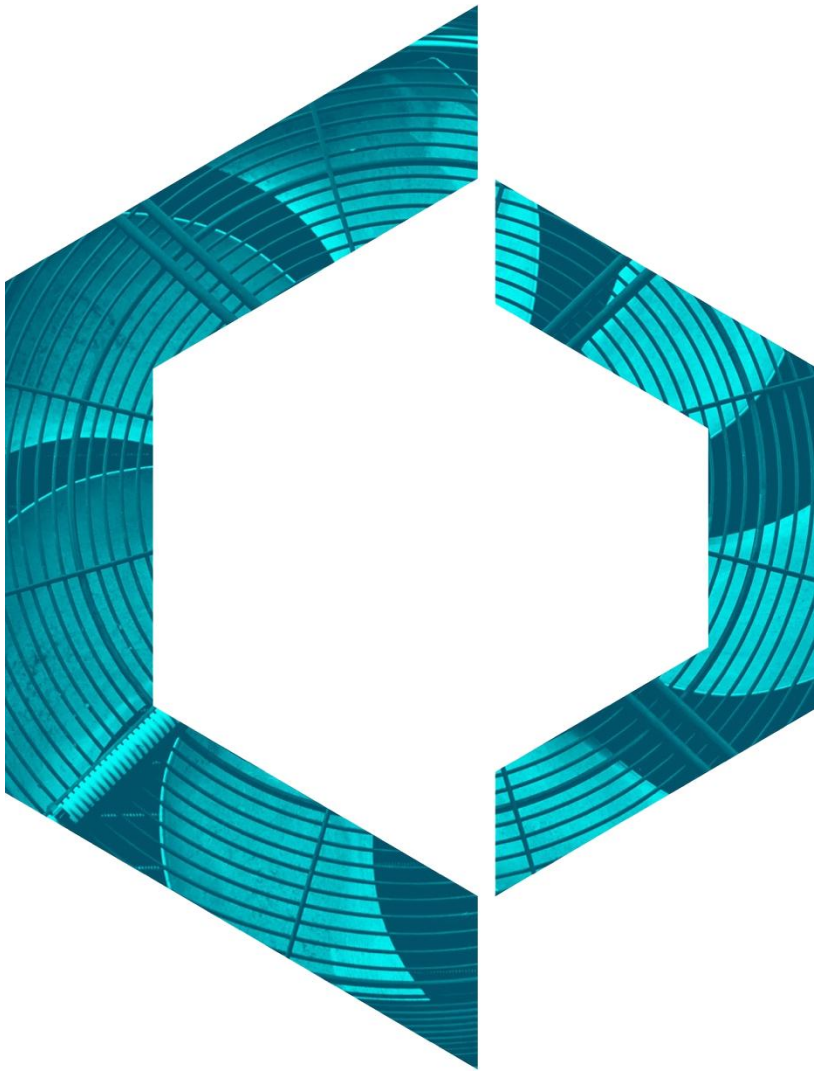

TUS Athlone Campus

Technical Specifications
Building Management System Servicing and Maintenance

Date	27/07/2026
Revision	01
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Client

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1.0 General

1.1 Outline Description

1.1.1 The Contractor shall demonstrate "Competence" and "Experience" of maintaining systems in equivalent applications, to undertake the work and shall ensure that the BMS System is inspected, maintained and serviced by a Competent Person. Evidence of this shall be included within the tender response. The Contractor shall ensure that any personnel proposed for the project meet all requirements for experience and skill and shall have at least 10 years' experience in the commissioning and maintenance of Building Management Systems.

1.1.2 The Contractors personnel must be trained, competent BMS Commissioning and Maintenance staff, with senior trade's qualifications, who have a thorough understanding of Commercial, Science and Technology, Industrial, mechanical and HVAC systems. It is essential that the Contractors personnel are familiar with all legislative requirement's relating to maintenance of mechanical services and have a thorough understanding of energy efficient maintenance regimes.

1.1.3 The Contractor shall ensure a high level of customer support is provided and contact details and protocols for communication must be clear. Details of how the Contract will be managed and supported are to be outlined in the tender return. Any calls to a support office must be logged and traceable to ensure an acceptable response time to queries is delivered.

1.1.4 The TUS campus comprises of the main campus and the east campus. The BMS alarm system comprises of outstations and motor control centres within the respective buildings with interface to the operators "front end" terminal located at the Estates Office within the Main University Campus Building. The BMS has a BMS ICT network with fibre optic links and BMS switches.

1.1.5 The service contract requirement is for a single point appointment of a contractor with responsibility for the "service" and "maintenance" of all BMS and HVAC system controls installations on the campus. The contractor must be capable of "servicing" and "maintaining" all of installed systems.

1.1.6 The Contractor shall be responsible for the Service and Maintenance of the campus Building Management and HVAC Control Systems in full accordance with the OEM manufacturer's recommendations, industry best practice BSRIA BMS Maintenance, BMS Commissioning, Improving System Performance Guides, CIBSE Commissioning Codes, CIBSE Guides.

1.1.7 In additional the Contractor shall be responsible for the Service and Maintenance of the Laboratory Ventilation and Fume Extract control systems accordance with relevant standards.

1.1.8 The Contractor shall formally demonstrate that they are authorised distributors / representative agents of the incumbent campus BMS OEM (Cylon), and that the proposed personnel have undertaken training from the manufacturers.

1.1.9 The BMS Maintenance Contract is initiated as part of the Universities commitments to Green Energy Procurement shall include measures to complement the Universities ISO 50001 Energy Management Standard accreditation. The BMS Maintenance shall completement the Green Public Procurement Strategy and Action Plan 2024-2027 which includes actions relative to BMS maintenance, on:

- Policy and Legislative context at national and EU level
- A mandate to accelerate Green Public Procurement implementation
- A focus on Monitoring and reporting
- Training and awareness
- Research and innovation

1.1.10 The Contractor shall be responsible for ensuring that Green Public Procurement and the spirit of its requirements is embedded in the delivery and implementation of the BMS maintenance service contract. The Contractors reporting shall be detailed and complementary to the Universities ISO 50001 Energy Management Systems policies, with energy efficiency to be a core deliverable of the BMS Maintenance contract.

1.1.11 The Contractor shall provide a complete BMS and HVAC controls maintenance service, with embedded principles of high-quality maintenance and energy management. The objectives of TUS for implementation and responsibility by the Contractor are;

- Ensure TUS's responsibilities under relevant statutory legislation and recommended guidelines are fully satisfied.
- Ensuring that the mechanical services in all campus buildings continue to function reliably, are effective and operate to optimal efficiency.
- Ensure the health, safety and comfort of occupants of the buildings.
- Ensure energy efficiencies and energy reduction are core principles of maintenance.
- Maintain and protect the value of the mechanical services and BMS System assets and enhance the value of the investments made in campus buildings and its equipment.
- Ensure TUS responsibilities under Health and Safety at Work Acts where these relate to environmental and comfort criteria controlled by the BMS are satisfied. Ensure Laboratory Ventilation systems and fume extract systems controlled by the BMS are operating within all relevant standards of safety.
- Ensure TUS policies and targets for energy saving and carbon reduction where these relate to systems controlled by the BMS are satisfied. Ensure that all potential avenues for energy reduction are considered and where appropriate that these proposals are presented to TUS with a rationale highlighting the benefits of such measures and any implications that may be associated with their implementation. It shall be the Contractors responsibility using their

experience, knowledge and best practice to identify opportunities for energy efficiency and system improvement, presenting same to TUS for consideration.

