mechanical & electrical services specification

ST MICHAEL & ALL ANGELS CHURCH, EAST COKER

TENDER ISSUE – SEPTEMBER 2025

PRELIMINARIES

Prepared by: PATRICK HICKS QA checked by: ANTHONY CROSBIE

MECHANICAL SPECIFICATION

Prepared by: BEN GUDZELAK QA checked by: PHILIP MORRIS

ELECTRICAL SPECIFICATION

Prepared by: PATRICK HICKS QA checked by: ANTHONY CROSBIE

specification.

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section one.

PARTICULAR PRELIMINARIES

section one.

PARTICULAR PRELIMINARIES

1.01 introduction

This part of the Specification should be read in conjunction with other sections of the Specification, the Main Contract Conditions, Preliminaries and Contract Drawings. The works described within this Specification are in the main designed; however, some design responsibility lies with the Contractor.

1.02 description

This Project is for the refurbishment and reordering of St Michael's and All Angels Church, a Grade II listed Church of England in the village of East Coker, Yeovil, Somerset.

The reordering includes the creation of an Accessible WC/Baby Changing Area, Vestry, Servery and Stores to the West of the Nave. The floor to the West of the Nave is also to be altered and made level.

This Specification covers the Engineering Services Works and includes new all electric heating systems consisting high level far infrared radiant heaters and low-level fan convectors heaters, pew heaters, plinth heaters, panel heaters and electric underfloor heating matting. The heating is designed such that each type of electric heating can be individually controlled to meet the needs of the many user groups of the Church, supporting a carbon friendly and low running cost solution.

The existing gas fired wet heating system shall be decommissioned and removed in full.

To support the electrification of the Church heating, a new, larger capacity three-phase electric supply shall be arranged with the National Grid which involves replacement of the fuse links in the existing service head as part of the contract works.

The M&E Specification and Drawings show equipment sizes, general routes of pipes and cables and full design details for plant equipment. The Contractor should note that there is still an element of Contractor design required for final coordination of the services. This shall consist of finalising the routes of cable ducts and pipes with the Architectural Layout, ensuring that all services are discretely hidden. The Contractor shall make allowance for any meetings required to achieve this when submitting their Tender return.

The Contractor undertaking the services works described in these Documents must make all necessary allowances for disruptions, temporary supplies, working sequences etc. to accommodate the programme of works that the Principal Contractor chooses to adopt.

The extent of the work is to produce a fully operational and integrated installation to the proposed Church.

The Contractor shall refer to the Architect's Layout Drawings, Employer's Requirements and Employer's Contract Particulars in conjunction with this Specification.

It shall be noted that the Contractor has design responsibility for the detailed design and integration of all of the engineering services but not for the sizing and selection of the services.

The design responsibility will include (but not be restricted to)

- Coordination Drawings and Detailing the Integration of the Works within the Buildings
- Services Supports and Suspension
- Builder's Work and Setting Out Drawings
- System Commissioning
- Temporary Works

1.03 conditions of contract

The general conditions of the Contract are laid down elsewhere. This Specification covers a particular specialist work package and will entail the Contractor working with specialist Sub-Contractors as stated.

The Engineering Services work shall be carried out to a Programme agreed between the Contractor and the Principal Contractor.

Payment terms shall be in accordance with the Contractor's agreement with the Principal Contractor.

1.04 appointment of mechanical and electrical contractor

The Principal Contractor shall engage specialist Contractors at the earliest possible point in the Project to ensure that all of the requirements of this Specification are met.

The Contractor shall be or use a specialist to undertake the various elements of the work who are members of the following bodies:

Mechanical Work	Gas Safe & B&ES Approved Contractor
Electrical Work	NIC EIC Contractor
Lift Engineering	Lift and Escalator Industry Association Member
Security	NSI Gold Contractor

With respect to this Specification the term 'The Contractor' shall mean the Specialist Contractor tendering for this work.

1.05 site

The Contract relates to work at:

St Michael and All Angels Church
East Coker
Yeovil
Somerset BA22 9JW

1.06 definitions

Employer (Client):

St Michael and All Angels Church
East Coker
Yeovil
Somerset BA22 9JW

Architect:

B2 Architects
The Borough Studios
The Borough
Wedmore BS28 4EB

Services Engineer (Engineer):	BJP Consulting Group Limited The Well House Manor Courtyard Stratton-on-the-Fosse Bath BA3 4QF
Principal Designer: (H & S Specialist)	B2 Architects The Borough Studios The Borough Wedmore BS28 4EB
Quantity Surveyor:	TBC
Structural & Civil Engineer:	TBC
The Principal Contractor:	TBC

1.07 scope of works

The works shall produce a fully integrated Mechanical and Electrical Engineering Services installation in accordance with the details and criteria laid down in this Specification and accompanying drawings, including (but not restricted to) the following: -

(a) Mechanical Services
(b) Electrical Services
(c) Full Cleaning, Commissioning & Testing
(d) Documentation of the Installation
(e) 12 Months' Maintenance and Call Out

The Contractor shall accommodate the Programme constraints of the Principal Contractor to efficiently progress the whole of the works. The Contractor shall where necessary, use temporary services to accommodate the Programme.

The installations shall be handed over fully and safely operational in accordance with the requirements of this Specification and to the satisfaction of the Services Engineer.

1.08 site conditions

The Contractor shall visit the site to obtain knowledge of the site conditions, no additional costs shall be allowed for want of knowledge or failure of the Contractor to observe this precaution.

As part of the site visit, the Contractor should fully inspect the scope of works and be solely responsible to ensure he has sufficient information, resources, equipment etc. to complete the works within the Programme.

Failure to comply with this recommendation shall not be accepted as an excuse for inadequate cost allowance in the submission, the Tender or execution of the works.

The visit shall be arranged through the Principal Contractor.

1.09 hazardous materials

Under The Control of Asbestos Regulations, it is a legal requirement that Asbestos Awareness Training be given to all those whose work could foreseeably expose them to asbestos containing materials. This requirement shall apply to the Contractor (and all operatives and sub-Contractors) tendering for the works.

The Contractor should obtain from the Client or Principal Contractor information on the location and condition of asbestos containing materials where this will affect their work so that it can be planned safely.

A Contractor who unexpectedly discovers any asbestos, or suspected asbestos, must report this to the Principal Contractor immediately and detail any discrepancy between the actual condition of material and the information given to the Contractor. The Contractor shall withdraw all personnel from the affected area until advised that it is safe to continue.

It is the responsibility of the Contractor to identify this and other potential emergencies that could occur on site. A Hazards Plan shall be prepared by the Contractor that demonstrates the Contractor has considered health and safety risks on the Project along with the procedures to respond to any incident.

The Hazards Plan should include events that are likely to occur on the Project or site, such as, the discovery of unexpected hazardous materials, high winds, structural collapse and environmental emergencies.

The Contractor must be prepared for and be able to notify (in an approved manner) the entire site workforce about the emergency and the proper evacuation or procedural protocols.

1.10 codes of practice/regulations/standards

The Contractor shall design, supply, install, connect, test and commission the whole of the installation to the entire satisfaction of the Engineer and in compliance with all latest versions of relevant statutory requirements or Regulations/Codes of Practice current at the date of Tender, in particular the following: -

(a) The Construction (Design and Management) Regulations

(b) 18th Edition of the Institution of IET Regulations for Electrical Installations (BS 7671) Amendment 3

(c) Electricity at Work Regulations 1989

(d) Electricity Supply Regulations

(e) Health and Safety at Work Act 1974

(f) Relevant and current British Standards and British Standard Codes of Practice, Acts, Bylaws, Regulations

(g) Water Act

(h) The Gas Safety (Installation and Use) Regulations

(i) The Environmental Protection Act

(j) BESA Guidance and Recommendation

(k) Any special guidance and requirements issued by the Local Utilities

(l) Building Regulations and Approved Documents

(m) CIBSE Guidance and Recommendation

(n) The National Joint Utilities Group (NJUG) recommendations and guidance

(o) Electrical Works in Churches Guidance Note from the Diocesan Advisory Committee for the Care of Churches

1.11 design and drawings

The Schedule in the Appendix lists the set of Drawings issued with this Specification to describe the works. These shall be read in conjunction with any Architectural, Structural and Civil Engineering (or any other relevant) Contract Drawings.

The Drawings accompanying this Specification are intended to indicate generally the layouts to assist Tenders to be prepared and not for use to allow the subsequent Contract Works to be progressed.

The Contractor is responsible for the design coordination and detailing of the works, associated Builder's Work, temporary works and phasing.

The Contractor shall use the sizes and specifications of the services. The detailed integration and setting out of the installations shall all be the responsibility of the Contractor.

The Contractor is responsible for the detailed coordination of the Scheme in accordance with the latest Architect's Site Drawings; this shall include any necessary development of the Scheme to provide a properly integrated solution.

The Contractor shall ensure that all equipment can be transported to and installed into the allotted space with adequate access for maintenance and repair.

After Tender stage, the Contractor shall take full ownership of the Drawings. Any changes, instructions or clarifications given shall be either written or on sketches, the Contractor shall be responsible for updating the working drawings.

The Contractor shall provide the following information in drawing form for comment by the Engineer.

(a) drawings

The Contractor shall prepare and submit for the comment of the Engineer, all Drawings detailing the services routes, plant bases, access chamber details and any other details necessary for the instructions of the workmen or as required by the Engineer. Should the Contractor fail to comply with the requirements of this Clause, he shall be responsible for any works rectification, including associated Builder's Works; Mechanical and Electrical Works etc. at his own cost.

The Contractor shall submit for 'comment' the details/drawings to ensure that they conform to the design intent. The Contractor shall be responsible for dimensions, setting out and detailed co-ordination of the services within the scope of this Contract.

(b) builder's work information and setting out

It is anticipated that all Builder's Work, such as cutting away and subsequent making good, the building-in of brackets and pipe sleeves etc. shall be carried out free of cost to the Contractor by the Principal Contractor. The Contractor shall confirm this arrangement with the Principal Contractor during the Tender process.

The Contractor should note that it is his responsibility to produce a full set of dimensioned and co-ordinated Builder's Work Drawings.

These Drawings shall show the size and position of all supports, bases for equipment, holding down bolts, holes, chases, trenches, pipe ducts etc. in the structure or building fabric, related where applicable to the column/building grid lines. Steelwork shall be built in or attached to the structure and be shown together with sizes and positions of all access platforms, panels and doors required in the building fabric to allow proper access to plant to enable inspection and maintenance to be effective.

The Builder's Work Drawings shall also include details of all plant and equipment weights. Where pipes or cables are to be run through the structure, the Contractor shall detail proposals to integrate these services, detailing means of support, necessary cutting away, chasing of walls etc. Should the proposals put forward be deemed unacceptable, the Contractor shall develop alternative methods. This should be done in good time to avoid delays and shall be at no additional cost.

The Drawings shall be in an AutoCad DWG format, all dimensions used in the Drawings shall be measured on site. No dimensions shall be taken by scaling from Drawings. Where dimensions are indicated on the Tender information, these shall be site checked. The Contractor shall liaise with all other parties to ensure that the above Drawings are co-ordinated with the work to be undertaken by others. These Drawings shall be issued to the Services Engineer, ten working days in advance of the latest date required for implementation to comply with the Building Programme. Working drawings shall be kept on site at all times and neatly modified to show all alterations made during the course of the installation. These Drawings shall form the basis of the Record Drawings described later.

(c) discrepancies

The Contractor shall take responsibility for the accuracy of all dimensions and levels relating to the Contract Works. He shall examine and co-relate all Drawings, Specifications and Builder's Work, holes and supports. The Contractor shall check drawing dimensions against the existing site measurements and shall check tolerances of components against those specified.

1.12 the construction (design and management) regulations

The Contractor's attention is particularly drawn to his responsibilities under these Regulations.

The Contractor's responsibilities include, but are not restricted to: -

(a) Co-operate with the Principal Designer (or his H & S specialist).

