PROVINCE OF THE NORTHERN CAPE

DEPARTMENT OF ROAD AND PUBLIC WORKS

the dr&pw
Department:
Roads and Public Works
NORTHERN CAPE PROVINCE
REPUBLIC OF SOUTH AFRICA

PROCUREMENT DOCUMENTS FOR NURSING COLLEGE KIMBERLEY PHASE 2A: ACADEMIC CAMPUS ELECTRICAL INFRASTRUCTURE SERVICES FOR DEPARTMENT OF HEALTH

THE EMPLOYER

Dept Roads and Public Works NC

Tebogo Leon Tume Complex
9 – 11 Stokroos Street
Square Hill Park
KIMBERLEY, 8301

Email: jseptember@ncpg.gov.za
Tel: 053 839 2100
Cell: 053 839 2100

PRINCIPAL AGENT

HOSPITAL DESIGN GROUP

57 Warden Street
HARRISMITH
9880

Email: braam@hdg.co.za
Tel: 058 622 3942
Cell: 084 299 2908

ELECTRICAL ENGINEER

MVD Kalahari Consulting Engineers
and Town Planners (Pty) Ltd
186 Du Toitspan Road
Kimberley
8301
Email: hendrik@mvdkalahari.co.za
Tel: 066 274 5464

BID NR : DRPW 015/2023-EP
CLOSING DATE : 28 August 2024
CLOSING TIME : 11:00

BIDDER'S NAME : ……

REFERENCED INDEX TO PARTS OTHER THAN SPECIFICATION AND BILLS OF QUANTITIES

The following index has been included for ease of paginating the document.

FORM OF OFFER AND ACCEPTANCE

FORM OF OFFER AND ACCEPTANCE

OFFER

The Employer, identified in the acceptance signature block, has solicited offers to **Nominate a Subcontractor to enter into a Nominated Subcontract with the Contractor** for the procurement of:

**NURSING COLLEGE KIMBERLEY PHASE 2A – ACADEMIC CAMPUS:
ELECTRICAL INFRASTRUCTURE SERVICES**

The Tenderer, identified in the offer signature block, has examined the documents listed in the tender data and addenda thereto as listed in the returnable schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the Tenderer, deemed to be duly authorized, signing this part of this form of offer and acceptance, the Tenderer offers to perform all of the obligations and liabilities of the **Subcontractor** under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the contract data.

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

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

VAT IS TO BE INCLUDED EVEN IF THE TENDERER IS A NON-VAT VENDOR

This offer may be accepted by the Employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the tender data, whereupon the Tenderer becomes the party named as **Subcontractor** in the conditions of contract identified in the contract data.

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

Company or Close Corporation: …… …… And: Whose Registration Number is: …… And: Whose Income Tax Reference Number is: ……	**OR**	Natural Person or Partnership: …… …… Whose Identity Number(s) is/are: …… …… Whose Income Tax Reference Number is/are: ……

AND WHO IS (if applicable)**:**

Trading under the name and style of: ……

AND WHO IS:

Represented herein, and who is duly authorised to do so, by: Mr/Mrs/Ms: …… In his/her capacity as: ……	**Note:** **A Resolution / Power of Attorney, signed by all the Directors / Members / Partners of the Legal Entity must accompany this Offer, authorising the Representative to make this offer.**

TENDERER:

Initial: Authorized Signatory/ies: 1 _____
2 _____

HDG

Initial: HDG _____

Witness: _____

SIGNED FOR THE TENDERER:

Name of representative	Signature	Date

WITNESSED BY:

Name of witness	Signature	Date

This Offer is in respect of: (Please indicate with an "X" in the appropriate block)

The official documents …….. ☐
The official alternative …….. ☐
Own alternative (only if documentation makes provision therefore) ☐

(N.B.: Separate Offer and Acceptance forms are to be completed for the main and for each alternative offer)

SECURITY OFFERED:

(a) the Tenderer accepts that in respect of contracts from R 500 000 and up to R 1 million, a surety of 2% of the contact value (excluding VAT) will be applicable and will be deducted by the Employer in terms of the applicable conditions of contract

(b) in respect of contracts above R 500 000, the Tenderer offers to provide security as indicated below:

(1) cash deposit of 10 % of the Contract Sum (excluding VAT) **Yes** ☐ **No** ☐

(2) variable construction guarantee of 10 % of the Contract Sum (excluding VAT) **(DPW 10.3)**

Yes ☐ **No** ☐

(3) payment reduction of 10% of the value certified in the **payment certificate** (excluding VAT)

Yes ☐ **No** ☐

(4) cash deposit of 5% of the **contract sum** (excluding. VAT) and a payment reduction of 5% of the value certified in the **payment certificate** (excluding. VAT)

Yes ☐ **No** ☐

(5) fixed **construction guarantee** of 5% of the **contract sum** (excluding VAT) and a payment reduction of 5% of the value certified in the **payment certificate** (excluding VAT)

Yes ☒ **No** ☐

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

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

……..

Other Contact Details of the Tenderer are:

Telephone No ……	Cellular Phone No. ……
Fax No ……	Other contact No. ……
Postal address: ……	
Main or Principal Place of Business: E-mail Address: ……	
Registered Place of Business: ……	
Banker …… Branch……	
Registration No of Tenderer at Department of Labour …..……	
CIDB Registration Number: (Attached copy of certificate) …….....	
CSD Number:……SARS Pin……	

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 who shall pay the Nominated Subcontractor** 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 **with respect to the Nomination of the Subcontractor who will enter into a Nominated Subcontract Agreement with the Contractor** 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 1 Agreement and contract data, (which includes this agreement)
Part 2 Tender Specification and Bill of Quantities

and drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 4 above.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as 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 said documents are valid unless contained in this schedule.

The Tenderer shall within one week after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the Employer 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. 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, if delivered by hand on the day of delivery, or if delivered by courier within two working days after submission by the Employer to the courier services for a door-to-door delivery to the Tenderer, provided that the Employer notifies the Tenderer of the tracking number within 24 hours of such submission, or if delivered by telefax, one working day after transmission, or if delivered by email, one working day after transmission.

For the Employer:

Name of signatory	Signature	Date

Name of Organisation:	DEPARTMENT OF ROADS AND PUBLIC WORKS
Address of Organisation:	Tebogo Leon Tume Complex 9-11 Stokroos Street Square Hill Park KIMBERLEY, 8301

WITNESSED BY:

Name of witness	Signature	Date

Schedule of Deviations

1.1.1. Subject:
Detail:

1.1.2. Subject:
Detail:

1.1.3. Subject:
Detail:

1.1.4. Subject:
Detail:

1.1.5. Subject:
Detail:

1.1.6. Subject:
Detail:

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

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

TENDERER:

Initial: Authorized Signatory/ies: 1 _____
2 _____

HDG

Initial: HDG _____

Witness: _____

THE TENDER

PART T1: TENDERING PROCEDURES

T1.1- Notice and Invitation to Tender

Notice and Invitation to Tender

THE DEPARTMENT OF ROADS & PUBLIC WORKS INVITES TENDERS FOR:

Project Title:	**NURSING COLLEGE KIMBERLEY PHASE 2A – ACADEMIC CAMPUS: ELECTRICAL INFRASTRUCTURE SERVICES**		
Bid No:	DRPW 015/2023-EP	Closing Time:	11:00
Closing Date:	As per advert	Validity Period:	90 Days

Tenderers should have a CIDB contractor grading of	**6 EP**

RESPONSIVENESS CRITERIA	
√	Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submission, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered for the specified **CLASS and RANGE** of construction works are eligible to submit tenders.
√	**Joint ventures are eligible to submit tender provided that**: 1. every member of the joint venture is registered with the CIDB 2. The lead partner has a contractor grading designation one grade lower in the value or higher as indicated above; 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 this project. 4. A Joint Venture Agreement must be submitted with the tender in the case of a joint venture offer.
√	Tender offer must be properly received on the closing date and time specified on the invitation, fully completed and signed in ink (All as per Standard Conditions of Tender).
√	Submission of applicable: Resolution by the Legal Entity or Consortium / joint venture, authorising a dedicated person(s) to sign documents on behalf of the Firm / Consortium / joint venture.
√	Submission of (NCP 4) DECLARATION OF INTEREST.
√	Submission of other compulsory returnable schedules / documents as per LIST OF RETURNABLE DOCUMENTS.
√	Submission of SITE INSPECTION CERTIFICATE as proof for attendance of compulsory site meeting.
√	Submission of PRICED BILL OF QUANTITIES WITH THE TENDER
√	**No bidder or any of its consortium/joint venture members may have an interest in any of the other bidder/joint venture/consortium participation in this bid." Bidders may be disqualified should such be found in your bid submission.**

Tender will be evaluated according to the price and specific goals:

The 80/20 system for requirements with a Rand value of up to R50 000 000; OR

The 90/10 system for requirements with a Rand value above R50 000 000.

Where the financial value inclusive of VAT of one or more responsive tenders received equals or is less than R 50 000 000, the 80/20 system shall be applicable.

Where the financial value inclusive of VAT of all responsive tenders received has a value in excess of R 50 000 000, the 90/10 system shall be applicable.

Price / Preference / Functionality:				
Requirement	**≤ R50 000 000**	**> R50 000 000**		
Price	80	90	**Total must equal**	100
Preference	20	10		
Functionality	0 of 80	0 of 90		

Table1: Specific goals for the tender and points claimed are indicated per table below.
(Note to organ of state: Where either the 90/10 or 80/10 goals point system is applicable, corresponding points must be indicated as such.
Notes to tenderers: The tenderer must indicate how they claim points for each preference system.)

The specific goals allocated points in terms of this tender	**Number of points allocated (90/10 system) (To be completed by the organ of state)**	**Number of points allocated (80/10 system) (To be completed by the organ of state)**	**Number of points claimed (90/10 system) (To be completed by the tenderer)**	**Number of points claimed (80/10 system) (To be completed by the tenderer)**
Enterprise with ownership of 51% or more by person/s who are black person/s	**80**	**20**		

collection of tender documents:

DEPOSIT	The document is available at www.mvdgroup.org under tenders as the department does not print out the document nor sell the document.
INSPECTION	Compulsory Clarification Meeting – 13 August 2024 at 11H00 at the New Mental Health Facility at the EMS Building boardroom on the R31, Kimberley, Northern Cape

Enquiries related to tender documents may be addressed to the Client's Representative:

Electrical Engineer:	HENDRIK JONCK	**Telephone no:**	053 831 1889
Cell no:	066 274 5464	**Fax no:**	
E-mail:	hendrik@mvdkalahari.co.za		

Deposit / RETURN of tender documents:

POSTED TO	Tender document may be posted to: DEPARTMENT OF ROADS AND PUBLIC WORKS, NORTHERN CAPE PROVINCE Tebogo Leon Tume Complex 9 – 11 Stokroos Street Squarehill Park Kimberley 8301
Telegraphic, telephonic, telex, facsimile, electronic and / or late tenders will not be accepted.	
Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the TENDER DATA (T 1. 2)	

T 1.2 - Tender Data

T1.2- TENDER DATA

The department of roads & public Works invites tender FOR:

Project Title:	NURSING COLLEGE KIMBERLEY PHASE 2A – ACADEMIC CAMPUS: ELECTRICAL INFRASTRUCTURE SERVICES		
Bid No:	DRPW 015/2023-EP	Closing Time:	11:00
Closing Date:	As per advert	Validity Period:	90 days

CLAUSE NUMBER	DETAIL
	The conditions of tender are the Standard Conditions of Tender as contained in Annexure F of the CIDB Standard for Uniformity in Construction Procurement as per Government Notice No 751 Published in Government Gazette No. 27831of 22 July 2005 and as mended for time to time. (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 marked 'F" in the above-mentioned Standard Conditions of Tender.
F.1.1	The employer is the Government of the Republic of South Africa in its Northern Cape Provincial Government, represented by the Accounting Officer of the Northern Cape Department of Roads & Public Works.
F.1.2	For this contract the single volume approach is adopted. This procurement document has been formatted and compiled under the headings for a single volume approach as contained in table 6 of the CIDB's "Standard Uniformity in Construction Procurement." The list of Returnable Documents identifies which of the documents a tenderer must complete when submitting a tender offer. The tenderer must submit his tender offer by completing the Returnable Documents including the Fully Priced Activity Schedule/ Bills of Quantities, signing the "Offer" section in the Form of Offer and Acceptance" and delivering the single volume procurement document back to the Department bounded up as it was when it was received. The single volume procurement document issued by the employer comprises the following: **TENDER** **Part 1: Tendering Procedures** T1.1 – Tender notice and invitation to tender (Refer to index) T1.2 – Tender data (Refer to index) **Part 2: Returnable Documents** T2.1 – List of returnable documents (Refer to index) T2.2 - Returnable Schedules **CONTRACT** **Part 1: Agreement and Contract Data** C1.1 – Form of offer and acceptance (Refer to index) C1.2 – Contract data (Refer to index) C1.3 – Form of Guarantee (Refer to index) **Part 2: Pricing Data** C2.1 – Pricing instructions (Refer to index) C2.2 - Activity schedules / Bills of Quantities **Part 3: Scope of Work** C3 – Scope of work (Refer to index) **Part 4: Site Information** C4 – Site information (Refer to index)

CLAUSE NUMBER	DETAIL	
F.1.4	The employer's agent is:	
	Name	Jewis September
	Capacity	PROJECT LEADER
	Address	Tebogo Leon Tume Complex 9-11 Stokroos Street Square Hill Park KIMBERLEY, 8301
	Tel:	053 839 2100 / 079 038 3057
	Fax	053 839 2291
	E-mail	jseptember@ncpg.gov.za
F.1.5.2	Insert the following: "…….…… tender offers, save for all tenders being non responsive, re-issue a tender covering ..……	
F .2.1	For eligibility refer to Notice and Invitation to Tender T1.1.	
	A contract will only be entered into with a tenderer who has in his employment management and supervisory staff satisfying the requirement of the scope of works for labour intensive competencies for supervisory and management staff – *NOT APPLICABLE*.	
	Only those tenderers who are registered with the CIDB or are capable of being so prior to the evaluation of Submissions in an **ELECTRICAL ENGINEERING WORKS- INFRASTRUCTURE** class of construction, in the grading mentioned in the **Notice and Invitation to Tender (T1.1),** are eligible to submit tenders. Tender offers scoring less than a minimum of 75**%** in respect of the total evaluation points for quality will be regarded as non-responsive. **NOTE:** **THIS SPECIAL CONDITIONS OF TENDER IS REGARDED AS A REPONSIVNESS CRITERIA, THUS FAILURE TO COMPLETE AND COMPLY WILL LEAD TO THE DISQUALIFICATION OF YOUR TENDER** **Individuals must be identified for each of the key personnel listed below.** In order to be considered for an appointment in terms of this tender, the tenderer must have the Following key personnel who will be the single-point of accountability and responsibility for the management of the construction works in its employment at the close of tender. Alternatively, a signed undertaking from an organisation having the required personnel, stating that they will undertake the necessary work on behalf of the tenderer in terms of a sub-consultant agreement, will be acceptable. **Key Personnel: Electrical Contractor** Where the key personnel are no longer accessible to undertake the necessary work after the award of the tender, the Subcontractor shall within a period of 10 working days replace the key personnel listed in T2.2d with a person with equivalent competencies and subject to approval by the Employer. Such approval shall not be unreasonably withheld. A suitably qualified and experienced electrical contractor who will be the single point of accountability and responsibility for the management of the construction works and who possesses, as a minimum, either of the following qualifications and experience: **A: Individual experience as table A1 clause F.2.1** • Registration as a 3-phase installation electrician at the Department of Employment and Labour **B: Project experience as table A1 clause F.2.1** The Curriculum Vitae of the electrical contractor, must be submitted with the tender submission, appended to Schedule T2.2d. Bidders are referred to clause F.2.1 of this tender data for the requirements regarding submission of certificates of qualifications of key personnel	

CLAUSE NUMBER	DETAIL
	Key Personnel: Electrical Construction Manager/Supervisor Where the key personnel are no longer accessible to undertake the necessary work after the award of the tender, the subcontractor shall within a period of 10 working days replace the key personnel listed in T2.2e – Electrical Construction Manager/Supervisor with a person with equivalent competencies and subject to approval by the employer. Such approval shall not be unreasonably withheld. A suitably qualified and experienced Construction Manager/Supervisor and who possesses as a minimum the following qualifications: A: Individual experience as table A2 clause F.2. 1 • A Trade Certificate (Electrician Construction) in the electrical built environment with a minimum of 10 years' experience B: Project experience as table A2 clause F.2. 1 • The Curriculum Vitae of the Electrical Construction Manager/Supervisor must be submitted with the tender submission, appended to Schedule T2.2e. Bidders are referred to clause C.2.23.2 of this tender data for the requirements regarding submission of certificates of qualifications of key personnel. **Key Personnel: SHEQ Officer** Where the key personnel are no longer accessible to undertake the necessary work after the award of the tender, the subcontractor shall within a period of 10 working days 11 replace the key personnel listed in T2.2f – SHEQ Officer with a person with equivalent competencies and subject to approval by the employer. Such approval shall not be unreasonably withheld. A suitably qualified and experienced SHEQ Officer and who possesses as a minimum the following qualifications: A: Individual experience as Table A3 clause F.2. 1 • A Registration Certificate with SACPCMP as a Health and Safety Officer in the built environment with a minimum of 2 years' experience B: Project experience as table A3 clause F.2. 1 • The Curriculum Vitae of the SHEQ officer must be submitted with the tender submission, appended to Schedule T2.2f. Bidders are referred to clause C.2.23.2 of this tender data for the requirements regarding submission of certificates of qualifications of key personnel. **Bank Rating** In order to be eligible for award in terms of this tender, tenderers must submit a bank rating from a recognized financial institution (not older than 3 months at tender closing date) which indicates that the bidder possesses the minimum following bank code; • Bank rating of minimum Code C: Good for amount quoted if strictly in the way of business – Unlikely to commit themselves beyond their means **Financial Statements** In order to be eligible for award in terms of this tender, tenderers must submit signed audited statements of the last three years. <u>Bidders must take note of the following</u>; The amount of enquiry on the bank rating letter must be equal to the sum of the amount tendered (including VAT) or higher. A tender shall not be evaluated further under the following conditions; 1.A bidder who fails to provide a bank rating letter. • Bidders who fail to satisfy any of the above eligibility criteria contained in clause C.2.1 shall be deemed to be non-responsive and their bids shall not be considered further. Bidders shall not be provided a second opportunity by the Employer to submit any information in relation to any of the above eligibility criteria where such information is not provided by the bidder, bound within the bid submission, on the date and time of the bid closing. Replace Clarification with Compulsory Briefing. For particulars regarding a pre-tender site inspection meeting, see Tender Notice and Invitation to Tender T1.1 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.

CLAUSE NUMBER	DETAIL
	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 12 enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal. Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer's standards and requirements. The modified Pricing Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the Employer's costs of confirming the acceptability of the detailed design before it is constructed. Alternative tender offer permitted: Yes ☐ No ☐ Replace sub-clause F.2.1 with the following; Return all returnable documents to the employer after completing them in their entirety by writing in non-erasable black ink Parts of each tender offer communicated on paper shall be submitted as an original, plus 1 (one) copy. The tender shall be signed by a person duly authorized to do so. Tenders submitted by joint ventures of two or more firms shall be accompanied by the document of formation of the joint venture, in the form of a joint venture agreement, in which it is defined precisely the conditions under which the joint venture will function, its period of duration, the persons authorized to represent and obligate it, the participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning. Failure to provide the joint venture agreement, bound with the tender submission, on the date and time of the closing of the bid, shall render the tender non-responsive. The tender offer validity period is 90 days. A tender may be rejected as non-responsive if the tenderer fails to provide any clarification requested by the employer within the time for submission stated in the employer's written request for such clarification. The clarification of a tender offer includes the provision of the priced bills of quantities (Part C2.2: Bills of Quantities). 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. Access shall be provided for inspections, tests and analysis as may be required by the Employer refer to PW371 Not a requirement. **Certificates Confirming Educational Qualifications of Key Personnel** Tenderers are required to submit certified copies of educational qualifications of key personnel. A certified copy is considered to be valid when the certification is less than three months old on the date of closing of bids. Failure to submit certified copies of key personnel qualifications will result in the bid being deemed non-responsive **Letter of Good Standing** Tender are required to submit, bound with the tender submission, a letter of good from the compensation commissioner indicating that the bidder is in good standing. Failure to submit will result in the bid not being evaluated further. Notwithstanding any requests for confirmation of receipt of Addenda issued, the tenderer shall be deemed to have received such addenda if the employer can show proof of transmission thereof (or a notice in respect thereof) via electronic mail, facsimile or registered post.

CLAUSE NUMBER	DETAIL

Bidders will be considered non-responsive if, inter alia:

1. The bidder has failed to attend the compulsory briefing meeting and failed to submit a fully completed briefing session certificate; After the briefing session, a signed briefing certificate will be issued to all the bidders who attended the briefing session.
2. The bid is submitted by Telegraphic, telephonic, telex, facsimile (faxed) or email media or if the tender is submitted late.
3. The bidder does not comply with the eligibility criteria listed in F2.1 above;
4. The resolution for signatory is not attached to the tender submission on a company letterhead.
5. The bidder has failed to fully complete and sign SBD1, SBD4, SBD 6.2, Annex C, SBD8 & SBD9.
6. The bidder failed to comply to TAX obligations at the award of the bid.

Stage 1 Functionality
Functionality of responsive bids submitted will be evaluated according to the predetermined criteria described below.

A bid will not be evaluated further if it fails to meet the minimum threshold of total 75 points out of maximum 100 points for functionality as prescribed in the following tables and a minimum of 50% per sub-section

	FUNCTIONALITY CRITERIA	POINTS ALLOCATED
A	Key personnel A1 Electrical Contractor	20
B	Key personnel A2 Electrical Construction Manager/Supervisor	20
C	Key personnel A3 Site SHEQ officer	10
D	Experience	50
E	**TOTAL**	**100**

A Key Personnel

Points are allocated for required competencies and qualifications of allocated personnel for the project in consideration / Required key personnel are Contracts Manager, Construction Manager/ Supervisor and Site SHEQ Officer

A1 Electrical Contractor		
Description of Criteria - Qualifications	**Points**	**Total points**
Qualification: Registration as a 3-phase installation electrician at the Department of Employment and Labour.	5	5
The tenderer has failed to address the question and has not proved qualification of the proposed electrical contractor.	0	
Description of Criteria - Experiences	**Points**	**Total points**
One (1) to Two (2) projects. Electrical Contractor experience on infrastructure projects with minimum electrical contract value of R5 million each or above appointed as an electrical contractor	15	15
Three (3) to Four (4) projects. Electrical Contractor experience on infrastructure projects with minimum value of R2.5 million each or above appointed as an electrical contractor.	10	
Five (5) or more projects. Electrical Contractor experience on infrastructure projects with minimum value of R1 million each or above appointed as an electrical contractor.	5	
The tenderer has failed to address the question and has not proved experience of the proposed contract manager	0	
SUB-TOTAL A1	**20**	

CLAUSE NUMBER	DETAIL

A2 Electrical Construction Manager / Supervisor		
Description of Criteria - Qualifications	**Points**	**Total points**
Qualification: Trade certificate in the Electrical Built Environment field of study	5	5
The tenderer has failed to address the question and has not proved qualification of the proposed Construction Manager/Supervisor	0	
Description of Criteria – Experiences	**Points**	**Total points**
One (1) to Two (2) projects. Electrical Construction management experience on projects with minimum value of R5 million each or above appointed as an Electrical Construction Manager / Supervisor	15	15
Three (3) to Four (4) projects. Electrical Construction management experience on projects with minimum value of R2.5 million each or above appointed as an Electrical Construction Manager / Supervisor	10	
Five (5) or more projects. Electrical Construction management experience on projects with minimum value of R1 million each or above appointed as an Electrical Construction Manager / Supervisor	5	
The tenderer has failed to address the question and has not proved experience of the proposed Electrical Construction Manager/ Supervisor	0	
SUB-TOTAL A2	**20**	
A3 Site SHEQ Officer		
Description of Criteria - Qualifications	**Points**	**Total points**
Qualification : A Registration Certificate with SACPCMP as C.2.1.6 in tender data	3	3
The tenderer has failed to address the question and has not proved qualification of the proposed SHEQ Officer	0	
Description of Criteria - Experience	**Points**	**Total points**
One (1) to Two (2) projects. SHEQ experience on projects with minimum value of R5 million each or above appointed as Site SHEQ Officer	7	7
Three (3) to Four (4) projects. SHEQ experience on projects with minimum value of R2.5 million each or above appointed as SHEQ Officer	5	
The tenderer has failed to address the question and has not proved experience of the proposed SHEQ Officer	0	
SUB-TOTAL A3	**10**	
TOTAL A		**50**

NB: Tenders are required to submit CV's with contactable references and certified qualifications of proposed key personnel. Failure to submit will result in the tenderer not being awarded points on the above criteria. All copies of qualifications must be certified not older than three months at tender closing date.

CLAUSE NUMBER	DETAIL

B Experience of bidder

Tenderers are required to demonstrate relevant past experience and competency and attach practical completion certificates. **Tenderers are required to submit full details of, and reliable contactable references for relevant buildings which were successfully completed.** **Projects relevant must be of similar scope, nature and size, completed within the last five (5) years. Tenderers are required to submit full details of, and reliable contactable references for relevant projects which were successfully completed within the contract period.**		
Successful completion of similar or comparative projects in the last tender (5) years		
Description of Criteria	**Points**	**Total points**
One (1) or more similar and or comparative projects successfully executed by the tenderer within the contract period in the past 5 years for the minimum value of R 5 million each or above.	50	50
Three (3) or more similar and or comparative projects successfully executed by the tenderer within the contract period in the past 5 years for the minimum value of R 2.5 million each or above.	45	
Four (4) or more similar and or comparative projects successfully executed by the tenderer within the contract period in the past 5 years for the minimum value of R 1 million each or above.	40	
The Tenderer has failed to address the question and has not provided proof of completing similar building construction projects	0	
TOTAL B		**50**
GRAND TOTAL		**100**
MINIMUM THRESHOLD		**75**

Stage 2 Price and Specific Goals

Add the following:
The financial offer will be scored using the following **Formula:**

$$Ps = 80[1 - \frac{Pt - Pmin}{Pmin}]$$

where

Ps = Points scored for price of tender under consideration;
Pt = Price of tender under consideration; and
Pmin = Price of lowest acceptable tender.

