The Contractor shall supply and install all cable trays and/or ladders as specified or as required by the cable routes including the necessary supports, clamps, hangers, fixing materials, bends, angles, junctions, reducers, T-pieces etc. He shall further liaise with the Main Contractor for the provision of holes and access through the structure and finishes.

3. SUPPORTS

Cable tray supports shall consist of two steel hangar rods, at least 8mm in diameter, on both sides of the tray with a substantial steel cross-member on the underside of the tray and bolted to the rods. Alternatively, cable trays may be cantilevered from walls on suitable brackets.

4. SPACING OF HORIZONTAL SUPPORTS

4.1 Horizontal trays shall be supported at the following maximum intervals:

(a) 1.2 mm to 1.6 mm thick metal with 12 mm to 19 mm return trays.
1 m maximum spacing

(b) 2.5 mm thick metal trays with 76 mm return — 1.5 m spacing.

(c) Cable ladders with 76mm side rail of 2mm thickness and with cross rungs.
1.5 m spacing

(d) Metal cable ladders other than c) above, including site manufactured angle iron types
1 m spacing

(e) 3 mm thick PVC trays with 40mm return. — 1 m maximum spacing

(f) 4 mm thick PVC trays with 60mm return — 1.5 m maximum spacing

4.2 In addition to the above spacing on the longitudinal run, trays and ladders shall be supported at each bend, offset and T-junction.

5. JOINTS

5.1 Joints shall be smooth and without projections or rough edges that may damage the cables. The Contractor will be required to cover joints with rubber cement or other non-hardening rubberised or plastic compounds if in the opinion of the Engineer joints may damage cables.

5.2 Joints shall as far as possible be arranged to fall on supports. Where joints do not coincide with supports, joints shall be made by means of wrap-around splices of the same material as the tray and at least 450mm long. The two cable tray ends shall butt tightly at the centre of the splice and the splice shall be bolted to each cable tray be means of at least 8 round head bolts, nuts and washers. Splices shall have the same finish as the rest of the tray.

5.3 Splices as described above shall be provided at joints, which do coincide with supports if the loaded tray sags adjacent to the joint due to the interruption of the bending moment in the tray.

6. FIXING TO SUPPORTS

Trays shall be bolted to supports by at least two round head bolts per support. Bolts shall be securely tightened against the tray surface to avoid projections which might damage cables during installation.

7. FIXING TO THE STRUCTURE

7.1 Where installed on concrete or brick, the supports for cable trays and ladders shall be securely fixed by means of at least 2 heavy duty, expansion type anchor bolts. Cantilevered trays shall be supported by a minimum of two 6mm diameter expansion bolts per support.

7.2 It is the responsibility of the Contractor to ensure that adequate fixing is provided since cable trays and ladders that work loose shall be rectified at his expense. The fixing shall take into account site conditions that prevail during installation.

7.3 Where installed on vertical steelwork, cable trays and ladders shall be fixed by means of 6mm diameter bolts and nuts.

7.4 On horizontal steelwork, use may alternatively be made of "CADDY" type fasteners.

7.5 Horizontal trays and ladders shall in general be installed 450 mm below slabs, ceilings, etc. to facilitate access during installation of cables.

7.6 Multiple runs shall be spaced at least 300 mm apart unless a different spacing is specified in the Detail Technical Specification.

8. INSTALLATION OF CABLES

Cables shall be installed adjacent and parallel to each other on the trays with spacing as specified in the standard specification for "INSTALLATION OF CABLES", Section B6, and snaked slightly to allow for expansion. Cables shall present a neat appearance and shall under no circumstances be bunched. Cables shall be clamped at maximum intervals of 3 m when installed on horizontal trays and at maximum intervals of 600 mm when installed on vertical trays.

9. EARTHING

Metal trays and ladders shall be bonded to the earth bar of the switchboard to which the cables are connected. Additional bare copper stranded conductors or copper tape shall be bolted to the tray or ladder where the electrical continuity cannot be guaranteed. These additional conductors or tapes shall always be installed in outdoor applications and in coastal regions.

10. CORROSION

PVC trays shall be used in corrosive atmospheres. All supports shall be adequately protected against corrosion, preferably with a powder coated paint finish.

SECTION B4

B.4 FIXING MATERIALS

1. RESPONSIBILITY

It is the responsibility of the Contractor to position and securely fix conduits, ducts, cables and cable channels, switchboards, fittings and all other equipment or accessories as required for the Installation. The Contractor shall provide and fix all supports, clamps, brackets, hangers and other fixing materials.

2. FINISHING

All unpainted supporting steelwork installed by the Contractor shall be wire brushed and given one coat of rust-resisting primer, followed by one coat of high quality enamel paint before any other equipment is fixed.

3. STRUCTURAL STEEL

Supports, brackets, hangers, etc. may only be welded to structural steel members where prior permission of the Engineer has been obtained. "CADDY" or similar fasteners may be used to fix equipment to structural steel members.

4. SCREWS AND BOLTS

Where holes exist in equipment to be fixed, bolts and fixing screws as specified shall be used. Where sizes are not specified, the largest bolt or screw that will fit into the hole shall be used.

5. WALL PLUGS

Where the fixing holes in brick or concrete walls are smaller than 10mm dia. and where the mass of the equipment is less than 10kg, wall plugs may be used to fix conduits, cables and other equipment. Fibre or plastic plugs shall be used. Wooden Plugs are not acceptable. Aluminium plugs may be used in face bricks. Plugs installed in joints between bricks are not acceptable. A masonry drill of the correct size shall be used to drill holes for plugs. Round-headed screws of the correct diameter to match the specific plug shall be used throughout.

6. ANCHOR BOLTS

Where the fixing holes are 10mm and larger or where the mass of the equipment is 10kg, equipment shall be fixed by means of expanding anchor bolts or by means of bolts cast into the concrete or built into walls.

7. GALVANISED EQUIPMENT

Brass screws bolts and nuts shall be used to fix galvanised equipment.

8. SHOT-FIRED FIXING

8.1 Materials such as metal cable ducts or channels may be fixed against walls and concrete slabs by means of the shot-fired fixings.

8.2 The Contractor shall ascertain whether this method of fixing will carry the weight of the material including conductors, cables and other items of equipment to be installed later. Should it be found that the method of fixing is inadequate and supports tend to loosen, the Contractor will be required to fix the material by an alternative method to the satisfaction of the Engineer.

8.3 Where the shot-fired method is used, warning signs shall be placed at all entrances leading to the area where this work is in progress. The Contractor shall take all reasonable precautions to prevent accidents. Refer also to The Occupational Health and Safety Act.

8.4 Nails and explosive charges recommended by the manufacturer shall be used throughout.

9. CLAMPS AND BRACKETS

Clamps and brackets used to fix or support equipment such as cable trays, ducts, etc. shall be of a purpose-made type suitable for the specific application. Refer also to the specification for "CABLE TRAYS AND LADDERS", Section B3 and "INSTALLATION OF WIRING CHANNELS", Section B2.

SECTION B5

B.5 WIRING

This section covers wiring in approved wire-ways for electrical installations in buildings or other structures under normal environmental conditions for 50 Hz systems not exceeding 600 V.

1. TYPE OF CONDUCTORS

PVC-insulated or equivalent, stranded copper conductors and bare stranded or green PVC-insulated copper earth conductors shall be used exclusively. Only where cables are specified or in instances where the exceptions stipulated in SANS 10142 are applicable, may the Contractor deviate from this requirement.

2. WIRE-WAYS

2.1 All unarmoured conductors shall be installed in conduits, cable channels (trunking) or power skirting and shall under no circumstances be exposed. Cable channels and power skirting shall be of metal construction unless specifically approved to the contrary.

2.2 Tenderers must note that common wire-ways will only be permitted for relatively light current-carrying conductors such as lighting and socket-outlet circuits. Refer also to par. 4 below. Heavy current-carrying conductors such as feeders to distribution boards and large power points must be installed in separate conduits or wire-ways.

3. ORDER OF WORK

Wiring shall only be carried out after the wire-way installation has been completed, but before painting has commenced. Debris and moisture shall be removed from the wireways prior to the installation of the conductors.

4. CIRCUITS

Conductors that are connected to different switchboards shall not be installed in the same wireway. The wiring of one circuit only will be allowed in a 20 mm dia. conduit with the exception of the wiring from switchboards to fabricated sheet metal boxes close to switchboards in which case more than one circuit will be allowed. For larger conduit sizes the requirements of SANS 10142, shall be met.

5. LOOPING AND JOINTS

A loop-in wiring system where conductors are looped from outlet to outlet shall be employed. Joints in conductors shall be avoided as far as possible but where it becomes unavoidable, joints will be accepted in cable channels only and not in conduits. Joints shall be soldered or shall alternatively consist of approved ferruling, properly covered with heat-shrink sleeves. The use of PVC insulation tape is not acceptable.

6. GROUPING OF CONDUCTORS

In cases where the conductors of more than one circuit are installed in the same wireway, the conductors of each separate circuit (including earth conductor) shall be taped at intervals of 1m with PVC insulation tape. The conductors of different circuits shall however remain separate in order that any given circuit can be withdrawn. Conductors entering switchboards or control boards shall be grouped and bound by means of plastic or metal bands (not tape).

7. CABLE TRAYS

Conductors may only be installed directly on cable trays if specifically approved by the Engineer. In these cases cable trays shall be at least 2m above walkways or working areas. Conductors of the same circuit shall be grouped in the same manner as described in the previous paragraph. All the conductors on the cable tray shall then be tied down securely to the cable tray at intervals of 2m or less by means of plastic or metal bands (not tape).

8. DRAWING-IN OF CONDUCTORS

When conductors are drawn through conduit, care shall be taken that they are not kinked or twisted. Care shall also be taken that the conductors do not come into contact with materials or surfaces that may damage or otherwise adversely affect the durability of the conductor.

9. THREE-PHASE OUTLETS

9.1 With the exception of three-phase outlets, circuits connected to different phases shall not normally be present at lighting, switch or socket outlet boxes. Where this is unavoidable, barriers shall be provided between terminals or connections of the various phases and the box shall be suitably labelled internally to indicate the presence of three phase voltages.

9.2 A neutral conductor shall be installed to all three phase outlets intended for equipment connection, whether sockets or isolators, irrespective of whether the particular equipment normally requires a neutral or not.

10. VERTICAL CONDUIT INSTALLATION

Conductors installed in vertical wire-ways shall be secured at intervals not exceeding 5m to support the weight of the conductors. Clamps shall be provided in suitable draw boxes for this purpose.

11. CONNECTIONS

The insulation of conductors shall only be removed over the portion of the conductors that enter the terminals of switches, socket outlets or other equipment. When more than one conductor enters a terminal, the strands shall be securely twisted together. Under no circumstances shall strands be cut off.

12. EARTHING CONDUCTORS

12.1 When earth continuity conductors are looped between terminals of equipment, the looped conductor ends shall be twisted together and then soldered or ferruled to ensure that earth continuity is maintained when the conductors are removed from a terminal.

12.2 The installation shall be earthed to comply with SANS 10142.

12.3 The installation shall be bonded to comply with SANS 10142.

13. COLOURS

The colours of conductor insulation shall comply with SANS 10142. The colours of conductors for sub-circuits shall as far as possible correspond with the colour of the supply phase. The colours of conductors for wiring to two-way and intermediate switches shall preferably differ from the colour of phase conductors.

14. SINGLE-POLE SWITCHES

Single-pole switches shall be connected to the phase conductor and not to the neutral conductor.

15. SIZE OF CONDUCTORS

Where conductor sizes are not specified, the following <u>minimum</u> conductor sizes shall be used:

Lighting circuits:	1.5mm² and 2.5mm² copper earth conductor
Socket-outlet circuits:	2.5mm² and 2.5mm² copper earth conductor.
Bell circuits:	1.5mm²
Stove circuits:	10mm² and 6mm² copper earth conductor
Clock circuits:	1.5mm²

16. PARTITIONS

16.1 When wiring is installed in removable partitions, the vertical and/or horizontal metal supports of the walls may be utilised for wiring on condition that:

(a) the conductors are not exposed,

(b) the metal supports are properly earthed,

(c) a separate bare earth continuity conductor is drawn in together with the current carrying conductors and is earthed to the metal parts of the switches and/or the socket-outlets, and

(d) conductors are installed in the metal and non-inflammable sections of the partitions.

16.2 Conductors enclosed in a copper braiding (harness wiring) may be installed in removable partitions. The braiding can be used as earth continuity conductor. The wiring shall be joined to the conduit (or cable) installation by interconnecting the conductor and the earth conductors in a draw-box using suitable ferrules and heat-shrink sleeves or screwed terminals.

SECTION B6

B.6 INSTALLATION OF CABLES

This section covers the installation of cables for the distribution of power in buildings, other structures and in ground for system voltages up to 11 kV, 50 Hz.

1. GENERAL

1.1 CABLE TYPES

(a) All cables and jointing and termination accessories used for power distribution shall comply with SANS 10142-1.

(b) Cables with copper conductors shall be used throughout unless otherwise specified or approved.

(c) All unarmoured cables shall be installed in metal trunking, sleeves or conduit unless clearly specified to the contrary.

(d) XLPE Cables shall only be used in exceptional circumstances with the written permission of the Engineer.

1.2. COMPETENCE OF PERSONNEL

It is a definite requirement that the Contractor shall only employ personnel fully conversant with cable manufacturer's recommendations for joining and terminating cables.

2. IDENTIFICATION OF CABLES

2.1 Cables shall be identified at all terminations by means of punched metallic bands or marked with labels or tags. (Refer also to SANS 10142).

2.2 The use of PVC tape with punched characters is not acceptable.

2.3 The identification numbers of cables shall be shown on "as built" drawings of the Installation.

3. TRENCHING

3.1 GENERAL

3.1.1 The Contractor shall be responsible for all trenching excavations unless specified to the contrary.

3.1.2 The Contractor shall, before trenching commences, familiarise himself with the routes and site conditions and the procedure and order of doing the work shall be planned in conjunction with the general construction programme for other services and building requirements.

3.1.3 The Contractor shall acquaint himself with the position of all the existing services such as stormwater pipes, water mains, sewer mains, gas pipes, telephone cables, etc. before any excavations are commenced. For this purpose he shall approach the Engineer, the local municipal authority and any other authority which may be involved, in writing.

3.1.4 The Contractor will be held responsible for damage to any existing services brought to his attention by the relevant authorities and shall be responsible for the cost of repairs.

3.1.5 The Contractor shall take all the necessary precautions and provide the necessary warning signs and/or lights to ensure that the public and/or employees on site are not endangered.

3.1.6 The Contractor shall ensure that the excavations will not endanger existing structures, roads, railways, other site constructions or other property.

3.2 MECHANICAL EXCAVATORS

3.2.1 Power driven mechanical excavators may be used for trenching operations provided that they are not used in close proximity to other plant, services or other installations likely to be damaged by the use of such machinery.

3.2.2

3.2.2 The use of power driven mechanical excavators shall be subject to the approval of the Engineer. Should the excavator produce trenches that exceed the required dimensions, payment based on volumetric excavation rates will be calculated on the required dimensions only.

3.3 BLASTING

3.3.1 No guarantee is given or implied that blasting will not be required.

3.3.2 Should blasting be necessary and approved by the Engineer, the Contractor shall obtain the necessary authority from the relevant Government Departments and Local Authorities. The Contractor shall take full responsibility and observe all conditions and regulations set forth by the above authorities.

3.4 ROUTES

3.4.1 Trenches shall connect the points shown on the drawings in a straight line. Any deviations due to obstructions or existing services shall be approved by the Engineer beforehand. Refer also to par. 10.4.

3.4.2 The Engineer reserves the right to alter any cable route or portion thereof in advance of cable laying. Payment in respect of any additional or wasted work involved shall be at the documented rates.

3.4.3 The removal of obstructions along the cable routes shall be subject to the approval of the Engineer.

3.5 SHORING AND WATERLOGGING

3.5.1 The Contractor shall provide shoring for use in locations where there is a danger of the sides of the trench collapsing due to waterlogging or other ground conditions. Refer to the Occupational Health and Safety Act.

3.5.2 The strength of shoring must be adequate for site conditions prevailing and the shoring must be braced across the trench.

3.5.3 The Contractor shall provide all pumps and equipment required to remove accumulated water from trenches. Water or any other liquid removed shall be disposed of without any nuisance or hazard.

3.6 TRENCHING

3.6.1 Trenching shall be programmed in advance and the approved programme shall not be departed from except with the consent of the Engineer.

3.6.2 Trenches shall be as straight as possible and shall be excavated to the dimensions indicated in this specification.

3.6.3 The bottom of the trench shall be of smooth contour, and shall have no sharp dips or rises which may cause tensile forces in the cable during backfilling.

3.6.4 The excavated material shall be placed adjacent to each trench in such a manner as to prevent nuisance, interference or damage to adjacent drains, gateways, trenches, water furrows, other works, properties or traffic. Where this is not possible the excavated materials shall be removed from site and returned for backfilling on completion of cable laying.

3.6.5 Surplus material shall be removed from site and disposed of at the cost of the Contractor.

3.6.6 Trenches across roads, access ways or footpaths shall not be left open. If cables cannot be laid immediately the Contractor shall install temporary "bridges" or cover plates of sufficient strength to accommodate the traffic concerned.

3.6.7 In the event of damage to other services or structures during trenching operations the Contractor shall immediately notify the Engineer and institute repairs. (Refer to par. 3.1.3 and 3.1.4)

3.6.8 Prior to cable laying the trench shall be inspected thoroughly and all objects likely to cause damage to the cables either during or after laying shall be removed.

3.6.9 Where ground conditions are likely to reduce maximum current carrying capacities of cables or where the cables are likely to be subjected to chemical or other damage or electrolytic action, the Engineer shall be notified before installing the cables. The Engineer will advise on the course of action to be taken.

3.6.10 Extreme care shall be taken not to disturb surveyor's pegs. These pegs shall not be covered with excavated material. If the surveyor's pegs are disturbed, they shall be replaced by a person qualified to do so.

3.7 DIMENSIONS OF TRENCHES

3.7.1 Cable trenches for one or two cables shall not be less than 300 mm wide and need not be more than 450 mm wide. This dimension shall be valid for the total trench depth.

3.7.2 The width shall be increased where more cables are installed to allow for the spacing stipulated in par. 4.2.

3.7.3 Where trenches change direction or where cable slack is to be accommodated, the Contractor shall ensure that the requirements of the relevant SANS Specification regarding the bending radii of cables are met when determining trench widths.

3.7.4 Trench depths shall be determined in accordance with cable laying depths and bedding thickness.

3.7.5 Payment will be made on a volumetric excavation rate calculated on the basis of the given maximum dimensions or the actual dimensions, whichever is the lesser. Refer also to par. 3.2.2 and 3.7.1 above.

3.8 JOINT HOLES

Where cable joints are required to be made in the course of a cable run, a joint hole shall be excavated of sufficient size to enable the cable jointer to work efficiently and unimpeded.

3.9 BEDDING

3.9.1 The bottom of the trench shall be filled across the full width with a 75mm layer of suitable soil sifted through a 6mm mesh and levelled off.

3.9.2 Only sandy clay or loam soil with a satisfactory thermal resistivity (not exceeding 1.5 °C m/W) may be used for this purpose. Sea or river sand, ash, chalk, peat, clinker or clayey soil shall not be used. The use of crusher sand is acceptable.

3.9.3 Where no suitable soil is available on site, the Contractor shall import fill from elsewhere and make all the necessary arrangements to do so. The cost of importing soil for bedding purposes shall be included in the unit rates for excavations.

3.9.4 After cable laying a further layer of bedding shall be provided to extend to 75 mm above the cables.

3.9.5 The bedding under joints shall be fully consolidated to prevent subsequent settling.

3.10 CABLE SLEEVES

3.10.1 Where cables cross under roads, railway tracks, other service areas, etc. and where cables enter buildings, the cables shall be installed in Polyethylene (6mm thickness), asbestos cement pipes or earthenware pipes. Pitch fibre and PVC pipes are not acceptable because of the adhesion that occurs after a period of time between the pipe and the sheathing or outer serving of the cables.

3.10.2 Pipes shall be joined in accordance with the manufacturer's instructions.

3.10.3 Sleeves shall cross roads and railway tracks at right angles.

3.10.4 Sleeves shall have a minimum diameter of 100mm. They shall extend at least 2m beyond the tracks of a railway line or of the outermost tracks where there is more than one line. In the case of roads, the sleeves shall extend at least 1m beyond the road edge or kerb on both sides of the road.

3.10.5 All sleeves shall be graded 1:400 for water drainage.

3.10.6 Cable sleeves shall be installed to the spacing and depths stated in paragraph 4 below.

3.10.7 Galvanised metallic sleeves up to and including 76mm dia. shall be supplied and installed by the contractor.

3.10.8 The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

3.11 BACKFILLING

3.11.1 The Contractor shall not commence with the backfilling of trenches without prior notification to the Engineer so that the cable installation may be inspected. Should the Contractor fail to give a timeous notification, the trenches shall be re-opened at the Contractor's cost. Such an inspection will not be unreasonably delayed.

3.11.2 For high voltage cables (1 kV to 11 kV) a coloured plastic marking tape shall be installed 400 mm above the cable. The tape shall be yellow, marked with the words "ELECTRIC CABLE/ELEKTRIESE KABEL" in red. These markings shall not be more than 1m apart from centre to centre.

3.11.3 Backfilling shall be undertaken with soil suitable to ensure settling without voids. The maximum allowable diameter of stones present in the backfill material is 75mm.

3.11.4 The Contractor shall have allowed in his tender for the importation of suitable backfill material if required.

3.11.5 The backfill shall be compacted in layers of 150mm and sufficient allowance shall be made for final settlement. The Contractor shall maintain the refilled trench at his expense for the duration of the contract. Surplus material shall be removed from site and suitably disposed of.

3.11.6 On completion, the surface shall be made good to match the surrounding area.

3.11.7 In the case of roadways or paved areas the excavations shall be consolidated to the original density of the surrounding material and the surface finish reinstated.

3.12 CABLE MARKERS (FOR HV CABLES ONLY, EXCEPT WHERE OTHERWISE SPECIFIED)

3.12.1 Cable markers shall be provided along all HV cable routes but need only be provided along LV cable routes where specified.

3.12.2 Cable markers shall consist of concrete blocks in the shape of truncated pyramids, approx. 300mm high, 150 x 150mm at the top and 250 x 250mm at the bottom.

3.12.3 Brass plates shall be cast into the tops of the blocks in such a manner that they cannot be prised loose. The wording "ELECTRIC CABLE/ELEKTRIESE KABEL" shall be stamped on the brass plates as well as direction arrows and the cable voltage rating.

3.12.4 Cable markers shall be installed on the surface along all the underground routes and shall project 35 mm above normal ground level unless the projected markers could be a hazard to pedestrian or other traffic in which case they shall be installed flush with the surface.

3.12.5 Cable markers shall be installed at the beginning and end of a cable run (e.g. where a cable enters a substation or building), at all changes of direction, above all joints, above cable pipe entries and exits and at intervals not exceeding 50 m along the cable route.

3.12.6 The position of cable markers shall be indicated on the "as built" drawings.

3.13 TRANSNET, PROVINCIAL ADMINISTRATION OR NATIONAL ROAD CROSSINGS

3.13.1 The Contractor shall not trench beneath any railway tracks without the TRANSNET Administration's supervision. The Contractor shall request the Engineer timeously to arrange for the necessary supervision. The cost of such supervision will be paid for by the Employer.

3.13.2 The Employer and/or Engineer will arrange for the necessary wayleave and permission to cross TRANSNET property and railway tracks, or Provincial or National road reserves and TELKOM Authority approval of proposed cable routes.

3.13.3 The Contractor shall carry out the crossing installation in strict accordance with the TRANSNET and Provincial Administration's requirements and stipulations. Where these requirements are in contradiction with this specification, the Engineer's ruling shall be sought.

3.13.4 The Contractor shall ensure that he will comply with the various Administrations' requirements regarding crossing of Provincial and National roads, especially with regard to the safeguarding of the public. The Contractor shall also provide proof of adequate insurance cover against any claim from any accident as a result of work done by the Contractor during the crossing operation. The Employer, Employer's Representatives and the Engineer shall also be indemnified from all liability in this regard.

3.13.5 The Contractor shall liaise with the various Administrations well in advance regarding the intended dates, times and expected duration of the crossing operations and obtain their approval of the programme and method of operation before commencing with the work.

4. INSTALLATION OF UNDERGROUND CABLES

4.1 INSTALLATION DEPTHS

4.1.1 Cables shall be installed at the following minimum depths below final ground level:

Up to 11kV: 800 mm

4.1.2 All cable depth measurements shall be made to the top of the cable when laid directly in ground or to the top of the duct or sleeve where these are provided.

4.1.3 The above depths shall apply to the top layer where cables are installed in layers.

4.1.4 The Contractor may only deviate from the above depths provided prior authority in writing has been obtained from the Engineer. In this event the cables shall be protected with a suitable concrete covering.

4.1.5 The depth of cable pipes or ducts beneath railway lines or roads shall be not less than 1.1 m below the formation level.

4.2 CABLE SPACINGS

4.2.1 Cables installed in the same trench shall be laid parallel to each other with the following spacing between cables (LV: up to 1 kV; HV: 1 kV to 11 kV):

LV/LV	:	2 cable diameters
LV/HV	:	150mm minimum

HV/HV	:	150mm minimum
LV/HV/PILOT	:	1 cable diameter

4.2.2 Where HV and LV cables have to be installed in the same trench, both shall be laid at a depth of 800 mm and then covered with 200mm of soil. The soil shall then be compacted, and then backfilled layer by layer and compacted until the trench is completely backfilled.

4.2.3 Cables for telephones, communication systems and other low voltage systems (less than 50 V) shall be separated from power cables by at least 1m. All control or pilot cables without a lead sheath and steel armouring shall be laid at least 300mm from power cables.

4.2.4 Cables shall not be buried on top of each other unless layers are specified. The minimum spacing between layers shall be 200mm.

4.3 CABLE LAYING

4.3.1 Except where ducts, tunnels or pipes are provided, cables shall be laid directly in the ground.

4.3.2 The cable shall be removed from the drum in such a manner that the cable is not subjected to twisting or tension exceeding that stipulated by the cable manufacturer.

4.3.3 Cable rollers shall be used as far as possible to run out cables. Rollers shall be spaced so that the length of cable in the trench will be totally suspended during the laying operation and sufficiently close to prevent undue sagging and the cable from touching the ground. Rollers shall also be placed in the trench in such a manner that they will not readily capsize.

4.3.4 Cable rollers shall have no sharp projecting parts liable to damage the cables.

4.3.5 Where cables have to be drawn around corners, well-lubricated skid plates shall be used. The skid plates shall be securely fixed between rollers and shall constantly be examined during cable laying operations.

4.3.6 Where cables have to be drawn through pipes or ducts, a suitable cable sock shall be used and particular care shall be exercised to avoid abrasion, elongation or distortion of any kind. In the case of oil filled cables, a cable sock may never be used. Special eyes giving access to the interior of the cable must be utilised.

4.3.7 The maximum allowable tension when pulling a cable is 70 N/mm2 of conductor area.

4.3.8 It will be assumed that the price or rates contained in the tender includes for the installation of cables in pipes and ducts or below existing or newly installed services.

4.3.9 The Engineer shall be informed timeously of the intention to carry out all cable laying operations to allow an inspection of the works by the Engineer if so required.

5. INSTALLATION OF CABLES IN CONCRETE TRENCHES

5.1 GENERAL

This paragraph covers the installation of cables in building trenches, service ducts, etc. The trenches, ducts, etc. inside buildings will be constructed and installed by others.

5.2 INSTALLATION

Cables shall be installed in one of the following ways:

(a) On horizontal cable trays.

(b) On horizontal metal supports with suitable clamps.

(c) On vertical cable trays or metal supports fixed to the side of the trench. The cables shall be clamped in position.

Cables shall not be bunched and laid on the floor of the building trenches.

5.3 COVERS

5.3.1 The covering of concrete trenches shall as a rule fall outside the scope of the electrical installation. The Contractor shall however be responsible for the cutting or drilling and smoothing of holes for cables through chequer plates, concrete or other coverings as required.

5.3.2 Cables shall enter and exit the trench through sleeves protruding 300mm beyond the covering. The sleeves shall be permanently secured in position and the open space between the cable and sleeves shall be sealed with a non-hardening, watertight compound.

5.4 FILLED TRENCHES

5.4.1 Where specified, floor trenches shall be filled with fine crusher sand (no river or see sand).

5.4.2 If a sand filling is specified, the cables shall be fixed to non-corroding supports.

5.4.3 Sand-filled trenches other than in substations shall be covered in one of the following ways:

(a) Reinforced concrete covers.

(b) Sand and cement screed.

(c) Removable chequer plates.

5.4.4 Method (a) above shall be used where vehicular traffic may be encountered over trenches. Unless otherwise specified allowance for a mass of 2 tons shall be made.

5.4.5 Cable trenches in substations, switch rooms and generator rooms shall be covered in accordance with Par. 9 or Section B13 "COVERING AND SEALING OF CABLE TRENCHES”.

6. FIXING OF CABLES TO TRAYS OR STRUCTURES

6.1 INSTALLATION

Cables may be installed in one of the following ways:

(a) On horizontal cable trays.
(b) Against vertical cable trays with suitable clamps.
(c) Against horizontal or vertical metal supports or brackets with suitable clamps.
(d) On clamps which are fixed to the structure.

6.2 CLAMPS

Suitable clamps (cleats) which will secure cables without damage shall be used. Metal clamps or drilled hard wood blocks shall be used. Clamps shall consist of adjustable metal wings which clamp to a metal support, or consist of two halves that are bolted together. The correct clamp size to fit the cable shall be used. Cables of different sizes may only be fixed by a common clamp when the clamp is specially made to accommodate the various cables.

6.3 SPACING OF SUPPORTS

Two methods of supporting cables are found in practice. The most generally known method is the restrained installation where the distance between supports is small enough to prevent any noticeable sag in the cable. The alternative method is the unrestrained installation where the distance between supports should be great enough to ensure that there will be obvious sag in each span between supports.

6.4 SPACING OF SUPPORTS OF UNRESTRAINED CABLES

Large single core cables shall always be installed according to this method. Generally, single core cables with conductors exceeding a cross sectional area of 185mm² should be supported at spacing in excess of 2m since the sag between supports will safely accommodate any thermal expansion.

Reducing the spacing between the supports to 1.5m or less shall be avoided at all costs, as expansion cannot be taken up by a change of sag and chances of sheath failure become considerable.

6.5 SPACING OF SUPPORTS OF RESTRAINED CABLES

Additional cleats shall be installed at each bend or offset in the cable run. The maximum distance between supports or cleats for multi-core control cables shall be 20 times the outside diameter of the cable with a maximum spacing of 550mm for unarmoured cables and 30 times the outside diameter of the cable with a maximum spacing of 900mm for armoured cables. Spacing of supports for cables for high voltage lighting shall be in accordance with Table 8 of SANS 10142. A minimum of 20mm ventilation clearance shall be maintained between cables and the wall to which they are cleated.

7. GROUPING AND SPACING OF CABLES IN BUILDINGS AND STRUCTURES

7.1 SPACING CORRECTION FACTORS

Cables shall as a rule be spaced two cable diameters apart, for which no grouping correction factor need be applied.

7.2 CABLES ON DIFFERENT LEVELS

Where parallel cable runs are installed at different levels (e.g. on parallel cable trays) and where the spacing of the layers is not specified, a minimum spacing of 300mm shall be maintained.

7.3 SINGLE CORE CABLES

Where single core cables are installed along a three-phase circuit, the cables shall be installed in trefoil formation and bound together at 300mm intervals.

7.4 HIGH VOLTAGE CABLES

High voltage cables shall be separated from other cables and services throughout the installation and shall as far as possible be installed in separate floor trenches, pipes or metal channels. Where this is not feasible a minimum spacing of 500 mm shall be maintained.

7.5 CABLES FOR OTHER SERVICES

Cables for telephones, communication systems and other low voltage systems (less than 50 V) shall be separated from power cables. In building ducts a physical barrier shall be provided between power cables and cables for other services. Where armoured cables are used for such other services, they shall be installed on separate cable trays or shall otherwise be at least 1m away from power cables. Where unarmoured cables are used for these other services, they shall be installed in separate conduits or metal channels.

TABLE B6.1

Cross-Sectional Area of Cable Conductors (mm²)	MAXIMUM SPACING OF SUPPORTS (CLEATS) (mm) FOR RESTRAINED CABLES			
	Wire Armoured Cables		Other than Wire Armoured Cables and Unarmoured Cables	
	Horizontal Cable Routes	Vertical Cable Routes	Horizontal Cable Routes	Vertical Cable Routes
1.5	450	750	300	400
2.5	450	750	300	400
4.0	600	750	300	400
6.0	600	750	300	400
10.0	750	900	400	450
16.0	750	1000	400	550
25.0	900	1000	450	550
35.0	900	1000	450	550
Bigger than 35.0	900	1000	450	550

For larger cables the spacing shall be 10 x outside diameter of the cable.

8. TERMINATION AND JOINTING OF CABLES

8.1 GENERAL

8.1.1 Cable ends shall be terminated with glands or in cable boxes with the associated accessories such as clamps, shrouds, etc. complying in all respects with the relevant SANS codes.

8.1.2 Connection of cables to switchgear shall always be effected in such a way that the various phases, seen from the front of the switchgear will be in the following positions:

No. 1 conductor: left (red) (A)
No. 2 conductor: centre (white) (B)
No. 3 conductor: right (blue) (C)

8.1.3 Exposed armouring shall be covered with bitumen-base paint.

8.1.4 All cable ends shall be supplied with the necessary earth connection.

8.1.5 A channel or other approved means of support shall be provided to remove mechanical stress from the glands.

8.1.6 Cable cores shall be marked with heat-shrunk sleeves where necessary to identify the phases. Refer to SANS 10142.

8.1.7 The current-carrying capacity and breakdown voltage of the cable end shall be the same as for the complete cable.

8.1.8 Cables shall be terminated in accordance with the recommendations laid down by the manufacturers of the cables and glands employed.

8.2 TERMINATION OF PAPER-INSULATED CABLES

8.2.1 The ends shall be terminated in cable end boxes filled with bituminous, cold filling or resin oil semi-fluid compound or heat-shrinkable terminations in accordance with all relevant SANS codes.

8.2.2 <u>Heat-shrinkable materials shall only be used in exceptional circumstances with the written permission of the Engineer.</u>

8.2.3 Before terminating or jointing paper-insulated cables, a test to establish the presence of moisture must be carried out.

The following procedure may be followed:

(a) Place an adequate quantity of cable impregnating oil in a suitable container and heat up to 130 C ± 5 C.

(b) Cut a small length (± 300mm) of the cable concerned and remove the armouring and sheath, taking care not to handle the dielectric in any way.

(c) Dip a section of the outer insulating impregnated paper (belt paper) in the heated oil, taking care not to contaminate the tapes with moisture from the hands. If frothing appears on the surface of the oil, this is a clear indication of the presence of moisture in the paper.

(d) The same procedure should then be repeated on the insulating impregnated paper around the conductors (especially those layers closest to the conductors). Frothing will also indicate the presence of moisture.

(e) Should only a small number of bubbles appear on the surface of the oil, this is an indication of air bubbles on the paper and not moisture since the presence of moisture will result in a series of bubbles rising to the surface of the oil for a number of seconds, until all moisture has been removed.

8.2.4 The armouring shall be bonded to the main earth bar of the switchgear or transformer, but the bond shall be easily removable for testing purposes.

8.2.5 The lead sheath shall be wiped against the conical wiping gland.

8.2.6 All cut cable ends which will be exposed to the atmosphere for more than two hours shall be sealed and wiped to prevent penetration of moisture.

8.3 TERMINATION OF XLPE CABLES

8.3.1 These cables shall only be used in exceptional circumstances and only with the written permission of the Engineer.

8.3.2 Cross-linked polyethylene cables (XLPE) shall be terminated in accordance with the relevant SANS codes.

8.3.3 The copper tapes of the earth screen on the cable shall be bonded to the main earth bar of the switchgear or transformer, but the bond shall be easily removable for testing purposes.

8.3.4 The cable shall be firmly secured on the switchgear by means of a clamp to prevent mechanical stress on the cable and terminations.

8.4 TERMINATION OF PVC-INSULATED CABLES

8.4.1 Cable ends shall be terminated by means of adjustable glands.

8.4.2 The glands shall be fitted in accordance with the cable and gland manufacturer’s instructions.

8.4.3 The correct size and type of gland shall be used for the particular cable and application.

8.5 CONNECTION OF CABLE CONDUCTORS

8.5.1 Suitable lugs shall be used, preferably solidly sweated to the cable conductor ends. Lugs may be crimped, using mechanical or pneumatic tools designed for this purpose, on condition that evidence is submitted that the method used complies with the performance requirements of BS 4579, Part 1: "COMPRESSION JOINTS IN COPPER".

8.5.2 Contact surfaces shall be thoroughly cleaned and smoothed and fixing bolts shall match the hole size of the lug.

8.5.3 Cables that are connected to clamp type terminals where the clamping screws are not in direct contact with the conductor need not be lugged but the correct terminal size shall be used.

8.5.4 Ferrules shall be used as far as possible where cable conductors are connected directly to equipment with screws against the conductor strands.

8.5.5 When cutting away insulation from cable conductors to fit into lugs, care shall be taken that no strands are left exposed. Under no circumstances may any of the conductor strands be cut away to fit into lugs.

8.6 JOINTS

8.6.1 Joints in cable runs will not be allowed unless specified in the Detail Technical Specification or authorised by the Engineer.

