Specification for the Building Energy Management Systems (BEMS) Maintenance, Inspection and Testing Contract

At

Rutherford Appleton Laboratory

Chilton, Didcot

Oxfordshire

Contents

Scope of Contract

1. General Requirements

UKRI, Science and Technology Facilities Council (STFC) is an independent, non-departmental public body of the Department for Business, Energy & Industrial Strategy (BEIS).

STFC's head office is in Polaris House in Swindon and is outside the scope of this contract.

STFC have facilities at three main sites;

a. The Rutherford Appleton Laboratory in Oxfordshire (RAL).

b. The STFC Chilbolton Observatory in Hampshire.

c. The Cosener's House, in Abingdon.

Rutherford Appleton Laboratory is on the Harwell Science and Innovation Campus.

RAL employs circa 1200 staff made up of scientists, engineers, support services etc. The RAL site is approximately 35 hectares with 61 buildings on it. Accommodation is provided at Ridgeway House (RAL) and The Cosener's House. The Cosener's House is a grade 2 listed building with conference facilities, 50 bedrooms and 5 meeting rooms.

Ridgeway House is a purpose built accommodation facility with 123 bedrooms.

Chilbolton Observatory is one of the world's most advanced meteorological radar experimental facilities and is home to the world's largest fully steerable meteorological radar, the Chilbolton Advanced Meteorological Radar (CAMRa).

Estates Property Services provides valuable support to the front-line, scientific activities of the STFC. This support is wide ranging, from the provision of suitable sites, buildings, workplaces and information and communications technology connectivity, through to an exceptionally wide range of business and staff support services.

There is an existing, established in-house maintenance and design team that operate and maintain much of the establishment's Building Services, Plant and Equipment. This requirement is for a Contractor to work alongside the in-house team, providing a maintenance and asset replacement service to the assets defined within the documents schedules and in future developments across the RAL estate.

The Contractor is to work in Partnership with the Estates Property Services team to ensure business continuity through robust maintenance and testing of the Building Energy Management Systems. The BEMS system not only manage HVAC plant and equipment within typical office facilities but, also control environments within laboratory facilities including cleanrooms, assembly areas, satellite testing and assembly, laser facilities etc. Some of these areas have critical environments i.e.

filtration, humidity etc. These conditions can be subjected to an ISO accreditation signed off by the client. The contractor is to provide the appropriate resource to comply with the service levels within the specification.

The contractor will work with the client to ensure that the STFC sustainability objectives are at the forefront of the maintenance and operation of the BEMS controls within the facilities.

The contractor is to use the reporting data that the systems generate to inform, and propose to the client efficiency measures, system performance issues, risk to service, asset replacement and changes in service requirements.

Asset uptime and availability is critical to the operation of the facilities, access to the operational facilities is restrictive due to the nature of the operation facilities. Several laboratories have internal safety protocols that work in parallel to RAL permit to work systems.

The Contractor is to be proficient in working in environments where detailed isolation prior to testing is planned and executed to ensure maximum safety, efficient testing, remediation of defects, and minimum disruption to the operation.

1.1 Contract

(a) The Contract will cover a 4 year period.

(b) This specification will align to BESA SFG20/30 (maintenance schedules in appendix C).

(c) The Contract will be under NEC4 TSSC.

(d) The Contract will include future assets and the Contractor will be requested to price the adjustment and resource appropriately in line with this contract as these facilities come on-line.

(e) The Contract will operate within client supplied contract management software CEMAR or within future CAFM system. This is provided by the Client.

(f) Works under this contract will be instructed within this system as a ‘Task order’ which, will include details of the services that are required.

(g) All task orders are administered through the client supplied, NEC Contract Management software. This software will be set up to include all relevant clauses, early warning processes, compensation events, task orders, etc. The contractor is responsible for adopting this system to communicate contractual change, cost etc. The Contractor is to only accept instruction through the NEC Contract Management system, and with a supporting PMO number, and purchase order from STFC.

(h) All project works will be administered through the Estates Project Management office. The PMO operates to ensure that the Clients requirements are clear and reasonable, they are either an instruction for a feasibility study or to carry out works. The contractor is expected to support the PMO Manager in obtaining or, providing clear requirements, programming etc. This will ensure that the Task order appropriately instructs all parties and is an approval to proceed with the works.

(i) The contractor is to include within the pricing document, a lump sum which, will be used for maintenance items, replacement assets, etc. This lump sum is managed by the Client's Contract Service Manager.

(j) Project Cost thresholds at which, differing levels of information are provided by the Contractor in advance of an instruction being issued, i.e.

Up to £1,000 – Contractor provides a not to exceed budget /quote within 3 working days for a specified scope of works (generally, this will either be urgent or minor works). Construction Phase Plan and Programme to also be provided;

Up to £50,000 – Contractor provides within 10 working days (subject to complexity) a build up to a cost based on schedule of rates and any specific star rate items with substantiation. Construction Phase Plan and Programme to also be provided;

Over £50,000 – Contractor provides within 14 working days (subject to complexity etc) a build up for any works not covered by the schedule or rates. Construction Phase Plan and Programme to also be provided.

(k) The Contractor shall report monthly to the Service Manager on all matters concerning the maintenance planning, programming, costings, resources (both direct and subcontract labour) and progress of the Task Orders (including any shortages or delays of staff, labour, plant, materials or sub-contracts) and health and safety performance (RIDDOR, minor accidents and near misses) and stating the actions being taken, in a format provided by the Service Manager. Any action which may be taken by the Service Manager to assist the Contractor shall not relieve the Contractor of his responsibilities. The Contractor shall minute all monthly meetings.

(l) Unless otherwise agreed, the Contractor must commence work on a Task Order within 2 weeks of it being received, subject to the necessary materials being available. The Contractor shall at all times try to minimise the actual and perceived total disruption time to the end user of work on site.