- Ensure Health and Safety procedures are fully complied with, including the Contractors responsibility to undertake the role of PSCS
- The Contractor shall demonstrate an understanding of the BMS and all Heating Ventilation and Air Conditioning (HVAC) controlled via the BMS on the campus and shall demonstrate capacity and capability to carry out servicing and maintenance on the different system types.
- The Contractor shall implement air quality measurement as part of TUS's policies for regular air quality auditing within teaching and administration spaces.
- The Contractor shall monitor and review plant operation, control loop PID's , setpoints, operational settings, proportional bands, system responses, calibration of sensors, operation of actuators, highlighting findings and making adjustments to ensure that plant operational efficiencies are maximised. All adjustments shall be documented and recorded in detailed reports (not service dockets).
- Where the Contractor identifies a requirement for client expenditure outside that included within the terms of the Service Contract, the Contractor shall demonstrate the advantages of such expenditure and the expected payback on energy savings that are to be attained.
- The Contractor shall be responsible for the servicing and maintenance of the BMS ICT Network as part of the BMS service contract. Where the contractor does not have in house expertise in this regard it is expected that an appropriate and competent sub-contractor will be appointed by the contractor to carry out this work.

1.1.12 TUS realise that effective maintenance contributes to the energy efficient operation of systems and equipment. It is also recognised and expected that effective maintenance prolongs the useful life of the mechanical systems and plant. The University will expect the Contractor to provide a high quality maintenance service, with detailed planning and scheduling of work, high quality workmanship, followed by accurate and detailed recording and documentation of all maintenance tasks completed. Key Performance Indicators shall be applied to management of the Contract, with any potential extension of the Contract beyond the initial 12 month period being contingent on the performance of the Contractor.

1.1.13 As there are a variety of buildings on campus, with differing operational requirements and therefore differing mechanical services installations, it is a requirement of this Contract that the Contractor provides a comprehensive maintenance and service plan which is tailored to the specific requirement of individual buildings.

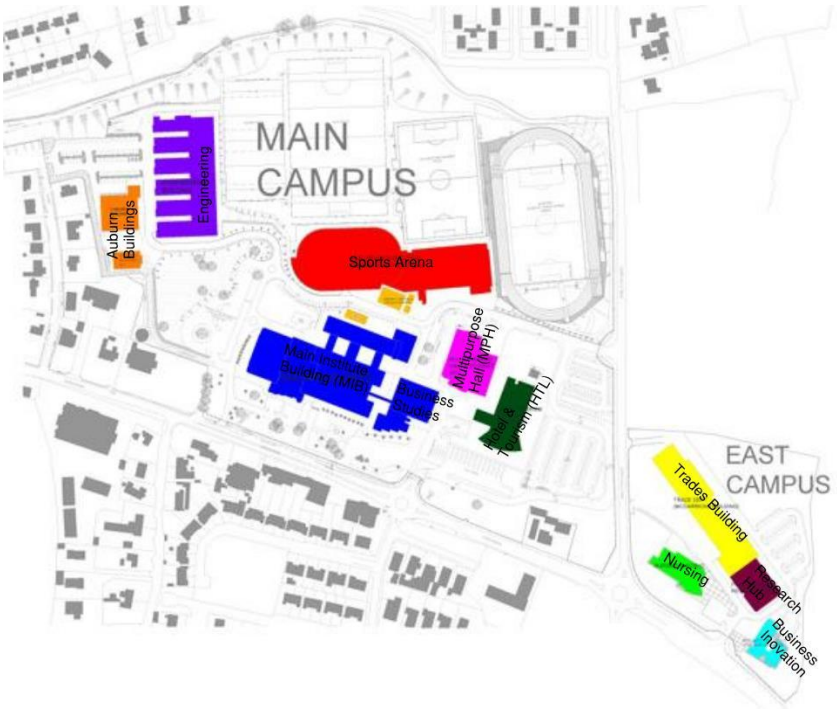
1.1.14 The Contractor shall include a minimum of 2 No. Comprehensive Service and Maintenance visits per building annually. (term to be 12 months from date of appointment). Note the Contractor may opt to increase the frequency of visits to each building however their maintenance plan must demonstrate how all of the BMS systems, devices, controls and operation, performance and optimisation etc shall be carried out with checks on all aspects to be undertaken and recorded at least twice annually. The Contractor shall note that the service contract must commence on the date of appointment and evidence of the maintenance contract being in place must be provided no later than 10 days from this date. The service visits shall be scheduled to ensure primary servicing is completed before commencement of the college term in September with an intermediate service to be completed at a six month interval.

1.1.15 Service visits shall include complete system checks and replacement of defective components. review plant operation, control loop PID's , setpoints, operational settings, proportional bands, system responses, calibration of sensors, operation of actuators, highlighting findings and making adjustments to ensure that plant operational efficiencies are maximised.

1.1.16 Energy management and optimisation shall be a core function and responsibility of the Contractor, with meter verification (power, heat energy etc.) to be routinely checked to ensure energy meter data is valid and representative of energy usage.

1.1.17 The Contractor shall provide a quantity of spares for use during service visits to replace devices where the component or device is defective.

1.1.18 The TUS campus comprises of the main campus and the east campus. In general the mechanical systems comprises of standalone systems within the respective buildings with interface to the campus BMS. The Main University Campus building and Hotel & Tourism building are served via a central energy centre.



Building	Reference keyplan	Approx. Area m²
Main University Campus Building (MIB)		18260
Engineering Building		12790
Hotel Tourism and Leisure (HTL)		3600
Multi-purpose Hall (MPH)		3235
APT and Auburn Buildings		2000
Trades Building		6065
Research Hub		
Nursing & Health Sciences Building		2375
Midland Innovation & Research (MIRC)		1255
TUS International Arena Building		14650

2.0 General Requirements and Scope

2.1 Personnel

2.1.1 The Contractor shall have in place, the appropriate suitably qualified, experienced Building Management Systems and Contract Management senior personnel to manage and implement the maintenance of the BMS and HVAC controls installations. This suitably qualified Personnel & Management team shall be assembled prior to commencement of the Contract. The TUS Estates Manager shall be provided with an organisational chart indicating the names and details of the Contractors appointed personnel. The BMS System is to be inspected, maintained and serviced by a Competent Person. Evidence of this shall be included within the tender response. The Contractor shall ensure that any personnel proposed for the project meet all requirements for experience and skill and shall have at least 10 years' experience in the commissioning and maintenance of Building Management Systems.

