The University of South Africa invites suitably qualified service providers to participate in a

Public Tender Process to provide the University with

Engineering Procurement and Construction (EPC)/Turn-Key Services for the Integrated Smart Building Management System (ISBMS) at Pietermaritzburg Campus which is situated at no.1 Langalibalele Street, Pietermaritzburg, 3201

Tender Specification Document

Tender Ref. No:	PT2023/36	Date of Issue:	17 December 2023

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1. BACKGROUND

The University of South Africa (UNISA) is a public higher education institution governed in terms of the Higher Education Act, 101 of 1997, as amended. UNISA as the largest open distance learning (ODL) institution in Africa with an indelible ODeL footprint across the continent, guided by student-centredness as one of its guiding principles has taking a bold decision to plan a Smart Campus, including Integrated Smart Building Management System.

The Facilities Management Department, as the custodian of UNISA facilities, strives to provide the physical and educational environment that is easily accessible to enable learning to take place. The Department has a goal to effectively manage, maintain and expand the infrastructure of UNISA within the country's relevant framework, policies, directives, and legislation. The Department is responsible for the management of the UNISA infrastructure development, refurbishments, and maintenance. This includes engaging the University community and external specialists to ensure that projects are executed in line with the planned budget timelines by applying project management principles and contract management to achieve this objective.

Given its huge mandate as defined above, Facilities Management (University Estates) is expected to roll out various construction, OHS compliance, and renovation/refurbishment projects across UNISA campuses and Regional centres.

Consistent with UNISA's 2030 strategy, UNISA's Campus Master Plan has identified a need to expand the current on-site and off-site accommodation to provide modern multi-use accommodation options. The aim is to create access to a safe and secure environment by providing modern, flexible, multi-use facilities, at a reasonable market related cost. In addition, to create on and off-site space that services a wide range of stakeholders, including staff, students, and external users.

The Integrated Smart Building Management Systems project through the installation a ISBMS systems comprising hardware such as servers, controllers, sensors, actuators, display and monitors etc; software and network protocols seeks to automate infrastructure, monitor systems, control systems, manage consumption and obtain reports.

UNISA council and Management initiated the process of developing a Smart Campus. The Smart Campus programme identified key focus areas and one of the areas is the Basic Services Management Capabilities which the Integrated Smart Building Management Systems project responds to.

The Integrated Smart Building Management System project will further respond to Strategic Focus Area 2 for UNISA to be agile and embed an innovative, collaborative, efficient and sustainable institution. With KPA 2.4 Achieve Brand Reputational range every time the survey is conducted that reflects UNISA as a high value and desirable HE brand by potential students, enrolled students, alumni, and employers. Additionally with KPA 2.6 which notes that all UNISA's campuses should demonstrate comprehensive Smart Campus implementation as measured against variables such as: Being intuitive and simple to use; demonstrating design thinking; is student-centric; is modular, adaptive, flexible and intelligent and is adaptable and scalable.

Facilities Management (Maintenance) has been implementing Building Management Systems, however the current roll out is only focused on HVAC, Generator Sets, UPS's, Water and Energy consumption monitoring therefore, the system's full potential has not been realized and additionally accurate information on CO2 emissions for reporting to the Sustainability office is a challenge. This poses a risk of non-compliance by UNISA with the Carbon Tax Act No. 15 of 2019 which was postponed to an effective date of 31 December 2025.

The ISBMS is additionally part of the Smart Campus initiated by Council and Management where one of the pillars is energy efficiency though the Equipment Management Solution. This is further fulfilling the Sustainability Policy which commits UNISA to energy saving.

Further, Facilities Management (Maintenance) in its endeavours to improve maintenance by reducing response time in operations, enhancing maintenance by improving on proactive maintenance which will ensure comfort in buildings and increase productivity and efficiency saw the need to add to the current systems and add new systems which will control and monitor more equipment, the project will provide great assistance.

A feasibility study was undertaken by UNISA in 2023, and the outcome has confirmed that it is feasible to install ISBMS to meet the university's functional and strategic requirements. The University therefore seeks to upgrade and install new ISBMS system throughout Unisa owned buildings.

UNISA calls for a suitably qualified EPC/Turnkey Services for the Design, Supply, Installation, Programming, Commissioning and Maintenance of the Integrated Smart Building Management Systems. The prospective contractor must be strategically and efficiently capacitated with experienced experts in their respective professions. Only a service provider, entity or consortium that can provide all the required multidisciplinary skills and capacity, to constitute such a team may submit tenders.

The contractor should have in their organisation or consortium skilled design, construction, project management and related professionals and contractors in the built environment who can be mobilised immediately after appointment to meet the specific project lifecycle phases.

2. PROPRIETARY AND CONFIDENTIAL INFORMATION

All material submitted in response to this tender shall become the property of UNISA. Any confidential information provided by a service provider in response to this Tender will be held in confidence and will only be used for the evaluation of this tender.

3. DEALING WITH THE UNIVERSITY OF SOUTH AFRICA

Service providers must not contact any member of UNISA and / or consultants with respect to queries they may have with this tender. A **compulsory information session** will be held during which it is expected that any queries raised, will be answered.

The service provider shall not disclose any such information or specification, whether explicit or implied, to any third party without the written consent from UNISA.

It is a requirement of this tender for prospective contactors to sub-contract not more than 30% of the works to QSE/EME contractors where possible as part of UNISA's supplier development initiatives.

4. COMPULSORY REGISTRATION AND ADMITTANCE TO THE TENDER INFORMATION SESSION

- Prospective tenderers must read the tender specification and bring a copy to the information session

Registration Date: **18 January 2024**

Registration Time: 10:00 to 10:30 (Latecomers will not be admitted)

Venue: **Virtual Session** (link will be published on the Unisa website the day before the session).

The above-mentioned time frames must be strictly adhered to; latecomers will not be registered and admitted to the information session. The information session will commence immediately after registration.

5. TENDER SUBMISSION AND CLOSING DATE

The original and a soft copy of the tender must be submitted into the official tender box in a sealed envelope located Kgorong Entrance, Muckleneuk Campus, Preller Street, Muckleneuk Ridge. Please quote the tender reference number **PT2023/36** on the sealed envelope.

Closing date: 09 February 2024 @ 12:00

Tenders submitted late will not be accepted or considered.

Points will be awarded for Broad-Based Black Economic Empowerment.

The decision of the UNISA Management Committee on awarding a tender is final.

UNISA reserves the right to appoint, contract with and monitor the performance of any service provider it deems will offer the best service in line with its requirements, although it may not necessarily be the lowest Tenderer. UNISA also reserves the right, in its sole discretion, not to award a tender, to re-advertise a tender or not to award the tender to a service provider who has more than two existing contracts with Unisa.

The tender awarded will be conditional and subject to successful negotiations and signing of a written contract, failing which Unisa reserves the right to withdraw the tender and to award the tender to another Tenderer without repeating the process.

6. MANDATORY REQUIREMENTS

Mandatory requirements will include the following and must be labelled and submitted in the following order. **Failure to comply and submit any one of the documents will disqualify the submission:**

Annexure A1: Attendance of compulsory information session (attach copy of the payment receipt).
Annexure A2: Completed and signed Supplier List Application Form (F25) including bank account details from the bank. (www.unisa.ac.za/tenders)
Annexure A3: Resolution to sign on behalf of the tendering unit (www.unisa.ac.za/tenders). Own company resolution will also be accepted.
Annexure A4: Copy of valid SARS clearance certificate to be submitted. SARS pin will also be accepted.

Annexure A5: Copy of company registration documents listing all active directors / members of the company. CIPC company registration document CoR14.3 / Disclosure Certificate. Copies of share certificates must be included (excluding close corporations).

Annexure A6: **Minimum of three recent** (not older than 7 years) **contactable references demonstrating completed similar work (Turnkey Services or Consortium) and of a value over R2 million** from customers to which the tenderer has provided or is providing goods/services that are substantially similar (size, nature & quantity) to the goods/service required.

Annexure A7: Financial Statements

a. One set (2 years comparative figures) of the most recent audited Annual Financial Statements together with a signed Independent Auditor's Report or a signed letter from the Accounting Officer for Close Corporations must be submitted unless the reporting entity is exempted in terms of the new South African Companies Act from obtaining an Independent Auditor's Report. The exempted entity must then submit a signed Independent Reviewer's report or signed compilation engagement (ISRS 4410) report from any recognised accounting professional body. **The annual financial statement submitted must be within six months of their financial year-end to qualify for evaluation.**

A complete set of Annual Financial Statements including the following:

- *Independent Auditor's Report (Letter from an External Accountant/Accounting Officer for Close Corporations)*
- *Statement of Comprehensive Income (Income Statement)*
- *Statement of Financial Position (Balance Sheet)*
- *Statement of Cashflows*
- *Statement of Changes in Equity*
- *Notes to the Financial Statements*

No draft summarized or extracts of financial statements will be accepted.

b. Where the financial statements of the holding company are submitted, a signed letter be included from the holding company, on their letterhead signed by the CEO/CFO, that they would be liable if the subsidiary defaulted. This must be attached to the financials being submitted. Failure to submit such signed letter will disqualify the tender submission.

c. The financial statements should be submitted as a separate bound document.