8.6.2 Jointing shall be carried out strictly in accordance with the manufacturer's instructions and by personnel competent in jointing the types of cables used.

8.6.3 During outdoor jointing operations, the joint bays shall be adequately covered by tents of waterproof material suitably supported. Where necessary a trench shall be excavated around the bay to prevent the ingress of moisture. The sides of the hole shall be draped with small tarpaulin or plastic sheeting to prevent loose earth from falling in during jointing operations.

8.6.4 The joint shall not impair the anti-electrolysis characteristics of the cable.

8.6.5 The Contractor shall notify the Engineer timeously of the day on which jointing is to be carried out in order than an inspection may be arranged if so required. Any cable joint not inspected by the Engineer because of insufficient notice being given, shall be opened for inspection and redone at the discretion of the Engineer at the cost of the contractor.

8.6.6 HV cable joints on paper insulated cables shall be of the compound cast type and the compound used shall comply with all relevant SANS codes.

8.6.7 HV cable joints on XLPE-insulated cables shall be of the heat shrinkable type and shall comply with all relevant SANS codes, or shall be based on a prefabricated system utilising pre-moulded slip-on stress cones.

8.6.8 LV cable joints shall be of the epoxy-resin type.

8.6.9 Joints shall be fully water and air tight and shall be free of voids and air pockets.

8.6.10 The crossing of cores in joints will not be permitted under any circumstances.

9. TESTING

9.1 Each cable shall be tested after installation in accordance SANS 1507 (up to 1 kV) and SANS 97 (up to 11 kV) as well as the requirements of the Local and Supply Authorities.

9.2 LV Cables shall be tested by means of a suitable megger at 1 kV and the insulation resistance shall be tabulated and certified.

TABLE B6.2

Cable Rating (kV)	TEST VOLTAGE (Applied for 15 minutes) (kV)

	Paper-insulated cables				XLPE-insulated cables
6.6 11	Between conductors		Conductors to sheath		Conductors to screen
	AC (RMS)	DC	AC (RMS)	DC	DC
	12 20	18 30	12 20	18 30	11 18

* High Voltage test with DC to 2kV for 1 minute only. Discharge cable slowly via discharge stick (1 minute). Clamp all conductors to earth for 24 hours.

9.3 HV Cables shall be high voltage tested in accordance with Table B6.2 and the exact leakage current shall be tabulated and certified.

9.4 The Contractor shall make all arrangements, pay all fees and provide all equipment for these tests. The cost of testing shall have been included in the tender price.

9.5 The Contractor shall notify the Engineer timeously to witness the tests.

9.6 On completion of the tests on any cable, the Contractor shall without delay, submit three copies of the certified Test Reports to the Engineer.

10. MEASUREMENTS

10.1 All measurements for payments shall be made jointly by the representatives of the Employer and the Contractor and the Contractor shall obtain the signature of the Engineer / Employer's representative including approval of such measurements.

10.2 No allowance shall be made for the breaking away of the trench sides, other earth movements or for trenches excavated in excess of the stipulated dimensions. Refer also to par. 3.7.5 above.

10.3 The classification shall be as follows:

Very hard rock shall mean rock that can only be excavated by means of explosives.

Hard rock shall mean granite, quartzitic sandstone, slate and rock of similar or greater hardness, solid shale and boulders in general requiring the use of jack hammers and other mechanical means of excavations.

Soft rock and earth shall mean rock and earth that can be loosened and removed by hand-pick and shovel.

10.4 Where very hard rock and hard rock are encountered, the prior approval of the Engineer shall be obtained before proceeding with the excavation. This requirement is stipulated in order to afford the Engineer the opportunity to determine whether an alternative cable route is justified.

10.5 All cable lengths indicated in the Detail Technical Specification and/or shown in the cable route drawings shall be regarded as estimates and are given for tendering purposes only. The successful tenderer shall measure actual cable lengths on site before ordering.

10.6 The final price for the supply and installation of all cables will be adjusted, on the basis of the actual lengths of installed cables, in accordance with the unit rates quoted at the time of tendering. Cable lengths shall be measured on site to the nearest 500mm for this purpose and surplus cable will not be paid for.

11. COMPLETION

11.1 The Engineer reserves the right to inspect the installation at any stage during the course of construction. Such inspections will however not deem the portions inspected as being complete or accepted and the Contractor shall remain responsible for completing the installation fully in accordance with the Contract Documents.

11.2 The Contractor shall carry out a final "as built" survey of the cable routes and present to the Engineer "as built" route plans of the complete installation. The following information shall be reflected on the plans or submitted as separate schedules with the plans:

(a) Overall length of each cable.

(b) Locations of all joints (if any) in relation to permanent reference points. Dimensions shall be shown and the method of triangulation i.e. two dimensions to each joint, shall be used.

(c) Identification of each cable.

11.3 The works will be deemed to be incomplete until all tests have been conducted successfully and all "as built" drawings and schedules have been handed to the Engineer.

SECTION B7

B.7 INSTALLATION OF LIGHT SWITCHES AND SOCKET-OUTLETS

1. GENERAL

1.1 STANDARDS

Light switches and socket-outlets shall comply with all relevant SANS standards.

1.2 POSITION OF OUTLETS

Switches and socket-outlets shall be accurately positioned in accordance with the drawings. It is the Contractor's responsibility to ensure that all outlets are installed level and square, at the correct height from the floor and at the correct position relative to building lines and equipment positions as specified. It is the Contractor's responsibility to determine the correct final floor level and ceiling level in conjunction with the Main Contractor.

1.3 COVER PLATES

All switches and socket-outlets shall be fitted with standard metal cover plates. The colour of cover plates shall be as specified or shall otherwise match the surrounding finishes as closely as possible. Unless specified to the contrary, ivory cover plates shall be installed on painted walls. Cover plates in the same area shall have the same colour. Flush mounted cover plates shall overlap the draw-box and edges of the recess. Cover plates shall under no circumstances be cut unless authorised by the Engineer.

1.4 ESCUTCHEON PLATES

Where flush mounted switches or socket-outlets are installed in special wall finishes e.g. wood or board panels, acoustic tiles or other cladding, etc. and where the wall finishes must be cut to accommodate the switch, it may be necessary to fix an escutcheon plate to the wall to cover the cut-outs. The escutcheon plate shall fit closely around the outlet boxes and shall be fixed independently of the boxes and cover plates. Bevelled cover plates shall be fixed to the outlet boxes and shall fit firmly against the escutcheon plate.

1.5 APPEARANCE

The sides of adjacent switches, plugs, push-buttons etc. shall be parallel or perpendicular to each other and uniformly spaced. A common escutcheon plate shall be placed around flush mounted outlets and accessories where the standard cover plates do not cover the cut-outs in the finishes.

1.6 DEEP BOXES

Where switch or socket-outlet boxes have been set deep, spiral type steel wire spacers shall be used to fix the yoke of the switch or socket.

2. INSTALLATION OF SOCKET-OUTLETS

2.1 MOUNTING HEIGHT

Unless specified to the contrary, socket-outlets shall be installed at the following heights above finished floor level, measured to the centre of the outlet:

Flush mounted in general:	300mm
Showrooms, shops, servants' quarters:	1.4m
Domestic kitchens, tea kitchens:	1.05m
Commercial kitchens:	1.4m
Factories, workshops, garages:	1.4m

2.2 WALLS

In cases where socket-outlets must be mounted at a nominal height of 300mm and where the lower portion of the wall consists of face bricks and the upper portion is plastered, the outlets shall be installed in the plastered portion of the wall. If however the plastered portion of the wall commences 500mm or more above floor level the outlets shall be installed in the face bricks. Where a wall has different surface finishes the outlets shall be installed within the same finish and not in the dividing lines between the different wall finishes. All outlets shall be installed at least 150mm away from door frames.

3. INSTALLATION OF LIGHT SWITCHES

3.1 MOUNTING

Light switches shall be installed 1.4m above finished floor level unless specified to the contrary. Mounting heights given shall be measured from the finished floor level to the centre of the switch. All single switches shall be installed with the long side of the toggle vertical.

3.2 DOORS

Unless specified to the contrary, switches adjacent to doors shall be installed on the side containing the lock. If the position of the lock is not shown on the drawings, the position shall be verified before the switch-box is installed. Switch boxes in brick or concrete walls shall be installed 150mm from the door frame. Light switches installed in partitions or door frames shall be of the type designed for that purpose.

3.3 WALLS

Where the lower portion of a wall is face brick and the upper portion plastered, light switches shall be installed wholly in the plaster provided that the lower edge of the plaster is not higher than 1.6m above the finished floor level. In general where different wall finishes are used in the same area. Switches shall be installed within the same finish and not on the dividing lines between finishes.

3.4 PARTITIONS

Light switches installed in partitions shall preferably be of the type designed to be accommodated in the partition construction. Switches installed in the metal supports do not require switch boxes. Switches may not be flush mounted in partition walls without switch boxes.

3.5 WATERTIGHT SWITCHES

Switches that are exposed to the weather or are installed in damp areas shall be of the watertight type complying with all relevant SANS codes.

3.6 MULTIPLE SWITCHES

Where several switches are required in one position, multi-lever switches in a common switch box shall be provided wherever possible. All circuits wired into this box shall be on the same phase in order that voltages in excess of 250 V are not present in the box. Where it is not possible or practical to do this, barriers shall be installed and a label shall be prominently displayed within the box stating that voltages in excess of 250 V are present.

SECTION B8

B.8 PHOTO-ELECTRIC DAYLIGHT SENSITIVE SWITCH FOR OUTSIDE LIGHTING

1. INSTALLATION

1.1 The outside lighting of each individual building i.e. light circuits marked "T" on the drawings, shall be controlled by photo-electric daylight sensitive switches.

1.2 The positions of the switches as indicated on the drawings are provisional and the exact positions shall be confirmed with the Engineer on site.

1.3 Individual outside lighting circuits on a building may be connected directly to the daylight sensitive switch.

1.4 Where two or more lighting circuits are to be controlled by a single daylight sensitive switch, a contactor actuated by the unit shall be provided in the switchboard.

1.5 A by-pass switch enabling the lights to be turned on at any time shall be provided.

1.6 Standard control circuits are indicated in fig. B8.1 and B8.2.

2. CONSTRUCTION

2.1 The unit shall comprise a photo cell, thermal actuator and change-over switch. The cover of the unit shall be manufactured from a tough, durable material providing protection against tampering. The cover shall have good weathering properties. It shall be ultraviolet-resistant and shall not deteriorate when exposed to sunlight for prolonged periods.

2.2 The unit shall be of the wall mounting type and shall be supplied complete with a suitable bracket.

2.3 The operational level shall be factory preset for "ON" at a light level of approximately 54 lux and "OFF" at approximately 108 lux. Voltage variations shall not materially affect the operational levels.

2.4 A time delay of not less than 15 seconds shall be provided to prevent the unit from functioning due to short period changes in illumination.

2.5 The unit shall be effectively safeguarded against voltage surges by means of a suitable surge protector which shall preferably form an integral part of the unit.

SECTION B9

B.9 INSTALLATION OF LUMINAIRES

1. POSITIONS

The mounting positions of luminaries shall be verified on site. All luminaries shall be placed symmetrically with respect to ceiling panels, battens, beams, columns or other architectural features of the space unless otherwise indicated. The layout as shown in the Documents shall generally be adhered to but any discrepancies or clashes with structural or other features must be referred to the Engineer, before commencing erection of the installation.

2. COVER PLATES

Cover plates shall be fitted over all draw-boxes and outlets intended for luminaries that are not covered by the luminaire canopy, lamp-holder, ceiling rose or similar accessories.

3. FIXING TO DRAW-BOXES

Where an outlet box or draw-box provides the necessary support for a luminaries, all luminaries with the exception of fluorescent luminaries mounted against ceilings, shall be fixed directly to the box. Fluorescent luminaries and luminaries with a mass in excess of 10kg shall however be suspended independently of the outlet box.

4. HANGERS AND SUPPORTS

Where provision has not been made for the fixing of luminaries, the Contractor shall supply the necessary supports, hangers, conduit extensions, angle brackets or any other fixing method approved by the Engineer.

5. SUSPENDED LUMINAIRES

The necessary hangers shall be provided where luminaries which are of the non-suspension type have to be fixed below false ceilings or roof slabs. The use of 20mm conduits fixed to the roof slab or ceiling is preferred. Provision shall be made for adjustments to enable the levelling of luminaries. Suspended conduits shall be fixed to the ceiling by means of screwed dome lids, bolts and nuts. Ball-and-spigot type domelids shall be used where conduit lengths exceed 600mm. Wiring shall be installed in the conduit hangers.

6. SUSPENDED WIRING CHANNELS

Luminaries (especially fluorescent luminaries) may also be suspended from ceilings by means of suspended metal channels. The metal channel may be supported by conduits or threaded rods. Should metal rods be utilised, these shall be screwed to anchor bolts fixed in the roof slab. Wiring shall either be installed in conduits fixed to the metal channel or in the metal channels and covered with a suitable cover plate. Purpose-made clamps shall be used to fix the luminaries to the cable channel.

7. CEILING BATTENS

Where wooden blocks are used to suspend luminaries, ceiling battens shall not be cut. The wooden blocks shall be cut to fit around battens and shall be screwed to the ceiling. Battens may however be cut where fluorescent or incandescent luminaries with metal canopies have to be installed against a false ceiling.

8. GLASS-BOWL LUMINAIRES

Unless specified to the contrary, suspended glass-bowl luminaries shall be installed with the underside at least 2.1 m above finished floor level.

9. FLUORESCENT LUMINAIRES FIXED TO CONCRETE SLABS

Fluorescent luminaries to be installed directly against concrete slabs or walls shall be securely fixed to the outlet box and at two additional points. Shot-fired fixings are not acceptable. Where approved, fluorescent luminaries may be installed against metal wiring channels in which the wiring is housed. The channel fixing may in this case be shot-fired. Purpose-made fluorescent fixing adaptors shall be used to fix luminaries to cable channels.

10. FLUORESCENT LUMINAIRES FIXED TO CEILINGS

10.1 In all cases where luminaries are fixed to false ceilings, the Contractor shall ensure that the ceiling is capable of carrying the weight of the luminaries before commencing installation. Should any doubt exist in this regard, the matter shall be referred to the Engineer.

10.2 In cases where the weight of the luminaire is not carried by the ceiling but by a support or other suspension method, provision shall be made to prevent relative movement between the ceiling and luminaire, ceiling rose or connection point.

10.3 Surface mounted fluorescent luminaries shall fit firmly against the ceiling brandering without leaving gaps between luminaire and ceiling. The luminaire shall be fixed directly to the ceiling by means of brass plated round-head wood screws and washers.

10.4 In the case of tiled ceilings with exposed or concealed T-section supports, surface mounted luminaries shall be fixed only to the tiles by means of butterfly screws or bolts with nuts and washers. The tiles shall be suitably reinforced.

10.5 Luminaries may alternatively be fixed to metal cross-pieces resting in the ceiling tees.

10.6 Drilling of holes in ceiling tees to support luminaries will not be allowed.

10.7 Luminaries shall be fixed in neat relation to the ceiling lay-out.

11. CONTINUOUS ROWS OF LUMINAIRES

In cases where fluorescent luminaries are installed in tandem, only one connection outlet need be supplied per circuit. All luminaries shall be coupled to one another by means of nipples or brass bushes and locknuts to ensure that wiring is not exposed and that earth continuity is maintained. Luminaries on the same circuit may be wired through the channel formed by the luminaire bodies. In this case silicon-rubber insulated conductors shall be used and internal connections shall be made at porcelain terminal blocks. "SCREW-IT" or similar connectors may only be used if prior permission is obtained from the Engineer. The wiring for any other circuits or outlets, even though these may be in the same row, may not be installed through the luminaire bodies. The Contractor shall ensure that continuous rows are straight and parallel to the relevant building lines.

12. RECESSED LUMINAIRES

12.1 Where recessed luminaries are specified, the Contractor shall maintain close liaison with the ceiling Contractor. In the case of tiled ceilings, the luminaries shall preferably be installed while the metal supports are being installed and before the tiles are placed in position. The Electrical Contractor shall be responsible for the co-ordination of the cutting of ceiling tiles with the other contractors concerned.

12.2 All mounting rings and other accessories shall fit closely into cut-outs to ensure a proper finish.

12.3 In all false ceilings where wiring channels are used, recessed luminaries shall be connected to the wiring channels by means of unswitched 5 A socket-outlets.

12.4 The following requirements shall be adhered to:

(a) Socket-outlets used shall comply with all relevant SANS codes, particularly SANS 10142-1, and shall be of 5 A minimum rating.

(b) The connector cord attached to the luminaire may not exceed 3m in length and shall consist of 1.5mm² minimum, 3-core, PVC-insulated flexible cord.

(c) The 5A socket-outlets shall be positioned such that they are not more than 600mm above the false ceiling.

13. SPECIAL CEILINGS

In cases where special ceilings e.g. aluminium strips, decorative glass, metal leaves, etc. are to be installed, the Contractor and the Manufacturer of the ceiling shall agree upon the method of fixing of luminaries in the ceiling.

14. BULKHEAD LUMINAIRES

Surface mounted bulkhead luminaries shall not be screwed directly to conduit ends. The conduit shall terminate in a round draw-box at the top or rear of the luminaire. The PVC-insulated conductors shall terminate in a porcelain terminal strip in the draw-box. Silicon-rubber-insulated conductors shall be installed from the terminal strip to the luminaire lamp-holder. "SCREW-IT" or similar connectors may only be used if prior permission is obtained from the Engineer.

15. TYPE OF CONDUCTOR

PVC-insulated conductors, unless protected by an approved heat-resistant sheathing, shall not be used where the temperature of the insulation is likely to exceed 70°C. In unventilated luminaries or luminaries capable of housing incandescent lamps over 60W, the interconnecting wiring from the lamp-holder to the circuit wiring shall consist of silicon-rubber insulated conductors. Silicon-rubber insulated conductors shall be used exclusively in the case of high bay fittings. Refer also to the provisions of SANS 10142.

16. WIRING OF LAMPHOLDERS

The central terminal of Edison Screw (E.S.-type) LAMP-HOLDERS shall be connected to the phase conductor and the screwed housing to the neutral conductor.

17. HIGH BAY LUMINAIRES

17.1 High bay luminaries shall be securely suspended from the roof structure.

17.2 The luminaries may be fixed to suspended wiring channels containing the wiring on condition that:

(a) rigid channels with a maximum width of 42 mm be used,

(b) the channels are supported at intervals that will prevent sag or warp and

(c) the channels are large enough to accommodate the wiring.

17.3 Luminaries may be suspended from metal roof trusses with the aid of "CADDY" or similar fasteners.

17.4 Luminaries shall preferably be connected to unswitched 5A socket outlets. Silicon-rubber insulated flexible cord shall be used exclusively to connect the luminaire to the outlet.

17.5 A safety chain to keep the luminaire from falling when loosened shall be provided.

SECTION B10

B.10 CONNECTIONS TO EQUIPMENT

1. GENERAL

This section covers the final electrical connections to switchboards and various equipment in general electrical installations under normal environmental conditions for system voltages up to 600 V. Refer also to the specifications for "WIRING", Section B5 and "INSTALLATION OF CABLES", Section B6.

2. CONNECTIONS TO SWITCHBOARDS

2.1 CONDUIT ENTRIES

2.1.1 Where sufficient space for conduit entries as well as adequate space for future conduit entries is available, conduits may be terminated directly on the switchboard.

2.1.2 Alternatively, conduits connected to switchboards shall terminate in a common fabricated sheet steel draw-box installed in the vicinity of the switchboard. In open roof spaces this draw-box shall be placed in a roof space of not less than 900mm clearance.

2.1.3 Lighting and socket-outlet circuits may be separately grouped in common conduits or metal ducts (trunking) from the distribution board to the draw-box. The draw box shall be of sheet steel with a minimum thickness of 1.6mm and shall be fitted with a removable cover plate.

2.2 FLUSH MOUNTED SWITCHBOARDS

Where flush mounted switchboards are required, the recessed switchboard tray shall be built into the brick or concrete wall. All conduits from the floor or roof shall be fully recessed and shall be bonded directly to the tray by means of locknuts on both sides and the ends of the conduits fitted with a brass bush.

2.3 SURFACE MOUNTED SWITCHBOARDS

Where surface mounted switchboards are specified but where the conduits can be fully recessed, the conduit shall be connected to a recessed connection box installed behind the switchboard. An opening with the same dimensions as the connection box shall be cut in the back of the switchboard and fitted with a suitable grommet.

2.4 SPARE CONDUITS

Where conduits from a switchboard run into a false ceiling space above the board, a minimum of two 25mm and two 20mm spare conduits shall be installed into the ceiling space immediately above the board.

2.5 CABLE CONNECTIONS

2.5.1 Where underground cables are to be connected to switchboards, it shall be the responsibility of the Contractor to ensure that metal, earthenware, asbestos-cement or other approved sleeves are built in correctly to enable installation and connection of the cable to the switchboard.

2.5.2 PVC or pitch fibre sleeves are not acceptable - refer to par. 3.10 of the standard specification for "INSTALLATION OF CABLES", Section B6.

2.5.3 Sleeves shall tie installed with a fall from inside to outside of the building to facilitate drainage. The sleeves shall be sealed with a non-hardening compound after installation of the cables to render the installation vermin proof and waterproof.

2.5.4 A metal cable channel with removable metal cover plate shall be installed by the Contractor and shall extend from the switchboard to the floor or into the ceiling void as required. The channel shall coincide with the position of sleeves. The channel shall be flush mounted except in the case of surface mounted switchboards and then only with the permission of the Engineer.

2.5.5 The cable channel shall be large enough to permit the installation of cable glands and future cables, particularly where spare sleeves have been provided.

2.5.6 The colour of the channel cover shall match that of the associated switchboard.

2.6 CABLE TRENCHES

Where cables in floor trenches have to be connected to wall mounted switchboards, approved sleeves or conduits shall be installed from the side of the trench to the bottom of the switchboard. These sleeves shall be positioned and fixed before the concrete is cast.

3. CONNECTIONS TO MOTOR DRIVEN EQUIPMENT.

3.1 An isolator or starter containing an isolator shall be installed within 2m of motor driven equipment. The requirements of SANS 10142 shall be met. If this isolator cannot be installed on a wall, switchboard or other suitable place, an approved free-standing pedestal shall be provided. The pedestal shall be 1m high and outside normal walkways, access routes, etc.

3.2 The connection to the equipment shall be carried out as follows:

(a) Metal reinforced plastic or PVC-covered flexible metal conduits with individual conductors or a multi-core PVC insulated cable and separate bare earth conductor installed inside the conduit may be used. The flexible conduit shall not exceed 600mm. Screwed conduit shall be used from the end of the flexible conduit to the isolator and/or starter. Refer to the specification for "FLEXIBLE CONDUIT", Section B1, par. 5.

(b) Multi-core armoured PVC- or rubber-insulated cable and earth conductor. The installation and termination of the cables shall comply with the specification for "INSTALLATION OF CABLES, Section B6.

(c) Cables and flexible conduits shall be provided with sufficient slack to allow positional adjustment of the equipment.

3.3 Supply cables to equipment may not be installed across floors which are for general use.

4. CONNECTIONS TO WATER HEATERS

4.1 Each water heater shall be connected to a separate circuit with a separate earth conductor.

4.2 The conduit from the switchboard to the water heater shall terminate in a draw-box within 1 m of the water heater terminals. The connection from the draw-box shall be conductors in conduit or PVC-insulated cable. Only in instances where heaters are mounted out of normal reach may flexible conduit and round boxes with dome lids be used for the final connection.

4.3 Three-phase supplies to fixed storage water heaters shall be in accordance with the wiring diagram, Fig. B10.1.

4.4 The mounting of the water heater and the provision of the water connections will be undertaken by others. The Contractor shall ensure that the elements and thermostats can easily be replaced.

4.5 Before testing a water heater, the Contractor shall confirm with the Plumbing Contractor that the unit is filled with water.

4.6 Unless otherwise specified in the Detail Technical Specification, the wiring of hot water heater circuits not exceeding 4 kW shall consist of $4mm^2$ conductors and $2.5mm^2$ earth conductor.

4.7 Unless it is specified that isolators for water heaters shall be provided in the switchboard, a local isolator shall be provided for each water heater. In the case of water heaters not exceeding 4 kW, a 30 A double-pole metal-clad isolator shall be surface mounted over the flush conduit outlet box.

5. CONNECTIONS TO HEATERS, FANS AND AIRCONDITIONING UNITS

5.1 ISOLATORS

A flush mounted suitably rated double-pole isolator shall be provided within 1m of the unit. Where the equipment is mounted out of reach, the isolator shall be installed at 1.5m above floor level. Only where units are mounted in easily accessible positions and where an isolating switch is incorporated in the unit, may this isolator be omitted. Where flush isolators are used, flush conduit shall be installed to link with the equipment outlet point. Flexible cords of sufficient rating may be used for the final connection to the equipment.

5.2 WIRING

The minimum conductor size to be used shall be 4 mm^2. Each fan, heater or air-conditioning unit shall be on a separate circuit.

5.3 FLUSH MOUNTED CONVECTION HEATERS

The heater frame or tray shall be built or cast into the wall at a height such that the underside of the heater is at 250mm above floor level. Conduits shall terminate on the frame near the terminals.

5.4 SURFACE MOUNTED EQUIPMENT

5.4.1 Connections to surface mounted equipment shall consist of a draw-box located in the vicinity of the terminals of the unit. In workshops and industrial areas the connections shall be made by means of flexible conduit connected to dome lids on the draw-box. Conductors shall be connected directly to the unit.

5.4.2 In non-industrial applications PVC-insulated 3-core flexible cables may be used for the connection.

5.4.3 Where flexible cables are used, a bush shall be provided at the rear of the unit for cable entry and a bush and clamp (or gripper gland) at the draw-box. The clamp shall tightly grip the outer insulation of the cable to prevent tension on the connections between cable and conductors in the draw-box.

5.4.4 Where heaters or air-conditioning units are situated above power skirting, the isolator shall be installed in the power skirting and the flexible cable or cord to the unit shall be installed in the power skirting through a gripper or compression gland. The cable shall be made as short as practical and shall be neatly saddled to the surface of the wall.

5.5 RADIANT HEATERS

The installation of radiant heaters and asbestos heaters, where specified, shall comply with the requirements of paragraph 5.4, with the exception that they shall be mounted on spacers, 25mm away from the mounting surface.

5.6 FAN HEATERS

5.6.1 The contractor shall allow for the supply, installation and electrical connection of the fan heaters as indicated on the drawings. The fan heaters shall be rated at 3 kW and shall be complete with control units.

5.6.2 The heaters shall be secured by means of approved expansion bolts at 2.4m above floor level in positions as shown, with the control units at 1.5m above floor level, directly below the unit.

5.6.3 The fan heater shall be installed on a box directly behind the unit.

5.6.4 Each connection shall be protected by means of a single-pole circuit-breaker on the associated switchboard.

5.6.5 Brass bushes shall be provided to protect the wiring at the rear cable entries to the control unit and fan connection box.

6. CONNECTIONS TO UNDERFLOOR HEATING

6.1 Where underfloor heating cable is specified, the Contractor shall supply the cable and thermostats which shall be purchased from a specialist supplier. The cable shall be laid by the specialist supplier and connected by the Contractor. The Contractor shall also be responsible for testing of the cables prior to their being covered by the screed and immediately thereafter. Details of circuit wiring and control of underfloor heating will be specified in the Detail Technical Specification.

6.2 PVC-insulated heating cable with a rating of not higher than 13 W per linear metre shall be used. Thermal insulation will be provided by the Builder.

6.3 The capacity of the heating cable shall he sufficient to give a 20°C temperature rise with an outside ambient temperature of 5°C.

6.4 The total heating load shall, however, not he more than 135 W/m².

7. CONNECTIONS TO INCINERATORS

7.1 GENERAL

This section covers connections to incinerators used for domestic purposes in buildings. Unless specified to the contrary, the supply and installation of incinerators will form part of the electrical installation and shall comply with the relevant SANS codes.

7.2 FLUSH MOUNTED INCINERATORS

Where flush mounted incinerators have been specified, the Contractor shall supply the mounting tray to the Builder in good time for it to be built into the structure.

7.3 MOUNTING HEIGHT

Unless specified to the contrary, incinerators shall be installed with the bottom 1m above finished floor level.

7.4 ISOLATOR

A flush mounted 30 A double-pole isolator shall be installed approximately 1.5m above the finished floor level adjacent to each incinerator. The isolator cover plate shall wholly fall within either the tiled or plastered surface of the wall. Unless specified to the contrary, the cover plate shall be finished in white baked enamel. An engraved label shall be provided at each isolator marked as follows:

"SWITCH OFF TO CLEAN AND REMOVE ASH"
"SKAKEL AF VIR SKOONMAAK EN ASVERWYDERING"

7.5 FLUES

The Contractor shall supply flue pipes to the Builder for installation. Two bends and an "H" piece exhaust canopy shall be allowed for each flue pipe.

7.6 EXHAUST FANS

Where more than 5 incinerators are connected to the same flue or where more than two 90° bends are used in the flue, an exhaust fan shall be installed at the flue outlet. In addition a small fan must be provided at each incinerator.

7.7 WIRING

Single incinerators shall be connected by means of 2 x 4mm² PVC insulated conductors and a 2.5mm² bare copper earth conductor in a 20mm conduit. Each incinerator shall be connected to a separate circuit where a common exhaust fan is not used. Where a common exhaust fan is needed, the following applies:

(a) All fans and incinerators connected to the same flue shall be on the same circuit.

(b) The current rating of the circuit-breaker shall be sufficient to allow the simultaneous operation of all the fans and 50 % of the incinerators.

(c) A 30 A double-pole isolator shall be flush mounted adjacent to each incinerator as described in paragraph 7.4. <u>However if the current rating of the circuit-breaker protecting the circuit is larger than 15A, a 15A fuse and fuse holder shall be installed at each incinerator in addition to the isolator.</u> The draw-box and cover plate for the isolator shall be large enough to accommodate the isolator and fuse. Alternatively, a 15A circuit-breaker may be installed adjacent to each incinerator in lieu of the isolator and fuse.

(d) The circuitry shall be arranged to ensure that all the fans will operate when any one of the incinerators is switched on.

(e) Earth leakage protection shall be installed on all incinerator circuits.

8. CONNECTIONS TO COOKING APPLIANCES

8.1 Unless specified to the contrary, the circuit connection to each cooking appliance shall consist of:

(a) 2 x 10mm² PVC-insulated conductors and 6mm² bare copper earth conductor for single phase connections, or

(b) 4 x 4mm² PVC-insulated conductors and 2.5mm² bare copper earth conductor for three phase connections.

8.2 A 60A double pole or 30A triple pole micro-gap isolator flush mounted in a wall outlet box shall be installed 1.5m above floor level to the left or right of the appliance in accordance with SANS 10142. A white baked enamel cover plate shall be provided, situated wholly on the tiled or plastered surface as applicable.

8.3 The conduit shall terminate 450mm above floor level behind the appliance position. The conduit end shall be approximately 75mm long and shall face downwards. Connections from the conduit end to the appliance shall be installed in accordance with SANS 10142. Sufficient slack shall be provided in the flexible connection to move the appliance 600mm away from its normal position for cleaning or maintenance.

8.4 Alternatively a 45A, 3-pin socket-outlet may be mounted on a round draw-box 450mm above floor level. The connection to the appliance shall consist of a plug and 10mm², rubber-insulated and sheathed cable in accordance with SANS 1520. The cable shall be long enough to enable the appliance to be moved 600mm from its normal position for cleaning or maintenance.

8.5 Crimped or soldered lugs shall be provided on all conductors intended for connection to cooking appliances.

8.6 Each appliance shall be connected to a separate circuit. A separate earth wire shall be provided for each appliance.

SECTION B11

B.11 EARTHING

This section covers the earthing of electrical installations in buildings or other structures. The total earthing system of any electrical installation shall be in complete accordance with SANS 10142.

1. GENERAL RECOMMENDATIONS ON THE PRACTICAL INSTALLATION OF EARTH ELECTRODES

1.1 REQUIREMENTS OF AN EFFECTIVE EARTH

1.1.1 An effective earth must prevent dangerous over voltages arising between metallic structures, frames, supports or enclosures of electrical equipment and the ground during fault conditions.

1.1.2 An effective earth must be able to permit fault currents of sufficient magnitude to flow so as to operate protective devices to isolate the fault before damage can occur.

1.1.3 The ohmic resistance of an effective earth must be low enough to ensure that the step potential on the ground in the vicinity of the earthing point is within safe limits under fault conditions i.e. a voltage gradient not exceeding 40 V/m for fault durations exceeding 1s.

1.2 TYPES OF EARTH ELECTRODES

Three types of earth electrodes are suitable:

1.2.1 Trench Earths

Trench earths comprise a bare copper or galvanised iron conductor laid at a minimum of 800mm below ground level, usually when underground cables are installed. This type of earth electrode provides a relatively large contact area between electrode and surrounding ground, makes contact with a variety of types of soil and soils of varying moisture content en route, and is economical to install.

1.2.2 Spike Earths

Spike earths comprise rods of bare copper, copper-coated steel, stainless steel or galvanised steel designed for the purpose of penetrating ground to depths of up to several metres. A low resistance earth may sometimes be obtained by driving multiple spikes at some distance from each other in order to provide parallel paths.

In hard or rocky ground, it is usually necessary to drill holes into which earth spikes are inserted and then packed with soft soil.

1.2.3 Foundation Earths

Foundation earths comprise bare copper or galvanised iron conductors laid under the foundations of buildings, miniature substations, distribution pillars, bases of wooden, concrete or steel poles and structures. Because soil under foundations usually retains moisture, foundation earths are located to take advantage of this favourable condition. Furthermore, they are economical to install.

1.3 MATERIALS FOR EARTH ELECTRODES

1.3.1 Bare copper, either in stranded, strip or rod form, is considered the most suitable general purpose material for earth electrodes. Its main disadvantage is its cost and susceptibility to theft.

1.3.2 Bare galvanised iron and steel, either in stranded, strip or rod form, has a satisfactory record of survival in non-aggressive soils and is more economical than copper.

1.3.3 Bare aluminium is unsuitable as electrode material.

1.4 CORROSION

Because galvanised ferrous metals corrode sacrificially to copper, galvanised iron and steel electrodes should not be buried in close proximity to bare copper.

2. TECHNICAL REQUIREMENTS OF NEUTRAL EARTHING

The following relevant aspects have been extracted from the "AMEU CODE OF PRACTICE FOR THE APPLICATION OF NEUTRAL EARTHING ON LOW VOLTAGE DISTRIBUTION SYSTEMS."

2.1 DISTRIBUTION SYSTEMS

Multiple Earthed Neutral (MEN) and Protective Multiple Earthing (PME) systems.

Distribution equipment associated with transformer substations that are either ground mounted or pole mounted and fed by underground cable or overhead line, with or without an earth continuity conductor, (ECC), should be installed, connected and earthed in accordance with the following requirements:

(a) Where the resistance to earth of the HV equipment earth is 1 ohm or less, it is permissible to earth the LV neutral to the HV earth electrode.

(b) Where the HV equipment earth exceeds 1 ohm the LV neutral shall be earthed at a minimum distance of 6m from the HV equipment earth (i.e. 6m from the HV electrode/s and also from any earthed metalwork connected thereto).

(c) Notwithstanding the requirements of (a) above, where transformers are associated with HV overhead lines, it is considered good practice to separate the HV and LV earth electrodes. The minimum earth separation should be 6m or one LV span.

(d) The overall resistance to earth of the neutral of an LV distributor or distribution system must not exceed 10 ohms.

(e) The LV neutral may be connected to other supply neutrals, earth electrodes, cable sheaths and armouring and these connections used to obtain the required earthing value of 10 ohms or less specified in par. (d). above.

(f) The neutral of underground and overhead LV distributors must be earthed at the remote ends of each distributor.

(g) Where the overall resistance to earth of the neutral of the distribution system exceeds 10 OHMS, the neutral shall be earthed at intermediate positions on the distributor/s to reduce its resistance to earth to below this limit.

(h) The cross-sectional area of the neutral of all LV distributors must not be less than that of a phase conductor.

(i) No circuit-breakers, isolators, fuses, switches or removable links shall be installed in the neutral between the transformer star point and the remote end of any LV distributor or service connection.

(j) All metallic sheathing and armouring of cables and all metalwork associated with meter cabinets, fuse pillars, etc., supporting or enclosing LV cables shall be bonded to the distributor neutral conductor.

(k) Where a Separate Neutral Earth (SNE) cable is part of an MEN or PME system, the armouring and/or metallic sheath and any ECC shall be bonded to the neutral at the supply end of the cable.

(l) To ensure the integrity of the neutral, it is recommended that all connections and joints on or to overhead line conductors be made by compression fittings or, alternatively double bolted connectors.

(m) MEN or PME may be applied to any single LV distributor without alterations to other LV distributors supplied from the same transformer.

2.2 PROTECTIVE NEUTRAL BONDING (PNB) SYSTEM

Since the neutral is earthed at one point only, the question of multiple earthing does not arise and there is therefore no necessity to meet the MEN/PME technical requirements.

2.3 SERVICE CONNECTIONS

2.3.1 MEN System

The following conditions apply to consumers' service connections as well as service connections to traffic signals, road signs, street lighting and other power-consuming equipment installed in public places:

(a) All service connections must be by means of cable with an insulated phase, an insulated neutral conductor and an ECC.

(b) A single phase service connection comprises a live, a neutral and an ECC.

(c) A polyphase service connection comprises two or three phase conductors, a neutral and an ECC.

(d) The service neutral and ECC must be solidly and separately connected to the distributor neutral at the tee-off point.