(m) Where the Task Order requires method statements, risk assessments or permits to work to be submitted for approval by the Service Manager, they shall be submitted no later than 5 working days prior to the agreed date to commence the works. Works must not commence without the prior approval and acceptance by the Service Manager of the Contractor's proposals; where information submitted is not acceptable or requires amendment, it is to be re-submitted and agreed with the Service Manager before commencing the works. Approval by the Service Manager shall not relieve the Contractor of his responsibilities under the Contract.

(n) The Contractor must agree and give reasonable access to the Client, Service Manager and/or its agents to carry out audits and checks of the Contractor's records to verify compliant operations in relation to adherence to method statements.

(o) The Service Manager may revise the time for the execution of the works if the Contractor notifies him in writing before commencing the works that the stated time on the Task Order appears unreasonable.

(p) The Contractor will be required to prepare and submit a programme before starting the works. The programme will be in an approved form and will be expected to include planning and mobilising, details of design and production information, critical activities, earliest and latest start and finish dates, testing and commissioning etc. including the work of sub- Contractors.

(q) The Service Manager for each individual Task Order will certify acceptance of work done. The Service Manager will confirm the completion of each individual Task Order, the date from which a maintenance period, of a minimum of 12 months, shall commence. Upon the completion of the maintenance period and the satisfactory completion of any defects or outstanding works, the Service Manager is to certify the completion of the Task Order.

(r) Mobilisation costs are paid by the Contractor. Mobilisation costs should include as a minimum any start-up costs, IT, project management software systems, contract training etc. These costs are not fees, and if not required or delivered, not charged at the Clients discretion.

(s) STFC will provide safety and site induction specific to working at RAL and its locations i.e. working on site, lone working etc.

(t) It is a condition of appointment to this contract that the Contractor employs on the Client's sites, only persons who have satisfactorily completed a DBS (Disclosure and Barring Service) application form and received a DBS Certificate, available online from www.gov.uk/government/organisations/disclosure-and-barring-service .The method the Client will use to monitor and audit this will be advised during the tender period or before mobilisation.

The Contractor will be required to achieve Baseline Security Clearance of all of their operatives and Sub-Contractors. Information on these requirements can be found;

https://www.gov.uk/government/publications/government-baseline-personnel-security-standard

(u) The Contractor is to include for all current and future known revisions in statutory compliance, including but not limited to National minimum and living wage, CDM regulations, changes in NEC4, British Standards, BESA SFG20 etc.

(v) A schedule of all equipment to be covered under this contract is given in the BMS Asset Register (Appendix B). This includes any equipment already planned to be installed during the contract period and that will need to be added for Annual Inspections when these items are put into service.

(w) The Contractor is to bring to the notice of the Employer any discrepancies or variations from the equipment described in the BMS Asset Register (see Appendix B) within the first 180 days of the contract. This is to include the verification report as described within this specification.

(x) The Contractor is to confirm the Forward Maintenance Plan against the assets detailed in Appendix B

(y) and compile an Asset Replacement Plan for assets that are included in their issued Asset Register. This shall be produced within the first 180 days of the contract. This should cover age, condition, parts availability, wiring condition and standards, compliance, labelling etc.

(z) The Asset Replacement Plan is to be fully costed to include Labour, Materials, and Plant, age and condition of asset, and a description on why the asset should be replaced (i.e. efficiency, criticality, obsolescence, and health and safety risk). The plan should also include an estimated programme of works and highlight any business impacts and any enabling factors that will affect the asset replacement/programme of works. Replacements shall conform to the RAL Standard Specification for installation methods and manufacturers. As part of the asset replacement plan, the Contractor must also complete asset tagging, and update list.

(aa) The Contractor is to demonstrate value for money by utilising contracted rates for their direct labour and sub-Contractors. These rates are to be included within the Tender under the Schedule of Charges (See pricing schedule). The Contractor will be required to quote for additional works and may be asked for supporting quotations and back up for full cost transparency.

(bb) The Employer encourages the Contractor to compete for these additional works. However, these works may not be singularly awarded to the Contractor, and the Employer can openly tender or include within other works packages (i.e. property refurbishments). Parts shall conform to the RAL Standard Specification for installation methods and manufacturers.

(cc) Assets can be added and removed from the Asset Register by the Employer and the Contractor is to update their own register confirming these changes in their report.

(dd) Where additional works are determined necessary by the Service Manager, the Contractor shall provide the additional resource. These visits shall be at a time to be agreed with the Service Manager and may take place outside normal working hours. Such work be charged at the labour rates detailed in the Schedule of Charges.

(ee) All prices to be quoted by the Contractor, and agreed with the Service Manager, prior to the work taking place.

2. Hours of Work

(a) The normal hours of working at the Rutherford Appleton Laboratory and associated sites are:

Monday to Thursday	08:00 – 16:30
Friday	08:00 – 16:00

Unless otherwise agreed between the Contractor and the Service Manager Annual Inspections shall be carried out between these hours. The requirements for Periodic Maintenance shall be agreed between the Service Manager and the Contractor.

(b) At all times the Contractor shall report to the Service Manager or his deputy at the start and finish of each working day.

3. Inspection of Site

(a) It is essential that prior to tendering the Contractor visits the sites to ascertain all the necessary information as to the risks and working procedures that may affect the tender sum. No claim for extra payment will be considered as a result of any misunderstanding or lack of awareness of the risks, working procedures, or condition of equipment at the Rutherford Appleton Laboratory. This site visit would be carried out under the sites COVID 19 Risk assessment, induction etc. If the Government Level changed to level 4, then the site visit would be cancelled, but not delaying the tender process as the Contracting Authority have provided sufficient information in order for bids to be submitted against the specification, the site tour will be only to familiarise yourself with the geography of this site.

(b) The remote sites of Chilbolton Observatory (a radio dish and other antennae near Andover, Hampshire) and The Cosener's House (a hotel in Abingdon, Oxfordshire) are both small establishments comprising of a small group of buildings.

4. Access to Premises

(c) The Contractor shall be offered reasonable access to the areas where the equipment is located. The Service Manager shall ensure that area representatives are made aware of any work taking place.

(d) Access to areas which are restricted, shall be arranged through the Service Manager prior to work being carried out, and any specific safety issues forwarded on to the Contractor by the Service Manager in advance of any Risk Assessments or Method Statements being produced.