Annexure A8: Unisa General Terms and Conditions to be completed and signed (www.unisa.ac.za/tenders)

Annexure A9: Completed NEC 3 ECC Document **including Pricing Schedule by:**

Bidding Entity

Annexure A10: Valid Letter of good standing with Department of Labour for compensation for occupational injuries and diseases. or from FEM (The Federated Employers Mutual Assurance Company Workmen's Compensation Insurance for The Construction Industry)

Bidding Entity

Technical Mandatory Requirements

Annexure A11: Contractors must have a CIDB grading of 5 EP or higher (proof to be submitted)

Contractor

Annexure A12: Proof of Professional Indemnity Insurance for the Professional Team to the value of R5 million. Such can be provided as one insurance for the consortium, fully specifying covered professional services as per list on the table below:

Or

Individual company Professional Indemnity Insurance can be provided, provided all professional services listed on the table below are covered and the combined insurance value is a minimum of R5 million.

All Below Services must be covered by the Professional Indemnity Insurance (Individually or Combined Consortium Cover)
Electronic Engineering Services
Electrical Engineering Services
Mechanical Engineering Services
Occupational Health and Safety Services

Annexure A13: Proof of the Performance Bond as stated in the NEC 3 ECC (Contractor)

Contractor

Annexure A14: Proof of professional registration with the relevant professional council for all members of the professional team.

Professional Team Member	**Registration Body (As a Professional)**
Electronic Engineering Services	ECSA
Electrical Engineering Services	ECSA
Mechanical Engineering Services	ECSA
Occupational Health and Safety Services	SACPMP

7. OTHER REQUIREMENTS

Annexure B1: A valid B-BBEE certificate from a SANAS accredited verification agency. An affidavit certifying their total annual income and level of black ownership will be sufficient for EMEs and QSEs. Failure to submit the above will result in a zero score for B-BBEE.
Annexure B2: Project specific Safety Health Environment and Quality (SHEQ) Management Plan.
Annexure B3: Baseline risk assessment
Annexure B4: Project specific level 2 program

Note: All documents submitted in support of this tender must be the documents of the tendering unit and may not pertain to different companies or units within a group. As an example, a tenderer cannot submit its own B-BBEE certificate, but the SARS certificate of its holding company

8. ENVIRONMENTAL IMPACT

Set out the detail of the environmental impact of the activities relating to the agreement/contract and the waste generated as a result thereof. Attach a detailed implementation plan by the contractor and/or the person(s) responsible for implementing the agreement/contract, indicating how the environmental impact and the waste generated will be minimized, mitigated and managed. Tenderers are required to include all the aspects that may affect the execution of the works in their planning. As discussed above, the tenderer should therefore as part of this tender include an Environmental Management Plan (EMP) that should as a minimum address:

- Ensuring compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international.
- Ensuring that there is sufficient allocation of resources on the project budget so that the scale of EMP-related activities is consistent with the significance of project impacts.
- Verifying environmental performance through information on impacts as they occur.
- Responding to changes in project implementation not considered in the EMP.
- Responding to unforeseen events.
- Providing feedback for continual improvement in environmental performance.

9. PRICING

- ❖ All pricing must be quoted in South African Rand (ZAR) including VAT.
- ❖ The pricing **must remain valid for 120 days** from the closing date of the tender.
- ❖ In instances where the contract period exceeds a year it is accepted that the prices will remain fixed for the first year.
- ❖ Pricing / costing template **must be completed** (Included in NEC 3 ECC Document, Annexure A11)
- ❖ Any pricing not included in the pricing template will not be considered.
- ❖ Foreign exchange rate used to be indicated (if applicable).

Prices charged by the supplier for goods delivered and services performed under the contract shall not vary from the prices quoted by the supplier in his tender, and any variance will render the contract null and void.

10. PAYMENT TERMS

The payment terms of the University are 30 days after receipt of goods and services and upon receipt of the required documentation. **No upfront payments will be considered.**

11. SUB-CONTRACTING

12.1 The tenderer and/or the contract, or any portion thereof, or any share or interest therein, may not be

transferred, assigned or granted to any other company without the specific written permission and conditions of the University.

12.2 The University may consider accepting sub-contracting if an agreement is entered into only with the primary supplier, and the agreement, or any portion thereof, or any share or interest therein, may not be transferred, assigned or granted to someone else subject to the following principles:

a) Sub-contracting is allowed, provided that the tenderer has declared upfront at the time of submitting the tender documents that a portion of the contract will be sub-contracted; this is limited to 30% of the work. **Annexure A15** must be completed. However, the University reserves the right to allow or not allow sub-contracting.
b) The primary supplier takes full responsibility and accountability for the portion of the work sub-contracted.
c) The name of the sub-contractor must be declared upfront to ascertain whether the sub-contractor is not blacklisted or has not defaulted.

12.3 The University encourages sub-contracting aimed at empowering exempted micro enterprises (EMEs) and qualifying small enterprises (QSEs), as defined in the B-BBEE Codes. In the event that sub-contracting is to any other than EMEs and/or QSEs which is 51% or more black owned, the sub-contracted supplier must have a B-BBEE status level equal to or higher than the appointed supplier.

12. JOINT ARRANGEMENTS

The University of South Africa will accept joint arrangement proposals on condition that the following is adhered to:

a) In case of a joint venture

- All mandatory requirements and non-mandatory documents must be in the name of the joint venture entity *(separate entity established for this purpose)*

b) In case of a joint agreement

- joint operation partners must each submit their own relevant mandatory requirements
- the joint operation agreement must be signed by all participating parties and must be submitted as part of this tender submission

13. EVALUATION CRITERIA

13.1 Pre-qualification:

Only tenderers that meet all the mandatory requirements including the financial evaluation will proceed to Stage 1 of the technical evaluation.

13.2 Evaluation of tenders:

Tenderers will be evaluated based on technical, financial offer, and preference. The evaluation of tenders will commence with the evaluation of quality/functionality/technical, and only those who achieve the **minimum qualifying score for functionality of 75 points** will be further evaluated for financial offer and preference in terms of the preference points system.

The successful tender will be determined using a weighted score between the points earned on each of the elements of the process described above. The tender evaluation weighted scoring will be as follows:

Stage 1: Technical evaluation:

	DESCRIPTION	POINTS
1	Company experience	40
2	Credentials, Qualifications, Experience of Staff	25
3	Project Compliance	15
4	Approach and Methodology	20
Total		**100**

Above scores will be converted to a percentage. Service providers who score 75% or more will be evaluated in Stage 2 of the evaluation.

Form A1.1 - Evaluation Schedule: Tender's Experience (40 points)

The experience of the tenderer or joint venture partners in the case of an unincorporated joint venture or consortium as opposed to the key staff members / experts **in similar projects or similar areas and conditions in relation to the scope of work over the past seven years will be evaluated**

Tenderers should describe their experience in this regard and attach these to this schedule. Reference will be necessary to any other returnable schedules submitted with this tender as is appropriate.

MAIN FUNCTIONALITY CRITERIA:	SUB CRITERIA	WEIGHTING FACTOR:
COMPANY EXPERIENCE Demonstrated experience of tendering entity with respect to relevant projects. Bidder must provide reference letters on client's letterhead not older than 7 years, confirming a successful completion of: **TURNKEY /CONSORTIUM SERVICES FOR COMPLETED PROJECTS WHICH ARE OF A SIMILAR SIZE (R2 MILLION OR MORE) AND NATURE AS PER THE SCOPE OF WORK, WORK WITH MUST HAVE BEEN COMPLETED IN THE PAST SEVEN YEARS** **Note: appointment letters /contract must accompany corresponding reference letters** (on client's letterhead) not older than 7 years on similar projects. The following must be vividly captured: ***a. Employer, contact person and telephone number*** ***b. Description of work (service)*** ***c. Value of work (i.e., the service provided) inclusive of VAT)*** ***d. Date completed*** Failure to submit appointment letter/contract with corresponding reference letters on client/s letter head the service provider will forfeit points\	**Note: The reference letter will be evaluated only if the corresponding appointment letter/contract is attached** **The appointment letter and contract alone hold no points.** 1.1) Five appointment letters /contract and corresponding reference letters (on client's letterhead) not older than 7 years on similar projects = **40 points** 1.2) Four appointment letters /contract and corresponding reference letters (on client's letterhead) not older than 7 years on similar projects = **35 points** 1.3) Three appointment letters /contract and corresponding reference letters (on client's letterhead) not older than 7 years on similar projects = **30 points** **Zero points will be awarded for less than 3 relevant reference letters with the corresponding appointment letter/contract.**	**40**

Form A1.2 - Evaluation Schedule: Contractor's Resources – Personnel (25 points)

The Consultant should propose the structure and composition of the team indicating i.e., the main disciplines involved, the key staff member / expert responsible for each discipline, and the proposed technical and support staff and site staff, together with names of second choice alternate personnel. Please note that the resources are not limited to the resources listed in the table(s) below. The Contractor should make provision in his pricing for all resources necessary (Including other professionals not listed in the table below) as inherent in turnkey/EPC type services.