(e) The consumer's earthing lead is connected to the Supply Authority's earth terminal which is in turn connected to the ECC in the service cable at the consumer's supply point.

(f) The neutral must not be connected to earth at the consumer's supply point.

(g) If required by the Supply Authority and earth electrode must be installed at the consumer's supply point.

(h) In a service connection to traffic signals, street light and other power-consuming equipment installed in public places, such equipment is earthed to the ECC of the service connection.

2.3.2 PME System

(a) All service connections must be by means of a cable with an insulated phase and an insulated neutral conductor.

(b) A single phase service comprises a live conductor and a neutral.

(c) A polyphase service connection comprises two or three phase conductors and a neutral.

(d) The consumer’s earthing lead is connected to the supplier's neutral and to a mandatory earth electrode at the consumer's supply point.

(e) A label must be attached at the consumers supply point on his premises indicating that the installation is part of a PME system.

Note: It is not recommended that the PME system be applied to supply traffic signals, street signs or other power-consuming equipment installed in public places, because the PME system is inherently unsafe under "broken-neutral" conditions.

3. SUBSTATION EARTHING

In order to comply with the requirements of par. 1 and 2 above, an earth resistivity measurement shall be undertaken at the site of a new substation or miniature substation, preferably be a specialist firm. The contractor shall then submit to the Engineer details of a proposed substation earth indicating whether a trench earth, spike earth or foundation earth is intended and the proposed interconnections with the installation.

4. FENCES OF OUTDOOR SUBSTATIONS

In cases where substations contain transformers or switchgear installed outdoors, the compulsory fence shall be earthed as follows, if no other method is specified:

(a) A 70mm² earth wire shall be installed 400mm below ground level and 500mm from the fence on the outside of the sub-station along the entire length of the fence. This earth wire shall be earthed at each corner by means of a 1.8m earth rod and the rod and earth wire bonded to the fence. The earth wire shall also be bonded, at least at two points, to the main earthing system.

(b) A 70mm² earth wire shall also be buried at a depth of 400mm around each transformer and switch and bonded to the main earthing system.

5. EARTHING OF A GENERAL ELECTRICAL INSTALLATION

5.1 GENERAL

All earth conductors shall be stranded copper with or without green PVC insulation. All earth conductor sizes shall be determined in accordance with SANS 10142, par. 4.6 where the earth does not form an integral part of the cable.

5.2 SWITCHBOARDS

A separate earth connection shall be supplied between the earth busbar of the main switchboard and the earth busbar of every sub-switchboard. These connections shall consist of bare or insulated stranded copper conductors installed along the same routes as the supply cables or in the same conduit as the supply conductors. Alternatively armoured cables with earth continuity conductors included in the armouring may be utilised.

5.3 SUB-CIRCUITS

The earth conductors of all sub-circuits shall be connected to the earth busbar in the supply switchboard in accordance with SANS 10142.

5.4 RING MAINS

Common earth conductors may be used where various circuits are installed in the same wiring channel in accordance with SANS 10142. In such instances the sizes of earth conductors shall be specifically approved by the Engineer. Earth conductors for individual circuits branching from the ring main shall be connected to the common earth conductor with T-ferrules or soldered. <u>The common earth shall not be broken.</u>

5.5 CONNECTIONS

Under no circumstances shall connection points, bolts, screws, etc. used for earthing be utilised for any other purpose. It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on equipment and materials that must be earthed where these are not provided. Unless earth conductors are connected to proper terminals, the ends shall be tinned and lugged. Lugs may be crimped, using mechanical or pneumatic tools designed for this purpose, on condition that evidence is submitted that the method used complies with the performance requirements of BS 4579, Part 1: "COMPRESSION JOINTS IN COPPER."

5.6 NON-METALLIC CONDUIT

Where non-metallic conduit is specified or allowed, stranded copper earth conductors shall be installed in the conduits and fixed securely to all metal appliances and equipment, including switch boxes, socket-outlet boxes, draw-boxes, switchboards, luminaries, etc. The securing of earth conductors by means of self-threading screws will not be permitted.

5.7 FLEXIBLE CONDUIT

An earth conductor shall be installed in all non-metallic flexible conduit. This earth conductor shall not be installed external to the flexible conduit but within the conduit with the other conductors. The earth conductor shall be connected to the earth terminals at both ends of the circuit.

5.8 WATER PIPES

Metal cold water mains shall be bonded to the earth busbar in the Main Switchboard by solid 15 x 2mm copper strapping. All other hot and cold water pipes shall be connected by 12 x 0.8mm perforated or solid copper strapping (not conductors) to the nearest switchboard. The strapping shall be fixed to the pipe work by brass nuts and bolts and against walls be brass screws at 150mm centres. In <u>all cases</u> where metal water pipes, down pipes, flues, etc. are positioned within 1.6 m of switchboards, an earth connection consisting of copper strapping shall be installed between the pipe work and the board. In vertical building ducts accommodating both metal water pipes and electrical cables, all the pipes shall be earthed at each switchboard.

5.9 ROOFS

Where service connections consist of overhead conductors, all metal parts of roofs, gutters and down pipes shall be earthed. One bare 10mm² copper conductor shall be installed over the full length of the ceiling void, fixed to the top purlin and connected to the main earth conductor of each switchboard. The roof and gutters shall be connected at 15m intervals to this conductor by means of 12 x 0.8mm copper strapping (not conductors) and galvanised bolts and nuts. Self-tapping screws are not acceptable. Where service connections consist of underground supplies, the above requirements are not applicable.

SECTION B12

B.12 PROVISION FOR TELEPHONE INSTALLATION

1. CONTRACTOR'S RESPONSIBILITY

The Contractor shall only supply and install outlet points, wiring channels and/or conduits for telephones. The telephone installation will be carried out by others.

2. REGULATIONS

All provisions for telecommunications and IT equipment shall comply with the latest relevant SANS standards.

3. SEPARATION OF SERVICES

3.1 Cables or conductors for Telephone, IT and Audio-Visual services shall be separated from all other services by:

(a) providing separate metal channels or conduits, or

(b) installing power cables, conductors and accessories at a minimum distance of 300mm from routes reserved for communications and IT cables, or

(c) an earthed metal barrier installed in such a manner to ensure that the minimum distance through free air space between the telephone cables and other services is at least 300mm.

3.2 In cases where power cable runs are parallel to telephone cable runs for more than 50m, the correct spacing shall be determined by conferring with the Engineer

3.3 Conduits or wiring channels provided for telephone services may not be used for any other purpose. Where non-metallic channels are used, the separation stated in par. 3.1 (b) shall he maintained throughout the installation.

4. MAIN TELEPHONE DISTRIBUTION BOARD

4.1 The size and position of the Main Telephone Distribution Board, where required, shall be in accordance with the requirements of the Detail Technical Specification.

4.2 The board shall consist of a metal tray, architrave frame and hinged doors and shall be flush mounted in the position shown on the drawing(s).

4.3 A 20mm thick soft wooden panel (fine grade pine to SANS 1359, without knots) shall be installed in the main telephone distribution board and shall cover the entire back of the board. Chipboard or similar materials are not acceptable.

4.4 All conduits and sleeves to telephone outlets or sub-distribution boards in the buildings or on the site as well as the main incoming sleeves shall terminate at the main telephone distribution board as indicated on the drawing(s).

4.5 Where 100 x 100 x 50mm draw-boxes are specified as main or sub-distribution boards, the boxes shall be flush mounted and provided with a cover plate. A wooden panel need not be provided in these cases.

5. VERTICAL BUILDING (SERVICE) DUCTS

5.1 If the telephone cables are to be installed in the same duct as power cables the separation of services described in par. 3 shall be maintained.

5.2 Conduits and metal channels to and from building duct(s) shall be installed from the section containing the telephone cables to obviate telephone cables crossing power cables or other services in the duct.

5.3 Where more than one vertical building duct is provided in the structure, the ducts shall be interconnected by at least 2 x 32mm dia. conduits at each floor level unless otherwise specified or indicated on the drawings.

6. TELEPHONE OUTLETS

6.1 Blank cover plates shall be fitted to all telephone outlets.

6.2 Telephone outlets in walls shall consist of flush mounted 100 x 100 x 50mm draw-boxes.

6.3 Telephone outlets in floors shall be of the same type as floor outlets for power socket-outlets. These provisions also apply to underfloor ducting. If the type of floor outlet is not specified, 100 x 100 x 50mm flush mounted draw-boxes shall be provided in the floor at the positions indicated on the drawings. The cover plates for these draw-boxes shall be of the die cast type.

6.4 Where twin underfloor ducts are provided and where the one duct is intended for telephone cables, the separation between the ducts shall be maintained throughout the underfloor ducting installation.

6.5 Where power skirting is specified for telephone installations, the Contractor need only install the skirting with covers since the telephone socket will be fixed directly to the cover. Where multiple power skirting is provided containing other services, no other cables may be installed in the section intended for telephone cables and the separation between the sections shall be maintained throughout the installation.

6.6 Refer also to the specification for the "INSTALLATION OF WIRING CHANNELS, UNDERFLOOR DUCTING AND POWER SKIRTING", Section B2.

7. CONNECTION OF TELEPHONE OUTLETS

7.1 Telephone outlets shall be inter-connected and connected to the telephone distribution boards as shown on the drawings.

7.2 If the inter-connecting conduits are not specified, conduit sizes shall be determined as follows:

Inter-connection of 10 outlets maximum - 25mm dia. conduit.

Inter-connection of 20 outlets maximum - 32mm dia. conduit.

7.3 Metal channels or power skirting installed on the same floor level on opposite walls of the same area as well as parallel runs of underfloor ducting intended for the installation of telephone cables, shall be interconnected at intervals of 6m. Conduit may be used for these inter-connections.

7.4 All conduits and all ducts or channels which do not have removable covers, shall be provided with galvanised steel draw-wires.

7.5 Conduit connections to power skirting or surface mounted metal channels shall consist of a 100 x 100 x 50mm draw-box which is flush mounted immediately behind the duct or channel in which the telephone cables are to be installed. A hole shall be cut in the back of the duct or channel, immediately opposite the draw-box. The edges of the hole shall be grommeted. The draw-box shall be accessible from the front when the cover is removed.

7.6 Purpose-made accessories for the connection of conduits to underfloor ducts shall be used. Where these are not available, a 100 x 100 x 50mm draw-box shall be installed below the underfloor duct opposite a floor telephone outlet. Inter-connecting conduits shall terminate at the draw-box. The edges of the hole shall be grommeted. The draw-box shall be accessible from the top via the floor outlet.

7.7 Exposed conduit ends intended for future extensions shall be terminated by means of a coupling and screwed brass plug. Only galvanised conduit shall be used in these instances.

SECTION B13

B.13 SUBSTATIONS SWITCH ROOMS AND GENERATOR ROOMS

This section covers the general building arrangement and special requirements for high and low voltage switch rooms, transformer rooms and generator rooms.

1. STANDARD BUILDINGS

This section has been intentionally omitted.

2. OTHER BUILDINGS

If the standard buildings cannot accommodate the equipment required, suitable substation rooms complying with the following constructional details shall be provided:

2.1 The rooms shall have a ceiling height of at least 2.8 m above finished floor level.

2.2 A concrete roof slab shall be provided or alternatively a roof consisting of corrugated iron, or clay or cement tiles with an asbestos ceiling.

2.3 The rooms shall be waterproof, vermin proof and fireproof.

2.4 Door openings shall be 1.85 m wide by 2.5 m high with steel louvered ventilation openings over at least 60 % of the door area. Doors shall open outwards and it shall be possible to readily open them from the inside. Provision shall be made for a night latch and a padlock.

2.5 The floor and transformer base shall be on the same level. Each transformer base shall be able to support a mass of 5 tons on castors.

2.6 Vermin proof steel louvered ventilation openings shall be provided with an area of at least 20 % of the total floor area for transformer and generator rooms and 10 % for switch rooms if not specified to the contrary. 50 % of the ventilation openings shall be installed in the lower part of the walls, not more than 300 mm above floor level and the other 50 % of the ventilation openings shall be installed in the upper part of the walls, not more than 300 mm below ceiling level <u>to achieve good cross and convection ventilation.</u> Louvers contained in the doors can normally be considered to provide the 50 % required in one of the walls.

2.7 Where possible, windows with an area equal to 5 % of the floor area shall be included to provide natural lighting. It shall not be possible to open these windows. The windows shall be in the upper portion of the walls, as high as possible.

2.8 Corners of transformer bases and cable ducts shall be cut off at an angle of 45° with the splay at least 100mm wide.

2.9 Cable entrance openings shall be at least 600mm wide x 500mm deep and level with the bottom of the cable trenches. Alternatively a separate sleeve for each cable and at least one spare sleeve shall be provided.

2.10 Cable trenches shall be 600mm wide and 800mm deep unless specified to the contrary.

2.11 The floors of cable trenches shall have a fall of 1:100 to make provision for the natural draining of water.

2.12 At least one light with a switch adjacent to the entrance and one standard 16A 3-pin earth leakage protected socket outlet shall be provided in each room. The illumination level in the substations shall not be less than 200 lux. If a battery supply is available one incandescent light per substation room shall be connected to this supply and the switch in the circuit marked "EMERGENCY LIGHT"/"NOODLIG".

2.13 The floors shall be floated to a smooth finish with a steel trowel.

2.14 Any one of the following interior wall finishes is acceptable:

(a) Plastered and painted white.

(b) Unpainted face brick (preferably light colour brick).

(c) Off-shutter concrete painted white.

3. NOTICES

The following notices in both official languages shall be exhibited at all entrances to and suitable places within premises in which are situated generating plant and transforming, switching or linking apparatus:

A notice showing the “Lightning” sign with the wording: Danger-Ingozi-Gevaar.

3.1 A notice prohibiting unauthorised persons from entering such premises.

3.2 A notice prohibiting any unauthorised persons from handling or interfering with electrical apparatus.

3.3 A notice detailing procedure in case of fire.

3.4 A notice containing directions for resuscitation of persons suffering from the effects of electric shock.

4. HIGH VOLTAGE SWITCH ROOMS (ABOVE 1 KV)

4.1 The equipment shall be installed and secured to the floor in accordance with the manufacturer's specification.

4.2 Sufficient space shall be provided between the switchboard and the walls of the switch room to allow for the installation, maintenance and operation of the switchboard.

4.3 In the case of switchboards with uninsulated conductors accessible from the back, a clear space of at least 1.2 m shall be provided between the back and sides of the board and the wall.

4.4 In the case of switchboards which are of a totally enclosed construction the minimum clear space between the back and sides of the board and the wall shall be at least 900mm.

4.5 A space of at least 1.2 m shall be provided in front of a switchboard for operating and maintenance personnel. If the circuit breakers are of the withdrawable carriage type this space shall be at least 900 mm when the breaker carriages are in the fully withdrawn position.

4.6 The access door into the room shall be in front of the switchboard.

4.7 The tools and earthing and operating devices for the switchgear shall be contained in a purpose-made sheet metal cupboard secured to the wall of the substation.

4.8 A reticulation diagram displaying sufficient detail to be able to assess problems and trace faults (both on the HV and LV sides of the system) shall be mounted against a wall in the HV switch room behind clear plastic.

5. LOW VOLTAGE SWITCH ROOMS (BELOW 1 KV)

5.1 The equipment shall be installed and secured firmly to the floor or wall of the switch room.

5.2 Sufficient space shall be provided between the switchboard and the walls of the switch room to allow for the installation, maintenance and operation of the switchgear. In general this space shall be 900mm at the back and sides of the board and 1.2 m in front of the switchboard.

5.3 In the case of switchboards with uninsulated conductors which are exposed and accessible from the back a clear space of at least 1.2 m shall be provided at the back.

5.4 A LV reticulation diagram displaying sufficient detail of at least the main LV reticulation in order to be able to assess problems shall be mounted against a wall in the LV switch room behind clear plastic.

6. TRANSFORMER ROOMS OTHER THAN IN STANDARD BUILDINGS

6.1 Transformer rooms shall be large enough to accommodate the transformer with a 900mm clear space between the walls and the transformer. The minimum dimensions of a transformer room shall in any case be not less than 3.5m wide and 4.0m long.

6.2 The dimensions of the room shall be determined by using the transformer dimensions of TABLE 2 of SANS 780.

6.3 Where natural cross ventilation of the transformer room is not possible, adequate forced ventilation shall be provided to dispose of the transformer's losses and to prevent the air temperature in the transformer room from exceeding 40 C.

6.4 The cable entrances to the transformer room shall be sealed off after the cables have been installed.

7. GENERATOR ROOMS OTHER THAN IN STANDARD BUILDINGS

7.1 The ventilation of generator rooms shall be sufficient to dispose of the heat radiated from the engine while delivering full power.

7.2 The heat from the radiator shall be released outside the building via a ventilation duct or an external heat exchanger.

7.3 The exhaust emission shall be released outside the building and shall comply with the local environmental control regulations.

7.4 The fuel storage tank shall be installed in compliance with SANS 10131 and the position shall be approved by the local Fire Department. When the storage tank must be located outdoors, it should be underground to insulate the fuel from severe temperature variations which may impede fuel flow.

7.5 An electrical schematic diagram indicating mains supply and change-over arrangement as well as all standby plant electrical control circuitry, shall be mounted on a wall behind clear plastic.

7.6 An emergency light with automatically rechargeable Nickel-Cadmium batteries shall be installed above the generator set to facilitate manual starting or fault tracing in the event that the set does not start during a power failure.

8. CABLES

8.1 Cables shall be installed in cable trenches which shall be provided for this purpose. The installation shall comply with the specification for "INSTALLATION OF CABLES", par. 5 of Section B6.

8.2 Under normal circumstances cables shall not be installed directly on the floor.

9. COVERING AND SEALING OF CABLE TRENCHES

9.1 All the cable trenches shall be covered with steel chequer plate or a compound wood, bound with a water resistant binder, or an approved fibreglass grating. The following types of compound wood coverings are acceptable:

(a) Five ply marine ply, 12 mm thick.

(b) Exterior grade particle board, 22mm thick.

(c) Tempered hardboard, 12.7mm thick.

9.2 The trench coverings shall be ridged and shall not sag more than 5 mm with two normal persons standing on one section.

9.3 The trench covering shall be in sections not exceeding 1.25 m.

9.4 The trench coverings shall be provided with holes or recessed handles to make it possible to remove and replace the covers easily.

9.5 The trench coverings shall be neatly cut where necessary to accommodate cables.

9.6 The covers shall overlap the trench on both sides and shall be recessed to fit flush with the surface of the floor.

9.7 The cable entrances in the trenches of the switch rooms, transformer rooms and generator rooms shall be closed and sealed after the cables have been installed to prevent the backfill material and water from entering the trenches in the building.

9.8 The cable entrances shall be closed with bricks, without mortar, in such a way as to prevent the weight of the bricks from resting on the cables. These bricks shall be plastered on the inside with a 10:1 ratio of sand and cement.

9.9 If the cables enter the trenches via sleeves, these sleeves shall be plugged on both sides with weak mortar, an asbestos and cement mixture or a non-hardening compound.

SECTION B14

B.14 OVERHEAD ELECTRICAL TRANSMISSION LINES

1 GENERAL

1.1 This section covers the supply, delivery, erection and commissioning of overhead transmission lines up to 22 kV on wooden poles.

1.2 An overhead line shall comprise the wooden poles, cross-arms, stays, conductors, insulators, isolators, fuse-links, transformers, lightning arrestors and any other auxiliary equipment specified.

1.3 All materials and fittings used shall be new and of high quality.

1.4 Overhead lines shall be erected in accordance with the "CODE OF PRACTICE FOR OVERHEAD POWER LINES FOR CONDITIONS PREVAILING IN SOUTH AFRICA", issued by the S.A. Institute of Electrical Engineers.

2. STATUTORY REQUIREMENTS

2.1 Occupational Health and Safety act. (1993) Act 85 of 1993 and subsequent amendments and regulations issued thereunder.

2.2 The Post Office Act, No. 44 of 1958 and the Postmaster General's Requirements issued in terms of that Act.

2.3 The Mines and Works Act, No. 27 of 1956 and subsequent amendments and regulations issued thereunder.

2.4 The Electricity Act, (1994) Act 41 of 1984.

2.5 The Fencing Act, No. 31 of 1963.

2.6 The Forest Act, Article 34 of Act No. 72 of 1968.

2.7 The Advertising on Roads and Ribbon Development Act, No. 21 of 1940 and No. 16 of 1962.

2.8 The Air Navigation Regulations promulgated in terms of the Aviation Act, No. 74 of 1962.

2.9 Explosives Act, No. 26 of 1956.

2.10 The South African Transport Services Safety Regulations.

3. RELEVANT SANS SPECIFICATIONS

3.1 SANS 182 : Conductors for overhead electrical transmission lines.

PART3 : Aluminium Conductors, Steel Reinforced.

3.2 SANS 60383 : Ceramic and glass insulators for overhead lines of nominal voltage greater than 1000V.

3.3 SANS 61284 : Non-current-carrying line fittings for overhead power lines.

3.4 SANS 753 : Wooden power transmission poles and cross-arms.

3.5 SANS 470 : Concrete poles for telegraph, telephone, power and lighting purposes (reinforced and prestressed types).

3.6 SANS 61643 : Low voltage lightning arresters.

4. STANDARD SPECIFICATIONS

4.1 Not Applicable.

4.2 Not Applicable

4.3 INSTALLATION OF CABLES, par.3.13, Section B6.

4.4 EARTHING, Section B11.

5. NOTICES AND PRECAUTIONS

5.1 The Contractor shall issue all notices and make the necessary arrangements with Supply Authorities, the Postmaster-General (TELKOM), Transnet, S.A. Transport Services, Provincial or National Road Authorities and other authorities as may be required with respect to the installation of overhead lines.

5.2 The Contractor shall take all the necessary precautions and provide the necessary warning signs and/or lights to ensure that the public and/or employees are not endangered.

5.3 The Contractor shall acquaint himself with the position of all existing services and infrastructure prior to commencing the installation.

5.4 The Contractor will be held responsible for damage to any existing services brought to his attention by the relevant authorities and will be responsible for the cost of repairs.

6. PEGGING THE ROUTE

6.1 The Contractor shall peg out the route for the overhead line but shall maintain close liaison with the Engineer.

6.2 Should the proposed position of poles appear unsatisfactory due to obstructions, poor soil conditions, rock, etc., the Engineer shall be consulted and a ruling obtained.

6.3 The Engineer reserves the right to alter the line route at any time prior to the installation of the overhead wires. Payment in respect of any additional or wasted work involved shall be at the documented rates.

6.4 The removal of obstructions along the route shall be subject to the approval of the Engineer.

7. LINE IMPULSE LEVEL

The line Basic Impulse Level (B.I.L.) shall be maintained at the full voltage, namely:

Line Voltage (kV)	Impulse Voltage withstand level (kV)
Up to 6.6	75
11	95
22	150

8. LINE CONFIGURATION

8.1 Lines shall generally be configured as indicated in the drawings included in this specification, Fig. B14.1 - B14.7.

8.2 Alternate arrangements shall be submitted to the Engineer for approval.

9. POLES

9.1 The line configuration and support structure shall be suitable for the proposed route. Refer also to the Occupational Health and Safety Act.

9.2 Wooden poles shall normally be used and shall comply with SANS 753, Group strength "A" and shall bear the SANS mark of approval.

9.3 Preservatives of the poles shall comply with the requirements for Type Al of SANS 1290 and the impregnation shall be carried out in accordance with SANS 10005 using the empty-cell pressure process.

9.4 Poles shall be LOOP TENSION banded at both ends.

9.5 Concrete poles where specified shall comply with SANS 470 and the Detail Technical Specification.

9.6 If the spacing of poles is not more than 80m specified in the Detail Technical Specification, poles for 11 kV and 22 kV lines shall be spaced not more than 80m apart and poles for LV lines shall be spaced not more than 45m apart. The spacing of LV lines in suburban areas shall be arranged to suite the requirements of city blocks and street lighting.

9.7 All the poles shall be installed with the marking tags facing the roadside where applicable or shall face in the same direction where a road does not exist alongside the overhead line.

9.8 The pole minimum dimensions listed in the table below shall be used. Poles not complying with these dimensions shall be removed from site.

Length (m)	Minimum top dia (mm)
9.0	160
10.2	160
12.0	180
13.0	180
16.0	200

9.9 Templates shall be used for drilling holes required to fix cross-arms, brackets, insulators, etc. to the poles. After drilling, the holes shall be coated with a mixture of creosote and tar.

9.10 The poles shall be planted at the following minimum depths:

Length	Planting depth (m)
9.0	1.7
10.0	1.8
12.0	2.0
13.0	2.2
16.0	2.6

9.11 Kicking blocks shall be provided where ground with poor bearing qualities is encountered.

9.12 Poles shall be planted vertically plumb and in line and sufficiently stayed to maintain that position.

10. CROSS-ARMS

10.1 Cross-arms shall be of wood. Steel cross-arms shall only be used when clearly specified in the Detail Technical Specification. Wooden cross-arms are preferred due to their higher electrical resistance and better lightning performance of the line.

10.2 Steel cross-arms where specified shall be manufactured from standard steel sections complying with BS 4360.

10.3 Wooden cross-arms shall comply with SANS 753, Group Strength "A" and shall be straight in grain. Preservatives shall comply with par. 9.2. above. The minimum diameter of cross-arms shall be as follows:

Length (m)	Diameter (mm)	
	min.	Max.
2.4	140	160
3.0	140	160
3.6	160	185
4.5	160	185

10.4 Cross-arms shall be LOOP TENSION banded at both ends.

10.5 Tie straps shall be manufactured of mild steel to Grade 43 of BS 4360.

10.6 Cross-arms shall be long enough to accommodate the insulator spacing specified below.

10.7 Cross-arms and tie straps shall be bolted to poles using galvanised bolts, nuts and washers. Curved wood pole washers shall be fitted between bolt heads and the poles and between cross-arms and the poles. Back straps and U-bolts may be used to attach wooden cross-arms to the poles.

10.8 Curved wood pole washers shall be galvanised malleable cast iron or mild steel with a minimum thickness of 6 mm and shall have a minimum square outside dimension of 63 mm.

11. INSULATORS AND FITTINGS

11.1 Insulators shall be chosen to provide the mechanical strength and insulation level required by the line at every point in accordance with relevant SANS codes.

11.2 Insulators shall be spaced to provide the conductor clearance required.

11.3 Pin insulators and their pins complying with SANS 60383 shall be used in straight line intermediate positions only.

11.4 Disc insulators shall be used in all strain, tension or angle positions, Clevis-and-tongue or ball-and-socket type insulators complying with SANS 60383 shall be used. Disc insulators may be of glass or porcelain.

11.5 Curved wood pole washers shall be fitted between the collars of insulator pins and the cross-arm or pole and between the pin nut and the cross-arm or the pole. The washers shall comply with par. 10.8 above.

11.6 Insulator hooks shall be of an approved pattern and shall be manufactured from BS 4360 grade 43 mild steel or forged.

11.7 Terminating and yoke straps shall be manufactured from BS 4360 grade 43 steel or forged to a design approved by the Engineer.

11.8 All steel or ironwork i.e., fittings, cross-arms, bolts, nuts, washers, etc., shall be hot dip galvanised to SANS 32 & 121.

12. CONDUCTORS

12.1 Steel reinforced aluminium conductors to SANS 182, Part 3 shall be used for overhead lines. Should copper conductors be specified, they shall comply with SANS 182, Part 1. The cross-sectional area shall comply with the Detail Technical Specification.

12.2 The spacing between phase conductors shall be increased by 20 % over the spacing determined according to the formula in par. 4.7.5 of the "Code of Practice for Overhead Power times" to compensate for stay movement and other factors and to maintain the B.I.L. of par. 7 above.

The minimum conductor spacing are:

Pole Spacing (m)	SUPPLY VOLTAGE		
	Up to 6.6 kV	11 kV	22 kV
	CONDUCTOR SPACING (mm)		
60	575	635	790
70	635	700	850
80	700	750	910
90	750	810	975

12.3 Manufacturer's stringing and tensioning charts shall be used to erect conductors. Conductors shall not be tensioned to more than 25 % of the breaking strength of the conductor at -5.5 °C with no wind.

12.4 Conductor running blocks shall be installed on all pole positions to run out the conductors. Conductors shall not be dragged along the ground. The three conductors shall be tensioned simultaneously using suitably rated chain-ratchet pullers and "come along" specially designed for the particular conductor.

12.5 The minimum conductor to ground clearances as stipulated in Occupational Health and Safety Act shall be closely observed. Allowance shall be made for conductor creepage and subsequent increased sag after a period.

12.6 Conductors shall be prestressed for not less than one hour before binding in.

12.7 Mid span joints shall be kept to a minimum and where unavoidable, shall be made with approved full tension line splices.

12.8 Conductor joints at non-tension points shall be made with two bolt parallel groove clamps of a type approved by the Engineer. The current carrying capacity of the clamps shall be at least equal to that of the conductor.

Non-oxidising conducting paste shall be liberally applied to the inside of these clamps.

12.9 Where aluminium to copper connections are made, suitable bimetal clamps shall be used.

13. CONDUCTOR TERMINATIONS

13.1 Cold compression, bolted snail clamps or preformed terminations shall be used. Suitable thimble clamps shall be used with the preformed terminations.

13.2 The conductor shall be bound in at pin insulators by a single stirrup and binding. A chafer tape of soft aluminium shall be wrapped around the conductor at the insulator contact area. The conductor shall be bound to the stirrup for a distance of 50mm on either side of the insulator. 5mm diameter hard drawn aluminium wire shall be used for binding.

13.3 Suitably sized preformed wrap lock ties with pads may be used as an alternative method to par. 13.2 above.

13.4 Trails and bridge wires must be neatly disposed and connected with clamps or line taps with a minimum of two per connection or by means of other approved mechanical connectors.

14. STAYS

14.1 The position of stays may or may not be indicated in the instructions for the service, but it is the responsibility of the Contractor to provide staying adequate to maintain correct tension of the line and the verticality of every pole in the line, with or without the additional use of kicking blocks as he may decide.

14.2 Wind stays must also be provided for straight lines in exposed positions. Struts shall not be used if this can be avoided by the use of aerial stays and pillar stays.

14.3 Stay wires shall be spliced and bound in, in the accepted manner. Approved preformed materials may also be used.

14.4 The angle between the stay and the pole must be between 35° and 45°. The stay must be made off on the pole, as near as practicable to the point of resultant stress, with one and a half complete turns around the pole, supported by a suitable clamp.

14.5 For terminal poles of vertical line arrangements, at least two stays shall be used to prevent deformation of the pole, with the stay plates buried at least 1.8 m apart.

14.6 Stay holes shall be vertical, not less than 1.5 m deep and no wider than necessary to accommodate the baseplate, with a narrow side channel cut to embed the rod at the correct angle.

The baseplate and portion of rod within the stay pole shall be firmly packed with hard material or concrete where necessary.

14.7 Stay pillars shall be concreted into the ground with top and bottom kicking blocks where required by the nature of the soil.

14.8 Porcelain stay insulators shall be installed in one stay wire as high as possible above ground level but far enough away from the structure to ensure that the portion of the stay below the insulator does not become alive.

14.9 Stay wire shall be of galvanised steel and the individual steel strands shall have a breaking stress of not less than 695 MPA and shall comply with BS 183 or SANS 182, Part 5. Stay wire make-offs shall be painted with bitumastic paint on completion.

14.10 Stay rods shall comply with BS Pattern 2 and shall be of circular section with tubular type turn buckles. Heavy duty construction, deep contoured type thimbles shall be used.

14.11 Galvanised steel stay plates shall be used.

14.12 Stay guards are required in the vicinity of public paths and roadways.

15. EARTHING OF STRUCTURES

15.1 Earthing requirements for service connections are specified in the specification for "EARTHING", Section B11.

15.2 Protective overhead earth wires shall only be provided where specified in the Detail Technical Specification. In cases where overhead earth wires are specified, a low impedance earth as determined by the Basic Impulse Level of the line shall be provided at every pole along the line.

15.3 An earth connection is not required at every pole along a line with wooden poles and without overhead earth wires. Lines with metal poles shall be earthed at every pole.

15.4 Steelwork on wooden poles shall generally not be earthed except at structures for transformers, isolators, fuse-links, cable boxes, lightning arresters or other equipment which impairs the impulse flashover value of the insulation provided by the wooden structure.

15.5 All metalwork to be earthed shall be bonded together with 1 mm² bare copper conductors. These common bonds shall be connected to a 35mm² bare stranded or solid copper earth down lead conductor.

15.6 The connection between the overhead conductors and lightning arrestors and between the arrestors and the earth down lead shall consist of bare copper conductors of not less than 25mm². The connecting leads shall have smooth bends and shall follow the shortest possible route.

15.7 The earth down lead conductor shall be stapled to the pole at intervals not exceeding 1m. Where atmospheric conditions are likely to cause galvanic action, staples shall be of non-ferrous metal and an earth clip used where possible.

15.8 The earth conductor shall be threaded through a black polyethylene sleeve for at least 2m above the ground.

15.9 The earth conductor shall not be installed in steel conduit nor shall the conductor be wrapped around the pole at any point since this will increase the reactance of the down lead.

15.10 A trench earth shall be installed at earthed structures carrying equipment such as transformers, fuse-links, lightning arresters, etc. extending 10 m on four sides of the structure in the form of a cross. The ends of the earth wires shall be bonded to four earth electrodes of at least 1.8m in length driven into the ground.

15.11 Intermediate earthing for overhead earth wires may consist of wrapping the earth wire 5 - 6 times around the pole below ground level.

15.12 The earth resistance shall be determined following the installation of the trench earth. Earth resistance values specified or required by protective devices shall be checked. The earth resistance values required to maintain the B.I.L. of the line as specified in par. 7 (assuming an average lightning current value of 25 kA), are as follows:

	Impulse Level (kV)	Earth Resistance (ohm)
Up to 6.6	75	3.0
11	95	3.8
22	150	6.0

15.13 Should the earth resistance be higher than specified or required, additional earthing shall be provided. Trench earths shall not exceed 50m. Proprietary clays may be used for soil treatment to improve the earth resistance.

16. EARTH WIRE ON LV SYSTEMS

16.1 Where specified, a continuous earth wire shall be installed along LV (up to 660 V) overhead lines in order to provide earth continuity between installations served by the line (ECC).

16.2 The earth wire shall be connected to every earth along the route in addition to the substation earth. Refer also to par. 4 of the specification for "EARTHING", Section B11.

16.3 All metalwork and the top positions of stay wires shall be bonded to the earth wire.

16.4 The earth wire shall be above the conductors.

17. LIGHTNING ARRESTERS

17.1 Lightning arresters shall be of a type approved by the Engineer.

17.2 Lightning arresters shall be installed at all points where the steelwork has to be earthed and where specified.

17.3 The arresters shall be connected to the overhead conductors by 25mm² (minimum) copper conductors minimum and suitable parallel groove clamps.

17.4 Lightning arresters shall be placed on all the phase conductors at the following points in addition to those specified in the Detail Technical Specification:

(a) As near as possible to the transformer terminals on the transformer side of the fused protection where applicable.

(b) At each termination of a cable on the overhead line.

(c) At every line sectionaliser or recloser.

(d) At each connection point to secondary lines.

17.5 Lightning arresters shall be mounted below the overhead conductors in order to reduce the length of the discharge path.

17.6 An earth shall be supplied and installed at each point where lightning arresters are installed in accordance with par. 15 above.

18. FUSE-LINKS

18.1 Fuse-links shall be of a type approved by the Engineer.

18.2 Details of fixing methods and mounting shall be submitted to the Engineer for approval.

18.3 Fuse-links shall be installed at all transformers and where specified.

19. TRANSFORMER MOUNTINGS

19.1 Transformers shall comply with all relevant SANS codes.

19.2 Transformers with a maximum power rating of 25kVA may be mounted on a single pole with the mounting brackets as specified in SANS 780.

19.3 Transformers with a power rating in excess of 25kVA and with a maximum of 200kVA shall be mounted on a platform between two poles.

19.4 The transformer platform for pole mounting shall consist of galvanised steel channels bolted to the two poles. The platforms shall be manufactured and installed in accordance with fig. B14.5 and B14.6.

19.5 All steelwork as well as the bolts, nuts and washers shall be galvanised to SANS 32 & 121.

19.6 An earth wire shall be installed against each pole of the structure and must extend for at least 500mm above the poles. These earth wires shall be bonded across at the top of the poles to shield the transformer.

19.7 Earthing in accordance with par. 15 shall be provided.

20. SUBSTATION EARTH

Substation earths and earths at transformers along the route intended for earth continuity connections to installations served by the line, shall be provided in accordance with the specification for "EARTHING", Section B11.

21. ANTI-CLIMBING DEVICES

21.1 Anti-climbing devices shall be fitted to all poles carrying transformers or mechanically operated fuses or switchgear.

21.2 Galvanised barbed wire wound around the poles for at least 1m at a height of 2m above ground may be employed for this purpose.

22. CRADLES

Where HV overhead lines cross roadways, railways and other supply lines, important communication lines and where an HV line is run above an LV line, an earthed cradle shall be installed. The longitudinal wires of the cradle shall not be less than $7.2mm^2$ and the cross-lacing not less than $4mm^2$.

23. DANGER NOTICES (LIGHTNING SIGN)

Danger notices with the wording "DANGER-GEVAAR-INGOZI" shall be fitted to all structures with transformers, mechanically operated switchgear and fuses.

24. EXCAVATIONS

24.1 Excavations for poles, stays and trench earths shall remain open for as short a period as possible. The Contractor shall erect and maintain guards, warning notices and lights at open excavations and soil heaps.