(b) Obtain from his Sub-Contractors all relevant information that relates to Health and Safety at Work, that is a consequence of their work.

(c) Obtain from his Sub-Contractors all relevant information that is necessary for inclusion in the Project Health and Safety File. This is likely to include detailed Method Statements for installation procedures.

The Project Health and Safety Plan has been created by the Principal Designer. The Contractor must satisfy himself that he has adequate information in this regard before submitting his Tender, as no additional payments will be made because of want of knowledge in this regard.

1.13 permit to work, risk assessments and method statements

The Contractor shall comply with any management procedures that the Client or site has in place and must obtain a Permit to work for either the isolation or interruption of any systems, services or specific hazardous activities and must also ensure the Principal Contractor, Client and/or Building Manager is aware of the Permit to work.

Where isolation Permit to work is required there must be sufficient consultation, exchange of information and planning between all parties concerned prior to the work commencing, in order to facilitate the Permit to work process and minimise disruption to the building and its occupants.

A Permit to work will only be issued if the appropriate control measures, identified by risk assessments, are put in place.

Permits are issued for either the isolation or interruption of systems or services or specific hazardous activities.

An “Isolation" Permit to work is required, for work on, or affecting, the following systems (or as agreed with the Client or Principal Contractor):

- Electrical Services
- Mechanical Services
- Water Supplies

A "Hazardous Activities" Permit to work is required for (or as agreed with the Client or Principal Contractor):

- Hot Work (tasks such as welding, brazing, or cutting that produce heat)
- Confined Space (an area with limited means of entry or exit that is large enough for a person to enter and perform work).
- Access to Roofs
- Working at Height
- Working on Live Services
- Excavations
- Asbestos

In the event of the Contractor carrying out higher risk work or unusual work activities, the Contractor shall issue full risk assessments and method statements.

Such documentation should be site and work specific, relevant (not generic), succinct and submitted to the Principal Contractor, Client and/or Building Manager prior to work commencing.

In the event of the need to deviate from the stated method statement, no further work is to be carried out until a revised method statement has been prepared and submitted.

1.14 fixed price tender

The Tender shall be fixed price Tender and no adjustment shall be made for fluctuations in price of materials, rates of wages or contributions, or any other matter whatsoever, and such fluctuations shall be at the sole risk of the Tenderer who should ensure that any work he may be permitted to sublet in accordance with these conditions is sublet on the same conditions. Any orders for Sub-Contractors and for suppliers under these conditions shall be placed at the same fixed price unless otherwise directed by the Engineer.

1.15 payment for tendering

No payment shall be made for Tenders.

1.16 acceptance of tender

The Principal Contractor does not bind himself to accept the Tender.

1.17 alternative offers

Where the Specification states equal and approved, the Tenderer may select an alternative supplier and offer the alternative as a potential saving within the Tender documentation.

The Tender return shall be based on the specified equipment, any alternative shall be stated in a schedule of alternatives with the potential saving to the Contract clearly indicated.

Changes to the supply of alternative equipment shall not be accepted after confirmation at Tender Stage.

If the Contractor uses any alternative supplier, then it is his responsibility to integrate such equipment into the scheme and adjust the design as necessary and absorb any consequential costs.

Any such changes to the design must be accepted in writing by the Engineer before any installation commences.

1.18 priced schedules

The Contractor must forward, within four days after he shall have received notice that the Principal Contractor is considering his Tender, a fully priced Schedule of Rates equating to the full Tender Sum and including all incidental charges.

The rates shall indicate the unit rate for each item of plant and supplying and fixing each element of the services.

This shall not relieve the Contractor of his responsibility to provide sufficient materials for the works, even if quantities are not sufficiently allowed or items omitted. This requirement shall not imply acceptance of Tender.

The Schedule of Rates shall be used as the basis of any variations to the Engineering Services element of the Contract and must be inclusive of all mark-ups, Contractor's discount etc.

1.19 sub-contractors

The Contractor shall seek written consent of the transfer, assignment or sub-letting of any part of the work involved in this Contract, and to submit any proposed sub-letting details when returning the Tender documents at Tender Stage.

The Contractor must take full responsibility for the co-ordination, supervision and administration of all his Sub-Traders delivery of all associated materials and goods, in accordance with the Work Programme. Approval of Sub-Contracts will not relieve the Contractor of his responsibilities under this Contract.

1.20 supervision

The Contractor shall employ a competent Foreman who shall have charge of the works and who shall be accessible to receive instructions in the absence of the Contractor's Project Engineer/Manager.

The Engineer shall have the right to require the withdrawal of any such person whose general conduct or handling of the job is, in the Engineer's opinion, not satisfactory.

1.21 co-ordination

The Contractor shall be responsible for the co-ordination of all installation work within his Contract with all other services, structures & architectural features to avoid clashes etc.

It is crucial for the success of this Project that the approach to the installation is well planned; the Contractor must therefore carefully programme the works well in advance.

1.22 progress chart

Immediately upon signing the Contract, the Contractor shall draw up a fully detailed Progress Chart, indicating the times required for the execution of the works.

1.23 site meetings

The Contractor shall be required to have an authorised representative in attendance at any Site Meeting which may be held and to which his attendance is requested. The Principal Contractor, or the Engineer, shall normally confirm in writing when time permits, or by telephone/verbally, notice of such meetings.

1.24 all necessary surveys

The Contractor shall undertake all necessary surveys to identify the location, size, nature etc. of all existing services, which are either affected by the construction, which shall be maintained throughout the construction or any services, which are to be connected to in the buildings.
Any drawings or information which is either issued to the Contractor, or he obtains from any other source, which purport to indicate any details of existing installations or services shall not be relied upon. The Contractor, from site survey, must verify all information that he requires.

1.25 working hours, car parking and messing facilities

The Contractor shall establish with the Principal Contractor the working hours, car parking and messing facilities to be made available. The Contractor shall allow sufficient funds within his Tender to cover any elements not included by the Principal Contractor.

1.26 damage to property

During the course of removal of existing material or the installation of new, the Contractor shall exercise every precaution to avoid unnecessary damage to the existing roads, buildings and trees etc.
Should any damage result from the negligence of his employees or those of his sub-Contractors or suppliers etc., he shall be responsible for making it good or meeting the cost thereof, to the satisfaction of the Engineer.

It is the Contractor's responsibility to conduct a photographic survey and to lodge the images with the Engineer, before works commence.

1.27 fire stopping

The Contractor shall be responsible for the appropriate and effective firestopping of all service penetrations, following best practice in design and installation.

The Contractor shall liaise with the Principal Contractor and follow the Architectural guidance and shall be responsible for ensuring that this element of the works is completed.

1.28 redundant and disused materials and equipment

The Contractor shall safely remove and dispose of all redundant and disused materials and equipment strictly in accordance with the requirements of the Environmental Protection Act.

Before removal, materials and equipment shall be offered to the Client for retention.

1.29 'as installed' drawings

During the process of the works, the Contractor shall prepare and maintain duplicate copies of draft 'As Installed' Drawings. These Drawings shall be kept on site and marked up by the Foreman to indicate: -

All positions, runs, sizes and types of service, trunking, cables, ducts, pipes etc. This shall include the services installed and the systems that are connected to, existing and new.

Drawings shall be clearly marked 'As Fitted' or 'As Installed' with the prints coloured with distinctive colours for different services etc. All drawings shall also be provided on a memory stick compatible with the latest version of AutoCAD.

1.30 O&M manual and users operating guide

The Contractor shall provide a fully indexed and cross-referenced electronic O&M Manual incorporating electronic copies of all record drawings.

The manuals shall include full details of all of the installation and include all maintenance schedules, procedures and processes.

The manual shall be in the form of an interactive PDF document.

The Manual shall be in accordance with the BSRIA Building Manuals and Building User Guides.

The Contractor shall, in addition to the O&M Manual, contribute to a User's Operating Guide / Log Book in accordance with CIBSE TM31 giving clear and simple instructions on the basic operation of the systems.

This is not intended to be a detailed technical manual but should also indicate a concise approach to understanding the systems, its operation and provide useful contact details and maintenance issues/periods.

1.31 provisional sums and contingencies

The Contractor shall allow within his Tender Provisional Sums and Contingencies as indicated in the Tender Summary.

1.32 training

The Contractor shall allow for 3 separate, half day training sessions for the Client, covering the operation and maintenance of the entire installation. Where specialist equipment is installed, the manufacturer's representative shall be in attendance to assist with the training.

Specifically with the controls installation, the Contractor shall allow an additional visit to that specified to refresh the Client on the system operation. This shall be in addition to that indicated in the Particular Specification.

All training shall be certified and the user will be required to sign confirmation that they have understood the training given. Certificates shall be lodged in the O&M Manual.

Training sessions shall be videoed and the video file lodged in the O&M manual.

1.33 twelve months' defects and maintenance period

The defects liability period shall be 12 months. During this period, the Contractor shall carry out all necessary breakdown and routine maintenance, replacement of faulty equipment, servicing etc., all at no extra cost.

All Mechanical and Electrical Services Systems and Plant installed (including any free issued to the Contractor) under this Contract shall also be covered by a 12 Months Maintenance Agreement, which shall commence from the date of the Certificate of Practical Completion.

All of the above conditions, preliminaries, site security rules etc. shall all apply for the duration of the Maintenance Agreement.

The Contractor shall ensure that sufficient spares (spare breakers etc.) are provided to maintain the plant during the Defects Liability Period.

Bespoke servicing tools and any specialist keys shall be provided and lodged with the Client.

The Contractor shall undertake the maintenance works in accordance with the Maintenance Schedules in the Operating and Maintenance Manuals he produces for the Contract, which will be held by the Client.

(a) records

The Contractor shall create a detailed Record System, which will identify each item of plant and equipment and record all inspections, faults, repairs etc. experienced with the equipment. The final classifications are to be agreed with the Engineer.

The record shall detail the time and date of all site visits, duration of visit, work done and identify the Service/Maintenance Engineer in attendance.

The Plant Record is to be kept on site at all times.

At the end of the 12-month Maintenance period, the Contractor shall provide updated and current certificates for the Fire Alarm, Gas, Electricity and Emergency Lighting Installations.

(b) call outs

The Contractor shall provide 24 hour, 365 days/year Emergency Call Out Service by which any plant failure alarm or a request, made by telephone or e-mail, shall cause a Service/Maintenance Engineer to attend site on the next working day.

The Contractor shall ensure that the Service/Maintenance Engineer sent to site has the skill and experienced with the installed systems to diagnose and repair the fault with the minimum of guidance.

If it is necessary to undertake work outside normal working hours due to the requirements of the Client, then this too will be at no cost to the Client and must be arranged to suit the Client.

appendix a.

DRAWING REGISTER

appendix a.

DRAWING REGISTER

DRAWING NO.	DESCRIPTION
25/2036/E/01	Proposed Electrical Services Layout
25/2036/M/01	Proposed Mechanical Services Layout

section two.

MECHANICAL SERVICES PARTICULAR SPECIFICATION

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2.01 general

This Project is for the refurbishment and reordering of St Michael's and All Angels Church, a Grade II listed Church of England in the village of East Coker, Yeovil, Somerset.

The reordering includes the creation of an Accessible WC/Baby Changing Area, Vestry, Servery and Stores to the West of the Nave. The floor to the West of the Nave is also to be altered and made level.

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The Contractor undertaking the services works described in these Documents must make all necessary allowances for disruptions, temporary supplies, working sequences etc. to accommodate the programme of works that the Principal Contractor chooses to adopt.

The extent of the work is to produce a fully operational and integrated installation to the proposed Church.

The Contractor shall refer to the Architect's Layout Drawings, Employer's Requirements and Employer's Contract Particulars in conjunction with this Specification.

It shall be noted that the Contractor has design responsibility for the detailed design and integration of all of the engineering services but not for the sizing and selection of the services.