2.1.2 All proposed personal shall undergo full Garda vetting.

2.1.3 The Contractor's maintenance personnel shall attend a Maintenance Induction with TUS and the contractor shall ensure that the maintenance personnel are fully versed in all aspects of the building operation.

2.1.4 The Contractor shall NOT be permitted to change any member of the maintenance team without written acceptance of the client. The Contractor must maintain a consistent presence of the same personnel throughout the term of the maintenance Contract. Whilst it is accepted that the Contractor cannot account for staff leaving the employ of the company, the Client shall insist on consistency. Should TUS consider that staff turnover is negatively impacting the quality of service being provided, the Contractor shall be notified and shall be expected to take satisfactory remedial action. Where in the opinion of TUS that the remedial action taken by the Contractor has not led to a satisfactory improvement, TUS fully reserves the right to determine the Contract.

2.1.5 The Contractor must ensure that all personnel are qualified and have commensurate or additional experience and qualifications to those outlined in the Contractors tender proposals. Contractor's staff providing relief during annual leave periods must have the same qualifications and experience as the persons they are replacing.

2.2 Scope (General)

2.2.1 The scope of works as relates to this Contract shall also be deemed to include the following;

- Electrical maintenance of HVAC Control Panels / Motor Control Centres and outstations
- BMS IT equipment and systems maintenance
- BMS Hardware maintenance
- BMS Software maintenance
- BMS Graphics maintenance
- BMS related building energy performance maintenance.

2.2.2 The Contractor shall demonstrate an understanding of the BMS and all Heating Ventilation and Air Conditioning (HVAC) controlled via the BMS on the campus and shall demonstrate capacity and capability to carry out servicing and maintenance on the different system types.

2.2.3 The Contractor shall include a minimum of 2 No. Service and Maintenance visits per building annually. The Contractor shall provide a "summary" maintenance plan as part of the tender submission to include a schedule and duration of expected service visits on a building by building basis. Within 21 days of appointment the Contractor shall be expected to submit a detailed maintenance plan.

2.2.4 Each of the service visits shall be fully documented and documented evidence of maintenance carried out shall be provided to the Client for inclusion in their records. The document service report must be issued within 5 days of the completion of the service. Hand written service reports will not be accepted.

2.2.5 It shall be the responsibility of the Contractor to maintain an accurate service log, which shall clearly outline the dates of servicing and the devices tested. On review of the log, it shall be possible to identify any device and determine the most recent date on which that device has been tested.

2.2.6 The Contractor shall note that "Handover Files" are available on site containing a significant amount of information for many of the buildings. The Contractor shall develop and maintain "Maintenance Manuals" for each of the buildings, to include maintenance logs. The Contractor shall also develop and maintain, accurate and detailed BMS System asset registers. The Contractor shall assume that these manuals, logs and registers are not currently available and it will be the responsibility of the Contractor to initiate this and present draft templates of Maintenance Manuals and Asset Registers within 21 days of commencement of the contract.

2.2.7 In addition to service reports, the Contractor shall submit a monthly report to the University that includes details on the following as a minimum;

- Details of BMS Maintenance Carried out in previous month to include narrative on any key findings and observations, along with recommendations and documentation of any implemented improvements that have been made.
- Details of Control loop optimisation, sensor calibration etc carried out.
- Tracker of planned V's actual maintenance
- Details of proposed maintenance to be undertaken in the following month.
- Energy Management, Proposals, Recommendations
- Details of Reactive Maintenance responded to the in previous month
- BMS Graphics maintenance
- BMS related building energy performance maintenance.

2.2.8 The Contractor shall present the Monthly report at a monthly progress meeting.

2.2.9 The performance of the Contractor shall be monitored throughout the period of the Contract using performance indicators. These indicators shall be reviewed between TUS and the Contractor at twice annual review meetings. Should TUS highlight any areas of concern regarding the quality of the deliverables or performance of the Contractor in any aspect of the contract, the Contractor shall be required to initiate an immediate improvement plan with improvements to be clearly demonstrated within one month of issues being raised.

2.3 Programme Duration & Working Hours

2.3.1 The Contractor shall note that the Service Contract duration is a 12 calendar months to commence in September 2026. The Service Contract may be renewed annually on four occasions, subject to the client satisfaction of the performance of the Contractor and the quality of the service being provided. Should the contractor perform some act, or omission that effects the performance of the contract, or causes TUS not to fulfil its statutory duties, the Client may determine the contract.

2.3.2 The Contractor shall note that there are no restrictions to work during normal working hours, however the Contractor must be aware that the campus is a "live" operational learning environment and work may be stopped during working hours if noise is considered excessive or if works are disruptive to normal operations. Claims for additional payments or extension of time arising from such stoppages will not be entertained. The Contractor shall be expected to adapt the maintenance plan around the operational use of the buildings.

2.3.3 The Contractor shall be aware that the college is a "live campus" with access by TUS Staff, Students and campus visitors throughout the year. Buildings such as the MIB and Arena are in operation 7 days per week. The Contractor shall note that access to

classrooms and lecture theatres etc., shall be dictated by the scheduled timetable and access to the Contractors cannot be facilitated when rooms are in use.

2.3.4 The Contractor shall include a minimum of 2 No. comprehensive Service and Maintenance visits per building annually. The duration of each visit shall ensure that all elements of the BMS are comprehensively maintained on each service visit. The Contractor shall provide a "summary" maintenance plan as part of the tender submission to include a schedule and duration of expected service visits on a building by building basis. Within 21 days of appointment the Contractor shall be expected to submit a detailed maintenance plan.

2.3.5 The Contractor shall allow for attendances "after hours" for maintenance tasks that may be deemed disruptive to the operations of the University Campus. Note some tasks may be scheduled for outside term time, where the frequency of service and maintenance dictates that these may be within acceptable intervals.

2.3.6 The Contractor shall note the normal operational hours for maintenance works is 8.00am until 4.30pm Mon- Friday. Emergency call-out facilities shall be provided outside of these hours.

2.4 Standards

2.4.1 The scope of works and terms shall ensure that the systems are to be serviced and maintained in full compliance with all relevant EN standards, BSRIA and CIBSE guidelines and industry best practice.

2.4.2 The Contractor shall be specifically familiar with EN standards for Laboratory Ventilation systems, as well as guidelines for control of legionella and any other such guidelines for mechanical systems where the BMS control system monitors or controls those systems and where the implications if not operating correctly can be serious in terms Health and Safety.