24.2 Excavations shall be classified as follows:-

Very hard rock shall mean rock that can only be excavated by means of explosives.

Hard rock shall mean granite, quartzitic sandstone, slate and rock of similar or greater hardness, solid shale and boulders in general requiring the use of jack hammers and other mechanical means of excavation.

Soft rock and earth shall mean rock and earth that can be loosened and removed by hand-pick and shovel.

24.3 After poles and stays have been planted, the holes shall be backfilled and well compacted. Compaction shall be executed in layers of not more than 300mm to obtain a high compaction density.

24.4 The following dimensions shall be used when calculating the cubic capacity of excavations:

(a) Pole holes: 1.2m x 0.6m x depth

(b) Stay holes: 1.2m x 0.6m x 1.8m

(c) Trench earths: 0.5m x 0.6m x length

24.5 Poles shall be installed in accordance with the Detail Technical Specification of the installation.

24.6 Poles shall not be installed in clayey soil or in swampy conditions without the necessary precautions to stabilise the installation.

24.7 If unsatisfactory conditions for the installation of poles and stays are encountered during the excavations, the Engineer shall be informed without delay in order to facilitate alteration of the foundation design or alteration of the route of the line.

24.8 Poles and stays shall be installed in undisturbed soil.

24.9 If wooden poles are installed in a concrete or other water retaining foundation, the pole shall protrude through the concrete to ensure adequate natural drainage to prevent rotting of the wooden pole in the foundation due to the accumulation of water between the pole and the foundation.

25. SAMPLES

Samples of equipment, materials and SANS Test Reports proposed for the installation shall be submitted to the Engineer on request.

SECTION B15

B.15 INSPECTIONS, TESTING, COMMISSIONING AND HANDING OVER

1. PHYSICAL INSPECTION PROCEDURE

1.1 Once the Contractor has completed the installation, written notice shall be given to the Engineer in order that a mutually acceptable date can be arranged for a joint inspection.

1.2 During the course of the inspection, the Engineer will compile a list of items (if any) requiring further attention. A copy of this list will be provided to the Contractor who will have a period of 7 days in which to rectify the offending items of the installation.

1.3 The Contractor shall then provide written notice that he is ready for an inspection of the remedial work to the offending items.

1.4 This procedure will continue until the entire installation has been correctly completed to the satisfaction of the Engineer.

2. TESTING AND OPERATIONAL INSPECTION PROCEDURE

2.1 In addition to the above the Contractor shall have the complete installation tested and approved by the local authorities where applicable.

2.2 Subsequent to the above testing and approval, the Contractor shall in the presence of the Engineer test all circuits with respect to:

(a) Phase balance.

(b) Insulation level.

(c) Polarity.

2.3 Upon completion of the installation and within 3 months of the handover date, the Contractor shall provide and make available a recording voltmeter to record the voltage at three locations in the complex over a period of 48 hours each. These locations will be nominated by the Engineer.

3. "AS BUILT" DRAWINGS

3.1 As each portion of the work is completed, the Contractor shall provide the Engineer with as-built drawings showing the exact location measured from fixed points of all cables, transmission lines, each outlet point, etc.

3.2 In addition a complete reticulation diagram showing all supply cables and switchboards shall be provided behind a plastic cover in the substation or adjacent to the Main Switchboard if not located in a substation.

3.3 The installation will not be regarded as complete until all of the above requirements listed in 1, 2 and 3 above have been met.

Appendix B – Bill of Quantities

Sum No		Unit	Qty	Rate	Amount
	ADDITIONAL PRICING INSTRUCTIONS				
1	The following pricing instructions are in addition to the pricing instructions in the tender document and apply to all sections of these bills of quantities. These pricing instructions form part of the contract document.				
2	These bills are for tender comparison only. Once appointed, the bill will become irrelevant and the contractor will be responsible for a design-build installation for the total price provided in the bill. The Sums below must be priced to include a full and complete installation, including design, engineering, supply and installation of materials, testing, commissioning and handover.				
3	Should the total nameplate capacity of the system increase or decrease at any point before or during the contract, and the adjusted capacity has been approved by the employer, the price for each component will be adjusted on a pro-rata basis. Any fixed or overhead costs must therefore be captured in the Preliminary and General section by the tenderer.				
4	Sums marked "rate only" do not contribute to the tenderer's total price, but rates must still be provided for these Sums.				
5	Failure to price any Sum marked "rate only" may result in disqualification.				
6	In the event that no rate is provided for any Sum below, it shall be assumed that the tenderer will provide that Sum free of charge.				
7	All electrical and structural designs shall be in accordance with relevant SANS codes, including SANS 10142-1. DC and AC cable cross-sectional areas shall be calculated strictly in accordance with SANS 10142-1.				
8	Under no circumstances may any hardware or software be installed which requires recurring licenses. All systems must function in accordance with the specifications provided in this tender document without recurring licenses. Once-off licenses are permitted as long as they are included in the tenderer total price.				

Sum No		Unit	Qty	Rate	Amount
	SECTION 1 - CARPORT SOLAR PV SYSTEM				
	BILL 1: PRELIMINARIES AND GENERAL				
	The tenderer shall include all Sums hereunder which are of a preliminary or general nature. This shall include provisions for all the contractors regulatory obligations, including the Occupational Health and Safety Act of 1993 and the Construction Regulations of 2014.				
	CARPORT SOLAR PV INSTALLATION				
1	Time-related costs	Sum	1		
2	Value-related costs	Sum	1		
3	Fixed costs	Sum	1		
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	SECTION 1 BILL 1: PRELIMINARIES AND GENERAL: CARRIED TO SUMMARY				

Sum No		Unit	Qty	Rate	Amount
	SECTION 1 - CARPORT SOLAR PV SYSTEM				
	BILL 2: KIRSTENBOSCH CARPORT SOLAR PV				
	Carport 52,5 kWp				
	PHOTOVOLTAIC MODULES				
	PV modules to meet local content requirements as per specifications and shall be rated for a 25-year lifetime.				
	Rates provided for PV modules below shall be totalled for the entire installation, not per module.				
	PV Modules				
1	PV Modules for system capacity of Carport 52,5 kWp	Sum	1		
	Mounting Structures and Attachment				
2	PV mounting structure of Carport 52,5 kWp	Sum	1		
	INVERTERS				
	Rates provided for inverters below shall be totalled for the entire installation per building. Rates should include all programming, commissioning, mounting brackets, and installation.				
	All inverters shall have datalogging functionality with a GSM/3G/4G/LTE modem for data upload to the OEM's cloud. SIM cards and contracts will be supplied by the Employer.				
	Inverters				
3	Inverters for system capacity of Carport 52,5 kWp	Sum	1		
	SECTION 1 BILL 2: KIRSTENBOSCH CARPORT SOLAR PV: CARRIED FORWARD				

Sum No		Unit	Qty	Rate	Amount
	Carried over from previous page			Insert value -->	
	CABLING AND ELECTRICAL DISTRIBUTION				
	Cabling, switchgear and enclosures to meet local content requirements as per specifications and shall be rated for a lifespan of 25 years in an outdoor environment. Cables shall be UV protected. Enclosures shall be certified for a 25-year lifespan in outdoor conditions and shall have a rating of at least IP44 for outdoor installations.				
	Rates provided for cabling below shall be totalled for the entire installation, not per metre. Rates are for a complete cable installation, bare copper earth conductors, joining, terminations, cable fasteners and labelling.				
	All DC and AC cables shall be labelled at 3-metre intervals using UV-resistant labels which are mechanically attached to the cables using cable ties or similar methods.				
	Rates for distribution boards and combiner boxes shall include all enclosures, switchgear, fuses, glands, busbars, and labels required for a complete, fit for purpose installation.				
	All new DC and AC boards shall be clearly labelled as a secondary supply derived from a solar photovoltaic installation. Similarly, the existing DB to which the PV system is connected shall also be labelled appropriately to indicate a secondary supply.				
	Cabling				
4	DC Cabling	Sum	1		
5	AC Cabling	Sum	1		
6	Labelling for all cabling	Sum	1		
	Distribution Boards and Combiner Boxes				
7	AC distribution boards	Sum	1		
8	DC combiner boxes and fuse boxes	Sum	1		
	SECTION 1 BILL 2: KIRSTENBOSCH CARPORT SOLAR PV: CARRIED FORWARD				

Sum No		Unit	Qty	Rate	Amount
	Carried over from previous page			Insert value -->	
	WIREWAYS				
	DC cabling shall be adequately labelled and separated from all other services, including existing and new 400/230V AC cabling as defined in SANS 10142-1. The rates below shall include all provisions for adequate separation of services.				
9	Conduit, trunking, cable trays, cable ladders, etc.	Sum	1		
	CONTROL AND MONITORING				
	Control and monitoring functionality is typically provided by the inverter. However, should the inverter not comply with the specifications provided in the tender document, the contractor will be required to provide such functionality with additional systems. The system shall be designed and configured such that all data gathered by the inverters and weather stations is centrally collected over an ordinary TCP/IP interface and stored in such a way that the end-user may access the data at any time over the next 25 years without an annual license (once-off licenses are acceptable and shall be included in the tenderer's price).				
	Tenderers may leave this section blank if the standard hardware is able to provide all specified functionality.				
10	Additional control and monitoring hardware (if required)	Sum	1		
11	Additional control and monitoring software (if required)	Sum	1		
12	Additional control and monitoring licenses (if required)	Sum	1		
	SAFETY HARNESS SYSTEM				
	As part of this installation, a safety harness system must be installed to ensure the rooftop complies with all safety standards for PV maintenance activities.				
13	Safety harness system	Sum	1		
	SECTION 1 BILL 2: KIRSTENBOSCH CARPORT SOLAR PV: CARRIED FORWARD				

Sum No		Unit	Qty	Rate	Amount
	Carried over from previous page			Insert value -->	
	LIGHTNING PROTECTION AND SURGE ARREST				
	All components of the system must be earthed and bonded in accordance with SANS 10142-1 and other applicable standards. Rates for earthing and bonding must be included in the sections above for PV modules, inverters, cabling and wireways.				
	Additionally, the contractor shall ensure that the PV installation is sufficiently protected from lightning strikes and surges.				
14	Lightning Protection System	Sum	1		
15	Surge Arrest System	Sum	1		
	WEATHER MONITORING STATION				
	A weather monitoring station shall be included for the purposes of benchmarking the performance of the PV installation. The weather station shall measure ambient air temperature and PV module temperature, and shall have a pyranometer and anemometer (speed and direction).				
	The weather station shall be connected to the client / end-user network system via TCP/IP Ethernet and all data shall be collected and stored in a system which is accessible by the end-user (see *Control and Monitoring* above).				
	The rates below shall include a full weather monitoring installation, including mounting brackets suitable for outdoor environments, cabling, configuration, software and once-off licenses (if required).				
16	Weather Monitoring Station (rate only)	Sum	1		Rate Only
	SECTION 1 BILL 2: KIRSTENBOSCH CARPORT SOLAR PV: CARRIED FORWARD				

Sum No		Unit	Qty	Rate	Amount
	Carried over from previous page			Insert value -->	
	REGULATORY APPROVALS				
	The following rates are for the administration and facilitation of the approvals. Any application fees charged by the regulatory authority (if applicable) will be paid directly by the employer, not the contractor.				
17	Preparation and submission of all application forms that may be required by the City of Cape Town and NERSA, including all liaisons with municipal officials.	Sum	1		
18	Application for new bi-directional City of Cape Town meters	Sum	1		
	TESTING, COMMISSIONING AND HANDOVER				
19	Preparation of acceptance tests, for approval by the client engineer, as outlined in the specifications	Sum	1		
20	Preparation of handover documentation pack to the client, as outlined in the specifications.	Sum	1		
	TRAINING				
21	Training of client and end-user staff, as outlined in the specifications	Sum	1		
	ADDITIONAL ITEMS REQUIRED				
	The tenderer may choose to list any additional itmes hereunder which are required to ensure a complete, fit-for-purpose system which fully complies with all specifications.				
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	SECTION 1 BILL 2: KIRSTENBOSCH CARPORT SOLAR PV: CARRIED TO SUMMARY				

Sum No		Unit	Qty	Rate	Amount
	SECTION 1 - CARPORT SOLAR PV SYSTEM				
	BILL 3: RECOMMENDED SPARE PARTS				
	CAPORT SYSTEM				
	As part of their tender submission, the tenderer shall provide a priced list of spare parts for the **carport system.**				
	Tenderers must specify each part individually below, including manufacturer, model and size/rating. The recommended quantity must be provided. Each Sum must be priced.				
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	: CARRIED TO SUMMARY				

Sum No		Unit	Qty	Rate	Amount
	SECTION 2 - CARPORT O&M				
	BILL 1: PRELIMINARIES AND GENERAL				
	The tenderer shall include all Sums hereunder which are of a preliminary or general nature. This shall include provisions for all the contractors regulatory obligations, including the Occupational Health and Safety Act of 1993 and the Construction Regulations of 2014.				
	CARPORT OPERATIONS & MAINTENANCE (6 SITES)				
1	Time-related costs	Sum	1		
2	Value-related costs	Sum	1		
3	Fixed costs	Sum	1		
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	SECTION 2 BILL 1: PRELIMINARIES AND GENERAL: CARRIED TO SUMMARY				

Sum No		Unit	Qty	Rate	Amount
	SECTION 2 - CARPORT O&M				
	BILL 2: OPERATIONS AND MAINTENANCE				
	24-month operation and maintenance				
	It shall be expressly noted that the award of the operations and maintenance portion of the contract is at the sole discretion of the Employer. The Employer reserves the right to omit the Operations and Maintenance portion from the contract.				
	The tenderer shall provide rates for a 24-month operation and maintenance of each system in accordance with the specifications.				
1	Kirstenbosch NBG Carport Solar PV	Month	24		
	Any additional Sums relating to the operations and maintenance phase may be listed and priced hereunder, if required.				
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	: CARRIED TO SUMMARY				

Sum No		Unit	Qty	Rate	Amount
	SECTION 3 - CARPORT SYSTEM				
	BILL 1: PRELIMINARIES AND GENERAL				
	The tenderer shall include all Sums hereunder which are of a preliminary or general nature. This shall include provisions for all the contractors regulatory obligations, including the Occupational Health and Safety Act of 1993 and the Construction Regulations of 2014.				
	CARPORT INSTALLATION				
1	Time-related costs	Sum	1		
2	Value-related costs	Sum	1		
3	Fixed costs	Sum	1		
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	SECTION 3 BILL 1: PRELIMINARIES AND GENERAL: CARRIED TO SUMMARY				-

Sum No		Unit	Qty	Rate	Amount
	SECTION 3 - CARPORT SYSTEM				
	BILL 2: BUILDERS WORK				
	STRUCTURAL STEELWORK				
	PREAMBLES				
	For preambles see "Model Preambles for Trades 2008"				
	SUPPLEMENTARY PREAMBLES				
	Descriptions of bolts shall be deemed to include nuts and washers				
	Descriptions of L-shaped and U-shaped anchor bolts shall be deemed to include bending, threading, nuts and washers and embedding in concrete				
	Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete				
	Descriptions of L-shaped and U-shaped anchor bolts shall be deemed to include bending, threading, nuts and washers and embedding in concrete. Where anchor bolts are described as embedded in sides or soffits of concrete it shall be deemed to include holes through formwork.				
	Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete.				
	PURLINS, GIRTS, BRACING, ETC				
	Welded bracing etc with flat section connection plates bolted to steel				
1	200 x 100 x 4mm x 4.53kg/m Round hollow section	t	1,08		
	Cold Form Lip Channels bolted to steel				

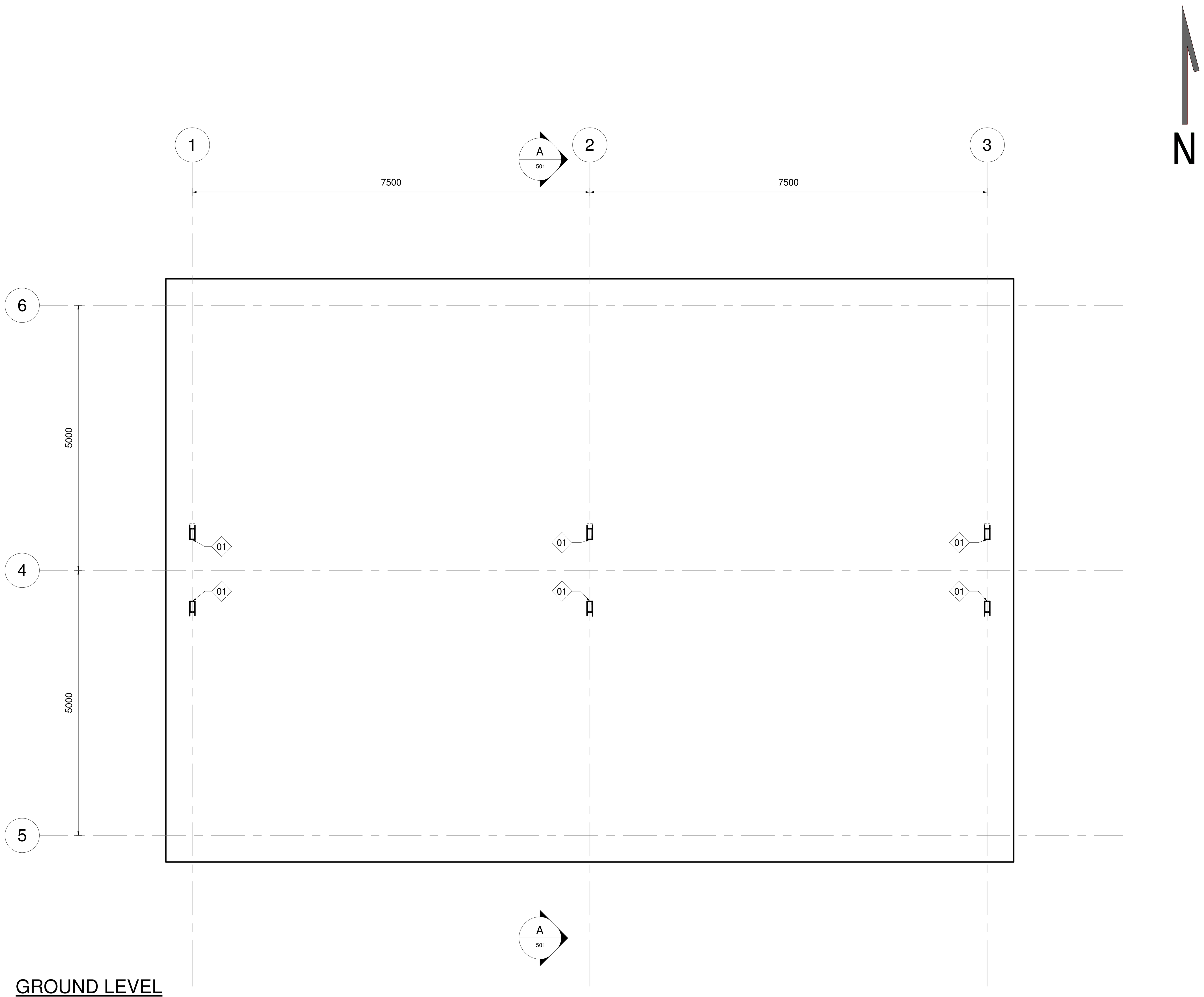
2	200 x 75 x 20mm x 2.5 x 7.29kg/m - Cold formed lipped channel	t	1,09		
	BASE, CONNECTION AND END PLATES				
	Connector and end plates bolted to steel				
3	Plates	t	0,22		
	Bolts to columns, beams, etc				
4	High tensile bolts	t	0,22		
	TOTAL CARRIED SUMMARY				
	SECTION NO 2: BUILDERS WORK				
	BILL NO 2				
	PROVISIONAL SUM				
	General				
	All Provisional Sums will include Supply and Installation by a Specialist.				
	Contractor to included Profit and Attendance to the Sub-contractor's amount.				
	FOUNDATIONS				
1	Allow the amount of R40 000.00 (forty thousand rand) for foundations to later detail	Item	1		
2	Allow for profit	%IT	2,50%		
3	Allow for attendance	%IT	2,50%		
	TOTAL CARRIED SUMMARY				
	SECTION SUMMARY				
1	STRUCTURAL STEELWORK				
2	PROVISIONAL SUM				
	SECTION 3 BILL 2: BUILDERS WORK: CARRIED TO SUMMARY				

Sum No		Unit	Qty	Rate	Amount
	<u>SECTION 3 - CARPORT SYSTEM</u>				
	<u>BILL 2: BUILDERS WORK</u>				
	<u>STRUCTURAL STEELWORK</u>				
	PREAMBLES				
	For preambles see "Model Preambles for Trades 2008"				
	SUPPLEMENTARY PREAMBLES				
	Descriptions of bolts shall be deemed to include nuts and washers				
	Descriptions of L-shaped and U-shaped anchor bolts shall be deemed to include bending, threading, nuts and washers and embedding in concrete				
	Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete				
	Descriptions of L-shaped and U-shaped anchor bolts shall be deemed to include bending, threading, nuts and washers and embedding in concrete. Where anchor bolts are described as embedded in sides or soffits of concrete it shall be deemed to include holes through formwork.				
	Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete.				
	PURLINS, GIRTS, BRACING, ETC				
	Welded bracing etc with flat section connection plates bolted to steel				
1	200 x 100 x 4mm x 4.53kg/m Round hollow section	t	1,08		
	Cold Form Lip Channels bolted to steel				

2	200 x 75 x 20mm x 2.5 x 7.29kg/m - Cold formed lipped channel	t	1,09		
	BASE, CONNECTION AND END PLATES				
	Connector and end plates bolted to steel				
3	Plates	t	0,22		
	Bolts to columns, beams, etc				
4	High tensile bolts	t	0,22		
	TOTAL CARRIED SUMMARY				
	<u>SECTION NO 2: BUILDERS WORK</u>				
	<u>BILL NO 2</u>				
	<u>PROVISIONAL SUM</u>				
	General				
	All Provisional Sums will include Supply and Installation by a Specialist.				
	Contractor to included Profit and Attendance to the Sub-contractor's amount.				
	<u>FOUNDATIONS</u>				
1	Allow the amount of R40 000.00 (forty thousand rand) for foundations to later detail	Item	1		
2	Allow for profit	%IT	2,50%		
3	Allow for attendance	%IT	2,50%		
	TOTAL CARRIED SUMMARY				
	SECTION SUMMARY				
1	STRUCTURAL STEELWORK				
2	PROVISIONAL SUM				
	SECTION 3 BILL 2: BUILDERS WORK: CARRIED TO SUMMARY				

Sum No	Item	Amount
	FINAL SUMMARY	
	SECTION 1 - CARPORT SOLAR PV SYSTEM	
1	BILL 1: PRELIMINARIES AND GENERAL	
2	BILL 2: KIRSTENBOSCH CARPORT SOLAR PV	
3	BILL 3: RECOMMENDED SPARE PARTS	
4	BILL 1: PRELIMINARIES AND GENERAL	
	SUBTOTAL: SECTION 1 - CARPORT SOLAR PV SYSTEM	
	SECTION 2 - CARPORT O&M	
5	BILL 1: PRELIMINARIES AND GENERAL	
6	BILL 2: OPERATIONS AND MAINTENANCE	
	SUBTOTAL: SECTION 2 - CARPORT O&M	
	PROVISIONAL SUM **SECTION 3 - CARPORT SYSTEM**	
7	BILL 1: PRELIMINARIES AND GENERAL	
8	BILL 2: BUILDERS WORK	
	SUBTOTAL: SECTION 3 - CARPORT SYSTEM	
	TOTAL (EXCLUDING VAT)	
9	VAT @ 15 %	
	FINAL SUMMARY: CARRIED TO FORM OF TENDER (INCLUDING VAT)	

Appendix C – Drawings



GROUND LEVEL

1 : 50

STRUCTURAL COLUMN SCHEDULE	
TYPE MARK	TYPE
01	200x100x4RHS

Cad File Name: DBEC-MRPRO-09-06 P20101-TN-03-STR-300 Rev A

GREEN BUILDING COUNCIL MEMBER ORGANISATION

CESA

LEGEND:

TENDER

Rev	Date	Description of changes	By
A	02-08-2021	ISSUED FOR TENDER	NP

REVISIONS

Client

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD
Making progress possible. Together.

Consultant

DELTA
built environment consultants

P O BOX 35703
MENLOPARK
0102

TEL: (012) 368 1850
FAX: (012) 348 4738

APPROVED
THE MASTER HELD AT DELTA BUILT ENVIRONMENT CONSULTANTS
BEARS THE ORIGINAL SIGNATURE OF APPROVAL

Pr. Eng. No: 20190651

N POXON

SIGNATURE: NAME: DATE:

Project

SANBI KIRSTENBOSCH

Project Description

SANBI KIRSTENBOSCH SOLAR PV

Drawing Title

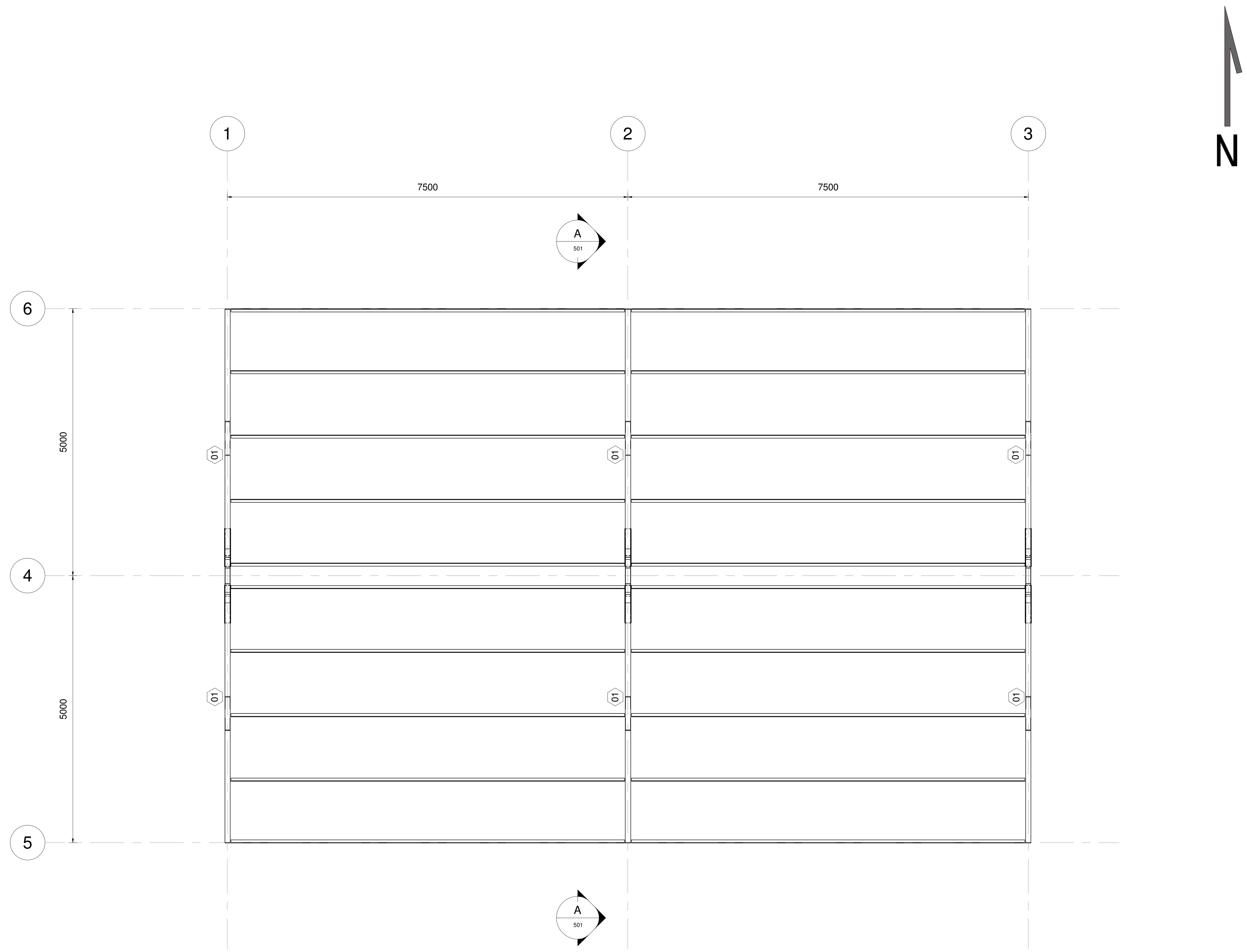
GROUND LAYOUT

Drawing Units: MILLIMETERS

Date	Scale	Designed By
AUGUST 2021	1 : 50	N POXON

Checked By	Drawn By	Approved By
N POXON	S. LEISEGANG	N POXON

Drawing No: P20101-TN-03-STR-300 Rev: A



ROOF LEVEL

1 : 50

STRUCTURAL COLUMN SCHEDULE	
TYPE MARK	TYPE
01	200x100x4RHS

STRUCTURAL FRAMING SCHEDULE	
TYPE MARK	TYPE
01	200x100x4RHS
02	LC200X50X20X2.5

Cad File Name: DBEC-MRPRO-09-06

P20101-TN-03-STR-500 Rev A

GREEN BUILDING COUNCIL SA MEMBER ORGANISATION

ISO 9001 International Standards Certifications

CESA Consulting Engineers South Africa

LEGEND:

TENDER

Rev	Date	Description of changes	By
A	02-08-2021	ISSUED FOR TENDER	NP

REVISIONS

Client

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Making progress possible. Together.

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FAX: (012) 348 4738

APPROVED Pr. Eng. No: 20190651

THE MASTER HELD AT DELTA BUILT ENVIRONMENT CONSULTANTS
BEARS THE ORIGINAL SIGNATURE OF APPROVAL

SIGNATURE: NAME: N POXON DATE:

Project

SANBI KIRSTENBOSCH

Project Description

SANBI KIRSTENBOSCH SOLAR PV

Drawing Title

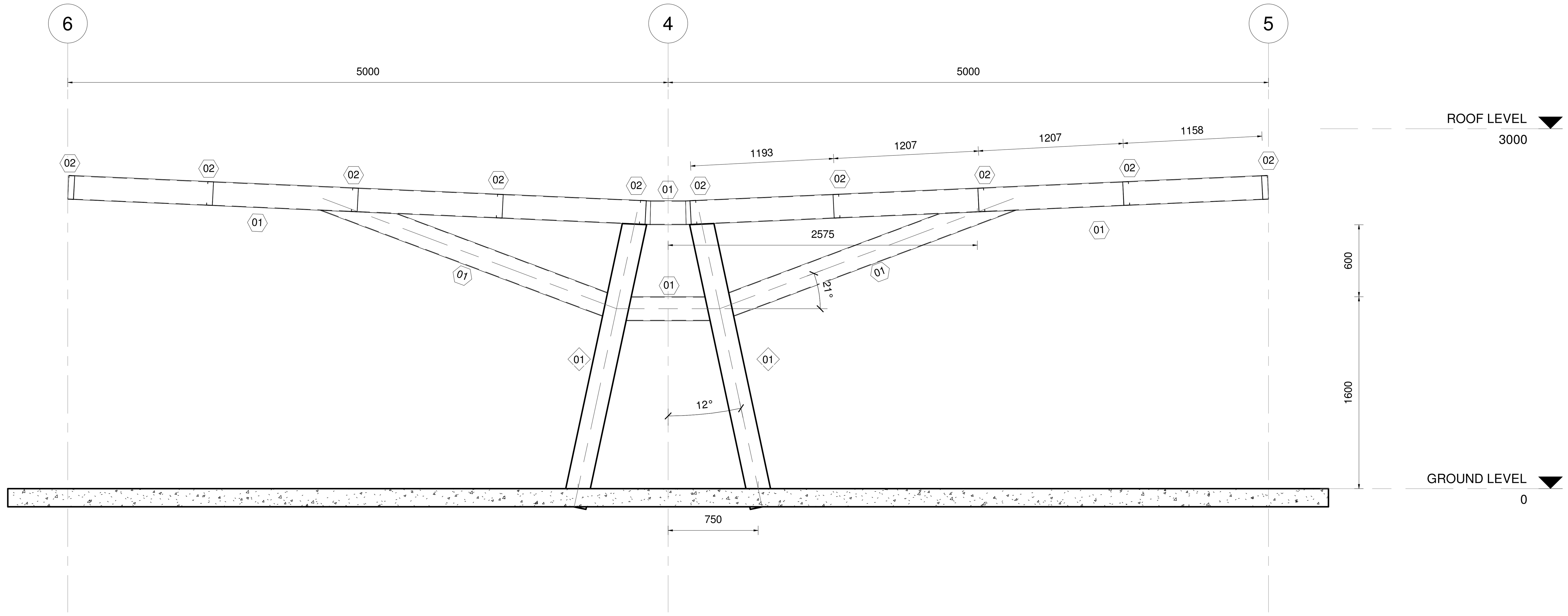
ROOF LAYOUT

Drawing Units: MILLIMETERS

Date	Scale	Designed By
AUGUST 2021	1 : 50	N POXON

Checked By	Drawn By	Approved By
N POXON	S. LEISEGANG	N POXON

Drawing No: P20101-TN-03-STR-500 Rev: A



SECTION A
1 : 25
300

STRUCTURAL COLUMN SCHEDULE	
TYPE MARK	TYPE
01	200x100x4RHS

STRUCTURAL FRAMING SCHEDULE	
TYPE MARK	TYPE
01	200x100x4RHS
02	LC200X50X20X2.5

Cad File Name: DBEC-MRPRO-09-06
P20101-TN-03-STR501 Rev A

LEGEND:

TENDER

Rev	Date	Description of changes	By
A	02-08-2021	ISSUED FOR TENDER	NP

REVISIONS

Client

Consultant

P O BOX 35703
MENLOPARK
0102

TEL: (012) 368 1850
FAX: (012) 348 4738

APPROVED
THE MASTER HELD AT DELTA BUILT ENVIRONMENT CONSULTANTS
BEARS THE ORIGINAL SIGNATURE OF APPROVAL

Pr. Eng. No: 20190651

SIGNATURE:
NAME: N POXON
DATE:

Project
SANBI KIRSTENBOSCH

Project Description
SANBI KIRSTENBOSCH SOLAR PV

Drawing Title
SECTIONS AND DETAILS

Drawing Units: MILLIMETERS

Date	Scale	Designed By
AUGUST 2021	1 : 25	N POXON

Checked By	Drawn By	Approved By
N POXON	S. LEISEGANG	N POXON

Drawing No: P20101-TN-03-STR-501
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Appendix D – Design Report (Tender Version)







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SANBI KIRSTENBOSCH NATIONAL BOTANICAL GARDEN SOLAR PV

DESIGN REPORT

FINAL REPORT
REVISION 00

AUGUST 2021

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EXECUTIVE SUMMARY

BACKGROUND

Delta Built Environment Consultants (Delta BEC) has been appointed by SANBI to provide professional services for the feasibility of photovoltaic (PV) systems to be installed at the Kirstenbosch National Botanical Garden (NBG).

Two areas were initially identified, while a third area was later identified as potential candidates for solar PV systems: the irrigation dam, the rooftops of the CBC and KRC buildings and the car park at the Kirstenbosch Garden Centre. This report looks at the technical feasibility of these three options.

The technical feasibility considers physical aspects of the sites such as structural integrity, shading and the condition and capacity of existing electrical infrastructure.

TERMINOLOGY

The three options are defined as follows in this report:

- **Option A:** Irrigation dam
- **Option B:** Rooftops
- **Option C:** Car Park.

For each of the options above, the following two scenarios are defined:

- **Scenario 1:** Optimised specific yield with some degree of energy export
- **Scenario 2:** Reduced size to limit energy export**.**

STATUS QUO

There are four miniature substations (minisubs) that feed the Kirstenbosch NBG. SANBI owns two of those minisubs, both of which are located within the Kirstenbosch Estate. In total, there are five electricity meters feeding the Kirstenbosch Estate. A summary of these meters is provided in Table 1-1 below.

Table 1-1: Electricity meters

METER LOCATION	AREA SERVED BY METER	AVERAGE MONTHLY CONSUMPTION (kWh)
Rhodes Avenue	Majority of the Kirstenbosch Estate	120 743
Upper Thistle Road	CBC and KRC complex	39 678
Rycroft Gate	South western area of the botanical garden	13 079
Klaasens Road Meter	Staff houses	946
Stone Cottage Meter	Stone Cottage facilities	760

TECHNICAL FEASIBILITY

Option A: Irrigation dam: The technical study found that the irrigation dam is suitable for a solar PV installation. With a total surface area of around 1.5 hectares, the dam is large enough to accommodate a PV system with a nameplate rating of 814 kWp. There are no major sources of shading that will materially affect energy production.

Option B: CBC and KRC rooftops: The roofs of the CBC and KRC buildings are being replaced. The structural integrity of the various roofs is unknown and an analysis into the suitability needs to be undertaken. The CBC roof has sufficient space to support a 26 kWp PV system. Only one half of the CBC building is suitable, as the other half has multiple obstructions that will affect energy production. The KRC has multiple roof spaces facing different directions. Some roof spaces are unsuitable due to their orientation or nearby sources of shading and obstructions. The entire optimised useable area of the KRC complex can accommodate a 97 kWp PV system.

Roofs with a shaded irradiance[1] less than 1 700 kWh/m² were not considered.

Option C: Car Park: There is currently an open car park situated near the Kirstenbosch Garden Centre with an area of 6800 m². It is proposed that new carports be installed in this area that will act as shading parking bays and allow for the installation of a rooftop solar PV system. A 638 kWp solar PV system can be accommodated. This will be installed on 70x10 m cantilever-type carports. There is a lot of flora currently present in the form of trees and plants that will have to be relocated for the installation of the new carports.