The design responsibility will include (but not be restricted to):

- Coordination Drawings and Detailing the Integration of the Works within the Buildings
- Services Supports and Suspension
- Builder's Work and Setting Out Drawings
- System Commissioning
- Temporary Works

2.02 scope of works

The Mechanical Services installation shall be installed, tested and commissioned in accordance with the relevant British and European Standards as appropriate, the Main Contract Conditions and Preliminaries, the Electrical Services Specifications and Drawings and the Mechanical Particular Preliminaries and Mechanical Services Drawings.

The extent of the work includes (but is not restricted to) the following:-

(a) Removal of Existing Mechanical Services (Heating, Domestic Hot & Cold Water and Ventilation)

(b) New Hot & Cold Domestic Water Services

(c) Ventilation Services

(d) Testing, Commissioning and Certification

(e) "As Fitted" Drawings, Operating and Maintenance Manuals

(f) Client Training

(g) 12 Months' Maintenance

2.02.01 standards of work

The Contractor shall install all of the systems described to the entire satisfaction of the Engineer and in compliance with the Regulations/Codes of Practice set out in Clause 1.10 of the Preliminaries.

2.02.02 contract intent

The Contractor shall note that the Drawings are for Tender purposes and that due to complexity of the site, the Contractor shall allow for carrying out all on site measurements necessary to ensure access and accommodation of the relevant equipment.

Fixing arrangements and installation methods shall be as required by the relevant standards or as manufacturers' recommendations and detailed by the Contractor.

All methods of fixing/suspension shall be submitted by the successful Tenderer for comment by the Engineer.

2.03 enabling works

The redundant existing services shall be stripped out in their entirety and disposed of in accordance with regulations and guidance to ensure that all items are recycled/disposed of in a responsible manner. Due to the age and Grade II listed status of the Church, should the removal of any redundant services jeopardise the integrity of the building in any way then this shall be raised with the Architect and Engineer and this shall not be carried out without prior approval from the design team. Should the removal of services cause damage to the property in any way then the Contractor shall be responsible for making good or paying for the satisfactory repair of any damage caused.

The services expected to be removed (not exhaustive) are:

- The Oil Tank and Associated Pipework
- Boilers, Tanks, Pumps, Pipework, Valves, Radiators and Controls Associated with the LTHW Heating System
- Domestic Cold Water Pipework Back to Incoming Positions
- Point of Use Water Heater and Associated Pipework in the Existing Toilet
- Extract Fan in the Existing Toilet

The oil shall be pumped from the system to reclaim any leftover oil and disposed of in a responsible manner. The oil tank and pipework shall be removed from site in a responsible manner.

The boilers shall be isolated, the system drained down and all items of the system removed and disposed of in a responsible manner.

The two incoming water positions shall be tested for flow and pressure to determine the suitability of using these to extend the water pipework to serve the domestic water requirements of the Church.

2.04 incoming services

2.04.01 incoming water

There are two incoming water positions that have been identified. One in the existing toilet and one in the Plant Room.

Following testing of these supplies and providing sufficient flow and pressure is recorded at these positions, there shall be double check valves, water meters and isolation valves installed and then the cold water pipework shall be extended from here.

The water meters shall be single jet cold water meter ¾" as distributed by BES part number 11357.

New incoming water supplies are not anticipated to be required, though the enabling works testing shall verify this. A provisional sum of £5,000 to allow for a new water connection from the mains is included at the rear of this Specification.

2.04.02 incoming gas

There is no gas on site and the space heating shall be all electric.

2.05 hot and cold water services

The Contractor shall provide a complete energy efficient and safe domestic hot and cold water installation.

The installation shall be sufficient in terms of pressure and flow to satisfy the demands of the fittings and without fluctuations in flow and pressure.

The water supply pressure to each outlet shall be not less than 1 Bar. Depending on the results of the flow and pressure tests, pressure reducing valves shall be installed as necessary.

All outlets other than cleaner's and kitchen sinks shall be fitted with Class TMV3 valves.

No cold water storage is proposed.

It is assumed the existing incoming water supply shall be utilised, as described elsewhere in this Specification.

Hot water shall be provided from unvented point of use water heaters with small storage tanks. Water shall be stored at 60°C.

Hot and cold water shall be piped to all outlets. Hot water shall be delivered at a maximum of 43°C to wash hand basins and 60°C to kitchen sinks.

Hot water to the desired temperature shall be delivered to the outlets within 30 seconds of opening the tap.

The domestic hot and cold water pipework installation shall be in Geberit Mapress Copper.

The entire installation shall be installed to the Approved Code of Practice on the control of Legionella. The Contractor shall refer to CIBSE guide TM13 for guidance.

All outlets shall be fitted with local and accessible isolation valves.

No flexible pipe connections will be allowed.

The Contractor shall supply and install 1No. unvented water heater cylinder to serve the WHBs in the new WC and existing WC and 1No. unvented water heater cylinder to serve the sink in the Servery. The water heater for the WHBs in the new WC and existing WC is to be ZIP Aquapoint 3 10L under counter unit, or equal and approved, and the water heater for the servery sink is to be ZIP Aquapoint 3 15L, or equal and approved.

The water heater serving the WC WHBs shall have a minimum of 10 litres storage and the water heater serving the servery sinks shall have a minimum of 15 litres storage.

The hot water cylinders shall be supplied with the necessary pressure reducing valve, expansion vessel, expansion relief valve, check valve and drain valves.

The cylinders shall be constructed with glass lined steel inner container tested to 13 bar.

The Contractor shall provide the relevant manufacturer's safety valve with temperature and pressure relief. The Contractor shall ensure that the valves discharge into a tundish, which in turn shall discharge to the nearest drain.

Water shall be stored at 60ºC. The cylinders shall be supplied with isolation valves at each pipe inlet and outlet and drain valves at all low points within the system. Pressure reducing valves shall be included where required. The cylinders shall be installed to the manufacturer's instructions and schematic diagrams, with the Contractor making due allowance for any additional valves or packs required by the manufacturer.

A self-acting high temperature safety valve shall be added to the hot water flow as a safety measure.

The Contractor shall provide a matching pressure expansion vessel from the same manufacturer.

2.05.01 final connections

The Principal Contractor shall supply and install all sanitaryware as specified by the Architect. The Contractor shall include for connecting to all tap outlets with full bore light copper tube to BS EN 12449 and BS EN 1057.

Each WC cistern shall be fitted with an isolation stopcock as required by the Water Regulations.

2.05.02 pipework

The specification for the domestic hot and cold water pipework shall be Geberit Mapress Copper.

All hot and cold water throughout the building shall be carried out in light copper tube to BS EN 12449 and BS EN 1057 with Geberit Mapress Copper fittings. All tube and fittings must bear the BS 'Kite' mark.

Compression connectors are to be used at 15m intervals for disconnection purposes if capillary joints are used, except where permanently concealed in chases, ducts, partitions, ceiling voids and floor. Bends may be manufactured on site using the correct spring for Table X piping.

Excessive ripple marks will mean rejection and replacement at the Contractor's expense.

Drains, vents and overflows shall be carried out in copper tube with capillary fittings, as specified above.

2.05.03 insulation

Insulation to be as specified in Clause 2.07.

2.05.04 chlorination

The whole of the cold water system shall be chlorinated and flushed in accordance with the requirements of this Specification, BS EN 806, BS 8558 and the WRAS Water Regulations Guide.

2.06 ventilation systems

Mechanical extract ventilation shall be provided to the new WC and existing WC as indicated on the Drawings.

The ventilation fan shall be as manufactured by Nuaire or equal and approved, model ES-OPUSDC40-M range. The extract fan shall trickle at 4l/s (2l/s per WC) and boost to 12l/s (6l/s per WC) under PIR detection in the new WC or by light switch operation in the existing WC.

The extract fan shall be ceiling mounted in the existing WC and services in the existing WC shall be exposed. The Contractor must ensure adequate space for service and maintenance and the installation shall be neat and of a standard acceptable to the architect.

To enable air to be extracted from the new WC the Contractor shall install a 100 diameter duct with a Helios ETS 100 diameter cross talk attenuator in the wall between the WCs. The Contractor shall install a Gilberts GX 100 air valve (-9 position) on the new WC wall, and a Gilberts GX 100 (-9 position) on the existing WC side.

(a) ductwork

All ductwork and accessories for the MVHR system shall be from the Nuaire PVC Ductmaster system, installed in accordance with the manufacturer's recommendations.

All ductwork is to have factory applied insulation. The installation shall have no flexible duct sections.

(b) fire dampers

Fire dampers shall be fitted where ductwork penetrates firewalls.

(c) flexible ducting

Flexible ductwork shall not be used.

2.06.01 balancing and testing

The Contractor shall provide commissioning and balancing to the ventilation system.

The Contractor shall commission airflows to each part of the system and to provide a test sheet of measured air flows against design air flows submitted to the Engineer for approval.

2.06.02 cleaning of air filters

The Contractor shall allow for air filters to ventilation plant to be cleaned or replaced with new prior to occupation of the building.

The Principal Contractor shall ensure all dust creating builder's works have been completed prior to replacement/cleaning of filters.

2.07 insulation

The thermal insulation to ductwork and hidden pipes shall be factory applied. The extent of the site applied insulation includes (but is not restricted to) the following:-

(a) Thermal Insulation to All Pipes
(b) Insulated Valve Covers
(c) Pipework and Ductwork Identification Bands

The Sub-Contractor shall include for the supply, delivery and installation of materials necessary for the thermal insulation of systems described in this Specification. All thermal insulation work shall be carried out in accordance with the Contract Documents and shall be undertaken by a member of the Thermal Insulation Contractors Association (TICA). The insulation must be applied by persons accredited or trained by the insulation system manufacturer. The thermal insulation specialists shall make themselves fully acquainted with all the site conditions and programme of works and shall execute their works within such confines and programme. Reference should be made to BS 5970 as appropriate.

The thermal insulation shall not be applied until the pipework, ductwork and plant installations have all been tested.

Insulation materials and finishes shall be inherently proof from rotting, mould and fungal growth and attack by vermin, be non–hygroscopic and in all respects be suitable for continuous use throughout the range of operating temperatures and within the environment indicated.

The Contractor shall be responsible for the work being carried out in accordance with this Specification and the manufacturer's recommendations and in a neat and proficient manner, to the satisfaction of the Engineer.

Any work not of acceptable standard shall be removed and replaced at no cost to the Contract. All insulation materials and finishes shall be installed in accordance with the manufacturers' recommendations. No insulation material containing CFC or HCFC components shall be accepted.

Insulation shall be applied in such a manner that there is a minimum of 25mm between the finished face of the insulation and adjacent pipes or surfaces. With the exception of pipework in boxing, this shall be installed as close together as possible. All pipes shall be separately insulated.

The Contractor shall include in his Tender for carrying out insulation work in separate stages in order to suit the required progress on the Contract.

Painting and pressure testing must be complete before the insulation is applied.

All insulation shall be in accordance with the appropriate British Standard, Codes of Practice and the current Building Regulations Approved Documents.

2.07.01 types of insulation

The thermal insulation shall be from a manufacturer's range, specifically manufactured for building engineering services.

The complete system shall be either:

(a) Class 0 Armaflex as manufactured by Armacell. If this system is used, all joints and seams must be glued.

(b) KoolTherm as manufactured and supplied by Kingspan.

Or equal and approved.

Thermal insulation to hot water and low temperature heating pipework located in Plant spaces and where visible elsewhere shall be either Armaflex Tuffcoat or Kooltherm with a PVC (Isogenapak) finish.

2.07.02 workmanship

Adhesives, sealants and coatings shall be utilised in strict accordance with current recommendations of the supplier, particularly in respect of coverage, drying time, service temperature limits and methods of application.

All pipework shall be insulated with preformed pipe insulation sections, be concentric and matched for thickness. No sections having damaged ends or edges shall be used.

Insulation for bends and fittings shall be formed from mitred and trimmed pipe insulation sections, cut to ensure that a good contact with the surface to be insulated is made.