(e) Some equipment is situated within Classified Ionising Radiation areas. Safe Systems of Work will be issued by Health Physics and permissions obtained from the persons responsible for those areas prior to any such work taking place.

(f) The Service Manager shall ensure that the Contractor is aware of the equipment situated in these areas for inclusion in their Risk Assessments and Method Statements

5. Records

(a) The Contractor shall provide a full report for each Annual Inspection, and any faults, failures, or non-conformities discovered during the visit shall be highlighted. This report shall be, and remain, the property of STFC.

(b) The Contractor shall provide a full report for each item of equipment maintained under Periodic Maintenance. These reports shall be passed on to the Service Manager at quarterly meetings following the maintenance where any faults or non-conformities shall be highlighted

6. Work Performance and Safety

(a) The Contractor shall keep the Service Manager informed of any additions, deletions, or other changes to any staff members utilised throughout the duration of the Contract. All operatives working on STFC equipment and systems must be in possession of a Letter of Appointment as a Nominated Person (Electrical) for covering the equipment or system being worked on. This letter will be issued by the STFC Authorising Engineer (Electrical).

(b) All works shall be carried out in accordance with the following legislation, regulations, or codes of practice:

(a) Health and Safety at Work Act 1974

(a) Electricity at Work Regulations 1989

(b) The Electricity Safety, Quality, and Continuity Regulations 2002

(c) The Provision and Use of Work Equipment Regulations 1998 (PUWER)

(d) Management of Health and Safety at Work Regulations 1999

(e) Reporting of Injuries, Diseases, and Dangerous Occurrences Regulations 1995 (RIDDOR)

(f) The Ionising Radiations Regulations 1999

(g) STFC Safety Codes (especially Safety Code 34) available at https://www.she.stfc.ac.uk/Pages/STFC-Codes-(numerical-order).aspx

(h) All other relevant safety legislation

All New operatives who are to work at the Rutherford Appleton Laboratory must attend a site induction (held each Monday morning at 09:30) to familiarise themselves to the specific Health and Safety requirements of the site. This is an annual requirement.

7. Key Performance Indicators

a. Purpose

The purpose of this Schedule is to outline the Client's proposal for the utilisation of Key Performance Indicators (KPIs) in the contract the 'Essence' of the KPI measurement is that both parties work at delivering appropriate service levels. Under this contract the contractor is to suggest best practice, through innovation, Health and Safety, maintenance and construction techniques, procurement, project management, and customer satisfaction.

The KPIs will be reported separately for each individual section within the contract.

It is the responsibility of the Contractor to submit KPI results for the contract to the Client's Representative in line with this schedule, the Management Information, Benchmarking and NEC 4 Agreement requirements.

b. Key Objectives

The contract KPIs are as identified on page 13. They are designed to ensure that the Contractor is complying with the terms of the contract, and that there is an adequate performance by the Contractor throughout the duration of the contract.

The Contractors 'Performance Exposed % Fee' is 5% of the monthly application account for the reporting period. The objective is for the contractor to have a key focus on:

- Health and Safety.
- Stakeholder Engagement and Management.
- Quality and Client Satisfaction.
- Construction time and Cost.
- Continuous Improvement.

The KPIs stated may be altered, added to or removed entirely, throughout the duration of the contract and will be subject to reviews.
The Contractor's KPIs must exceed the action level stated.

c. Frequency of reporting

The frequency of reporting is detailed in the table on page 13, Schedule of KPIs however this is subject to change throughout the term of the contract.

d. KPI Reported Status

Each KPI will be given a colour status depending on the target and action level as stated.

- Target met = Green
- Target not met, but exceeded action level = Amber
- Target not met, below action level = Red

Each KPI is individually weighted, as detailed in the table on page 13
In each reporting period the Contractor will be expected to achieve a total weighted KPI score of 90% or greater.

e. Individual KPI Performance Failure

In the event that the Contractor fails to exceed the action level stated for a KPI, the Contractor shall submit an Exceptions Report and Action Plan to the Client for consideration.

The timescales for the submission of an Exceptions Report and Action Plan is 1 week.
The Exceptions Report shall document the factors that lead to the KPI failure.
The Action Plan shall indicate the remedial measures, which, will be taken to improve performance.

f. Persistent overall KPI Performance Failure

In order to avoid repeat failures in overall contract performance of the contracts KPIs, an escalation procedure **may be applied** as follows:

- Reporting Period one (1) – total grouped KPI period score 75% or less: **No % fee paid**
- Reporting Period two (2) – continuous total grouped KPI period score 75% or less: **No % fee paid and written warning issued.**
- Reporting Period three (3) - continuous total grouped KPI period score 75% or less: **No % fee paid and Client is entitled to issue notice of termination.**

The Contract Assessment Summary (CAS) total is calculated as follows:

From a Score Card:

Excellent	4
Good	3
Acceptable	2
Poor	1
Very Poor	0

Example Weighted Average with %

Grade %	**Weight %**
80 %	40
70 %	30
40 %	30

Convert to Decimals:

(0.8 x 0.4) + (0.7 x 0.30) + (0.4 x 0.3) = 0.32 + 0.21 + 0.12 = 0.65

Average % with weighting 0.65 x 100 = 65%

The percentage of profit payable shall be dependent on the performance of the Contractor against the total KPI scores. These indicative targets are shown below:

Total Grouped KPI Score	Profit Payable
75% or less	No % fee payable
80% or less	20% of % fee payable
80.1% - 84.9%	50% of % fee payable
85% - 89.9%	80% of profit payable
90% - 100%	100% of profit payable

Fig 1.

g. Critical KPI alert

- Not all KPIs will have a 'critical level' applied.

- In the event that a KPI fails to exceed the critical level stated, the Client may:

    - Insist on immediate action to be taken to rectify the critical failure within one (1) working week; or
    - Issue a notice of termination.

Schedule of KPIs

Please note this list is subject to change throughout the duration of the Framework Agreement, any amendment will be agreed between the Client and the Contractor.