Option C3: reduced Carport Size represents a single carport (45mx10m) which is capable of accommodating 36 parking bays.

SCENARIOS

Two scenarios were developed for each option in the feasibility of each site:

- **Scenario 1: optimised specific yield:** A system that is optimised by finding a balance between an improved specific yield whilst still maximising the energy produced by the system. This is done by removing PV modules from areas that have negative qualities, including shading and obtrusions. The system will still generate excess PV energy from time to time, which will be exported into the grid.
- **Scenario 2: no export:** A system that is reduced in size to match the site's maximum electricity demand, particularly around noon. The system will rarely generate excess PV power, thereby limiting the amount of energy exported to the grid.

The following table summarises the performance of the installations at each site.

RECOMMENDATIONS

Both options and their variants are feasible on technical grounds.

[1] In HelioScope, this equates to a Total Solar Resource Factor (TSRF) of approximately 86.9%.

Based on the electrical reticulation of the site, it is recommended that two separate solar PV systems are installed: a carport rooftop system at the existing carpark near the Kirstenbosch Garden Centre and a rooftop system on the CBC and KRC buildings.

Because of the way in which the electricity meters are installed, the power produced by the carport system will serve most of the Kirstenbosch Estate, while the rooftop installation will provide power for to the CBC and KRC buildings and some minor adjacent loads.

Irrigation Dam: Due to the complexity of the dam relating to the irregular shape, fluctuating water level to zero conditions and contours of the dam, it is not recommended to install a floating PV system.

CBC and KRC rooftops: Option B1 is recommended. Any excess power generated can be exported to the grid.

Car Park: Option C1 is recommended. Although the installation is larger than option C2, the PV system is sized to meet the Estate’s electricity consumption and may export power from time to time. This also allows PV production to be maximised throughout the day, flattening the curve, instead of only at midday.

Alternatively, option C1 could also be split into two subsystems. The larger of these subsystems would connect to the electricity meter that covers the Estate, while the smaller subsystem would connect to either the KRC or the Rycroft gate electricity meter, although this may not be feasible due to the large distance between the PV plant and the respective meters.

SANBI would like to install **Option C3** initially with the master plan of upgrading the system in future to Option C1.

CONCLUSION

Due to budget limitations, SANBI Kirstenbosch is looking to implement **Option C3** initially, a single carport reduced in size with a solar PV potential of 52 kWp with future plans of upgrading the system.

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GLOSSARY OF TERMS AND ABBREVIATIONS

CBC	Centre for Biodiversity Conservation
DB	Distribution board
Delta BEC	Delta Built Environment Consultants (Pty) Ltd
EPC	Engineering, Procurement and Construction
Estate	The portion of the Kirstenbosch NBG that contains the main Garden.
Kirstenbosch NBG	Kirstenbosch National Botanical Garden
KRC	Kirstenbosch Research Centre
kWh	kilowatt-hour
kWp	kilowatt peak
LV	Low Voltage
Minisub	Miniature substation
MV	Medium Voltage
NBG	National Botanical Garden
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
NMD	Notified Maximum Demand
NWA	National Water Act
PV	Photovoltaic, with reference to solar photovoltaics
RMU	Ring Main Unit
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SSEG	Small-scale Embedded Generation
TSRF	Total Solar Resource Factor

1 INTRODUCTION

1.1 BACKGROUND

SANBI is considering the possibility of installing solar photovoltaic (PV) systems at the Kirstenbosch National Botanical Garden order to promote renewable energy, reduce municipal electricity bills and improve the sustainability of the Kirstenbosch National Botanical Garden. SANBI has expressed an interest in installing a floating PV system on an irrigation dam as this will not only provide renewable energy to the botanical garden but will also reduce water evaporation from the dam.

SANBI has appointed Delta Built Environment Consultants (Delta BEC) for the feasibility study and procurement documentation for the solar PV system, and overseeing its construction and a 24-month operation and maintenance contract.

1.2 PURPOSE OF REPORT

This report presents the design of the solution SANBI is looking to implement.

1.3 TERMINOLOGY

The following terminology is used in this report:

Scenario 1 (optimised specific yield): A system that is optimised by finding a balance between an improved specific yield whilst maximising the energy produced by the system. This is done by removing PV modules from areas that have negative qualities such as shading, obtrusions and suboptimal tilts or orientations. The system will generate excess PV energy from time to time, which will be exported to the municipal grid.

Scenario 2 (no export): A system which is reduced in size to match the site's maximum electricity demand, particularly around noon. The system will rarely generate excess PV power, thereby limiting the amount of energy exported to the grid.

1.4 STRUCTURE OF REPORT

The report comprises the following sections:

- Section 2: Approach
- Section 3: Site Visit
- Section 4: Technical Feasibility
- Section 5: PV Yield Simulations
- Section 7: Conclusion
- Appendices.

2 APPROACH

The following sites were considered for potential PV installations:

- **Option A:** A floating PV system on the irrigation dam
- **Option B:** Rooftop PV systems on the CBC and KRC buildings
- **Option C:** Carport PV system at the Garden Centre car park.

2.1 TECHNICAL FEASIBILITY

The technical assessments established whether the existing infrastructure is compatible with PV systems on the irrigation dam and the CBC and KRC rooftops, including structural load bearing capacity, the location and size of nearby electrical infrastructure, and the ability to anchor the PV system to the dam. The assessments also looked at shading, obstructions and any other issues which may present challenges for the proposed PV installations.

The following table provides a summary of criteria that were assessed.

Table 2-1: Evaluation criteria for technical feasibility

CRITERIA	REMARKS	DISQUALIFICATION CRITERIA
Location	Security (facility & surroundings)	
Dam size	Available area for PV modules	
Obstructions	Any obstacles that will prevent successful placement of PV system	
Shading sources	Any overhanging trees or structures surrounding the dam or rooftops	Excessive shading
Possible fixing methods	Underwater penetration of the dam lining vs. anchors along dam edge	
Roof slope and orientation	In Cape Town, an optimum roof is north facing with approx. 30° tilt	South of east or west
Roof uniformity	Obstacles, sky lights, service pathways, other services	
Roof type and construction	Concrete, steel, timber, asbestos, sheeting profile	Asbestos
Roof load bearing capacity	Visual inspection only. If required, a detailed structural analysis will be performed prior to implementation	Roof unable to accommodate the 20 kg/m² PV loading
Roof defects	Deflection, cracks, efflorescence, rust, bent/missing elements, broken tiles	

CRITERIA	REMARKS	DISQUALIFICATION CRITERIA
Shading	Trees, neighbouring buildings, towers	Shaded irradiance less than 1 700 kWh/m² (TSRF ~ 86.9%)
Load profile	Assessment of load profile suitability for embedded solar PV generation	Energy export
Electricity supplier	Eskom / municipality	
Electricity tariff	Rate per kWh, time of use and seasonal variations	
Electricity connection size	Determines maximum power and energy exports (NRS 097-2-1)	
Main distribution board	Age, capacity, spare space for additional switchgear	No possibility of tying into board without extensive upgrades or replacement
Electrical reticulation	Internal network: cable sizes, circuit breakers, municipal connection size	
Inverter locations	Available space for inverters	No possibility of installing inverters safely or securely
Wireways	Distance between PV modules and distribution board	Excessive distances leading to ohmic losses or excessive cable sizes
Heritage status	The KRC building was completed in 1993 and the CBC building in 2005	None. PV can be installed on heritage buildings with permission from the relevant heritage council (SAHRA)

3 SITE VISIT

3.1 GENERAL ASSESSMENT

On 09 September 2020, Delta BEC assessed the irrigation dam for the proposed floating solar PV system, and the KRC and CBC buildings for the proposed rooftop PV systems.

Figure 3-1: Satellite image: irrigation dam

Figure 3-2: Satellite image: CBC and KRC buildings

4 TECHNICAL FEASIBILITY

4.1 INTRODUCTION

The technical feasibility looked at the physical characteristics of each site and whether PV systems can be installed at those sites.

4.2 ELECTRICAL RETICULATION

An overview of the electrical reticulation at the Kirstenbosch Estate can be seen in Figure 4-1.

There are four miniature substations (minisubs) that feed the Kirstenbosch Estate. SANBI owns two of those minisubs located on the premises:

- Minisub 1: Botanical Gardens 1 (loads shown in blue in Figure 4-1)
- Minisub 2: Botanical Gardens 2 (loads shown in green in Figure 4-1).

The two SANBI minisubs feed the majority of the Kirstenbosch Estate and are metered by a single 11 kV electricity meter. The meter and other municipal electrical infrastructure are located on Rhodes Avenue. The MV cable feeding the Botanical Gardens 1 and 2 minisubs is represented in lilac in Figure 4-1. This meter accounts for the majority of electricity usage at the Kirstenbosch Estate, with an average monthly usage of 120 743 kWh.

A second electricity meter on Klaasens road feeds the staff houses. The electricity averages around 946 kWh per month, which is very low. There is a third meter at Stone Cottage opposite the Botanical Garden Nursery area, with an average monthly use of 760 kWh. A fourth meter is located at Rycroft Gate connected to a minisub called the Vodacom Minisub. This minisub feeds the south-western area of the estate, including the ticket office, garden office, manor house, protea section, various pump houses and the cellular base stations. It has an average monthly usage of 13 079 kWh.

There is a minisub and electricity meter located on Upper Thistle Road which feeds the CBC and KRC buildings and surrounding infrastructure. This meter has an average monthly consumption of 39 678 kWh and accounts for the second highest electricity usage at Kirstenbosch.

The energy measurement data used for this feasibility study is generally from the period between October 2018 and October 2019. Due to the COVID-19 lockdown, more recent electrical usage has been subdued and is not an accurate reflection of the Estate's usage prior to the pandemic. By the time the PV systems are commissioned, it is assumed that the electricity usage will be back to the levels seen prior to the COVID-19 lockdown.

Power and energy exported by the proposed PV systems will be limited by the actual usage of the site and not by space available. The PV systems are sized according to the electricity usage recorded by each upstream meter and is largely limited by the loads that are connected to those meters. While it is possible for PV systems to export excess power to the municipal grid, there are two major limitations that exist.

1) The City of Cape Town requires end users to be net importers of electricity and not net exporters. This means that the Kirstenbosch National Botanical Garden needs to purchase more kilowatt-hours from the City of Cape Town than the number of kilowatt-hours sold back to the City.

2) The second limitation is imposed by the NRS 097-2 standard, which requires that the size of PV systems be limited to 75% of the notified maximum demand (NMD) for dedicated LV feeders. For MV connections, the total generation connected to the MV feeder is limited to 15% of the MV feeder's maximum loading.

4.3 ENVIRONMENTAL CONSIDERATIONS

The Kirstenbosch National Botanical Garden houses many indigenous and protected plant species. There are multiple environmental concerns that need to be addressed before installing a renewable energy system. Several activities and investigations may be triggered by the South African National Environmental Management Act (NEMA), National Water Act (NWA) and the National Heritage Resources Act (NHRA). A preliminary screening memorandum has been produced. These issues will be addressed more comprehensively during the next stage of the project, in coordination with the environmental specialist allocated to this project.

Potential authorisation requirements include:

- Environmental authorisation in terms of NEMA (basic assessment)
- Removal and/or transportation permits for protected species
- Water use licence / general authorisation
- Complying with safety regulations from the Department of Human Settlements, Water and Sanitation (DHSWS) relating to the irrigation dam wall and placement of the inverters at the foot of the dam
- Notice of intent to develop to be issued to Heritage Western Cape (HWC).

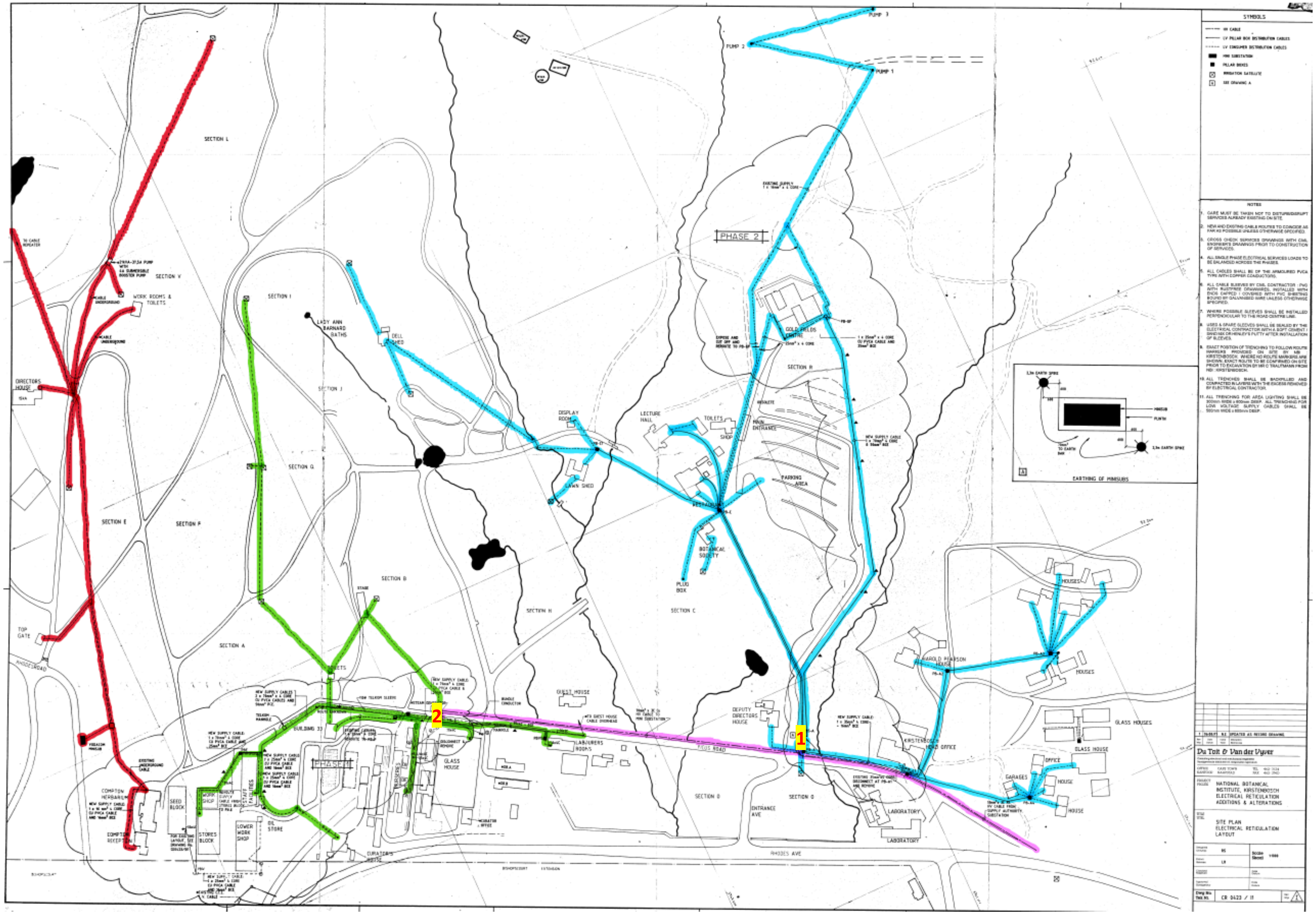


Figure 4-1: Site plan: existing electrical reticulation layout

4.4 IRRIGATION DAM

4.4.1 DESCRIPTION

The irrigation dam is situated in the south-western region of the Kirstenbosch Estate. The dam has a surface area of approximately 1.5 hectares. There are no significant sources of shading, particularly around the middle of the dam. Table 4-1 provides information about two potential floating PV systems on the irrigation dam.

Table 4-1: Irrigation dam summary

CONSTRAINT	UNIT	A1 OPTIMISED	A2 NO EXPORT
Azimuth	°	0	0
Shaded irradiance	kWh/m²	2 109.5	2 110
Shading	-	OK	OK
PV Tilt	°	15	15
Racking	-	Fixed Tilt	Fixed Tilt
Nominal power	kWp	814.4	268.8
Energy per year	kWh	1 396 534	459 491
Specific yield	kWh/kWp	1 714.8	1709.4

4.4.2 ELECTRICAL ASSESSMENT

The dam can accommodate an 814 kWp solar PV system. This amounts to an annual energy production of 1.4 GWh. Electricity bills show that the Kirstenbosch NBG uses around 2.1 GWh each year. The meter with the highest usage is the one feeding the two minisubs (1.44 GWh), while the meter feeding the Research Centre has the second-highest usage (0.48 GWh).

Based on the average monthly usage, it is projected that the daily maximum power demand on the estate’s two main minisubs is approximately 265 kW. This assumption was used to design a PV system that minimises export of electricity to the grid (option A2).

There is a minisub located near Rycroft gate, referred to as Vodacom Minisub. The minisub is not suitable as a connection point for the irrigation dam PV system due to the low power usage on this minisub. Should this minisub be utilised, this would greatly reduce the size and feasibility of the irrigation dam PV system.

For both options A1 and option A2, the termination point would be at the minisub located near the main building or Glass House (Botanical Gardens 2 minisub). This minisub is approximately 900 metres from the irrigation dam and is the nearest point of connection that has a substantial load. As a result of the large distance between the floating PV system and this minisub, there will be significant electrical losses when transmitting power at 400 V from the PV system to the minisub. To reduce these transmission losses, the voltage must be stepped up to the site's medium voltage level. This will require about 900 metres of underground MV cabling, a step-up transformer at the irrigation dam, and an MV ring main unit (RMU) at the Botanical Gardens 2 minisub. This will increase the cost of the installation.

The inverters would require a footprint of around 20 m². The most appropriate inverter location is at the base of the dam wall, next to the cell phone towers. To maintain the integrity of the dam wall, concrete-free screw pile foundations are proposed for the inverters.

A proposed MV cable routing map is shown in Figure 4-2. The route will follow existing roads or paths to minimise disturbances to sensitive fauna and flora in the area. The cable can either run underneath or alongside the existing roads.

Figure 4-2: Cabling routing from PV inverters to minisub: Botanical Gardens 2

4.4.3 PV SIMULATION RESULTS

Various scenarios were evaluated against one another. Using Figure 4-3, representing a week, the green line shows the projected load profile of the Kirstenbosch Estate based on the collected utility bills. The red line indicates the solar PV production assuming the maximum possible PV system is installed on the dam and the blue line represents a solar PV system that is sized to match the usage of the facility.

It can be seen that while the Estate uses power 24 hours of the day, the solar PV system is only operational during daylight hours, from roughly 06:00 in the morning until 18:00 at night and produces a maximum output at 12:00 midday. During the evenings or on cloudy days, the Estate will be supplied from the City supply.

A simple cost comparison, as in Table 4-2, shows a saving of roughly R1 million annually. This assumes a PV installation sized to meet the site's demand and ignores any exporting that may occur.

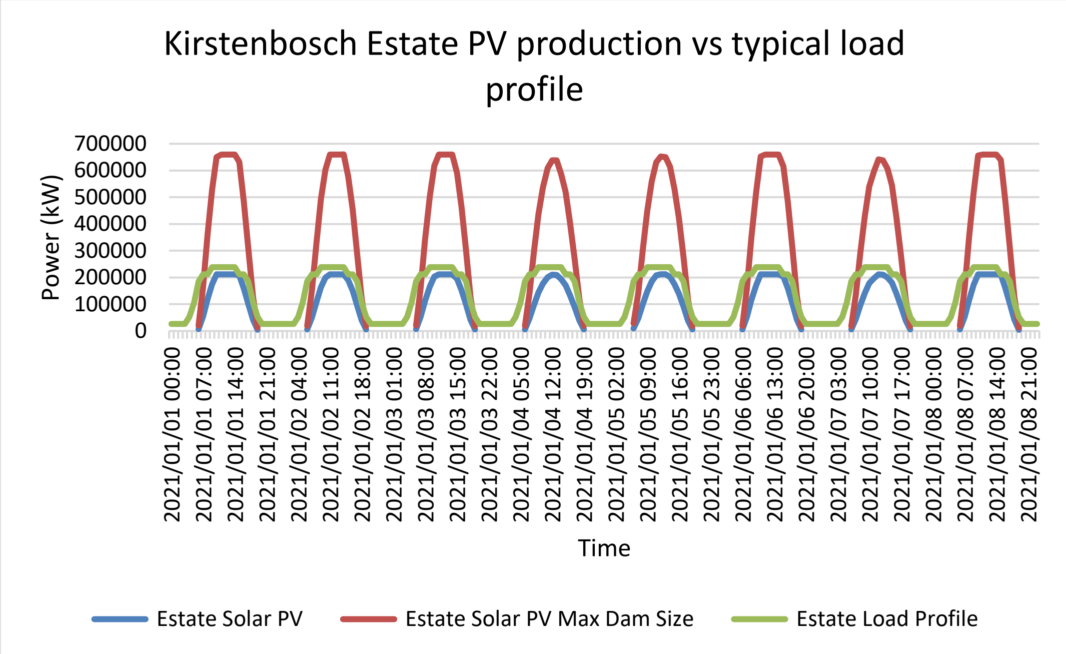


Figure 4-3: Kirstenbosch Estate: PV production vs typical load profile

Table 4-2: Kirstenbosch Estate cost comparison of City supply vs Solar PV

	ESTATE USAGE	SOLAR PV
Total Power (kW)	1 446 571	459 491
Total Cost (R)	2 507 920	1 518 721
Effective R/kWp	1,73	3,31

4.5 CBC AND KRC ROOFTOP INSTALLATION

4.5.1 BUILDING DESCRIPTION

Two buildings were considered:

1) Centre for Biodiversity Conservation (CBC)
2) Kirstenbosch Research Centre (KRC).

A single roof space was considered for the CBC building, while eleven separate roof spaces were considered for the KRC complex. Table 4-4 provides a summary of all the rooftops considered for a PV installation.

Table 4-3: Rooftop installation common parameters

Rooftop	Azimuth (°)	Roof structure	Structure capacity	Shaded Irradiance (kWh/m²)	Shading	Roof Tilt (°)	Racking
CBC	283	TM	TBC	1 931	OK	17.5	Flush Mount
KRC1	151	TM	TBC	1 672	NOT OK	17.5	Flush Mount
KRC2	196	TM	TBC	1 572	NOT OK	17.5	Flush Mount
KRC3	102	TM	TBC	1 880	OK	17.5	Flush Mount
KRC4	14	TM	TBC	2 190	OK	17.5	Flush Mount
KRC5	282	TM	TBC	1 865	OK	17.5	Flush Mount
KRC6	14	TM	TBC	2 189	OK	17.5	Flush Mount
KRC7	103	TM	TBC	1 918	OK	10	Flush Mount
KRC8	282	TM	TBC	1933	OK	17.5	Flush Mount
KRC9	284	TM	TBC	1853	OK	17.5	Flush Mount
KRC10	103	TM	TBC	1816	OK	17.5	Flush Mount
KRC11	103	TM	TBC	1594	NOT OK	10	Flush Mount

Table 4-4: Rooftop installation summary for the CBC and KRC buildings

ROOF	NOMINAL POWER (kWp)	ANNUAL ENERGY (kWh)	NOMINAL POWER (kWp)	ENERGY PER YEAR (kWh)
	B1 - OPTIMISED SYSTEM		**B2 - MAX WITHOUT EXPORT**	
CBC	26.20	36 300	26.2	37 600
KRC1	-	-	-	-
KRC2	-	-	-	-
KRC3	3.84	5 220	3.84	5 410
KRC4	8.96	13 900	8.96	14 400
KRC5	20.50	27 400	20.50	28 400
KRC6	9.92	15 400	9.92	16 000
KRC7	7.04	9 750	7.04	10 100
KRC8	10.60	14 600	10.60	15 100
KRC9	6.72	8 930	-	-
KRC10	3.20	4 200	-	-
KRC11	-	-	-	-
Total	**97.0**	**135 800**	**87.0**	**127 100**

4.5.2 ELECTRICAL ASSESSMENT

All roofs have timber structures with an average tilt of 17.5°. The roof sheeting on the KRC building has recently been replaced with Klip-Lok® type sheeting, while a similar replacement is scheduled for the CBC building at the start of 2021.

Based on the average monthly usage, it was projected that the daily maximum power demand for the Research Centre complex is around 87 kW. This was used to design a PV system that minimises export of electricity to the grid (option B2).

The CBC and KRC buildings each have a main distribution board. The CBC's main distribution board is labelled MDB and has a main incomer of 300 A. There is sufficient spare space available for a new solar PV feed-in breaker. The main distribution board in the KRC building is labelled MDB-1/1E. It appears to have a 350 A main incomer according to as-built single line diagrams.

There are several obstructions such as skylights on some rooftops. This limits the number of PV modules that can be installed. In addition, there are multiple sources of shading, largely from nearby trees.

4.5.3 PV Simulation Results

PV simulations were compared against projected load profiles for the CBC/KRC complex. Using Figure 4-4, the red line indicates the buildings usage and the blue line indicates the solar PV production.

At times when the PV generation is greater than the load, the excess power can be exported to the grid. However, the energy export is not significant.

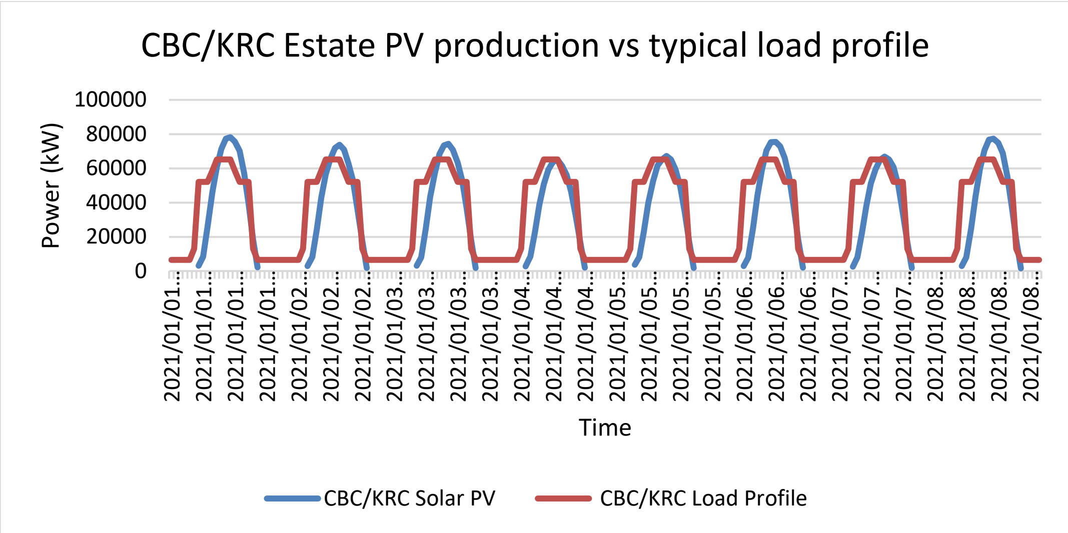


Figure 4-4: CBC/KRC Complex: PV production vs typical load profile

Table 4-5: CBC/KRC Complex cost comparison of City supply vs Solar PV

	CBC/KRC USAGE	SOLAR PV
Total Power (kW)	476 132	135 750
Total Cost (R)	82 370 836	23 484 687
Effective R/kWp	1,73	1,73

4.6 GATE 2 PARKING AREA INSTALLATION

4.6.1 SITE DESCRIPTION

There is a parking lot situated near the Kirstenbosch Garden Centre. The existing parking lot is approximately 370 m². There are currently seven sets of double bays, with each set being separated by an island consisting of trees and plants. There are two single bay sets situated at either end of the parking lot.

There are multiple plants as well as large sized trees present in the existing parking lot. These will have to be removed and relocated as they will obstruct the installation of the new carports and have the potential to contribute towards shading should they remain as is. From an environmental standpoint, the trees present can be removed. Care needs to be taken to ensure none of the trees are listed as protected trees.

Table 4-6 provides information about two potential carport systems. System C1 is the maximum sized system where excess generated energy is exported to the grid. System C2 is a reduced system size that minimises export to the grid. System C3 is a single carport design which can accommodate 36 parking bays.

Table 4-6: Carport summary

CONSTRAINT	UNIT	C1 OPTIMISED	C2 NO EXPORT	C3 REDUCED SIZE
Azimuth	°	41.9	41.9	41.9
Shaded irradiance	kWh/m²	1 943	1 943	1 943
Shading	-	OK	OK	OK
PV Tilt	°	0	0	0
Racking	-	Flush mount	Flush mount	Flush Mount
Nominal power	kWp	638.4	291.2	52.5
Energy per year	kWh	1 001 000	455 900	77 300
Specific yield	kWh/kWp	1 567	1 565	1 473

4.6.2 CARPORT

Based on the current space available, it is possible to install seven new carports with solar PV modules placed on top of the carports. A double cantilever carport structure is proposed as depicted in Figure 4-5. This reduces the number of upright posts required and is an aesthetically pleasing design.

Three of the carports are expected to be approximately 70 m x 10 m. This will allow for 28 cars in a single row and 56 cars for an entire carport structure. Two carports will be approximately 65 m x 10 m, one carport 60 m x 10 m and one carport 50 m x 10 m, based on the layout of the floor area available. There will be 360 shaded parking bays across all the planned new carports, with additional space for non-shaded parking bays which may remain.

Figure 4-5: Cantilever carport

4.6.3 ELECTRICAL ASSESSMENT

The PV system will be capable of supplying the entire garden during the day with a system size of 638 kWp. This equates to an annual energy production of 1.0 GWh.

Based on the location of the current parking lot, shading is expected to be at a minimal. Trees surrounding the parking lot will not have a shading effect on the PV system. Assuming the existing trees are removed, no sources of shading are present that will adversely affect the PV system during the day. The only shading source present is the mountain range situated west of the garden that may produce shading into the late evenings.

The solar PV system will tie into Minisub Botanical Gardens 1, situated on the corner of Ficus Avenue and the road leading up to the Kirstenbosch Garden Centre. The distance from the PV system to the minisub is approximately 200 m.

There are three options to tie into the existing infrastructure. The output from the solar PV system can be stepped up to medium voltage (MV) and tie into the existing minisub. This will require a step-up transformer and expensive cabling. This is not recommended due to the relatively short distance between the PV system and the minisub. The second option is to tie into the existing minisub at low voltage. This is recommended as it reduces upfront capital costs and reduces complexity. The third option is to tie into a nearby building. Assuming the building's DB has sufficient space and electrical capacity, this option will also work.

The inverters can be placed on the south-eastern section of the parking area or the north-western side as there is sufficient space available at these locations. A 20 m² area is required for the inverters. A proposed cable route is shown in Figure 4-6.

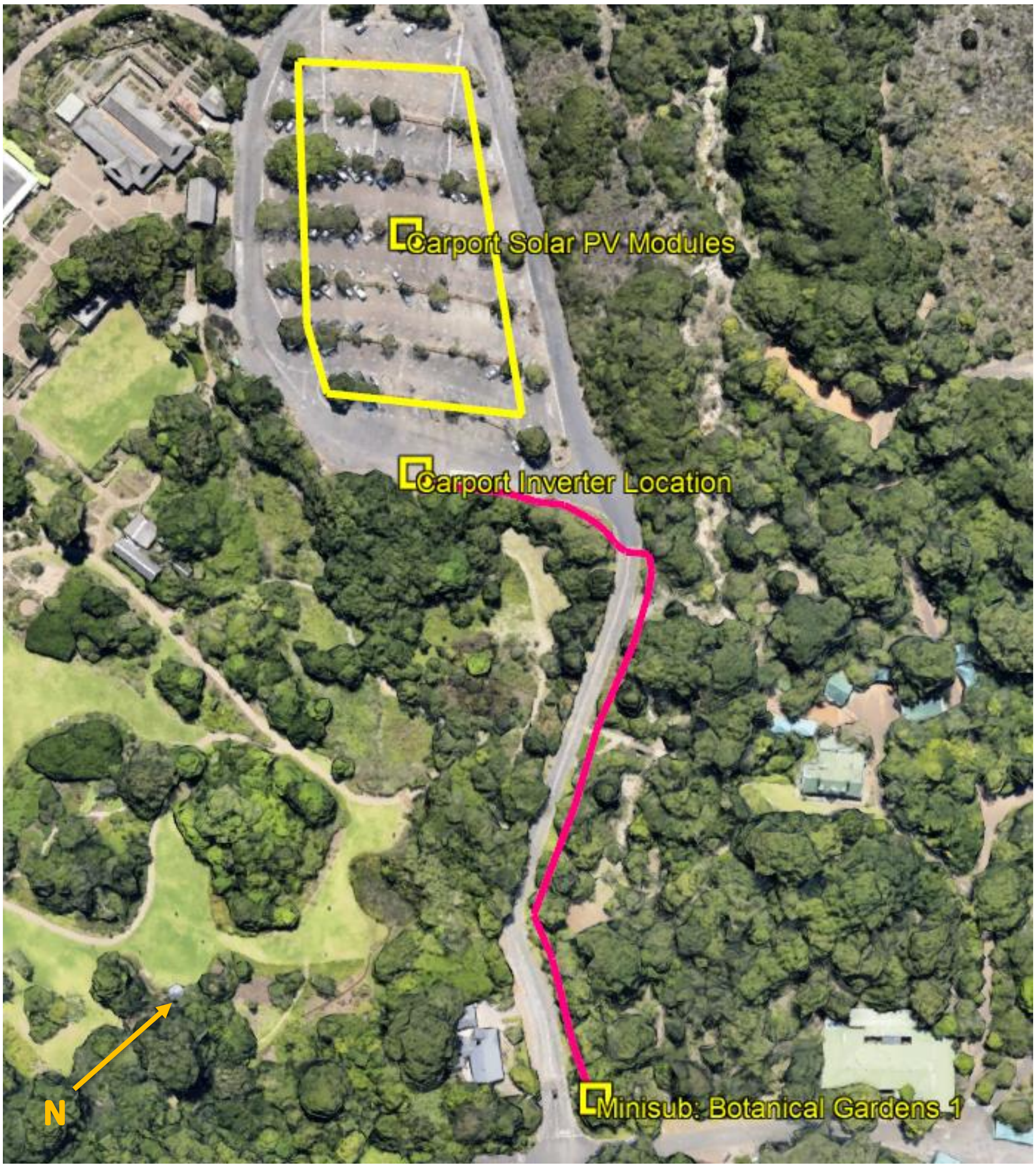


Figure 4-6: Cabling routing from Carport PV inverters to Minisub: Botanical Gardens 1

4.6.4 PV SIMULATION RESULTS

Of the 1 GWh of energy produced from the solar PV system each year, 78 % of the generated PV energy will be used on-site and 22 % will be exported to the grid every year.

Table 4-7: Carport energy usage

CARPORT	ENERGY (kWh/year)	% of total
Total energy produced	1 000 597	
Energy used on-site per year	784 468	78
Energy exported per year	216 129	22

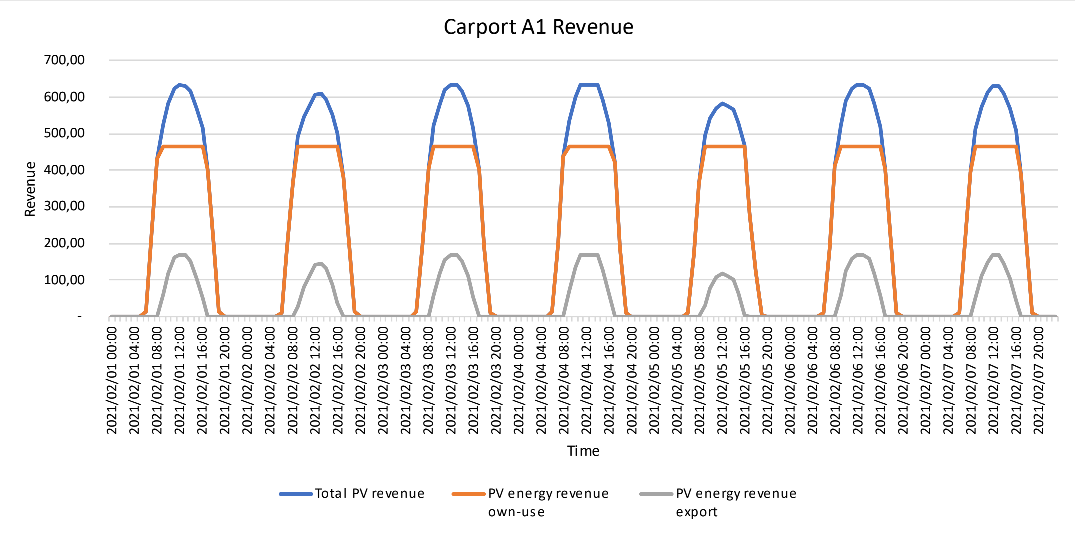


Figure 4-7: Carport Revenue

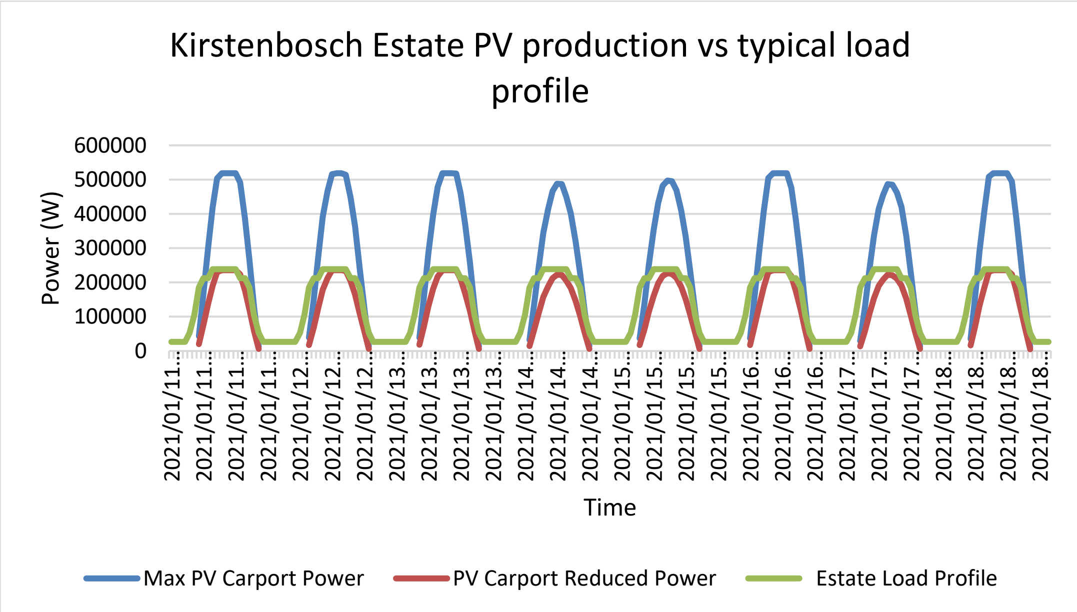


Figure 4-8:Kirstenbosch Estate PV production vs typical load profile

5 PV YIELD SIMULATIONS

5.1 PV DESIGN

Following the site visits, designs were created using measurements and information gathered from site. This included a conceptual PV array placement. The design was simulated with HelioScope simulation software to determine the system's nameplate power rating and annual energy production.