2.4.3 The maintenance works to be carried out are to be in full compliance with, but not limited to the following standards:-

- CIBSE Guides.TM39,(Building Energy Metering)
- Guide F (Energy Efficiency in Buildings)
- Guide H (Controls)
- Guide M (Maintenance)
- BS 7258 Laboratory Fume Cupboards
- EN 14175 Fume Cupboards

2.4.4 All goods, products and materials shall be in accordance with the latest revision of Irish and EU Standards. All installations shall be in accordance with latest Standards and Department of the Environment Building Regulations and Technical Guidance Documents.

2.4.5 All products, materials and equipment used throughout the maintenance term shall comply with the Construction Products Regulations. All Construction Products covered by harmonised European Standards must carry a CE mark. The EU Construction Products Regulation (No. 305/2011 - CPR) shall apply in full to all products and materials proposed for use.

2.4.6 All products where applicable must comply with relevant Harmonised European Standards (hENs). All products must be provided with a Declaration of Performance (DoP). The DoP must be provided by the manufacturers and must provide information relating to the characteristics of the product and confirm the conformity of the construction product with the declared performance. The CE mark attributed to the product must follow the DoP.

2.4.7 All products and materials proposed for use during the term of the maintenance contract must be equivalent or better than the materials being replaced. The Contractor shall be expected to identify suitable product replacements where the existing product is no longer available. TUS shall require technical submittals for products and equipment proposed by the Contractor must include all relevant DoP's, and must in the first instance be verified by the Contractor before submitting to the TUS. The Contractor must verify that the products being proposed do comply with the DoP and are suitable for their intended use in construction works and suitable for the application intended. The Contractor must also refer to National Standards to ensure that any National minimum standards for specific intended uses of the product in Ireland are complied with. Where such verifications and a DoP has not been provided as part of the technical submittal, the submittal will be deemed invalid and will not be considered.

2.5 Plant & Equipment Warranties

2.5.1 The contractor shall provide a 12 month all-inclusive warranty on all works. Any new plant equipment replaced as part of the ongoing maintenance shall be provided with a minimum 3 year manufacturers warranty. The Contractor shall note that the lifecycle costs of plant and components must be considered when selecting plant and equipment and shall fully understand the consequences in terms of warranty and maintenance. All equipment selected must be provided with Manufacturer's Warranty of not less than 3 years.

2.6.2 The maintenance regime shall reflect the expectations of the plant manufacturers and the Engineer to ensure that the plant warranty, plant life and energy efficiency is optimised.

2.6.3 The Contractor shall ensure that all servicing and maintenance is carried out in strict accordance with manufacturer's instructions and no actions of the Contractor shall lead to a non-conformity with warranty instructions, or to loss of warranty to TUS.

2.6 Maintenance Schedule

2.6.4 The Contractor shall be responsible for the formulation and presentation of a complete maintenance programme, outlining the maintenance requirements of each plant element and system. The maintenance programme shall detail all service intervals for the maintenance of all plant controls, control devices and associated control loops.

2.6.5 The maintenance programme for plant shall take account of expected high demand periods and shall be programmed such that plant is always available to run when the demand is highest and at maximum efficiency. All planned plant down time shall be scheduled where there is no impact on the day-to-day building operation e.g. boiler controls maintenance shall take place outside the heating season. All down times shall be agreed with TUS Estates Manager.

2.6.6 The Contractor's proposal shall clearly stipulate all proposed maintenance requirements categorising them in terms of critical and recommended tasks. A maintenance matrix and asset register is to be included for information.

2.7 Testing & Inspections

2.7.1 The Contractor shall be responsible for a carrying out all, testing and inspections as required by the specification or by any governing regulations or codes of practice not referenced in the specifications.

2.7.2 The Contractor shall maintain an accurate documented record of all maintenance and test results to include the type of test carried out, listing all observations and findings including defects and failures. The documentation shall also give details of proposed or instructed remedial actions taken to correct any defects or failures. A retest of all failures shall be documented.

2.7.3 All systems where legislative mandatory inspection and testing is required to be carried out shall be completely and verifiably recorded and certificates of maintenance undertaken shall be presented to the TUS Estates for inspection by relevant parties or insurers.

2.8 Reporting and Logging

2.7.4 Following each service and maintenance period a report of all completed scheduled and unscheduled maintenance shall be provided to the client with a copy of to be included in the Maintenance Manual. The technicians report shall clearly describe the maintenance undertaken, highlighting were any remedial action was /is required.

2.7.5 The Contractor's service report shall be presented no later than one week after the period inspection. The contractor shall then attend a brief review meeting to discuss

the main contents of the report. This review may be informal and is intended as a means of keeping the client advised of progress and any issues that are required to be addressed.

2.7.6 In addition to the above, the contractor shall provide a monthly report outlining the maintenance to be undertaken in the following period and synopsising the maintenance undertaken in the previous month. The report shall highlight any known problems and shall illustrate what remedial action has been put in place. The report shall track previously highlighted problems, provide an update on progress and clearly highlight where a previous problem has been rectified. This report shall be presented not less than five days in advance of review meetings. The Contractor shall then attend a review meeting to discuss the content of the report, and all other general maintenance and energy performance related issues.

2.7.7 Any items requiring additional expenditure that are not included within the Contractors tender sum must be highlighted with detailed proposals and costs provided for client approval. No additional expenditure shall proceed without approval and instruction from the client.

2.7.8 The Contractor shall record all maintenance visits and service reports in a dedicated section of the Operation and Maintenance Manual. The record shall be maintained on site for review or inspection by the TUS Estates Manager or designated personnel, or client's representative.

2.7.9 The Contractor shall not leave site on any occasion leaving items unattended, works incomplete or, without informing TUS Estates personnel as to the necessary actions to be undertaken, either by the Contractor or a third party.

2.9 Call Out's

2.9.1 The Contractor shall include for 2 number standard call-outs during the 12 month maintenance term. Standard call outs shall be made at the discretion of TUS where their own maintenance team identify an issue with the BMS / HVAC controls that requires investigation or attention that cannot be deferred until the next scheduled contractors service visit. Attendance on the site will be expected within 5 working days. The Contractor shall include for site time excluding any travel or rest breaks of at least 4 hours for each call-out. Rates for additional call outs shall be as per the tender.

2.9.2 The Contractor shall include for 2 number emergency call-outs during the 12 month maintenance term. Attendance on the site will be expected within 4 hours of the call for critical issues with attendance on the site the next working day being acceptable where the issue is deemed less critical by TUS. The Contractor shall include for site time excluding any travel or rest breaks of at least 4 hours for each call-out. Rates for additional call outs shall be as per the tender.

2.9.3 The Contractor shall include for remote diagnostic support, with an appropriate engineer to respond within 4 hours of a call for assistance. The remote support shall assist with fault diagnostics, settings adjustment etc.

2.10 Demonstration and Training

2.10.1 In addition to service and maintenance attendances the Contractor will include for supplementary system training to be given to TUS technical personnel nominated by the client. Training is to be provided at a time to be agreed with the client.