STFC Reporting Requirements			Reporting Requirement			Target Level	Action Level	Critical Level	Weight applied
Area	Description	Purpose	Responsible	Frequency	Source				
1. Invoicing Accuracy	% of invoices submitted for payment that do not meet the requirements detailed in Call off, Price list, Task order detail etc.	To ensure that all invoices submitted for payment are in line with the requirements and therefore paid promptly.	Contractor's Representative	Every month	PMO KPI Scorecard	95%	90%	75%	30%
2.Terms and Conditions	Adherence to all Contract Terms and Conditions. 0 - 4 Score	To ensure that the Contractor is adhering to the Terms and Conditions set.	Client's Representative	Every month	Contractors Report	3	2	1	N/A
3.Compliance – Information Requests	% of information requests, quotes, Order of cost etc responded to within the agreed timescales.	To ensure that all responses are received by the relevant named individual in accordance with the mandatory contractual arrangements or agreed timescales.	Contractor's Representative	Every month	PMO KPI Scorecard	95%	90%	80%	30%

4.Compliance – Cost Certainty	Adherence to the costs (PPM Schedule etc) submitted and agreed within the Contract, Task order etc.	To ensure that all work is completed in line with the agreed costs provided, including any agreed changes to costs.	Contractor's Representative	Every month	PMO KPI Scorecard	95%	90%	80%	30%
5.Performance – Complaints	% of complaints raised by the Customer that remain unresolved, not including those relating to time or costs.	To ensure that all complaints are monitored and actioned as appropriate.	Contractor's Representative	Every month	PMO KPI Scorecard	95%	90%	N/A	10%
6.Health and Safety	Number of RIDDOR occurrences (reportable and non-reportable).	To ensure the adherence to all Health and Safety regulations and policies.	Contractor's Representative	Every month	KPI Scorecard	3	1	N/A	N/A

The Contract Assessment Summary (CAS) total is calculated as follows:

KPI 1. 95% Score 30% Weighting – 0.95 x 0.30 = 0.285
KPI 2. Scorecard
KPI 3. 95% Score 30% Weighting – 0.95 x 0.30 = 0.285
KPI 4. 95% Score 30% Weighting – 0.95 x 0.30 = 0.285
KPI 5. 95% Score 10% Weighting – 0.95 x 0.30 = 0.095
KPI 6. Scorecard.

Total 0.95 x 100 = 95% compliance score.

8. General Governance

The Contractor is encouraged to discuss Best Practice around the provision of the Services. The forum should aim to share initiatives and specific successes. For avoidance of doubt, it will be the responsibility of the Client to provide a suitable venue.

As the contract operates under NEC4 TSSC, and promotes innovation, the Client reserves the right to share proposals for Incentivisation Scheme with other Contractors providing Services to the Client. Any innovation suggested by either party during the contract period to improve service, reduce cost, and improve quality and customer experience will be presented at the monthly review meetings, and reviewed.

9. Capturing Asset Information.

Whenever a new asset has been installed or an existing asset upgraded, under a Term Service Contract Task Order, the details should be passed to the Client's helpdesk to update the asset information on the Client's CAFM system. The contractor is to follow the PMO process, and utilise the format, capture sheets and barcodes (issued by the Client). The asset data is to be either captured on the approved template or using the clients mobile App.

If the new equipment is a replacement, the old equipment will also need to be removed and disposed off-site, and the asset register on the CAFM system updated accordingly to 'Disposed' or the status of the asset changed on the system (i.e. out-of-service/decommissioned), where assets are agreed as remaining on site. The new equipment should be allocated a new barcode and registered on the asset register on the CAFM system.

When there is a new building or an extension to an existing building, the assets for the building/extension will need to be placed on the system and will need to be treated as a new asset and allocated a barcode and recorded on the asset register of the CAFM system.

The relevant SFG20 maintenance code should also be submitted for each asset as soon as possible along with any warranty information to enable the Client to manage issues/maintenance during the warranty period.

Assets are to include all electrical and mechanical plant, building fabric and other such items held on the Client CAFM system. Full details available on request.

10. Audits and Spot Checks.

The Client may carry out periodic audits of the aforementioned quality assurance systems at approximate intervals of three (3) Months and may carry out other periodic monitoring, spot checks and auditing of the Contractors quality systems. The Contractor shall ensure that the Client shall have a like right in respect of any relevant Sub-Consultants. The Contractor shall co-operate and shall ensure that any relevant Sub-Contractor co-operate with the Client including providing it with all information and documentation which it reasonably requires in connection with its right under this clause

The Client may also utilise an independent Audit Consultant, who is responsible to the Client. The Contractor will be responsible for liaison with the Audit Consultant and for implementing points arising from the audits.

Prior to the Monthly Review and Governance meeting, the service manager will select at their discretion, 3 projects to review the compliance to KPI's, quality, progress, and value for money, Health and Safety etc. The Contractor will be given one weeks' notice prior to the review meeting to prepare evidence such as programmes, Health and Safety files, account information etc.

11. Trend, RDM, BEMS Specification

The Contractor shall provide a professionally managed, high quality BEMS service support, energy and integration contract that as a minimum complies with:

- Manufacturers recommendations as set out in their O&M schedules or as required to meet the needs of the as-built environment.
- Relevant BS EN Standards
- SFG20/30 schedules
- UKAS - ISO 9001 (or other QMS approved by STFC)
- UKAS - ISO 14001 (or other EMS approved by STFC)
- UKAS - BS OHAS 18001 or CITB SSTS (Site Supervision Safety Training Scheme), CHAS, Safe Contractor, Construction line.

Through the use of industry best practice and the introduction of innovation, the service will achieve and demonstrate value for money on a continuous basis.

The contract period will be for a 4 year term, subject to satisfactory performance and ongoing requirement by the Science and Technical Facilities Council (STFC).