5.2 METHODOLOGY

5.2.1 STEP 1: DETAILED DESIGN USING HELIOSCOPE

Delta BEC produced a reference design for the irrigation dam and rooftop PV systems. The rooftops were covered with PV modules, ignoring any structural limitations and most sources of shading. However, areas with severe sources of shading were avoided, as were other obstacles and protrusions that may significantly affect energy production. The design was then simulated in HelioScope to determine the system's power and energy output characteristics.

5.2.2 STEP 2: ACQUIRING LOAD PROFILE DATA

Delta BEC has not yet been able to obtain 30-minute load profile data from the City of Cape Town for the various electricity meters. Should this information become available, the sizing of each system will be revisited.

Information for the main two meters, the Kirstenbosch Estate and the Research Centre, was obtained from data collected by Utility Savings. The data was extrapolated to determine both the annual usage as well as an estimate of the average daily maximum demand.

5.3 SIMULATION RESULTS

Simulation results are summarised in the table below. Simulation reports are provided in the appendices.

Table 5-1: Simulation results

CONSTRAINT	NAMEPLATE POWER kWp	ANNUAL ENERGY MWh
Irrigation Dam		
Option A1: Optimised	814.4	1 397.0
Option A2: No export	268.8	459.5
KRC and CBC Buildings		
Option B1: Optimised	97.0	135 750
Option B2: No export	87.0	127 097

Carport		
Option C1: Optimised	638.4	1 001
Option C2: No export	291.2	455.9
Option C3: Reduced size	52.5	77.3

6 CONCLUSION

A technical and feasibility study was conducted for each possible option. Assuming that all energy is consumed on site and only a small amount is exported to the City's grid, it was found that all options and scenarios are feasible on technical grounds.

6.1 RECOMMENDATION

Due to the nature of the site's electrical reticulation and the number of meters for the site that limits the PV size of any single installation, it is recommended to have two separate solar PV installations: a carport rooftop system at the existing carpark near the Kirstenbosch Garden Centre and a rooftop installation on the KRC and CBC buildings.

Since all options and scenarios are feasible, the following is proposed:

- Option B1: rooftop installation optimised for maximum specific yield
- Option C1**:** carport rooftop optimised for maximum specific yield.

The two PV systems will feed different areas of the Kirstenbosch Estate. The carport PV system will feed most of the Estate, which consumes the most energy, while the rooftop installation will supply the CBC and KRC buildings, which has the second highest electricity usage.

Due to budget constraints, SANBI's preference at this stage is to opt for **Option C3**: a reduced carport rooftop solar PV system.

APPENDIX A: HELIOSCOPE SIMULATION REPORTS

Parking Lot SANBI Kirstenbosch NBG, Rhodes Drive, Newlands, Cape Town

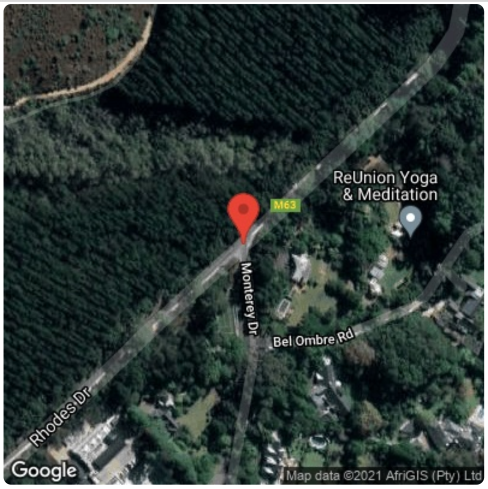
Report

Project Name	SANBI Kirstenbosch NBG
Project Address	Rhodes Drive, Newlands, Cape Town
Prepared By	Delta BEC helioscope08@gmail.com

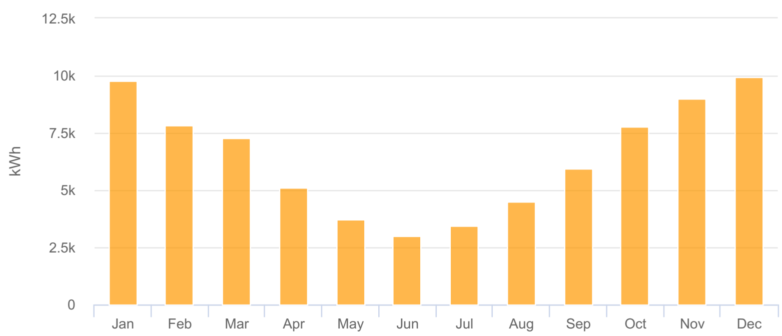
System Metrics

Design	Parking Lot
Module DC Nameplate	52.5 kW
Inverter AC Nameplate	48.1 kW Load Ratio: 1.09
Annual Production	77.30 MWh
Performance Ratio	75.8%
kWh/kWp	1,473.0
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
Simulator Version	79ae66d755-6c48e55c95-131952e5b2-5a8a302cd0

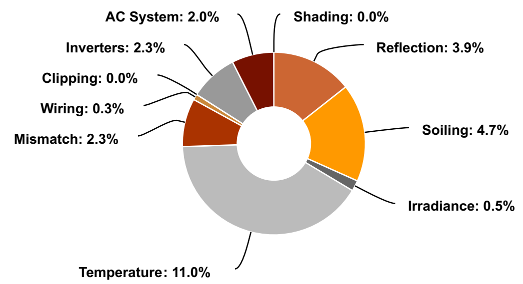
Project Location



Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m^2)	Annual Global Horizontal Irradiance	1,942.9	
	POA Irradiance	1,942.9	0.0%
	Shaded Irradiance	1,942.9	0.0%
	Irradiance after Reflection	1,868.0	-3.9%
	Irradiance after Soiling	1,781.1	-4.7%
	Total Collector Irradiance	**1,781.1**	**0.0%**
Energy (kWh)	Nameplate	93,513.2	
	Output at Irradiance Levels	93,040.6	-0.5%
	Output at Cell Temperature Derate	82,843.4	-11.0%
	Output After Mismatch	80,942.2	-2.3%
	Optimal DC Output	80,723.4	-0.3%
	Constrained DC Output	80,723.3	0.0%
	Inverter Output	78,879.4	-2.3%
	Energy to Grid	**77,301.8**	**-2.0%**
Temperature Metrics			
	Avg. Operating Ambient Temp		19.2 °C
	Avg. Operating Cell Temp		38.0 °C
Simulation Metrics			
	Operating Hours		4574
	Solved Hours		4574

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.075	3°C
Flush Mount	-2.81	-0.0455	0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
3	4	5	6	6	7	7	6	6	5	4	3

Irradiation Variance	5%
Cell Temperature Spread	4° C
Module Binning Range	-2.5% to 2.5%
AC System Derate	2.00%

Module Characterizations

Module	Uploaded By	Characterization
TSM-PD14 320 (May16) (Trina Solar)	Folsom Labs	Spec Sheet Characterization, PAN

Component Characterizations

Device	Uploaded By	Characterization
Sunny Tripower 24000TL-US (SMA)	Folsom Labs	Modified CEC

Components

Component	Name	Count
Inverters	Sunny Tripower 24000TL-US (SMA)	2 (48.1 kW)
Strings	10 AWG (Copper)	10 (174.0 m)
Module	Trina Solar, TSM-PD14 320 (May16) (320W)	164 (52.5 kW)

Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	5-20	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Carport 1	Flush Mount	Landscape (Horizontal)	0°	228.18857°	0.1 m	1x1	164	164	52.5 kW

Detailed Layout

Parking Lot SANBI Kirstenbosch NBG, Rhodes Drive, Newlands, Cape Town

Shading Heatmap

Shading by Field Segment

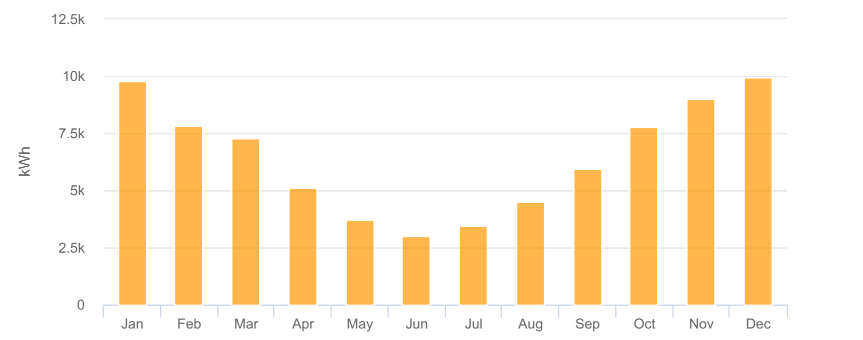
Description	Tilt	Azimuth	Modules	Nameplate	Shaded Irradiance	AC Energy	TOF[2]	Solar Access	Avg TSRF [2]
Carport 1	0.0°	228.2°	164	52.5 kWp	1,942.9kWh/m^2	77.3 MWh[1]	88.3%	100.0%	88.3%
Totals, weighted by kWp			164	52.5 kWp	1,942.9kWh/m^2	77.3 MWh	88.3%	100.0%	88.3%

[1] approximate, varies based on inverter performance
[2] based on location Optimal POA Irradiance of 2,199.5kWh/m^2 at 30.6° tilt and -1.4° azimuth

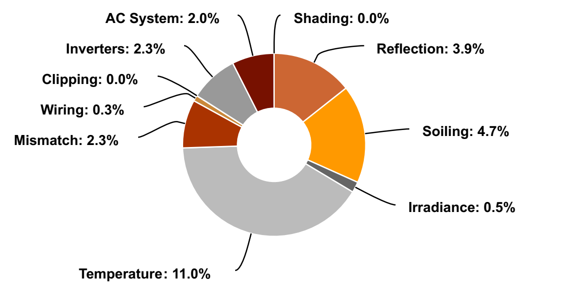
Solar Access by Month

Description	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
Carport 1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Solar Access, weighted by kWp	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
AC Power (kWh)	9,773.3	7,836.1	7,287.9	5,103.1	3,719.9	3,015.1	3,419.8	4,481.3	5,957.1	7,772.5	9,009.7	9,926.0

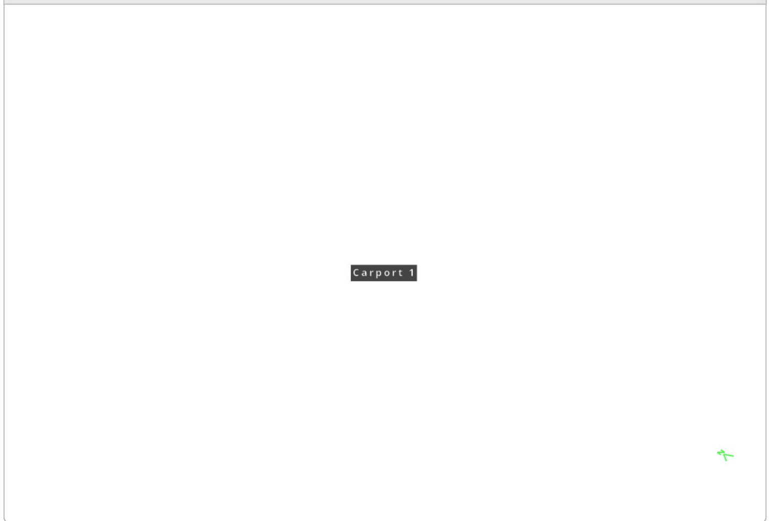
Monthly Production



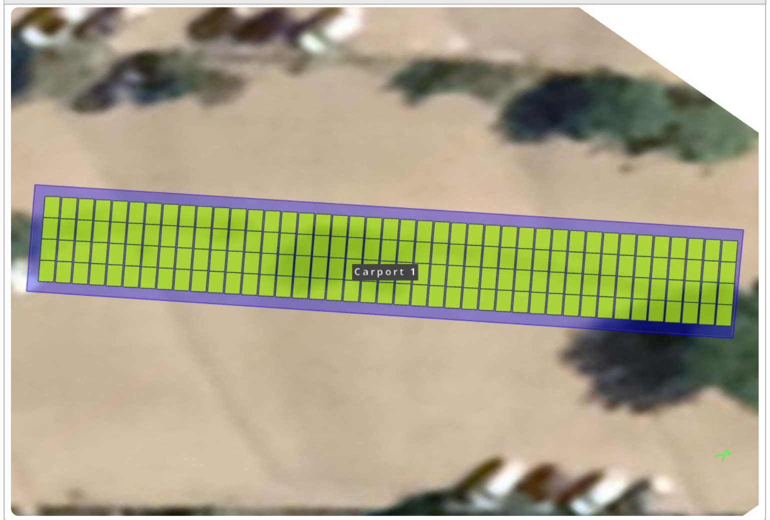
Sources of System Loss



Southwestern Angle



Southeastern Angle



APPENDIX B: ELECTRICITY BILLS

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	210006850346
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655, Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 07/01/2019 — **Due date 01/02/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		763497.97
Less payments (10/12/2018)	Thank you	191842.30-
Arrears (a)	**Payable immediately**	**571655.67**
Latest account - see overleaf		204353.11
Current amount due (b)	**Payable by 01/02/2019**	**204353.11**
	Total (a) + (b)	**776008.78**
Total (a) + (b) above	776008.78	
Total liability	**776008.78**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, SHOPRITE, Checkers, WOOLWORTHS, SPAR, Post Office, Pick n Pay, EasyPay, payCity, PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	776008.78
Amount due if paid in cash	776008.70
Rounded down amount carried forward to next invoice	0.08

>>>>> 915552202268861

Account details as at 07/01/2019 **Account number** **220226886**

ELECTRICITY (Period 29/11/2018 to 28/12/2018 - 30 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 124527.000 kWh / Daily average 4150.900 kWh

& Consumption charge: Commercial (Small Power User - High)	
(124527.000 kWh X R 1.4065)	175147.23
& Service charge	
(30 Days X R 49.3300)	1479.90
	176627.13

Add interest on outstanding balance	**1231.91**
Add 15% VAT on amounts marked with & above	**26494.07**
Current account: Total due	**204353.11**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553600	007	915.503kWh	(Actual)	1040.030kWh	(Actual)	124.527(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	180007061177
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 06/02/2019 — **Due date 04/03/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		776008.78
Less payments		0.00
Arrears (a)	**Payable immediately**	**776008.78**
Latest account - see overleaf		209084.29
Current amount due (b)	**Payable by 04/03/2019**	**209084.29**
	Total (a) + (b)	**985093.07**
Total (a) + (b) above	985093.07	
Total liability	**985093.07**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · SHOPRITE · Checkers · WOOLWORTHS · W · SPAR · Post Office · Pick n Pay · EasyPay (Pay online at www.easypay.co.za) · payCity (connected citizens) · PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	985093.07
Amount due if paid in cash	985093.00
Rounded down amount carried forward to next invoice	0.07

>>>>> 915552202268861

Account details as at 06/02/2019	Account number	220226886

ELECTRICITY (Period 29/12/2018 to 29/01/2019 - 32 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 126415.000 kWh / Daily average 3950.469 kWh

& Consumption charge: Commercial (Small Power User - High)	
(126415.000 kWh X R 1.4065)	177802.70
& Service charge	
(32 Days X R 49.3300)	1578.56
	179381.26

Add interest on outstanding balance	**2795.84**
Add 15% VAT on amounts marked with & above	**26907.19**
Current account: Total due	**209084.29**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553600	007	1040.030kWh	(Actual)	1166.445kWh	(Actual)	126.415(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	240006516864
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
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Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655, Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 06/03/2019 — **Due date 01/04/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		985093.07
Less payments		0.00
Arrears (a)	**Payable immediately**	**985093.07**
Latest account - see overleaf		210544.32
Current amount due (b)	**Payable by 01/04/2019**	**210544.32**
	Total (a) + (b)	**1195637.39**
Total (a) + (b) above	1195637.39	
Total liability	**1195637.39**	

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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

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(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · SHOPRITE · Checkers · WOOLWORTHS · SPAR · Post Office · Pick n Pay · EasyPay · payCity · PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	1195637.39
Amount due if paid in cash	1195637.30
Rounded down amount carried forward to next invoice	0.09

>>>>> 915552202268861

Account details as at 06/03/2019	Account number	220226886

ELECTRICITY (Period 30/01/2019 to 28/02/2019 - 30 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 127028.000 kWh / Daily average 4234.267 kWh

& Consumption charge: Commercial (Small Power User - High)	
(127028.000 kWh X R 1.4065)	178664.88
& Service charge	
(30 Days X R 49.3300)	1479.90
	180144.78

Add interest on outstanding balance	**3377.82**
Add 15% VAT on amounts marked with & above	**27021.72**
Current account: Total due	**210544.32**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553600	007	1166.445kWh	(Actual)	1293.473kWh	(Actual)	127.028(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	260006345374
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 03/04/2019 **Due date 29/04/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		1195637.39
Less payments		0.00
Arrears (a)	**Payable immediately**	**1195637.39**
Latest account - see overleaf		181242.62
Current amount due (b)	**Payable by 29/04/2019**	**181242.62**
	Total (a) + (b)	**1376880.01**
Total (a) + (b) above	1376880.01	
Total liability	**1376880.01**	

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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

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(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR Post Office Pick n Pay EasyPay payCity PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	1376880.01
Amount due if paid in cash	1376880.00
Rounded down amount carried forward to next invoice	0.01

>>>>> 915552202268861

Account details as at 03/04/2019	**Account number**	**220226886**

ELECTRICITY (Period 01/03/2019 to 29/03/2019 - 29 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 107162.000 kWh / Daily average 3695.241 kWh

& Consumption charge: Commercial (Small Power User - High)	
(107162.000 kWh X R 1.4065)	150723.35
& Service charge	
(29 Days X R 49.3300)	1430.57
	152153.92

Add interest on outstanding balance	**6265.61**
Add 15% VAT on amounts marked with & above	**22823.09**
Current account: Total due	**181242.62**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553600	007	1293.473kWh	(Actual)	1400.635kWh	(Actual)	107.162(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	190007087988
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 07/05/2019 **Due date 03/06/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		1376880.01
Less payments		0.00
Arrears (a)	**Payable immediately**	**1376880.01**
Latest account - see overleaf		195454.55
Current amount due (b)	**Payable by 03/06/2019**	**195454.55**
	Total (a) + (b)	**1572334.56**
Total (a) + (b) above	1572334.56	
Total liability	**1572334.56**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS SPAR
Post Office Pick n Pay EasyPay payCity PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	1572334.56
Amount due if paid in cash	1572334.50
Rounded down amount carried forward to next invoice	0.06

>>>>> 915552202268861

Account details as at 07/05/2019	Account number	220226886

ELECTRICITY (Period 30/03/2019 to 30/04/2019 - 32 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 115925.000 kWh / Daily average 3622.656 kWh

& Consumption charge: Commercial (Small Power User - High)	
(115925.000 kWh X R 1.4065)	163048.51
& Service charge	
(32 Days X R 49.3300)	1578.56
	164627.07

Add interest on outstanding balance	**6133.42**
Add 15% VAT on amounts marked with & above	**24694.06**
Current account: Total due	**195454.55**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553600	007	1400.635kWh	(Actual)	1516.560kWh	(Actual)	115.925(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	180007231973
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 05/06/2019 — **Due date 01/07/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		1572334.56
Less payments		0.00
Arrears (a)	**Payable immediately**	**1572334.56**
Latest account - see overleaf		176906.66
Current amount due (b)	**Payable by 01/07/2019**	**176906.66**
	Total (a) + (b)	**1749241.22**
Total (a) + (b) above	1749241.22	
Total liability	**1749241.22**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR Post Office Pick n Pay EasyPay payCity PEP

PUBLIC WORKS AND TRANSPORT

>>>>> 915552202268861

Account number	**220226886**
Total due if not paid in cash	1749241.22
Amount due if paid in cash	1749241.20
Rounded down amount carried forward to next invoice	0.02

Account details as at 05/06/2019	Account number	220226886

ELECTRICITY (Period 01/05/2019 to 29/05/2019 - 29 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 102637.000 kWh / Daily average 3539.207 kWh

& Consumption charge: Commercial (Small Power User - High)	
(102637.000 kWh X R 1.4065)	144358.94
& Service charge	
(29 Days X R 49.3300)	1430.57
	145789.51

Add interest on outstanding balance	**9248.72**
Add 15% VAT on amounts marked with & above	**21868.43**
Current account: Total due	**176906.66**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553600	007	1516.560kWh	(Actual)	1619.197kWh	(Actual)	102.637(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	500015132178
Customer VAT registration number	
Account number	220226886
Distribution code	01-08-R002-01
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 05/07/2019 — **Due date 30/07/2019**
At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		1749241.22
Less payments (13/06/2019)	Thank you	1572334.56-
Arrears (a)	**Payable immediately**	**176906.66**
Latest account - see overleaf		193856.29
Current amount due (b)	**Payable by 30/07/2019**	**193856.29**
	Total (a) + (b)	**370762.95**
Total (a) + (b) above	370762.95	
Total liability	**370762.95**	

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www.capetown.gov.za/thinkwater

Please note:

1. Payment options
(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.
(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference
(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.
2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.
3. Interest will be charged on all amounts still outstanding after the due date.
4. You may not withhold payment, even if you have submitted a query to the City concerning this account.
5. Failure to pay could result in;
(a) The City recovering debt overdue on the purchasing of pre-paid electricity,
(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed. A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR
Post Office Pick n Pay EasyPay payCity PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	370762.95
Amount due if paid in cash	370762.90
Rounded down amount carried forward to next invoice	0.05

>>>>> 915552202268861

Account details as at 05/07/2019	Account number	220226886

ELECTRICITY (Period 30/05/2019 to 28/06/2019 - 30 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 118799.000 kWh / Daily average 3959.967 kWh

& Consumption charge: Commercial (Small Power User - High)	
(118799.000 kWh X R 1.4065)	167090.79
& Service charge	
(30 Days X R 49.3300)	1479.90
	168570.69

Add 15% VAT on amounts marked with & above	**25285.60**
Current account: Total due	**193856.29**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553600	007	1619.197kWh	(Actual)	1737.996kWh	(Actual)	118.799(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	190007215427
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 06/08/2019 — **Due date 02/09/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		370762.95
Less payments (17/07/2019)	Thank you	176906.66-
Arrears (a)	**Payable immediately**	**193856.29**
Latest account - see overleaf		213358.67
Current amount due (b)	**Payable by 02/09/2019**	**213358.67**
	Total (a) + (b)	**407214.96**
Total (a) + (b) above	407214.96	
Total liability	**407214.96**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay, WOOLWORTHS, payCity, SPAR, PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	407214.96
Amount due if paid in cash	407214.90
Rounded down amount carried forward to next invoice	0.06

>>>>> 915552202268861

Account details as at 06/08/2019	Account number	220226886

ELECTRICITY (Period 29/06/2019 to 26/07/2019 - 28 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 120878.000 kWh / Daily average 4317.071 kWh

& From 29/06/2019 : Consumption charge: Commercial (Small Power User - High)	
(8634.142 kWh X R 1.4065)	12143.92
& From 29/06/2019 : Service charge	
(2 Days X R 49.3300)	98.66
& From 01/07/2019 : Consumption charge: Commercial (Small Power User - High)	
(112243.858 kWh X R 1.5314)	171890.24
& From 01/07/2019 : Service charge	
(26 Days X R 53.7100)	1396.46
	185529.28

Add 15% VAT on amounts marked with & above	**27829.39**
Current account: Total due	**213358.67**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553600	007	1737.996kWh	(Actual)	1858.874kWh	(Actual)	120.878(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	130007928411
Customer VAT registration number	
Account number	220226886
Distribution code	01-08-R002-01
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 05/09/2019 **Due date 30/09/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		407214.96
Less payments		0.00
Arrears (a)	**Payable immediately**	**407214.96**
Latest account - see overleaf		254828.89
Current amount due (b)	**Payable by 30/09/2019**	**254828.89**
	Total (a) + (b)	**662043.85**
Total (a) + (b) above	662043.85	
Total liability	**662043.85**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, SHOPRITE, Checkers, WOOLWORTHS, W, SPAR, Post Office, Pick n Pay, EasyPay, payCity, PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	662043.85
Amount due if paid in cash	662043.80
Rounded down amount carried forward to next invoice	0.05

>>>>> 915552202268861

Account details as at 05/09/2019	Account number	220226886

ELECTRICITY (Period 27/07/2019 to 29/08/2019 - 34 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 142628.000 kWh / Daily average 4194.941 kWh

& Consumption charge: Commercial (Small Power User - High)	
(142628.000 kWh X R 1.5314)	218420.52
& Service charge	
(34 Days X R 53.7100)	1826.14
	220246.66

Add interest on outstanding balance	**1545.23**
Add 15% VAT on amounts marked with & above	**33037.00**
Current account: Total due	**254828.89**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553600	007	1858.874kWh	(Actual)	2001.502kWh	(Actual)	142.628(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	230006899228
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 04/10/2019 **Due date** **29/10/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		662043.85
Less payments		0.00
Arrears (a)	**Payable immediately**	**662043.85**
Latest account - see overleaf		210314.44
Current amount due (b)	**Payable by 29/10/2019**	**210314.44**
	Total (a) + (b)	**872358.29**
Total (a) + (b) above	872358.29	
Total liability	**872358.29**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR
Post Office Pick n Pay EasyPay Pay online at www.easypay.co.za payCity connected citizens www.paycity.co.za PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	872358.29
Amount due if paid in cash	872358.20
Rounded down amount carried forward to next invoice	0.09

>>>>> 915552202268861

Account details as at 04/10/2019	Account number	220226886

ELECTRICITY (Period 30/08/2019 to 27/09/2019 - 29 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 117527.000 kWh / Daily average 4052.655 kWh

& Consumption charge: Commercial (Small Power User - High)	
(117527.000 kWh X R 1.5314)	179980.85
& Service charge	
(29 Days X R 53.7100)	1557.59
	181538.44

Add interest on outstanding balance	**1545.23**
Add 15% VAT on amounts marked with & above	**27230.77**
Current account: Total due	**210314.44**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553600	007	2001.502kWh	(Actual)	2119.029kWh	(Actual)	117.527(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	500015365250
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 07/11/2019 **Due date 02/12/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		872358.29
Less payments (29/10/2019)	Thank you	872358.29-
(a)		**0.00**
Latest account - see overleaf		209047.71
Current amount due (b)	**Payable by 02/12/2019**	**209047.71**
	Total (a) + (b)	**209047.71**
Total (a) + (b) above	209047.71	
Total liability	**209047.71**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR Post Office Pick n Pay EasyPay payCity PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	209047.71
Amount due if paid in cash	209047.70
Rounded down amount carried forward to next invoice	0.01

>>>>> 915552202268861

Account details as at 07/11/2019	**Account number**	**220226886**

ELECTRICITY (Period 28/09/2019 to 28/10/2019 - 31 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 117615.000 kWh / Daily average 3794.032 kWh

& Consumption charge: Commercial (Small Power User - High)	
(117615.000 kWh X R 1.5314)	180115.61
& Service charge	
(31 Days X R 53.7100)	1665.01
	181780.62

Add 15% VAT on amounts marked with & above	**27267.09**
Current account: Total due	**209047.71**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553600	007	2119.029kWh	(Actual)	2236.644kWh	(Actual)	117.615(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	500015412103
Customer VAT registration number	
Account number	220226886
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: NATIONAL BOTANICAL GARDENS
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 09/12/2019 **Due date** **03/01/2020**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		209047.71
Less payments		0.00
Arrears (a)	**Payable immediately**	**209047.71**
Latest account - see overleaf		219848.61
Current amount due (b)	**Payable by 03/01/2020**	**219848.61**
	Total (a) + (b)	**428896.32**
Total (a) + (b) above	428896.32	
Total liability	**428896.32**	

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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226886 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR
Post Office Pick n Pay EasyPay payCity PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226886**
Total due if not paid in cash	428896.32
Amount due if paid in cash	428896.30
Rounded down amount carried forward to next invoice	0.02

>>>>> 915552202268861

Account details as at 09/12/2019	Account number	220226886

ELECTRICITY (Period 29/10/2019 to 28/11/2019 - 31 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 3507409553600 / Consumption 123748.000 kWh / Daily average 3991.871 kWh

& Consumption charge: Commercial (Small Power User - High)	
(123748.000 kWh X R 1.5314)	189507.69
& Service charge	
(31 Days X R 53.7100)	1665.01
	191172.70

Add 15% VAT on amounts marked with & above	**28675.91**
Current account: Total due	**219848.61**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553600	007	2236.644kWh	(Actual)	2360.392kWh	(Actual)	123.748(X1000)k

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	500012922184
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 14/01/2019 **Due date 08/02/2019**

At BOTANICAL GARDENS, KIRSTENBOSCH 875 / Erf 875

Previous account balance		232.40-
Less payments		0.00
Credit (a)		**232.40-**
Latest account - see overleaf		1655.92
Current amount due (b)	**Payable by 08/02/2019**	**1655.92**
	Total (a) + (b)	**1423.52**
Total (a) + (b) above	1423.52	
Total liability	**1423.52**	

THINK WATER
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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed. A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS SPAR Post Office Pick n Pay EasyPay payCity PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	1423.52
Amount due if paid in cash	1423.50
Rounded down amount carried forward to next invoice	0.02

>>>>> 915552180371570

Account details as at 14/01/2019	Account number	218037157

PROPERTY RATES (Period 08/12/2018 to 08/01/2019) 32 Days
At BOTANICAL GARDENS, KIRSTENBOSCH 875 / Erf 875

Total value	
# From 08/12/2018 : R 0.00 @ 0.0143080 ÷ 365 x 32	0.00
	0.00

ELECTRICITY (Period 02/10/2018 to 02/01/2019 - 93 Days) (Actual reading)
At BOTANICAL GARDENS, KIRSTENBOSCH 875 / Erf 875
Meter no: 345052 / Consumption 3272.000 kWh / Daily average 35.183 kWh

Consumption charge: domestic	
& From 02/10/2018 : (1) 458.6300 kWh @ R 1.6115 (2) 611.5070 kWh @ R 1.6115	
(3) 764.3840 kWh @ R 1.6115 (4) 1,437.4790 kWh @ R 2.2239	6153.13
& Home User Charge	130.44
Reversal of estimated consumption (2531.076 kWh)	4843.64-
	1439.93

Add 15% VAT on amounts marked with & above	**215.99**
0% VAT on amounts marked with # above	
Current account: Total due	**1655.92**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 345052	001	908274.000kWh	(Actual)	911546.000kWh	(Actual)	3272.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	170007145003
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 08/02/2019 **Due date 05/03/2019**

At BOTANICAL GARDENS, KIRSTENBOSCH 875 / Erf 875

Previous account balance		1423.52
Less payments		0.00
Arrears (a)	**Payable immediately**	**1423.52**
Latest account - see overleaf		3013.45
Current amount due (b)	**Payable by 05/03/2019**	**3013.45**
	Total (a) + (b)	**4436.97**
Total (a) + (b) above	4436.97	
Total liability	**4436.97**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR
Post Office PicknPay EasyPay payCity PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	4436.97
Amount due if paid in cash	4436.90
Rounded down amount carried forward to next invoice	0.07

>>>>> 915552180371570

Account details as at 08/02/2019		Account number	218037157

PROPERTY RATES (Period 09/01/2019 to 07/02/2019) 30 Days
At BOTANICAL GARDENS, KIRSTENBOSCH 875 / Erf 875

Total value	
# From 09/01/2019 : R 0.00 @ 0.0143080 ÷ 365 x 30	0.00
	0.00

ELECTRICITY (Period 03/01/2019 to 08/02/2019 - 37 Days) (Estimate reading)
At BOTANICAL GARDENS, KIRSTENBOSCH 875 / Erf 875
Meter no: 345052 / Consumption 1320.618 kWh / Daily average 35.692 kWh

Consumption charge: domestic	
& (1) 182.4660 kWh @ R 1.6115 (2) 243.2870 kWh @ R 1.6115	
(3) 304.1100 kWh @ R 1.6115 (4) 590.7555 kWh @ R 2.2239	2489.95
& Home User Charge	130.44
	2620.39

Add 15% VAT on amounts marked with & above	**393.06**
0% VAT on amounts marked with # above	
Current account: Total due	**3013.45**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	345052	001	911546.000kWh	(Actual)	912866.618kWh	(Estimate)	1320.618kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	120007793564
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 08/03/2019 **Due date** **02/04/2019**

At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		4436.97
Less payments (19/02/2019)	Thank you	1655.92-
Arrears (a)	**Payable immediately**	**2781.05**
Latest account - see overleaf		2259.41
Current amount due (b)	**Payable by 02/04/2019**	**2259.41**
	Total (a) + (b)	**5040.46**
Total (a) + (b) above	5040.46	
Total liability	**5040.46**	

THINK WATER
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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	5040.46
Amount due if paid in cash	5040.40
Rounded down amount carried forward to next invoice	0.06

>>>>> 915552180371570

Account details as at 08/03/2019	Account number	218037157

PROPERTY RATES (Period 08/02/2019 to 07/03/2019) 28 Days
At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Total value	
# From 08/02/2019 : R 0.00 @ 0.0143080 ÷ 365 x 28	0.00
	0.00

ELECTRICITY (Period 09/02/2019 to 06/03/2019 - 26 Days) (Estimate reading)
At 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 966.029 kWh / Daily average 37.155 kWh

Consumption charge: domestic	
& (1) 128.2190 kWh @ R 1.6115 (2) 170.9590 kWh @ R 1.6115	
(3) 213.6990 kWh @ R 1.6115 (4) 453.1519 kWh @ R 2.2239	1834.26
& Home User Charge	130.44
	1964.70

Add 15% VAT on amounts marked with & above	**294.71**
0% VAT on amounts marked with # above	
Current account: Total due	**2259.41**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 345052	001	912866.618kWh	(Estimate)	913832.647kWh	(Estimate)	966.029kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	240006560364
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 08/04/2019 — **Due date 03/05/2019**

At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		5040.46
Less payments (31/03/2019)	Thank you	6696.38-
Credit (a)		**1655.92-**
Latest account - see overleaf		1160.53
Current amount due (b)	**Payable by 03/05/2019**	**1160.53**
	Total (a) + (b)	**495.39-**
Total (a) + (b) above	495.39-	
Total liability	**495.39-**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS SPAR Post Office Pick n Pay EasyPay payCity PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	495.39-
Amount due if paid in cash	495.39-
Rounded down amount carried forward to next invoice	495.39-

>>>>> 915552180371570

Account details as at 08/04/2019	Account number	218037157

PROPERTY RATES (Period 08/03/2019 to 05/04/2019) 29 Days
At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Total value	
# From 08/03/2019 : R 0.00 @ 0.0143080 ÷ 365 x 29	0.00
	0.00

ELECTRICITY (Period 03/01/2019 to 01/04/2019 - 89 Days) (Actual reading)
At 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 2823.000 kWh / Daily average 31.719 kWh

Consumption charge: domestic	
& From 03/01/2019 : (1) 438.9040 kWh @ R 1.6115 (2) 585.2060 kWh @ R 1.6115	
(3) 731.5060 kWh @ R 1.6115 (4) 1,067.3840 kWh @ R 2.2239	5202.93
& Home User Charge	130.44
Reversal of estimated consumption (2286.648 kWh)	4324.21-
	1009.16

Add 15% VAT on amounts marked with & above	**151.37**
0% VAT on amounts marked with # above	
Current account: Total due	**1160.53**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 345052	001	911546.000kWh	(Actual)	914369.000kWh	(Actual)	2823.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	108009317206
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655, Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 09/05/2019 **Due date 03/06/2019**

At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		495.39-
Less payments		0.00
Credit (a)		**495.39-**
Latest account - see overleaf		2194.98
Current amount due (b)	**Payable by 03/06/2019**	**2194.98**
	Total (a) + (b)	**1699.59**
Total (a) + (b) above	1699.59	
Total liability	**1699.59**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay, WOOLWORTHS, payCity, SPAR, PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	1699.59
Amount due if paid in cash	1699.50
Rounded down amount carried forward to next invoice	0.09

>>>>> 915552180371570

Account details as at 09/05/2019	**Account number**	**218037157**

PROPERTY RATES (Period 06/04/2019 to 08/05/2019) 33 Days
At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Total value	
# From 06/04/2019 : R 0.00 @ 0.0143080 ÷ 365 x 33	0.00
	0.00