2.10.2 Training shall be a minimum of 4 hours training in each of two sessions (per year of contract).

2.10.3 Training shall include specific training to the TUS technical staff on the interrogation of the control system information, trend graphs, reporting functions, identification of control loop deviations, fault finding, updates to system operation, updates to user interfaces etc. Training shall also provide advice and guidance on recommended steps for maximising the use of the BMS by TUS technical staff.

2.11 PPM and Reactive Maintenance

2.11.1 The Contract shall be for a full suite of Maintenance Services Maintenance to include the following; The following definitions shall apply to this Service Contract;

2.11.2 "**Planned Preventative Maintenance**" This relates to preventative or condition based maintenance intended to maintain systems and equipment in optimum condition and performance. Preventative maintenance is to be carried out in accordance with the best practice recommendations and is intended to maximise the performance and quality in use of the system, prevent or limit the risk of equipment failure, or to limit the damage caused by failure, maximise energy efficiency and occupancy comfort. TUS regards planned preventive maintenance as essential in reducing failures that may affect systems performance and also to reduce time and cost spent on "reactive maintenance".

2.11.3 "**Reactive Maintenance**" This relates to "unplanned maintenance" generally as a result of breakdown or unexpected failure.

2.11.4 "**Statutory Maintenance"** This relates to planned maintenance to systems or components, to ensure all of TUS's Statutory obligations and responsibilities for maintenance, testing, inspections, etc., are complied with.

2.11.5 A key objective of the Planned Preventative Maintenance regime, in addition the optimisation of the BMS system performance and life of equipment is to maximise the efficiency in use of the installations. The Contractor shall provide a holistic approach

to systems maintenance and improvements in perfomance as well as optimisation initiatives proposed and implemented by the Contractors shall be monitored and referenced as a Key Performance Indicators (KPI) during review meetings and will be considered when determining an extension to the Contract.

2.11.6 A key objective of the Reactive Maintenance, is to minimise disruption to operations, minimise downtime of reductions in system performance, minimise damage to equipment and system components etc. Restoration of the system, or operations with minimised downtime without compromise to quality of the repair. The Contractor shall maintain a log of all reactive maintenance carried out, to include details of the fault, actions taken by the Contractor and confirmation as to whether there are any requirement for follow up action. Response time, restoration time, quality of the repairs, recurrence of faults, initiatives of the Contractors shall be monitored and referenced as a Key Performance Indicators (KPI) during review meetings and will be considered when determining an extension to the Contract. Note it is an expectation of TUS that high quality preventative maintenance should lead to reduced reactive maintenance. Repeated / recurring reactive maintenance may be considered as a deficit in the Contractors approach to Planned Preventative maintenance and will be considered as part of Contractor performance.

2.11.7 Reactive Maintenance requirements shall be notified to the TUS Estates office, or shall be initiated by the TUS estates office. The Contractor shall ensure that all reactive maintenance calls are logged and that an instruction is provided by TUS to proceed with works. Time allocated to reactive maintenance shall be accurately logged and presented in service reports to TUS. The Contractor shall be expected to monitor repeat reactive maintenance where this applies on a recurring basis to specific locations, specific systems and specific components. The Contractor shall discuss recurring problems with TUS to ensure that permanent solutions are examined to avoid recurring reactive maintenance.

2.12 Delineation of Responsibilities

2.12.1 The Contractor shall be responsible for the complete maintenance of the entire Building Management and HVAC control system including the IT infrastructure on which it communicates.

2.12.2 TUS Estates personnel shall carry out visual inspections at a superficial level and shall advise the Contractor of any reportable observations. The Contractor shall be responsible for scheduled inspections of all plant areas and for all other maintenance as set out in the maintenance plan.

2.12.3 The Contractor shall be responsible for the maintenance and servicing of all BMS controlled plant and equipment on the campus with the exception of the following systems that are maintained under separate contract by others;

- Science Laboratory Fume Cupboards (vent control system to be maintained under the BMS contract)
- Mechanical Plant and installations (controls to be maintained under the BMS contract)

2.12.4 It shall be noted that the Contractor shall be expected to liaise with TUS Maintenance personnel and other contractors such as mechanical maintenance contractors on an ongoing basis and shall provide attendances on other specialists where there are overlaps between systems and servicing.

2.12.5 Where replacement of a controls device is required, this shall be carried out by the Contractor except for elements that requires a mechanical contractor to undertake the work e.g. fitting a replacement control valve. Replacement of actuator motors or sensors shall be by the Contractor.

2.13 Health and Safety

2.13.1 The Contractor shall conform to the provision of the 1990 Building Control Act, the Safety, Health & Welfare at Work Act 2005 and the Safety Health & Welfare at Work (Construction) Regulations 2013 and will be deemed to indemnify the Employer against all claims or liabilities arising from breach, by the Contractor, of such Legislation.

2.13.2 The Contractor shall act as Project Supervisor Construction Stage for the duration of the service contract.

2.13.3 The Contractor shall in respect of all persons and site activities provide for and ensure compliance with all Health, Welfare & Safety Standards and Regulations whatsoever arising in connection with the works and as between the Employer and the Contractor. The Contractor shall be responsible for the health and safety of all persons employed on the site, whether under his direct control or not. The Contractor shall ensure that safe practices and methods of work are adopted at all times.

2.13.4 The Contractor shall be aware that the college is a “live campus” with access by TUS Staff, Students and campus visitors throughout the year.

2.13.5 The Contractor shall provide Risk Assessments and Method statements for review by TUS prior to commencement of the service contract. Specific tasks such as accessing devices at high level, roof level, etc., shall be subject to detailed risk assessment and detailed method statements shall be provided by the Contractor for TUS review prior to commencement of such works.

2.13.6 Risk Assessments and Method statements for maintenance works involving Laboratory Ventilation systems shall include, notifications to TUS staff of any

shutdowns required, access to internal parts of the system (AHU's, etc.,) that may contain contaminants, etc.

2.13.7 The Contractor shall provide all barriers, signage etc. to work zones. The Contractor shall provide all suitable access platforms, ladders, MEWP's etc. The Contractor shall be expected to carry out detailed risk assessments when selecting suitable access equipment for the task.

2.13.8 The Contractor shall comply with the requirements of the construction industry's safety accreditation scheme (SAFEPASS). All trades and operative personnel are to be compliant and hold a valid "safepass" card.

2.13.9 The Contractor shall note that whilst there are a number of modern buildings on the campus there are also some buildings e.g. Main University Campus Building, Trades Building, Multi-purpose Hall, that were constructed before the time when Asbestos materials were no longer permitted. The Contractor shall be expected to include risk assessments that possibility of Asbestos materials being present, and shall ensure that Asbestos Awareness training is provided to personnel who will be attending site.

2.13.10 The Contractor shall note that plant serving some buildings e.g. Main University Campus Building, is located on flat roofs with low parapets and roof materials that are slippery when wet.