The Contractor shall deliver, but not limited to:

(a)	**Scope**
	The mechanical plant at the STFC Harwell is controlled by a Trend Building Energy Management System (BEMS), which has been fully integrated to form a complete functioning site wide system. The systems comprise of approximately 280 IQ2, 3 and 4 controllers along with approximately 100 IQ Eco's and IQL's. The maintenance and service contract will ensure the performance standard for the entire Building Energy Management System is met, including delivered environmental conditions and plant operating efficiencies and compliance. STFC requires a Building Energy Management System (BEMS) specialist to undertake the maintenance and support of the BEMS and associated systems and networks. This maintenance and service contract shall ensure the performance standard for the entire building control system is met, including delivered environmental conditions, plant operating efficiency and occupier comfort.

(b)	**Company Credentials**
	Expertise and Probity In order to demonstrate suitability for undertaking these Services the tenderer shall provide the following information: Quality Management System accredited to: UKAS - ISO9001, or equivalent (or other QMS approved by STFC); Environmental Management System accredited to: UKAS - ISO14001, or equivalent (or other EMS approved by STFC); Manufacturer accreditation for installation and services: Main Manufacturer TREND Technology Centre TREND Systems Integrator RDM Resource Data Management Approved Partner with national coverage Accreditation with at least one of the following schemes is required: CITB SSTS (Site Supervision Safety Training Scheme). CHAS Safe Contractor Construction line UKAS - OHSAS 18001
(c)	**BEMS Overview**
	STFC has invested heavily over a number of years in Building Energy Management System (BEMS) equipment, utilising and integrating existing systems and introducing as much new technology as possible in order to maintain/improve environmental conditions and save energy. STFC has benefited from the use of a central supervisor software solution, which has allowed the BEMS system to be supported from a central location. This has prevented major disruption to the plant and equipment in the buildings on this site by helping to quickly identify faults.

	The BEMS networks consist of several older networks/protocols interfaced with modern high-level communications networks/protocols across the various buildings on the contract. The site has a Trend BEMS system installed with various ages of this equipment installed across it. The BEMS system is key in helping to reduce energy consumption and it is essential that the software systems operate at maximum efficiency at all time to maintain the savings that are currently being achieved. **A properly maintained and managed BEMS system:** • Reduces energy consumption and CO2 emissions • Reduces operating costs • Minimises plant downtime by effective alarm monitoring and response • Extends plant life using anticipation of plant failure • Reduces lifecycle costs of installed plant • Reduces occupant complaints In conjunction with the Trend BEMS the site operates a Resource Data Management (RDM) energy monitoring system giving STFC staff access to in-depth utility user graphics. The BEMS contract is currently supported by a manufacturer trained BEMS Engineer, who is site based. This Engineer is to be supported by technical engineers; and a Senior Service/Contract Manager who all have a full understanding of the sites. Regular site visits will be required to ensure that the latest version of BEMS software is installed and maintained on all client's PC software. Whether this be the current software package or an alternative offered by the BEMS contractor.
(d)	**Safety, Health & Environment**
	The tenderer shall demonstrate they have in place a system for maintaining compliance with and records for the relevant health, safety and welfare regulatory standards:

	• STFC Safety, Health and Environment statement • Safety, Health and Environment policy. • Accident statistics • Structure and organization arrangements for safety issues. • Management review process • System for issuing safety alerts • Details of staff training • Written procedure for safety isolation of electrical circuits • Method statement for completion of the 'services' • Sample site risk assessment The tenderer shall demonstrate that intended site staff are trained and instructed in the safety procedures, which are relevant to their work. Site staff shall in particular complete and maintain the following standards and training: • Asbestos Risks • Electrical safety • Use of step ladders • Eye protection • Fire safety • Hazard identification All site staff shall have current certification in the following: • Electrical Competency 0-1000v AC • Construction skills certification scheme • Portable appliance testing of engineer equipment All maintenance work is to be risk assessed and recorded before commencement. If risks are identified, then no work is to proceed until those risks have been eliminated or reduced. Site staff shall be in possession and trained in the use of the following personal protective equipment: • Goggles & safety glasses • Safety Gloves • Safety shoes/boots • Insulated hand tools to 1000v • Static mats • Gauntlets
(e)	**Individual Credentials & Qualifications (which will apply to all engineering tasks)**

	The chosen contractor will provide Engineers who are suitably qualified, experienced and trained in the work that they are carrying out. Copies of competency including training, qualification records including BS7671 18th Edition Electrical Wiring Regulations and CSCS and accreditation will be supplied with the tender return. All Engineers undertaking work on the Trend BEMS shall have all the relevant training that is required for the contract. This includes IQVision, IQ engineering and others as may be required to carry out the service work. All engineering tasks to be carried out by holders of a current Trend Technical Support PIN. Tenderers will be required to provide prior evidence for all engineers working on site to include copies of the following as a minimum: Current DBS Enhanced Checked (renewable within 36 months) CSCS Card Holder Manufacturer technical certification BS7671 18th Edition Electrical Wiring Regulations Tenderers will provide evidence that all engineers working on their sites have completed the following Trend training courses as a minimum: 963 Operator 963 Engineering System Engineering IQ Engineering SET Communications IQ Eco Engineering TONN Engineering IQVision Other requirements for the tenderer will be to prove that engineers have the following requisite skills: Experience with RDM enterprise software including Active FM and KEWEB TDB Experience with RDM/BACnet interfacing protocols Experience in using the RDM energy monitoring platform Extensive knowledge of RDM's data manager and its configuration Experience of monitoring and metering of HV systems Tenderers will be required to provide evidence of credentials and qualifications for all engineers working on site prior to the

	commencement of the services and upon request of STFC at any time during the contract period. The Supplier warrants that Engineers assigned to carry out the Services are technically and physically proficient and capable of carrying out all services under the contract.
(f)	**Planned Preventative Maintenance**
	BEMS equipment and installed services must be maintained in accordance with the Asset schedule detailed in Appendices B. The PPM work will be carried out so as to ensure the absolute minimum interruption to the normal working of the buildings. Where interruption to normal operation is required, this shall only be approved in advance by the BEMS Manager or nominated deputy. Back-ups must be taken of the complete SET project for all sites bi-annually, or after any major controller configuration change. An additional copy must be uploaded to the client's back-up system. The tenderer will be responsible for maintaining a copy of the backup stored on an electronic database system with remote capabilities to enable access in the event of a reactive callout. The tenderer will ensure full compliance with the following Planned Preventative Maintenance Regime: Control Panels Visual checks of control panel inside (signs of overheating, water ingress etc. and clean as necessary) and report; Visual check of control outside (rust, broken lamps / switches etc) and report; Mechanical spot check / test of terminal tightness and rectify as necessary; Check that all control switches are in the 'auto' position (if not report back to the BMS Manager BMS or Technician); Check all control panel lamps and report as necessary; Report whether the BMS drawing / wiring diagram / manual is present and up to date; Check local panel UPS units that support BMS equipment. Plant Visual check of the plant and its surroundings (obstruction / damage / build-up of debris, vibration and unusual noises etc.).