The roles and responsibilities of each key staff member / expert should be set out as job descriptions. In the case of an association / joint venture / consortium, it should, indicate how the duties and responsibilities are to be shared. In addition, they shall provide a summary of the key staff member's qualification (certificates, diplomas or degrees as well as professional registration certificates), experience previous and current occupation. Please include full detailed CVs of the key staff members that will be fully dedicated to this project.

The Consultant must attach his / her organization and staffing proposals to this page. Reference will be necessary to any other returnable schedules submitted with this tender.

[1.2 A] PLEASE ATTACH CV`S FOR ALL KEY STAFF AND CERTIFIED QUALIFICATIONS

***NOTE**: Failure to submit CV`s, copy of certified qualification service provider will forfeit points*

KEY STAFF	QUALIFICATION AND KEY STAFF EXPERIENCE (25) Qualifications (10); Experience (15)
1. Contracts Manager	**QUALIFICATION** Diploma or bachelor's degree or higher in Architecture, Engineering, Building Science or Built Environment degree – **1 points.** Registration with SACPCMP (PrCM). = 1 **points** **EXPERIENCE** 10 years or more experience in the project and/or construction management = **3 points** 6 to 9 years' experience in the project and/or construction management = **2 points** 1 to 5 years' experience in the project and/or construction management = **1 point** No experience = **0 points**

KEY STAFF	QUALIFICATION AND KEY STAFF EXPERIENCE (25) Qualifications (10); Experience (15)
2. Occupational Health and Safety Consultant	**QUALIFICATION** Diploma or bachelor's degree or higher or recognized qualification and expertise in Health and Safety Management in construction environment plus = **1 point** Registration with SACPCMP (PrCHSA) = **1 point** **EXPERIENCE** 10 years or more experience in the implementation and management of health and safety oversight on major construction works = **3 points** 6 to 9 years' experience in the implementation and management of health and safety oversight on major construction works = **2 points** 1 to 5 years' experience in the implementation and management of health and safety oversight on major construction works = **1 point** no experience = **0 points**
3. Mechanical Engineer	**QUALIFICATION** Diploma or bachelor's degree or higher in Mechanical Engineering with = **1 point** Professional registration with ECSA (Pr Eng and/or Pr Tech). = **1 point** **EXPERIENCE** 10 years or more experience in the provision of mechanical engineering = **3 points** 3 to 4 years' experience in the provision of mechanical engineering = **2 points** 1 to 2years' experience in the provision of mechanical engineering = **1 point** No experience = **0 points**

KEY STAFF	QUALIFICATION AND KEY STAFF EXPERIENCE (25) Qualifications (10); Experience (15)
4. Electrical Engineer	**QUAIFICATION** Diploma or bachelor's degree or higher in Electrical Engineering with = **1 point** Professional registration with ECSA (Pr Eng and/or Pr Tech). = **1 point** **EXPERIENCE** 10 years or more experience in the provision of electrical engineering = **3 points** 3 to 4 years' experience in the provision of electrical engineering = **2 points** 1 to 2years' experience in the provision of electrical engineering = **1 point** No experience = **0 points**
5. Electronic Engineer	**QUALIFICATION** Diploma or bachelor's degree or higher in Electrical or Electronic Engineering = **1 point** Professional registration with ECSA (Pr Eng and/or Pr Tech). = **1 point** **EXPERIENCE** 10 years or more experience in the provision of electronic engineering = **3 points** 3 to 4 years' experience in the provision of electronic engineering = **2 points** 1 to 2years' experience in the provision of electronic engineering = **1 point** No experience = **0 points**

[1.2 B] PLEASE PROVIDE SUPPORTING DOCUMENTATION

***NOTE**: Failure to complete table, the service provider will forfeit points*

PROJECT COMPLIANCE (15 Points)	
1. Demonstrate compliance with required system, system must meet all items on the check sheet below (15 points) ✓ Complies with check sheet requirements (All items ticked) = **15 points** ✓ Non-compliance or Non completion of check sheet or Not all items ticked= **0 points**	
DESCRIPTION (The system offered must provide for ALL ITEMS listed herein)	**EQUIPMENT OFFERED (By ticking the box below, service provider ascertains that system offered caters for these items**
2x PC User Workstation (or attach specifications)	☐
2x PC Monitor (or attach specifications)	☐
2x PC Server Software	☐
1x TV Screen (Per campus/site)	☐
Application/Automation Data Server	☐
Application User Interface - Hardware	☐
Application User Interface - Software	☐
Main Network Controller	☐
Field Controllers (Input/Output Modules)	☐
Supported ISBMS Open Communication Protocols	☐
3rd Party Applications Supported	☐
Field Devices Open Communication Protocols Supported	☐
The system must provide for the monitoring, control, and reporting ALL Equipment: Provision must be made for points where equipment is not installed yet ((The system offered must provide for all items listed herein)	**EQUIPMENT OFFERED (By ticking the box below, service provider ascertains that system offered caters for these items**
Lift	☐
Water metres	☐

Energy metres	
Solar Plant	
Data Centre/ Servers/Switches	
UPS	
Circuit Breakers	
HVAC	
Main Substation	
Gas suppression (Fire)	
Fire Alarm System	
Fire/ Smoke Detection System	
Fire Pumps	
Fire Dampers, including hydrants, booster, hose reels)	
Chillers	
Cold-rooms and Freezers	
Ground water pumps	
Sewerage pump	
Water Harvesting Plant	
Geysers and Heat Pumps	
Generators	
Water supply and reservoirs	
CO2 Emissions	
CCTV's	
Windows and Doors	
Access Control	

Irrigation	
PA Systems	
Solar Plant	
LPG Gas	
Diesel Tank	
Lights, including Emergency Lights, High Mast Lights	

Form A1.3 Evaluation Schedule: Approach and Methodology (20 points)

Provide an approach and methodology paper for the proposed required solution, that outlines the team's approach and understanding of the following in relation to the project:

The proposal should not be more than 10 pages and the evaluation scoring will be as follows:

- Outline the bidder's detailed methodology and approach including but not limited to the design approach and installation management *(2 points)*, demonstration of project life cycle model *(2 points)*, system offered and integration management *(3 points)* = **07 Points**.
- Project schedule, including demonstration of equipment lead times and keeping to project timelines (4 months implementation) = **02 Points**
- Outline the bidder's project specific governance framework that should as a minimum indicate communication and stakeholder management plan *(1 point)*, RACI matrix *(1 point)*, decision matrix (including stage gate review processes and key deliverables) *(1 point)*, change control processes and procedures *(1 point)*, risk and issue management processes *(1 point)* = **05 Points**;
- Please indicate your firm's value proposition to UNISA and indicate what sets you apart – collateral, tools and accelerators that can be leveraged by UNISA to fast track the execution of the project = **02 Points**
- Project specific Quality Management Plan (QMP) that indicate control practices and procedures which will ensure compliance with stated minimum requirements of the Employer *(1 points)*; plus, Quality Control Certifications (ISO 9001 certification) *(1 Points)* = **02 Points**
- Project specific Occupational Health and Safety management plan that indicate control practices and procedures which ensure compliance with Employer safety policies, regulations and legislation *(1 points);* plus, Safety management certification (ISO 18001 certification) *(1 points)* = **02 Points**

Above scores will be converted to a percentage. Service providers who score 7**5%** or more will be evaluated in Stage 2 of the evaluation.

Stage 2: Price and B-BBEE Evaluation

CRITERIA			POINTS
Price and B-BBEE Evaluation $Ps = 75\left(1 - \frac{Pt - P\min}{P\min}\right)$ Where: Ps = Points scored for price of tender under consideration Pt = Rand value of tender under consideration Pmin = Rand value of lowest acceptable tender			**75**
B-BBEE B-BBEE score to be taken from valid B-BBEE certificate provided			**25**
A	**B-BBEE LEVEL**	**Points Allocation (10)**	10
	Level 1	10	
	Level 2	9	
	Level 3	8	
	Level 4	5	
	Level 5	4	
	Level 6	3	
	Level 7	2	
B	**Black Ownership**	**Points range**	8
	51% to 70%	6	
	71% to 99%	7	
	100%	8	
C	**Female Black Ownership**	**Points range**	3
	30% to 50%	2	
	51% to 100%	3	
D	**Youth Owned**	**Points range**	2
	25.1% to 50%	1	
	51% to 100%	2	
E	**People Living with Disabilities**	**Points range**	2
	25.1% to 50%	1	
	51% to 100%	2	
	TOTAL:		**100**

14. OPTIONAL PRE-SCREENING OF MANDATORY SUPPORTING DOCUMENTATION

A non-compulsory pre-screening opportunity will be available to assist service providers to ensure that their documentation meets the commercial mandatory requirements prior to the closing date of the tender responses. The **pricing requirement does not form part of this opportunity** and must only be submitted on the closing date.