A trust, consortium or joint venture will qualify for points for their BBB-EE status level as a legal entity, provided that the entity submits their BBB-EE status level certificate. A trust, consortium or joint venture will qualify for points for their BBB-EE status level as an unincorporated entity, provided that the entity submits their consolidated BBB-EE scorecard as if they were a group

Bidders to fail to satisfy any of the above eligibility criteria in clause F.2.1 shall be determined to be non-responsive and their bids shall not be considered further. Bidders shall not be provided a second opportunity y the employer to submit any information in relation to any of the above eligibility criteria where such information is not provided by the bidder, bound within the bid submission, on the date of the bidding.

F .2.7	For particulars regarding A PRE-TENDER SITE INSPECTION MEETING, see Notice and Invitation to Tender T1.1

CLAUSE NUMBER	DETAIL
F .2.12	If a tenderer wishes to submit an own alternative offer, the only criteria permitted for such alternative tender offer is that if demonstrably satisfies the Employer's standards and requirements. A tender may submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted. Provided that the tenderer's main tender offer is according to specification and would under normal circumstances be recommended for acceptance, his alternative tender offer may also be considered for the purpose of the award of the contract. Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take 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 a contractual obligation of the tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respect with the Employer's standards and requirements. The modification Pricing Data must include an amount equal to 5% of the amount tenderer for the alternative offer to cover the Employer's cost of confirming the acceptability of the detailed design before it is constructed Alternative tender offer permitted: **NO**
F .2.12	The EMPLOYER ADDRESS FOR DELIVERY of tender offers and identification details to be shown on each tender offer package are as per **Notice and Invitation to Tender T1.1**
F.2.13.6 **F .3.5**	A single-envelope procedure is required
F.2.15	The **CLOSING TIME** for submission of tender offers is as per **Notice and Invitation to Tender T1.1**
F.2.16	The tender offer **VALIDITY PERIOD** is as per **Notice and Invitation to Tender T1.1**
F.2.18	The tenderer will be required to submit a fully Priced Bill / Lump Sum tender document, with tender closing.
F.2.19	Access shall be provided for inspection, tests and analysis as may be required by the Employer.
F.2.22	Not a requirement.
F.3.4.1 **F.3.4.2.**	The location for opening of the tender offers, immediately after closing time thereof shall be at: Main Boardroom, DEPARTMENT OF ROADS AND PUBLIC WORKS, NORTHERN CAPE PROVINCE Tebogo Leon Tume Complex 9 – 11 Stokroos Street, Squarehill Park Kimberley, 8301
F.3.11.1	The procedure for the evaluation of responsive tender is • ~~Method 1: Financial offer~~ • ~~Method 2: Financial offer and preferences~~ • ~~Method 3: Financial offer and quality~~ • Method 4: Financial offer, quality and preferences **METHOD 4 - WILL apply for this tender**.

CLAUSE NUMBER	DETAIL
F.3.11	**Scoring the Financial Offer:** Ps = NEP + Wc (calculated separately for each tender offer) The score for quality and financial offer is to be combined, before the addition of the score for preference, as follows: $Wc = W_3 (1+ \frac{(P - P_m)}{P_m})$ where W_3 = The number of tender evaluation points for quality and financial offer and equals: 1) 90 where the financial value inclusive of VAT of all responsive tenders received have a value in excess of R 50 000 000; or 2) 80 where the financial value inclusive of VAT of one or more responsive tender offers equals or is less than R 50 000 000. P = The price of the financial offer of the submission under consideration. P_m = The price of the financial offer of the submission of the lowest acceptable tender. Wc = Points allocated for price of tender under consideration. **Scoring for Preferences:** In terms of the Preferential Procurement Regulations 2011 preferences points for B-BBEE level of contribution are calculated on their B-BBEE Status Level of Contribution in the industry. Tender evaluation points will be awarded to tenderers who completes the preferencing schedule and who is found to be eligible for the preference claimed. Points for Direct Preference will be calculated according to the B-BBEE Status Level of Contribution of the tender under consideration as a per the points stated in the Notice and Invitation to Tender T1.1 and claimed in this form. **Calculate Total tender Evaluation Points:** The point calculated for price will be added to the point scored for preference for each individual tender offer.
F.3.13.1	Tender offers will only be accepted if: a) The tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act, 2004 (Act 12 of 2004) as a person prohibited from doing business with the public sector; and b) The tenderer has not: 1. abused the Employer's Supply Chain Management System; or 2. Failed to perform on any previous contract and has been given a written notice to this effect.
F.3.18	Provide to the successful tender one copy of the signed contract document.
F.4	**ADDITIONAL CONDITIONS OF TENDER** The additional conditions of the tender are:
F.4.1	**Invalid Tender** Tenders shall be considered invalid and shall be endorsed and recorded as such in the tender opening record, by the responsible official who opened the tender, in the following circumstances: a) If the tender offer is not submitted on the Form of Offer and Acceptance bound into this tender document (formC1.1, Part C1: Agreements and Contract Data): b) If the Form of Offer and Acceptance has not been completed or has not been signed by the authorised representative of the tender c) If the Form of Offer and Acceptance is signed, but the name of the tenderer is not stated or is indecipherable d) If the tender offer is not completed in non-erasable ink.

CLAUSE NUMBER	DETAIL
F.4.2	**Negotiations with preferred tenderers** The Employer may negotiate the final terms of a contract with tenderers identified through a competitive tendering process as preferred tenderers provided that such negotiations: a) Does not allow any preferred tenderer a second or unfair opportunity. b) Is not to the detriment of any other tender; and c) Does not lead to a higher price than the tender as submitted. Minutes of any such negotiations shall be kept for record purposes
F.4.3	**Letter of good standing (COIDA)** The Tenderer shall submit to the Employer a letter of good standing (COIDA)
F.4.4	**Claims arising after submissions of tender** No claim for an extra arising out of any doubt or obscurity as to the true intent and meaning of anything contained in the Conditions of Contract, Scope of Work and Pricing Data, will be admitted by the Employer after submission of any tender and the tenderer shall be deemed to have: 1) Read and fully understood the whole text of the Contract Data, Scope of Work and Pricing Data and thoroughly acquainted himself with the nature of the works proposed and generally of all matters which may influence the Contract. 2) Visited the site of any proposed works. 3) Requested the Employer or his duly authorised agent to make clear the actual requirements of anything contained in the Scope of Works and Pricing Data, the extract meaning or interpretation of which is not clearly intelligible to the tenderer. 4) Received any Addenda to the tender documents which have been issued in accordance with the Employer's Supply Chain Management Policy.
F.4.5	**Imbalance in tendered rates** In the event of tendered rates or lump sums being declared by the Employer to be unacceptable to it because they are either excessively low or high or not in proper balanced with other rates or lump sums, the tenderer may be required to produce evidence and advance arguments in support of the tendered rates or lump sums objected to. If, after submission of such evidence and any further evidence requested, the Employer is still not satisfied with the tendered rates or lump sums objected to, it may request the tenderer to amend these rates and lump sums along the lines indicated by it. The tenderer will then have the option to alter and/or amend the rates and lump sums objected to and such other amounts as are agreed on by the Employer, but this shall be done without altering the tender offer as tendered. Should the Tenderer fail to amend his Tender in a manner acceptable to the Employer, the Employer may reject the Tender.
F.4.6	The Employer shall not formally issue tender documents in electronic format as contemplated in C.2.12.2 and C.2.13.3 and shall only issue tender documents in hardcopy. An electronic version of the issued tender documents may be made available to the tenderer, upon written request in terms of this clause, subject to the following: (a) Electronic copies of the contract document, or parts thereof, will only be provided to tenderers who have been issued with the tender documents as contemplated in C.1.2 in hardcopy. (b) The electronic version shall not be regarded as a substitute for the issued tender documents. (c) The Employer shall not accept Tender submitted in electronic format. Tenderers may not complete and submit a printed copy of the electronic version of the tender document or part thereof. Only those Tender that have been completed on an issued hard copy tender document shall be considered. (d) The Employer accepts no responsibility or liability arising from the reliance on or use of the electronic version provided in terms of this clause. The Employer further does not guarantee that the electronic version corresponds with the issued tender document in all respects. Tenderers are alerted to the fac that electronic version of the tender documents may not reflect any notices or addenda that ament the tender document. (e) Any non-compliance with these provisions, including effecting any unauthorized alterations to the tender as contemplated in C2.11, shall render the tender invalid. The Employer reserves the right to take any action against such tenderer allowed in law including, in circumstances where the tender had already been awarded, the right to cancel the contract. (f) In requesting the electronic version of the tender document or parts thereof, the tenderer is deemed to have read, understood and accepted all of the above conditions.

CLAUSE NUMBER	DETAIL
F.4.7	**Local Content and Production for Designated Sectors: N/A** ~~Only locally produced or locally manufactured steel products and components for the construction with stipulated minimum threshold of **100%** for local production and content will be considered. If the quantities of steel products and components for construction required cannot be wholly sourced in South Africa (RSA) based manufacturers and/or at the designated local content threshold of **100%**, bidders and procuring entities should obtain written authorization from DTI should there be a need to import and copy of this authorization letter must be submitted together with the bid document at the closing date and time.~~ ~~The exchange rate to be used for the calculation of the local production and content must be the exchange rate published by the South Africa Reserve Bank (SARB) at 12:00 on the date of advertisement of the bid.~~ ~~A bid will be disqualified if:~~ ~~• The bidder fails to achieve the stipulated minimum threshold for the local production and content unless written exemption has been granted to the bidder by the DTI to bid at a lower content level.~~ ~~• Failure to indicate the minimum percentage (100% & 90%) or not meeting minimum percentage for local content will automatically invalidate the bid from further consideration.~~ ~~• The Declaration Certificate for Local Content (SBD 6.2), the Annex C (Local Content Declaration: Summary Schedule) are not completed, duly signed, and submitted by the closing date and time of the bid~~ ~~Bidders may contact the Metals Fabrication, Capital and Rail Transport Equipment Unit within the **DTI** at telephone **012 394 1356** or Primary Minerals Processing and Construction Unit at telephone **012 394 5157**~~
F.4.8	~~**Subcontracting as a condition of Tender: N/A**~~ ~~The successful bidder shall be required to subcontract a minimum 30% of the value of the Contract including labour and materials to EME'S and/or QSE'S enterprises determined in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act. These sub-contractors can be selected from the CIDB database who are registered on the CSD for the purposes of compliance. Bidders shall make allowance in their preliminaries for any additional costs required in this regard, for example, for the preparation of work packages, management of the subcontractors including site supervision, drafting and conclusion of the subcontract agreements, subcontractor OHS plan approvals, etc., that may arise due to this commitment.~~
F.4.9	**Compliance with Occupation Health and Safety Act 1993** Tenderers are to note the requirements of the Occupational Health and Safety Act (No. 85 of 1993) and the Construction Regulations 2014 issued in terms of Section 43 of the Act. The tenderer shall be deemed to have read and fully understood the requirements of the above Act and Regulations and to have allowed for all the costs in compliance therewith. Tenderers are to note that the service provider is required to ensure that all sub-contractor/sub-consultants or other engaged in the performance of this contract also comply with the above requirements.

PART T2: RETURNABLE DOCUMENTS

T2.1- List of Returnable Documents

LIST OF RETURNABLE DOCUMENTS

1. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES

(Insert a tick in the "Returnable document" column to indicate which documents must be returned with the tender)

Tender document name		Number of pages issued	Returnable document
T 2. 2-1	Resolution of Board of Directors (PA-15.1)	1 Page	☒Yes
T2. 2-2	Resolution of Board of Directors to enter into consortia or JV's (PA-15.2)	2 Pages	☒Yes
T2 2-3	Special Resolution of Consortia or JV's (PA-15.3)	3 Pages	☒Yes
T2. 2-4	Schedule of proposed sub-contractors (DPW-15: EC)	1 Page	☒Yes
T2. 2-7	Site Inspection Meeting Certificate (DPW-16: EC)	1 Page	☒Yes
T2. 2-8	Declaration of Interest (PA-11)	3 Pages	☒Yes
T2. 2-15	Compulsory Enterprise Questionnaire	2 Pages	☒Yes
F.2.1	Bank Rating Letter (not older than 3 months at the close of tender)	Pages	☒Yes
F.2.1	Past three years Audited financial Statements	Pages	☒Yes
	Valid Letter of Good Standing	Pages	☒Yes
	Declaration Certificate for Local Content (SBD 6.2)	Pages	☒Yes
	Joint Venture Agreement (State percentage split)	Pages	☒Yes
	Priced Bills of Quantities	Pages	☒Yes
			☒Yes
			☒Yes

2. RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT

Tender document name		Number of pages issued	Returnable document
T2. 2-6	Preference Certificate (SBD6.1)	6 Pages	☒Yes
T2. 2-11	Record of Addenda to tender documents (DPW-21: EC)	1 Pages	☒Yes
T2. 2-12	Particulars of Subcontractor (refer to index)	1 Page	☒Yes

3. OTHER DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT

Tender document name	Number of pages issued	Returnable document
Form of construction guarantee (DPW 10.1 & DPW 10.3)	Pages	☒Yes

Resolution of Board of Directors

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 DEPARTMENT OF ROADS & PUBLIC WORKS 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			
5			
6			

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

TENDERER:

Initial: Authorized Signatory/ies: 1 _____
2 _____

HDG

Initial: HDG _____

Witness: _____

Resolution of Board of Directors to Enter into Consortia or Joint Ventures

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:

3. 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 DEPARTMENT OF ROADS & PUBLIC WORKS in respect of the following project:

_____

_____
(*Project description as per Bid /Tender Document)*

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

4. *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.

5. The Enterprise accepts joint and several liability with the parties listed under item 1 above for the due fulfilment of the obligations of the joint venture deriving from, and in any way connected with, the Contract to be entered into with the Department in respect of the project described under item 1 above.

6. The Enterprise chooses as its *domicilium citandi et executandi* for all purposes arising from this joint venture agreement and the Contract with the Department in respect of the project under item 1 above:

Physical address: _____

_____

_____

_____(code)_____

Postal Address: _____

_____

_____

_____ (code)

Telephone number: _____ (code)

Fax number: _____ (code)

	NAME	CAPACITY	SIGNATURE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Note:

1. ** Delete which is not applicable*
2. ***NB**. This resolution must be signed by <u>all</u> 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

Joint ventures are eligible to submit tender provided that:

- every member of the joint venture is registered with the CIDB
- 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 this project.
- A Joint Venture Agreement <u>must</u> be submitted with the tender in the case of a joint venture offer.

<u>TENDERER:</u>

Initial: Authorized Signatory/ies: 1 _____
2 _____

<u>HDG</u>

Initial: HDG _____

Witness: _____

Special Resolution of Consortia or Joint Ventures

SPECIAL RESOLUTION OF CONSORTIA OR JOINT VENTURES

RESOLUTION of a meeting of the duly authorized 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)*

7. _____

_____

8. _____

_____

9. _____

_____

10. _____

_____

11. _____

_____

12. _____

_____

13. _____

_____

Held at _____ (*place)*

On _____ *(date)*

RESOLVED that:

A. The above-mentioned Enterprises submit a Bid in Consortium/Joint Venture to the DEPARTMENT OF ROADS & PUBLIC WORKS 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, authorized 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 liability for the due fulfilment of the obligations of the Consortium/Joint Venture deriving from, and in any way connected with, the Contract entered into with the Department in respect of the project described under item A above.

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

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 Department, cede any of its rights or assign any of its obligations under the consortium/joint venture agreement in relation to the Contract with the Department referred to herein.

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 Department in respect of the project under item A above:

Physical address: _____

_____

_____

_____ (code)

E-mail address : _____

Business address: _____

_____

_____

_____ (code)

Postal Address: _____

_____

_____

_____ (code)

Telephone number: _____ (code)

Fax number: _____ (code)

	NAME	CAPACITY	SIGNATURE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Note:

1. ** Delete which is not applicable*
2. ***NB**. This resolution must be signed by all the Duly Authorised Representatives of the Legal Entities to the ConsortiumJoint 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.*

Joint ventures are eligible to submit tender provided that:

- every member of the joint venture is registered with the CIDB
- 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 this project.
- A Joint Venture Agreement must be submitted with the tender in the case of a joint venture offer.

Schedule of Proposed Subcontractor

SCHEDULE OF PROPOSED SUBCONTRACTORS

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

We confirm that all subcontractors who are contracted to construct a house are registered as home builders with the National Home Builders Registration Council and/or with the CIDB (Construction Industry Development Board).

	Name and address of proposed Subcontractor	Nature and extent of work	Previous experience with Subcontractor
1			
2			
3			
4			
5			

Name of representative	**Signature**	**Capacity**	**Date**

Name of organisation:	

Capacity of Tenderer

CAPACITY OF TENDERER

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

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

4.1. Provide full particulars of:

Machinery	**Plant**	**Workshops**

TENDERER:

Initial: Authorized Signatory/ies: 1 _____
2 _____

HDG

Initial: HDG _____

Witness: _____

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

5.1. Current projects:

Project		Place (town)	Reference / Contact Person	Contact Tel. No.	Contract amount	Contract period	Date of commence-ment	Scheduled date of completion
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

5.2. Previous projects:

Project		Place (town)	Reference / Contact Person	Contact Tel. No.	Contract amount	Contract period	Date of commence-ment	Scheduled date of completion	Actual date of completion
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Name of Tenderer	Signature	Date

Preference Certificate

SBD 6.1

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

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

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

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1. GENERAL CONDITIONS

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

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

1.2 To be completed by the organ of state

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

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

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

c) ~~Either~~ the ~~90/10 or~~ 80/20 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.

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

(a) Price; and

(b) Specific Goals.

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

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

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

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

2. DEFINITIONS

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

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

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

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

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

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1 POINTS AWARDED FOR PRICE

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

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

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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

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

3.2.1 POINTS AWARDED FOR PRICE

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

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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

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

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

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

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

***Note to tenderers: The tenderer must indicate how they claim points for each preference point system or specific goal*)**

NB: Tender must complete column 4 to claim points. 80 is default for price and 20 specific goals (80/20).

4.2.1 Preferential Points will be awarded as per below scoring:

CRITERION	POINTS	PROOF OF CLAIM
B-BBEE Status	4	Valid B-BBEE verification certificate or an affidavit confirming micro enterprise status**.**
Business Location		Proof of a Business Address not older than three months, where business as an electrical contractor is daily performed and where a workshop, a store, plant and equipment, and office/s utilised for the works carried out by an electrical contractor are present at the said business address.
Kimberley	4	
Frances Baard	3	
Northern Cape	2	
Free State	1	
Other Provinces	0	
Ownership by Youth	4	**PA-40**, Company Registration Documents, and Identity Documents of Shareholders**.**
Ownership by Women	4	**PA-40**, Company Registration Documents, and Identity Documents of Shareholders**.**
Ownership by People with Disabilities	4	**PA-40**, Company Registration Documents, and Identity Documents of Shareholders**.**

4.2.1.1 B-BBEE Status Points will be awarded as indicated below:

B-BBEE STATUS	POINTS	Number of points claimed (80/20 system) (To be completed by the tenderer)
Level 1	4	
Level 2	3	
Level 3	2	
Level 4 and below	1	
Non-compliant	0	

4.2.1.2 Business Locality Points will be awarded as indicated below:

Locality Point Scoring (Northern Cape = Preference)	POINTS	Number of points claimed (80/20 system) (To be completed by the tenderer)
Kimberley	4	
Frances Baard	3	
Northern Cape	2	
Free State	1	
Other Provinces	0	

4.2.1.3 Ownership Points for Women will be awarded as indicated below:

OWNERSHIP	POINTS	Number of points claimed (80/20 system) (To be completed by the tenderer)
Above 50%	4	
Above 40%	3	
Above 25%	2	
Above 10%	1	

4.2.1.4 Ownership Points for Youth will be awarded as indicated below:

OWNERSHIP	POINTS	Number of points claimed (80/20 system) (To be completed by the tenderer)
Above 50%	4	
Above 40%	3	
Above 25%	2	
Above 10%	1	

4.2.1.5 Ownership Points for People with Disabilities will be awarded as indicated below:

OWNERSHIP	POINTS	Number of points claimed (80/20 system) (To be completed by the tenderer)
Above 50%	4	
Above 40%	3	
Above 25%	2	
Above 10%	1	

5. DECLARATION WITH REGARD TO COMPANY/FIRM

5.1 Name of company/firm…….

5.2 Company registration number: ……..

5.3 TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

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

i) The information furnished is true and correct;

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

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

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

(a) disqualify the person from the tendering process;

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

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

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

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

……
SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME: …….
DATE: ……

ADDRESS: ……

……

……

Site Inspection Meeting Certificate

TENDERER:

Initial: Authorized Signatory/ies: 1 _____
2 _____

HDG

Initial: HDG _____

Witness: _____

SITE INSPECTION MEETING CERTIFICATE

Project title:	**NURSING COLLEGE KIMBERLEY PHASE 2A – ACADEMIC CAMPUS: ELECTRICAL INFRASTRUCTURE SERVICES**

This is to certify that I, _____representing

_____in the capacity

of _____ visited the site on: _____

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

Name of Tenderer	Signature	Date

Name of DEPT Representative or Project Leader	Signature	Date

Name of Electrical Engineer	Signature	Date

Declaration of Interest

NCP4

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

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

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

2. BIDDER'S DECLARATION

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

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

Full Name	Identity Number	Name of State institution

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

2.2.1 If so, furnish particulars:
……
……

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

2.3.1 If so, furnish particulars:
……
……

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

3 DECLARATION

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

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

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

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

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

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

3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

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

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

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

…… ……
Signature Date

…… ……
Position Name of bidder

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

Record of Addenda to Tender Documents

RECORD OF ADDENDA TO TENDER DOCUMENTS

1. I / We confirm that the following communications received from the DEPARTMENT OF ROADS & PUBLIC WORKS 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.		
10.		
11.		
12.		
13.		

Name of Tenderer	Signature	Date

2. I / We confirm that no communications were received from the **Error! Reference source not found.** before the submission of this tender offer, amending the tender documents.

Name of Tenderer	Signature	Date

Particulars of Electrical Contractor

PARTICULARS OF ELECTRICAL CONTRACTOR

We confirm that the **Electrical Contractor** contracted to construct are registered with the Electrical Contracting Board of SA, the Department of Employment and Labour and with the CIDB (Construction Industry Development Board) in their class of construction.

Name of Electrical Contractor:	
Address:	
Electrical Contractor registration number at the Electrical Contracting Board of S.A as a Three-Phase Installation Electrician:	

Name of Tenderer	Signature	Date

Compulsory Enterprise Questionnaire

1. 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.

Attach to this form the most recent financial statements of the tendering entity.

Section 1: Name of enterprise: . . . . . .

Section 2: VAT registration number, if any: . . . . . .

Section 3: cidb registration number, if any: . . . . . .

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

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

Section 5: Particulars of companies and close corporations

Company registration number . . . . . .

Close corporation number . . . . . .

Tax reference number . . . . . .

CSD Number……

SARS Pin……

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 1 of 1999)
- ☐ a member of an accounting authority of any national or provincial public entity
- ☐ an employee of Parliament or a provincial legislature
- ☐ an employee or a member of board of directors of cidb

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 of 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 been 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 1 of 1999)
- ☐ a member of an accounting authority of any national or provincial public entity
- ☐ an employee of Parliament or a provincial legislature
- ☐ an employee or a member of board of directors of CIDB

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 authorized to do so on behalf of the enterprise:

i) authorizes 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 of 2004;
iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;
iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and
iv) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed ---------- Date ----------

Name ---------- Position ----------

Enterprise name ----------

THE CONTRACT

PART C1: AGREEMENT AND CONTRACT DATA

Contract Data: JBCC 2000
Nominated Subcontract Agreement

CONTRACT DATA: JBCC 2000 NOMINATED SUBCONTRACT AGREEMENT (Edition 4.1 of March 2005)

CONTRACT DATA

NURSING COLLEGE KIMBERLEY PHASE 2A – ACADEMIC CAMPUS: ELECTRICAL INFRASTRUCTURE SERVICES

The Subcontractor will enter into a Nominated Subcontract agreement with the Contractor of which the contract agreement will be **JBCC 2000 Nominated Subcontract Agreement (Edition 4.1 of March 2005)**

PART C2:
TENDER SPECIFICATION
AND BILL OF QUANTITIES

HOSPITAL DESIGN GROUP

TENDER SPECIFICATION AND BILL OF QUANTITIES

ELECTRICAL INSTALLATION: INFRASTRUCTURE

DRPW 015/2023 KIMBERLEY NURSING COLLEGE PHASE 2A – ACADEMIC CAMPUS

Tenderer : _____

Contact Person : _____ Cell No._____

Address : _____

Telephone : _____

MVD Kalahari

Consulting Engineers and Town Planners (Pty) Ltd
Reg. No. 2015/141138/07
186 Du Toitspan Road, Kimberley, 8301
P.O. Box 580, Kimberley 8300
Tel. (053) 831 1889
E-mail: admin@mvdkalahari.co.za

AUGUST 2024

SPECIFICATION FOR ELECTRICAL WORK

CONTENTS

LIST OF DRAWINGS

All drawings as listed in the Drawing List: P2A/MVD/00/001 (REV A) will form part of this contract.

Note: Only the drawings listed below are attached to this tender document for the purpose of tendering.