2.13.11 The Contractor shall be expected to include within risk assessments access requirements for maintenance to all plant controlled by the BMS, as well as to BMS Outstations and motor control centres.

2.14 Review Procedures

2.14.1 The performance of the Contractor shall be monitored throughout the period of the Contract using performance indicators. These indicators shall be reviewed between TUS and the Contractor at twice annual review meetings.

2.14.2 As well as the twice yearly review meetings the contractor shall be assessed in terms of the delivery of services and attention to detail in respect of the ongoing maintenance. In the event that the contractor is found to be failing in terms of the level of service and the quality of maintenance being undertaken and following a period that may be granted to improve an alternative contractor may be engaged to complete these works and any / all associated costs shall be deducted from outstanding accounts.

2.14.3 Contractor performance shall be assessed on an on-going basis. TUS shall utilise a number of mechanisms for monitoring the performance of the Contractor to include assessment under the following KPI's;

- Quality of Maintenance work.

- Quality of Documentation, reporting and logging.
- Customer Service and Interaction with the client personnel
- Energy performance and Energy Saving measures implemented
- Impact to Operations
- Response time
- Health and safety
- Improvements initiated by the Contractor

2.14.4 TUS will reserve the right without prejudice to invite other specialists to inspect ongoing or completed maintenance. Any findings will be brought to the attention of the Contractor.

2.14.5 The Contractor shall be expected to regularly update the client and to invite client personnel on a regular to witness completed maintenance.

2.14.6 The Contractor shall be expected to maintain accurate records with photographs were relevant, to further demonstrate the quality of maintenance being undertaken.

2.14.7 In the event that TUS are not satisfied with the performance of the Contractor, the Contractor shall be advised of the issues in writing and shall be given an opportunity to address issues and ensure improvement. Where improvement is not demonstrated within a satisfactory period, the client may provide a final notice to the Contractor and may at their discretion decide to terminate the contract.

3.0 Maintenance

3.1 Scope

3.1.1 The existing BMS system is a Cylon system consisting of outstations, motor control centres and a graphics based user interface front end. The scope of works associated with the maintenance contract shall include for the maintenance of all hardware, firmware, software and system components to ensure the optimal efficient running of all connected plant and equipment. Energy efficiency, systems reliability and high levels of occupant comfort are key functions that must be delivered through the effective operation and maintenance of the BMS systems.

3.1.2 The existing BMS is configured to operate on a BMS LAN on a BMS Fibre Network. The scope of works and responsibilities of the Contractor shall also include maintenance of the BMS LAN.

3.1.3 The existing Cylon platform in use on the TUS Campus includes the Cylon Active Energy system with approximately 70 meters connected to provide real time energy information.

3.1.4 The existing BMS system is interfaced with and controls the science laboratory ventilation systems. The Contractors scope of works shall include the calibration, verification validation and certification of the complete ventilation system to ensure all supply and extract systems are operating correctly at all times to ensure the safe operation of fume cupboards by TUS Staff and Students. Ensuring safe discharge of the extract air is also a requirement and this is also to be verified by the Contractor. As this is a critical safety element it is essential that the Contractor can demonstrate competence for this task and where necessary the Contractor shall engage the services of specialists, with all costs to be included by the Contractor.

3.1.5 The Contractor shall provide complete Maintenance of Building Management Systems (B and Automatic Control's Installations including but not limited to the following;

- To complete Planned Preventative Maintenance of the complete Building Managem Systems, to include all system Hardware, system Software, system field devices, syst controllers and motor control centres.
- To complete Reactive Maintenance of the complete Building Management Systems, include on-site call out support, remote login and diagnostics, on-call technical supp to TUS Maintenance staff , provisions of spares or replacement components,
- To complete systems calibration to include, energy optimisation through thorough calibration checks on control loops, calibration checks on sensors and input devices operational and calibration checks on actuators.
- To complete systems validation to include, checks and Certified calibration of Scien Laboratory Ventilation Control Systems
- To complete system checks on all Heating Ventilation and Air Conditioning Plant. Th

BMS Maintenance Contractor shall be responsible for checking correct operation of devices and control algorithms.

- The BMS Maintenance Contractor shall also be responsible for liaising with Mechani and Electrical Maintenance personnel and for reporting of any element of plant harc that requires attention where such element is precluding the controls systems from operating as they are intended, or as would be optimal.
- To complete provision of maintenance reports, fully detailed to show works that hav been carried out, observations made, actions taken and any items that are required attended to by third parties.

3.1.6 The scope of maintenance works as relates to this Contract shall be deemed to include all aspects of the following;

- Electrical maintenance of HVAC Control Panels / Motor Control Centres and outstations
- BMS IT equipment and systems maintenance
- BMS Hardware maintenance
- BMS Software maintenance
- BMS related building energy performance maintenance
- System Updates
- Graphics Updates (new graphics to be provided 30% of all per annum to be replaced with new format contemporary style animated graphics)
- System / component calibration
- Replacement of faulty components
- Energy saving upgrades
- System Point to Point checks

3.1.7 The Contractor shall through effective maintenance ensure the following;

- TUS's responsibilities under Health and Safety at Work Acts where these relate to environmental and comfort criteria controlled by the BMS are satisfied.
- Maintenance carried out by the Contractor shall ensure that Laboratory Ventilation systems and fume extract systems controlled by the BMS are operating within all relevant standards of safety.
- Ensure TUS's policies and targets for energy saving and carbon reduction where these relate to systems controlled by the BMS are satisfied. Ensure that all potential avenues for energy reduction are considered and where appropriate that these proposals are presented to TUS with a rationale highlighting the benefits of such measures and any implications that may be associated with their implementation.
- The Contractor shall implement air quality measurement as part of TUS's policies for regular air quality auditing within teaching and administration spaces.

3.1.8 Where the Contractor identifies a requirement for client expenditure outside that included within the terms of the Service Contract, the Contractor shall demonstrate the advantages of such expenditure and the expected payback on energy savings that are to be attained.

3.1.9 The Contractor shall monitor and review plant operation, control loop PID's , setpoints, operational settings, proportional bands, system responses, calibration of sensors, operation of actuators, highlighting findings and making adjustments to ensure that plant operational efficiencies are maximised.

3.1.10 The Contractor shall be responsible for the servicing and maintenance of the BMS ICT Network as part of the BMS service contract. Where the contractor does not have in house expertise in this regard it is expected that an appropriate and competent sub-contractor will be appointed by the contractor to carry out this work. The ICT Network consists of Fibre Optic installations, network switches, cables, leads and patch panels.

3.2 Electrical Maintenance

3.2.1 The Contractor shall ensure that only suitably qualified personnel with a background in the electrical trades shall undertake electrical maintenance and checks as part of the BMS Systems Maintenance.