The insulation shall be neatly trimmed with purpose made end caps at pump casings, flange joints, valves and strainers.

All insulation coverings shall be continuous at junctions, with insulated pipe support inserts and joints sealed.

2.07.03 pipe and ductwork supports

The insulation system shall comprise insulated pipe support inserts and be in accordance with BS 5422 and BS 5970.

Pipework supports shall be insulated from the pipework on all HVAC services.

On hot water services insulated pipe support inserts shall be used to limit overall system heat loss, and to minimise the risk of heat transfer through supporting structures.

2.07.04 valve and flange covers

On all valves, flanges, metering orifice plates etc, the Contractor shall provide purpose made muff covers. The Covers shall have mineral wool insulation and utilise Velcro fixing.

2.07.05 condition of materials

All materials delivered to the site shall be new and fully dried out and maintained through the progress of the work. The only exception shall be those materials that are applied wet, subject to the materials not depending on an initial dry state before application.

2.07.06 identification of services

The Contractor shall include for the identification of those services both insulated and uninsulated where services are located in back of house areas or concealed from view.

Where located in back of house areas or concealed from view, identification on insulated pipelines shall be by means of BS 1710 painted non–ferrous colour bands, fastened around the insulation. Directional arrows or other labels denoting flow and return (F & R) where specified, shall be either PVC adhesive tape or painted symbols as agreed with the engineer.

Colour band identification, and when specified directional arrows and labels, shall be made at:

(a) 3 metre centres on exposed pipework;
(b) 6 metre centres on concealed pipework; and
(c) Adjacent to all valves, changes of direction, inlets and exits to ducts and buildings and at either side of walls and floors where back of house or concealed from view.

All arrows used to indicate direction of flow shall be either black or white to contrast with the colour of the insulation finish.

2.07.09 ductwork

Insulation of ductwork shall be factory applied and the standard arrangement offered by the ductwork manufacturer.

2.08 builder's work

The Contractor shall determine the Builder's Work requirements associated with this installation. He shall provide this to the Principal Contractor.

The Builder's Work scope shall include the entire excavation and graded back fill of all buried pipes and systems including those for the Ground Source Heat Pump.

The Principal Contractor shall be responsible for sealing all holes after installation to prevent the ingress of weather and vermin.

2.09 manuals and drawings

The Contractor shall provide, at the completion of the Contract, a detailed Schematic indicating reference numbers, pipe sizes etc. as a record of the installation. This should be provided as an "As Fitted" Drawing in the latest version of AutoCad LT.

2.10 automatic controls

The manufacturer's proprietary controls shall be set up to enable the systems to react and serve their purpose effectively.

The Contractor shall be responsible for providing all controls, such as temperature sensors, PIR etc. The Electrical Contractor shall be responsible for all wiring to controls. The manufacturer of each item of equipment shall carry out commissioning.

It shall remain the Contractor's responsibility to ensure the systems are controlled correctly and effectively, though a brief description of intended controls are as follows:

2.10.01 hot water

The hot water generation will be from the point of use water heaters. The storage temperature that they operate to can be altered and the system should be set to store water at a minimum of 60°C, as there is no pasteurisation cycle possible with the units. The point of use water heater shall be operated by a time clock.

2.10.02 ventilation

The wall mounted fan in the WC shall come complete with integral controls. It shall be set to operate at a continuous trickle rate, with a boost rate being achieved on presence detection in the new WC and by light switch operation in the existing WC.

2.11 balancing, commissioning and tests

The Contractor must ensure that sufficient time be allowed in the Contract Programme for proper and adequate flushing of all pipework systems with clean water. The systems must be divided into manageable sections in order to achieve complete flushing and the necessary valved connections must be allowed for these operations. After disinfection of the systems, further flushing with clean water is required before the systems are put into use.

2.11.01 tests

The Contractor shall employ a specialist to chlorinate the entire domestic Hot and Cold Water System, in line with the recommendations of BS EN 806 and BS 8558. He shall provide test sheets proving its compliance with the Water Regulations and relevant British Standards, prior to connection to the main water system.

After cleaning and chlorination of all the water services pipework, the System shall be fully drained off on a weekly basis until handover.

(a) general

The tests are to be carried out in the presence of the Engineer or his representative and the Contractor is required to give notice to the Engineer in writing when he anticipates testing any part or parts of the installations.
The Contractor shall rectify any leaks or defects disclosed by tests at his own cost and the tests shall be repeated until the installation is to the satisfaction of the Engineer.

The Contractor shall allow in his Tender for testing various sections of the installations at different times, as becomes necessary, to suit the progress and requirements of the Principal Contractor.

(b) hydraulic pressure tests

The whole of the water piping installations shall be tested by the Contractor to the following hydraulic pressures and for a period of not less than 60 minutes in each case, during which time all parts must remain dry. The pressure tests are to be: -

Cold Water Pipe Work	5 bar
Hot Water Supply Pipe Work	5 bar

(c) heat and efficiency tests

Upon satisfactory completion of the hydraulic pressure tests, the whole of each installation shall be operated under normal working conditions for a period of not less than five days. The hot water supply systems are to be maintained at full working temperatures throughout the period, after which the systems are to be allowed to cool down and to be examined for defects.

If any defects are found in these or the other installations, the Contractor is to carry out the necessary repairs and, if required, the System shall be re-tested to the approval of the Engineer.

2.11.02 balancing and commissioning

(a) general

The Contractor shall be responsible for setting all plant to work and conducting all tests and inspections necessary prior to the regulation of the air and water distribution systems in accordance with the current CIBSE Commissioning Codes, where available.

(b) systems flushing and cleaning

The Contractor shall include for all systems to be flushed out and cleaned by a specialist firm prior to any commissioning being carried out.

The Contractor shall allow for the necessary valved and plugged connections in all circuits for these flushing operations with dosing pot assembly.

All strainer screens shall be removed prior to the flushing operations and be replaced immediately afterwards. At the end of the commissioning period, all strainer screens shall be inspected and replaced or cleaned, as necessary, before handover.

(c) commissioning

Care must be taken throughout the installation to keep the inside of the ductwork clear of dust etc. and all openings must be blanked off as necessary during the progress of the work. The Contractor shall be held responsible for any damage to decorations caused by operating the ventilating systems.

The commissioning work must be carefully programmed with the Principal Contractor and must be carried out in sections to suit the building and services programmes.

The Contractor shall include in his Tender for the regulating and testing of the complete Mechanical Services Installations.

The systems are to be regulated in accordance with the relevant CIBSE Commissioning Code where available.

The Contractor shall be responsible for handing over the whole of the plant in proper working order to the satisfaction of the Engineer.

(d) manufacturer's equipment

The Contractor shall ensure that each item requiring specialist commissioning is commissioned by the manufacturer. Correct lubrication of moving parts, protection against frost and damage caused by fire and flooding shall also remain the responsibility of the Contractor. Controls and heat exchanger systems will be considered as manufacturer's equipment, so far as this Clause is concerned.

(e) instruments

The Contractor shall provide all necessary instruments for balancing and commissioning of the system.

(f) report sheets

Before commencing of the balancing, the Contractor shall agree with the Engineer, the presentation of the report sheets to be used.

2.11.03 maintenance and user instruction manuals

Draft Maintenance and Instruction Manuals are to be handed to the Engineer at least two weeks prior to completion of work, describing each item of mechanical equipment. The Contractor shall provide two bound copies of the agreed Operation and Maintenance Manuals, including copies of all Test and Commissioning Certificates, at handover. Two electronic copies shall also be produced and provided along with CAD drawings in the latest format of AutoCAD LT format on a memory stick.

2.11.04 spares

Sufficient lubricants, oil and grease etc. shall be provided to maintain the equipment throughout the Defects Liability Period.

2.11.05 final drawings and work instructions

During the progress of the work, the Contractor shall keep a separate record of any alterations and additions and exact route of mains etc. and at the completion of the works, he shall provide the ‘As Fitted’ Drawings.

2.12 provisional sums and contingencies

The Contractor shall include in his Tender the provisional sums indicated in the Tender Summary, which shall be expended either in part or as a whole, or not at all, as directed by the Engineer.

section three.

MECHANICAL SERVICES TENDER SUMMARY

section three.

MECHANICAL SERVICES TENDER SUMMARY

1.00 measured works

1.01	Preliminaries	£
1.02	Enabling Works	£
1.03	Hot and Cold Water Services	£
1.04	Ventilation Systems	£
1.05	Insulation	£
1.06	Controls	£
1.07	Balancing, Commissioning and Tests	£
1.08	Manuals and Drawings	£

Sub Total for measured works……. £

2.00 provisional sums

2.01	New Incoming Water Supply	£ 5,000.00

Sub Total for Provisional Sums..... £ 5,000.00

3.00 twelve months' maintenance

3.01	Twelve Months' Maintenance	£

TOTAL TAKEN TO MAIN BILL OF QUANTITIES ……..£

Signed .....Position.....

Company ……

Address ……...

……

section four.

ELECTRICAL SERVICES PARTICULAR SPECIFICATION

section four.

ELECTRICAL SERVICES PARTICULAR SPECIFICATION

Appendices

4.01 general

This Project is for the refurbishment and reordering of St Michael & All Angels Church, a Grade II listed Church of England in the village of East Coker, Yeovil, Somerset.

The reordering includes the creation of an accessible WC/Baby Changing, Servery, Vestry and Storerooms.

The Church existing oil-fired wet heating system is to be decommissioned and removed in full. New all electric heating systems consisting high level infrared radiant halo heaters, low level fan convector heaters, plinth heaters, pew heaters, panel heaters and underfloor heating matting shall be installed. The new electric heating systems are designed such that each type of electric heating can be individually controlled to meet the needs of the many user groups of the Church, supporting a carbon-friendly and low running cost solution.

To support the electrification of the Church heating, a new, larger capacity three phase electric supply, shall be arranged with the National Grid by the electrical contractor, which involves replacement of the fuse links in the existing service head. The increase in supply is expected to be installed during the contract period and shall be connected to the existing/new three-phase electrical installation at the Church.

As part of this work, the Contractor shall replace the existing primary electrical distribution board located in the Ground Floor Switch Room with new, to support the proposed electrical installations, generally as noted on the Drawings.

Existing lighting and audio-visual systems shall be retained in full. Existing small power circuits supplying 13A socket outlets throughout the Church shall be retained, adapted, or removed as noted on the Drawings and as detailed in the Distribution Board Schedules.

New small power and lighting shall be provided in the Servery, Vestry, Storerooms and Accessible WC/Baby Changing Area as indicated on the Drawings.

The M&E Specification and Drawings show equipment sizes, general routes of pipes and cables and full design details for plant equipment. The Contractor should note that there is still an element of Contractor design required for final coordination of the services. This shall consist of finalising the routes of cables and pipes with the architectural layout, ensuring that all services are discretely routed and hidden. The Contractor shall make allowance for any meetings required to achieve this when submitting their Tender return. The route of replacement cables and pipes shall generally follow the route of existing, using existing fixing positions. All fixings shall be new with no existing fixings reused in the new installations. Generally, where existing fixings are removed and the fixing position is not reused for the installation of new services no making good of the surface shall occur unless requested by the Architect.

The Contractor undertaking the services works described in these Documents must make all necessary allowances for disruptions, temporary supplies, working sequences etc. to accommodate the programme of works that the Principal Contractor chooses to adopt.

The extent of the works is to produce a fully operational and integrated installation to the Church.

The Contractor shall refer to the Architect's Layout Drawings, Structural Engineer's Drawings, Employer's Requirements and Client's Contract Particulars in conjunction with this Specification.

4.02 scope of work

The Electrical Services installation shall be installed, tested and commissioned in accordance with the relevant British and European Standards as appropriate, the Main Contract Conditions and Preliminaries, the Mechanical Services Specifications and Drawings, Electrical Services Specification and Drawings and the Particular Preliminaries.