DRAWING NUMBER	DESCRIPTION
P2A/MVD/00/001	DRAWING LIST
P2A/MVD/010/002	PHASE 2A LIGHTING SCHEDULE (REV A)
P2A/MVD/010/001/MV	MV RETICULATION LAYOUT (REV A)
P2A/MVD/010/001/LV	LV RETICULATION LAYOUT
P2A/MVD/010/001/AL	AREA LIGHTING LAYOUT (REV A)
P2A/MVD/010/0001/SLD	MV & LV SINGLE LINE DIAGRAM (REV A)
P2A/MVD/010/040/DS	ABOVE GROUND DIESEL STORAGE TANK AND FUEL PIPING INSTALLATION
P2A/MVD/010/040/D	ABOVE GROUND DIESEL STORAGE TANK AND FUEL SPECIFICATIONS
P2A/MVD/010/015/SLD 2	BLOCK B- DB B2 E SINGLE LINE DIAGRAM

SECTION 1. NOTICE TO TENDERERS

- As per the Occupational Health and Safety Act (No. 85 of 1993)., Electrical Installation Regulations, all electrical work shall be done by a Registered Electrical Contractor.

- A person registered as Installation Electrician shall exercise daily control over all electrical installation work being carried out under this contract. This accredited person/s must be on site on a full-time basis.

- The Electrical Contractor shall be appointed by the Main Contractor as a subcontractor as per the Main Contractor's conditions of contract for subcontractors.

- The tenderer shall submit additional information regarding the installer of the electrical installation together with the returnable schedules enclosed with the tender enquiry document.

- Tenderers shall submit the information indicated on the forms in the Returnable Schedules with their tenders.

- Tenderers shall note that the specified work are for site services and Tenderers shall allow in their tender rates for all related survey- and setting out including the coordination with the relevant trades to complete the works.

SECTION 2. CONDITIONS OF CONTRACT

1.1. GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract shall be CONTRACT DATA: JBCC 2000 NOMINATED SUBCONTRACT AGREEMENT (Edition 4.1 of March 2005).

SECTION 3.SPECIAL CONDITIONS OF CONTRACT

2.1. GENERAL

These special provisions shall form an integral part of and supplement to the General Conditions of Contract and General Specifications which governs the work embodied in this contract. In case of conflict with any part of the said General Conditions of Contract and General Specifications, the Special Provisions in this part shall take preference and shall govern.

2.2. METHOD OF TENDER AWARD AND APPOINTMENT OF CONTRACTORS

Successful tenderer(s) shall be appointed by the Main Contractor according to the Main Contract Conditions of Contract.

2.3. DESCRIPTION OF WORK

The works is described in The Technical Specification and on the Drawings and information forming part of this document.

2.4. MANUFACTURING DRAWINGS

The manufacturing drawings will mean detail drawings from manufacturers or suppliers for items such as miniature substations, light luminaries, distribution boards/kiosks, installation detail and other equipment/material as may be requested by the engineer.

2.5. CONTRACTOR'S PERSONNEL AND QUALITY CONTROL

The Contractor shall be responsible for all the requirements of his own personnel. The Contractor shall allow in his tender price for the **full-time** supervision by a three-phase installation electrician.

The full-time supervision of the works must include the implementation of quality control schedules (check sheets), appropriate for the various installations of the works, to be approved by the Engineer before being implemented.

2.6. CONTRACTOR'S SITE FACILITIES

A suitable area will be made available where limited storage facilities can be erected. The Contractor shall supply at his own expense the necessary facilities including temporary ablutions as required for his operations on site. The Contractor shall arrange and pay for all sanitary removals, water supplies, electric and telephone connections required for his operations on site.

Except for security personnel, the contractor and his personnel cannot be accommodated on site overnight.

2.7. AVAILABILITY OF WATER AND ELECTRIC POWER

Although temporary water and electric power may be available on site it may not be accepted as a responsibility from the employer to provide such services. Contractors shall at all times be prepared to provide water and electric power for themselves for the intended construction activities. The Contractor may approach the Local Authority for the provision of water end electric power connections at his own cost.

2.8. OFFICES

The Contractor shall provide temporary office accommodation on the site, as mentioned in, for his own use. The employer or main contractor will provide for facilities for site meetings.

2.9. STORAGE AND ACCOMMODATION

The Contractor shall at his own cost provide and maintain adequate and suitable storage of all perishable or corrodible materials and fittings on site. Such storage accommodation shall be ventilated, weather and waterproof, with floors raised off the ground so as to keep the material perfectly dry and freely aerated and shall be subjected to approval of the Engineer, who shall have free access at all times to the storage facilities.

2.10. TEMPORARY SANITARY FACILITIES

The Contractor shall provide sanitary and ablution facilities for the use of his employees and shall be entirely responsible for maintaining such facilities in a clean, orderly and sanitary condition to the satisfaction of the employer and Local Authority.

2.11. TRANSPORT OF MATERIALS

All materials for the Works shall be delivered on site and such deliveries shall be for the expense of the Contractor.

2.12. OFF-LOADING OF MATERIAL

The Contractor shall supply all the necessary labour, tools and equipment for off-loading the materials and equipment delivered by road, and shall include therefore in his rates.

2.13. HANDING OVER OF SITE

The Sites will be deemed to be handed over to the Contractor on the date that the Site Handing Over Form has been signed by the client and/or the Main Contractor.

The Contractor shall consider all other construction activities on the site in the planning and execution of the works.

2.14. PROTECTION OF EXISTING WORKS OR SERVICES

The Contractor shall take all necessary steps to ascertain the location of existing services before commencing any section of the work and shall exercise the greatest care when working in the vicinity of such services.

The Contractor must obtain the latest available drawings showing the location of services already installed and the latest proposals for any services and connections to buildings which may still be required and installed by others.

The Contractor shall take all necessary steps to ascertain which service have actually been installed and to protect any existing works whatsoever against damage which may arise as a result of his operations on Site. The Contractor shall be responsible for the repair of damage to any service the possible existence of which could reasonably have been ascertained by him in good time.

The Contractor shall assume full responsibility for the further protection and care of existing works and shall report in writing to the Engineer any defects and/or obstruction which may be found:

a) within five working days of the Site being handed over to this Contractor in the case of service structure and/or pipelines which are open to view or capable of being inspected after the lifting away of removable covers only;

b) within one working day of works being opened up under this contract after having previously been covered over with gravel in terms of another contract, or

c) within one working day or work under this contract being commenced on any particular section of existing earthworks carried out as part of a previous contract.

In the event of any existing works being found defective and/or obstructed and duly reported in accordance with the provisions of the foregoing paragraph, the Engineer shall inform the Contractor of the remedial measures which will be taken, in all probability by another Contractor in terms of the maintenance provisions of a previous contract. Once the necessary remedial measures have been taken to the satisfaction of the Engineer and of the Contractor, further protection and care of the service (s) concerned shall become the responsibility of the Contractor.

Failure on the part of the Contractor to report existing defects within the appropriate period allowed, shall result in the Contractor being held fully responsible for rectifying such defects.

Machine excavations near existing services and buildings will only be permitted to the extend agreed to by the Engineer and will be dependent on the skill of the operator(s) involved. Notwithstanding authorisation by the Engineer of any machine excavation, the Contractor will be responsible for the repair of any damage which may occur in the process. No additional payment will be made for any hand excavation which may be required.

Any service, structure or foundation which may be exposed during the cause of excavation shall be adequately shored, strutted, slung or otherwise suitably protected. No backfilling shall be commenced before the item concerned had been inspected and passed by the engineer as being undamaged. The Contractor shall conduct his operation in such a manner as not to increase the danger of flooding on Sites occupied by other Contractors. Temporary access roads which may be required to reach various parts of his site, will be the Contractor's responsibility.

The Contractor shall ascertain the telephone numbers and persons to be contacted at each of the service authorities in the case of damage to services. These numbers shall be prominently displayed in the Contractor's site office, preferably near the telephone or radio, before the first payment certificate will be issued. When damage to existing services occurs, the Contractor shall immediately contact the relevant service authority, after which he shall notify the Engineer or his representative, who will investigate the matter and determine liability for the damage.

2.15. PERIOD OF COMPLETION AND PROGRAMMING OF WORK

The programming of the works will be determined by and based on the Main Contractor's works programme.

The contractor shall ensure that the activities for the electrical installation is properly documented and included in the Main Contractor's programming for the project.

The Engineer services the right to change the sequence of activities within the accepted construction period, without any cost implications to the Employer.

2.16. PENALTY FOR DELAY

Penalties for Delays shall be determined in accordance with the Main Contractor conditions of contract and agreement between the Main Contractor and Subcontractor.

2.17. PENALTY FOR FAILURE TO PROVIDE STATED CONSTRUCTION CAPACITY

It is a specific tender requirement that tenderers must guarantee their construction capacity which will be made available for this contract. If, when an actual award of work is made to a Contractor, he fails to establish on Site or to provide the guaranteed capacity within the time indicated in the contract programme, the following will apply:

- A penalty amount will be payable by the Contractor to the Employer within 30 days of the Actual Award Date or of it becoming apparent that he will fail to provide the guaranteed capacity
- The Employer may request the Main Contractor to appoint other parties for the execution of the Works. Any additional cost thus incurred, over and above the original tender amount, will be recovered from the Contractor.
- The Contracting company may automatically be disqualified from any future tenders issued by the Employer.

2.18. PRELIMINARY AND GENERAL COST ALLOWANCE

The total amount included in the tender price for P & G items such as Site establishment, travelling expenses, head office overheads, etc, shall be presented as a detail tabulation in the Bill of Quantities. The preliminary and general allowance shall be paid in accordance the following formula:

$$\text{P\&G payable} = \text{total P\&G as per bill*} \quad \frac{\text{Value of work certified to date}}{\text{Total contract value}}$$

2.19. EXTENSION OF CONTRACT PERIOD

Extension of Contract Period shall be determined in accordance with the Main Contractor conditions of contract and agreement between the Main Contractor and Subcontractor.

2.20. SPOIL MATERIAL

No indiscriminate spoiling or undue waste of material will be allowed. All surplus or unsuitable material shall be stored in designated areas as directed by the Engineer. It is the responsibility of the Contractor to verify the exact quantities of materials required prior to ordering and the Employer will not be liable for or take over any excess or wasted material.

2.21. FINISHING AND TIDYING

Finishing and tidying shall be undertaken during and after completion of the construction activity.

2.22. PRACTICAL COMPLETION

Practical Completion for the completed installation will be certified after meeting the following conditions:

- All stages of the construction work have been completed, tested, commissioned and all certification for the works have been completed.
- Finishing and Tidying has been completed to the satisfaction of the Engineer
- Accurately marked-up, record drawings (in paper format) of the completed installation have been provided to the Engineer

At the discretion of the engineer, a limited number of defects may still be corrected within ten (10) days after the practical completion date. This will be indicated as such on the practical completion certificate**.**

2.23. VARIATIONS OF WORK

Notwithstanding anything to the contrary, contained in the Conditions of Contract the Employer reserves the right to increase or decrease the amount of work to be done allocated under this contract without any adjustments to the tendered rates.

2.24. GUARANTEE PERIOD

The guarantee period shall be for one year commencing on the practical completion date. During the guarantee period, the Contractor shall repair all defects in the Installation which may arise as result of inferior quality materials or faulty workmanship.

The fact that the installation will be handed over to the Employer during the guarantee period shall in no way exempt the Contractor from his responsibility under this clause.

Should a non-urgent fault occur during the guarantee period, the Contractor will be advised, and he shall repair the fault within 7 (seven) days of receiving notice.

Should a fault occur that is of an urgent nature to repair, the Employer will affect any emergency repairs required. These faults include the arising of dangerous situations on site, or faults causing power interruptions to consumers. The cost of such repair work shall be borne by the Contractor in accordance with the escalated tendered rates. In such a case the faulty equipment shall be kept for scrutiny by the Contractor, and he will have the right to inspect the repair work.

Should the Contractor not proceed within 7 days to rectify a fault of normal nature, the Employer shall obtain the services of any available party to repair the fault. The cost of such repair work shall be borne by the Contractor in accordance with the escalated tendered rates. In such a case the faulty equipment shall be kept for scrutiny by the Contractor.
Should the Contractor be responsible for faults and defects in the Installation during the guarantee period the Contractor shall upon receipt of a Written instruction from the Engineer without delay satisfactorily correct and repair all faults and defects.

Should the frequency of faults and breakdown in the opinion of the Engineer become so regular as to constitute an unacceptable state of affairs or should the Installation or portions thereof prove to be unacceptable, the Contractor shall, upon receipt of a Written Instruction from the Engineer replace portions or components of the Installation at his own cost as prescribed by the Engineer.

2.25. PROGRESS PAYMENTS

The Contractor's request for payments shall include invoices for the purchases of materials and equipment delivered to the Site and shall include explanatory data on the cost of labour, the latter item differentiating between the various types of labour, e.g. artisans, apprentices and labourers. Included with these requests shall be a cession of all unfixed materials to the Employer. Ownership of unfixed materials shall be passed on to the Employer upon receipt of payment, retention excluded.

The equipment or material shall be delivered to Site, unless prior arrangements have been made with the Employer and the Employer agreed to authorise payment for material or equipment stored elsewhere, under conditions prescribed by the Employer.

Each progress invoice shall be divided in and shall include the following items:

a) Total value of contract work done and contract material on Site up to the invoice date.

b) Total value of previously valued and approved variations orders completed up to date of the invoice.

c) The total value of escalation of the Contract Sum in terms of the specified escalation clauses where applicable.

The Contractor shall not cede or transfer his claim to any payment which may be due or become due in terms of the Contract. The Employer will also not recognise any such cession or transfer.

2.26. MARKING OF MATERIALS

The Contractor shall ensure that all materials and equipment delivered by road are consigned in his name and that they are properly marked to facilitate identification on the Site as so to avoid confusion with materials consigned to the Employer itself to other Contractors.

2.27. ALLOWANCE FOR THE COMPLETION OF THE CONTRACT IN ITS ENTIRETY

Tenderers shall allow in their tender priced for all materials, equipment, machinery, labour, supervision, transport and all other items which are or may be necessary to complete the Contract in its entirety or implied therein.

2.28. DEVIATIONS OR OMISSIONS

Tenderers shall specify any deviations to or omissions from this Specification and the drawings. Tenderers shall also give full details of materials not specified but which are considered necessary by the Tenderer for the completion of the Contract.

2.29. SITE CONDITIONS

Before submitting tenders, Tenderers shall carry out a site inspection in order to acquaint themselves with the site conditions, access, etc.

Tenders must allow for all conditions on site in their tenders since extra claims arising from difficult site conditions in respect of transport, handling, loading, off-loading, labour, housing etc will not be entertained.

2.30. LAWS AND REGULATIONS

The Contractor shall be responsible to ensure that the Contract Works comply in full with the requirements, as amended, laid down by:

- The Electricity Supply Regulations as published in the official Gazette.
- The requirements of the Electricity Act, Act 41 of 1987.
- The requirements of the Code for Overhead lines NRS 041 of 1995.
- The Occupational Health and safety Act (Act 85/1993), including the Construction Regulations, Regulation R1010 of 18 July 2003
- Code of Practice for the Wiring of Premises SANS 10142 (AS AMENDED).
- The regulation of the local Supply Authority.
- The local Fire Regulations.
- The Regulations of Telkom
- The Standard Regulations of any Government Department or public service company, where applicable.
- The applicable specifications and codes of the SABS / SANS and NRS, for materials and workmanship or in the absence of such specifications and codes the applicable IEC or BS specifications and codes.

In addition, the Contractor shall issue all notices and pay all the required fees in respect to the Installation to the local authorities, and shall exempt the Employer from all losses, costs or expenditures which may arise as a result of the Contractors negligence to comply with the requirements of the regulations enumerated.

It shall be assumed that the Contractor is conversant with the aforementioned requirements. Should any requirement, bye-laws or regulation, which contradicts the requirements of this specification, apply or become applicable during erection of the Installation, such requirement, bye-law or regulation shall overrule the requirements of this specification 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.

2.31. INTERCHANGEABILITY OF EQUIPMENT

All items of similar equipment supplied under this contract shall be identical and completely interchangeable.

2.32. INFORMATION TO BE SUBMITTED WITH TENDERS

Tenderers shall indicate whether their offer complies in every respect with this Specification or, if not, precisely how they deviate from the Specification.

Tenders shall submit details of construction facilities, manpower and equipment available in their companies and allocated towards this project.

All Returnable Schedules shall be submitted with tenders.

2.33. INSPECTION AND TESTS

2.33.1. Factory Inspection and Tests

The Engineer reserves the right to inspect any of the work at any stage or to be present at any of the tests specified.

The Contractor shall perform all tests as described in the relevant SABS/NRS, BS Specifications of IEC Publications and as specified in this Specification.

The Contractor shall inform the Engineer of any work and tests which have been arranged, in which case the Engineer will arrange for an inspection if it is deemed necessary.

Three copies of all equipment maintenance and test reports, whether these tests have been carried out in the presence of the Engineer or not, shall immediately after they become available be submitted to the Engineer for scrutiny, unless otherwise stated in this Specification.
All electrical equipment will be subjected to tests and commissioning on site. The Contractor will allow in his rates to use an experienced Technician to perform this task. Well documented test reports will be submitted and all equipment should be suitable for the application.

Upon completion of the erection at the site, the Contractor shall perform all tests as specified or as required by the Engineer to ensure that all equipment, cabling etc have been connected correctly and that the installation is ready for handing over and commissioning into regular service.

The Contractor shall provide his own test equipment which shall be of an accepted standard. All test equipment older than 1 year should be accompanying by a calibration certificate.

The Contractor shall allow the Engineer at least 14 days' notice before any tests and commissioning are scheduled to be performed, unless otherwise stated in this Specification.

2.33.1.1. Inspection and Handing Over Procedure

The Contractor shall conduct an inspection to satisfy himself that all lugs have been properly crimped, that all labels are engraved and properly fixed, that bolts and screws are not missing, that all phasing is correct, that all spoil which is the responsibility of the Contractor is removed, and in general that the Installation has been completed to the requirements of the Specification and that the workmanship complies with the expected standard.

After the Contractor has conducted the above-mentioned inspection, he shall notify the Employer in writing, for a final inspection.

The Installation shall then be inspected in the presence of Representatives of the Engineer and the Contractor.

Should the completed project not pass the inspection, the Contractor shall rectify the Fault(s) and apply for a re-inspection within 10 working days.

One (1) re-inspection of the Contract as a whole, shall be conducted free of charge. The Contractor shall incur a penalty of R5000,00 (five thousand rand) for all subsequent re-inspections required on the Contract and this amount will be deducted from the following payment due to the Contractor.

When the Installation passes a handing over inspection, the Contractor shall submit a completion and handing over certificate for signing by the Employer. The retention period for the particular section of the Installation shall commence on the date this section of the Installation passes the final handing over inspection.

2.34. RETENTION AND SURETIES

Retention and Sureties shall be determined in accordance with the Main Contractor conditions of contract and agreement between the Main Contractor and Subcontractor.

2.35. ESCALATION AND PRICE VAR

Escalation Price Variations will be applicable on this project.

2.36. INSURANCE OF THE WORKS

The Contractor must take note that all insurance costs for the total project (material and labour) is for the successful tenderer's account in accordance with the Main Contractor conditions of contract and agreement between the Main Contractor and Subcontractor.

2.37. COMPLYING WITH CONSTRUCTION REGULATIONS

The tenderer must make provision to comply with the Occupational Health and Safety Act (Act No.85 of 1993), Construction Regulations (R1010) of 18 July 2003 as amended. The financial implication must be accommodated in the P&G's of the Bill of Quantities. Failure to comply will lead to the termination of the contract and the contractor will carry the full responsibility of his actions.

SECTION 3. GENERAL SPECIFICATIONS

3.1. TESTS

After completion of the Works and before first delivery is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory working thereof. During this period the whole of the Works will be inspected and the Contractor shall make good, to the satisfaction of the Engineer, any deficiencies that my arise.

The contractor shall provide all instruments and equipment required for testing.

Any water, power and fuel required for the commissioning and testing of installations on their completion will be provided by and at the expense of the Electrical Contractor.

3.2. MAINTENANCE OF INSTALLATIONS

With effect from the date of the First Delivery / Practical Completion Certificate the Contractor shall at his own expense undertake the regular servicing of the installation during the 12-month maintenance period and shall make all adjustments necessary for the correct operation thereof.

If during the said period the installation is not in working order for any reason for which the Contractor can be held responsible, or if the installation develops defects, he shall immediately upon being notified thereof take steps to remedy the defects or to make any necessary adjustments.

Should such stoppages however be so frequent as to become troublesome, or should the installation otherwise prove unsatisfactory during the said period the Contractor shall, if called upon by the Client or Representative, at his own expense replace the whole installation or such parts thereof as may deem necessary with apparatus specified by the Client or Representative.

3.3. REGULATIONS

The installation shall be erected and tested in accordance with the following Acts and regulations as amended:

- The latest issue of SANS 10142: "Code of Practice for the Wiring of Premises".
- The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended.
- The Local Government Act 1998 (Act 10 of 1998 (Gauteng), municipal by-laws and any special requirements of the Local Supply Authority.
- The Fire Brigade services Act, 2000 (Act 14 of 2000),
- The National Building Regulations and Building Standards Act 1996 (Act 29 of 1996),
- The Post Office Act 1998 (Act 124 of 1998),
- The Electricity Act, 1996 (Act 88 of 1996),
- The Regulations of the Local Gas Board where applicable,
- The National Water Act 1998 (Act no. 36 of 1998),
- The Water Service Act 1997 (Act 108 of 1997),
- The General Authorizations (Water Act),
- The Environmental Management Act 1998 (Act no. 73 of 1989),
- The National Environmental Management Act 1998 (Act no. 107 of 1998),
- The relevant SANS publications

3.4. NOTICES AND FEES

The Contractor shall give all notices required by and pay all necessary fees, including any inspection fees which may be due to the Local Supply Authority.

On production of the official account, the net amount of fees charged by the Supply Authorities will be refunded to the contractor.

Connection fees for the electrical connection will be paid direct by the client. The tenderer shall allow in his tender to consult with the supply authority on behalf of the client for all related issues.

3.5. SCHEDULE AND SPECIFICATIONS

In all instances where schedules of information are attached or included on the drawings, these schedules are to be regarded as forming part of the specification.

3.6. QUALITY OF MATERIALS

Only materials of first-class quality shall be used, and all materials shall be subject to the approval of the Client. Specifications for various materials to be used on this contract are available from the Engineer and form part of this specification.

Wherever applicable material shall comply with the relevant South African Bureau of Standards specifications, or to British Standard Specifications, where no SANS Specifications exist.

Materials wherever possible, must be of South African manufacture.

3.7. WORKMANSHIP AND STAFF

An accredited person shall exercise general control over all electrical installation work being carried out.

The workmanship shall be of the highest grade and to the satisfaction of the Engineer.

All inferior work shall, on indication, immediately be removed and rectified by and at the expense of the electrical contractor.

3.8. NOTICES

The Contractor shall issue all notices and make the necessary arrangements with Supply Authorities, the Postmaster-General, S.A. Transport Services, Provincial or National Road authorities and other authorities as may be required with respect to the installation.

3.9. ELECTRICAL EQUIPMENT

All equipment and fittings supplied must be in accordance with the attached quality specification in this document, suitable for the relevant supply voltage, and frequency and must be approved by the Engineer.

3.10. DRAWINGS

Where applicable drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The position of power points, switches and light points that may be influenced by construction methods or other services must be established on site, prior to these items being built in.

3.11. BALANCING OF LOAD

The Electrical Contractor is required to balance the load as equally as possible over the multiphase supply.

3.12. SERVICE CONDITIONS

All plant shall be designed for the climatic conditions appertaining to the service and location.

3.13. CERTIFICATE OF COMPLIANCE

On completion of the service, certificates of compliance must be issued in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

3.14. EARTHING OF INSTALLATION

The type of main earthing must be as required by the supply authority if other than specified, and in any event as directed by the Engineer, who may require additional earthing to meet test standards.

3.15. MAINTENANCE OF ELECTRICAL SUPPLY

All interruptions of the electrical supply that may be necessary for the execution of the work will be subject to prior arrangement between the Contractor, the user, and the Client's representative.

SECTION 4. DETAIL SPECIFICATION

4.1. EXTENT OF WORK

The work covered by this contract comprises the complete electrical installation, in working order, as shown on the drawings and as per this specification, including the supply and installation of all specified materials and the installation of such equipment supplied by the Client.

The work entails the complete MV & LV Electrical Reticulation and Area Lighting installation for the proposed new Nursing College, Phase-2A. Including, but not to be limited to the following installation components:

- 11kV SF6 Ring-Main Unit
- 11kV/400/231V Miniature Substations
- 6.35/11kV Cable Installations
- 400/231V Distribution Systems.
- 600/1000V Electrical cable installations.
- Standby Generator Installation with Above Ground Diesel Storage
- Underground Cable sleeves.
- Underground Sleeves, manholes and draw wire installations for electronic services.
- Installation of new Public Lighting Systems
- Installation of Sports Field Lighting
- Electrical supplies and connections to other installations.
- Test and commission of complete installation.

4.2. SUPPLY AND CONNECTION

A new electricity supply system forms part of the proposed works under the section for MV Installation.

Each new building will be supplied with a new 400/231V electricity connection.

The contractor shall arrange with all other parties that may be influenced before the electricity supply to a building or any section of the installation is to be energised or interrupted.

4.3. MINIATURE SUBSTATIONS

4.3.1. General

The miniature subststions shall be supplied and delivered to site complete with new plinth by the Contractor. The Contractor must allow for the placement of the plinths and the miniature substation on the new plinth.

4.3.2. Miniature Substation Specification

4.3.2.1. General

Miniature substations shall be complete with MV, LV, transformer terminal and streetlight compartment.

The four compartments shall form complete compartments, bolted to one another with a channel iron base. The compartments shall be so constructed that any compartment can be removed without disturbing the rest of the compartments. The streetlight compartment shall be separate from the low voltage compartment with a separate door.