ELECTRICITY (Period 02/04/2019 to 02/05/2019 - 31 Days) (Actual reading)
At 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 968.000 kWh / Daily average 31.226 kWh

Consumption charge: domestic	
& (1) 152.8770 kWh @ R 1.6115 (2) 203.8350 kWh @ R 1.6115	
(3) 254.7950 kWh @ R 1.6115 (4) 356.4930 kWh @ R 2.2239	1778.24
& Home User Charge	130.44
	1908.68

Add 15% VAT on amounts marked with & above	**286.30**
0% VAT on amounts marked with # above	
Current account: Total due	**2194.98**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	345052	001	914369.000kWh	(Actual)	915337.000kWh	(Actual)	968.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	130007806336
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 10/06/2019 **Due date** **05/07/2019**

At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		1699.59
Less payments		0.00
Arrears (a)	**Payable immediately**	**1699.59**
Latest account - see overleaf		1707.97
Current amount due (b)	**Payable by 05/07/2019**	**1707.97**
	Total (a) + (b)	**3407.56**
Total (a) + (b) above	3407.56	
Total liability	**3407.56**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay (Pay online at www.easypay.co.za), WOOLWORTHS, payCity (connected citizens, www.paycity.co.za), SPAR, PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	3407.56
Amount due if paid in cash	3407.50
Rounded down amount carried forward to next invoice	0.06

>>>>> 915552180371570

Account details as at 10/06/2019	Account number	218037157

PROPERTY RATES (Period 09/05/2019 to 07/06/2019) 30 Days
At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Total value	
# From 09/05/2019 : R 0.00 @ 0.0143080 ÷ 365 x 30	0.00
	0.00

ELECTRICITY (Period 03/05/2019 to 03/06/2019 - 32 Days) (Actual reading)
At 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 783.000 kWh / Daily average 24.469 kWh

Consumption charge: domestic	
& (1) 157.8080 kWh @ R 1.6115 (2) 210.4110 kWh @ R 1.6115	
(3) 263.0140 kWh @ R 1.6115 (4) 151.7670 kWh @ R 2.2239	1354.75
& Home User Charge	130.44
	1485.19

Add 15% VAT on amounts marked with & above	**222.78**
0% VAT on amounts marked with # above	
Current account: Total due	**1707.97**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 345052	001	915337.000kWh	(Actual)	916120.000kWh	(Actual)	783.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	120007992962
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
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Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 08/07/2019 **Due date 02/08/2019**

At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		3407.56
Less payments		0.00
Arrears (a)	**Payable immediately**	**3407.56**
Latest account - see overleaf		1748.68
Current amount due (b)	**Payable by 02/08/2019**	**1748.68**
	Total (a) + (b)	**5156.24**
Total (a) + (b) above	5156.24	
Total liability	**5156.24**	

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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS SPAR
Post Office PicknPay EasyPay payCity PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	5156.24
Amount due if paid in cash	5156.20
Rounded down amount carried forward to next invoice	0.04

>>>>> 915552180371570

Account details as at 08/07/2019 **Account number** **218037157**

PROPERTY RATES (Period 08/06/2019 to 05/07/2019) 28 Days
At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Total value	
# From 08/06/2019 : R 0.00 @ 0.0143080 ÷ 365 x 23	0.00
Agricultural	
Total value	
# From 01/07/2019 : R 0.00 @ 0.0011100 ÷ 366 x 5	0.00
	0.00

ELECTRICITY (Period 04/06/2019 to 01/07/2019 - 28 Days) (Actual reading)
At 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 711.000 kWh / Daily average 25.393 kWh

Consumption charge: domestic	
& From 04/06/2019 : (1) 133.1510 kWh @ R 1.6115 (2) 177.5340 kWh @ R 1.6115	
(3) 221.9180 kWh @ R 1.6115 (4) 153.0041 kWh @ R 2.2239	
& From 01/07/2019 : (1) 4.9180 kWh @ R 1.7546 (2) 6.5570 kWh @ R 1.7546	
(3) 8.1970 kWh @ R 1.7546 (4) 5.7209 kWh @ R 2.4214	1246.92
& Home User Charge	142.02
& Dunning charge	131.65
	1520.59

Add 15% VAT on amounts marked with & above **228.09**

0% VAT on amounts marked with # above

Current account: Total due **1748.68**

Meter details		**Previous reading**		**New reading**		**Units used**
ELECTRICITY 345052	001	916120.000kWh	(Actual)	916831.000kWh	(Actual)	711.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	290005864263
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 08/08/2019 **Due date 02/09/2019**

At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		5156.24
Less payments (17/07/2019)	Thank you	5107.15-
Arrears (a)	**Payable immediately**	**49.09**
Latest account - see overleaf		2182.33
Current amount due (b)	**Payable by 02/09/2019**	**2182.33**
	Total (a) + (b)	**2231.42**
Total (a) + (b) above	2231.42	
Total liability	**2231.42**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay (Pay online at www.easypay.co.za), WOOLWORTHS, W, payCity, SPAR, PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	2231.42
Amount due if paid in cash	2231.40
Rounded down amount carried forward to next invoice	0.02

>>>>> 915552180371570

Account details as at 08/08/2019	Account number	218037157

PROPERTY RATES (Period 06/07/2019 to 07/08/2019) 33 Days
At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Agricultural	
Total value	
# From 06/07/2019 : R 0.00 @ 0.0011100 ÷ 366 x 33	0.00
	0.00

ELECTRICITY (Period 02/07/2019 to 01/08/2019 - 31 Days) (Actual reading)
At 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 893.000 kWh / Daily average 28.806 kWh

Consumption charge: domestic	
& (1) 152.4590 kWh @ R 1.7546 (2) 203.2790 kWh @ R 1.7546	
(3) 254.0980 kWh @ R 1.7546 (4) 283.1640 kWh @ R 2.4214	1755.66
& Home User Charge	142.02
	1897.68

Add 15% VAT on amounts marked with & above	**284.65**
0% VAT on amounts marked with # above	
Current account: Total due	**2182.33**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 345052	001	916831.000kWh	(Actual)	917724.000kWh	(Actual)	893.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	210007186739
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 09/09/2019 **Due date** **04/10/2019**

At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		2231.42
Less payments (26/08/2019)	Thank you	1748.64-
Arrears (a)	**Payable immediately**	**482.78**
Latest account - see overleaf		2545.96
Current amount due (b)	**Payable by 04/10/2019**	**2545.96**
	Total (a) + (b)	**3028.74**
Total (a) + (b) above	3028.74	
Total liability	**3028.74**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS SPAR Post Office Pick n Pay EasyPay payCity PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	3028.74
Amount due if paid in cash	3028.70
Rounded down amount carried forward to next invoice	0.04

>>>>> 915552180371570

Account details as at 09/09/2019 **Account number** **218037157**

PROPERTY RATES (Period 08/08/2019 to 06/09/2019) 30 Days
At 28B RHODES DRIVE, WYNBERG NU / Erf 875

Agricultural	
Total value	
# From 08/08/2019 : R 0.00 @ 0.0011100 ÷ 366 x 30	0.00
	0.00

ELECTRICITY (Period 02/08/2019 to 02/09/2019 - 32 Days) (Actual reading)
At 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 1029.000 kWh / Daily average 32.156 kWh

Consumption charge: domestic	
& (1) 157.3770 kWh @ R 1.7546 (2) 209.8360 kWh @ R 1.7546	
(3) 262.2950 kWh @ R 1.7546 (4) 399.4920 kWh @ R 2.4214	2071.86
& Home User Charge	142.02
	2213.88

Add 15% VAT on amounts marked with & above	**332.08**
0% VAT on amounts marked with # above	
Current account: Total due	**2545.96**

Meter details		**Previous reading**	**New reading**	**Units used**
ELECTRICITY 345052	001	917724.000kWh (Actual)	918753.000kWh (Actual)	1029.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	108009580720
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 08/10/2019 **Due date 04/11/2019**

At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		3028.74
Less payments (07/10/2019)	Thank you	2231.40-
Arrears (a)	**Payable immediately**	**797.34**
Latest account - see overleaf		2170.75
Current amount due (b)	**Payable by 04/11/2019**	**2170.75**
	Total (a) + (b)	**2968.09**
Total (a) + (b) above	2968.09	
Total liability	**2968.09**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	2968.09
Amount due if paid in cash	2968.00
Rounded down amount carried forward to next invoice	0.09

>>>>> 915552180371570

Account details as at 08/10/2019	Account number	218037157

PROPERTY RATES (Period 07/09/2019 to 07/10/2019) 31 Days
At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875

Agricultural	
Total value	
# From 07/09/2019 : R 0.00 @ 0.0011100 ÷ 366 x 31	0.00
	0.00

ELECTRICITY (Period 03/09/2019 to 01/10/2019 - 29 Days) (Actual reading)
At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 878.000 kWh / Daily average 30.276 kWh

Consumption charge: domestic	
& (1) 142.6230 kWh @ R 1.7546 (2) 190.1640 kWh @ R 1.7546	
(3) 237.7050 kWh @ R 1.7546 (4) 307.5080 kWh @ R 2.4214	1745.59
& Home User Charge	142.02
	1887.61

Add 15% VAT on amounts marked with & above	**283.14**
0% VAT on amounts marked with # above	
Current account: Total due	**2170.75**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 345052	001	918753.000kWh	(Actual)	919631.000kWh	(Actual)	878.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	170007529742
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 08/11/2019 **Due date 03/12/2019**

At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		2968.09
Less payments (24/10/2019)	Thank you	797.30-
Arrears (a)	**Payable immediately**	**2170.79**
Latest account - see overleaf		1700.60
Current amount due (b)	**Payable by 03/12/2019**	**1700.60**
	Total (a) + (b)	**3871.39**
Total (a) + (b) above	3871.39	
Total liability	**3871.39**	

THINK WATER
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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR
Post Office PicknPay EasyPay payCity PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	3871.39
Amount due if paid in cash	3871.30
Rounded down amount carried forward to next invoice	0.09

>>>>> 915552180371570

Account details as at 08/11/2019 **Account number 218037157**

PROPERTY RATES (Period 08/10/2019 to 07/11/2019) 31 Days
At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875

Agricultural	
Total value	
# From 08/10/2019 : R 0.00 @ 0.0011100 ÷ 366 x 31	0.00
	0.00

ELECTRICITY (Period 02/10/2019 to 01/11/2019 - 31 Days) (Actual reading)
At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 720.000 kWh / Daily average 23.226 kWh

Consumption charge: domestic	
& (1) 152.4590 kWh @ R 1.7546 (2) 203.2790 kWh @ R 1.7546	
(3) 254.0980 kWh @ R 1.7546 (4) 110.1640 kWh @ R 2.4214	1336.76
& Home User Charge	142.02
	1478.78

Add 15% VAT on amounts marked with & above	**221.82**
0% VAT on amounts marked with # above	
Current account: Total due	**1700.60**

Meter details		**Previous reading**		**New reading**		**Units used**
ELECTRICITY 345052	001	919631.000kWh	(Actual)	920351.000kWh	(Actual)	720.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	270006508352
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 09/12/2019 **Due date** **03/01/2020**

At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		3871.39
Less payments		0.00
Arrears (a)	**Payable immediately**	**3871.39**
Latest account - see overleaf		2691.92
Current amount due (b)	**Payable by 03/01/2020**	**2691.92**
	Total (a) + (b)	**6563.31**
Total (a) + (b) above	6563.31	
Total liability	**6563.31**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay, WOOLWORTHS, payCity, SPAR, PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	6563.31
Amount due if paid in cash	6563.30
Rounded down amount carried forward to next invoice	0.01

>>>>> 915552180371570

Account details as at 09/12/2019	Account number	218037157

PROPERTY RATES (Period 08/11/2019 to 06/12/2019) 29 Days
At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875

Agricultural	
Total value	
# From 08/11/2019 : R 0.00 @ 0.0011100 ÷ 366 x 29	0.00
	0.00

ELECTRICITY (Period 02/11/2019 to 02/12/2019 - 31 Days) (Actual reading)
At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 1076.000 kWh / Daily average 34.710 kWh

Consumption charge: domestic	
& (1) 152.4590 kWh @ R 1.7546 (2) 203.2790 kWh @ R 1.7546	
(3) 254.0980 kWh @ R 1.7546 (4) 466.1640 kWh @ R 2.4214	2198.78
& Home User Charge	142.02
	2340.80

Add 15% VAT on amounts marked with & above	**351.12**
0% VAT on amounts marked with # above	
Current account: Total due	**2691.92**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 345052	001	920351.000kWh	(Actual)	921427.000kWh	(Actual)	1076.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	120008617392
Customer VAT registration number	
Account number	218037157
Distribution code	
Business partner number	1000954838

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS
CARE OF: THE CURATOR
KIRSTENBOSCH NATIONAL BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 09/10/2020 **Due date 03/11/2020**

At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875

Previous account balance		136075.65
Less payments		0.00
Arrears (a)	**Payable immediately**	**136075.65**
Latest account - see overleaf		3294.37
Current amount due (b)	**Payable by 03/11/2020**	**3294.37**
	Total (a) + (b)	**139370.02**
Total (a) + (b) above	139370.02	
Total liability	**139370.02**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 218037157 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS SPAR Post Office Pick n Pay EasyPay payCity PEP

KIRSTENBOSCH NATIONAL BOTANICAL GARDENS

Account number	**218037157**
Total due if not paid in cash	139370.02
Amount due if paid in cash	139370.00
Rounded down amount carried forward to next invoice	0.02

>>>>> 915552180371570

Account details as at 09/10/2020	Account number	218037157

PROPERTY RATES (Period 08/09/2020 to 07/10/2020) 30 Days
At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875

Agricultural	
# From 08/09/2020 : R 0.00 @ 0.0011540 ÷ 365 x 30	0.00
	0.00

ELECTRICITY (Period 09/09/2020 to 08/10/2020 - 30 Days) (Estimate reading)
At KIRSTENBOSCH, 28B RHODES DRIVE, WYNBERG NU / Erf 875
Meter no: 345052 / Consumption 910.508 kWh / Daily average 30.350 kWh

Consumption charge: Home User	
& (1) 147.9450 kWh @ R 1.8393 (2) 197.2600 kWh @ R 1.8393	
(3) 246.5760 kWh @ R 1.8393 (4) 318.7271 kWh @ R 2.5383	1897.49
& Home User Charge	148.88
	2046.37

SUNDRIES

& Dunning charge	144.00
	144.00

Add interest on outstanding balance	**775.44**
Add 15% VAT on amounts marked with & above	**328.56**
0% VAT on amounts marked with # above	
Current account: Total due	**3294.37**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 345052	001	930314.487kWh	(Estimate)	931224.995kWh	(Estimate)	910.508kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	109008398612
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 04/01/2019 **Due date 29/01/2019**
At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		71797.98
Less payments		0.00
Arrears (a)	**Payable immediately**	**71797.98**
Latest account - see overleaf		25372.44
Current amount due (b)	**Payable by 29/01/2019**	**25372.44**
	Total (a) + (b)	**97170.42**
Total (a) + (b) above	97170.42	
Total liability	**97170.42**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR
Post Office Pick n Pay EasyPay payCity PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	97170.42
Amount due if paid in cash	97170.40
Rounded down amount carried forward to next invoice	0.02

>>>>> 915552202268705

Account details as at 04/01/2019	Account number	220226870

ELECTRICITY (Period 29/11/2018 to 02/01/2019 - 35 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 14321.000 kWh / Daily average 409.171 kWh

& Consumption charge: Commercial (Small Power User - High)	
(14321.000 kWh X R 1.4065)	20142.49
& Service charge	
(35 Days X R 49.3300)	1726.55
	21869.04

Add interest on outstanding balance	**223.04**
Add 15% VAT on amounts marked with & above	**3280.36**
Current account: Total due	**25372.44**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 474903	001	627588.000kWh	(Actual)	641909.000kWh	(Actual)	14321.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	140007493369
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 05/02/2019 **Due date 04/03/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		97170.42
Less payments		0.00
Arrears (a)	**Payable immediately**	**97170.42**
Latest account - see overleaf		29481.28
Current amount due (b)	**Payable by 04/03/2019**	**29481.28**
	Total (a) + (b)	**126651.70**
Total (a) + (b) above	126651.70	
Total liability	**126651.70**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

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(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS SPAR Post Office PicknPay EasyPay payCity PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	126651.70
Amount due if paid in cash	126651.70
Rounded down amount carried forward to next invoice	0.00

>>>>> 915552202268705

Account details as at 05/02/2019	Account number	220226870

ELECTRICITY (Period 03/01/2019 to 05/02/2019 - 34 Days) (Estimate reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 16795.691 kWh / Daily average 493.991 kWh

& Consumption charge: Commercial (Small Power User - High)	
(16795.691 kWh X R 1.4065)	23623.14
& Service charge	
(34 Days X R 49.3300)	1677.22
	25300.36

Add interest on outstanding balance	**385.87**
Add 15% VAT on amounts marked with & above	**3795.05**
Current account: Total due	**29481.28**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	474903	001	641909.000kWh	(Actual)	658704.691kWh	(Estimate)	16795.691kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	201008211328
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 05/03/2019 — **Due date** **01/04/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		126651.70
Less payments		0.00
Arrears (a)	**Payable immediately**	**126651.70**
Latest account - see overleaf		17129.27
Current amount due (b)	**Payable by 01/04/2019**	**17129.27**
	Total (a) + (b)	**143780.97**
Total (a) + (b) above	143780.97	
Total liability	**143780.97**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · Post Office · SHOPRITE · Pick n Pay · Checkers · EasyPay · WOOLWORTHS · payCity · SPAR · PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	143780.97
Amount due if paid in cash	143780.90
Rounded down amount carried forward to next invoice	0.07

>>>>> 915552202268705

Account details as at 05/03/2019	Account number	220226870

ELECTRICITY (Period 03/01/2019 to 05/03/2019 - 62 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 26156.000 kWh / Daily average 421.871 kWh

& Consumption charge: Commercial (Small Power User - High)	
(26156.000 kWh X R 1.4065)	36788.41
& Service charge	
(28 Days X R 49.3300)	1381.24
Reversal of estimated consumption (16795.691 kWh)	23623.14-
	14546.51

Add interest on outstanding balance	**400.78**
Add 15% VAT on amounts marked with & above	**2181.98**
Current account: Total due	**17129.27**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	474903	001	641909.000kWh	(Actual)	668065.000kWh	(Actual)	26156.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	500014255085
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 08/04/2019 **Due date 03/05/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		143780.97
Less payments		0.00
Arrears (a)	**Payable immediately**	**143780.97**
Latest account - see overleaf		20544.53
Current amount due (b)	**Payable by 03/05/2019**	**20544.53**
	Total (a) + (b)	**164325.50**
Total (a) + (b) above	164325.50	
Total liability	**164325.50**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR
Post Office Pick n Pay EasyPay payCity PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	164325.50
Amount due if paid in cash	164325.50
Rounded down amount carried forward to next invoice	0.00

>>>>> 915552202268705

Account details as at 08/04/2019	Account number	220226870

ELECTRICITY (Period 06/03/2019 to 01/04/2019 - 27 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 11273.000 kWh / Daily average 417.519 kWh

& Consumption charge: Commercial (Small Power User - High)	
(11273.000 kWh X R 1.4065)	15855.47
& Service charge	
(27 Days X R 49.3300)	1331.91
	17187.38

Add interest on outstanding balance	**779.04**
Add 15% VAT on amounts marked with & above	**2578.11**
Current account: Total due	**20544.53**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 474903	001	668065.000kWh	(Actual)	679338.000kWh	(Actual)	11273.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	108009305457
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 06/05/2019 **Due date 31/05/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		164325.50
Less payments (09/04/2019)	Thank you	185868.85-
Credit (a)		**21543.35-**
Latest account - see overleaf		22442.88
Current amount due (b)	**Payable by 31/05/2019**	**22442.88**
	Total (a) + (b)	**899.53**
Total (a) + (b) above	899.53	
Total liability	**899.53**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed. A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, SHOPRITE, Checkers, WOOLWORTHS, SPAR, Post Office, Pick n Pay, EasyPay, payCity, PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	899.53
Amount due if paid in cash	899.50
Rounded down amount carried forward to next invoice	0.03

>>>>> 915552202268705

Account details as at 06/05/2019	Account number	220226870

ELECTRICITY (Period 02/04/2019 to 02/05/2019 - 31 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 12788.000 kWh / Daily average 412.516 kWh

& Consumption charge: Commercial (Small Power User - High)	
(12788.000 kWh X R 1.4065)	17986.32
& Service charge	
(31 Days X R 49.3300)	1529.23
	19515.55

Add 15% VAT on amounts marked with & above	**2927.33**
Current account: Total due	**22442.88**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 474903	001	679338.000kWh	(Actual)	692126.000kWh	(Actual)	12788.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	180007231972
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655, Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 05/06/2019 — **Due date 01/07/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		899.53
Less payments		0.00
Arrears (a)	**Payable immediately**	**899.53**
Latest account - see overleaf		23504.07
Current amount due (b)	**Payable by 01/07/2019**	**23504.07**
	Total (a) + (b)	**24403.60**
Total (a) + (b) above	24403.60	
Total liability	**24403.60**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, SHOPRITE, Checkers, WOOLWORTHS, SPAR, Post Office, Pick n Pay, EasyPay, payCity, PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	24403.60
Amount due if paid in cash	24403.60
Rounded down amount carried forward to next invoice	0.00

>>>>> 915552202268705

Account details as at 05/06/2019	Account number	220226870

ELECTRICITY (Period 03/05/2019 to 03/06/2019 - 32 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 13409.000 kWh / Daily average 419.031 kWh

& Consumption charge: Commercial (Small Power User - High)	
(13409.000 kWh X R 1.4065)	18859.76
& Service charge	
(32 Days X R 49.3300)	1578.56
	20438.32

Add 15% VAT on amounts marked with & above	**3065.75**
Current account: Total due	**23504.07**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 474903	001	692126.000kWh	(Actual)	705535.000kWh	(Actual)	13409.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	160007490691
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 03/07/2019 — **Due date 29/07/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		24403.60
Less payments (13/06/2019)	Thank you	899.53-
Arrears (a)	**Payable immediately**	**23504.07**
Latest account - see overleaf		20310.21
Current amount due (b)	**Payable by 29/07/2019**	**20310.21**
	Total (a) + (b)	**43814.28**
Total (a) + (b) above	43814.28	
Total liability	**43814.28**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	43814.28
Amount due if paid in cash	43814.20
Rounded down amount carried forward to next invoice	0.08

>>>>> 915552202268705

Account details as at 03/07/2019	Account number	220226870

ELECTRICITY (Period 04/06/2019 to 01/07/2019 - 28 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 11535.000 kWh / Daily average 411.964 kWh

& From 04/06/2019 : Consumption charge: Commercial (Small Power User - High)	
(11123.036 kWh X R 1.4065)	15644.55
& From 04/06/2019 : Service charge	
(27 Days X R 49.3300)	1331.91
& From 01/07/2019 : Consumption charge: Commercial (Small Power User - High)	
(411.964 kWh X R 1.5314)	630.88
& From 01/07/2019 : Service charge	
(1 Days X R 53.7100)	53.71
	17661.05

Add 15% VAT on amounts marked with & above	**2649.16**
Current account: Total due	**20310.21**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 474903	001	705535.000kWh	(Actual)	717070.000kWh	(Actual)	11535.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	130007882219
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 05/08/2019 — **Due date 30/08/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		43814.28
Less payments (09/07/2019)	Thank you	23504.07-
Arrears (a)	**Payable immediately**	**20310.21**
Latest account - see overleaf		27420.92
Current amount due (b)	**Payable by 30/08/2019**	**27420.92**
	Total (a) + (b)	**47731.13**
Total (a) + (b) above	47731.13	
Total liability	**47731.13**	

THINK WATER
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www.capetown.gov.za/thinkwater

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · Post Office · SHOPRITE · Pick n Pay · Checkers · EasyPay · WOOLWORTHS · payCity · SPAR · PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	47731.13
Amount due if paid in cash	47731.10
Rounded down amount carried forward to next invoice	0.03

>>>>> 915552202268705

Account details as at 05/08/2019	**Account number**	**220226870**

ELECTRICITY (Period 02/07/2019 to 01/08/2019 - 31 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 14483.000 kWh / Daily average 467.194 kWh

& Consumption charge: Commercial (Small Power User - High)

(14483.000 kWh X R 1.5314) 22179.27

& Service charge

(31 Days X R 53.7100) 1665.01

23844.28

Add 15% VAT on amounts marked with & above **3576.64**

Current account: Total due **27420.92**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	474903	001	717070.000kWh	(Actual)	731553.000kWh	(Actual)	14483.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	105004802134
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 04/09/2019 **Due date 30/09/2019**
At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		47731.13
Less payments (26/08/2019)	Thank you	47731.13-
(a)		**0.00**
Latest account - see overleaf		27303.05
Current amount due (b)	**Payable by 30/09/2019**	**27303.05**
	Total (a) + (b)	**27303.05**
Total (a) + (b) above	27303.05	
Total liability	**27303.05**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · Post Office · SHOPRITE · Pick n Pay · Checkers · EasyPay · WOOLWORTHS · payCity · SPAR · PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	27303.05
Amount due if paid in cash	27303.00
Rounded down amount carried forward to next invoice	0.05

>>>>> 915552202268705

Account details as at 04/09/2019	Account number	220226870

ELECTRICITY (Period 02/08/2019 to 02/09/2019 - 32 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 14381.000 kWh / Daily average 449.406 kWh

& Consumption charge: Commercial (Small Power User - High)	
(14381.000 kWh X R 1.5314)	22023.06
& Service charge	
(32 Days X R 53.7100)	1718.72
	23741.78

Add 15% VAT on amounts marked with & above	**3561.27**
Current account: Total due	**27303.05**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	474903	001	731553.000kWh	(Actual)	745934.000kWh	(Actual)	14381.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	170007479704
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655, Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 03/10/2019 **Due date 28/10/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		27303.05
Less payments		0.00
Arrears (a)	**Payable immediately**	**27303.05**
Latest account - see overleaf		25476.40
Current amount due (b)	**Payable by 28/10/2019**	**25476.40**
	Total (a) + (b)	**52779.45**
Total (a) + (b) above	52779.45	
Total liability	**52779.45**	

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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay (Pay online at www.easypay.co.za), WOOLWORTHS, payCity, SPAR, PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	52779.45
Amount due if paid in cash	52779.40
Rounded down amount carried forward to next invoice	0.05

>>>>> 915552202268705

Account details as at 03/10/2019 **Account number** **220226870**

ELECTRICITY (Period 03/09/2019 to 01/10/2019 - 29 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 13449.000 kWh / Daily average 463.759 kWh

& Consumption charge: Commercial (Small Power User - High)	
(13449.000 kWh X R 1.5314)	20595.80
& Service charge	
(29 Days X R 53.7100)	1557.59
	22153.39

Add 15% VAT on amounts marked with & above	**3323.01**
Current account: Total due	**25476.40**

Meter details		**Previous reading**		**New reading**		**Units used**
ELECTRICITY 474903	001	745934.000kWh	(Actual)	759383.000kWh	(Actual)	13449.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	240006824868
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 05/11/2019 — **Due date 02/12/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		52779.45
Less payments (24/10/2019)	Thank you	52779.40-
Rounded down amount b/f (a)		**0.05**
Latest account - see overleaf		24122.23
Current amount due (b)	**Payable by 02/12/2019**	**24122.23**
	Total (a) + (b)	**24122.28**
Total (a) + (b) above	24122.28	
Total liability	**24122.28**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, SHOPRITE, Checkers, WOOLWORTHS, SPAR, Post Office, Pick n Pay, EasyPay, payCity, PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	24122.28
Amount due if paid in cash	24122.20
Rounded down amount carried forward to next invoice	0.08

>>>>> 915552202268705

Account details as at 05/11/2019	Account number	220226870

ELECTRICITY (Period 02/10/2019 to 31/10/2019 - 30 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 12645.000 kWh / Daily average 421.500 kWh

& Consumption charge: Commercial (Small Power User - High)	
(12645.000 kWh X R 1.5314)	19364.55
& Service charge	
(30 Days X R 53.7100)	1611.30
	20975.85

Add 15% VAT on amounts marked with & above	**3146.38**
Current account: Total due	**24122.23**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 474903	001	759383.000kWh	(Actual)	772028.000kWh	(Actual)	12645.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	240006864526
Customer VAT registration number	
Account number	220226870
Distribution code	
Business partner number	1000263359

PUBLIC WORKS AND TRANSPORT
CARE OF: KIRSTENBOSCH BOTANICAL GAR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 05/12/2019 — **Due date 30/12/2019**

At UNKNOWN ROAD, CAPE TOWN / Erf 875

Previous account balance		24122.28
Less payments (25/11/2019)	Thank you	24122.23-
Rounded down amount b/f (a)		**0.05**
Latest account - see overleaf		25703.96
Current amount due (b)	**Payable by 30/12/2019**	**25703.96**
	Total (a) + (b)	**25704.01**
Total (a) + (b) above	25704.01	
Total liability	**25704.01**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 220226870 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed. A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · SHOPRITE · Checkers · WOOLWORTHS · W · SPAR · Post Office · Pick n Pay · EasyPay · payCity · PEP

PUBLIC WORKS AND TRANSPORT

Account number	**220226870**
Total due if not paid in cash	25704.01
Amount due if paid in cash	25704.00
Rounded down amount carried forward to next invoice	0.01

>>>>> 915552202268705

Account details as at 05/12/2019	Account number	220226870

ELECTRICITY (Period 01/11/2019 to 02/12/2019 - 32 Days) (Actual reading)
At UNKNOWN ROAD, CAPE TOWN / Erf 875
Meter no: 474903 / Consumption 13473.000 kWh / Daily average 421.031 kWh

& Consumption charge: Commercial (Small Power User - High)	
(13473.000 kWh X R 1.5314)	20632.55
& Service charge	
(32 Days X R 53.7100)	1718.72
	22351.27

Add 15% VAT on amounts marked with & above	**3352.69**
Current account: Total due	**25703.96**

Meter details		Previous reading		New reading		Units used
ELECTRICITY 474903	001	772028.000kWh	(Actual)	785501.000kWh	(Actual)	13473.000kWh

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	108009010051
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 16/01/2019 **Due date 11/02/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		8779.88
Less payments (03/01/2019)	Thank you	5732.65-
Arrears (a)	**Payable immediately**	**3047.23**
Latest account - see overleaf		3588.88
Current amount due (b)	**Payable by 11/02/2019**	**3588.88**
	Total (a) + (b)	**6636.11**
Total (a) + (b) above	6636.11	
Total liability	**6636.11**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, SHOPRITE, Checkers, WOOLWORTHS, SPAR, Post Office, Pick n Pay, EasyPay, payCity, PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	6636.11
Amount due if paid in cash	6636.10
Rounded down amount carried forward to next invoice	0.01

>>>>> 915551158890587

Account details as at 16/01/2019	Account number	115889058

ELECTRICITY (Period 29/11/2018 to 02/01/2019 - 35 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 810.000 kWh / Daily average 23.143 kWh

& Consumption charge: Commercial (Small Power User - High)	
(810.000 kWh X R 1.4065)	1139.27
& Service charge	
(35 Days X R 49.3300)	1726.55
	2865.82

WATER (Period 07/12/2018 to 11/01/2019 - 36 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 9.000 kl / Daily average 0.250 kl

Consumption charge (domestic)	
& (1) 7.1010 kl @ R 13.6800 (2) 1.8990 kl @ R 19.4600	134.09
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	234.09

Add interest on outstanding balance	**23.99**
Add 15% VAT on amounts marked with & above	**464.98**
Current account: Total due	**3588.88**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	297121	001	50036.000kWh	(Actual)	50846.000kWh	(Actual)	810.000kWh
WATER	BXXA163	001	7718.000kl	(Actual)	7727.000kl	(Actual)	9.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	140007510582
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/02/2019 **Due date 12/03/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		6636.11
Less payments		0.00
Arrears (a)	**Payable immediately**	**6636.11**
Latest account - see overleaf		3724.87
Current amount due (b)	**Payable by 12/03/2019**	**3724.87**
	Total (a) + (b)	**10360.98**
Total (a) + (b) above	10360.98	
Total liability	**10360.98**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, SHOPRITE, Checkers, WOOLWORTHS, SPAR, Post Office, Pick n Pay, EasyPay, payCity, PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	10360.98
Amount due if paid in cash	10360.90
Rounded down amount carried forward to next invoice	0.08

>>>>> 915551158890587

Account details as at 15/02/2019	Account number	115889058

ELECTRICITY (Period 03/01/2019 to 05/02/2019 - 34 Days) (Estimate reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 953.005 kWh / Daily average 28.030 kWh

& Consumption charge: Commercial (Small Power User - High)	
(953.005 kWh X R 1.4065)	1340.40
& Service charge	
(34 Days X R 49.3300)	1677.22
	3017.62

WATER (Period 12/01/2019 to 11/02/2019 - 31 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 8.000 kl / Daily average 0.258 kl

Consumption charge (domestic)	
& (1) 6.1150 kl @ R 13.6800 (2) 1.8850 kl @ R 19.4600	120.33
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	220.33

Add interest on outstanding balance	**1.23**
Add 15% VAT on amounts marked with & above	**485.69**
Current account: Total due	**3724.87**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	297121	001	50846.000kWh	(Actual)	51799.005kWh	(Estimate)	953.005kWh
WATER	BXXA163	001	7727.000kl	(Actual)	7735.000kl	(Actual)	8.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	240006529333
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/03/2019 **Due date** **09/04/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		10360.98
Less payments (14/02/2019)	Thank you	3588.88-
Arrears (a)	**Payable immediately**	**6772.10**
Latest account - see overleaf		2121.21
Current amount due (b)	**Payable by 09/04/2019**	**2121.21**
	Total (a) + (b)	**8893.31**
Total (a) + (b) above	8893.31	
Total liability	**8893.31**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	8893.31
Amount due if paid in cash	8893.30
Rounded down amount carried forward to next invoice	0.01

>>>>> 915551158890587

Account details as at 15/03/2019	Account number	115889058

ELECTRICITY (Period 03/01/2019 to 04/03/2019 - 61 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 1160.000 kWh / Daily average 19.016 kWh

& Consumption charge: Commercial (Small Power User - High)	
(1160.000 kWh X R 1.4065)	1631.54
& Service charge	
(27 Days X R 49.3300)	1331.91
Reversal of estimated consumption (953.005 kWh)	1340.40-
	1623.05

WATER (Period 12/02/2019 to 13/03/2019 - 30 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 8.000 kl / Daily average 0.267 kl

Consumption charge (domestic)	
& (1) 5.9180 kl @ R 13.6800 (2) 2.0820 kl @ R 19.4600	121.48
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	221.48

Add 15% VAT on amounts marked with & above	**276.68**
Current account: Total due	**2121.21**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	297121	001	50846.000kWh	(Actual)	52006.000kWh	(Actual)	1160.000kWh
WATER	BXXA163	001	7735.000kl	(Actual)	7743.000kl	(Actual)	8.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	230006673038
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/04/2019 **Due date 10/05/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		8893.31
Less payments (27/03/2019)	Thank you	10360.98-
Credit (a)		**1467.67-**
Latest account - see overleaf		2727.26
Current amount due (b)	**Payable by 10/05/2019**	**2727.26**
	Total (a) + (b)	**1259.59**
Total (a) + (b) above	1259.59	
Total liability	**1259.59**	

THINK WATER
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www.capetown.gov.za/thinkwater

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay, WOOLWORTHS, payCity, SPAR, PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	1259.59
Amount due if paid in cash	1259.50
Rounded down amount carried forward to next invoice	0.09

>>>>> 915551158890587

Account details as at 15/04/2019 **Account number** **115889058**

ELECTRICITY (Period 05/03/2019 to 01/04/2019 - 28 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 545.000 kWh / Daily average 19.464 kWh

& Consumption charge: Commercial (Small Power User - High)	
(545.000 kWh X R 1.4065)	766.54
& Service charge	
(28 Days X R 49.3300)	1381.24
	2147.78

WATER (Period 14/03/2019 to 10/04/2019 - 28 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 8.000 kl / Daily average 0.286 kl

Consumption charge (domestic)	
& (1) 5.5230 kl @ R 13.6800 (2) 2.4770 kl @ R 19.4600	123.75
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	223.75

Add 15% VAT on amounts marked with & above **355.73**

Current account: Total due **2727.26**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	297121	001	52006.000kWh	(Actual)	52551.000kWh	(Actual)	545.000kWh
WATER	BXXA163	001	7743.000kl	(Actual)	7751.000kl	(Actual)	8.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	103005349982
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 16/05/2019 **Due date 10/06/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		1259.59
Less payments		0.00
Arrears (a)	**Payable immediately**	**1259.59**
Latest account - see overleaf		3200.40
Current amount due (b)	**Payable by 10/06/2019**	**3200.40**
	Total (a) + (b)	**4459.99**
Total (a) + (b) above	4459.99	
Total liability	**4459.99**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, SHOPRITE, Checkers, WOOLWORTHS, SPAR, Post Office, Pick n Pay, EasyPay, payCity, PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	4459.99
Amount due if paid in cash	4459.90
Rounded down amount carried forward to next invoice	0.09

>>>>> 915551158890587

Account details as at 16/05/2019	**Account number**	**115889058**

ELECTRICITY (Period 02/04/2019 to 02/05/2019 - 31 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 641.000 kWh / Daily average 20.677 kWh

& Consumption charge: Commercial (Small Power User - High)	
(641.000 kWh X R 1.4065)	901.57
& Service charge	
(31 Days X R 49.3300)	1529.23
	2430.80