	User Interface Displays (IQ View 4 and IQ View 8) Check the operation of the control buttons. Check the operation of the modem (request office to dial up the system). Check the operation of the front-end PC and all pages and values are correct. Overall Checks Inspect for damage to detectors on plant etc. Inspect valves and linkages for free operation; Report any signs of leakage on glands; Carry out a percentage of functional tests on each visit and report any defects. (Note: All valves are to be stroked once per annum.); Calibrate controls as necessary. Check devices are working correctly, e.g. differential pressure sensors / switches; Check operation of all control units, relays, starters, transformers etc.; Check fuses for correct size, type and overloads for correct operation – annually; Spot check all terminations for tightness, signs of arcing or overheating; Visual wiring inspection and report deficiencies as necessary; Full operational check. Caution must be taken to ensure is not inadvertently shut down; Check air / water flow proving switches etc. (by turning off fans / pumps) – permission must be sought before turning off fans and pumps in Critical Buildings (a list of which will be provided by the BEMS Manager prior to the start of the contract); Switch on and off the whole system (by adjusting time schedules) only with prior authorisation to turn off systems; Check the operation of all plant faults (by tripping out overloads, high limit stats and dirty filter switches etc.). Caution must be taken to ensure services are not inadvertently shut down; Where plant must be shut down for reasons of critical safety, this may be done by the Engineer using their professional judgement but must be reported immediately to the BEMS Manager or BEMS Technician; Check the operation of the frost protection devices. Caution must be taken to ensure is not inadvertently shut down; Record the frequency values of all VSD units and check these match the BEMS outputs; Check through the alarm log and remedy any problems. Check through the temperature log (calibrate any sensors if required within limits (to be advised at contract start); Control loop fine tuning;

	Optimiser fine tuning; Take a backup of the system after any change to the controls or upgrade to the software. The following minimum maintenance tasks are to be undertaken for each BEMS outstation at least once per annum: Visually inspect electronic control components and PCB condition; Make a back-up of any resident software; Check controller settings and record all values; Check time and date settings; Check system parameters; Visually check all electrical connections; Check earthing to control system; Check screening on out-going cables; Confirm the controls operate in-line with design specification; View alarm messages and check/correct any spurious alarms; Check plant start-up sequence; Check output command relays; Check plant shut-down sequence; Check plant fire shut-down operation; Check all frost protection programs and function; Simulate summer/winter conditions; Carry out control loop fine tuning; Write a report based on the work undertaken; Inform the client of any necessary action that will be required; The following maintenance tasks are to be undertaken for each BEMS outstation at least once per annum. Test operation of valve actuators; Test operation of damper actuators; Test operation of sensors; Test operation of transducers; Check operation of digital inputs; Check operation of digital outputs; Check relay operation and condition; Re-calibrate transducers (as necessary); Re-calibrate valve start points and actuator travel times; Test shut-off operation of spring return actuators; Test operation of high-low limit thermostats; Test operation of frost thermostats and capillary sensing area; Test operation of pressure switches; Check control valve operation (let-by, shut-off and leakage); Test emergency stop button operation (providing it is safe to

	do so); Test Fire/Smoke Shut-down operation (providing it is safe to do so); Write a report based on the work undertaken; Inform the client of any necessary actions that will be required. The following maintenance tasks are to be undertaken for each BEMS Computer at least once per annum: Obtain and record all passwords for the supervisor computer; Back-up BEMS data from the computer hard drive; Check all serial and parallel connection points; Remove all temporary files; Check remaining disk space, defragment if necessary; Remove old alarms; Re-start and check time and date; Check communication to the Building Energy Management; System network Check operation of all BEMS functions on the graphical or text Pages; Write a report based on the work undertaken; Inform the client of any necessary action that will be required to improve the system further; Annual BEMS Maintenance activities as a minimum to include: Review of all BMS graphics to confirm that they are reading correctly; Review the BMS graphics to confirm they are a reasonable representation of the systems Schematics; Review of set points and dead bands; Review of real occupancy hours and level (with the building BEMS Manager); Discussion of perceived performance/ comfort levels; Review sensor and driver plots and compare with actual occupancy; Detail performance review of weather compensation; Detailed performance review night set back where used; Detail performance review of night purging where used; Detailed performance review of heat reclaim devices where used;
(g)	**Remote & Onsite Response**

The tenderer will have in place a local provision for a dedicated established, Site Based, Senior BMS Engineer Resource. This engineer will support/work closely with the Clients BMS engineering team in the delivery of Reactive response, PPM, Energy Management and asset replacement. First response will be with the on-site BMS team, and the contractor's on-site resource is to support this first response.

The on-site engineer is a dedicated resource to this contract provided by the contractor. The engineers workflow will be managed through the Clients CAFM system (PPM schedules etc) and managed by both parties to ensure appropriate use of resource, and support to the facilities.

The contractor is to be capable of working with the Client to design and develop a remote monitoring capability utilising the Estates BMS Trend and RDM systems, to support the strategies set out in this contract. This includes but not limited to;

- Management of building environment
- Energy Management, Energy reduction.
- Conditioned based maintenance
- Critical Environment management
- Asset up-time, and system parameter compliance.
- Perpetual Commissioning etc.
- Support the on-call engineering teams.