Miniature Substation units shall be a neat and firm. The unit shall be provided with lifting hooks to load, unload and install the unit, with a crane. In the lifting process the miniature substation shall stay in a horizontal level.

The transformer shall be fitted with suitable lifting hooks to remove it from the unit if required.

4.3.2.2. Construction Material

Where specified, the roof, walls and doors shall be manufactured of powder coated mild steel not less than 2mm thick or 3CR12 not less than 2,5mm thick. The steel construction shall comply with the minimum strength requirements of Clause 3,4 of SANS 1029.

All steel bolts, nuts, screws and washers used shall be electro galvanized to SANS 129 or stainless steel. Spring washers or lock nuts must be used.

4.3.2.3. Doors

Every compartment will be provided with a vented door that can hinge, with front entry. The high voltage compartment must have a front and two side vented doors entry with doors that can hinge.

Piano hinges are not acceptable. The hinges shall be of brass or other corrosion resistant materials. Door restraints shall be provided. Cloth or canvas straps are not acceptable. The fixing points of the restraints at both the door and doorframe shall be reinforced. All doors shall be vented with 12 vents at the top and bottom but still be weather and rodent proof.

All doors shall be fitted with brass or stainless-steel lever locks equal or similar to the "Barker & Nelson" type with a 180 degree movement. The locking mechanism shall be 3-point locking behind the frame of the cubical. The locking mechanism shall be pad lockable with 12mm holes for padlocks. Supply Authority padlocks shall be fitted after commissioning of the miniature substation. The contractor to provide his own padlocks for the duration of the project.

4.3.2.4. Signs

The letters MV shall be painted in red on the inside of the high voltage compartment doors. The letters LV shall be painted in red on the inside of all low voltage compartment doors.

A blank name plate of 200mm x 40mm shall be screwed to the inside of the high voltage compartment front door. The name plate material must be equal and similar to the "Trafolite" white with black backing, to be engrafted with the correct name.

Blank number plates of 150mm x 50mm must be provided for the two cable entry sides on the switch gear. The number plate's material must be equal and similar to the "Trafolite" white with black backing, to be engrafted with the correct cable label

4.3.2.5. Warning signs

All warning signs shall comply with the Health and Safety Act, 85 (1993). Warning signs will be mounted on the outside of the high voltage, low voltage and streetlight compartments. The warning sign will be painted as follow: a black flash over a skull (in a red triangle) on yellow background with red letters on white background. All writing shall be in English, Afrikaans and Zulu.

All plates, name plates and warning signs shall be fixed firmly with 5mm airplane pop-reverts on all doors.

4.3.2.6. Paint work

The miniature substation cubicle will be cleaned and painted according to SANS 780. The following requirements is applicable: (Refer to project specifications: miniature substation to be painted or unpainted 3CR12, not less than 2.5mm thick).

a) The colour of the outer surfaces of the substation shall be an acceptable match to SANS 1091:
   - Navy light grey Nr G35 or
   - Stone light Nr .....
   - Avocado Green Nr.....
b) The dry under coat paint thickness shall be more than 0,025mm and less than 0,035 mm.
c) The internal final dry coat thickness shall be more than 0,075mm
d) The outside first dry paint work thickness shall be more than 0,125mm.
e) The steel base of the miniature substation shall be hotdip galvanised to SANS 129 and then epoxy tar coated (black).

4.3.2.7. Earthing of metal parts

All non-current carrying metal parts of the miniature substation e.g. framework, panels, base, steel housings, transformer housing, ring main unit housing, etc. shall be bound to the earth busbar with 70 mm^2 BCEW jump connection pieces.

4.3.3. Medium Voltage Compartment

4.3.3.1. General

The high voltage compartment of the miniature substation shall be equipped with a non-extensible 11kV ring main unit with two isolating switches and a circuit breaker T-off.

The minimum clearances between connecting cables and jumpers and any sharp metal edges of protrusions shall be at least 75 mm.

"DELARON" or "THIOLITE" resin bound synthetic wood or other suitable dielectric material shall be treated to prevent surface tracking. Only stranded annealed copper conductors shall be used for jumper cables or tails.

All terminals shall be shrouded with "RAYCHEM", "OZOCORITE" or similar heat shrinkable shrouds. Putty and taping is not acceptable. The high tension connections between the fused switch unit and the transformer shall be suitably blanked off so that they cannot be easily or directly touched.

4.3.3.2. Medium Voltage Switchgear

The RMU shall comply with the requirements of SANS 1874 together with the following:

The equipment shall consist of an oil submerged ring main unit with a fused switch protecting the transformer.

The ring main unit shall be rated for 350 MVA, 400 A load break/fault make capacity or higher, while the fused switch shall be suitable for 350 MVA at 11 kV with a continuous current rating of 85 A. The unit shall comply with specification BEBS S16 of 1968.

The operation of the three switches shall be similar except for the trip facility on the fused unit.

4.3.3.3. Ring Main Isolators

a) Switching : Lockable ON/OFF/EARTH positions

b) Mechanism : Spring operated hand control

The removable operating handle shall be used in separate positions for ON/OFF or OFF/EARTH switching. Access to these positions shall be controlled by spring operated lockable covers.

c) Interlocking : The unit shall be interlocked as follows:

i) in the ON position to render the EARTH position inactive;

ii) in the EARTH position until the TEST cover is locked;

d) Current transformers : Nil

e) Fault indication : Nil

f) Cable end box : Two end boxes with solid brass connecting terminals, complete with compound and suitable for the cables in accordance with the specification.

4.3.3.4. Fused Switch

a) Purpose : Transformer supply

b) Identification : Transformer with kVA capacity as specified

c) Tripping : Any blown fuse shall trip all three phases

d) Interlocking

i) to allow replacement of a fuse in the OFF position only;

ii) automatic lock out of the ON/OFF positions until a blown fuse has been replaced;

e) Switching : Lockable ON/OFF/EARTH positions

f) Mechanism : Hand controlled with ON/OFF/EARTH mechanism interlocking and tripping as per (c) and (d) above. When operating from OFF to ON the switch shall fully engage under fault switching where after the fuse shall be completely blown before the switch trips and isolates. The unit shall be provided with safety latches to prevent accidental wrong switching. An operation handle and handle bracket shall be provided with every miniature substation.

g) Fuses : HRC fuses shall be fitted in compliance with the manufacturer's recommendation for the protection of the transformer specified. The tripping system shall be brought into operation with a fuse fault and automatically lock the switch mechanism to prevent closure. The tripping of any single fuse shall open all three phases.

Note: cable accessories (terminations and joints) shall comply with the requirements of NRS053.

4.3.3.5. HV Fuse

The fuse carriage shall have two positions "SERVICE" and "ISOLATED". To isolate, the switch must be in the "OFF" position. Safety shutters shall also be provided to shield all internal live parts. Fuses rated for the transformers, shall be supplied and fitted in the fuse compartment.

The High Voltage Fuse shall be equal or similar to the English Electric type KEBXD, or equal and similar approved, as rated below:

Transformer rating Fuse rating
200 kVA - 20A
315 kVA - 31,5A
500 kVA - 50A
630 kVA - 63A

An approved metal receptacle shall be provided in the MV compartment to contain three spare fused of the same rating as used in the miniature-substation. These spare fuses shall be provided.

4.3.3.6. Cable Fault Indicators

The Earth fault relay frame shall be equal and similar to Bowden's type, with a "LED" self-reset indicator complete with auxiliary voltage transformer.

A cable earth fault indicator incorporating an operation indicating LED relay from an encapsulated split-care, core-balance current transformer shall be fitted over one of the incoming cables. The current transformer shall be of adequate size to fit over a 240mm2. PILC SWA PVC cable and a suitable mounting bracket shall be provided. The self-reset relay shall be mounted at the inside of the front door frame of the MV compartment, with the LED indication lamp visible from the outside.
The current transformer shall be designed to saturate during heavy earth faults, to protect the indicator. Other types of fault indicators may be offered for approval by the engineer.

All earth fault relays shall be proven functional in the factory with an injection test before units are delivered to site.

4.3.3.7. Cable Boxes

The cable boxes shall comply with the following:

Post insulator for dry termination in air, which comply with the requirements of NRS 008. The post insulator for dry terminations shall be protected and covered with a vertical-type trifurcating cover, open at the bottom, suitable for the type and size of cable specified. A rail with and V-form Cable support clamp for clamping the cables 100mm below the termination crutch shall be provided.

4.3.4. Transformer Compartment

4.3.4.1. Transformer

The transformer shall be fully in compliance with clause 3.5 of SANS 1029. The transformer shall be a sealed unit and shall not contain a silica gel breather.

An off-load 5-point type tap switch of -5%, -2,5%, 0%, +2,5%, +5%, taps shall be provided in accordance with clause 4.81 of SANS 780.

The off-load tap switch to be mounted on the transformer, accessible from the LV-compartment.

4.3.4.2. Windings

The windings shall be type Dyn 11 and shall be a low loss type transformer.

4.3.4.3. No-load Voltage

The transformer shall comply to the following:

a) Phase to Phase high voltage: 11kV
b) Nominal Secondary Phase to Phase voltage: 400Volts
c) Nominal Secondary Phase to neutral: 231Volts
d) Neutral: Solidly earthed
e) Frequency: 50 Hz
f) Phase rotation: Anti Clock

4.3.4.4. Transformer Oil

The transformer shall be filled with the correct isolation oil in accordance with SANS 555. Oil test certificates must be handed to the engineer before commissioning will commence. An easily readable oil level indicator shall be provided, accessible in the LV-compartment, that gives a oil level reading at all times.

4.3.4.5. Transformer Terminals

a) The high voltage terminals shall be mounted on the side of the transformer tank. Easy access to these terminals must be from the high voltage compartment.

The three phase connection cables from the high voltage switchgear to the transformer must be kept apart by a spacer of none electrical material.

The terminations on the terminal shall be sealed with an approved type preformed 12kV termination boots

The high voltage terminals must be marked A, B and C. The connection leads from the ring main unit to the transformer shall be 70mm^2 and shall be connected as follows:

Ring main unit	-	Transformer terminals
A	-	C (Red)
B	-	B (White)
C	-	A (Blue)

b) The four low voltage transformer terminals shall be mounted on the side of the Transformer tank and access to these terminals must be through a door on the side of the miniature substation. All four of these terminals shall have the same load and fault level capacity.

The open low voltage terminals shall have a protection cover made of 4mm perspex (clear) marked in Red "35mm letters"

"WARNING LIVE TERMINALS/WAARSKUWING LEWENDIGE TERMINALE".

The low voltage terminals must be marked a, b, c and n. The connection leads from the main circuit breaker to the terminals will be in the following colours.

Terminal point	Phase colour
a	blue phase
b	white phase
c	red phase
n	black (neutral) phase

4.3.4.6. Transformer dimensions

The dimensions of the transformer compartment must be the same, to allow for upgrading of the miniature substation, as follows:

- 200 kVA transformer to 315 or 500 kVA transformer
- 630 kVA transformer to 800 kVA transformer

The interchanging of transformers must be possible on site, without dismantling the miniature substation or any compartment.

4.3.5. Low Voltage Compartment

4.3.5.1. Low Voltage Connection Cables and MCB Tails

The low voltage compartment must have enough space for the connection cables from the terminals to the main circuit breaker and from the main circuit breaker to the busbar without touching any equipment or part of the miniature substation.

The connection cables and MCB tails must be according to BS 638 and be isolated with EPM/CSM material (coloured heat shrink) of the flexible type not PVC tape. These cables must have a 100% service record and the sizes will be as follows:

Transformer size	Cable size
200 kVA	2 x 70mm^2 Cu
315 kVA	2 x 95mm^2 Cu
500 kVA	2 x 185mm^2 Cu
630 kVA	2 x 240mm^2 Cu or Busbars

The connection cables must be permanently and clearly marked red, white, blue and black. No colour insulation tape will be accepted. These cables must be interchangeable to correct phase rotation if need be. The MCB tails shall be provided with a 30% (Amp) overload rating to the MCB load rating.

The termination of these cables shall be done by fitting crimped lugs which are bolted to the terminals and the circuit breaker.

Equipment support frame

The low voltage compartment shall be provided with a rigid angle iron or folded metal "unistrut" support framework.

The frame shall be bolted down on the base by at least four M16 high tensile steel bolts. All steelwork shall be hot-dip galvanized in accordance with SANS 129.

All equipment and busbars shall be flush mounted within a purpose made sheet metal frame enclosed by a machine punched removable front cover, fascia panel through which the operation handles of the equipment protrude. Care shall be exercised that the rear stud and terminations of the circuit breakers are properly insulated from the steel chassis and fascia cover. Miniature circuit breaker shall be installed on clip-in trays mounted on the frame or on mounting plate of 3mm mild steel with bolts and nuts.

4.3.5.2. Busbars

a) Application

Busbars shall be manufactured of solid drawn tinted high conductive copper, with a rectangular cross-section in accordance with SANS 1195 and BS 159 and BS 1433, where applicable. No lamination type or parallel busbars will be accepted.

Although SANS 784 refers to overhead and rising busbars, busbars in miniature substations shall comply with applicable sections of this specification, especially as far as insulation and clearance values, creepage distance, joints, insulation resistance, dielectric strength, deflection tests, absorption resistance and rated short time withstand current are concerned.
Busbars shall be supplied for the following applications:

I) Distribution of supply voltage.
ii) Connections with rating exceeding the current rating of 240mm². Al conductors.
iii) Outgoing circuits with provision for connection of cables to excess of 240mm^2 Al conductors.
iv) Connection piece between MV-earth bar, LV-earth bar and Neutral bar
v) Earth busbars with all connection holes, bolts and washers.
vi) Connections to all circuit-breakers and fuses.

b) Voltage rating

Busbars for system voltages up to 600V shall be designed to withstand a test voltage of 2,5kV for one minute.

c) Rating

The maximum allowable temperature of busbars (including joints) carrying full load current in an ambient temperature as specified, shall not exceed 80 deg C. Unless different ambient temperatures are specified, an ambient temperature of 35 deg C shall be assumed with a maximum temperature increase of 45 deg C.

The distance between the phase busbars is at least the distance of the longer side of the cross section with minimum spacing of 50 mm and at least 150 mm from the sheet metal enclosure. It is however essential that the manufacturer shall make due allowance for the "proximity and skin" effects, the effects of ferrous enclosures, ventilation, etc. for the arrangement used in his design. Manufacturers shall, where requested, prove that the busbar rating and enclosure design comply with the temperature rise specified above.

Neutral busbars in three phase, four wire supplies shall have a cross-section of at least 100% of the cross-section of the phase busbars.

The current rating of the bars shall be as followed:

Transformer size	Busbar current rating
200kVA-	800A (40mm x 10mm)
315kVA-	800A (40mm x 10mm)
500kVA-	800A (40mm x 10mm)
630kVA-	1200A (63mm x 10mm)

From the top to the bottom the phase colours will be as follows:

- Red
- White
- Blue
- Black (earth)
- Earth

d) Mounting

All busbars shall be installed horizontally with the longer side of the section in the vertical plane. Main busbars shall be supported by "DELARON" or "THIOLITE" resin bound synthetic wood panels or resin insulators. The surface of these supports shall be treated to prevent surface tracking. The supports shall be bolted securely to the framework and busbars shall fit tightly in the support. Porcelain insulators will not be allowed. Mounted on both sides and in the centre to support the busbars.

The rating and fixing of busbars shall be designed to withstand mechanical and temperature stresses during fault conditions. The busbars shall withstand a fault current under test conditions of the specified fault level. If a fault level is not specified, the busbars shall be tested at 20 times rated current for one second. The fault current shall be applied:

i) between all phases
ii) any two phases
iii) neutral and adjacent phase, and
iv) earth conductor and the nearest phase conductor.

The minimum clearance for system voltage up to 600 V is 100mm in accordance with SANS 784 and BS 159 and shall be strictly maintained.

e) Mechanical Stresses

If no other methods are specified, the mechanical stresses under fault conditions shall be calculated as follows, taking into account correction factors for different configurations:

$$F = \frac{16 \times I^2 \times k}{d \times 10\,000} \text{ N/m}$$

where

F = force (N/m)
I = maximum fault current (A.r.m.s. symm.)
d = spacing between bars (m)
k = space factor for rectangular bars

The maximum allowable spacing of busbar supports for fault levels of 15kA and more is 600mm. All secondary and "dropper" busbars shall be mounted on suitable insulators or directly on circuit-breaker terminals, where practical. Busbars shall be mounted at least 100mm away from the nearest equipment. Special attention should be given to spacing between fuse-switches, circuit-breakers and busbars.

f) Covering

Busbars shall not be covered completely but for phase indication with coloured heat-shrinkable material equal to "RAYCHEM" or "SIGMAFORM" products. The colour shall correspond to the colour of the supply phase. Busbars shall be radius-edged where they change direction.

g) Connections

Conductor ends shall be fitted with crimped or solid sweated lugs which are bolted to the busbar. Busbar clamps with bolted connections are not acceptable. Where lugs are crimped, evidence shall be submitted that the crimping technique used is in compliance with the performance requirements of BS 4579, Part 1: "COMPRESSION JOINTS IN COPPER".

h) Outgoing Circuits

Conductors up to a maximum size of 240mm^2 Al may be used for connections from equipment to external cables. Busbars connection pieces shall be provided and shall extend to approximately 900mm above the cable gland plate for connection of outgoing circuits with larger cable size. These busbars shall be insulated on outgoing circuit-breakers where specified.

i) Small Neutral Busbars

Neutral conductors for circuits protected by a single-pole circuit breaker or fuse-switch shall be connected to a small neutral bar mounted in a suitable position with easy access.

A separate neutral bar shall be provided for each earth leakage unit provided. These neutral bars shall have a cross-section of at least 6,3 x 25 mm and shall be long enough for the lugs of all neutral conductors to be bolted separately to the busbar without overlapping the lugs. The rating of neutral busbars for three-phase circuits is specified above.

j) Earth Busbar

An earth busbar shall be installed in a horizontally position along the entire length of the LV compartment. The requirements covering, connections, rating and neutral busbars are applicable to earth busbars with the exception that earth busbars may be bolted directly to the framework. The cross-sectional area of earth busbars shall be a minimum cross section of 40mm x 10mm. In addition the longer side of the earth busbar shall be at least twice the diameter of the largest bolt that will be fitted to the busbar. All earth busbars shall be manufactured of solid drawn tinted high conductive copper.

k) Earthing of Metal Parts
All non-current carrying metal part of the miniature substation, e.g. framework, panels, base, steel housing, transformer, ring main unit, etc shall be connected to the earth busbar with removable tails.

l) Bolts and Nuts

Only cadmium-plated high tensile steel bolts and hexagonal nuts may be used at busbar joints and connection points. All nuts shall be provided with spring washers or be of the "NYLOCK" type nuts with washers, for fixing of brackets, covers frames and equipment. The largest possible size bolt that will fit into holes in lugs and fixing holes of equipment shall be used in every instance. Bolts shall be of sufficient length that at least two, but not more than five threads, protrude beyond the nut when installed.

Spare bolts, nuts and spring washers, the correct size, shall be provide in every hole of the busbars for future connections. The length of these bolts shall be minimum 50mm.

4.3.5.3. Equipment for Low Voltage

The specified equipment shall be installed in the low voltage compartment on purpose made support frames.

The following equipment shall be housed as standard in each low voltage compartment. Provision shall be made for other equipment specified in the project specification.

a) A main circuit-breaker shall be provided in the transformer low voltage compartment. The main circuit-breaker shall be triple pole, 25kA and rated as shown below:

Transformer	Current rating
200kVA	- 350A
315kVA	- 500A
500kVA	- 800A
630kVA	- 1000A

The main circuit-breaker shall be clearly marked in red "MAIN BREAKER" "HOOF STROOMBREKER". The incoming terminators of the main circuit-breaker shall be clearly marked in red "LEWENDIG" "LIVE".

The mounting frame size of the main circuit breaker shall make provision for future upgrading of the main circuit breaker with a higher rated circuit breaker.

b) Voltmeter, flush mounted (0-600V) and controlled by a seven position voltage selector switch.

c) Combined maximum demand and indicating Ammeters, one for every phase, flush mounted together with current transformers. The current transformers shall be class 1 accuracy and interchangeable. The meters shall be permanently marked in phase colours and able to take an overload reading of 20% of full load.

Transformer	Meter size	CT's ratio
200kVA	0- 300A	300/5
315kVA	0- 600A	500/5
500kVA	0- 960A	800/5
630kVA	0-1200A	1000/5

d) Lightning surge arrestors, 275V (4 off) shall be installed below the main circuit-breaker, baring the SABS mark.

e) Outgoing feeder circuit-breakers shall be provided on the switchgear mounting board or brackets in the low voltage compartment and shall be suitable for the installation of six (6) - 25kA Moulded Case circuit breakers compatible with the main circuit breaker. The circuit breakers shall be spaced 60mm apart from each other.

The feeder circuit-breakers shall be as follows, unless differently specified in project specifications:

The low voltage feeder schedule is attached at the end of this section.

All circuit breakers shall be provided with a extended lug terminal (set/3) to insure the termination of LV-cables.

The connection to the feeder circuit breakers shall be in the order starting from left: Red, White and Blue.

The busbars and circuit breakers must be covered separately with fascia plates, fixed by wing nuts and bolts that are permanently fixed to the frame.

4.3.5.4. Internal wiring

a) Cable

All feeder cables shall be terminated on the gland plates as provided. Cable tails up to 70mm2 may be terminated to the feeder circuit breakers with lugs. All cables larger than 70mm2 shall terminate on terminal studs which are connected directly to the equipment. Parallel feeder cables shall be connected to a busbar stud without crossing the conductor cores.

b) Wiring

The current rating of conductors for the internal wiring shall be sufficient to carry the maximum continuous current that can occur in the circuit. This value shall be determined from the protection of the circuit. The smallest conductor size to be used for power wiring shall be 2,5mm2. The standard 600/1000 V grade PVC - insulated stranded annealed copper conductor to SANS 1507 shall be used for the internal wiring.

Wiring shall be installed away from terminals, clamps or other current carrying parts. Wiring shall also be kept away from exposed metal edges or shall be protected where they cross metal edges. Joints in the wiring are **not** acceptable. Where conductors change direction, smooth bends shall be formed with a radius of at least five times the outside diameter of the conductor and cable ties will be use to group the circuits together.

c) End Connections

The supply end connections to equipment shall be at the top and the load end connections at the bottom of the equipment.

d) Conductor termination

All conductors terminating on equipment with screwed terminals shall be fitted with lugs. The lugs shall be soldered or crimped to the end of the conductor with the correct amount of insulation removed from the end of the conductor to fit the lugs.

Connections to circuit-breakers, isolators or contactors shall be installed by one of the following methods:

A ferrule of the correct size or soldering the end of the conductor.

e) Identification

The colour of the conductor for all correspond to the colour of the supply phase for that circuit. Neutral conductors shall be black. All other conductors for control circuits, etc, shall be coded in colours other than those specified above. The devised colour codes shall be shown on a wiring diagram. Coloured PVC sleeves or other type will not be acceptable for colour coding.

4.3.5.5. Gland Plates

A mild steel galvanized gland plate shall be provided for every feeder cable at the bottom of the frame across the full length of the low voltage compartment. Six (6) gland plates with 8mm pilot holes must be provided for each feeder cable glad.

A minimum distance of 400mm shall be provided between the lowest MCCB terminals of major equipment and the gland plate.

The unistrut on which the gland plates are fasten must be isolated from the body of the miniature substation by means of an insulator and shall be bound to the earth busbar with 70 mm^2 BCEW jump connection pieces.

4.3.5.6. Labels

Engraved plastic or ivory sandwiched strips shall be used for labels. The labels shall bear black lettering on a white background to label all outgoing circuits. Painted or printed labels are not acceptable. The main switch shall be labelled in accordance with the regulations.

The function and circuits of all other equipment shall be clearly identified. Flush mounted equipment within the front panel shall be identified by labels fixed to the front or fascia panel. The labels for all equipment installed behind panels shall be fixed to the fascia panel close to the equipment.

The labels shall be secured by means of brass nuts and bolts, self-tapping screws, pop-rivets or slotted label holders. Engraved labels shall be secured to facilitate a neat alteration of the designation of the labels. Labels shall not be glued to their mounting positions. Sufficient fixing points shall be provided to prevent labels from moving.

All labels' designations shall be approved by the engineer before manufacturing commences.

4.3.6. Streetlight Compartment

The streetlight compartment shall be a separate functional unit.

The following equipment shall be provided in the streetlight compartment:

Three 60A single-phase circuit-breakers having breaking capacity of 10kA, shall serve as the main streetlight circuit breaker(s) and shall be labelled "MAIN CIRCUIT BREAKER". These circuit breaker(s) must be connected between the LV busbars via the terminal block to the circuit-breakers and the three-phase contactor.

Two 5A single-phase circuit breakers with a breaking capacity of 10kA curve1. The first labelled "CONTROL CIRCUIT" used as a main supply for the control circuit, and the second labelled "BYPASS SWITCH" used for switching the streetlights for testing purposes.

One 60A three-phase contactor with a 230-volt coil for the streetlight control unit.

Terminal blocks for connecting the LV busbars, circuit breakers and photocell cables must be mounted at the base of the panel and properly shielded. Terminal blocks with a current carrying rating of not less than 145A must be supplied. Provision is to be made for 6 outgoing streetlight cables to a maximum size of 16mm2 cables. This excludes the photocell control cable.

Six 40A, 10kA single phase circuit breakers connected between the contactor and the terminal strip by means of 16mm2 insulated copper conductors.

A 70 mm2 neutral and earth bar, connected to the main neutral and earth bar, must be provided near the terminal blocks.

4.3.7. Inspections

The engineer shall be notified at least two weeks in advance of the completion of the miniature substation in order that a factory inspection and tests may be carried out or witnessed before delivery.