The Supply Chain Management Directorate will be available on:

Date: 29 January 2024
Time: 10:00 – 12:00
Venue: OR Tambo Administration building, Level 5, Room 5-18, Preller Street, Muckleneuk Campus, Muckleneuk Ridge, Pretoria.

15. TENDER SPECIFICATION

15.1 Request for Services

The University of South Africa (UNISA) is inviting responses to this tender with reference number PT2023/36, in order to appoint a suitably qualified and experienced service provider for **Design, Supply, Install, Programming, Commissioning and Maintenance of Building Management System** to carry out the Integrated Smart Building Management System (ISBMS) of the Pietermaritzburg Campus situated at no.1 Langalibalele Street, Pietermaritzburg, 3201 as specified in the tender specification. UNISA intends to develop an integrated system enabling the management, control and partial automation of several building systems and functions. The appointment of a successful service provider is subject to the conclusion of a service level agreement (SLA) between UNISA and the service provider.

15.2 Scope of work

In Integrated Smart Building Management System (ISBMS) buildings conserve energy and create a responsive, comfortable, and productive indoor environment for users and occupants. As a crucial component of smart buildings, ISBMS should provide a wide range of functions and bring about the intended benefits upon successful deployment. This paper identifies salient ISBMS attributes and explores key factors influencing building professionals' intention to use the system in commercial buildings

An Integrated Smart Building Management System (ISBMS) should:

- Provide intelligent & optimal start/stop of building systems
- Monitor and control building facilities
- Provide optimal equipment time scheduling
- Enable alarm settings and automatic notifications
- Support maintenance processes
- Enable disaster management and automatic recovery
- Ensure building safety
- Have an intelligent and interactive interface
- Adopt open communication protocols
- Be expandable for Internet of Things (IoTs)
- Enable trending and data analysis
- Enable building users to make adjustments
- Recording building functions and performance (data collection, trend analysis)
- Monitoring and controlling building's equipment
- Managing loads and enhancing efficiency (Reduce the energy needed to illuminate, heat, cool and ventilate a building)
- Optimally controlling energy management (operational scheduling)
- Measuring, predicting and defining energy optimisation actions
- Provides alerting, diagnosing, trending and management reports

The scope of work for the ISBMS shall include:

- Headend equipment and software
- Field devices
- GUI and report development

The system must provide for the following; where an equipment requires an upgrade, the service provider must provide a ISBMS point, where the university plans new equipment such as PV systems/Solar, the service provider must provide a point. The offered price will be deemed to include all required points per schedule below.

Control	**Monitoring- Through Monitors/SMS/App**	**Reporting (Daily, Monthly and Quarterly)**
Lift	Lift	Lift
Water metres	Water metres	Water metres
Energy metres	Energy metres	Energy metres
Solar Plant	Solar Plant	Solar Plant
Data Centre/ Servers/Switches	Data Centre/ Servers/Switches	Data Centre/ Servers/Switches
UPS	UPS	UPS
TBC	Circuit Breakers	Circuit Breakers
HVAC	HVAC	HVAC
TBC	Main Substation	Main Substation
-	Gas suppression (Fire)	Gas suppression (Fire)
-	Fire Alarm System	Fire Alarm System
-	Fire/Smoke Detection System	Fire/ Smoke Detection System
-	Fire Pumps	Fire Pumps
-	Fire Dampers, including hydrants, booster, hose reels)	Fire Dampers, including hydrants, booster, hose reels)
Chillers	Chillers	Chillers
Cold-rooms and Freezers	Cold-rooms and Freezers	Cold-rooms and Freezers
Ground water pumps	Ground water pumps	Ground water pumps
Sewerage pump	Sewerage pump	Sewerage pump
Water Harvesting Plant	Water Harvesting Plant	Water Harvesting Plant
Geysers and Heat Pumps	Geysers and Heat Pumps	Geysers and Heat Pumps
Generators	Generators	Generators
Water supply and reservoirs	Water supply and reservoirs	Water supply and reservoirs
TBC	CO2 Emissions	CO2 Emissions
TBC	CCTV’s	CCTV’s

Windows and Doors	Windows and Doors	Windows and Doors
Access Control	Access Control	Access Control
Irrigation	Irrigation	Irrigation
PA Systems	PA Systems	PA Systems
Solar Plant	Solar Plant	Solar Plant
LPG Gas	LPG Gas	LPG Gas
Diesel Tank	Diesel Tank	Diesel Tank
Lights, including Emergency Lights, High Mast Lights	Lights, including Emergency Lights, High Mast Lights	Lights, including Emergency Lights, High Mast Lights

Note: The tenderer is to conduct their own due diligence research to ensure that all the requirements are met.

The proposal by tenderers should demonstrate that consideration to exploit should exploit the EPC strategy benefits, predominantly the scheduling/sequencing of the work in order to meet the timelines and all the standards required.

The successful bidder will be responsible for executing the works for the project by providing a full team of built-environment project management and related professional services as well as construction team to execute the project from start to completion.

The Contractor should have in their organisation skilled project management and related professionals in the built environment who can be mobilised as soon as they are an appointment letter is received to meet the specific project lifecycle phase to correspond with the needs that will arise at various stages of the project.

15.2.1 Site Conditions and Work Environment

The service provider must note that the ISBMS implementation will be on a “LIVE ENVIRONMENT”, adequate allowances should be made to ensure minimal disturbance to the operations of the university. The service provider through arrangement and approval can work through the night/weekend.

The major contractor's site access and entrance criteria, OHS regulations, and the certification and identification of workers are only a few of the specific requirements that must be followed.

A conditional assessment report and layouts have been provided to aid the service provider with the site conditions.

15.2.2 Time elapsed

Due to the time elapsing between the release of this specification and the design, supply, installation, and construction works, it is anticipated that some of the equipment proposed will be superseded by later models by construction time. The contractor is to review products and confirm the models of all equipment and products proposed with the engineer and client.

15.2.3 Old Equipment not Compactable to the ISBMS

The university while embarking on a smart campus, has old equipment which is not compatible with ISBMS'; such equipment has been noted as such on the Points Schedules provided. Prior to dealing with such equipment, the service provider engineer must test such equipment and where the requirement only requires a control system/ communication point installation and/or replacement; the client must be notified, and a quotation will be required prior to the service provider procuring and installing such an item.

15.2.4 Equipment and Sensor Placement

Describe where various sensors, controllers, and equipment will be located within the building or facility. Ensure that the placement of these components aligns with the building's HVAC, lighting, and security systems.

15.2.5 Infrastructure Requirements

The university while embarking on a smart campus, has old equipment which is not compatible with ISBMS'; such equipment has been noted as such on the Points Schedules provide. It is not an expectation that such equipment must be replaced. Where such equipment is identified (based on the conditional assessments and points schedule provided) and further tested for confirmation of non-compatibility with ISBMS; the client must be notified, and the expectation will be for an ISBMS point to be provided which can be pulled on replacement of the equipment (replacement elsewhere).

The university is in the process of upgrading buildings in line with the Smart Campus, as such all equipment listed above must be provided for through ISBMS points which must be also allowed for in the pricing schedule.

15.3 Period of Performance

The overall period of performance for the Pietermaritzburg Campus is 4 months, inclusive of design, supply, installation, programming, testing, commissioning and maintenance of the system.

15.4 System Design

In addition to section specific requirements the following general system design requirements shall be adhered to.

The scope of work shall be for the design, supply, installation, programming, testing, commissioning and maintenance of the system as detailed in this specification. Ancillary works to be carried out by the contractor shall include, but not be limited to.

- Project management of the scope of work.
- Project coordination with other services trades to ensure timely and successful completion of the scope of work including on-site and off-site project meetings as required.
- Project documentation.
- User training.
- Maintenance during the Defects Liability Period.

The supply, construction, programming, testing, commissioning and maintenance of the installation shall comply with all relevant Statutory Regulations, and the latest editions of all applicable standards as listed in the specification.

The contractor shall operate an auditable quality assurance procedure covering the supply, construction, inspection and testing of the installation.
The contractor shall provide all materials and equipment not explicitly mentioned in this specification but which is obviously needed for the completion of the scope of work. This is not limited to the system only, but also includes all tools, equipment for testing, safety equipment, working platforms, scaffolding, ancillary materials, etc., needed to complete the design, supply, installation, programming, commissioning and maintenance of the system. The operation of the system shall be configurable per the client's requirements.

15.5 System Requirements

The various system requirements shall be as detailed for each service required.

All equipment installed under this contract shall comply with the requirements of IEC 61000 Parts 1 to 6 ELECTROMAGNETIC COMPATIBILITY (EMC). Any equipment found producing Electromagnetic interference subsequent to commissioning, shall be suppressed or replaced to the satisfaction of the Engineer without any cost to the Employer.

15.6 Components and Equipment

In addition to section specific requirements the following general component and equipment requirements shall be adhered to.

All materials, equipment and components shall be new, of good quality and fit for purpose. The contractor shall not provide without written approval products that are obsolete, discontinued or about to be discontinued.