The extent of the works is to produce a fully operational and integrated electrical installation, in accordance with this Specification and accompanying Drawings, which includes (but is not restricted to) the following elements:

(a) Incoming Three Phase Low Voltage 55kVA 80A Rated Electrical Supply
(b) Distribution Boards including metering and Submain Distribution
(c) Demand assessment and balancing the electrical load across the three phases of new and existing distribution boards
(d) Surge Protection
(e) Containment Systems i.e. Trunking, Tray and Conduit Installation
(f) Internal Lighting and Controls Wiring
(g) Small Power installation and Fixed Equipment Electrical Supplies
(h) Mechanical Services Wiring and Controls
(i) Supply and Installation of the Pew Heaters and Controls
(j) Supply and Installation of the Plinth Heaters and Controls
(k) Supply and Installation of the Fan Convector Heaters and Controls
(l) Supply and Installation of the Electric Panel Heaters and Controls
(m) Supply and Installation of the Halo Heaters and Controls
(n) Supply and Installation of the Electric Underfloor Heating Matting and Controls
(o) Earthing and Bonding
(p) Accessible WC Alarm System
(q) Testing, Commissioning and Certification
(r) “As Fitted” Drawings, Operating and Maintenance Manuals
(s) Client Training
(t) 12 Months’ Maintenance

The Programme and other particular contractual obligations are detailed in the Main Contract Conditions.

All of the above are indicated on the Contract Drawings and detailed in the Particular Section of this Specification, and it shall be the responsibility of the Contractor to form a complete installation, including all methods of containment trunking, tray, conduit, wiring, bracketing, fittings and accessories.

The Contractor shall make allowance to resource the necessary workforce and working hours to enable the installation to be completed during the contract period.

The Contractor shall employ the services of the various Specialist Sub-Contractors as detailed in the Specification and liaise closely with them to ensure all their requirements are managed and effectively met during the Programme. It will be necessary to attend regular meetings and provide close monitoring throughout the

Contract to ensure the installations incorporate all of the necessary elements including commissioning.

The Contractor shall ensure special materials and specialist contractors are available to suit the specific programme and appoint when the Contract is let.

4.02.01 standards of work

The Contractor shall install all of the systems described to the entire satisfaction of the Engineer and in compliance with the Regulations/Codes of Practice set out in Clause 1.10 of the Preliminaries.

4.02.02 contract intent

The Contractor shall note that the Drawings are for Tender purposes and the Contractor shall allow for carrying out all on site measurements necessary to ensure access and accommodation of the relevant equipment.

Fixing arrangements and installation methods shall be as required by the relevant standards or as manufacturer's recommendations and detailed by the Contractor.

All methods of fixing/suspension shall be submitted by the successful Tenderer for approval by the Engineer.

4.03 removals

The Contractor shall familiarise himself with the Asbestos Register prior to the undertaking of any removal works.

The existing main electrical distribution board DB1 located adjacent the incoming electric supply position shall be removed in full with all existing final circuits disconnected.

The existing electrical distribution board DB4/5 located in the Chancel shall be removed in full with all existing final circuits disconnected.

The existing radial circuits for the oil-fired boiler and heating controls and submain distribution to DB4/5 shall be identified, traced, disconnected and removed in full. Any other services found to be connected from these circuits shall be brought to the attention of the Engineer before any removal.

The existing lighting installation in the Vestry shall be disconnected and removed in full.

The existing door access control system and electrical supply on the North entrance shall disconnected and removed in full.

All other existing circuits shall be retained, tested in full and subject to satisfactory results, adapted for termination at the proposed distribution boards DB1 and DB4.

The audio systems shall be retained in full and protected for the duration of the works.

Existing luminaires and control positions shall be retained in full and protected for the duration of the works.

The removals shall include but not be limited to the following elements:

(a) Electrical Distribution Equipment

(b) Limited Small Power Installation

(c) Limited Lighting Installation

(d) Access Control on the North Entrance

(e) Redundant Surface Containment and Fixings

There is no requirement to maintain power to any installations during the Contract.

All equipment removed shall be offered to the Client before disposal.

4.04 incoming services

The existing metered incoming three phase electric service located in the switch room externally at the rear of the Church shall be retained.

The fuses located in the 100A rated cutout shall be upgraded from 60A to 80A, increasing the supply capacity from 41.4kVA to 55.2kVA, to be arranged with the National Grid. This shall form part of the contract works.

The Contractor shall provide new tail connections from the fused cutout and meter position to the new primary distribution board DB1 described later.

The particulars of the tails connections and sub main distribution are described later.

There are no proposed works to any other incoming services related to this project.

4.04.01 low voltage electric supply

An existing National Grid, below ground metered three phase electrical supply enters the building from the south side of the site, terminating at a three phase and neutral fuse cutout and meter arrangement located internally in the Ground Floor Electric Switch Room. The service feeds the whole of the existing electrical installation in the Church, wired from an adjacent three-phase and neutral distribution board.

The existing metered supply and fused cutout shall be retained.

The Contractor shall arrange for the installation of larger fuses in the 100A rated fused cutout, upgrading them from 60A to 80A rated fuses.

The Contractor shall arrange with the National Grid for the upgrade of the fuses, sized to meet the expected demand for the new electric heating within the Church.

This is based on the demand profile deemed to be cyclic in nature where the electric heating system operates less than 8 hours duration at the time of use. This shall allow three phase loads to be connected greater than 55.2kVA and up to 69kVA on the 80A rated fuse links in the cutout as confirmed by the National Grid.

National Grid have confirmed the 80A rated fuses have built in tolerance that allows higher current of up to 100A be carried for a limited duration typically a few hours without causing the fuses to blow.

The Contractor shall undertake all necessary negotiations and arrangements with the National Grid for the upgrade of the fuses in the existing cutout.

The National Grid have confirmed no charges shall apply for the increase in electrical connection to the existing LV electrical infrastructure.

In accordance with the 18th Edition of the IET Wiring Regulations, the design of the installation has been based on the following parameters at the LV intake

position, from the most recent Electrical Installation Condition Report dated 25th March 2024:

(a) Nominal voltage 230/400 volts, three phase, 4-wire
(b) Alternating current at 50Hz
(c) Prospective fault current at the origin expected to be 1.4kA
(d) Earth fault loop impedance (Ze) target at the origin to be 0.34Ω
(e) Protective device at the origin - expected to be 80A
(f) Maximum demand assessed deemed to be cyclic in nature with load profile for three phase loads greater than 55.2kVA and up to 69 kVA
(g) Type of earthing to be installed – PME TN-C-C (TN-C-S)

The Contractor shall confirm the measured conditions of the upgrade in supply connection at the earliest opportunity for review by the Engineer and before ordering any switchgear.

The Contractor shall liaise with the National Grid for the upgrade of the fuses in the cutout.

Initial checks and enquiries have been carried out by BJP to obtain the information provided. The National Grid job reference is 5595500 for this enquiry dated 24th June 2025.

The contact at the National Grid:

Anthony Ogunyomi - Planner
Email: aogunyomi@nationalgrid.co.uk
Tel: 01460 273095
Mobile: 07907 721347

The Contractor may use this information to speed up the application process. Final responsibility for the application lies with the Contractor; any information used that has been obtained by BJP in the initial enquiry stage is preliminary only, and if used by the Contractor shall be entirely at their own risk.

The Contractor shall also allow for site attendance and charges associated with the procurement of changes to the existing incoming low voltage electrical supply, including any connection charges, and notifications.

The Contractor shall be responsible for obtaining a quotation and completing the acceptance form provided by the National Grid for the service to be completed in line with the Contract Programme.

The existing electric energy meter shall be retained and reused.

The Contractor shall provide new LSF/LSF tails between the fuse cut out and meter and primary distribution board. The tails shall be 25mm CSA, installed trefoil arrangement, surface clipped direct to the distribution board.

4.04.02 telecommunications

No telecommunications works are required as part of this project.

4.05 distribution boards

The existing electrical distribution equipment DB1 and DB4/5 shall be decommissioned and removed in full as described previously. All distribution boards, consumer units and redundant cabling shall be removed in their entirety.

The Contractor shall make allowance to dispose of these items accordingly in the approved manner. The removals shall include cutting back conduits where they drop into floors or ceilings and making good to all the fabric and fire sealing by agreement with the Architect.

The Contractor shall supply and install a new system of electrical distribution including the distribution boards DB1, DB4 and DB5, as indicated on the Drawings and Schedules to serve the existing and proposed fixed wiring installations within the Church.

The existing single phase and neutral distribution board DB2 and DB3 located in the plant room and bell tower shall be retained in full.

The Contractor shall carry out a demand assessment and balancing of the electrical load across the three phases of the distribution boards DB1 to DB5 to ensure the overall electrical load does not exceed 69kVA 100A three phase and 23kVA 100A across each phase of the main electrical supply.

4.05.01 distribution boards

The Contractor shall supply and install 2No. three-phase and neutral distribution boards DB1 and DB5, and 1No. single phase and neutral distribution boards DB4 to serve the existing and proposed fixed wiring installation in the Church.

The distribution boards shall be of the miniature circuit breaker type (MCB), 10KA rating complete with integral main isolator and hinged lockable cover with a barrel lock and common set of keys.

Distribution boards shall be wall mounted, securely fixed and be manufactured by Elucian, their Single Phase and Three Phase Distribution range or equal approved.

All distribution boards shall be surface metal clad types.

All distribution boards shall be lockable and rated at 125A as indicated on the Drawings and Distribution Schedules, complete with 125A rated switch disconnector incomer device. Each device shall have 25kA breaking capacity.

The Distribution Boards shall be complete with timers, miniature circuit breakers type B and C, RCBOs, AFDDs etc. with sizes as detailed on the relevant Drawings/Schedules and breaking capacity of 10kA.

Spare ways shall be protected through the use of manufacturers' blanking plates.

All RCBOs/ RCDs/AFDDs shall be 30mA rated with breaking capacity of 10kA, unless indicated otherwise.

Distribution board DB1 shall be a Three Phase board with 12 three phase ways. The distribution board shall be located in the electrical switch room adjacent to the incoming electric supply. DB1 shall serve all existing retained electrical circuits in the Church, including existing submain distribution, lighting circuits and small power circuits. Additionally, DB1 shall serve the new submain distribution to distribution boards DB4 and DB5, and new under pew heaters and plinth heaters.

Distribution board DB4 shall be a metered Single-Phase board with 24 single phase ways (8 three phase ways with single phase conversion kit). The distribution board shall be located in new timber cabinetry in the Chancel. DB4 shall serve all existing retained and new electrical circuits in the Church, including lighting circuits

and small power circuits and power requirements for the accessible WC and Vestry.

Distribution board DB5 shall be a metered Three Phase board with 8 three phase ways. The distribution board shall be located in new timber cabinetry at the rear of the Nave. DB5 shall serve the power requirements and shall be the point of connection for the proposed high level infrared halo heating and heating control panel, under floor heating matting, fan convector heaters and Servery. The board shall also serve lighting in the new timber cabinetry.

All existing and proposed circuits serving socket outlets rated < 32A shall be wired from new arc fault protection devices in accordance with the recommendations of BS7671.

Distribution boards DB4 and DB5 shall be metered by an energy check multi-function meter, provided DIN rail mounted integral within the bottom of each board assembly.

The multi-function meters shall provide visual readout and pulsed output for measurement of kWh and can also provide visual readout of other parameters such as line voltage and current.

A combined type 1+2 surge protection device Connection Type 1 (CT1) shall be provided DIN rail mounted integral within the bottom of each distribution board assembly of DB1, DB4 and DB5, to limit the effects of transient voltages. Refer to the surge protection part of this Specification for further details.

Final positions for all distribution boards shall be agreed with the Engineer prior to installation.

An agreed corresponding distribution board chart shall be provided encapsulated in a frame and fixed adjacent to each distribution board by approved permanent fixings at each location.