The contractor will be responsible to check miniature substations for any visual defects when the miniature substation is delivered on site by the supplier or before loading at the stores. The contractor shall be liable to repair any scratches and damage to the miniature substation station panel.

4.3.8. Drawings and Technical Documentation

a) Shop drawings

A set of three prints of the shop drawings of the miniature substations shall be submitted to the Engineer for approval before manufacturing commences. The following information shall be presented:

Schematic and wiring diagrams.

A complete to scale, layout drawing of the internal arrangement of the miniature substations showing all equipment dimensions and constructional details.

The following information shall be presented:

All labelling information in English on a separate sheet.

The makes, catalogue numbers and capacities of all equipment scheduled on a separate sheet.

A detail drawing of the concrete plinth showing concrete mixes, dimensions, openings sizes, steel reinforcing details and holding down bolts fixing details.

The approval of drawings shall not relieve the contractor of his responsibility to supply the miniature substation according to the requirements of this Specification.

b) Final drawings

A complete set of "as built" transparent drawings of the miniature substations shall be submitted to the engineer within two weeks after delivery. The information called for in above shall be provided.

The following additional information shall be provided:

- Maintenance instruction.
- Spare parts list.
- Equipment type and Routine test Certificates.
- A copy of the circuit drawing engraved on aluminium depicting the reticulation emanating from the miniature substation shall be fixed onto the inside of the miniature substation in a convenient position.

c) Completion

The contract shall be regarded as incomplete until all drawings and/or documentation has been handed to the engineer.

4.3.9. Installation of Miniature Substations

The miniature substations shall be installed in the positions as shown on the drawings inside enclosed structures with concrete floor and plinth provided by others.

4.3.10. Earthing of Miniature Substation

The earthing of the miniature substation shall be an earth mat, manufactured and installed underneath the miniature substation plinth.

If the earth resistance value is higher than 1Ω (**one ohm)** an earthed switching platform must be installed.

4.3.11. Labelling and Marking

Engraved label plates with 25mm high letters with the name of the substation to which the cables are connected, as well as with the length of the 11kVcable to the next miniature substation shall be fitted at the incoming and outgoing 11kV cables in the high voltage compartment.

Labels shall be installed on the front of the switch gear and at the cable termination.

Engraved labels with 12mm lettering shall be installed at the outgoing cables in the low voltage compartment to indicate the point supplied by the cable and the cable size.

All labels shall be fixed by means of screws.

4.3.12. Cable Termination

Medium Voltage Cables cables inside miniature substations and T switch shall be terminated with indoor 11kV termination kits in accordance with the manufacturer's instructions

Low Voltage Cables shall be terminated in miniature substations with k-clamps, in accordance with the instructions of the manufacturers.

The Contractor shall supply all the cable accessories for termination of the cables.

4.3.13. LV Circuit Breakers

Miniature Substations shall be provided with the apropriate number and type of 25kA circuit breakers for the LV feeder cables which are installed.

TESTING AND COMMISSIONING

a) General

The contractor shall be responsible for the complete testing of the installation as defined herein. All test equipment shall be provided by the contractor and shall remain his property.

The contractor shall obtain and hand over the Routine Test Certificates for each miniature substation, done by the manufacturer, namely:

- Transformer test to SANS 780 (Group III) - test card.
- Transformer test to SANS 780 (Group I and Group II) for every size of transformer delivered.
- 11kV Switchgear test.
- 11kV Switchgear oil test.
- Busbar fault circuit test.
- Busbar system flash over test (2,5kV).

b) Site Testing and Commission after Installation

An individual record sheet will be supplied by the Engineer at commissioning and shall be completed for each miniature substation. The items on the record sheet shall be carried out in the presence of the engineer and a responsible person representing the contractor.

The following tests shall be required on site:

i) 11kV Switchgear

- All ring main switches, transformers, earth switches, padlockable shutters, interlocks and cable test facilities are to be operated to check for current functioning.
- The transformer fuses are to be checked and their correct rating verified and recorded.
- The tank is to be filled with oil to SANS 555 and the oil level checked. The breakdown voltage of the oil is to be tested and recorded in accordance with IEC 156 before filling. A minimum value of 40kV is to be achieved.
- Ascertain that the labelling on the ring main switches agree with the physical interconnections and drawings.
- With the transformer isolated and RMU connected, the cables shall be tested through RMU using a DC test voltage, as specified in SANS 1339, for 15 minutes between phases and earth, on a "Two up, one down" basis.
- The phasing of the HT cables at switchgear terminations to insure correct phases and colours.
- All switching operation shall be done only by the local authority according to standard specifications.

ii) Transformer

- Check oil level
- Operate switch to check for correct functioning. The tap switch is to be adjusted to achieve 400V line voltage after energizing.
- Insulation resistance between phase and earth of all windings. A one minute test using a DC insulation tester shall be carried out at the following voltages:
  LV windings : 1000V DC
  HV windings : 5000V DC
- After energizing, the transformer terminals shall be tested to check phase rotation which shall be as specified in the project specification.

iii) Low Voltage Compartment and Low Voltage Equipment

- Check all circuit breakers for correct operation. Set any adjustable overloads and record setting.
- Check all connections for tightness before energizing.
- Check voltmeter selector switch for correct functioning.

- Check ammeters, CT ratios and phase colour markings. CT ratios and name plates shall be clearly visible without having to remove any panels in the LV compartment.
- The LV busbar system and connections shall be tested at 1000V DC to earth on "two up, one down" basis. Any voltage sensitive equipment likely to be damaged during such tests must be disconnected.
- The co-ordination between the labelling and external cabling is to be verified by individual energizing and testing of the live remote end.
- 1000V Insulation tests to be done on all outgoing LV cables before switched on.
- Phase rotation will be confirmed.

4.4. SF6 RING MAIN UNIT (RMU)

The scope of this portion of the works shall be the supply, delivery, off-loading, possible storage, placing into position, erecting, testing and commissioning of the 11kV metering, type SF6 ring main unit, required for this project.

The ring main unit shall comply with SANS 1874/NRS 006 Rev 2.1.

The Tenderer must allow for the termination of all cables as per the drawings.

Recommended spares:

The tenderer shall furnish in his offer a list of recommended spares with unit rates for each set of equipment that may be necessary for satisfactory operation and maintenance of the circuit breaker and isolators for a period of 5 years. The Employer reserves the right of selection of items and quantities of these spares to be ordered. The cost of such spares shall not be considered for tender evaluation.

Erection and maintenance tools:
All the special tools, equipment and instruments required for erection, testing, commissioning and maintenance of the equipment shall be included in the tender price.

a) General Requirement

Two Load break isolators for incoming & outgoing cables and one Circuit breaker shall be enclosed in the main tank using SF6 gas as insulating and vacuum as arc quenching medium.

The total breaking time for faults should not exceed 80 milliseconds (CB + Relay+ trip coil).

The switchgear and switchboard shall be designed such that the position of the different devices shall be visible to the operator on the front of the switchboard and easy to operate and shall prevent access to all live parts during operation without the use of tools. There shall be no access to exposed conductors.

b) Enclosure

i) Outer Enclosure:

The RMU enclosure (Outer) shall be made up of stainless steel of 2 mm thickness. The rating of enclosure shall be suitable for operation on three phase, three wire, 11 kV, 50 Hertz, A.C. system with a short-time current rating of 20kA for 3 seconds. The complete RMU enclosure shall be of degree of protection IP 54 (Main Door close) and IP 41 (Main Door open).

The enclosure shall provide full insulation, making the Switchgear insensitive to the environment like temporary flooding, high humidity etc. The active parts of the Switchgear shall be maintenance-free, and the unit shall require minimum -maintenance.
The complete RMU unit shall be powder coated.

Each switching device shall be identified by an appropriately sized label which clearly indicates the functional units and their electrical characteristics.

ii) Inner Enclosure (Main tank)

The tank shall be robotically welded stainless-steel sheet of minimum 3mm thickness. The tank shall be sealed, and no handling of gas shall be required throughout the 25 years of service life. However, the SF6 gas pressure inside the tank shall be constantly monitored by a temperature compensating gas pressure indicator offering a simple go, no-go indication. The gas pressure indicator shall be provided with green pressure and red pressure zones. There shall be one Non – return valve to fill up the gas. The manufacturer shall give guarantee for maximum leakage rate of SF6 gas will be lower than 0.1 % / year. An absorption material such as activated alumina in the tank shall be provided to absorb the moisture from the SF6 gas to regenerate the SF6 gas following arc interruption. The degree of protection of the inner enclosure shall be IP 67.

iii) Name Plate

a) Name of manufacturer
b) Type
c) Serial number
d) Voltage
e) Current
f) Frequency
g) Symmetrical breaking capacity
h) Making capacity
i) Short time current and its duration
j) Purchase Order number and date
k) Month and Year of supply
l) Rated lighting impulse withstand voltage

b) Bus Bars

The three bus bars with a rated current of 630A shall be provided. The bus bar connections shall anti-oxide greased.

The bus bars shall be constructed of high conductivity copper of sufficient cross-sectional area to carry the full rated current of the switches installed. The bus bars shall be suitably supported on PVC or other approved insulators within the main tank. The bus bars and insulators or supports shall be suitably constructed to withstand through fault currents.

All connections between the circuit breakers and switches and the bus bars shall form part of the internal wiring to be provided by the manufacturer.

An earth bar of brass or copper shall be supplied within the outer enclosure and be provided with one bolt, washer and two nuts for each cable.
The bus bars, support insulators and the total system are to be designed to withstand the following conditions:

i) Symmetrical fault current: 20kA/1 sec.
ii) Earth fault current: 20kA/1 sec.

c) Load Break Switches (Isolators)

Load Break Isolators for incoming and outgoing supplies must be provided and the load break isolators shall be fully insulated by SF6 gas. The operating mechanism shall be a spring assisted mechanism with an operating handle for ON, OFF and Earth positions with arrangement for padlocking in each position.

Mechanically operated indication shall be provided. The earth switch shall be interlocked to prevent the main and earth switch being switched 'ON' at the same time. Each load break switch shall be of the triple pole, simultaneously operated, non-automatic type with quick break contacts and with integral earthing arrangement. The rated current of Isolator shall be 630 Amps continuous at maximum ambient temperatures. No de-rating shall be allowed.

d) Circuit Breaker (SF6 or Vacuum media for arc quenching)

The 3-pole circuit breaker shall be enclosed in the main tank. The rated breaking and making current at rated voltage shall be 20 kA for 3 seconds. The manual operation of the circuit breaker shall not have an effect on the spring charging mechanism.

The circuit breaker shall be fitted with flag indication, which shall operate in the event of fault occurrences. The breaker indications ON and OFF positions shall be indicated by suitable flags, a Red flag for ON position indication and a Green flag for OFF position indication.
The rated operating sequence shall be O-3min-CO-3 min- CO.

i) Protection on the circuit breaker:

The circuit breaker unit shall be fitted with 3 protection current transformers with a ratio of 100/50/1A, minimum class of 10P10, having low burden and a trip coil and auxiliary switch assembly allowing the use of a self-powered non directional IDMT (Inverse Definite Minimum Time) Over Current and Earth Fault Relay (Microprocessor based). The O/C elements current setting shall be variable from 25% to 200% of CT secondary ratings in minimum 25% steps. Standard inverse (SI), Very inverse (VI) and Extreme inverse (EI)

curves shall be included with minimum time multiplier settings from 0,05 to 0,5 with minimum steps of 0,05 and the E/F elements having current setting variable from 10% to 40% and with the same curve and time multiplier settings as for the OC element. The protection curves and all other settings shall be adjustable from the front panel.

e) Earthing of Isolators and Breakers (Earth Switch)

The unit shall consist of a 630 Amp Tee-Off spring assisted, three positions, padlocking in all positions, SF6 circuit breaker unit, with an earth switch. The functions shall be naturally interlocked to prevent the breaker and earth switch from being switched `ON` at the same time and the CB not allowed to trip in `Earth On` position.

The cables shall be earthed by an integral earthing switch with short-circuit making capacity, in compliance with IEC 129 standard. The earthing switch shall be operable through the main circuit mechanism and manual closing shall be driven by a fast-acting mechanism, independent of operator action.

f) Bushings and Terminations

All the bushings shall be of same height, parallel, on equal distances from the ground and protected by a cable cover. Only type "interface C" medium voltage separable connectors/bushings will be allowed at all medium voltage terminations. Exact size, shape and product code as prescribed by the metering ring-main unit manufacturer.

g) Cable Boxes

All cable boxes shall be air insulated suitable for dry type cable terminations. The cable boxes at each of the two ring switches shall be suitable for 3-core 240mm² cables and circuit breaker cable box shall be suitable for 3-core 120mm² cables. Compound filled cable boxes are not acceptable. The cable box shall be arc resistant as per IEC 62271-200 amended. The internal arc fault test on the cable box shall be carried out at 20 kA for 1 second. The clearance between phase to phase and phase to earth shall be as per IEC 61243 – 5 amended. The cable termination and gland arrangements shall be appropriate for PILC and XLPE cables.

h) Voltage Indicator Lamps and Phase Comparators

The RMU shall be equipped with voltage indication. Each switch of the RMU shall be equipped with a permanent voltage indicator as to indicate whether or not there is voltage on the cables.

The capacitive dividers will supply low voltage power to sockets at the front of the unit. There should be a facility to check the synchronization of phases.

i) Safety of People

Any accidental overpressure inside the sealed chamber will be limited by the opening of a pressure limiting device in the enclosure. Gas will be released to the rear of the unit away from the operator. The manufacturer shall provide type test report to prove compliance with IEC 298 appendix AA 'Internal fault'.

j) Operating Lever

All manual operations will be carried out on the front of the switchboard.

The effort exerted on the lever by the operator should not be more than 250 N for the switch and circuit breaker.

k) Front Plate

The front shall include a clear mimic diagram which indicates different functions.

The position indicators shall give a true reflection of the position of the main contacts. They shall be clearly visible to the operator.

The lever operating direction shall be clearly indicated in the mimic diagram.

The manufacturer's plate shall include the switchboard's main electrical characteristics.

l) Danger Board

The danger plate shall be riveted on the front plate of the RMU.

m) Ventilation

Ventilation grilles or slots shall be vermin proofed and insect proofed. The construction of the grilles or slots shall prevent the ingress of rain, water and dust.

4.5. CABLES

4.5.1. General

The contractor shall supply and completely install all distribution cables as indicated on the drawings and listed in the Schedule of Cables.

Tenderers must base their tender on the amounts of cable, including earth conductors, as indicated in the Bill of Quantities. During the course of the work the actual lengths will be measured on site and adjustments will be made according to the price per meter length as inserted by the tenderer for the particular cable size concerned.

Tenderers must base their cost for trenching in earth, soft rock and hard rock on the total quantities as indicated in the Bill of Quantities. The actual quantities, based on the dimensions as specified below for trenches for the applicable number of cables to be laid, will be measured on site during the course of the service and adjustments made according to the price per cubic meter as inserted by the tenderer. Payment for cable trenching having a greater volume than that specified for the purpose will not be considered except where extra excavations are necessary to by-pass obstacles such as water pipes, drains, large boulders etc. In all such instances the amount of the extra excavations must be agreed upon on site between the Engineer and the contractor.

4.5.2. Trench Excavations:

a) Hard rock:

shall mean granite, quartz sandstone, slate and rock of a similar or greater hardness, solid shale and boulders over 0,03m; in volume.

b) Soft rock:

shall mean rock that can be loosened by hand-pick and includes hard shale, compact ouklip and boulders from 75mm in diameter up to 0,03m; in volume.

c) Earth

shall mean grounds that can be removed by pick and hand shovel and includes loose gravel, clay, made-up ground, loose or soft shale, loose ouklip and boulders less than 75mm in diameter.

The storage, transportation, handling and laying of the cables shall be according to first class practice, and the contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operations.

The cable-trenches shall be excavated to a depth of 0,7m deep for LV cables and 1m deep for MV cables below ground level and shall be 400mm wide for one to three cables. The width shall be increased where more than three cables are laid together so that the cables may be placed at least two cable diameters apart throughout the run. The bottom of the trench shall be level and clear and the bottom and sides free from rocks or stones liable to cause damage to the cable.
The contractor must take all necessary precautions to prevent the trenching work being in any way a hazard to the personnel and public and to safeguard all structures, roads, sewage works or other property on the site from any risk of subsidence and damage.

In the trenches made in soft and hard rock the cables shall be laid on a 75mm thick bed of earth and be covered with a 150mm layer of earth before the trench is filled in.

Backfilling (after bedding) of the trenches is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150mm. The surface is to be made good as required.

On each completed section of the laid and jointed cable, the insulation resistance shall be tested to approval with an approved Insulation Tester.

Earth continuity conductors are to be run with all underground cables constituting part of a low-tension distribution system. Such continuity conductors are to be stranded bare copper of a cross-sectional area equal to at least half that of one live conductor of the cable, but shall not be less than 6mm² or more than 70mm². A single earth wire may be used as earth continuity conductor for two or more cables run together.

Earth continuity conductors shall comprise of stranded copper conductors of cross-section where specified in project specification.

4.5.2.1. Cable route markers

Cable route markers shall be constructed of reinforced concrete and shall be of dimensions as indicated on standard drawing included in this document, where specified in the project specification.

4.5.2.2. Cable warning tape

The plastic cable warning tape shall consist of a strip of poly-ethylene of thickness 0,04 mm and of normal width 230 mm, completely impregnated with a pigment such that the colour of the tape is yellow according to No B49 of SANS 1091, and having printed at intervals not exceeding 1 metre along its length a black triangle and an electric flash symbol and the words "Danger, Gevaar, Ingozi".

The plastic warning tape shall be installed on cable routes (MV) at 300 mm above the top cover layer where specified in the project specification. Where a cable route exceeds 600 mm in width multiple tapes shall be installed in such a way that the space between adjacent warning tapes does not exceed 185 mm.

4.5.2.3. Concrete protective slabs

Concrete reinforced protective slabs shall have the following dimensions:

Length	1 000 mm
Width	350 mm
Thickness	50 mm

The slabs shall be constructed of 20 MPa concrete and each slab shall be reinforced with one longitude and three transverse mild steel rods of minimum diameter 8 mm. The slabs shall be manufactured in such a way that the slabs interlock with each other thus avoiding shifting of the slabs after installation.

4.5.2.4. Excavation of mv jointing chambers

Jointing pits shall be excavated to a depth of 1.2 m and shall be rectangular in shape and large enough for the cable jointers to work comfortably and in an efficient manner. Where more than one joint is to be made in the same position the joint pit shall be larger and long enough to allow staggered joints to be made. The minimum size of a joint pit shall be as follows:

-One joint : 3 m long x 2 m wide x 1.2 m deep
-Two joints : 6 m long x 2 m wide x 1.2 m deep

4.5.2.5. Excavated material

No excavated material shall be left closer than 300 mm from the side of the excavation to prevent back spill of loose soil. The excavated material which is considered by the engineer to be suitable for bedding material for the cable shall be placed separately on one side of the trench so that it is available when required. The excavated material shall take up as small an area as possible with the safety of the public, workmen and Works taken into consideration.

Safety barrier or danger tape shall be installed around all open trenches

4.5.2.6. Inspection and measurement of excavations

Once the excavations for cable trenches and joint pits have been completed, the contractor shall give the engineer 24 hours' notice to inspect the trench and to be present when the measurements are made. No inspections shall be undertaken on Saturdays, Sundays and public holidays and after 14:00.

Full detail of the cable trench dimensions and classification of the type of excavation shall be recorded and signed by the contractor's representative and the engineers as the final quantities for payment of excavations.

Inspections and recordings shall be completed before the installation of any bedding or backfilling and the contractor shall be responsible to keep all excavation records as proof of progress. These records shall be checked by the engineer who will issue a site instruction to the contractor and will be used as a basis for claims for payments

4.5.2.7. Maintenance of excavations

The contractor shall maintain the excavation in a good condition, free of water, mud, loose ground, rocks, stones, gravel and other strange material until the cables are installed and the excavation is backfilled and compacted.

4.6. MEDIUM VOLTAGE CABLES

4.6.1. Standards

MV cables shall be manufactured according to SANS97, Table 19 and SANS1339 Table A and shall bear the SABS mark.

4.6.2. Working conditions

The cables shall be for a 6.35kV/11kV or 11kV/11kV, 50Hz system. **A portion of the cable is supplied by the Client and the Contractor shall price to collect same at a site in Kimberley including cranage and pressure testing**.

4.6.3. Construction

The cable conductors shall be single or three cores; of high conductivity annealed stranded Copper or Aluminium that may be shaped or circular, but the cross-section area of each conductor shall not be less than specified in the project specification.

Cables shall be of the following type:

i) Cable shall be individually screened, have a lead sheath (E-Alloy) and single galvanized steel wire armouring completed with PVC outer cover(PILC), all in accordance with SANS97 or where approved, unarmoured PLP (4mm) outer sheath, able to carry 13.1kA.

The lead sheath shall be factory lead "capped" and inspected before delivery to site.

ii) Cables shall be individually screened, XLPE insulated, PVC bedded and single galvanized steel wire armoured and PVC sheathed for 6.35/11kV systems.

4.6.4. Marking

The cables shall be marked on the PVC sheath cover permanently additional to SABS with size and length indication in 2m intervals example 2m, 4m, and 6m to 300m to determine cable left on a drum. Numbering to start at the cable end at the drum centre, cable drums shall be marked clearly in accordance with SANS97.

4.6.5. Cable drums

The cable standard lengths shall be 300m per drum unless other length is specified in project specification.

Wooden cable drums shall be constructed strong and safe for loading and transporting cables, the total mass of the filled cable drums shall be specified in the tender. The total measurement shall be as follows:

Diameter	2,3m
Width	1,3m

The drum shall take a shaft of 100mm diameter.

4.6.6. Standard cable size

The following cable sizes are standard of the Client.

- 70 mm^2 x 3 core Cu (300m lengths)
- 150mm^2 x 3 core Cu (300m lengths)
- 185mm^2 x 3 core AL (300m lengths)

4.6.7. Information and Technical Data

The following information shall be provided to the engineer before delivery will be approved.

a) Conductor resistance
b) All test certificates in accordance with SANS97

The contractor shall keep record of the drum numbers as installed and the position of installation, if later queries may arise to identify each specific drum delivered.

4.6.8. Sand bed for cables

A sand bed layer of soft soil shall be installed and levelled at the bottom of each trench after the trench has been approved by the engineer, and prior to cable laying.

The minimum thickness of the sand bed layer is 100 mm.

If the material that has been excavated is not suitable to sift for the sand bed layer then suitable soil shall be imported for this purpose. The cost thereof shall be included in the unit price for the excavation unless otherwise specified. An adequate quantity of soil similar to the sand bed material shall be available next to the excavation for the sand cover before an inspection of the cables is called for. The sand cover for MV cables shall be a minimum of 300 mm thick and shall be placed directly after the cable(s) has been inspected and approved by the engineer.

If the soil for the sand bed and sand cover has to be sifted, a sieve with holes not larger than 10 mm shall be used. Contractor to provide enough sieves to cover the cable length in one day.

4.6.9. Laying of cables

MV cables shall be laid at 1m below final ground level, after the completion of the trench, be laid with the minimum of delay so that the trench can be backfilled the same day. The contractor shall, however, not backfill the trench until each length of cable has been inspected and approved by the engineer. Prior segments of the inspection shall be done by the contractor not to delay backfilling.

The service position shall be as specified in the project specification or as detailed on the standard services drawing.

The method to be used for laying cables shall be approved by the engineer prior to the commencing of the laying of the cables.

Cable rollers shall be used when cables are drawn into trenches. The cable rollers shall be placed so that the cable does not touch the bottom or the sides of the trench. The rollers shall be of an approved construction without any sharp metal parts which could damage the cables.

If the contractor intends using a winch to draw the cable into the trench, an approved cable stocking shall be used or the draw wires shall be soldered to the cable so that the tension is exerted on all the cores, lead sheath and/or steel wire armouring at the same time. No vehicle/tractor or truck may be used to draw the cable into the trench.

The maximum tension on a cable during laying operations shall not exceed the value specified by the manufacturer, these tension scales and tables shall be approved by the engineer prior to the installation of the cable. Should the engineer not be satisfied with the manner or method employed to lay the cable he shall have the authority to instruct the contractor to lay the cable by hand or in accordance with approved standards.

The medium-voltage cables shall be laid in such a manner that the beginning of a drum shall be laid from the end of the previous drum to ensure that the lay of the cores remain the same. Medium-voltage cables shall overlap by at least 1 m, but not more than 1,5 m at each joint. In cases where the MV cable should be jointed, provision must be made for slack in the joining chamber.

Sufficient lengths of cable shall be left at the beginning and end of the cable routes to allow for the termination of the cables. Where necessary the engineer shall decide on what length of cable is to be left. The contractor shall take the necessary precautions to protect the cable ends until they are terminated. The cable ends shall be sealed by means of lead and heat shrink sealing caps to ensure that the cable is waterproof. Where the end seal is damaged with the installations, the contractor shall redo the sealing of the lead end cap the same day.

Where cables are drawn through sleeves, care shall be taken that they are not kinked or excessively bent. No bend in a cable shall have a radius less than the minimum bending radius specified by the cable manufacturer.

The contractor shall keep accurate records of each length of cable laid. The following information shall be recorded:
- Cable drum number
- Size of cable
- Laid from where to where (stand numbers)
- Length of cable
- Date laid

The contractor shall be liable for the repair of the cable due to the faulty manufacture of the cable, should this information not be recorded directly after the cable has been laid.

Every cable shall be marked by means of a lead label on which the size of cable and its source or destination number is punched. This applies to cables that are not alive and radial ends. All off cuts shall be sealed.

4.6.10. Verification of cables

The contractor shall be solely responsible for inspecting all cables before backfilling to ensure that the correct type, size and number of cables have been installed.

The engineers shall inspect all cable trenches before backfilling to ensure that the laying of cables complies with the specification.

During this inspection the contractor's and engineer shall record the lengths for all cables and all such records shall be signed by both representatives as the final quantities. The contractor shall be responsible to keep the records as proof of progress and as basis for claims for payment.