The contractor shall provide equipment and associated accessories which are the products of established manufacturers regularly engaged in the manufacture of such equipment applicable to the system.

All equipment and materials used in these works shall be standard components that are regularly manufactured and utilized in the manufacturers' system.

Attic stock of the main components of the installed system shall be required. The final quantities and items shall be agreed with the engineer during construction.

All system components shall operate reliably within the range of -10 degrees to +55 degrees and 98% non-condensing humidity.

To ensure the long-term dependability of the system, the contractor shall provide all system components with appropriate environmental protections including (as appropriate);

- Protective enclosures.
- Seals.
- Insulation.
- Water proofing.
- Rust proofing.

- UV protection.

Any modifications to equipment to meet the intent of this specification shall be performed in a way that does not alter the manufacturers' warranty.

15.7 Interfacing with other systems

System interfacing requirements shall be as detailed for each service required.

15.8 Installation of components and equipment

In addition to section specific requirements the following general installation of components and equipment requirements shall be adhered to.

Major items requiring coordination are listed as follows:

- Coordinate with other trades to ensure that no conflict occurs between proposed cable, cable tray and ducting routes, pipe runs and air conditioning ductwork, hydraulics pipework and the like.
- Ensure staging of works is to the requirements of the Construction Program.

The location of all outlets, switches and equipment indicated in the drawings is indicative only and may be relocated within a 3000mm radius to suit coordination with other services, finishes, architectural preference and to meet code requirements. The exact locations are to be determined by reference to architectural plans, sections and details and are to be confirmed with the engineer prior to installation. Clinical architectural room data sheets and room layouts sheets shall also be adhered to.

The installation and mounting of all equipment shall ensure that the components remain operational and connected to the structure and to their foundations (if applicable) throughout a seismic event by means of proper installation of all anchors and mounting hardware. The contractor shall issue a seismic compliance certificate at completion.

All equipment shall be securely mounted using proprietary fixtures and fittings.

The method of equipment installation shall not adversely affect the function or structural integrity of the structure to which the equipment is attached.

The method of equipment installation shall not compromise the IP rating of the equipment.

15.9 Framework and brackets

- Site-fabricated framework and brackets shall not be used.
- Framework and brackets shall be positioned so as not compromise the removal and replacement of equipment.
- Where it is necessary to modify on site any pre-fabricated galvanized mild steel framework, the cut edges shall be dressed and treated immediately with an approved cold galvanizing paint to prevent corrosion.
- Fasteners securing equipment to framework and brackets shall be independent of those securing framework and brackets to walls and floors.

15.9.1 Positioning of Equipment

- Final positions of equipment shall be agreed on site, prior to installation.

- Equipment shall be positioned with due regard to the aesthetics of the installation.

All surface mounted equipment shall be solidly fixed to walls or soffits by means of their back plates.

15.10 Cables

- Dedicated metal wire trunking for the system shall be provided by the electrical contractor as per the layout drawings.
- The cable installation shall comply with the requirements of BS 7671.
- Cables shall, as far as possible, run parallel with the lines of building construction.
- Cables and their support systems shall not be fixed to protective barriers, guards or direct to guard-rails.
- Cables shall be installed strictly per the manufacturers' requirements pertaining to:
    - Maximum tensile or compressive stresses (e.g. due to pinching or squashing).
    - Minimum bending radius.
    - Temperature of installation.
    - Operating environment.
    - Cable installation in conduit shall conform to BS 7671
    - Conduit shall be debugged and swabbed prior to cables being pulled in.
    - The entire conduit system shall be complete prior to installing cables.

No joints shall be allowed in the cables without the prior approval of the engineer.

The use of PVC insulation tape shall not be accepted – heat shrink or approved equivalent method shall be used.

The contractor shall take utmost care whilst pulling conductors through conduit to ensure that the conductors are not kinked, twisted or strained in any manner. Damaged cables shall be replaced in its entirety:

- Care shall furthermore be taken to ensure that conductors do not come into contact with materials or surfaces that may damage or otherwise adversely affect the insulation and durability of the conductor.
- Conductors installed in vertical wire ways shall be secured at intervals not exceeding 400mm to support the weight of the conductors.
- Proprietary or approved clamps shall be supplied and installed in suitable draw- boxes for this purpose.
- The contractor shall allow for the installation of the "last mile" conduit connection/link from the containment infrastructure installed by the electrical contractor, i.e. from trunking/cable basket to device location.

15.11 Method of Cable Support

- Fixing of cables to containment shall be via appropriate cable metallic straps, clamps and clips.
- No cable ties shall be used in the installation.
- Cables should be strapped to cable containment or supports every 500mm.
- The methods of cable support should be non-combustible and their installation should not in any way compromise the integrity of the circuit. The cable support material should be of a material that can withstand a similar temperature and duration to that of the fire rated cable whiles maintaining adequate support.

15.12 Terminations

Connectors recommended by the manufacturer of the cable being terminated shall be used. Terminating equipment must be designed for the connection type and be used in the manner intended by the manufacturer.

Connections must be of compression crimp type or similar, such that it is not possible to easily disconnect equipment simply through applying cable tension. All connections must be located in accessible locations and protected against tampering and environmental risks.

Spare electrical/optical cores shall be terminated into spare terminals for future connections and proper insulation.

15.13 Identification

All system components shall be suitably identified with labels. Labels shall be located so that they are easily seen from normal access adjacent to the item being marked. Labels shall not be installed on components normally removed or replaced.

General labels:

- Stencil with black or white lettering contrasting with background.
- For indoor applications only, engraved two-colour laminated plastic, black lettering on white background.
- Engraved and black filled lettering on stainless steel or brass, minimum thickness 1mm.
- Warning labels and markings.
- Danger and warning labels, fire and safety equipment labels: White lettering on red background.
- Pipes, conduits and ducts.
- Identification of the contents of pipes, conduits and ducts.
- Wiring and terminal strips.
- Identify wiring with numbered ferrules at both ends.
- Number each terminal of terminal strips.
- Numbering system: To match electrical and control shop drawings.
- Equipment identification
- Identify each item by name and identification number.
- Contents: Match terminology and numbering system of the contract documents. Number multiple items individually.

Minimum lettering heights:

- Equipment nameplates: 40mm
- Danger, warning and caution notices: 10mm for heading 5mm for text.
- Warning notices: 7mm.
- Minor lettering: 3mm
- Lettering style: Helvetica medium.

15.14 Samples, drawings and documentation

Samples, drawings and documentation requirements shall be adhered to.

All drawings, information, and documentation shall be in English, and each item shall be identified with the client’s name and project / scheme / contract reference title and numbers, the Employer’s representative’s name and reference numbers, and the Manufacturer’s works / contract / order references.

Shop drawings, samples, product data submission and connection diagrams of the system configurations shall be provided by the contractor for approval by the engineer prior to equipment ordering.

15.15 Factory acceptance testing (FAT)

Allowance for factory acceptance testing as per pricing schedule.

15.16 Shop drawings

Shop drawings shall be submitted by the contractor for approval by the engineer and client prior to any equipment ordering or installation.

The general building drawings are schematic and do not show the exact dimensions or positions of equipment. Contractors must satisfy themselves that the equipment offered by them will fit in the available space and can be positioned so that access for maintenance, repair or removal is not encumbered.

Not later than the time stated in the contract document (typically 1 week) after access to site or receiving verbal instruction, the successful contractor shall submit to the engineer, two copies of the detailed working drawings showing the required conduits, conduit boxes, position of equipment, cable trays, ducts, etc. It must also be ensured that the complete installation is according to the specification and standards.

Approval by the engineer of these drawings submitted by the contractor shall not relieve him of his liability to carry out the work in accordance with the requirements of the contract documents.
NOTE: Final dimensions must be taken on site before any equipment or materials is either purchased or manufactured.

15.16.1 Sample submissions

The contractor shall submit one sample of each designated item with copies of its supporting documentation. The contractor shall submit a range of samples if choice of colour or finish is required.

The contractor shall also reselect and resubmit samples which are not approved.

The contractor shall keep the approved samples in good condition on site, until practical completion. The approved samples shall be checked against the installed products at Practical Completion and will not be returned.

15.17 Product data submissions

The contractor shall submit manufacturer’s data for all equipment, materials components and systems to be provided including the following as applicable:

- Technical specifications and datasheets
- Evidence of compliance with specified product certification schemes
- Drawings, showing size, arrangement, operating and maintenance clearances
- Schematic layout, piping, wiring and control drawings
- Operating weight and support loadings
- Lifting points

- Control details
- Recommendations for installation and maintenance

15.18 Submissions Schedule

The contractor shall maintain and submit a monthly schedule of submissions to identify all proposed submissions designated with the following information:

- Submission number, description, date and revision number
- Status
- Accepted
- Submitted awaiting acceptance
- Not yet submitted
- To be corrected and re-submitted

All documentation shall be detailed and be written to enable any supplier or maintenance organization to maintain the system.