The charts shall be typewritten and shall be completed and fitted to identify the individual circuit reference, connected load and description of the connected load. The circuit protective devices shall correspondingly be identified and reference to the typewritten list.

In all cases, all neutral connections shall be made to a neutral bar within the distribution board and each neutral shall have an individual terminal. Similarly, earthing connections shall be made to an earthing bar within the distribution board with each earth having an individual terminal.

Connection to neutral and earth bars shall be made in such a manner that they correspond to phase connectors and conductors. These connectors shall be appropriately marked with cable ring markers to indicate the circuit number and phase of the connection.

The Contractor shall supply and install electric safety notices, warning shock notices and system procedures within each cupboard and adjacent to each distribution board.

The Contractor shall produce a 1:20 setting out elevation drawing detailing the final position of the distribution boards prior to installation taking account of cabinetry details and furniture arrangements.

4.06 submain cables

Existing connection tails between the incoming supply fuse cut-out and meter arrangement and the existing distribution board shall be removed in full as described previously.

The Contractor shall supply and install new tails connections and submain supplies as described below and indicated on the Schedules and Drawings.

4.06.01 tails connection

The Contractor shall supply and install new LSZH double insulated tails between the fuse cut out and meter, and the three phase and neutral distribution board DB1 described previously. The tails shall be 25mm² CSA including 6491B type 25mm² CSA CPC, installed trefoil arrangement, surface clipped direct to the distribution board.

LSZH double insulated cables shall be in accordance with BS7211, IEC 60502-1 and EN 60228 Standards with multistranded copper conductors. Insulation shall be XLPE, outer sheath shall be LSZH with a white outer sheath colour.

Each cable shall be clearly marked externally to indicate the phase colour.

Double insulated single core cable shall be manufactured Eland Cables, Batt Cables, Prysmian Cables or equal and approved.

4.06.02 SWA submain supply

The Contractor shall supply and install a new multicore submain cable from the primary distribution board DB1 to distribution board DB4 and distribution board DB5.

The submain cable shall be wired using LSZH/XLPE insulated SWA/LSZH sheathed cable with multi-stranded copper conductors to BS6724. The cable construction shall be class 2 stranded copper conductors to BS EN 60228, XLPE insulation, low smoke zero halogen bedding, SWA armour, low smoke zero halogen sheath, finished black.

All conductors shall be suitably identified with numbered and lettered ferrules each end.

The submain cable supply between distribution board DB 1 and distribution board DB4 shall be LSZH/XLPE insulated SWA/LSZH sheathed, 16mm² CSA, three core, with 16mm² separate integral CPC.

The submain cable supply between distribution board DB 1 and distribution board DB5 shall be LSZH/XLPE insulated SWA/LSZH sheathed, 16mm² CSA, four core, with separate 6491B type 16mm² CPC.

The submain cables shall be installed using the routes as shown on the drawings.

Generally, the installation shall be run concealed at low level in the Chancel, Nave, South Transept within the floor channels, clipped to the building fabric and fair faced stonework and timber, within joinery and routed in the floor void in the area of the Pews.

The installation shall also be run at high level along the length of the South Aisle clipped to the top of the wall plate passing over the back of any truss connections and dropping in corners.

The submain cables shall be fixed directly to the building fabric in a discrete and sensitive manner, generally following the route of existing cables and pipework.

The Contractor shall pay particular attention to neatly dressing cables around the contours of stonework and timbers and other services and the building finishes.

The submain cable shall be surface cleated to the building fabric at 400mm centres with black nylon cable cleats from Thorne and Derrick, their Elite Range Taker Cable clamp.

SWA cable shall be manufactured Eland Cables, Batt Cables, Prysmian Cables or equal and approved.

4.07 containment systems

Existing containment systems connected to redundant switchgear and final accessories shall be removed in full as described previously. This shall include but not be limited to all trunking, cable tray, conduits, mini trunking, including all fixings, screws, wall plugs. Extreme care shall be taken when removing all containment systems and fixings to ensure no damage to stonework occurs.

The Contractor shall supply and install a trunking, tray and conduit system to distribute power cabling within the building. The systems shall be sufficient in size and construction to facilitate the requirements of the proposed installations and also for 20% future cabling capacity.

All cable containment shall be medium duty, fixed directly to the building fabric using existing fixing positions wherever possible. Fixings shall be provided at regular intervals as per manufacturer's recommendations.

The Contractor shall provide containment forms throughout the building generally as indicated on the Drawings sufficient to distribute mains cables. The location of infrastructure connection points is generally identified on the Layout Plans and shall include drops to floor channels and risers within joinery and voids.

In instances where formed containment systems are not proposed, the cable installation shall be fixed directly to the building fabric in a discrete and sensitive manner, generally following the route of existing removed cables. The Contractor shall pay particular attention to the dressing of cables around other services and the building finishes generally and stone profiles.

Cables shall be installed kink free, with even spacing between cables. The Contractor shall consider the route of cables and their order of installation to minimise the number of cable cross overs. Where cables are required to cross another service, this shall be done at right angles only and typically out of view.

All cables fixed direct to the building fabric and stonework shall be secured using metallic, LSZH insulated fire rated clips in accordance with BS7671. Cable clips shall be Prysmian manufacture, from their AP Clip range or equal and approved, finish to match the installed cable. Fixing intervals shall be 300mm horizontal and 400mm vertical in accordance with the manufacturer's recommendations.

4.07.01 trunking

The Contractor shall supply and install a medium duty single compartment steel galvanised cable trunking system in accordance with this Specification, applicable standards, and the Drawings.

The trunking systems shall comply with the following standards:

(a) BS EN 50085-1: Cable Trunking Systems and Cable Ducting Systems for Electrical Installations – General Requirements

(b) BS EN 50085-2-1: Cable Trunking Systems and Cable Ducting Systems for Electrical Installations - Cable trunking systems and cable ducting systems intended for mounting on walls and ceilings

(c) BS EN ISO 1461: Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles.

(d) BS 7671: Requirements for Electrical Installations (IET Wiring Regulations)

Galvanised steel trunking shall be provided horizontally and vertically at each distribution board position top, bottom and sides for improved cable access. A single level section of trunking shall be installed to the top of distribution boards DB4 and DB5 and shall extend from DB5 over the top of the adjacent APX infrared heating control panel.

Fixings for all trunking shall be provided in accordance with the manufacturer's recommendations.

Trunking shall be 150mm by 100mm. Any deviations shall be approved by the Engineer.

The trunking system shall comprise galvanised steel trunking and interconnecting conduits and cable glanding kits.

The precise position of trunking and conduits shall be carefully coordinated to ensure no clash with the building structure and joinery.

Manufacturer approved accessories shall be used to enable changes in direction, connections etc, site manufactured accessories will not be permitted.

The Contractor shall make allowance for all supplementary fixings and for rust inhibitor protection to any exposed ends of the containment systems.

Cables shall be laid within the trunking without exceeding the maximum fill capacity. Cables shall be secured with non-metallic clips to prevent movement and damage.

The trunking system shall be bonded to the main earthing system of the building. Earth continuity shall be ensured across all joints and fittings using appropriate earth bonds.

Care shall be taken to ensure that the trunking system is free of burrs and sharp edges that could damage cables.

All trunking shall be provided by:

Trench UK
Unit 7
CMT Trading Estate
Broadwell Road
Oldbury, West Midlands
B69 4BQ

Tel:0121 544 7011

Or equal approved.

4.07.02 cable tray

The Contractor shall supply and install a robust and fully supported medium duty 150mm perforated galvanised steel cable tray system to distribute final circuit cabling.

150mm medium duty cable tray shall be provided vertically at distribution boards DB 4 and DB 5 to provide a neat cable way at low level. The vertical cable tray shall be boxed in with painted timber joinery by the Main Contractor. The exact position of the vertical tray work shall be agreed on site with the Architect.

The cable tray systems shall comply with the following standards:

(a) BS EN 61537:2007 - Cable Management - Cable Tray Systems and Cable Ladder Systems for Electrical Installations

(b) BS EN ISO 1461: Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles.

(c) BS 7671: Requirements for Electrical Installations (IET Wiring Regulations)

Cable tray shall be Marshall Tufflex manufacture or equal and approved.

4.07.03 conduit

The contractor shall supply and install a rigid white uPVC conduit system in accordance with this Specification, applicable standards, and the Drawings within new stud construction for the proposed Accessible WC, Vestry and Kitchen Servery.

The conduit system shall be designed to provide a robust, durable, and rewireable solution suitable for indoor applications.

The conduit shall be manufactured from high-quality, rigid uPVC, compliant with BS EN 61386-21 for mechanical and non-metallic cable conduit systems. The uPVC material shall exhibit high impact resistance, flame retardance, and a smooth internal surface to prevent cable damage during installation.

The conduit shall be resistant to corrosion, moisture ingress, and chemical degradation in typical building environments.

The materials and installation practices shall comply with the following standards:

(a) BS EN 61386-1: Conduit Systems for Cable Management - General Requirements

(b) BS EN 61386-25: Conduit Systems for Cable Management - Particular Requirements. Conduit Fixing Devices

Conduits shall be routed to avoid sharp bends and minimise the use of running couplers. Manufacturers approved accessories shall be used including but not limited to terminal, angle, tee and through boxes. All supports and fixings shall be fire rated to ensure the integrity of the entire system.

All joints and connections shall be tight and secure, using appropriate fittings. Care shall be taken to ensure that the conduit system is free of sharp edges that could damage cables.

Conduits shall be a minimum size of 20mm, for installation of the FireTuff enhanced cabling and disabled alarms cabling only. No other cabling types shall be installed within the conduit system.

All conduit shall be provided by Marshall Tufflex or equal approved.

The Contractor shall supply and install 25mm diameter steel helically wound flexible conduit with PVC coating finished in black and laid within the floor structure. The flexible conduit shall contain the power supplies to the following:

(a) Twin switched socket outlets in the flush floor mounted outlet boxes.

(b) 1no fused connection unit for the power supply to the proposed controls for the automated doors on the North Entrance.

(c) Power supplies to the new servery.

(d) Power supplies to the halo heaters and underfloor heating matting in the servery.

The 25mm steel flexible conduit shall be provided with IP54 steel connections. No other cabling types shall be installed within the conduit system.

The steel flexible conduit with black PVC coating shall be by Atkore Flexicon or equal approved.

The 25mm steel flexible conduit for the proposed power supplies shall be co-ordinated with the proposed electric under floor heating matting.

4.08 type of installation

Generally, the electrical installation to all areas of the Church excluding the proposed Accessible WC, Vestry and Servery shall be surface clipped direct at low, medium and high levels.

The proposed Accessible WC, Vestry and Servery shall adopt a flush concealed installation wired using FireTuff enhanced fire-resistant multicore cable drawn into uPVC conduit containment systems as described previously and indicated on the Drawings.

The proposed floor sockets, power supplies for the door access control on the North entrance, to the Servery, halo heaters and underfloor heating matting shall adopt a flush installation wired using FireTuff enhanced fire-resistant multicore cable drawn into 25mm diameter steel helically wound flexible conduit with PVC coating finished in black and laid within the floor structure.

Above finished floor level within the Servery the power supplies shall adopt a flush concealed installation wired using FireTuff enhanced fire-resistant multicore cable drawn into uPVC conduit containment systems.

The installation in the South and North Aisles and within the Nave shall be carried out using FireTuff enhanced fire-resistant multicore cable surface clipped to the building fabric, stonework, within the floor channels and routed under the existing raised timber floor in the area of the pews.

The cables shall be fixed directly to the building fabric and stonework in a discrete and sensitive manner, generally following the route of existing cables and pipework. The Contractor shall pay particular attention to the dressing of cables around other services and the building finishes and stonework generally.

Generally, the installation shall be run surface clipped to the building fabric concealed at high level and low level dropping in corners , within joinery and floor channels and routed under the existing raised timber floor in the areas of the Pews.