3.2.2 The following is the minimum expected schedule of maintenance to be undertaken. Detailed checklists are to be provided by the Contractor and completed checklists are to be included as part of service reports;

- Check MCC and Control Outstations for signs of damage
- Check operation of main door electrical isolator
- Check tightness of all electrical terminations
- Check and re-torque busbar bolts
- Carry out checks and inspections of cabling
- Check for signs of overheating of components such as contactors, cables, connections
- Check panels for adequate ventilation, cleanliness, dirt, moisture etc.,
- Check settings, ratings and operation of safety devices.
- Check operation of isolators, relays, contactors and starters
- Check power quality at MCC panels and at motors, confirming correct voltage. Check Voltage and Current recording measurements for comparison with future readings.
- Carry out Thermographic survey of MCC panels
- Check operation of all panel status indicator lamps
- Check operation of all panel facia switches
- Check accuracy of panel labels and circuit chart information
- Check operation of all emergency stop and fire alarm interface functions

3.2.3 The Contractor shall bring to the attention of TUS maintenance personnel any element of electrical installations within the field that may require electrical testing or that may require attention. The Contractor shall be responsible for testing, inspections and maintenance of the electrical elements of the BMS and HVAC controls system.

3.3 Calibration of Plant

3.3.1 At regular intervals and as part of the Planned Preventative Maintenance programme the Contractor shall routinely review the "as installed" commissioning data, or previous trend graphs and check any drifting in system operation and performance from that data. Any elements which have been found to have drifted 10% or greater shall be re-calibrated and tested to ensure the plant or systems are operating within optimum thresholds.

3.3.2 Where commissioning data is not available, the Contractor shall ensure that the client is advised of any perceived irregularities and shall make recommendations to the client in respect of suggested action to be taken. This may involve engaging specialists for a design review, system commissioning review, etc.

3.3.3 The Contractor shall include for testing and calibrating all sensors verifying the accuracy of the input data. Sensor accuracy shall be verified by use of calibrated certified hand held test instrument sensors (temperature, humidity, air quality etc.). Calibration certificates for the test instruments shall be included with service reports. Offsets shall be applied to the BMS to correct any discrepancy between certified measured values and BMS indications. All programmed offsets shall be recorded and presented with service reports.

3.3.4 The Contractor shall be expected to verify the locations of all sensors in the field and where considered necessary shall make recommendations for repositioning of sensors where it is deemed that the current position is affecting accuracy of the system.

3.3.5 The Contractor shall include for testing and calibrating all actuators verifying the full stroke of the motor and measuring its response to the output signal. Actuator control and mechanical connections to the associated control valves or dampers shall be verified. Correct seating of the valves and dampers shall also be verified. All checks and actions shall be recorded and presented with service reports.

3.3.6 The Contractor shall include for "point to point" checks of all connected controls signals verifying the signal presence at the device, correct representation on the BMS controllers and accurate representation on the front end graphics.

3.3.7 Whilst not ideal, TUS recognise that calibration of all sensors and actuators and "point to point" checks throughout the campus may take longer than the initial 12-month maintenance term due to budget constraints. The Contractor shall be expected to complete calibrations and checks to at least 50% of all devices and control loops across all buildings during year 1.

3.3.8 The remaining 50% of sensor calibrations and point to point checks shall be deferred to year 2, with the cycle to be repeated in year 3. Costs submitted within the tender shall be for year 1. Note the Contractor shall be expected to carry out all other routine BMS Maintenance during year 1.

3.3.9 Where the Contractor observes unusual sensor readings, or poor control response on any system within any building, the exercise of sensor calibration, actuator checking etc., shall be carried out as part of normal expected maintenance during the maintenance term.

3.3.10 The Contractor shall include for verification of all energy metering on a twice annual basis.

Calibration of Control Loops

3.3.11 As part of the Planned Preventative Maintenance programme the Contractor shall routinely check control loop PID's and identify any "drifting" or "hunting" in system operation and performance. The Contractor shall monitor and review plant control loop PID's making adjustments to correct deviations and to improve system performance, energy efficiency and occupant comfort.

3.3.12 The Contractor shall demonstrate improvement in control function using "trend logs" indicating before and after conditions.

3.4 Energy Management

3.4.1 Energy management shall be considered as a prime focus of the Planned Preventative maintenance policy and should be reflected in the Contractors detailed maintenance plan. Optimum operation of plant and equipment is clearly understood to result in reduced energy consumption and as such the contractor is directed to examine CIBSE and BSRIA Energy saving guidelines which are directly related to the maintenance and operation of the building.

3.4.2 The Contractor shall take cognisance of energy "benchmarks" and shall be monitored by the contractor to ensure optimal operation to ensure that the building is achieving improvements on benchmark results.

3.4.3 Opportunities for further energy savings are to be highlighted for review by TUS. A baseline scale shall be set at award of contract, to allow evaluation of energy performance.

3.5 Front End User Interface

3.5.1 The Contractor shall include for updates to the "front end" operator interface, to include updates to current revisions of the manufacturer's software, application of updates etc.

3.5.2 The existing graphics have developed over years with modifications following various projects. The Contractor shall update all graphics to current best practice, to improve visual appearance, providing consistency and common structures. At least 30% of all graphics shall be fully replaced with new graphics on an annual basis. All costs with graphics development are to be included. Formats for new graphics shall be presented to TUS for approval prior to commencement. The Contractor shall also responsible for generating additional graphics to ensure that all BMS functionality and control of all spaces and plant is correctly represented on the graphics system.

3.5.3 Trending and reporting functions shall be configured for all plant and connected devices.

3.5.4 Alarm handling functions shall be reviewed such that critical alarms are identified separately to common alarms.

3.6 System Controllers

3.6.1 The Contractor shall include for replacement of legacy outstation controllers where existing controllers are no longer supported and cannot accept firmware upgrades.

3.6.2 The Contractor shall carry out an audit of all system controllers installed on site and shall advise TUS of the current status and support options. A phased replacement plan shall be developed between the Contractor and TUS with controllers to be replaced on a priority basis.

3.6.3 The Contractor shall include within his tender for installation and commissioning of 4 No. UC 32 universal controllers for replacement of legacy controllers as part of planned preventative action during the 12 month maintenance term.

3.7 System Sensors

3.7.1 The Contractor shall include for replacement of temperature and humidity sensors that are found not be maintaining an accurate measurement.

3.7.2 The Contractor shall include within his tender for installation and commissioning of replacement sensors;

- 6 No. wall mounted space temperature sensors
- 6 No. duct mounted temperature sensors
- 4 No. wall mounted Co2 sensors
- 6 No. airflow DP Switches c/w capillary tubes
- 3 No. AHU coil frost thermostats
- 4 No. Belimo damper actuators up to 3sqm
- 4 No. Belimo motorized valve actuators up to 50mm line size

3.7.3 Spares are to be delivered to the University at commencement of the service contract and shall be used during maintenance visits when the contractor demonstrates to TUS that an existing device is faulty and requires replacement.