This 'Future' facility will provide for continuous remote diagnostic support in the event of any BEMS fault occurring allowing for 24 hour continuous emergency cover to be provided offering call out site response within 4 working hours.

STFC will request assistance for remote or site callout response as outlined below and as per the following criterion:

If required, available 24hrs with directly employed trained engineers (holders of current Trend Technical Support PIN) available 24/7 365 days a year;

The tenderer shall provide evidence of resource resilience in providing the required site attendance.

On request access to the manufacturer Technical support specialists will be made available in order to provide advice and assistance with exceptional technical matters;

	Must have the ability to access and support all generations of currently supported Trend products in order to interrogate and resolve site issues. This includes all Trend hardware variants and devices including all associated platforms and system protocols configured across STFC buildings. The ability to remotely monitor critical alarms (energy alarms, plant alarms, condition based maintenance alarms) and provide immediate notification through an agreed escalation procedure; All fault calls to be tracked via a unique reference number associated to each call and log activity for the production of reports; Fault call site reports will be produced in electronic format and provided to the customer within 24 hours along with details and costs for any required remedial works. Reports will detail the nature of the fault, actions undertaken by the tenderer to resolve and any requirements for action by the end user of the system.
(h)	**Remote Connectivity & Alarm Monitoring**
	The tenderer will provide and maintain remote IP Ethernet connectivity to site to monitor alarms and provide remote access if required. The tenderer will develop an overarching strategy for site critical alarm monitoring in conjunction with STFC. This strategy will allow for the ability to remotely monitor critical alarms (energy alarms, plant alarms, and condition based maintenance alarms) from STFC sites and provide immediate notification through an agreed escalation procedure.

(i)	**Critical Parts Availability**
	STFC will free issue all spares, apart from test equipment, laptops, etc. The spare components will include controllers and peripherals deemed to be critical to the continued operation of critical facilities and plant. This will include controllers, sensors, input/output modules and similar equipment. The quantities and types will be estimated at a realistic amount based on discussions with the BEMS Service Manager and with reference to the STFC Trend and BEMS Asset Register (Appendix B). The Employers has allowed a lump sum of £100,000.00 p.a. which, the contractor is to allow for in their annual costs. This will be managed by the BMS Service. Please note this is a provisional sum and not all of these funds will be committed. The contractor will support the Client with stock management identifying critical parts, parts with long lead in times, rare parts, etc. These parts will be stored in a secure location onsite to be used for critical hardware replacements in and out of hours when required. The contractor is invited to quote for the supply of these parts. Critical hardware used and replenished accordingly over the contract period. The tenderer shall maintain a critical spares list and review stock levels on a quarterly basis; Spare parts shall be refreshed to ensure parts meet current specification and warranty;
(j)	**Software Upgrades & Support**
	The Contractor is to provide System Engineering Tool (SET) will be provided to STFC and will be supported for the contract term to allow the end user to write strategy for the Trend System. This software will always need to be of the latest version and providing the PC meets the minimum required specification, upgrading of the SET will be carried out on a continuous basis as to enhance the software with its improved operability to the user; Trend 963 has now been withdrawn from the price list and further development has ceased. IQ Vision has been installed on a new server within R89 data centre. This is the new supervisor/head end of the STFC. The IQ Vision software will be of the latest version, currently V2.3, and when applicable and providing the server meets the minimum required specification, regular upgrading will be undertaken as to enhance the system with its extra features and improved

	operability to the user. The Contractor is to provide full technical support to develop the IQ Vision user interface on continuous basis throughout the contract term. All software upgrades will be correctly licensed by the controls specialist and be presented to STFC in order to comply with software and security.
(k)	**Hardware Upgrades & Support**
	There may be times during the contract period that controllers might need to be replaced. This may be due to faulty components, IO modules or controllers. It may even be because that a controller or piece of hardware becomes obsolete and will no longer communicate with either other controllers or the IQ Vision head end supervisor. Controllers and IO modules will be released to the contractor from STFC stock. Any IQ2 to IQ4 upgrade will have the strategy upgraded to IQ4 compatibility, including wiring upgrades. Strategy upgrade from IQ3 to IQ4 is relatively straightforward; however, wiring may need to be altered. For larger I/O configurations, a power supply may be needed to power the channels.
(l)	**Energy Performance Review**
	STFC is tasked with making year on year savings of electricity, gas and water energy usage by fine-tuning the BEMS. Reducing the controlled levels and the plant run times to a minimum, but still maintaining a good level of environmental comfort within the buildings while aiming to achieve this. The BEMS Company will be expected to play a major part in assisting the engineering team to reach these targets, by bringing innovative ideas to the table. Emphasis will be placed on implementing energy improvement measures where possible on a continuous basis during servicing of the controls. This will also allow for close analysis and the continuous development of the control strategies in order to identify plant problems or excessive energy usage; All plant operating strategy will be checked to ensure correct plant sequencing and energy efficient operation;

	Advice on how to improve energy efficiency and reduce associated Carbon Emissions through the Trend BEMS will be both pointed out during maintenance visits and documented accordingly within the service report; Independently to the maintenance activities the tenderer shall provide the necessary expertise to audit and review BEMS control strategies with the aim of reducing site energy consumption and carbon emissions; The tenderer will carry out an in-depth review of key buildings as indicated by the client as having high energy demand; A comprehensive plan report will be produced detailing current performance and opportunities for improving future energy performance including actual costs, financial payback data and CO2 emission data; Support and specialist advice will be provided to the client energy team; The review will be conducted by a suitably qualified Energy Engineer; The results of the Energy Performance Reviews will be reported as part of the quarterly Contract Management Reviews.
(m)	**Sub-contracting**
	Due to the technical/critical importance of the site, no part of the BEMS contract should not be sub-contracted without the consent of STFC's Building Management Systems Manager. Any new engineers introduced to the site should be inducted and accredited by STFC.
(n)	**Qualities & Efficiency**
	The BEMS engineering team must maintain quality and efficiency of equipment at all times, all of the systems are to be fine-tuned to maximise on energy savings and deliver comfort control of the environment.
(o)	**Consultation & Design Support for Trend and RDM Installations & Adaptations**