Flush, uPVC white moulded plastic accessories shall be used in the Accessible WC, Vestry and Servery area only.

Surface grey metal clad accessories shall be used for all individual outlets in all other areas of the church.

Containment systems and surface clipped direct cabling shall be installed as described previously making full use of existing fixing positions where practicable and following guidance of the Church of England Electrical Wiring Installations in Churches guidance document, specifically points A-M listed in Annex B of the Document.

The FireTuf cable installations shall be clipped direct to fair faced stonework and timbers in all areas and shall be with a white coloured outer LSZH sheath.

High, mid and low-level installations in the Nave, Chancel, Transepts and Aisles shall be planned such that cables are neatly dressed around the contours of stonework and timbers.

Cables to be installed at high level along the length of the Nave and Aisles shall be clipped to the top surface of the wall plate, passing over the back of any truss connections.

Cable types and sheath colours for all other systems shall be as detailed elsewhere in this Specification.

All exposed cabling routes shall be agreed with the Architect and Engineer prior to installation. Primary distribution routes shall generally be as indicated on the Layout Drawings.

All cabling shall be fixed at regular intervals using a proprietary fire rated clip systems as described previously, in compliance with BS 7671 and BS 5839.

Surface mounted powder coated steel back boxes shall be used for all new outlets to ensure a neat and consistent installation is provided. Accessories to be installed surface on fair faced stonework and timbers shall be fixed at existing positions where appropriate. New positions to be agreed with the Architect first.

The systems shall be completely rewirable, and concealed draw-in boxes will not be accepted in any part of the installation.

Existing audio-visual cabling shall be retained in full as described previously. There are elements of the existing retained audio-visual cable installation that require refixing to the building fabric and where existing equipment needs to be relocated outside the Nave near the organ in a position to be confirmed. A provision sum is included to re-fix and modify this element of the installation where necessary. These works shall be carried out as directed by the Engineer and Architect.

The Contractor shall survey all floor and ceiling voids to determine final routes, holes and required builders work necessary for the wiring installation.

All cables shall be AEI Cables, Doncaster Cables, Prysmian Cables, Batt Cables or Eland Cables manufacture or equal and approved.

All systems shall be installed in strict accordance with the manufacturer's instructions.

Final cable and containment routes shall be agreed prior to installation.

All Electrical Services shall be contained within and protected by the purpose forms of containment as described in Section 4.07.

The electrical supplies shall be derived from the replacement distribution boards DB1 DB4 & DB5.

4.09 earthing systems

Earthing and bonding shall be provided to all services and exposed conductive parts of the installation in strict compliance with BS7671 18th Edition of the IET Wiring Regulations, suitable for a 'TN-C-S' (PME) main earthing arrangement.

New equipotential bonding shall be provided to all retained incoming services, water etc. and any conductive part of the building structure. New equipotential bonding conductors shall be 10mm² 6491B LSF cables.

Supplementary bonding shall be provided to all exposed conductive parts, i.e.: hot and cold-water pipes, etc. This shall apply to all rooms, which contain any of the above-mentioned items and extraneous metalwork requiring bonding such as WC sanitaryware, Servery and new trunking, tray and back boxes for outlet locations.

The Contractor shall supply and install, adjacent to the primary distribution board DB1 a 6-way main copper-earthing terminal, M.E.T. complete with single disconnecting link, to which all services protective conductors/equipotential bonding connections shall be terminated. Each connection shall be clearly labelled with approved cable markers.

The M.E.T shall be connected to the DNO earth terminal at the fuse cut-out. The type of earthing provided by National Grid is expected to be TN-C-S earthing.

The Contractor is urged to make early provision for all bonding requirements, including the provision of trunking and tray etc. and shall be responsible for obtaining approval from the Engineer for the bonding methods proposed.

4.10 lighting

The existing internal and external lighting installations shall be retained in full.

Existing lighting circuits that are proposed to be connected from new distribution boards DB1 and DB4 shall be tested in full with no limitations and, subject to satisfactory test results, shall be terminated at new 30mA RCBO devices installed in the respective distribution board DB1/DB4. Existing circuit arrangements shall be retained with local wiring adaption at the distribution board positions only, in the event existing cable lengths are insufficient to terminate at the new distribution boards. Adaptions to the existing lighting wiring shall be carried out in wiring to match the existing installation, including cable type and conductor size. A purpose din rail enclosure complete with DIN rail terminal blocks shall be installed at a location to be agreed with the Architect and Engineer, to joint and extend the existing lighting circuit installation for connection to the new distribution boards.

All conductors shall be suitably identified with numbered and lettered ferrules each end. The DIN rail enclosure shall be permanently labelled with an engraved traffolyte label.

The Contractor shall, under this Contract, supply, install, complete with all light controllers, LED lamps, modules, arrays the luminaires in the positions shown and switched as detailed on the Layout Drawings.

The luminaires shall be connected to new circuits as indicated on the Distribution Board Schedule DB4.

The Contractor shall provide new luminaires, fixed wiring and controls for the lighting installation in the Accessible WC and Vestry as indicated on the Layout Drawing. This shall include circuits to all proposed internal and emergency lighting. The proposed lighting shall be ceiling surface fixed.

The luminaire types shall be manufactured by Dextra Lighting as indicated on the Drawings.

Contact:	Dextra Lighting Limited – Jasin Wojcik
Tel:	07880 290388
Email:	JWojcik@dextralighting.co.uk

The Contractor shall be responsible for checking the final approved luminaires and ensuring all wiring and controls wiring is suitable for the chosen luminaires and compliant with BS7671 with regards to environment.

The final lighting installation shall consist of fittings with LED technology to be ceiling surface mounted type.

The lighting shall be controlled through the use of one-way wall switches and automatic detection for presence detection as indicated.

All wiring for the lighting circuits shall be as noted in the Schedules.

All cabling shall be enclosed within cable trunking, fixed to cable tray or surface clipped direct to building fabric as described previously.

All final connections to luminaires shall be made using LSF multicore heat-resistant cables of a suitable rating.

Lighting switches shall be MK Electric manufacture from the White Logic Grid Plus range with 20A rated grid type switches.

Where indicated, light switches shall be engraved with a description of the circuit type they control.

4.10.01 emergency lighting

The Contractor shall supply, install and test all new luminaires, fixed wiring and controls for a self-contained, maintained surface mounted emergency lighting installation within the room areas as indicated on the Layout Drawings.

The luminaire types shall be manufactured by Dextra Lighting as indicated on the Drawings.

A permanent live feed connection shall be provided to each emergency luminaire position indicated on the Layout Drawings to maintain a charge to the emergency luminaire battery.

The emergency luminaire shall operate only on mains failure, either by local circuit failure or loss of incoming mains power. The internal emergency lighting shall be self-test.

4.11 small power installation

The Contractor shall supply, install and connect all power outlets shown on the Drawings. This shall include 13A switched socket outlets, fused connection outlets and isolating switches as indicated.

Socket outlets, fused connection outlets, isolation switches etc. shall generally be the same manufacturer.

Local control shall be provided at each equipment position as detailed on the Drawings and shall comprise surface or flush mounted control switches as appropriate. Final connection to the equipment shall be made with cable of appropriate size and type.

Where required at points such as the fridge, the control point shall be mounted above the worktop within a fused connection unit with a unswitched socket outlet mounted behind or adjacent to the position of the equipment for final connections.

Final equipment connections shall be carried out under this Contract irrespective of who supplies the equipment.

Each power socket outlet, fused connection unit and isolation control switch shall be complete with pressed powder coated steel box, surface pattern and manufactured fly-lead of 2.5mm^2 size with green/yellow insulation.

All 13-amp socket outlets, fused connection units and isolation control switches shall be complete with cover plates.

The accessories shall be MK Electric manufacturer from the White Logic Plus range of accessories for the servery, vestry and accessible WC.

The accessories shall be MK Electric manufacturer from the Metalclad Plus range of accessories with Metalclad surface back boxes for the new electric heating and controls and new automatic doors.

MK manufacture Commando Safety Switch IP65 range, lockable rotary isolator shall be used to serve the halo heaters.

The flush floor outlet boxes for the twin switched sockets shall be as manufactured by Cableduct Limited, the 700 Series IP65 Rectangle Floor Box each with 1no compartment for 1no outlet plate. The inset on the floor box recess lid shall be at the maximum depth of 30mm for the stone floor finish plus adhesive to match and be level with the final floor covering/finish. The robust lid frame size shall be 250x148mm made of stainless steel and standard base box 260x158mm with depth of 85mm product SBOX-718-IP65 and twin switched socket outlet plate ref 7R054 or equal approved.

Accessories shall be installed in the positions as shown on the Layout Drawings.

Where required, fused connection units providing flexible cable connections shall be used and final connections to equipment shall be with heat resistant cable of suitable size.

The Contractor shall ensure that the correct cartridge fuse has been inserted into the fused connection unit in respect of the equipment being controlled.

Cables for 13-amp power outlets shall be a minimum size of 2.5mm^2 and installed using the “ring main” or “radial” principle as indicated on the Schedules. As

indicated in the Schedules, RCBOs/RCDs/AFDDs should be provided with 30mA rating and suitable to connect to one way only of the board.

Generally, all sockets shall be provided with two separate earthing terminals and ring-earthing conductors shall be connected to different terminals at the sockets and in the distribution boards.

All fixed equipment shall be served by a dedicated radial circuit, and will include but not be limited to the following:

(a) Electric Heating
(b) Water Heaters
(c) Automatic Doors
(d) Call Alarm System

The wiring accessories shall be as previously described or equal and approved.

The time switch for the proposed electric point of use hot water heaters in the Accessible WC/Baby Changing Area and Servery shall be the Timeguard, 7 Day Fused Spur Digital Time Switch FST77.

4.12 mechanical services wiring

The Contractor shall supply, wire, connect, in full the items of Mechanical Services heating equipment and controls detailed within this section of the specification.

The Contractor shall wire and connect the point of use hot water heaters and extract ventilation provided by the Mechanical Contractor.

The Contractor shall refer to the Electrical and Mechanical Services Drawings for Wiring Requirements and the locations of the plant and equipment.

The Mechanical Services shall include but shall not be limited to the following:

(a) Pew heaters and Controls – Provided by Electrical Contractor
(b) Plinth Heaters and Controls – Provided by Electrical Contractor
(c) Fan Convector Heaters and Controls - Provided by Electrical Contractor
(d) Halo Heaters and Controls - Provided by Electrical Contractor
(e) Underfloor Heating Matting and Controls - Provided by Electrical Contractor
(e) Point of Use Water Heater – Provided by Mechanical Contractor

(f) Extract Fan - Provided by Mechanical Contractor

The Contractor shall include in his Tender for the installation of all power supplies and interconnecting cables to items of equipment listed above and as detailed on the Drawings.

The final setting up and commissioning of the Mechanical Services equipment shall be the responsibility of the Electrical and Mechanical Services Contractors.

The Contractors shall allow for co-operating fully with each other to ensure that all plant functions correctly.

Final connections to mechanical plant listed above and indicated on the Drawings shall be carried out using heat resistant flex where isolators or fused connection units are mounted adjacent, the length of the flex shall not exceed 500 millimetres in length.

The Contractor shall allow for fully testing and checking all power wiring, ensuring that all motors rotate in the correct direction.

The Contractor shall fully co-operate with all other Contractors during commissioning and ensure that all the plant and equipment operates correctly.

4.13 accessible wc alarm system

The Contractor shall supply, install, test and commission a standalone Accessible WC Alarm System where indicated on the Drawing. The system shall serve the purpose of an Accessible WC alert.

The system shall comprise pull cords, reset button in Accessible WC and over door sounder indicator unit.

On activation of any pull cord a signal shall be sent to the local indicator outside the room.

There shall be a constant tone and light indication at the location until the call is reset.

The Accessible WC shall have a pull cord provided directly adjacent to the toilet with a separate reset point to allow the alarm to be acknowledged and reset from

the room. These points shall be located as required by the appropriate Building Regulations and BS8300.