As-built drawings shall be provided by the contractor for the completed installation:

“As-built” drawings shall be computer generated through a recognized CAD software package. Drawings submitted for acceptance shall be provided on A3 paper size.

Final “As-built” drawings shall be submitted in A0 paper format, PDF and CAD format, on CD. Paper copies are to be neatly folded and placed in a Perspex cover sleeve.

The contractor shall supply laminated A3 layouts of the “As-built” drawings for the main control room. The detailed “As-built” drawings shall be provided by the Contractor showing positions of the following.

- Equipment
- Wire ways
- Cable Routes.

Comprehensive operating and maintenance manuals (hard and soft copy) shall be provided by the Contractor prior to the commissioning stage. This shall include all duly completed certificates.

A draft copy shall be provided to the engineer for approval prior to final handover.

The operating and maintenance manuals shall include at least the following:

- A schedule of all components in the installations with the following information provided:
- Manufacturer’s name and contact details
- Function
- Full description and details of design capacity and design criteria for each item of equipment and each product.
- Detailed description of the function of all operator controls.
- Operator training manuals and operation procedures:
- Safety procedures for protection against electrical, mechanical, and any other hazards.
- Clear instructions for setting up and configuring the system.
- Complete software configuration and physical connection information.
- Safe starting up, operating and shutting down procedures for the systems.

- Drawings and technical data as necessary for the efficient operation and maintenance of the systems.

Project-specific Administrator's Guide that must detail all the functions available to the Administrator. It must also provide a detailed record of all the system configuration and programming settings for all programmable parameters. It must also contain:

- All the administrator passwords that have been programmed into the system
- Procedures for fault finding.
- Maintenance instructions for all components, including frequency, repair, overhaul, change-out and installation procedures. Including:
- Emergency maintenance procedures, including telephone numbers for emergency services and after hour's contacts for suppliers and contractors.
- Detailed recommendations for preventative maintenance procedures, which should be adopted to ensure the most efficient operation of the systems installed.
- Inspection, testing and maintenance programme in tabular form showing frequency and level of routine checks for each item.
- Trouble shooting checklists and simple diagnostic analysis.
- Schedule of normal consumable items, local sources of supply, and expected replacement intervals.
- Schedule of recommended spare parts
- Commissioning procedures.
- "As-built" drawings.
- Copies of Software Licenses
- Manufacturer's Manuals, Warranties and Certificates

15.19 End-user training

The contractor shall provide training to two separate groups of users, namely System Administrators and System Operators. In general, the training shall include presentations, informal discussions, demonstrations and hand-on activities on the actual system.

Training for System Operators shall cover all the functions and activities that the operators need to carry out on a daily basis. The training for the System Administrations shall include that provided for the System Operators and additional training specific to system administration. Further, the System Administrators training shall also include training on how to teach other staff members by way of a 'train the trainers' approach.

The System Administrators' training shall be provided for up to 10 personnel. The training shall be carried out up to 2 sessions with 1 or more personnel per session.

The System Operators training shall be provided for up to 10 personnel. The training shall be carried out up to 2 sessions with 1 or more personnel per session.

Refresher training shall be provided after client occupation – typically 3 to 6 months following completion

The timing of the training shall be agreed between the contractor and the users, but must be completed prior to the handing over of the live system to the user. The contractor shall make provision for training of users on multiple work shifts.

15.19.1 Training Plan and Course Materials

Training plan and course materials shall be submitted to the engineer at least two weeks prior to the commencement of the training for approval. The contractor shall provide all course materials, all support equipment (e.g., computer, projector, whiteboard, flipchart, etc.). The venue for the training shall be on the project site. A training feedback form shall also be provided for all trainees to fill out at the conclusion of every training session to evaluate the effectiveness of the training and for future improvement.

15.19.2 Training Records and Certificates

The contractor shall maintain a complete record of the training. The record shall include:

- Date and time of training session.
- Name of trainer.
- Name of all trainees.
- Names of trainees issued with a completion certificate.
- Training feedback forms.
- All trainees who have successfully completed the training shall be issued with a certificate signed by the trainer.

15.20 Testing and commissioning

Comprehensive testing and commissioning of the system shall be required. The contractor shall provide qualified personnel for the supervision of all inspection and testing activities.

A test plan and programme shall be submitted for approval by the engineer before any tests are conducted.

The test plans shall be developed to unambiguously demonstrate the correct operation of the installed equipment. The contractor shall identify any testing that may impact on critical operations and seek direction from the engineer.

At minimum, the test plan shall include the following

- Details of the equipment to be tested.
- Configuration (e.g., memory, I/O cards, power supplies) of equipment to be tested.
- Software and/or firmware versions of equipment to be tested.
- Major software configuration parameters.
- System diagram showing how equipment is logically arranged.
- Details of any interfaces to third party equipment, both high level and low level.
- Cause and effect matrix detailing all input/output relationships/results.
- viii. Pass or fail criteria to be specified within test documentation.

The test programme shall be developed providing the sequence of testing to be conducted. As a minimum, the test programme shall indicate the relative start and finish dates for the following:

- System Commissioning Tests
- System Acceptance Tests

15.20.1 System Commissioning Tests

Upon receiving approval for the test plan and programme from the engineer, the contractor shall conduct unsupervised System Commissioning Tests in accordance with the test plan and within the dates defined in the programme.

Any defects shall be rectified immediately by the contractor and the system re- tested. Tests shall be repeated until the contractor is able to complete all approved tests successfully without any defects. Upon successful completion, the contractor shall formally advise the engineer in writing of such, and that they are ready for the System Acceptance Tests.

The engineer is not required to witness the system commissioning tests but may choose to do so.

15.20.2 System Acceptance Tests

The contractor shall demonstrate the functionality of the system using the approved test plan. System Acceptance Tests shall be witnessed and signed off by the engineer or his representatives. The contractor shall provide two-way radio communications and all equipment required for the testing.

If the System Commissioning Tests have been properly carried out, the systems acceptance tests should be straight forward and no defects should arise. In any case, should there still be defects; the systems acceptance tests shall be repeated. The contractor shall bear all costs incurred by the engineer or his/her representatives in attending system acceptance re-testing.

Report of all the test event transactions shall be provided in both soft and hardcopy. Softcopy shall be in in the Microsoft Office Excel format for easy analysis.

The Contractor shall provide all necessary safety equipment and test instruments. All test instruments shall be covered by a current test and calibration certificate.

All inspection and test results shall be recorded using proforma documentation (test certificates and schedules) complying with applicable standard (e.g. BS 5839) – all test results shall be included in the handover documentation.

All certificates to be issued once final commissioning has been completed shall be submitted to the engineer for approval before being issued.

The Contractor shall make provision for all inspection and testing activities to be witnessed by the engineer. Unless otherwise specified, the period of notice for witness testing shall be 10 working days.

Unless otherwise agreed by the engineer, no part of the installation shall be commissioned until all defects or omissions revealed by inspection and testing have been rectified. Where a defect or omission renders all or part of the installation unsafe for use, the contractor shall take approved precautions to ensure that no part of the installation can be commissioned.
Before testing and commissioning, inspections shall be performed to verify:

- All equipment and material is of the correct type and complies with applicable BS standards.
- All parts of the installation are correctly installed.
- No part of the installation is visibly damaged or otherwise defective.
- The installation is suitable for the environmental conditions.
- The installation complies with this Specification.

On satisfactory completion of the inspections the following tests shall be performed in the sequence listed:

- A power failure shall be simulated to test the standby power supply. If required by the applicable standard, or requested by the engineer, cables and wiring shall be insulation tested at 500V after they are installed.
- The insulation resistance to earth and between conductors shall comply with the requirements of BS 7671. Because 500V can damage electrical and electronic equipment, the insulation test

shall be carried out before equipment is connected to the cables or wire. The completed installation shall be tested at a lower voltage, as recommended by the manufacturer.
- Earth continuity should be tested in accordance to BS 7671.
- Each system component dynamically tested to ensure that they work satisfactorily, and that the correct indications and responses are given by the fire control panel.
- Annunciating devices shall be tested to ensure that the correct sound levels are achieved throughout the building.
- All signals from the system to ancillary systems shall be checked to ensure that the correct actions or responses are achieved.
- After individually testing the components and equipment, system simulation tests shall be done to commission the system and to indicate that the system is working.

15.21 Maintenance during defects liability period

Comprehensive maintenance shall be provided during the twelve months Defects Liability Period.

The defect period shall commence upon successful completion of system acceptance testing and the issue of the certificate of completion. Comprehensive maintenance shall comprise of:
- Half-yearly preventative maintenance for all installed items.
- Ad-hoc corrective maintenance for reported faults.
- Keeping a maintenance register.
- Connection of ISBMS points where equipment has been replaced by the university.

15.22 Quality of service

Quality of service shall be based on the key performance indicators below. [Service/Fault Description: Minimum Standard]

15.22.1 Fault Reporting

Help desk calls answered within 30 seconds during business hours. Return calls within 8 hours during weekends, public holidays and non- business hours.