WATER (Period 11/04/2019 to 14/05/2019 - 34 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 14.000 kl / Daily average 0.412 kl

Consumption charge (domestic)	
& (1) 6.7070 kl @ R 13.6800 (2) 5.0300 kl @ R 19.4600	
(3) 2.2630 kl @ R 27.6300	252.16
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	352.16

Add 15% VAT on amounts marked with & above	**417.44**
Current account: Total due	**3200.40**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	297121	001	52551.000kWh	(Actual)	53192.000kWh	(Actual)	641.000kWh
WATER	BXXA163	001	7751.000kl	(Actual)	7765.000kl	(Actual)	14.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	140007698632
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655, Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 18/06/2019 **Due date 15/07/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		4459.99
Less payments (11/06/2019)	Thank you	4459.90-
Rounded down amount b/f (a)		**0.09**
Latest account - see overleaf		3498.37
Current amount due (b)	**Payable by 15/07/2019**	**3498.37**
	Total (a) + (b)	**3498.46**
Total (a) + (b) above	3498.46	
Total liability	**3498.46**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay, WOOLWORTHS, payCity, SPAR, PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	3498.46
Amount due if paid in cash	3498.40
Rounded down amount carried forward to next invoice	0.06

>>>>> 915551158890587

Account details as at 18/06/2019 **Account number** **115889058**

ELECTRICITY (Period 03/05/2019 to 03/06/2019 - 32 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 835.000 kWh / Daily average 26.094 kWh

& Consumption charge: Commercial (Small Power User - High)	
(835.000 kWh X R 1.4065)	1174.43
& Service charge	
(32 Days X R 49.3300)	1578.56
	2752.99

WATER (Period 15/05/2019 to 12/06/2019 - 29 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 11.000 kl / Daily average 0.379 kl

Consumption charge (domestic)	
& (1) 5.7210 kl @ R 13.6800 (2) 4.2900 kl @ R 19.4600	
(3) 0.9890 kl @ R 27.6300	189.07
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	289.07

Add 15% VAT on amounts marked with & above **456.31**

Current account: Total due **3498.37**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	297121	001	53192.000kWh	(Actual)	54027.000kWh	(Actual)	835.000kWh
WATER	BXXA163	001	7765.000kl	(Actual)	7776.000kl	(Actual)	11.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	190007187828
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/07/2019 **Due date** **12/08/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		3498.46
Less payments		0.00
Arrears (a)	**Payable immediately**	**3498.46**
Latest account - see overleaf		2786.01
Current amount due (b)	**Payable by 12/08/2019**	**2786.01**
	Total (a) + (b)	**6284.47**
Total (a) + (b) above	6284.47	
Total liability	**6284.47**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay (Pay online at www.easypay.co.za), WOOLWORTHS, payCity, SPAR, PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	6284.47
Amount due if paid in cash	6284.40
Rounded down amount carried forward to next invoice	0.07

>>>>> 915551158890587

Account details as at 15/07/2019 **Account number** **115889058**

ELECTRICITY (Period 04/06/2019 to 01/07/2019 - 28 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 602.000 kWh / Daily average 21.500 kWh

& From 04/06/2019 : Consumption charge: Commercial (Small Power User - High)	
(580.500 kWh X R 1.4065)	816.47
& From 04/06/2019 : Service charge	
(27 Days X R 49.3300)	1331.91
& From 01/07/2019 : Consumption charge: Commercial (Small Power User - High)	
(21.500 kWh X R 1.5314)	32.93
& From 01/07/2019 : Service charge	
(1 Days X R 53.7100)	53.71
	2235.02

WATER (Period 13/06/2019 to 10/07/2019 - 28 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 6.000 kl / Daily average 0.214 kl

Consumption charge (domestic)	
& From 13/06/2019 : (1) 3.5510 kl @ R 13.6800 (2) 0.3061 kl @ R 19.4600	
& From 01/07/2019 : (1) 1.9670 kl @ R 14.9100 (2) 0.1759 kl @ R 21.2100	87.60
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	187.60

Add 15% VAT on amounts marked with & above **363.39**

Current account: Total due **2786.01**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	297121	001	54027.000kWh	(Actual)	54629.000kWh	(Actual)	602.000kWh
WATER	BXXA163	001	7776.000kl	(Actual)	7782.000kl	(Actual)	6.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	106004325866
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 16/08/2019 — **Due date 10/09/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		6284.47
Less payments (19/07/2019)	Thank you	3498.37-
Arrears (a)	**Payable immediately**	**2786.10**
Latest account - see overleaf		3856.46
Current amount due (b)	**Payable by 10/09/2019**	**3856.46**
	Total (a) + (b)	**6642.56**
Total (a) + (b) above	6642.56	
Total liability	**6642.56**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · Post Office · SHOPRITE · Pick n Pay · Checkers · EasyPay · WOOLWORTHS · payCity · SPAR · PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	6642.56
Amount due if paid in cash	6642.50
Rounded down amount carried forward to next invoice	0.06

>>>>> 915551158890587

Account details as at 16/08/2019	Account number	115889058

ELECTRICITY (Period 02/07/2019 to 01/08/2019 - 31 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 967.000 kWh / Daily average 31.194 kWh

& Consumption charge: Commercial (Small Power User - High)	
(967.000 kWh X R 1.5314)	1480.86
& Service charge	
(31 Days X R 53.7100)	1665.01
	3145.87

WATER (Period 11/07/2019 to 12/08/2019 - 33 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 7.000 kl / Daily average 0.212 kl

Consumption charge (domestic)	
& (1) 6.4920 kl @ R 14.9100 (2) 0.5080 kl @ R 21.2100	107.57
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	207.57

Add 15% VAT on amounts marked with & above	**503.02**
Current account: Total due	**3856.46**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	297121	001	54629.000kWh	(Actual)	55596.000kWh	(Actual)	967.000kWh
WATER	BXXA163	001	7782.000kl	(Actual)	7789.000kl	(Actual)	7.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	104005199257
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 16/09/2019 **Due date** **11/10/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		6642.56
Less payments		0.00
Arrears (a)	**Payable immediately**	**6642.56**
Latest account - see overleaf		3806.01
Current amount due (b)	**Payable by 11/10/2019**	**3806.01**
	Total (a) + (b)	**10448.57**
Total (a) + (b) above	10448.57	
Total liability	**10448.57**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	10448.57
Amount due if paid in cash	10448.50
Rounded down amount carried forward to next invoice	0.07

>>>>> 915551158890587

Account details as at 16/09/2019	Account number	115889058

ELECTRICITY (Period 02/08/2019 to 02/09/2019 - 32 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 887.000 kWh / Daily average 27.719 kWh

& Consumption charge: Commercial (Small Power User - High)	
(887.000 kWh X R 1.5314)	1358.35
& Service charge	
(32 Days X R 53.7100)	1718.72
	3077.07

WATER (Period 13/08/2019 to 11/09/2019 - 30 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 8.000 kl / Daily average 0.267 kl

Consumption charge (domestic)	
& (1) 5.9020 kl @ R 14.9100 (2) 2.0980 kl @ R 21.2100	132.50
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	232.50

Add 15% VAT on amounts marked with & above	**496.44**
Current account: Total due	**3806.01**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	297121	001	55596.000kWh	(Actual)	56483.000kWh	(Actual)	887.000kWh
WATER	BXXA163	001	7789.000kl	(Actual)	7797.000kl	(Actual)	8.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	230006912670
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/10/2019 **Due date** **11/11/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		10448.57
Less payments (03/10/2019)	Thank you	6642.50-
Arrears (a)	**Payable immediately**	**3806.07**
Latest account - see overleaf		3584.87-
Credit (b)		**3584.87-**
	Total (a) + (b)	**221.20**
Total (a) + (b) above	221.20	
Total liability	**221.20**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed. A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay, WOOLWORTHS, payCity, SPAR, PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	221.20
Amount due if paid in cash	221.20
Rounded down amount carried forward to next invoice	0.00

>>>>> 915551158890587

Account details as at 15/10/2019	Account number	115889058

ELECTRICITY (Period 03/09/2019 to 03/10/2019 - 31 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 535.000 kWh / Daily average 17.258 kWh

& Consumption charge: Commercial (Small Power User - High)	
(535.000 kWh X R 1.5314)	819.30
& Service charge	
(31 Days X R 53.7100)	1665.01
& Dunning charge	136.87
	2621.18

WATER (Period 12/09/2019 to 10/10/2019 - 29 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 5.000 kl / Daily average 0.172 kl

Consumption charge (domestic)	
& (1) 5.0000 kl @ R 14.9100	74.55
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	174.55

SUNDRIES

Account Maintenance	157.40-
Account Maintenance	2570.27-
Account Maintenance	3617.75-
Account Maintenance	215.74-
Account Maintenance	238.71-
Account Maintenance	0.09-
	6799.96-

Add 15% VAT on amounts marked with & above	**419.36**
Current account: Total due	**3584.87-**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	297121	001	56483.000kWh	(Actual)	57018.000kWh	(Actual)	535.000kWh
WATER	BXXA163	001	7797.000kl	(Actual)	7802.000kl	(Actual)	5.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	150007779434
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/11/2019 **Due date 10/12/2019**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		221.20
Less payments (17/10/2019)	Thank you	3806.01-
Credit (a)		**3584.81-**
Latest account - see overleaf		3276.04
Current amount due (b)	**Payable by 10/12/2019**	**3276.04**
	Total (a) + (b)	**308.77-**
Total (a) + (b) above	308.77-	
Total liability	**308.77-**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK Post Office SHOPRITE Pick n Pay Checkers EasyPay WOOLWORTHS payCity SPAR PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	308.77-
Amount due if paid in cash	308.77-
Rounded down amount carried forward to next invoice	308.77-

>>>>> 915551158890587

Account details as at 15/11/2019	Account number	115889058

ELECTRICITY (Period 04/10/2019 to 31/10/2019 - 28 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 650.000 kWh / Daily average 23.214 kWh

& Consumption charge: Commercial (Small Power User - High)	
(650.000 kWh X R 1.5314)	995.41
& Service charge	
(28 Days X R 53.7100)	1503.88
	2499.29

WATER (Period 11/10/2019 to 12/11/2019 - 33 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 13.000 kl / Daily average 0.394 kl

Consumption charge (domestic)	
& (1) 6.4920 kl @ R 14.9100 (2) 4.8690 kl @ R 21.2100	
(3) 1.6390 kl @ R 30.1200	249.44
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	349.44

Add 15% VAT on amounts marked with & above	**427.31**
Current account: Total due	**3276.04**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	297121	001	57018.000kWh	(Actual)	57668.000kWh	(Actual)	650.000kWh
WATER	BXXA163	001	7802.000kl	(Actual)	7815.000kl	(Actual)	13.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	130008066011
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 17/12/2019 **Due date 13/01/2020**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		308.77-
Less payments		0.00
Credit (a)		**308.77-**
Latest account - see overleaf		3768.02
Current amount due (b)	**Payable by 13/01/2020**	**3768.02**
	Total (a) + (b)	**3459.25**
Total (a) + (b) above	3459.25	
Total liability	**3459.25**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed. A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR Post Office Pick n Pay EasyPay payCity PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

>>>>> 915551158890587

Account number	**115889058**
Total due if not paid in cash	3459.25
Amount due if paid in cash	3459.20
Rounded down amount carried forward to next invoice	0.05

Account details as at 17/12/2019	Account number	115889058

ELECTRICITY (Period 01/11/2019 to 02/12/2019 - 32 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 657.000 kWh / Daily average 20.531 kWh

& Consumption charge: Commercial (Small Power User - High)	
(657.000 kWh X R 1.5314)	1006.13
& Service charge	
(32 Days X R 53.7100)	1718.72
	2724.85

WATER (Period 13/11/2019 to 10/12/2019 - 28 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 19.000 kl / Daily average 0.679 kl

Consumption charge (domestic)	
& (1) 5.5080 kl @ R 14.9100 (2) 4.1310 kl @ R 21.2100	
(3) 9.3610 kl @ R 30.1200	451.69
& Fixed Basic Charge (20mm - BXXA163) R 100.00 x 1	100.00
	551.69

Add 15% VAT on amounts marked with & above	**491.48**
Current account: Total due	**3768.02**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	297121	001	57668.000kWh	(Actual)	58325.000kWh	(Actual)	657.000kWh
WATER	BXXA163	001	7815.000kl	(Actual)	7834.000kl	(Actual)	19.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	240007260072
Customer VAT registration number	
Account number	115889058
Distribution code	
Business partner number	1001136607

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH
THE CURATOR
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

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Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/10/2020 **Due date** **09/11/2020**

At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf

Previous account balance		24352.93
Less payments		0.00
Arrears (a)	**Payable immediately**	**24352.93**
Latest account - see overleaf		3189.01
Current amount due (b)	**Payable by 09/11/2020**	**3189.01**
	Total (a) + (b)	**27541.94**
Total (a) + (b) above	27541.94	
Total liability	**27541.94**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 115889058 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK Post Office SHOPRITE Pick n Pay Checkers EasyPay WOOLWORTHS payCity SPAR PEP

NATIONAL BOTANIC GARDENS - KIRSTENBOSCH

Account number	**115889058**
Total due if not paid in cash	27541.94
Amount due if paid in cash	27541.90
Rounded down amount carried forward to next invoice	0.04

>>>>> 915551158890587

Account details as at 15/10/2020 **Account number** **115889058**

ELECTRICITY (Period 03/09/2020 to 30/09/2020 - 28 Days) (Estimate reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: 297121 / Consumption 507.387 kWh / Daily average 18.121 kWh

& Consumption charge: Commercial (Small Power User - High)	
(507.387 kWh X R 1.6053)	814.51
& Service charge	
(28 Days X R 56.3000)	1576.40
& Dunning charge	144.00
	2534.91

WATER (Period 10/09/2020 to 12/10/2020 - 33 Days) (Actual reading)
At STONE COTTAGES, RHODES DRIVE, STONE COTTAGES CAPE RD 875, KIRSTENBOSCH / Erf 27

Meter no: BXXA163 / Consumption 2.000 kl / Daily average 0.061 kl

Consumption charge (domestic)	
& (1) 2.0000 kl @ R 15.5800	31.16
& Fixed Basic Charge (20mm - BXXA163) R 104.50 x 1	104.50
	135.66

Add interest on outstanding balance	**117.85**
Add 15% VAT on amounts marked with & above	**400.59**
Current account: Total due	**3189.01**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	297121	001	63072.000kWh	(Actual)	63579.387kWh	(Estimate)	507.387kWh
WATER	BXXA163	001	8065.000kl	(Actual)	8067.000kl	(Actual)	2.000kl

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	180007034457
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 16/01/2019 | **Due date** **11/02/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		129987.33
Less payments (03/01/2019)	Thank you	62344.21-
Arrears (a)	**Payable immediately**	**67643.12**
Latest account - see overleaf		65465.19
Current amount due (b)	**Payable by 11/02/2019**	**65465.19**
	Total (a) + (b)	**133108.31**
Total (a) + (b) above	133108.31	
Total liability	**133108.31**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS SPAR Post Office PicknPay EasyPay payCity PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	133108.31
Amount due if paid in cash	133108.30
Rounded down amount carried forward to next invoice	0.01

>>>>> 915551147911957

Account details as at 16/01/2019 **Account number** **114791195**

ELECTRICITY (Period 29/11/2018 to 28/12/2018 - 30 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 36205.440 kWh / Daily average 1206.848 kWh

& Consumption charge: Commercial (Small Power User - High)	
(36205.440 kWh X R 1.4065)	50922.95
& Service charge	
(30 Days X R 49.3300)	1479.90
	52402.85

REFUSE (Period 18/12/2018 to 16/01/2019) 30 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4523.40
	4523.40

Add 15% VAT on amounts marked with & above	**8538.94**
Current account: Total due	**65465.19**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553592	007	2446.286kWh	(Actual)	2747.998kWh	(Actual)	301.712(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	102005486216
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/02/2019 **Due date** **12/03/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		133108.31
Less payments (28/01/2019)	Thank you	72563.86-
Arrears (a)	**Payable immediately**	**60544.45**
Latest account - see overleaf		71071.60
Current amount due (b)	**Payable by 12/03/2019**	**71071.60**
	Total (a) + (b)	**131616.05**
Total (a) + (b) above	131616.05	
Total liability	**131616.05**	

THINK WATER
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www.capetown.gov.za/thinkwater

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

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Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK Post Office SHOPRITE Pick n Pay Checkers EasyPay WOOLWORTHS payCity SPAR PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	131616.05
Amount due if paid in cash	131616.00
Rounded down amount carried forward to next invoice	0.05

>>>>> 915551147911957

Account details as at 15/02/2019	Account number	114791195

ELECTRICITY (Period 29/12/2018 to 29/01/2019 - 32 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 39601.440 kWh / Daily average 1237.545 kWh

& Consumption charge: Commercial (Small Power User - High)	
(39601.440 kWh X R 1.4065)	55699.43
& Service charge	
(32 Days X R 49.3300)	1578.56
	57277.99

REFUSE (Period 17/01/2019 to 15/02/2019) 30 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4523.40
	4523.40

Add 15% VAT on amounts marked with & above	**9270.21**
Current account: Total due	**71071.60**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553592	007	2747.998kWh	(Actual)	3078.010kWh	(Actual)	330.012(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	260006325399
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/03/2019 — **Due date 09/04/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		131616.05
Less payments		0.00
Arrears (a)	**Payable immediately**	**131616.05**
Latest account - see overleaf		71378.35
Current amount due (b)	**Payable by 09/04/2019**	**71378.35**
	Total (a) + (b)	**202994.40**
Total (a) + (b) above	202994.40	
Total liability	**202994.40**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

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A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, SHOPRITE, Checkers, WOOLWORTHS, SPAR, Post Office, Pick n Pay, EasyPay, payCity, PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	202994.40
Amount due if paid in cash	202994.40
Rounded down amount carried forward to next invoice	0.00

>>>>> 915551147911957

Account details as at 15/03/2019	Account number	114791195

ELECTRICITY (Period 30/01/2019 to 28/02/2019 - 30 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 39861.240 kWh / Daily average 1328.708 kWh

& Consumption charge: Commercial (Small Power User - High)	
(39861.240 kWh X R 1.4065)	56064.83
& Service charge	
(30 Days X R 49.3300)	1479.90
	57544.73

REFUSE (Period 16/02/2019 to 15/03/2019) 28 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4523.40
	4523.40

Add 15% VAT on amounts marked with & above	**9310.22**
Current account: Total due	**71378.35**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553592	007	3078.010kWh	(Actual)	3410.187kWh	(Actual)	332.177(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	150007480685
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/04/2019 **Due date 10/05/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		202994.40
Less payments (22/03/2019)	Thank you	65465.19-
Arrears (a)	**Payable immediately**	**137529.21**
Latest account - see overleaf		60508.87
Current amount due (b)	**Payable by 10/05/2019**	**60508.87**
	Total (a) + (b)	**198038.08**
Total (a) + (b) above	198038.08	
Total liability	**198038.08**	

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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

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A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay, WOOLWORTHS, payCity, SPAR, PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	198038.08
Amount due if paid in cash	198038.00
Rounded down amount carried forward to next invoice	0.08

>>>>> 915551147911957

Account details as at 15/04/2019	Account number	114791195

ELECTRICITY (Period 01/03/2019 to 29/03/2019 - 29 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 33176.280 kWh / Daily average 1144.010 kWh

& Consumption charge: Commercial (Small Power User - High)	
(33176.280 kWh X R 1.4065)	46662.44
& Service charge	
(29 Days X R 49.3300)	1430.57
	48093.01

REFUSE (Period 16/03/2019 to 15/04/2019) 31 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4523.40
	4523.40

Add 15% VAT on amounts marked with & above	**7892.46**
Current account: Total due	**60508.87**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553592	007	3410.187kWh	(Actual)	3686.656kWh	(Actual)	276.469(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	109008671226
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
PRIVATE BAG X7
CLAREMONT
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Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 16/05/2019 — **Due date 10/06/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		198038.08
Less payments		0.00
Arrears (a)	**Payable immediately**	**198038.08**
Latest account - see overleaf		71054.01
Current amount due (b)	**Payable by 10/06/2019**	**71054.01**
	Total (a) + (b)	**269092.09**
Total (a) + (b) above	269092.09	
Total liability	**269092.09**	

THINK WATER
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Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK, Post Office, SHOPRITE, Pick n Pay, Checkers, EasyPay (Pay online at www.easypay.co.za), WOOLWORTHS, payCity (connected citizens, www.paycity.co.za), W, SPAR, PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	269092.09
Amount due if paid in cash	269092.00
Rounded down amount carried forward to next invoice	0.09

>>>>> 915551147911957

Account details as at 16/05/2019	**Account number**	**114791195**

ELECTRICITY (Period 30/03/2019 to 30/04/2019 - 32 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 39257.160 kWh / Daily average 1226.786 kWh

& Consumption charge: Commercial (Small Power User - High)	
(39257.160 kWh X R 1.4065)	55215.20
& Service charge	
(32 Days X R 49.3300)	1578.56
	56793.76

REFUSE (Period 16/04/2019 to 16/05/2019) 31 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4523.40
	4523.40

Add interest on outstanding balance	**539.28**
Add 15% VAT on amounts marked with & above	**9197.57**
Current account: Total due	**71054.01**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553592	007	3686.656kWh	(Actual)	4013.799kWh	(Actual)	327.143(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	130007816132
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 18/06/2019 **Due date** **15/07/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		269092.09
Less payments		0.00
Arrears (a)	**Payable immediately**	**269092.09**
Latest account - see overleaf		70015.42
Current amount due (b)	**Payable by 15/07/2019**	**70015.42**
	Total (a) + (b)	**339107.51**
Total (a) + (b) above	339107.51	
Total liability	**339107.51**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

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3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

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(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

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A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR Post Office Pick n Pay EasyPay Pay online at www.easypay.co.za payCity connected citizens PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	339107.51
Amount due if paid in cash	339107.50
Rounded down amount carried forward to next invoice	0.01

>>>>> 915551147911957

Account details as at 18/06/2019 | **Account number** **114791195**

ELECTRICITY (Period 01/05/2019 to 29/05/2019 - 29 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 38266.920 kWh / Daily average 1319.549 kWh

& Consumption charge: Commercial (Small Power User - High)	
(38266.920 kWh X R 1.4065)	53822.42
& Service charge	
(29 Days X R 49.3300)	1430.57
& Dunning charge	131.65
	55384.64

REFUSE (Period 17/05/2019 to 17/06/2019) 32 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4523.40
	4523.40

Add interest on outstanding balance	**1121.17**
Add 15% VAT on amounts marked with & above	**8986.21**
Current account: Total due	**70015.42**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553592	007	4013.799kWh	(Actual)	4332.690kWh	(Actual)	318.891(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	201008468199
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/07/2019 **Due date 12/08/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		339107.51
Less payments		0.00
Arrears (a)	**Payable immediately**	**339107.51**
Latest account - see overleaf		76022.84
Current amount due (b)	**Payable by 12/08/2019**	**76022.84**
	Total (a) + (b)	**415130.35**
Total (a) + (b) above	415130.35	
Total liability	**415130.35**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR Post Office Pick n Pay EasyPay payCity PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	415130.35
Amount due if paid in cash	415130.30
Rounded down amount carried forward to next invoice	0.05

>>>>> 915551147911957

Account details as at 15/07/2019	Account number	114791195

ELECTRICITY (Period 30/05/2019 to 28/06/2019 - 30 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 41572.320 kWh / Daily average 1385.744 kWh

& Consumption charge: Commercial (Small Power User - High)	
(41572.320 kWh X R 1.4065)	58471.47
& Service charge	
(30 Days X R 49.3300)	1479.90
	59951.37

REFUSE (Period 18/06/2019 to 15/07/2019) 28 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4750.50
	4750.50

Add interest on outstanding balance	**1615.68**
Add 15% VAT on amounts marked with & above	**9705.29**
Current account: Total due	**76022.84**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553592	007	4332.690kWh	(Actual)	4679.126kWh	(Actual)	346.436(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	500015195424
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

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Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 19/08/2019 **Due date 13/09/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		415130.35
Less payments (16/07/2019)	Thank you	339107.51-
Arrears (a)	**Payable immediately**	**76022.84**
Latest account - see overleaf		86706.10
Current amount due (b)	**Payable by 13/09/2019**	**86706.10**
	Total (a) + (b)	**162728.94**
Total (a) + (b) above	162728.94	
Total liability	**162728.94**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	162728.94
Amount due if paid in cash	162728.90
Rounded down amount carried forward to next invoice	0.04

>>>>> 915551147911957

Account details as at 19/08/2019 **Account number 114791195**

ELECTRICITY (Period 29/06/2019 to 26/07/2019 - 28 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 45420.000 kWh / Daily average 1622.143 kWh

& From 29/06/2019 : Consumption charge: Commercial (Small Power User - High)	
(3244.286 kWh X R 1.4065)	4563.09
& From 29/06/2019 : Service charge	
(2 Days X R 49.3300)	98.66
& From 01/07/2019 : Consumption charge: Commercial (Small Power User - High)	
(42175.714 kWh X R 1.5314)	64587.89
& From 01/07/2019 : Service charge	
(26 Days X R 53.7100)	1396.46
	70646.10

REFUSE (Period 16/07/2019 to 16/08/2019) 32 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4750.50
	4750.50

Add 15% VAT on amounts marked with & above **11309.50**

Current account: Total due **86706.10**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553592	007	4679.126kWh	(Actual)	5057.626kWh	(Actual)	378.500(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	500015291500
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
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BOTANICAL GARDENS, 7735
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CLAREMONT
7735

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Tel: 086 010 3089 - Fax: 086 201 1017
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E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 17/09/2019 **Due date 14/10/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		162728.94
Less payments (29/08/2019)	Thank you	415130.35-
Credit (a)		**252401.41-**
Latest account - see overleaf		96705.17
Current amount due (b)	**Payable by 14/10/2019**	**96705.17**
	Total (a) + (b)	**155696.24-**
Total (a) + (b) above	155696.24-	
Total liability	**155696.24-**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK SHOPRITE Checkers WOOLWORTHS W SPAR
Post Office Pick n Pay EasyPay payCity PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	155696.24-
Amount due if paid in cash	155696.24-
Rounded down amount carried forward to next invoice	155696.24-

>>>>> 915551147911957

Account details as at 17/09/2019 **Account number** **114791195**

ELECTRICITY (Period 27/07/2019 to 29/08/2019 - 34 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 50616.960 kWh / Daily average 1488.734 kWh

& Consumption charge: Commercial (Small Power User - High)	
(50616.960 kWh X R 1.5314)	77514.81
& Service charge	
(34 Days X R 53.7100)	1826.14
	79340.95

REFUSE (Period 17/08/2019 to 16/09/2019) 31 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4750.50
	4750.50

Add 15% VAT on amounts marked with & above	**12613.72**
Current account: Total due	**96705.17**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553592	007	5057.626kWh	(Actual)	5479.434kWh	(Actual)	421.808(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	140007865370
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
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BOTANICAL GARDENS, 7735
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CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/10/2019 — **Due date 11/11/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		155696.24-
Less payments (01/10/2019)	Thank you	86706.10-
Credit (a)		**242402.34-**
Latest account - see overleaf		79030.04
Current amount due (b)	**Payable by 11/11/2019**	**79030.04**
	Total (a) + (b)	**163372.30-**
Total (a) + (b) above	163372.30-	
Total liability	**163372.30-**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK Post Office SHOPRITE Pick n Pay Checkers EasyPay WOOLWORTHS payCity SPAR PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	163372.30-
Amount due if paid in cash	163372.30-
Rounded down amount carried forward to next invoice	163372.30-

>>>>> 915551147911957

Account details as at 15/10/2019	Account number	114791195

ELECTRICITY (Period 30/08/2019 to 27/09/2019 - 29 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 40755.960 kWh / Daily average 1405.378 kWh

& Consumption charge: Commercial (Small Power User - High)	
(40755.960 kWh X R 1.5314)	62413.68
& Service charge	
(29 Days X R 53.7100)	1557.59
	63971.27

REFUSE (Period 17/09/2019 to 15/10/2019) 29 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4750.50
	4750.50

Add 15% VAT on amounts marked with & above	**10308.27**
Current account: Total due	**79030.04**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553592	007	5479.434kWh	(Actual)	5819.067kWh	(Actual)	339.633(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	500015377316
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
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CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
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E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 18/11/2019 **Due date 13/12/2019**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		163372.30-
Less payments		0.00
Credit (a)		**163372.30-**
Latest account - see overleaf		80902.36
Current amount due (b)	**Payable by 13/12/2019**	**80902.36**
	Total (a) + (b)	**82469.94-**
Total (a) + (b) above	82469.94-	
Total liability	**82469.94-**	

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www.capetown.gov.za/thinkwater

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · Post Office · SHOPRITE · Pick n Pay · Checkers · EasyPay · WOOLWORTHS · payCity · SPAR · PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	82469.94-
Amount due if paid in cash	82469.94-
Rounded down amount carried forward to next invoice	82469.94-

>>>>> 915551147911957

Account details as at 18/11/2019	Account number	114791195

ELECTRICITY (Period 28/09/2019 to 28/10/2019 - 31 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 41748.960 kWh / Daily average 1346.741 kWh

& Consumption charge: Commercial (Small Power User - High)	
(41748.960 kWh X R 1.5314)	63934.36
& Service charge	
(31 Days X R 53.7100)	1665.01
	65599.37

REFUSE (Period 16/10/2019 to 15/11/2019) 31 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4750.50
	4750.50

Add 15% VAT on amounts marked with & above	**10552.49**
Current account: Total due	**80902.36**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553592	007	5819.067kWh	(Actual)	6166.975kWh	(Actual)	347.908(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	150007820292
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
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7735

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Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 17/12/2019 **Due date 13/01/2020**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		82469.94-
Less payments		0.00
Credit (a)		**82469.94-**
Latest account - see overleaf		82115.41
Current amount due (b)	**Payable by 13/01/2020**	**82115.41**
	Total (a) + (b)	**354.53-**
Total (a) + (b) above	354.53-	
Total liability	**354.53-**	

Please note:

1. Payment options
(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.
(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference
(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.
2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.
3. Interest will be charged on all amounts still outstanding after the due date.
4. You may not withhold payment, even if you have submitted a query to the City concerning this account.
5. Failure to pay could result in;
(a) The City recovering debt overdue on the purchasing of pre-paid electricity,
(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed. A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	354.53-
Amount due if paid in cash	354.53-
Rounded down amount carried forward to next invoice	354.53-

>>>>> 915551147911957

Account details as at 17/12/2019	**Account number**	**114791195**

ELECTRICITY (Period 29/10/2019 to 28/11/2019 - 31 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 42437.760 kWh / Daily average 1368.960 kWh

& Consumption charge: Commercial (Small Power User - High)	
(42437.760 kWh X R 1.5314)	64989.19
& Service charge	
(31 Days X R 53.7100)	1665.01
	66654.20

REFUSE (Period 16/11/2019 to 16/12/2019) 31 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4750.50
	4750.50

Add 15% VAT on amounts marked with & above	**10710.71**
Current account: Total due	**82115.41**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553592	007	6166.975kWh	(Actual)	6520.623kWh	(Actual)	353.648(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	500015442919
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
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Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 17/01/2020 — **Due date 11/02/2020**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		354.53-
Less payments		0.00
Credit (a)		**354.53-**
Latest account - see overleaf		80861.25
Current amount due (b)	**Payable by 11/02/2020**	**80861.25**
	Total (a) + (b)	**80506.72**
Total (a) + (b) above	80506.72	
Total liability	**80506.72**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · Post Office · SHOPRITE · Pick n Pay · Checkers · EasyPay · Pay online at www.easypay.co.za · WOOLWORTHS · payCity · W · SPAR · PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	80506.72
Amount due if paid in cash	80506.70
Rounded down amount carried forward to next invoice	0.02

>>>>> 915551147911957

Account details as at 17/01/2020 **Account number** **114791195**

ELECTRICITY (Period 29/11/2019 to 31/12/2019 - 33 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 41655.480 kWh / Daily average 1262.287 kWh

& Consumption charge: Commercial (Small Power User - High)	
(41655.480 kWh X R 1.5314)	63791.20
& Service charge	
(33 Days X R 53.7100)	1772.43
	65563.63

REFUSE (Period 17/12/2019 to 16/01/2020) 31 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4750.50
	4750.50

Add 15% VAT on amounts marked with & above	**10547.12**
Current account: Total due	**80861.25**

Meter details			**Previous reading**		**New reading**		**Units used**
ELECTRICITY	3507409553592	007	6520.623kWh	(Actual)	6867.752kWh	(Actual)	347.129(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	190007468254
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 17/02/2020 **Due date 13/03/2020**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		80506.72
Less payments		0.00
Arrears (a)	**Payable immediately**	**80506.72**
Latest account - see overleaf		68173.21
Current amount due (b)	**Payable by 13/03/2020**	**68173.21**
	Total (a) + (b)	**148679.93**
Total (a) + (b) above	148679.93	
Total liability	**148679.93**	

THINK WATER
CARE A LITTLE. SAVE A LOT.
www.capetown.gov.za/thinkwater

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed. A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK · Post Office · SHOPRITE · Pick n Pay · Checkers · EasyPay · WOOLWORTHS · payCity · SPAR · PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	148679.93
Amount due if paid in cash	148679.90
Rounded down amount carried forward to next invoice	0.03

>>>>> 915551147911957

Account details as at 17/02/2020	Account number	114791195

ELECTRICITY (Period 01/01/2020 to 29/01/2020 - 29 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 34591.200 kWh / Daily average 1192.800 kWh

& Consumption charge: Commercial (Small Power User - High)	
(34591.200 kWh X R 1.5314)	52972.96
& Service charge	
(29 Days X R 53.7100)	1557.59
	54530.55

REFUSE (Period 17/01/2020 to 17/02/2020) 32 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4750.50
	4750.50

Add 15% VAT on amounts marked with & above	**8892.16**
Current account: Total due	**68173.21**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553592	007	6867.752kWh	(Actual)	7156.012kWh	(Actual)	288.260(X120)kW

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Civic Centre
12 Hertzog Boulevard 8001
PO Box 655 Cape Town 8000
VAT registration number
4500193497

Tax invoice number	290006357828
Customer VAT registration number	
Account number	114791195
Distribution code	
Business partner number	1000839733

NATIONAL BOTANICAL INSTITUTE
T/A KIRSTENBOSCH
BOTANICAL GARDENS, 7735
PRIVATE BAG X7
CLAREMONT
7735

Computer generated copy tax invoice

Tel: 086 010 3089 - Fax: 086 201 1017
Tel: International calls +27 21 401 4701
E-mail : accounts@capetown.gov.za
Correspondence: Director : Revenue, P O Box 655,
Cape Town 8000
Web address:www.capetown.gov.za

Account summary as at 15/10/2020 **Due date 09/11/2020**

At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

Previous account balance		52750.68
Less payments		0.00
Arrears (a)	**Payable immediately**	**52750.68**
Latest account - see overleaf		52234.40
Current amount due (b)	**Payable by 09/11/2020**	**52234.40**
	Total (a) + (b)	**104985.08**
Total (a) + (b) above	104985.08	
Total liability	**104985.08**	

Please note:

1. Payment options

(a) Debit orders: Call 0860 103 089 or visit a Customer Service Centre.(b) Internet payments: Visit www.Easypay.co.za or www.payCity.co.za.

(c) Electronic payments (EFT): Select the City of Cape Town as a bank-listed beneficiary on your bank's website. Use only your nine-digit municipal account number as reference

(d) Direct deposit at Nedbank: Please present your account number 114791195 to the bank teller. (e) Cash, debit card, credit card and other: Please present your account to the cashier.

2. Where the City incurs bank costs on any mode of payment, the City will recover such cost on the portion of the amount above R7000.00 per transaction per account number. The City absorbs such costs in respect of a single payment of R7000.00 and below.

3. Interest will be charged on all amounts still outstanding after the due date.

4. You may not withhold payment, even if you have submitted a query to the City concerning this account.

5. Failure to pay could result in;

(a) The City recovering debt overdue on the purchasing of pre-paid electricity,

(b) your water and/or electricity supply being disconnected/restricted. Immediate reconnection of the supply after payment cannot be guaranteed.

A disconnection fee will be charged and your deposit amount might be increased.

Pay points: City of Cape Town cash offices or the vendors below:

NEDBANK Post Office SHOPRITE Pick n Pay Checkers EasyPay Pay online at www.easypay.co.za WOOLWORTHS payCity SPAR PEP

NATIONAL BOTANICAL INSTITUTE

Account number	**114791195**
Total due if not paid in cash	104985.08
Amount due if paid in cash	104985.00
Rounded down amount carried forward to next invoice	0.08

>>>>> 915551147911957

Account details as at 15/10/2020 **Account number** **114791195**

ELECTRICITY (Period 29/08/2020 to 29/09/2020 - 32 Days) (Actual reading)
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862
Meter no: 3507409553592 / Consumption 24109.080 kWh / Daily average 753.409 kWh

& Consumption charge: Commercial (Small Power User - High)	
(24109.080 kWh X R 1.6053)	38702.31
& Service charge	
(32 Days X R 56.3000)	1801.60
	40503.91

REFUSE (Period 16/09/2020 to 15/10/2020) 30 Days
At 72 UPPER THISTLE AVENUE, NEWLANDS / Erf 138862

& Refuse charge (30 X 240lBIN X 1 Removals)	4917.30
	4917.30

Add 15% VAT on amounts marked with & above	**6813.19**
Current account: Total due	**52234.40**

Meter details			Previous reading		New reading		Units used
ELECTRICITY	3507409553592	007	8607.380kWh	(Actual)	8808.289kWh	(Actual)	200.909(X120)kW