	The contractor will report any faults or problems encountered during routine maintenance. The contractor will provide proposed options to enable an effective solution to the fault. The HVAC plant plays a crucial part in the operation of the associated site facilities and plant should not be switched off or modified under any circumstance without the prior consent of site facilities engineering team. Site-specific information concerning maintenance or associated fault repairs should be requested from the Engineering Team prior to commencement of any task. Any BEMS errors and/or associated equipment failures identified for repair or replacement through the maintenance protocols as outlined within this document must be recorded and the relevant maintenance solution undertaken. Similarly, any problems or issues noticed concerning the operation of HVAC or associated mechanical plant should be reported to the STFC's Estates team. The controls contractor will provide upon request assistance with scoping and design of small works installations and upgrade work. For example, this could be in the form of: • Technical assistance, • Design and installation compliance, • Equipment decommissioning and Risk review. • Small works quotations • Larger projects quotation Works upgrading existing controllers and smaller new systems will usually be undertaken by the controls contractor directly and design advice will be provided on a personal basis with interaction with the Estates team. The contractor will always approach the Building Management Systems Manager directly to discuss any point of clarification or possible improvement and will co-operate and liaise fully with other contractors on site where applicable to ensure an operational BEMS system. All materials and test equipment used will meet the relevant British and European Standards and all work will be carried out in accordance with the relevant standards and guidance with particular reference to documents and standards from the following:

	• STFC specifications for associated works; • Health & Safety at Work Act 1974 and all appropriate legislation made under the Act; • Institute of Electrical Engineers (IEE) Wiring Regulations 17th Edition BS7671 • STFC Safety, Health and the Environment safety Policies (SHE Codes)
(p)	**Condition Based Monitoring**
	In order to reduce the time necessary to maintain the BEMS it is important that the systems notify the users in the event of a failure of decline in performance or increase in energy use. Condition based management software is to be introduced under the contract and used so that time is not wasted looking at equipment that is already running at its maximum efficiency. This pilot scheme will be provided under this contract and address suitability for a wider roll out of this service at a later date, with the goal of reducing the required level of routine service visits in the longer term. The Condition based management system features shall include monitoring of: • Control loop performance and time of day analysis • Alarm performance • Network communication performance • Sensor offset indication • Optimiser performance • Controller time synchronisation • Graphical or pictorial performance reports
(q)	**Training & New Equipment**
	The BEMS company must provide regular update training for their Engineers and make available training for STFC Estates team due to the constant changes in the technology surrounding the BEMS industry. New “recently launched” BEMS equipment will be provided FOC on request for testing and approval prior to installation on this site.

(r)	**Contract Implementation**
	Following award of the Contract, the Supplier will work with the Building Management Systems Manager on an implementation plan to ensure an efficient and timely commencement of the services. During the implementation phase, the Supplier will provide copies of training records and certification for all engineers engaged to carry out the Services. Should any engineers be replaced during the contract period, the Supplier will provide copies of training records for any replacements.
(s)	**Contract Management**
	STFC will require the BEMS Service /Contract manager to attend quarterly contract review meetings, at no cost to STFC, where they will provide evidence of compliance to specification, and provide feedback on improved working practices in accordance with the following Key Performance Indicators: Provide a quarterly update of fault call activity and PPM progress. Visits due: Visits completed. Visits completed: Visits reports received. Issues identified in reports: Quotes provide and/or parts ordered to rectify Response to call outs completed within 4 hours. Background to calls, outcome and recommendations to prevent future re-occurrences. Inventory of overridden controls. Repetitive alarm summary; Outstanding alarms list older than 1 week / 1 month. Correct Invoices submitted within 1 month. Review of stock holding and stock turnover. Recommendations for the enhancement of system performance and the reduction of energy consumption and carbon emissions. Health and Safety update – including KPIs, accident statistics and incident data.

(t)	**Data Security & Regulatory Compliance**
	A fully licenced issue of TREND System Engineering Tool (SET) shall be provided and maintained for exclusive use of the client BMS engineer. The tenderer shall provide all appropriate software licences, registration and documentation for all software and firmware used in connection with the contract at no additional cost to the STFC. The tenderer shall guarantee the software installed is the latest revision and will be supported for a minimum of four years from contract commencement. On a bi-annual basis the tenderer shall review existing software and upgrade to the latest version at no extra cost.
(u)	**Call Out**
	The associated costs for call outs in normal hours/out of hours needs to be identified.
(v)	**Remedial/Reactive works**
	A transparent quote for any suggested remedial/reactive works in relation to any identified faults/failures to be provided within 5 working days.
(w)	**Field Service Reports**
	A full site report will be issued to Estates Help Desk/CAFM System either on completion or within 24 hours of the planned Service visit or reactive fault callout. All Field Service reports will be forwarded as a pdf document by email, to the given contact. This report will be uploaded to the Clients CAFM system as a record against the PPM, Reactive, or general instruction generated from the CAFM system. The contractor is to ensure that any recommendations, non-compliance, access issues, parts etc, are included in the job closure in the CAFM system. The service report will generally contain the following: • Routine maintenance schedules that have been undertaken; • Itemized functionality, verification and compliance checks of the BEMS and associated plant; • Recommendations for operational improvement including

	possible energy savings; • Any observations of detrimental operation issues or circumstances that hinder any of the service visit tasks; Any subsequent quotations for additional works will also be forwarded as outlined above.
(x)	**ISO9001 and ISO 14001 Compliance**
	An excel spreadsheet is required to log all of the maintenance work completed and to be carried out. This provides an audit trail of evidence for the contractors ISO accredited work for the compliance inspector. A record of all the calibration certificates for the testing instrumentation is required and must be kept updated.
(y)	**Appendices**
	Appendix B – BMS Asset Register Appendix C – SFG20 Schedules Appendix D - STFC Hardware and Software Asset Summary Appendix E - STFC Environment Policy Appendix F – Design Guidance for Mechanical Electrical and Public Health Services – Full Appendix G – STFC Trend RDMS BMS Specification