4.6.11. Road crossings

The contractor shall approve all crossings positions with the engineer prior to the crossing. Cable sleeves shall be installed 1.5 m below ground level to avoid damage when the roads are constructed.
Unless otherwise specified, two additional sleeves shall be installed for future use at each crossing and shall extent 500mm past both sides of the road surface or future road.

Sleeves used for crossings shall be straight and undamaged. Bends shall not be allowed in road crossings.

After the installation of the sleeves, the sleeves shall be meticulously backfilled so that no air pockets are left. The trench shall thereafter be backfilled in layers of 300 mm and compacted with mechanical vibrators to the original density.

The contractor shall lay and join the cable sleeves and compact the trench to the satisfaction of the engineer. After installation, the sleeves shall be cleaned and a 2 mm galvanized steel draw wire installed in the sleeves. The type and sizes of the sleeves to be used shall be specified in the project specification.

4.6.12. Crossing of other services

Where a cable crosses over other services, the cable shall not be installed at a depth less than 800 mm below ground level and if this is not possible the cable shall be installed underneath the other services, it shall be protected in the prescribed manner by means of concrete slabs. The depth of the cable crossing shall be maintained for one metre on either side of the crossing. No services shall be cut to install cable.

If it is not possible to cross over or underneath a service in the prescribed manner, the matter shall be referred to the engineer for a decision.

The following minimum clearances shall be maintained between electrical cables and other services: (side to side)

	Vertical	Horizontal
GPO Cables	0.5 m	0.5 m
Water pipes	0.3 m	0.3 m
Sewer pipes	0.3 m	0.8 m
Storm water pipes	0.3 m	0.6 m
Other electrical cables	0.15 m	0.15 m

Where LV-cable are laid along the same route as the MV-cable, the LV-cable shall be installed at the same depth as the MV-cable, 150mm apart from each other.

4.6.13. Backfilling of trenches

When the cable has been laid, inspected and approved and the sand bed cover as specified in the clause on "Sand bed for cables" has been installed, the trench shall be backfilled with soil containing not more than 40% rock or shale which shall be able to pass through a 10 mm sieve which is approved by the engineer.

Where more than 40%, but less than 70% rock occurs, the contractor shall replace the rock with imported soil. However, should more than 70% rock occur then all the backfilling material shall be imported.

- The contractor may import further stone-free material to the site or sieve the excavated material for sand bedding and cover but payment shall only be compensated for the actual quantity imported material required as determined by the engineer. The quantity of imported material required shall be calculated from the standard trench width specified.

- The excavated material shall be backfilled in layers of 300 mm and shall be compacted to the satisfaction of the engineer. Where necessary the engineer may require a mechanical vibrator to be used for compacting the trench, and tests to be done by specialist contractors.

- The contractor shall maintain the completed sections of the cable trench in a proper safe condition for the duration of the contract. The contractor shall refill and compact the trench where subsidence occurs at his own cost.

- After completion of the work the route of the cable shall be neatly finished off and cleared. All stones bigger than 25 mm and all loose rubble shall be removed from site.

4.6.14. Installation of concrete slabs

Where cables cross other services such as water pipes, sewerage pipes and other cables or where the chance exists that the cable may be damaged as a result of excavation by others, the cable shall be protected by means of reinforced concrete slabs or fibre protection covers. The slabs or covers shall protect the cable for a distance of 500 mm on either side of the crossing.

4.6.15. Cable markers

Cable route markers shall be installed where specified to indicate the cable route and positions of cable joints and cable sleeves. The markers shall be buried in the ground on the stand boundary, with the rounded side to the cable, indicating the distance from the boundary to the cable, joint, sleeve, or where the cable crosses a known service, with the top protruding 100 mm above the final ground level. The route marker shall be marked with signal red paint at the top 100mm. Route markers shall be placed at every change in direction and at 100 m intervals on straight runs and where the cable turns or leaves a substation yard.

4.6.16. Jointing and Termination of Medium-Voltage Cables

The contractor shall provide the engineer with documentary proof that he has qualified, experienced and competent cable jointers in his employ to execute the work to the satisfaction of the engineer.

The engineer shall be informed in advance of when jointing is to take place to enable him to inspect or witness the joint.

4.6.16.1. Equipment and conditions

The contractor shall, before he commences with the jointing, ensure that:

- he has sufficient and suitable material to properly and efficiently complete the joint, including cable bridge pieces
- the joint chamber is the correct size, dry and clean
- all stones, loose ground, sticks, leaves etc is removed from the joint chamber
- the walls and sides of the joint chamber is firm and free of loose ground, stones, gravel etc which could fall into the chamber
- the necessary barriers are made to keep water out of the joint chamber
- the necessary cover is provided over the joint chamber to keep unexpected rain out of the chamber and that enough light and ventilation is provided under the cover
- he has the necessary material to seal off the joint or termination when he has to discontinue jointing or terminating the cable due to unexpected storms or flooding of the chamber which makes it impossible to continue jointing or terminating the cable, irrespective of how far the work has progressed
- he has the necessary ground sheets to line the floor of the joint chamber

- the cable and other materials are dry, undamaged and in all respects suitable for jointing or terminating
- his equipment and tools are the correct tools for different type of joints and at all times dry, clean and absolutely free of ground or moist
- he has all test equipment such as oil, gas etc. to test the cable for moist before jointing commences
- the engineer reserves the right to stop the jointer from doing any joint or termination due to the neglect of above items

No jointing or terminating shall commence in rainy weather without the prior approval of the engineer. When the jointer commences with a joint he shall complete the joint before he leaves the site.

The standard phase arrangement shall be observed when connecting up cables in the end boxes. The contractor shall ensure that the prescribed phase arrangement is at all times maintained on the connection terminals of the end boxes. Phasing between mini substations shall be the contractors own responsibility.

The contractor is responsible to ensure that the requirements and quality are carried out by his jointer.

4.6.17. Moisture test

A Moisture test shall be carried out before any joint or termination is made.

The engineer shall be contacted if moist is detected. Cable shall only be cut back on approval of the Engineer and Employer. New cable shall not be cut back without the cable supplier being notified in writing of the moist problem and possible claim against the supplier. A 1,5m cut piece of cable shall be sealed and send to the factory for analysing.

The cut back method shall be in 10m lengths, retested till dry paper is found only three cutbacks will be allowed, if moist is still found the complete section of cable will be replaced with new cable, at the guilt parties cost, due to factory or installation error.

4.6.18. Tests Before Acceptance

After the completion of the electrical installation, the contract shall arrange with the test department of the Employer to test the installation in accordance with the requirements of the specification.

The engineer shall have the right to call for or to carry out any additional tests which may be necessary to prove that the requirements of the specification have been met. The contractor shall assist with the conducting of these tests without delay.

All tests shall be conducted in the presence of the engineer and the supply authority, the costs or fees thereof shall be payable by the contractor to Supply authority prior to testing the works.

The tests hereinafter described comprise only the site tests and tests before acceptance or handing over of the installation. Where cables and other material are supplied by the contractor the factory or manufacturing tests shall be as specified.

After completion of the installation, before the service is taken over, the following tests shall be undertaken. These tests shall form an integral part of the erection, construction or installation of the various items and the costs thereof shall be included in the unit rates for the erection, construction or installation of the various items.

4.6.18.1. Tests on medium-voltage cables

The contractor shall arrange to undertake the following tests in the presence of the engineer before the engineer shall agree to accept any part of the installation. The contractor shall, furthermore undertake any other test the engineer may prescribe to satisfy himself that the work is of an acceptable standard. If these test are done by Employer's test department the fees thereof will be payable by the contractor.

All test instruments used by the contractor shall be of a high quality and shall, if required, be annually calibrated by the SABS or such body, test certificates to be provided for approved by the engineer, at the cost of the contractor.

Note: The testing process of the specific supply authority must be followed by the contractor if it differs from the tests described below.

(i) Voltage tests

Each section of the cable installation between switchgear and miniature substations shall be subjected to preliminary voltage or insulation resistance test to prove the insulation resistance and cross phase faults.

A 5kV Megger or insulation tester shall be used to do above tests.

(ii) Continuity test

The resistance between each core and the lead sheath of the cable shall be measure for each section (between mini subs) whiles the core and sheath is short circuited at the far end to ascertain if all connections have been correctly made.

(iii) DC medium-voltage tests for PILCSWA cables

Each cable circuit, including joints and terminations, shall be tested by means of a direct current voltage of 17,5 kV between the different cores and 14,5 kV between the cores and the lead sheath or copper tape screen for a period of 15 minutes. The voltage shall be gradually raised to the test voltage and kept there for 15 minutes.

If the supply authority is Eskom the test voltage shall be 19kV DC for a period of 15 minutes, between the different cores.

(iv) XLPE medium-voltage cable tests – SANS10198-13 or as per manufacture specifications.

Two types of tests are acceptable for XLPE cables:

- 50Hz a.c test:
  Each cable circuit, including joints and terminations, shall be tested by means of an alternating current with a 50Hz waveform, 13kV between the different cores for a period of 60 minutes. The voltage shall be gradually raised to the test voltage and kept there for 60 minutes.

- 0.1 Hz VLF test
  Each cable circuit, including joints and terminations, shall be tested by means of an alternating current of maximum 19kV between the different cores for a period of 60 minutes. The voltage shall be gradually raised to the test voltage and kept there for 60 minutes.

  The contractor shall undertake all repairs and replacements at his own costs in the event of the installation failing the above-mentioned tests. Re-testing the installation will be at the contractor's cost.

(v) 5KV DC Sheathing Test

The test is to prove correctness installation without sheath damage. The contractor shall cover the cable with sand bedding (300 mm) and test between an earth probe and the armouring of the cable at 5KV DC, for 2min, testing the cable sheathing, leakage current of <1mA/km is acceptable.

(vi) Phase Colours

The contractor to test and correct phase colours with a minimum 1000V tester in the presence of the Engineer before commissioning.

4.6.18.2. Record Information

The contractor shall submit the "as built" drawings on which complete information of the installation, cable route, joints, as installed, is indicated after the completion of the installation and before the installation is handed over to the Employer.

4.6.18.3. Clearing of Site

The contractor shall remove everything that he brought onto the site or handled on the site in the execution of the works as well as all excess excavated material and rubble so as to leave the site in a neat and clean condition to the satisfaction of the engineer after the completion of the contract and after the engineer's approval has been obtained.

Any cleaning up work to be done by the contractor will be allowed for in the excavation rate as tendered.

4.7. DISTRIBUTION BOARDS AND KIOSKS

Special Note:

- Only "**CBI or Schneider"** type circuit breakers shall be used on this contract.
- Only "**Schneider"** type contactors shall be used on this contract

The electrical contractor shall supply and install the distribution boards and kiosks as indicated on the in the drawings. All distribution board/kiosk designs shall comply with approved by the Engineer prior to manufacturing.

4.7.1.1. General information

a) *Construction*

All distribution boards and kiosks shall be manufactured according to the detail specifications and drawings, and shall be inspected and approved by the Engineer before installation.

The Engineer shall first approve any other type of distribution boards and kiosks, which may be submitted as an alternative.

b) Quality specification and Manufacturers

All switchgear and equipment shall comply with the quality specification in the document.

c) *Wiring*

Wiring between switchgear and busbars shall be done by means of PVC insulated stranded copper conductors, fixed to the busbars with copper lugs, and brass bolts.

Only colour coded wiring shall be accepted, e.g.: Red, yellow and blue for phases, and black for neutral.

Wiring coloured by means of PVC insulated tape shall not be accepted.

Wiring shall be neatly strapped in a vertical and horizontal manner.

All instrument and control wiring shall be 2,5mm² PVC insulated copper conductors, and shall be numbered for ease of tracing circuits.

d) *Colour*

The colour of all distribution boards shall be as indicated on the single line diagrams for each board.

e) *Doors and cover plates*

All distribution boards and kiosks shall be fitted with padlock lockable doors and internal cover plates. Cover plates shall be fitted with square key latches

f) *Separate Compartments*

Where distribution boards have separate compartments, they shall be separated by means of a metal dividing section, and be equipped with individual removable circuit breaker covers.

g) *Labelling*

All distribution boards and kiosks shall be labelled in the following manner:

Name of distribution board.

Supply information and size of cable e.g.: Supply from Mini-sub with 1 x 50mm² x 4 core cable.

All circuit breakers shall be marked with an engraved type of label (black letters on white background) and secured to the metal panel by means of self-tapping screws, or pop rivets. (Letters shall not be smaller than 5mm.)

Legend cards can be used for circuits of which the description is too long to fit below the circuit breaker.

All distribution boards shall comply with the requirements as stipulated in the Standard Specifications of this document.

The electrical contractor shall supply and install the distribution boards as indicated on the drawings and listed in the Distribution Board Schedule. All distribution boards shall comply with the quality specification in Section 3 of this specification, and be approved by the Engineer.

An engraved Trefolyte, PVC or aluminium label indicating the name, size and origin of the cable feeder, e.g. "DB A1 fed from DB A by means of 50mm² x 4 core cable" shall be secured to the front side of the DB door, by means of 2 x pop-rivets. Minimum size of label: 2 x 50 x 100mm. Similar labels identifying

the main switch and all outgoing (L1, P1, ELU, PP1) circuits shall be secured inside ALL the distribution boards against the internal panels.

h) *Construction:*

All distribution boards shall be manufactured according to the detail specifications and drawings, and shall be inspected and **approved** by the Engineer before installation.

The Engineer shall first approve any other type of distribution board, which may be submitted as an alternative.

All busbars and lugs shall be insulated, and wiring shall enter the switch gear from the back of the distribution board.

i) *Quality Specification and Manufacturers:*

All switchgear and equipment shall comply with the specification in the document.

j) *Wiring:*

The manufacturers shall internally wire all distribution boards.

Wiring between switchgear and busbars shall be done by means of PVC insulated stranded copper conductors, fixed to the busbars with copper lugs, and brass bolts.

Only colour coded wiring shall be accepted, e.g.: Red, yellow and blue for phases, and black for neutral.

Wiring coloured by means of PVC insulated tape shall not be accepted.

Wiring shall be neatly strapped in a vertical and horizontal manner.

All instrument and control wiring shall be 2,5mm² PVC insulated copper conductors, and shall be numbered for ease of tracing circuits.

k) *Separate Compartments:*

Where distribution boards have separate compartments, they shall be separated by means of a metal dividing section, and be equipped with individual removable circuit breaker covers.

l) *Legend Cards:*

Legend cards covered by removable glass or 1.6mm transparent acrylic plastic shall be fitted to the inside of the door of the distribution board and circuits shall be noted on this legend card. Legend cards shall be as follow, for example:

Main	Main Isolator Switch **OR** Local Isolator Switch (As case may be).
L1	Lights; Bedroom 1, Bedroom 2 & Kitchen.
P1	Plugs; Bedroom 1, Bedroom 2 & Kitchen.
ELU1	Earth leakage unit for plug circuits 1, 2 & 3.

4.8. LIGHT FITTINGS

Light fittings and accessories shall be according to the Schedule of Light Fittings and shall be approved by the Engineer. All light fittings which differ from the specified items shall be approved by the Engineer prior to purchase.

Important Notes:

- All light-fitting prices shall include lamps and shall be priced as per the specifications.
- Any deviation from the specification, shall first be approved by the client, engineer and architect, after the tender has been awarded.
- Details or samples of all light fittings must be submitted to the engineer for approval prior to installation.
- Unless otherwise recommended by manufacturer, only Osram or Philips lamps shall be acceptable. Details of lamps offered shall be submitted at tender stage.
- Unless otherwise recommended by manufacturer, only Osram or Tridonic LED Control gear shall be acceptable.

4.9. PHOTOCELL

Area lighting and Security lighting on the outside of buildings shall be controlled by a 16A photocell. **"National"** type mounted in a weatherproof enclosure.

4.10. CIRCUITS AND WIRING

Electrical circuits shall be arranged according to the indications on the drawings. Only one circuit shall be installed per conduit.

Wiring shall be done with general purpose PVC insulated copper wire or SWA underground cable where specified. The following wiring sizes shall be used:

Item	Circuit Type	Circuit Breaker	L+N Wire	Earth Wire
1	Area Lighting	15A	Min 4mm²	Min 4mm²
2	General Lighting	15A	1.5mm²	2.5mm²

4.11. SPORTS FIELD LIGHTING MASTS

4.11.1. General

This item is for the design, manufacture, off-loading and installation of masts for sport field floodlighting. The mounting height of the luminaires shall be not less than 18m. Deviation in ground levels shall be considered in the determination of the length of the other masts. It is therefore essential that the tenderer acquaint himself with site conditions before submitting his offer.

4.11.2. Light Luminaires

Type P1 flood lights type BEKA OMNIBLAST-2E-MIDI, LED, 910W including DALI DRIVERS as detailed in the schedule of lighting luminaires or equal and approved, at 18m mounting height are required for this installation. Each mast fitted with a total of 6 x Luminaires.

4.11.3. Foundations

The mast is to be mounted on a steel reinforced concrete foundation supplied and erected by the contractor as per the mast supplier's design drawings. The mast foundation shall contain a 100mm diameter cable sleeve. This sleeve shall allow cable access from 1m below ground level to within the mast through the mast baseplate.

The design and the dimensions of the concrete foundation shall depend on the type of mast, mast height, wind velocity, number of type of luminaires and the soil conditions.

Design drawings for the foundation are to be obtained from the mast manufacturer timeously and submitted to the Engineer for approval.

The construction of the foundation shall be in accordance with accepted construction practice. It should be noted that the foundation design must take into account the ground pressure and formation. **Notwithstanding the Engineer's approval, the responsibility of the erection of the foundation and its operating performance lies solely with the contractor.**

A standard cube sample is to be taken when the foundation is laid for testing. It is recommended that the concrete mixture reach a strength of 40mPa in 28 days.

The foundation shall reach a height of 400mm above ground level.

Foundation bolts and a template for the correct positioning of the bolts are to be supplied with the mast. The bolts shall be finished using the hot-dip galvanising process.

Each foundation bolt shall be provided with two nuts and two flat washers, with the base plate resting on the lower washer and nut. The upper washer and nut shall keep the mast in position, while the lower nuts facilitate levelling of the mast.

M39 Bolts, or as specified by the manufacturer, are to be used. The quantity and pitch circle diameter (PCD) shall be determined by the size and the loading of the mast.

4.11.4. Construction Of Mast

4.11.4.1. General

Masts shall be constructed from conical sections which, when assembled shall form a tapered column of circular cross section. 763.

4.11.4.2. Material

The mast columns shall be manufactured from SANS 1431-355WA steel, Hot dipped Galvanised to SANS 121: 2nd ED 2011: HOT DIP GALVANIZED COATINGS ON FABRICATED IRON AND STEEL ARTICLES - SPECIFICATIONS AND TEST METHODS. Commercial quality steel will not be acceptable.

4.11.4.3. Welding

Welders must be coded and tested by the SANS10238. Certificates must be presented on request.

4.11.4.4. Site Assembly

The masts shall be delivered to site in sections and assembled to form one tapered column. No welding or drilling shall be permitted during assembly. Care shall be taken that the zinc coating of all galvanised material is not damaged during assembly.

4.11.4.5. Design Parameters

The masts shall be designed in accordance with the SANS Code of Practice for Design and Construction of Lighting Masts. (SANS 0225 – 1991). All masts shall be suitable for environmental and site conditions in Kimberley, Northern Cape.
The masts shall withstand the maximum design conditions when fully equipped with luminaires, their associated equipment, cross arms and safety cage ladder commencing 4.5m above ground level.
The mass of the structure, luminaires, cables cross arms ladder etc. must be considered in the design.

4.11.4.6. Assembly and Erection

The masts shall be designed to be mounted onto a concrete foundation by means of a base plate bolted to a bolt group cast into the concrete.
It must be possible to adjust the mast from deviations from the vertical without the use of wedges.
The opening between foundation and lower face of the base plate shall be filled with a suitable grouting mixture. Drainage holes, insect proofed shall be provided.
In the design, the bolts shall be adequate to carry the full load without contribution by the grouting mixture.

4.11.4.7. Access Opening

An opening at a suitable height above the base plate shall be provided to give access to cable terminations. The opening shall be equipped with a lockable hinged door and suitably reinforced by a doorframe.

4.11.4.8. Safety Ladder

A caged ladder commencing approximately 4.5m above the base plate shall be provided to permit access to the floodlighting cross arms. Access to the caged ladder shall be by means of removable footrests on the lower 4.5m of the mast.

4.11.4.9. Mounting of Floodlights

Cross arms, Hot dipped Galvanised to SANS 121, suitably dimensioned to permit the mounting of **7 x BEKA OMNIBLAST-2E-MIDI, LED, 910W with DALI DRIVERS housed in mast DB** shall be provided. The control gear of the luminaires will be mounted in the mast in a distribution board at each mast.

4.11.4.10. Corrosion Protection

All masts and associated equipment shall be hot dip galvanised to SANS 121. The anchor bolts shall be galvanised to SANS 121 over their entire length.
No welding, drilling, filing or grinding which will expose the parent metal shall be permitted after galvanising.

4.11.4.11. Earthing

Prior to the installation of the foundation two 1.2m earth electrodes shall be installed. These electrodes shall be driven into the ground vertically to a minimum depth of

1500mm below the bottom of the foundation excavation, 2m from the mast on opposite sides.

70mm² Stranded copper conductor shall be used running through the foundation into the mast centre. All earth connections are to be braised.

The earthmat shall be connected to the mast foundation bolts. The Engineer shall inspect the earthing installation prior to the concrete being cast. After installation of the earth spikes the earth resistance shall be measured which shall not exceed 10 ohm.

4.12. CABLE SLEEVES

Where cables cross under roadways, building platforms, other services and where cables enter buildings, the cables shall be installed in double wall corrugated high density polyethylene sleeve pipes.

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.

As part of this contract the contractor shall install cable sleeves and manholes for other services as well.

All cable sleeves shall be Double Wall Corrugated HDPE sleeves.

4.13. EARTHING AND BONDING

The Contractor will be responsible for all earthing and bonding of the installation. The earthing and bonding is to be carried out strictly as described in SANS 10142, this specification and to the satisfaction of the Engineer.

4.14. STANDBY DIESEL GENERATOR AND DIESEL STORAGE

The Contractor will be responsible for the supply and installation of the complete standby diesel generator plant consisting of the following:

a) One new 350kVA standby diesel generator set synchronised with an existing 350kVA standby diesel generator set.

b) The new 350kVA generator must be manufactured and supplied by Unilec Power Systems and must be in product and manufacture equal to the existing 350kVA unit on site.

c) The Contractor must familiarise himself with the existing unit installed on site which is utilised for the student accommodation. The following minimum specifications will serve as a guideline of the existing unit on site:

- Three phase, 50HZ, 1500rpm, 350kVA standby diesel generator set.
- Housed in a weatherproof sound attenuated canopy.
- Automatic change-over with 8610 deep sea controller.
- 30% dummy load complete with 3-phase electrical supply and distribution board.

- Lockable fuel filling cap and fuel pipes with fuel filling pump.
- 8-hour/1000Litre double wall day tank.
- Water jacket heater set and element.
- Weatherproof and sound attenuated canopy with doors.
- Residential silencer with stainless steel tail pipe and flexible bellow fitted between engine and silencer.
- The six-cylinder, turbo charged, TAD1342GE VOLVO diesel engine must be capable of producing 375kVA under standby conditions and 350kVA under prime conditions @ 1500m above sea level.
- The alternator must be 365kVA @ 0,8power factor, three phase, Marelli motori/Leroy Somer single bearing, brushless alternator coupled via flange and flexible coupling.
- The switchboard must be complete with 630A ABB Motorized Mains Isolator & Genset Circuit Breaker, Ammeters, Voltmeters, Frequency Display on Controller, control circuit breakers, slave relays & engine wiring terminals including an 8610 DSE Deep Sea Controller with the Vdo Fuel gauge for fuel level display on controller.
- Two 120A/Hour Bosch Maintenance Free Batteries complete with 24V independent battery charger unit for each genset.
- All required notices and labels, complete as specified including a set of earmuffs for hearing protection.
- The Carbon Dioxide fire extinguisher, 5kg must be mounted outside the outdoor weatherproof canopy.

The existing 350kVA standby diesel generator set which is currently an outdoor installation must be dis-connected and re-installed inside the new genset room of the plant building to form part of the synchronised standby generator system. The contractor must allow for all rigging, storage of all engine liquids and re-filling.

d) The two standby generators (1 x 350kVA new and 1 x 350kVA existing) must be synchronized via two (2) deep sea DSE 8610 slave controllers to control each standby generator set and one (1) master deep sea DSE 8660 controller which command- and control the two slave controllers. The master controller will be housed in the main floor standing distribution board (Main DB E). **Hence, the contractor must allow for coordination between the generator supplier and distribution board manufacturer.**

e) The control and automatic transfer during the synchronization are scheduled as follows:

- Power/Mains failure occur.
- Genset 1 and 2 sense the failure, and each diesel engine start.
- The slave automatic transfer switch of the first generator (say Genset 1) which reach the prescribed frequency will close and energise the dead standby bus.
- The second generator (say Genset 2) will synchronize with the live standby bus where after the slave automatic transfer switches will close.

- The master controller (DSE 8660) senses the status of all two genset slave controllers (2 x DSE 8610) and when both generators are synchronised at the prescribed frequency, the main automatic transfer switch is closed.

- The master controller (DSE 8660) will manage the total standby generator load demand and command the switch-off of generator/s should the total load reduce to such an extent that only one standby generator is required.