3.8 Spares and Consumables

3.8.1 The contractor shall allow for all necessary consumables such as fuses, lamps, resistors, etc.

3.8.2 The following is a non-exhaustive schedule of spares and consumables that the Contractor shall be expected to provide and include within general rates.

- Oils and Lubricants for adhoc use
- Disposables, sand papers, wire scrubs, cleaning agents, cloths, containers etc.
- Galvanised Protective Sprays (Galvo Paints etc,)
- PVC and other insulative or protective tapes (duct tape etc.)
- Drill bits and fixings

3.8.3 In addition to the above, the Contractor shall refer to the pricing document and shall include for the supply of necessary spares and consumables that are expected to be required. These spares shall be delivered to site and stored for use during the maintenance contract.

3.8.4 In addition to client requested spares of sensors and controllers (listed above), the Contractor shall include for the provision of 4 No. motorised damper actuators of Belimo type or equal and approved suitable for fresh air AHU dampers up to 3m2.

3.8.5 The provision of spares and whether these are to be delivered to site at commencement shall be agreed with the client at initial contract meetings.

3.8.6 The Contractor shall refer to the pricing document and shall provide a tendered % mark-up rate for Overheads and Profit for any additional materials, equipment, plant item, consumables etc. that may be required from time to time. This may also include materials associated with minor works. If requested by TUS, the Contractor shall obtain comparable quotations from suppliers for the supply of requisite materials. The Contractor shall indicate in the Tender return pricing document a % mark-up rate that would apply to

supply of materials. TUS fully reserves the right to seek alternative quotations and to "free issue" materials to the Contractor at any stage. TUS also reserves the right to request copies of final invoices paid by the Contractor to the suppliers for the supply of materials to TUS.

3.9 Additional Maintenance Requirements

3.9.1 The Contractor must be capable of servicing and maintaining all of installed systems and it shall be the responsibility of the Contractor to ensure that third parties are engaged at the contractors own expense where programming and servicing capabilities for all systems are not contained within the contractors own organisation. The Client will not be responsible for liaison between specialists

3.9.2 The contractor shall complete the schedule of rates included in the pricing document relating to maintenance costs.

3.9.3 The Contractor shall as part of "maintenance" carry out a full verification and provide a documented record of the "existing" functional operations strategy for each system in each building, including verification of the operation of third party devices. The Contractor shall provide a report to the client clearly describing the programmed controls strategies and highlighting where improvements may be recommended.

3.9.4 In the event that third party elements (non BMS system components) are found to be defective or non-operational these items should be identified to the client for remedial action to be taken by the client. Verification testing should be repeated by the Contractor once the client has confirmed that remedial actions have been taken to repair identified items.

3.9.5 The verification and testing of functional operation strategies shall be completed no later than the end of the second servicing period.

3.9.6 The Contractor shall allow for changes and alterations to the control strategies each building, as may be directed by the client following their review of the Contractors verification report. The Contractor shall allow for 1 day per building to carry out revisions to the programme and 1 day per building for commissioning and verification of a revised control strategy.

3.9.7 The Contractor shall as part of "maintenance" carry out a full verification of existing "as built" drawings to ensure that all devices are accurately represented on drawings to include verification of the device type, device location and device address. The Contractor shall ensure that every device listed on the system controllers is identified on drawings. Where drawings are not available, the Contractor shall obtain layout plans from TUS and shall over the course of the maintenance term update the layouts to indicate all controls devices.

3.10 Documentation

3.10.1 The following documentation will be required to be submitted at the associated stages;

- Outline Programme of Works – Tender Stage
- Detailed Programme of Works – Commencement
- Method Statements - Commencement
- Risk Assessments - Commencement
- Test Procedures – Commencement
- Test Results / Certificates – Ongoing throughout works
- Work Reports– Ongoing throughout works

3.10.2 All reports must be in typed format and issued within 3 days of site visits. Note, Hand written carbon copy service reports will not be accepted.

3.10.3 Monthly detailed reports are to be submitted in advance of review meetings.

3.10.4 Accurate as built information and operational strategies shall be documented and presented as part of a BMS handover file.

4.0 Minor Works

4.1 "Minor Works" : At the discretion of the Client, the Contractor may be requested to undertake "minor works" which shall be taken to mean, small scale BMS system modifications, or additions to HVAC control systems. Replacement of plant, or energy upgrades may also be considered as "minor works".

4.2 The client will reserve the right to obtain quotations from other BMS Services or Specialist Contractors depending on the specifics or scale of the project. (Note this would be outside of the maintenance requirements described above, which is to be included by the Contractor)

4.3 As part of ongoing maintenance and management of the campus Building Management System Installations, TUS at its discretion may award via sole quotation additional minor works, up to a value of €50,000 ex VAT per 12 month term, to the Contractor. The value of any additional works would be in accordance with tendered rates. TUS fully reserves the right to seek alternative quotations for works of any value.

4.4 The Contractor shall include within the tender for the following "minor works" that are intended to be carried out within the first maintenance term (subject to funding). The amount included within the tender summary for Minor works will be reviewed on an annual basis at any extension to the 12 month maintenance term, and subject to identified requirement and agreement with the Clients, this amount may be considered for continued minor works elements that may be planned for subsequent maintenance terms;

- Provision of 6 No. air quality / Co2 sensors to spaces identified by TUS as part of air quality auditing exercises. Sensors shall be configured on the BMS for monitoring purposes and shall trigger alarms where threshold are being exceeded.

- Provision of 6 No. immersion sensors to water services tanks or distribution pipework for Legionella Risk Management. Sensors shall be configured on the BMS for monitoring purposes and shall trigger alarms where temperatures are such that legionella can develop..

4.5 As part of the Maintenance contract, the Contractor shall produce a detailed, building by building, plant by plant BMS HVAC Controls Asset Register. The Asset Register is to provide a detailed record to include, equipment item, manufacturer, vendor, make, model, specification and where known, date of installation. Each BMS plant component shall be Asset Tagged in accordance with details on the register. The Asset Register shall be completed in line with Maintenance schedules and shall be presented to the client on an ongoing

basis showing progress and development of the register. The register shall be completed within the 12 month maintenance term.

5.0 Existing Front End Graphics

5.1 The appendices include "screen shots" from the existing "front-end" PC terminal and are provided as a general indication of the scale and function of the existing BMS. The Contractor shall fully establish the complete extent of the BMS through system downloads and survey during the tender period and shall not rely on information contained on the graphical information provided for extent of the entire system or its functions.

6.0 Mechanical Plant Schedules

6.1 The appendices include "extracts" from the existing mechanical plant asset schedules and are provided as a general indication of the scale and function of the existing BMS. The Contractor shall fully establish the complete extent of the BMS through system downloads and survey during the tender period and shall not rely on information contained on the following schedules for extent of the entire system or its functions.