15.22.2 Critical fault that impact on safe operation:

Technician on site within 24 hours of fault being lodged and fault resolved within 48 hours. For urgent fault that impact on efficient operation. Technician on site the next business day of the fault being lodged and fault resolved within 3 business days.

15.22.3 Minor fault that inconveniences the operation:

Technician on site within 2 business day of the fault being lodged and fault resolved within 5 business days.

15.22.4 Maintenance register:

Every maintenance activity is accurately recorded in the register at the conclusion of the service activity. The maintenance register must be made available for inspection by the user following a 24 hours' notice.

15.23 ISBMS Installation System design

The building ISBMS system shall be provided to monitor and control all university equipment, such as power supplies, generators, UPS, HLI to HVAC control system (fixed IP address), water usage, pumps,

clinical systems, etc. as per the schedule provided of the list of equipment to be on the system and the point schedule. The ISBMS shall be network- based and it shall be possible to log into the ISBMS system from any computer linked to the security network.

Implement an open architecture system that uses open protocol such as BACnet, Modbus or LonWorks that will allow products from various suppliers to be integrated into a unified system.

Unless specified otherwise, alternate solutions may be proposed for consideration provided they achieve and exceed that of the documented design.

The following systems, including but not limited to the following, shall be connected to the ISBMS system.

Control	**Monitoring- Through Monitors/SMS/App**	**Reporting (Daily, Monthly and Quarterly)**
Lift	Lift	Lift
Water metres	Water metres	Water metres
Energy metres	Energy metres	Energy metres
Solar Plant	Solar Plant	Solar Plant
Data Centre/ Servers/Switches	Data Centre/ Servers/Switches	Data Centre/ Servers/Switches
UPS	UPS	UPS
TBC	Circuit Breakers	Circuit Breakers
HVAC	HVAC	HVAC
TBC	Main Substation	Main Substation
-	Gas suppression (Fire)	Gas suppression (Fire)
-	Fire Alarm System	Fire Alarm System
-	Fire/Smoke Detection System	Fire/ Smoke Detection System
-	Fire Pumps	Fire Pumps
-	Fire Dampers, including hydrants, booster, hose reels)	Fire Dampers, including hydrants, booster, hose reels)
Chillers	Chillers	Chillers
Cold-rooms and Freezers	Cold-rooms and Freezers	Cold-rooms and Freezers
Ground water pumps	Ground water pumps	Ground water pumps
Sewerage pump	Sewerage pump	Sewerage pump
Water Harvesting Plant	Water Harvesting Plant	Water Harvesting Plant
Geysers and Heat Pumps	Geysers and Heat Pumps	Geysers and Heat Pumps
Generators	Generators	Generators
Water supply and reservoirs	Water supply and reservoirs	Water supply and reservoirs
TBC	CO2 Emissions	CO2 Emissions
TBC	CCTV's	CCTV's
Windows and Doors	Windows and Doors	Windows and Doors
Access Control	Access Control	Access Control
Irrigation	Irrigation	Irrigation
PA Systems	PA Systems	PA Systems
Solar Plant	Solar Plant	Solar Plant
LPG Gas	LPG Gas	LPG Gas
Diesel Tank	Diesel Tank	Diesel Tank
Lights, including Emergency Lights, High Mast Lights	Lights, including Emergency Lights, High Mast Lights	Lights, including Emergency Lights, High Mast Lights

The HVAC systems shall have its own dedicated control systems that links to the building ISBMS system via HLI interface to provide monitoring functions and alarm duplication on the ISBMS system and these control systems are subject to investigation and testing by the engineer and further approval of installation by client.

The ISBMS point schedule applicable to this specification is appended to this document.

The ISBMS system shall operate on the security ICT network. All ICT network points shall be provided by the structured cabling system contractor and all devices that will be installed must support 1Gb connections". Active network equipment shall be supplied and configured by the clients' ICT representative, including VLANs, VPN, etc. The BMS contractor shall liaise with the ICT trade contractors to ensure his requirements are met. Details on the ICT network will be discussed during implementation.

The ISBMS contractor shall be the lead coordinating contractor to coordinate all interfaces between the ISBMS and all other systems.

The functional descriptions provided in this document provide the design intent and the ISBMS contractor shall actively participate in the development of the final functional descriptions for the ISBMS.

The ISBMS contractor shall produce documentation to support the delivery, installation, testing and commissioning of the ISBMS in conjunction with affected parties.

The client shall be the named license holder, or shall nominate the name to be used, of all software associated with any and all incremental work on the project.

15.24 System requirements

The ISBMS shall primarily be a monitoring system and a selected number of other equipment and systems shall be controllable via the integrated smart building management system frontend, including the main distribution board change over circuit breakers and substation switchgear.

The entire ISBMS shall comprise a network of interoperable, stand-alone digital controllers communicating via LonWorks, Modbus and/or BACnet communication protocols to Network Interface Controllers (NICs). To provide maximum flexibility and to respond to changes in the building use, the system offered shall support the use of standard communication protocols at controller level and Ethernet TCP/IP communication technologies at Server and Terminals level at minimum. High level interfaces are to use BACnet protocol where possible.

The new integrated smart building management system shall perform the following functions:

- Overall system status monitoring
- Control of connected systems as detailed in the point schedule
- Energy monitoring
- System scheduling
- System reporting
- Alarm reporting
- Email & SMS (via SMS server) capabilities

The BMS contractor shall provide the hardware and software necessary to implement the functions shown or implied in the contract documents.

The Human Machine Interface shall allow the user to make full use of the features provided with these operating systems.

The system shall support standard LAN communication on Ethernet® or fibre optics TCP/IP and standard network equipment.

The features of the system shall include dynamic graphical user interfaces, data acquisition and logging alarm and system exception handling.

The system response times are shown below. The times are maximum overall elapsed times after initial event (non-cumulative). The system must additionally allow for escalations to at least 5 people and the main control centre.

The ISBMS software package shall provide the following tools for network analysis and monitoring:

- Protocol analyser tool;
- Traffic analysis tool; and
- Network diagnostic tool.

The ISBMS software shall provide alarm recognition, storage, routing, management and analysis. The server software shall be able to route any alarm to any defined user location whether connected the local network or remote via dial-up, telephone connection, or wide-area network.

Alarm generation shall be selectable for annunciation type and acknowledgement requirements including, but not limited to:

- To alarm
- Return to normal
- To fault

The system shall provide for the creation of alarm classes for the purpose of routing types and or classes of alarms, i.e. security, HVAC, fire and additionally allow for escalations where item has not been attended to.

The system shall provide alarm generation from “runtime” and / or event counts for equipment maintenance. The user shall be able to reset runtime or event count values with appropriate password control.

Control equipment and network failures shall be treated as alarms and enunciated. Alarms shall be enunciated in any of the following manners as defined by the user:

- Screen message text
- E-mail of the complete alarm message to multiple recipients

The ISBMS server shall provide the following functions at minimum.

- Calendar
- Scheduling
- Trending of ALL parameters, including SQL database (Historian function)
- Alarm monitoring & routing
- Time synchronization
- Time zone handling
- Integration of multiple communication protocol-based controller data
- Object linking and embedding for process control (OPC Unified Architecture) for connectivity to third party OPC complaint software/devices
- Colour graphic display

- On-line plots Use Microsoft-based security
- System documentation and graphs generation
- Dynamic data exchange (DDE)
- Dispatch of a single time schedule to all programmable nodes
- Tune control loops through the adjustment of control loop parameters (if required)
- Enable or disable systems
- Generate text file reports to a networked printer
- Select points to be alarmable and define the alarm state
- Configure alarms to be send to Microsoft windows mail client
- Select points to be trended over a period of time and initiate the recording of values automatically
- Provide different levels of security to every object in the server database
- Modify and create users with passwords and access levels and also be able to use currently logged on users and passwords.

The server shall have multiple graphics with flashing alarm object(s) with printed messages, routed directly to a designated alarm printer (when selected) and audio messages.

The following shall be recorded by the server software for each alarm (at a minimum):

- Time and date (ISO 8601 format)
- Location (building, floor, zone, office number, etc.)
- Equipment (label, access way, etc.)
- Acknowledge time, date and user who issued acknowledgement.
- Number of occurrences

Alarm actions may be initiated by user defined programmable objects created for that purpose. Defined users shall be given the proper access to acknowledge any alarm, or specific types of classes of alarms defined by the user. A log of all alarms shall be maintained by the server and shall be available for review by the user, attach a graphic screen, text notes, and/or plant status report, to each alarm, as defined by the user.

Repeat/nuisance must have the feature to be disabled, and a feature for monitoring disabled alarms.

An alarm notification window will supersede all other windows on the desktop and shall not be capable of being minimized or closed by the operator. This window will notify the operator of new alarms and un-acknowledged alarms. The dedicated alarm window shall provide user selectable colours for each different priority alarm.