- The utility/normal power returns. The master controller (DSE 8660) command the two slave controllers (DSE 8610) to switch-off after a pre-set time.

f) All the Deep-Sea communication GSM modules shall be provided to ensure alarm and status communication via SMS notification.

g) The contractor will be responsible for the supply, delivery, storage, installation, and commissioning of an above-ground storage tank system including all fuel piping, valves, solenoids, weatherproof vent pipes at both the storage and generator day tanks and fuel conditioning system by a fuel storage- and piping installation specialist. A PC sum is allowed for this item in the Bill of Quantities. The fuel storage- and piping installation specialist must advise regarding the required dimensions and layout of the complete fuel storage- and piping system to comply to the required SANS regulations.

h) The contractor will be responsible for the weatherproof outlet louvres with steel extension frame that will coincide and link/fit with the dummy load outlet grill/frame to form a neat and continuous outlet louvre system which could be conveniently removed for maintenance and repair. A PC sum is allowed for this item in the Bill of Quantities.

i) The contractor must allow for the commissioning factory acceptance and site acceptance diesel fill of both the new and existing standby diesel generator sets.

j) The contractor must allow for the complete 50ppm diesel first fill of both the new and existing standby diesel generator including the AST bulk storage tank.

k) Detail workshop drawings of the new generator set including the schematic diagrams of the proposed synchronised set must be submitted for approval by the Engineer prior to manufacturing.

l) The canopy shall be designed to attenuate the generator noise to 70 dBA, measured 7m from the generator set, 1 m above ground. The soundproof material shall be self-extinguished. The physical size of the canopy shall be approximately 5,0m in length, 1,5m in width and 2,6m in height and shall be manufactured from 1,6 mm thick mild steel sheet metal with a powder coat finish. The colour of the canopy shall be confirmed prior to manufacturing. Adequate ventilation louvres shall be provided with due allowance for the required sound attenuation. The steel canopy shall include a centre lifting eye on top for hoisting purposes. The control panel, engine and alternator shall have convenient access for repair and maintenance. The access doors shall be pad lockable with a three-point barker and nelson locking mechanism. Convenient access to cable work and cable terminations shall be provided. Enclosed type damp proof LED luminaires, type Beka 46W LED Vapourline or of equal quality and approval with stainless steel clips shall be provided at the top, inside the canopy for repair and maintenance purposes. A detail sketch of the proposed sound attenuated canopy shall be enclosed with the tender.

SECTION 5. RETURNABLE SCHEDULES

5.1. ELECTRICAL CONTRACTOR DETAILS

Name and address of Electrical Contractor: (Company Name)

_____

_____

_____

Tel. No._____

Name and registration number of Certified Accredited Person:

_____

Reg No:_____

Certified Accredited Person Registration Type: **Please mark**
(Minimum requirement for person to exercise general control over the work for this project is registration as an Installation Electrician)

- ❑ Master Installation Electrician
- ❑ Installation Electrician – 3 Phase
- ❑ Electrical Tester for Single Phase

Electrical Contractor's Registration Number:

_____ Valid Till: _____
(Copy of current registration document must be attached)

_____
Authorised Signature

_____
Name

_____
Date

5.2. SCHEDULE OF EQUIPMENT OFFERED

a) LV Cables, Distribution Boards and Lighting

ITEM	MATERIAL	MAKE OR TRADE NAME	COUNTRY OF ORIGIN
1.	Distribution boards		
2.	Circuit breakers 1P, 2P, 3P		
3.	On load isolators without trips		
4.	Contactors 1P, 2P, 3P		
5.	Earth leakage relays 1 & 3 phase		
6.	H.R.C. fuse switches		
7.	Current transformers		
8.	Voltmeter		
9.	Low voltage cable (400 V)		
10.	Cable Ladders and trays		
11.	Area Lighting:		
11.1	Type O1		
11.2	Type O2		
11.3	Type P		
11.4	Type P1		
11.5	Type P2		
11.6	Type T		
11.7	Type T1		
11.8	Type U		
11.9	Type V		
11.10	Type W		
11.11	Type X		
12.	Low voltage cable (400V and 230V)		RSA
13.	18m MH Fixed Masts	SECTIONAL POLES	RSA

b) MV Cable and SF6 RMU

ITEM	MATERIAL	MAKE OR TRADE NAME	COUNTRY OF ORIGIN
1.	SF6 Ring-Main Unit with Bulk meter	ABB	RSA
2.	11kV/400V Mini subs	ACTOM	RSA
3.	Medium voltage 6.35/11kV XLPE, Cu cable		RSA

c) Generator

i. Generator Engine

NO	ITEM	REMARKS 350KVA GENSET
1.	Manufacturer's Name	
2.	Country of Origin	
3.	Manufacturer's model No. and year of manufacture	
4.	Continuous sea level rating after allowing for ancillary equipment : a) In bhp b) In kW	
5.	Percentage de-rating for site conditions, in accordance with BS 551.4 a) For altitude b) For temperature c) For humidity d) Total de-rating	
6.	Net output on site in kW	
7.	Nominal speed in rpm	
8.	Number of cylinders	
9.	Strokes per working cycle	
10.	Stroke in mm	
11.	Cylinder bore in mm	
12.	Swept volume in cm^3	
13.	Mean piston speed in m/min	
14.	Compression ratio	
15.	Cyclic irregularity	
16.	Fuel consumption of the complete generating set on site in l/h of alternator output at : a) Full load b) ¾ load c) ½ load NOTE : A tolerance of 5% shall be allowed above the stated value of fuel consumption.	
17.	Make of fuel injection system.	
18.	Capacity of fuel tank in litres	
19.	Is gauge glass fitted to tank?	
20.	Is electric pump for filling the fuel tank included?	
21.	Method of starting	
22.	Voltage of starting system	
23.	Method of cooling	
24.	Type of radiator if water-cooled	

NO	ITEM	REMARKS 350KVA GENSET
25.	Type of heater for warming cylinder heads	
26.	Capacity of heater in kW	
27.	Method of protection against high temperature	
28.	Method of protection against low oil pressure	
29.	Type of governor	
30.	Speed variation in % a) Temporary b) Permanent	
31.	Minimum time required for as assumption of full load in seconds	
32.	Recommended interval in running hours for : a) Lubricating oil change b) Oil filter element change c) Decarbonising	
33.	Type of base	
34.	Can plant be placed on solid concrete floor?	
35.	Are all accessories and ducts included?	
36.	Is engine naturally aspirated?	
37.	Are performance curves attached?	
38.	Diameter of exhaust pipe	
39.	Noise level in plant room in dBA	
40.	Noise level at tail of exhaust pipe in dBA	
41.	BMEP (4 stroke) at continuous rating (kPa)	
42.	% Load acceptance to BS 5514, Part 4, with 10% transient speed drop	

ii. Generator Alternator

NO	ITEM	REMARKS 350KVA GENSET
1.	Maker's name and model no.	
2.	Country of Origin and year of manufacture	
3.	Type of enclosure	
4.	Nominal speed in rpm	
5.	Number of bearings	
6.	Terminal voltage	
7.	Sea level rating kVA at 0.8 power factor	
8.	De-rating for site conditions	
9.	Input required in kW	
10.	Method of excitation	
11.	Efficiency at 0,8 power factor and : a) Full load b) ¾ load	

NO	ITEM	REMARKS 350KVA GENSET
	c) ½ load	
12.	Maximum permanent voltage variation in %	
13.	Transient voltage dip on full load	
14.	Voltage recovery on full load application in milliseconds	
15.	Is alternator brushless?	
16.	Class of insulation of windings	
17.	Is alternator tropicalised?	
18.	Symmetrical short circuit current at terminals n Ampere	
19.	Type of Coupling	

iii. Generator Switchboard

NO	ITEM	REMARKS 350KVA GENSET
1.	Maker's Name	
2.	Country of Origin	
3.	Is board floor mounted?	
4.	Finish of board	
5.	Make of volt, amp, and frequency meters	
6.	Dial size of meters in mm	
7.	Scale range of voltmeter	
8.	Scale range of ammeters	
9.	Ratio of current transformers	
10.	Make of hour meter	
11.	Range of cyclometer counter	
12.	Smallest unit shown on counter (Item 11)	
13.	Make of circuit breaker	
14.	Type of circuit breaker	
15.	Rating of circuit breaker in Amp and fault level in kA	
16.	Setting range of overload trips	
17.	Setting range of instantaneous trips	
18.	Make of change-over equipment	N/A
19.	Make of voltage relay	
20.	Is control and protection equipment mounted on a small removable panel?	
21.	Type of control equipment	
22.	Make of mains isolator	
23.	Type of indicators for protective devices	

NO	ITEM	REMARKS 350KVA GENSET
24.	Make of rectifier	
25.	Type of rectifier	
26.	Is battery charging	
27.	Are volt- and ammeters provided for charging circuit?	
28.	Is the alarm hooter of the continuous duty type?	
29.	Rating in Amps of : a) Change-over equipment b) Mains on load isolator c) By-pass switch d) Circuit breaker to outgoing feed	N/A
30.	Is manufacture of switchboard/control panel to be sub-let?	
31.	If yes, state name and address of specialist manufacturer	

iv. Generator Battery

NO	ITEM	REMARKS 350KVA GENSET
1.	Maker's Name	
2.	Country of Origin	
3.	Type of battery	
4.	Voltage of battery	
5.	Number of cells	
6.	Capacity in cold crank amp	

v. Generator Dimensions

NO	ITEM	REMARKS 350KVA GENSET
1.	Overall dimensions of set in mm	
2.	Overall mass	
3.	Is the generator room adequate for the installation of the set	

vi. Generator Guarantee

This item <u>must</u> be completed for tender purposes.

NO	ITEM	REMARKS
1.	Guarantee period in months	
2.	State conditions of guarantee	

NOTE:

Tenderers are to note that under no circumstances may materials be installed other than that offered in the above material schedule, which has been approved and accepted by the Engineer.

Should the successful Tenderer wish to supply materials other than that originally offered, prior written approval must be obtained from the Engineer.

5.3. SCHEDULE OF IMPORTED MATERIALS AND EQUIPMENT

TO BE COMPLETED BY TENDERER

The Contractor shall list imported items, materials and/or equipment which shall be adjusted in terms of currency fluctuations only. Copies of the supplier's quotations for the items, materials or equipment (not higher than the Contract rate as listed below) shall be attached to this page and submitted with the tender documentation, failing which, the tender may be considered not compliant and maybe disqualified. No adjustment of the contractor's profit, local VAT amount, discount, mark-up, handling costs, etcetera shall be allowed.

ITEMS	MATERIAL / EQUIPMENT	RAND (R) EXCLUDING VAT
1		
2		
3		
4		
5		
6		

FORMULA:

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

A = V (Z/Y – 1)
A = the amount (R) of adjustment

V = the net amount (R) (Supplier's Quotation) of the imported item (Material or Equipment)

Y = exchange rate at the closing date of tender submission

Z = exchange rate on the date of payment

SECTION 6. BILL OF QUANTITIES

6.1. PREAMBLE

1. The bill of quantities shall be read in conjunction with the General Conditions together with the Specifications and the Drawings for a full description of each item. The general requirements and descriptions of the Works and equipment given in the Specification are not repeated in the bill of quantities.

2. Each item shall be priced and extended to the "Total" column by the Tenderer. If the Tenderer omits to price any item in the bill of quantities then the cost of the work of each item shall be considered as included in the prices given for the other items.

3. The quantities of work and material set forth in the bill of quantities are estimates only and are not to be considered as limiting nor as extending the amount of work to be done and material to be supplied by the Contractor and the work and material set forth in the bill of quantities will be re-measured. The Contractor shall ascertain the correct quantities before ordering. Items will only be paid for insofar as they have been supplied and installed. Excessive quantities or wastage shall not be paid for.

4. The price quoted against each item of this bill of quantities shall cover the full inclusive cost of the completed work to which it refers, as described in the Specification and as shown on the Drawings and shall allow for transporting, loading, storage, supervision commissioning, wastage, profit etc.

5. No alterations, erasure or addition is to be made in the text of the Document. Any alteration, erasure or addition made will not be recognised and the original working of the Document will be adhered to.

6. Tenderers shall clarify any doubt about the meaning of any wording in the bill of quantities before the Tender closing date.

7. The prices quoted shall be exclusive of Sales Tax as applicable.

8. All rates and amounts tendered in the bill of quantities shall be in Rand.

9. Tenderers shall check their calculations for arithmetical errors as the total Tender Price, as submitted, will remain fixed.

10. Preliminary and General costs shall be allowed for as per the P&G bill.

Tender No DRPW 015/2023-EP

KIMBERLEY NURSING COLLEGE PHASE 2A - ACADEMIC CAMPUS: ELECTRICAL INFRASTRUCTURE SERVICES
Schedule of Quantities

BILL 1: PRELIMINARY AND GENERAL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
		BILL NO 1: PRELIMINARY AND GENERAL					
		GENERAL CONDITIONS OF CONTRACT					
		Where applicable costs shall be tendered for Fixed, Variable Related and Time Related items.					
		Payment shall be calculated as follows:					
		Fixed: According to % construction progress					
		Variable Related: According to % payment progress based on the approved amended contract amount.					
		Time Related: According to % approved contract period elapsed					
1.1		a) Fixed Amount	Sum	1			
1.2		b) Variable Related Amount	Sum	1			
1.3		c) Time Related Amount	Sum	1			
		SPECIAL CONDITIONS OF CONTRACT					
		The electrical sub-contractor shall allow in his tender for all costs according to items specified under Special Conditons of Contract in this tender document.					
		Payment for these items shall be calculated as % of the Contract Amount, excluding Preliminary & General costs, certified. (Refer to Part 18 of the Special Conditions of Contract)					
1.4		Part 1: General Items	Sum	1			
1.5		Part 4: Manufacturing Drawings	Sum	1			
1.6		Part 5 & 6: Contractor's personnel and Quality Control, 3-phase installation electrician full-time supervision and Site Facilities	Sum	1			
1.7		Part 7: Water and Electric Power	Sum	1			
1.8		Part 8: Offices	Sum	1			
1.9		Part 9: Storage and Accomodation	Sum	1			
Total Carried Forward							

Tender No DRPW 015/2023-EP

KIMBERLEY NURSING COLLEGE PHASE 2A - ACADEMIC CAMPUS: ELECTRICAL INFRASTRUCTURE SERVICES
Schedule of Quantities

BILL 1: PRELIMINARY AND GENERAL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
1.10		Part 10: Temporary Sanitary Facilities	Sum	1			
1.11		Part 11 & 12: Transport and off loading of Material HEALTH AND SAFETY Part 15: Programming of the work	Sum	1			
1.12		Part 21: Finishing and Tidying	Sum	1			
1.13		Part 22: Practical Completion	Sum	1			
1.14		Part 24: Guarantee Period	Sum	1			
1.15		Part 26: Marking of Materials	Sum	1			
1.16		Part 27: Allowance for the completion of the contract in it's entity	Sum	1			
1.17		Part 29: Site Conditions	Sum	1			
1.18		Part 30: Laws and Regulations	Sum	1			
1.19		Part 33: Inspection and Tests	Sum	1			
1.20		Part 36: Insurance of the Works	Sum	1			
1.21		Part 37: Complying with Construction Regulations	Sum	1			
Total Carried Forward To Summary							

BILL 2: MEDIUM VOLTAGE RETICULATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
		BILL 2: MEDIUM VOLTAGE RETICULATION					
		MINIATURE SUBSTATIONS					
		Supply, delivery, off-loading storage and installation of new miniature substations complete with Ring Main Unit, including concrete plinth and earth mat as per specification.					
2.1		a) Setting out of mini-sub positions	No	2			
2.2		b) Mini-Substation Earthing Installation, including excavations and compaction	No	2			
2.3		c) Mini-Substation Plinth Installation	No	2			
2.4		d) 150A TP, 400V, 25kA circuit breaker for existing mini-sub on site	No	2			
2.5		e) 200A TP, 400V, 25kA circuit breaker for existing mini-sub on site	No	2			
2.6		f) 250A TP, 400V, 25kA circuit breaker for existing mini-sub on site	No	2			
2.7		g) 300A TP, 400V, 25kA circuit breaker for existing mini-sub on site	No	6			
2.8		d) Supply, delivery to site, temporary storage, re-loading and positioning of a 630kVA 11kV/400V, DYN11 mini-substation, complete as specified, required by this section of the works, complete with oil, cable termination boxes, switchgear and metering equipment as specified. Shop drawings to be submitted for approval prior to ordering. This price must allow for LV circuit breakers as specified on SLD.	No	2			
2.9		e) Labeling & warning signs miniature substations (equipment and circuits)	No	8			
		MEDIUM VOLTAGE CABLES					
		Supply, install medium voltage (6.35/11kV) insulated cable and material required:					
2.10		a) 150 mm² x 3C XLPE copper cable (Supplied by client. Allow for collection and cranage in Kimberley and pressure testing at the stoarge site)	m	600			
Total Carried Forward							

BILL 2: MEDIUM VOLTAGE RETICULATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
2.11		b) 150 mm² x 3C XLPE copper cable	m	1000			
2.12		c) Provision and Installation of Cable Marker Concrete blocks and grid references	No	15			
		EARTH WIRE Stranded bare copper eart wires laid with cables in cable trenches and drawn into cable sleeves					
2.13		BCEW: 95 mm² Laid with 150 mm² cables	m	1600			
		INDOOR CABLE TERMINATIONS Termination and joints of MV cables					
2.14		a) Terminations for 11 kV 150 mm² Cu XLPE and screened and armoured cable	No	7			
2.15		b) Joint for 11 kV 150 mm² Cu XLPE and screened and armoured cable	No	3			
		EXCAVATIONS Excavations as specified including backfilling and compaction. Cable Trenches shall be measured as max 600 mm wide x 1100 mm deep unless otherwise specified.					
2.16		a) Earth	m³	267			
2.17		b) Soft Rock	m³	89			
2.18		c) Hard Rock	m³	535			
2.19		d) Tarred or paved road surface including repair to match existing	m³	50			
2.20		e) Imported bedding	m³	388			
2.21		f) Cart away and legally dispose of excess excavation material, level and make neat trenched areas	m³	17			
2.22		g) Danger Tape	m	1600			
		CABLE SLEEVES Double wall corrugated complete with all couplings, fittings, bends, galvanised draw wire and accessories installed in cable trenches					
Total Carried Forward							

Tender No DRPW 015/2023-EP

KIMBERLEY NURSING COLLEGE PHASE 2A - ACADEMIC CAMPUS: ELECTRICAL INFRASTRUCTURE SERVICES
Schedule of Quantities

BILL 2: MEDIUM VOLTAGE RETICULATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
2.23		a) 160 mm Ø HDPe	m	250			
2.24		b) 110 mm Ø HDPe	m	250			
2.25		c) 75 mm Ø HDPe	m	250			
		SF6 RING MAIN UNIT Supply, delivery, off-loading storage and installation of new SF6 RMU (ring-main unit) complete with concrete plinth and earth mat as per specification.					
2.26		a) Setting out of RMU positions	No	1			
2.27		b) RMU Earthing Installation including complete excavations and compaction	No	1			
2.28		c) RMU Plinth Installation	No	1			
2.29		d) Supply, delivery to site, storage, re-loading and positioning of a ABB SF6 metering 4-way, Ring-Main Unit, complete as specified and required by this section of the works, complete with outdoor housing enclosure with doors, cable termination boxes (only C-type terminations), switchgear and metering equipment as specified. Shop drawings to be submitted for approval prior to ordering.	Sum	1			
2.30		e) Labeling & warning signs RMU (equipment and circuits)	No	3			
		NEW METERING CT's AT EXISTING 11kV SWITCH BOARD CIRCUIT BREAKER PC Sum for the design, manufacture, supply, delivery, installation, assembling, on site testing & commissioning of the following equipment at the existing single busbar circuit breaker.					
2.31		a) 2,5 mm x 4c Cu cable from11000/110V voltage transformer unit	m	30	150.00	4500	00
2.32		b) 2,5 mm x 7c Cu cable from11000/110V current transformer unit	m	30	250.00	7500	00
2.33		c) Metering CT's, Metering : C1 0,5 10 VA, Metering : 300/1 A (Connect 300/1)	No	3	20000.00	60000	00
Total Carried Forward							

BILL 2: MEDIUM VOLTAGE RETICULATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
2.34		d) Coordination and liaison with PV solar specialist	Sum	1	3500.00	3500	00
2.35		e) Profit & Attendance on the above items 2.31 to 2.34	Sum	1			
		TEST & COMMISSION ELECTRICAL INSTALLATION					
2.36		a) Commission complete medium voltage reticulation installation	Sum	1			
2.37	BW 8.2.1	b) Pressure test of MV cable	Sum	1			
2.38		c) Test and certify electrical installation according to SANS 10142	Sum	1			
		GUARANTEE ON INSTALLATION					
2.39		Allow for a 12 month guarantee on the complete medium voltage reticulation system. The 12 month period to commence from practical completion.	Sum	1			
Total Carried Forward To Summary							

BILL 3: LOW VOLTAGE RETICULATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
		BILL 3: LOW VOLTAGE CIRCULATION					
		LOW VOLTAGE CABLE					
		600/1000V PVC/PVC/SWA/PVC copper cables laid in cable trenches and drawn into cable sleeves					
3.1		a) 240 mm² x 4 Core	m	250			
3.2		b) 185 mm² x 4 Core	m	170			
3.3		c) 150 mm² x 4 Core	m	850			
3.4		d) 120 mm² x 4 Core	m	120			
3.5		e) 95 mm² x 4 Core	m	1110			
3.6		f) 70 mm² x 4 Core	m	30			
3.7		g) 50 mm² x 4 Core	m	525			
3.8		h) 35 mm² x 4 Core	m	1470			
3.9		i) 25 mm² x 4 Core	m	1030			
3.10		j) 16 mm² x 4 Core	m	165			
3.11		k) 10 mm² x 4 Core	m	1			
3.12		l) 6 mm² x 4 Core	m	1			
3.13		m) 4 mm² x 4 Core	m	1			
3.14		n) 2,5 mm² x 4 Core	m	1			
3.15		o) 1,5 mm² x 4 Core	m	1			
3.16		p) 6 mm² x 3 Core	m	1			
3.17		q) 4 mm² x 3 Core	m	1			
3.18		r) 2,5 mm² x 3 Core	m	1			
3.19		s) 1,5 mm² x 3 Core	m	1			
		EARTH WIRES					
		Stranded bare copper eart wires laid with cables in cable trenches and drawn into cable sleeves					
3.20		a) BCEW: 120 mm² Laid with 185 mm² cables	m	250			
Total Carried Forward							

BILL 3: LOW VOLTAGE RETICULATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
3.21		b) BCEW: 95 mm² Laid with 185 mm² cables	m	170			
3.22		c) BCEW: 95 mm² Laid with 150 mm² cables	m	850			
3.23		d) BCEW: 70 mm² Laid with 120 mm² cables	m	120			
3.24		e) BCEW: 50 mm² Laid with 95 mm² cables	m	1110			
3.25		f) BCEW: 35 mm² Laid with 70 mm² cables	m	30			
3.26		g) BCEW: 25 mm² Laid with 50 mm² cables	m	525			
3.27		h) BCEW: 25 mm² Laid with 35 mm² cables	m	1470			
3.28		i) BCEW: 16 mm² Laid with 25 mm² cables	m	1030			
3.29		j) BCEW: 10 mm² Laid with 16 mm² cables	m	165			
3.30		k) BCEW: 6 mm² Laid with 10 mm² cables	m	1			
3.31		l) BCEW: 4 mm² Laid with 6 mm² cables	m	1			
3.32		m) BCEW: 2,5 mm² Laid with 4 mm² cables	m	1			
		TERMINATION OF LOW VOLTAGE CABLES Complete as specified including lugs, glands, shrouds, cable boots and other accessories					
3.33		a) 240 mm² x 4 Core	No	6			
3.34		b) 185 mm² x 4 Core	No	6			
3.35		c) 150 mm² x 4 Core	No	10			
3.36		d) 120 mm² x 4 Core	No	2			
3.37		e) 95 mm² x 4 Core	No	40			
3.38		f) 70 mm² x 4 Core	No	2			
3.39		g) 50 mm² x 4 Core	No	12			
3.40		h) 35 mm² x 4 Core	No	22			
3.41		i) 25 mm² x 4 Core	No	38			
3.42		j) 16 mm² x 4 Core	No	16			
Total Carried Forward							

BILL 3: LOW VOLTAGE RETICULATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
3.43		k) 10 mm² x 4 Core	No	1			
3.44		l) 6 mm² x 4 Core	No	1			
3.45		m) 4 mm² x 4 Core	No	1			
3.46		n) 2,5 mm² x 4 Core	No	1			
3.47		o) 1,5 mm² x 4 Core	No	1			
3.48		p) 6 mm² x 3 Core	No	1			
3.49		q) 4 mm² x 3 Core	No	1			
3.50		r) 2,5 mm² x 3 Core	No	1			
3.51		s) 1,5 mm² x 3 Core	No	1			
		TERMINATION OF EARTH WIRES Complete as specified including lugs and other accessories					
3.52		a) BCEW: 120 mm²	No	6			
3.53		b) BCEW: 95 mm²	No	6			
3.54		c) BCEW: 95 mm²	No	10			
3.55		d) BCEW: 70 mm²	No	2			
3.56		e) BCEW: 50 mm²	No	40			
3.57		f) BCEW: 35 mm²	No	2			
3.58		g) BCEW: 25 mm²	No	12			
3.59		h) BCEW: 25 mm²	No	22			
3.60		i) BCEW: 16 mm²	No	38			
3.61		j) BCEW: 10 mm²	No	16			
3.62		k) BCEW: 6 mm²	No	1			
3.63		l) BCEW: 4 mm²	No	1			
3.64		m) BCEW: 2,5 mm²	No	1			
Total Carried Forward							

BILL 3: LOW VOLTAGE RETICULATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
		LOW VOLTAGE DISTRIBUTION BOARDS New distribution boards complete with all equipment as per schedules and specifications (Schneider type switchgear equipment only)					
3.65		a) 750A TP MCCB, 25kA in existing mini-sub 2 as supply to DB Main	No	1			
3.66		b) DB-Main N: 3 Phase, surface mounted, floor standing interior distribution board including connections (As per SLDs)	No	1			
3.67		c) DB-Main E: 3 Phase, surface mounted, floor standing interior distribution board including connections (As per SLDs)	No	1			
3.68		d) DB-B2E: 3 Phase, surface mounted, floor standing exterior distribution board including connections (As per SLDs)	No	1			
3.69		e) PC Amount for cable trench recta grid installation in genset room - type Eskom fibreglass	PC Sum	1	50000.00	50000	00
3.70		f) Set out positions for DBs	No	4			
3.71		g) Medium Duty Perforated Galvanised Steel Cable Tray: 300 mm Wide mounted vertical on brick walls under DB.	m	20			
3.72		h) P2000 Mounting supports for 300 mm cable tray	m	20			
3.73		i) Standard padlocks for minisubs and distribution kiosks	No	15			
3.74		j) Labeling and warning signs for Distribution boards	Sum	1			
		EXCAVATIONS Excavations as specified including backfilling and compaction. Cable Trenches shall be measured as max 500 mm wide x 750 mm deep unless otherwise specified.					
3.75		a) Earth	m^3	255			
3.76		b) Soft Rock	m^3	255			
Total Carried Forward							

BILL 3: LOW VOLTAGE RETICULATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
3.77		c) Hard Rock	m³	128			
3.78		d) Tarred or paved road surface including repair to match existing	m³	1			
3.79		e) Imported bedding	m³	340			
3.80		f) Cart away and legally dispose of excess excavation material, level and make neat trenched areas	m³	19			
3.81		g) Danger Tape	m	1400			
		CABLE SLEEVES Double wall corrugated complete with all couplings, fittings, bends, galvanised draw wire and accessories installed in cable trenches					
3.82		a) 160 mm Ø HDPe	m	250			
3.83		b) 110 mm Ø HDPe	m	250			
3.84		c) 75 mm Ø HDPe	m	250			
		CABLE TRAYS Medium Duty Perforated Galvanised Steel Cable Tray mounted on brick walls including all bends,joints and support brackets complete with all bolts and nuts.					
3.85		a) O-line 38H x 114W	m	50			
3.86		b) O-line 38H x 228W	m	50			
3.87		c) O-line 38H x 306W	m	200			
		COMMISION AND TEST ELECTRICAL INSTALLATION					
3.88		a) Commission complete low voltage reticulation installation	Sum	1			
3.89		b) Test and certify electrical installation according to SANS 10142	Sum	1			
		GUARANTEE ON INSTALLATION					
3.90		Allow for a 12 month guarantee on the complete low voltage reticulation system. The 12 month period to commence from practical completion.	Sum	1			
Total Carried Forward To Summary							

BILL 4: STANDBY DIESEL GENERATOR INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
		BILL 4: STANDBY DIESEL GENERATOR INSTALLATION					
		350 kVA STANDBY DIESEL GENERATORS					
		Supply and install three phase, 50HZ, 1500 rpm diesel standby genset complete with 1000 Litre day tank, water jacket heater, electric fuel filling pump, lifting lugs and 30% dummy load including residential silencer with stainless steel tail pipe and flexible bellow fitted between engine and silencer and weatherproof canopy complete as manufactured and supplied by Unilec Power Systems.					
		a) Six cylinder turbo charged, TAD1342GE VOLVO diesel engine capable of producing 375 kVA under standby conditions and 350 kVA under prime conditions @ 1500 m above sea level.s or equal and approved.					
4.1		b) 365 kVA @ 0,8 power factor, three phase, Leroy Somer LSA 47A single bearing, brushless alternator coupled via flange and flexible coupling.	**No**	1			
4.2		c) Switchboard (genset panel) complete with 630A ABB Motorized Mains Isolator & Genset Circuit Breaker, Ammeters, Voltmeters, Frequency Display on Controller, control circuit breakers, slave relays & engine wiring terminals including a 8610DSE Deep Sea Controller. The Vdo Fuel gauge for fuel level display on controller. Separate swivel door wiring harnesses for separation of AC and DC cabling between the backplate and the conroller on the door.	No	1			
4.3		d) 1000 Litre Double wall, diesel day tank manuafctured of 3 and 4mm sheet metal, including fuel pump, lockable fuel filling cap and fuel pipes.	No	1			
4.4		e) 120 A/Hour Bosch Maintenance Free Battery complete with 24V battery charger or equal and approved.	No	1			
4.5		f) All required notices and labels, complete as specified:	No	1			
Total Carried Forward							

BILL 4: STANDBY DIESEL GENERATOR INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
4.6		g) A set of earmuffs for hearing protection	No	1			
4.7		h) Carbon Dioxide fire extinguisher, 5 kg mounted inside outdoor weatherproof canopy	No	1			
4.8		i) Construct a weather proof and sound attenuated canopy, for the new generator, complete as specified.	No	1			
4.9		j) 30% Dummy load complete as specified.	No	1			
4.10		k) Relocate existing 350 kVA genset to new genset room to form synchronised set with new 350 kVA genset	No	1			
4.11		l) Replace existing DSE 7320 on existing genset with a new Deep Sea DSE8610 genset controller.	No	1			
4.12		m) Remove the existing mains motorised circuit breaker on the existing genset and reconfigure the output	No	1			
4.13		n) PC amount for weatherproof outlet louvres	PC Sum	2	33500.00	67000	00
4.14		o) PC amount for weatherproof inlet louvres	PC Sum	2	33500.00	67000	00
4.15		p) Profit & Attendance on the above items 4.13 and 4.14 above	Sum	1			
		Test and commission fo the complete Standby diesel, synchronised generator installation					
4.16		a) Complete Factory test as specified	Sum	1			
4.17		b) Commission complete standby diesel generator installation	Sum	1			
4.18		c) Complete synchronizing between the two standby diesel generators, including all programming and settings of the 2 x DSE 8610 and 1 x DSE 8660 controller, for the FAT and SAT with load acceptance tests, as specified, including belden 9841 comms cable. The DSE 8660 will be located in DB MAIN E in the genset room.	Sum	1			
Total Carried Forward							

BILL 4: STANDBY DIESEL GENERATOR INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
4.19		d) Test and certify electrical installation according to SANS 10142-1, and NRS 024-1: Diesel Alternator sets for fixed installations	Sum	1			
4.20		e) Maintenance and repair during the 12 month defects liability period	Sum	1			
4.21		f) Maintenance and repair during the 12 months following the completion of the guarantee period	Sum	1			
4.22		g) Training of user department staff as specified	Sum	1			
4.23		h) Compilation of Operation and Maintenance Manuals	Sum	1			
		<u>BULK FUEL AST TANK AND PIPING INSTALLATION</u> PC amount for the supply and installation of a complete above ground fuel storage and piping installation by an approved petroleum installation specialist to comply with SANS 10131 and SANS 10089-3. <u>Remote Filler Point</u>					
4.24		a) Supply and install type Forgeweld Eco Safe recessed ground mounted diesel filler point complete with SIDE ENTRY elbow assembly, filler spill containment body, clamp band, sump ring seal, frame ring, lid, tank ID Marker frame & labels and lid locking assembly, complete with a **dry break fuel coupler**.	Sum	1	23000.00	23000	00
4.25		b) Supply and install a Filler-Spill brick **manhole** plastered and painted with PLASCOGUARD GEHOPON 3000 WB SERIES colour grey on inside of manhole, including a cast -iron cover rated to accommodate heavy duty vehicles. Manhole inside measurements of 1000mm L x 600mm W x 600mm D including excavations and base of manhole.	Sum	1	10000.00	10000	00
Total Carried Forward							

BILL 4: STANDBY DIESEL GENERATOR INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
4.26		c) Supply and install type Forgeweld Eco Safe recessed ground mounted diesel containment sump complete with SIDE ENTRY elbow assembly, filler spill containment body, clamp band, sump ring seal, frame ring, lid, tank ID Marker frame & labels and lid locking assembly, complete with full metal brass Lupatech Mipel **shut-off gate valve** at filler point for maintenance purposes complete with all fittings.	Sum	1	13000.00	13000	00
		Supply from Remote Filler Point to AST Tank					
4.27		a) Supply and install 160 mm Ø Corrugated PVC sleeve between the remote filler point and the AST tank as specified on the drawings, including allowance for the SLOW BEND.	m	30	100.00	3000	00
4.28		b) Supply and install 75 mm Ø flexible fuel pipe type Continental Prospector Petro 150 inside the 160 mm Ø sleeve from the remote filler point to the flexible-steel connection point at the AST tank as specified on the drawings complete with all fittings. Measured per route length.	m	34	1000.00	34000	00
4.29		c) Supply and install 75 mm Ø schedule 40 steel pipe from the flex-to-steel connection to the AST tank filler point as specified on the drawings complete with elbows, bends, fittings including 300 mm P2000 unistrut portions with saddles and roll bolts to support the schedule 40 steel pipe at 1m intervals. Measured per route length.	m	10	650.00	6500	00
4.30		d) Supply and install complete 75 mm Ø Flex-to-steel connection complete with all clamps.	No	1	500.00	500	00
4.31		e) Supply and install full metal brass Lupatech Mipel shut-off gate valve at AST tank filler point including lock-out mechanism with pad-lock.	No	1	330.00	330	00
Total Carried Forward							

BILL 4: STANDBY DIESEL GENERATOR INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
		AST Fuel Tank					
4.32		4500 Litre Bulk Fuel AST Tank as manufactured and supplied by Forgeweld, complete with all filler and drain outlets and flanges with footing support cradles and platform with staircase as specified on drawings.	No	1	110000.00	110000	00
		Fuel Filtration - and Drain Pipeline Section					
4.33		a) Supply and install DUVALCO MFS semi-bulk fuel-filtration system for outdoor weatherproof installation at bulk tank complete with all fittings.	No	1	70000.00	70000	00
4.34		b) Supply and install 22 mm Ø stainless steel fuel pipe with spacer saddles at 1m intervals as supplied by SPU Stainless Steel Piping Utilities at the fuel filtration - and drain pipeline section including all crimp link male/female 90˚ bend, elbow, end union, coupling, reducer/cap and Tee adaptors completely crimped to supplier specifications. Measured per route length.	m	6	600.00	3600	00
4.35		c) Supply and install full metal brass Lupatech Mipel drain gate valves at fuel filtration pipeline section as specified on the drawings complete with all fittings	No	3	330.00	990	00
4.36		d) 1,5 mm x 3c Cu cable between genset 1 and the DUVALCO filtration system for 24V DC supply complete with 25 mm galvanise conduit and spacer saddles at 1 m intervals.	m	20	100.00	2000	00
		Supply from AST Tank to Genset Day Tanks					
4.37		a) Supply and install full metal brass Lupatech Mipel shut-off gate valve at AST tank outlet point complete with all fittings	No	1	330.00	330	00
4.38		b) Supply and install a full metal brass fuel fire shut-off valve with 121˚C fuse link as specified on the drawings complete with 4mm steel cable, 2 kg cast iron weight, 40 mm key rings, 5mm steel u-bolt, 6mm steel anchors and 6mm steel chain, including P2000 unistrut for support from AST tank.	No	1	2500.00	2500	00
Total Carried Forward							

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Schedule of Quantities

BILL 4: STANDBY DIESEL GENERATOR INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
4.39		c) Supply and install type FP Filter Plus B10-ALBSP Bulk Tank In-Line Fuel Water Separator with transparent glass complete with Fittings and Spare Filter.	No	1	3100.00	3100	00
4.40		d) Supply and install 22 mm Ø stainless steel fuel pipe with spacer saddles at 1m interval as supplied by SPU Stainless Steel Piping Utilities at the Tee to split section after water separator including all crimp link male/female 90˚ bend, elbow, end union, coupling, reducer/cap and Tee adaptors completely crimped to supplier specifications. Measured per route length.	m	4	600.00	2400	00
4.41		e) Supply and install full metal brass Lupatech Mipel shut-off gate valve at Tee to split section after water separator complete with all fittings	No	2	330.00	660	00
4.42		f) Supply and install 22 mm Ø stainless steel fuel pipe with spacer saddles at 1m interval as supplied by SPU Stainless Steel Piping Utilities between the AST tank and the genset day tanks including all crimp link male/female 90˚ bend, elbow, end union, coupling, reducer/cap and Tee adaptors completely crimped to supplier specifications. Two separate feeds, one two each day tank. Measured per route length.	m	50	600.00	30000	00
4.43		g) Supply and install full metal brass Lupatech Mipel shut-off gate valve at each day tank connection before the N/O and N/C actuators, complete with all fittings. The N/O and N/C actuators are supplied and installed by other.	No	2	330.00	660	00
		Vent Pipes and Spill Drains					
4.44		h) Supply and install 3 x 50 mm Diesel fuel vent pipes, each with a weatherproof upflow vent end, complete with all bends, support brackets, couplings and connections . All three vent pipes measured per route length.	m	12	330.00	3960	00
4.45		i) Supply and install full metal brass Lupatech Mipel shut-off gate valve inside the spill drain complete with all fittings	No	1	330.00	330	00
Total Carried Forward							

BILL 4: STANDBY DIESEL GENERATOR INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R	AMOUNT c
Brought Forward							
4.46		Profit & Attendance on the above items 4.24 to 4.45 above	Sum	1			
		EXCAVATIONS Excavations as specified including backfilling and compaction. Pipe Trenches shall be measured as max 450 mm wide x 750 mm deep unless otherwise specified.					
4.47		a) Earth	m³	5			
4.48		b) Soft Rock	m³	3			
4.49		c) Hard Rock	m³	3			
4.50		d) Imported bedding	m³	4			
4.51		e) Cart away and legally dispose of excess excavation material, level and make neat trenched areas	m³	3			
		TEST AND COMMISIONING					
4.52		Test, commissioning and certification of the complete above ground fuel storage system by an approved specialist	Sum	1			
		DIESEL FILLING					
4.53		Supply and install Diesel 50 ppm in two genset day tanks and one AST tank	ℓ	6500			
		GUARANTEE ON INSTALLATION					
4.54		a) Allow for a 12 month guarantee on the complete standby diesel synchronised generator system. The 12 month period to commence from practical completion.	Sum	1			
4.55		b) Allow for a 12 month guarantee on the complete above ground fuel storage system. The 12 month period to commence from practical completion.	Sum	1			
Total Carried Forward To Summary							

BILL 5: AREA LIGHTING INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
		BILL NO 5: AREA LIGHTING INSTALLATION					
		LOW VOLTAGE CABLES					
		600/1000V PVC/PVC/SWA/PVC copper cables laid in cable trenches and drawn into cable sleeves					
5.1		a) 6 mm² x 3 Core - post top and street lights	m	2300			
5.2		b) 4 mm² x 3 Core - bollards and signage lights	m	800			
5.3		c) 2,5 mm² x 3 Core	m	100			
5.4		d) 1,5 mm² x 3 Core - spike lights	m	100			
		TERMINATION OF LOW VOLTAGE CABLES					
		Complete as specified including lugs, glands, shrouds, cable boots and other accessories					
5.5		a) 6 mm² x 3 Core	No	150			
5.6		b) 4 mm² x 3 Core	No	140			
5.7		c) 2,5 mm² x 3 Core	No	1			
5.8		d) 1,5 mm² x 3 Core	No	50			
		LIGHT FITTINGS					
		Supply and install Light Fittings or equipment complete with lamps, connections, etc mounted in position. Refer to Schedule of Light Fittings for detail.					
5.9		a) Type O1 - post top	No	50			
5.10		b) Type O2- street light	No	25			
5.11		c) Type P -flood	No	3			
5.12		d) Type T -spot wall wash	No	10			
5.13		e) Type T1 -spike tree	No	40			
5.14		f) Type U -neon strip-length 10 m in total	No	10			
5.15		g) Type V-up/down	No	5			
Total Carried Forward							

BILL 5: AREA LIGHTING INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
5.16		h) Type W - Each signage letter is 600 mm high x 500 mm wide. Quantity per signage letter	No	60			
5.17		i) Type X - bollard	No	70			
		EXCAVATIONS Excavations as specified including backfilling and compaction. Cable Trenches shall be measured as max 500 mm wide x 750 mm deep unless otherwise specified.					
5.18		a) Earth	m³	190			
5.19		b) Soft Rock	m³	38			
5.20		c) Hard Rock	m³	152			
5.21		d) Tarred or paved road surface including repair to match existing.	m³	1			
5.22		e) Imported bedding	m³	152			
5.23		f) Cart away and legally dispose of excess excavation material, level and make neat trenched areas	m³	1			
5.24		g) Danger Tape	m	1450			
		CABLE SLEEVES Double wall corrugated complete with all couplings, fittings, bends, galvanised draw wire and accessories installed in cable trenches					
5.25		a) 160 mm Ø HDPe	m	250			
5.26		b) 110 mm Ø HDPe	m	250			
5.27		c) 75 mm Ø HDPe	m	250			
		MANHOLES AND WEATHER PROOF BOXES AT STEEL TREES Double wall corrugated complete with all couplings, fittings, bends, galvanised draw wire and accessories installed in cable trenches					
5.28		a) 75 mm Ø HDPe	m	500			
Total Carried Forward							

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Schedule of Quantities

BILL 5: AREA LIGHTING INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
5.29		b) 600 x 600 x 600 mm Brick manhole with cast iron cover and frame	No	10			
5.30		c) Pratley, IK5 rectangular enviro IP68 junction box with 10 x 20 mmØ entries, hinged lid and screws	No	11			
5.31		d) Phase 3, 50 x 130 x 320 mm galvanised box with knock outs, cover and screws to house neon strip light IP67 LED drivers.	Sum	11			
		TEST & COMMISSION ELECTRICAL INSTALLATION					
5.32		a) Commission complete low voltage reticulation installation	Sum	1			
5.33		b) Test and certify electrical installation according to SANS 10142	Sum	1			
		GUARANTEE ON INSTALLATION					
5.34		Allow for a 12 month guarantee on the complete low area lighting system. The 12 month period to commence from practical completion.	Sum	1			
Total Carried Forward To Summary							

BILL 6: SPORTSFIELD LIGHTING INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
		BILL 6: SPORTSFIELD LIGHTING INSTALLATION					
		LOW VOLTAGE CABLES					
		600/1000V PVC/PVC/SWA/PVC copper cables laid in cable trenches and drawn into cable sleeves					
6.1		a) 25 mm² x 4 Core	m	332			
6.2		b) 4 mm² x 7 Core	m	240			
6.3		c) 2,5 mm² x 3 Core neoprene HO7 cable	m	84			
		EARTH WIRES					
		Stranded bare copper eart wires laid with cables in cable trenches and drawn into cable sleeves					
6.4		BCEW: 16 mm² Laid with 25 mm² cables	m	332			
		TERMINATION OF LOW VOLTAGE CABLES					
		Complete as specified including lugs, glands, shrouds, cable boots and other accessories					
6.5		a) 25 mm² x 4 Core	No	8			
6.6		b) 4 mm² x 7 Core	No	24			
6.7		c) 2,5 mm² x 3 Core neoprene HO7 cable	No	56			
		GALVANISED MASTS WITH FOUNDATIONS, LIGHT BRACKETS AND EXCAVATIONS					
6.8		a) Supply, delivery to site, erection, installation and commissioning of a complete 18 m mounting height, Hot dipped Galvanised to SABS 763, floodlight mast with crossarms suitable to mount 7 x Beka Omniblast-2E-Midi, LED, 824W Luminaires, complete with cage ladder, access door, base plate, foundation bolts and templates as specified including cranage. As manufactured by Sectional poles	No	4			
Total Carried Forward							

BILL 6: SPORTSFIELD LIGHTING INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
6.9		b) Concrete foundations complete with Structural Design by Supplier to Engineer's specifications, complete including all excavations, cable sleeves and earthing.	No	4			
6.10		c) Supply, install, connect, test and commissioning of complete weather proof mast DB's (**Mast 1 DB, Mast 2 DB, Mast 3 DB, Mast 4 DB**) moulded from polyethylene material of the buried root type and UV protected, and as indicated on the drawings, complete with all internal equipment, switchgear, floodlight control gear and wiring as shown on the schematic wiring diagrams. Including all doors, labels, legend cards, busbars and wiring connections. (Supply of cable connections are excluded)	No	4			
6.11		d) Contractor must allow for a crane for erection of masts	No	4			
		LED SPORTFIELD FLOOD LIGHT LUMINAIRES					
6.12		a) Type P1 - Beka Omniblast-2E-Midi, LED, 910W including DALI Drivers	No	28			
6.13		b) Type P2 - Beka Omniblast-2E-Maxi, LED, 1408W including DALI Drivers	No	16			
6.14		c) Aiming of lights tio achieve average horisontal illumination for practive level of 200lux	No	28			
6.15		d) PC amount for the supply,delivery to site and installation of DALI control system consisting of 4 x ITERRA NODE weatherproof outdoor units, 1 x Repeater unit, complete including technician set-up and commissioning costs.	Sum	1	50000.00	50000	00
6.16		e) Profit & Attendance on the above item 6.15	Sum	1			
		EXCAVATIONS Excavations as specified including backfilling and compaction. Cable Trenches shall be measured as max 500 mm wide x 750 mm deep unless otherwise specified.					
Total Carried Forward							

BILL 6: SPORTSFIELD LIGHTING INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
6.17		a) Earth	m³	33			
6.18		b) Soft Rock	m³	7			
6.19		c) Hard Rock	m³	26			
6.20		d) Tarred or paved road surface including repair to match existing.	m³	1			
6.21		e) Imported bedding	m³	26			
6.22		f) Cart away and legally dispose of excess excavation material, level and make neat trenched areas	m³	1			
6.23		g) Danger Tape	m	250			
		CABLE SLEEVES Double wall corrugated complete with all couplings, fittings, bends, galvanised draw wire and accessories installed in cable trenches					
6.24		160 mm Ø HDPe	m	50			
		TEST & COMMISSION ELECTRICAL INSTALLATION					
6.25		a) Commission complete low voltage reticulation installation	Sum	1			
6.26		b) Test and certify electrical installation according to SANS 10142	Sum	1			
		GUARANTEE ON INSTALLATION					
6.27		Allow for a 12 month guarantee on the complete low voltage sportsfield lighting system. The 12 month period to commence from practical completion.	Sum	1			
Total Carried Forward To Summary							

BILL 7: ICT SERVICES' SLEEVES AND MANHOLES

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
		BILL 7: ICT SERVICES' SLEEVES AND MANHOLES					
		EXCAVATIONS Excavations as specified including backfilling and compaction. Cable Trenches shall be measured as max 500 mm wide x 750 mm deep unless otherwise specified.					
7.1		a) Earth	m³	126			
7.2		b) Soft Rock	m³	25			
7.3		c) Hard Rock	m³	101			
7.4		d) Tarred or paved road surface including repair to match existing.	m³	1			
7.5		e) Imported bedding	m³	126			
7.6		f) Cart away and legally dispose of excess excavation material, level and make neat trenched areas	m³	1			
		CABLE SLEEVES Double wall corrugated complete with all couplings, fittings, bends, galvanised draw wire and accessories installed in cable trenches					
7.7		a) 160 mm Ø HDPe	m	1			
7.8		b) 110 mm Ø HDPe	m	3550			
7.9		c) 75 mm Ø HDPe	m	1			
		MANHOLES Polyethylene modular stackable cable access chamber complete with tamper proof galvanised steel lid with frame embedded in concrete and key wrench. System symilar to Duraline Stackbox: 600 x 600 x 600 mm deep.					
7.10		a) 600 x 600 x 600 mm Deep, 3 x 3 way with galvanised frame and lid	No	45			
7.11		b) Excavation of manhole	No	45			
7.12		c) Dry cement and stone mix (ratio 1:10), 100 mm thick base	No	45			
Total Carried Forward							

Tender No DRPW 015/2023-EP

KIMBERLEY NURSING COLLEGE PHASE 2A - ACADEMIC CAMPUS: ELECTRICAL INFRASTRUCTURE SERVICES
Schedule of Quantities

BILL 7: ICT SERVICES' SLEEVES AND MANHOLES

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
Brought Forward							
7.13		d) Backfill around stackbox with soil crete (10% dry cement) and compact in 150 mm layers	No	45			
7.14		e) Concrete apron at least 100 mm thick around the metal frame	No	45			
		GUARANTEE ON INSTALLATION					
7.15		Allow for a 12 month guarantee on the complete ICT sleeve and manhole system. The 12 month period to commence from practical completion.	Sum	1			
Total Carried Forward To Summary							

Tender No DRPW 015/2023-EP

KIMBERLEY NURSING COLLEGE PHASE 2A - ACADEMIC CAMPUS: ELECTRICAL INFRASTRUCTURE SERVICES
Schedule of Quantities

BILL 8 : CONTINGENCIES

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	
						R	c
		BILL 8: CONTINGENCIES					
8.1		Provide an amount that can be used in total or partially to cover for unforseen or additional work as instructed in writing by the Engineer. This amount will be duducted from the contract amount should it not be required. Amount = 0,10 (Sum of Bill 1 to 7) = 0,10 x R..... Amount = R.....	%	10			
Total Carried Forward To Summary							

DEPARTMENT OF ROADS AND PUBLIC WORKS

TENDER NO: DRPW 015/2023

KIMBERLEY: NURSING COLLEGE - PHASE 2A: ACADEMIC CAMPUS

SCHEDULE OF QUANTITY SUMMARY

BILL NO	DESCRIPTION	AMOUNT
1	PRELIMINARIES AND GENERAL	R -
2	MEDIUM VOLTAGE RETICULATION	R -
3	LOW VOLTAGE RETICULATION	R -
4	STANDBY DIESEL GENERATOR INSTALLATION	R -
5	AREA LIGHTING INSTALLATION	R -
6	SPORTSFIELD LIGHTING INSTALLATION	R -
7	ICT SERVICES' SLEEVES AND MANHOLES	R -
8	CONTINGENCIES	R -
	Nett Tender Total **Excluding** VAT	R -
	ADD : VAT @ 15% on Nett Tender Total	R -
	TOTAL CARRIED TO TENDER FORM, **INCLUDING VAT @ 15%**	R -