The system shall have the ability to collect data for any property of any object and store this data for future use. The data collection shall be performed by objects, resident in the node and server, shall have at a minimum, the following configurable properties:

- For interval logs, the object shall be configured for time of day, day of week and the sample collection interval
- For deviation logs, the object shall be configured for the deviation of a variable to a fixed value. This value, when reached, will initiate logging of the object
- For all logs, provide the ability to set the maximum number of data stores for the log and to set whether the log will stop collecting when full, or rollover the data on a first-in, first-out basis
- Each log shall have the ability to have its data cleared on a time-based event or by a user-defined event or action
- All log data shall be stored in a database in the server and the data shall be accessed from a server or a standard Web Browser.

15.25 Conditions of Contract and Pricing

Contract

The Conditions of Contract are the NEC3 Engineering and Construction Contract (Third edition with amendments issued up to and including April 2013) published by the Institution of Civil Engineers, copies of which may be obtained from Engineering Contract Strategies (telephone 011-803 3008). (Amendments made since the publication of the Third Edition of June 2005 may be downloaded from www.neccontract.com/products/contracts)

The NEC3 ECC Document must be completed in full and submitted as Annexure A11 which includes the pricing schedule.

Pricing

The Contractor is to be paid under Option C (Target contract with activity schedule) for the works.

The contractor will be paid on a monthly basis his cost as defined in the contract, less deductions for disallowed cost plus the Fee calculated in accordance with the contract using the data contained in Contract Data: Part 2 – Data provided by the Contractor. He is also, after the Completion of the whole of the works, paid his share, if any, of the "gain" or pays the Employer his share, if any, of the "pain", based on the difference between the total of Prices (lump sum prices for activities), adjusted in terms of the contract for compensation events, and his costs and the share percentages contained in the Contract Data: Part 1 – Data provided by the Employer.

DOCUMENT DESCRIPTION	***DOCUMENT***
1. NEC3 ECC Document, Including Pricing Schedule	NEC3 Engineering Construction Contract
2. Conditional Assessment	ISBMS Pietermaritzburg- Cor
3. Point Schedule of Information	Pietermaritzburg Points Schedule.pdf

15.26 Other Refence Documents

15.26.1 *Facilities Management Standard Specifications*

It is imperative for tenderers to note the attached Facilities Management Department's standard corporate identity schedules for building finishes and fittings. Tenderers are use these schedules in the preparation of their proposed designs, technical specifications as well as the budgets. The following is the schedule of the requirements:

DOCUMENT DESCRIPTION	STANDARD
1. BUILDING LAYOUTS	reid bldg.as built.1011.AB.500.01.F NEW RES.1011.AB.600.02A. NEW RES.1011.AB.600.01B. reid bldg.as built.1011.AB.500.03.F reid bldg.as built.1011.AB.500.02.F
2. UNISA SMART CAMPUS REQUIREMENTS	tsanyt_201029-142306-2c41.pdf

15.26.2 *Facilities Management Department: Administration Forms*

As discussed previously, tenderers are expected use these schedules in the preparation of their proposed designs, technical specifications as well as the budgets. Should the tender wish to deviate from the above standards, the tenderers and propose other similar (quality and colour) products, the attached sample approval form is to be completed and included as part of this tender. The said proposals are to be submitted as **alternative tenders to the main tender**. Should the tenderer **not** submit the main tender based on the above requirements, the tender will be disqualified from taking part in the technical evaluation. The following is form for the proposed alternatives:

DOCUMENT DESCRIPTION	FORM

1. UNISA SAMPLE APPROVAL FORM	UNISA SAMPLE APPROVAL FORM.pdf

15.26.3 *Quality Management and Programming*

The following is the UNISA standard document for the programming of the works and the quality management. Tenders are to ensure that as part of this tender that they include a project specific quality management plan.

DOCUMENT DESCRIPTION	DOCUMENT
2. QUALITY MANAGEMENT ASSURANCE AND PROGRAMMING PROJECT REQUIREMENTS	QUALITY MANAGEMENT ASSU

15.26.4 *Occupational Health and Safety*

The following is the UNISA standard specification for OHS compliance. Tenderers are therefore required to incorporate all these requirements into their execution planning pertaining to the associated works on the construction site so as to ensure the health and safety; as well as to submit a project specific OHS management plan.

DOCUMENT DESCRIPTION	DOCUMENT
1. SHEQ CHS SPECIFICATION	UE SHEQ CHS Specification 2019.pdf

15.26.5 *Environmental*

The following is the UNISA standard specification for Environmental compliance. Tenderers are therefore required to incorporate all these requirements into their execution planning pertaining to the associated works on the construction site so as to ensure environmental management; as well as to submit a project specific Environmental management plan.

DOCUMENT DESCRIPTION	DOCUMENT
1. ENVIRONMENTAL MANAGEMENT SPECIFICATION	Environmental specification.pdf

15.26.6 *Risk Management*

Tenders are to note that a baseline risk assessment is required as part of their submission. The risk assessment template to be submitted should as a minimum include the following headings:

- All potential risks identified
- Context of the identified risk (description)
- The root cause of the identified risk
- The potential consequences should the risk materialise
- Inherent likelihood for the risk to materialise
- Inherent consequence should risk materialise
- Inherent risk rating
- Risk priority rating
- Tender's controls to manage the risks
- Residual risks after the controls are implemented
- Residual consequence after the controls are implemented
- Residual risk rating
- Residual Priority rating
- Risk treatment

15.27 Performance Management of the Contractor

The Bidder is required to provide a performance management plan detailing methodology and approach to ensure that the proposed interventions and controls are effective in meeting their obligations.

Key Performance Management Metrics

DISCIPLINE	KEY PERFORMANCE AREA (KPA)	KEY PERFORMANCE INDICATOR (KPI)	MEASURE
CONSTRUCTION / ENGINEERING PROFESSIONAL TEAM	Technical accuracy of deliverables and advice provided (time, quality and cost)	1. Deliverables provided are aligned to industry standards/best practice and constitute bankable business cases for projects 2. Little to no change requests/variations to the execution plans (time, cost, quality) 3. Little to no change requests/variations to the project scope of work 4. Deliverables are aligned to UNISA's strategic objectives and goals 5. Stakeholder satisfaction 6. Project execution cycle is appropriate for the required turn-around time	1) Project execution plan 2) Stakeholder management plan 3) Stakeholder feedback 4) Communication plan 5) Project status reports 6) Close-out documentation
	Project integration	7. Loss cost of deliverable changes 8. Project lifecycle turn-around time 9. Quality of deliverables 10. Communication and interaction between the professional team and the stakeholders 11. Involvement of key stakeholder groups	1) The total percentage of change - Extent of rework Percentage of late projects 2) Project status reports 3) Project execution plans 4) Stakeholder feedback 5) Communication plan
	Stakeholder Management	12. Communication effectiveness 13. Stakeholders support projects, 14. Trust, respect in relationship with stakeholders Conflicts mitigated on time 15. Shared organisational knowledge of problems/issues	1) Project execution plan 2) Stakeholder management plan 3) Stakeholder feedback 4) Communication plan 5) Project status reports
	Statutory, regulatory, legal and institutional compliance	16. Number of non-compliance reports 17. Internal and external audit score rating 18. Number of strategic objectives met 19. Regulatory report creation cycle length 20. Turn-around time to implement new regulations, policies and processes	1) UNISA Policies, Procedures and Process 2) Industry standards and regulations 3) Regulatory compliance expense per resource 4) Non-compliant change request percentage 5) Percentage of compliance issues handled correctly 6) External complaints per resource 7) Internal audits frequency
	Innovation	21. The number of innovation solutions implemented 22. Potential impact of innovative solutions implemented (time, cost, quality) 23. Risk aversion 24. Stakeholder satisfaction	1) Project execution plan 2) Stakeholder feedback 3) Project status reports 4) Close-out documentation

DISCIPLINE	KEY PERFORMANCE AREA (KPA)	KEY PERFORMANCE INDICATOR (KPI)	MEASURE
CONSTRUCTION TEAM	Resource Management	1. The budgeted cost of work that has actually been performed in carrying out a scheduled task during a specific time period 2. Cost and time predictability 3. The total percentage of change - Extent of rework 4. Project progress relative to milestones 5. Cost Efficiency 6. Schedule/Time Efficiency 7. The number of working hours spent on different aspects of the works. 8. The use of materials on site 9. The number of variations orders	1) Project execution plan 2) Stakeholder feedback 3) Project status reports 4) Close-out documentation
	Stakeholder Management	10. The Contractor's ability to manage stakeholders and to ensure that their operations do not impede or impose on them 11. Number of complaints	1) Project execution plan 2) Stakeholder management plan 3) Stakeholder feedback 4) Communication plan 5) Project status reports
	Occupational Health and Safety, Environmental, Quality and Risk Management	12. Number of incidents/accidents. 13. The number of defects. 14. The amount of waste generated and the amount of recycling	1) Project execution plan 2) Stakeholder management plan 3) Stakeholder feedback 4) Communication plan 5) Project status reports 6) SHEQ report/incident reports

16. SIGNATURES OF TENDER WORKING COMMITTEE MEMBERS

17. APPROVAL OF SPECIFICATION DOCUMENT AND ALL APPLICABLE ANNEXURES BY TTEC