The Contractor shall include all cabling and equipment, containment, power supplies and earthing required for a complete flush installation. All cables shall be installed flush in uPVC white conduit with fire rated fixings throughout. All cables shall be concealed to final equipment locations.

The system shall be of CTEC or Wandsworth manufacturer with stainless steel finish.

4.14 electric heating systems

The Contractor shall supply, install, test and commission the electric heating systems in the building to replace the existing oil-fired wet heating system.

The new systems of electric heating shall be supplied and installed as indicated on the Drawings and describe herein.

4.14.01 electric plinth heaters

The Contractor shall supply and install the electric plinth heaters PH1 and PH2 with integral controls within the North Transept Space and South Transept Space in the bottom of the storage units in the locations shown on the Drawing.

The plinth heaters shall be manufactured by Smiths model No. SS2E 2.0kW Space Saver Base Unit Heaters with air outlet grille finished in brown product code HASS10131, each operated by a wireless wall mounted controller next to the pew heater controllers in the chancel. The wireless temperature control is provided with on/off function, programmable timer and frost protection supplied (battery operated).

The Contractor shall provide dedicated radial power supplies to the plinth heaters.

Switched fused connection units shall be mounted adjacent to the plinth heaters.

The Contractor shall carry out final connections to heaters; to be wired using heat resistant flex from adjacent fused connection units, the length of the flex shall not exceed 500 millimetres in length.

The contact at Smith is as follows:

Contact: Matt Cooper – Sales & Account Manager
Email: matt.cooper@smithsep.co.uk
Tel: 07884 736789

4.14.02 electric fan convector heaters

The Contractor shall supply and install the electric fan convector heaters FCH1 and FCH2 to be encased in bespoke joinery in front of the pews in the locations shown on the Drawing.

The front case of the fan convectors shall be removable for maintenance.

The electric fan convector heaters shall be manufactured by SPC Belgravia Classic range 3.75kW model No. BEL 40.

Remote on/off master variable speed control switch type RS13 shall be provided for each heater to be wall mounted next to the pew heater controllers in the chancel.

The Contractor shall provide dedicated radial power supplies to the fan convector heaters.

Local isolation switches shall be provided adjacent, but not below the heaters, typically mounted above floor level fixed to the stonework or timber joinery.

The contractor shall carry out final connections to heaters; to be wired using heat resistant flex from adjacent fused connection units, the length of the flex shall not exceed 500 millimetres in length.

The contact at SPC is as follows:

Contact: Lewis Gregory – Internal Sales Engineer
Email: Lewis.Gregory@spc-hvac.co.uk
Tel: 0116 249 8027

4.14.03 electric under floor heating matting

The Contractor shall supply, install, test and commission a system of electric under floor heating in the area of the West Nave and Southwest and Northwest Aisles as shown on the Drawings.

The underfloor heating system shall be the loose electric heating cable type suitable for installation in the new flooring area.

The heating mat type shall be the Schluter Ditra-Heat-E mat system designed for attaching heating cables. The heating mat system, heating cables and controls shall be installed by the Electrical Contractor.

The electric under floor heating shall be installed below the final floor finish in each of the areas indicated on the Drawings. Each area shall have its own heating cable installation and thermostat controller.

The underfloor heating shall be sized to offer a maximum heating output of 150w/m². Each system shall be supplied with a remote wall thermostat controller and two number floor sensors automatically controlling the heating as required.

Each electric underfloor heating installation shall be provided by Schluter, their Ditra-Heat-E-HK, heating cable colour graphite black, 12.5W/m, complete with Ditra-Heat-E-R digital thermostat controller finished in white or equal and approved.

Each electric underfloor heating installation shall be provided with a dedicated radial circuit wired from the local distribution board DB5 as indicated in the Schedules. Each circuit shall be rated 16A, protected by 30mA RCBO. The heating cable shall not be shortened or extended in any way. The cold conductor is 4m as standard. Where this is not sufficient to connect to the thermostat controller the cold conductor shall be extended using the multicore fixed wiring systems described elsewhere in Section 4 particulars part of the main Specification. All cold conductor joints shall be made in an appropriate maintenance free joint box, at an agree position and recorded on the record drawings.

The underfloor heating system shall operate on floor temperature only.

All controls including switched fused connection units shall be located directly below the local distribution board DB5 in the new store cupboard as indicated on the Drawings.

All system shall be installed in accordance with the manufacturers recommendations and in compliance with the requirements of BS7671.

The contact at Schluter Systems is as follows:

Contact:	Chris Emery – Sales Consultant
Tel:	07972 080 731
Email:	sales@scluter.co.uk
Tel:	01530 813396

4.14.04 electric pew heaters

The Contractor shall supply and install under pew electric heaters, quantity and locations as shown on the Drawings to minimise the visual impact of the heater on the wider space.

The heaters shall be mounted under the pew seats located in the north and south aisle and chancel generally as indicated on the Drawings.

The heaters shall be grouped and connected through 3No. 40A DP contactors DIN rail mounted within an enclosure in the plant room each controlled by an adjustable run-down timer located within purpose built timber cabinetry in the Chancel.

The 3No. adjustable run-down timers shall be manufactured by Timeguard DS3HDN, adjustable from 2min to 180min. The run-down timers shall be set to 2 hours.

Heaters shall be switched into groups, each group isolated via a local fused switched connection unit adjacent to each run of heaters.

The heaters shall incorporate thermal cut-out protection and overheat detection.

The heaters shall be manufactured by BN Thermic Ltd, their PH Series Under Pew Heating system range, model PH30 0.3kW output and model PH65 0.65kW output as indicated.

Each group of heaters shall be wired on a dedicated radial circuit wired from distribution board DB1 as indicated on the Schedules.

Final connection shall be from a local switched fused connection unit. The final connection to heater shall be carried out using heat resistant flex from and adjacent fused connection unit, the length of the flex shall not exceed 500 millimetres in length.

The existing pew heaters, electrical supplies and controls shall be retained. The existing run-down timer presently set to 3 hours shall be set to 2 hours.

4.14.05 infrared halo heaters

The Contractor shall supply and install a system of high-level infrared heating to West of the Nave.

The system shall be manufactured by Herschel Infrared Ltd, using their bespoke Halo Heaters and Herschel bespoke APX control panel APX-H2-UK.

The installation shall consist of 2No. high-level pendant infrared halo heaters spaced centrally in the South Aisle and North Aisle stone arches. The heaters shall be controlled from a local Herschel APX heating control panel. The Contractor shall include to install, test, commission and set to work the system as part of the works.

The halo heaters shall be the Herschel 4800W three-phase, each with 12No. 400W Herschel Kanthal Ceramic Heating Elements heating elements without lights and decorative finish IR-HALO-4800 black positioned, as indicated on the Drawings.

The heating elements shall emit zero light.

The full and final output of each Halo heater shall be as indicated on the Drawings.

The Halo heaters shall be supported from the building structure, suspended at 3.5m - 3.6m above finished floor level from the stone arches. The Contractor shall ensure the height works with the existing stone arches

The fixing method for each heater shall be confirmed as suitable by the structural Engineer prior to installation for supporting each heater.

Each Halo heater shall be wired for three phase connection with a single point of connection at the terminal box mounting rose.

Each heater shall be wired on individual dedicated radial circuits from distribution board DB5. The circuits shall be wired through dedicated bespoke control panel, supplied and manufactured by Herschel Infrared Ltd for the purpose of controlling the Halo Heaters only.

The control panel shall house a separate 230V power supply to operate switching relays, controller and built in smart switches managing the switching of the Halo heaters, ensuring in-rush currents are managed and do not overload the system.

The Halo heaters shall be switched individually ensuring maximum flexibility and energy efficiency for the many heating scenarios required by the Church Group.

Each heater shall be controlled from a Herschel three push button smart switch TPBS, for switching the heaters on/off and to regulate the power levels by dropping out heater elements in groups of four. The smart switches shall also ensure the switching of heating loads is managed to avoid disruptive inrush currents. Each controller shall switch and control three relays in the control panel, in turn switching one or more phases in each Halo heater on or off to adjust the heater output.

Smart Switch shall provide simple switch control for end users of the system without operating electrical isolators or circuit protective devices. The control panel will also ensure no heater is left on indefinitely, automatically switching the heater off after 7 hours of continuous use in accordance with the Ecodesign Directive 2009/125/EC and National Grid supply requirements.

The control panel shall be the Herschel APX-H2-UK and three push button smart switches Herschel TPBS x 2No. finished in white.

The existing Wi-Fi located in the church shall be linked to the heating system to allow the heaters to be remotely controlled, set scenes and timers using a smart phone or tablet through the free App called Smart Life.

The control panel shall be located in the store cupboard West of the Nave, adjacent to DB5, located within joinery, easily accessible and shall control the Halo Heaters 1 & 2. Total installed maximum electrical load 9600W.

The control panel shall be ordered at the same time as the infrared heaters to ensure the control panel matches the requirements of the installation.

Each infrared heating circuit shall be provided with a four pole 25A, 400V rated isolator between the Distribution Board DB5 and the control panel. Each Isolator shall be labelled to identify which infrared heater unit is connected.

Heaters shall generally be wired internally by the manufacture providing a point of connection at the terminal box mounting rose.

Final connections to heaters shall be made from Wiska Combi joint boxes finished black. Cable entry and exit to/from the joint box shall be fully glanded and sealed. The joint box shall act as the local point of disconnection for the Halo heaters heating and lighting circuits. The joint boxes shall be labelled to draw attention to 400V presence, and identify the circuit ID.

Final connections to the heater units for the heating circuits shall be made using N2XH Enhanced Flex 5 core flex with 4.0mm² CSA class 5 stranded conductors, outer sheath finished black.

A full technical submittal including final heater and panel wiring drawings shall be submitted to the Engineer for review before the final order is placed.

A quotation has been raised by Herschel for the project as is available from the contact as follows:

Contact:	Liam White – Product Manager
Email:	liam.white@Herschel-infrared.com
Tel:	0117 325 3858
Office:	01473 760059

4.14.06 electric panel heaters

The Contractor shall supply and install the electric panel heaters EPH1 and EPH2 with integral controls within the Accessible WC and Vestry in the locations shown on the Drawing.

The heaters shall be manufactured by Glen Dimplex LSTE Low Surface Temperature Panel Heaters complete with integral adjustable 7-day programmer and digitally controlled electronic thermostat.

(a) Glen Dimplex 1.0kW LSTE Panel Heater model No. LST100E 091185 shall be provided in the Accessible WC.

(b) Glen Dimplex 1.0kW PLXE Panel Heater model No. PLX100E 090713 shall be provided in the Vestry.

The Contractor shall provide dedicated radial power supplies to the electric panel heaters.

Local switched fused connection units shall be provided adjacent, but not above or below the heaters, typically mounted above floor level fixed to the stonework.

The contractor shall carry out final connections to heaters; to be wired using heat resistant flex from adjacent fused connection units, the length of the flex shall not exceed 500 millimetres in length.

4.15 audio visual system

Existing audio-visual system including existing wiring, control desks, amplifiers, loudspeakers etc. shall be retained in full.

The existing audio cabinet with transceiver and amplifier shall be relocated outside the Nave near the organ in a position to be confirmed.

Elements of the existing wiring have also become detached from the building fabric over time or cross over other services to be removed. The Contactor shall include to re-fix any existing retained wiring back to the building fabric as described previously and wiring modifications required to the new position of the existing AV equipment.

A provisional sum has been included for this element of the work.

4.16 surge protection

The Contractor shall supply, install, test and commission combined Class 1 and 2 level surge protection in the proposed distribution boards DB1, DB4 and DB5.

The Class 1 and 2 electronic surge protection devices shall be a combined unit as Schneider Electric manufacture, Type 1+2 combined Lightning and Surge Arrester kit for TN-C-S installations and shall limit current to 20kA.

Connection to each device shall be limited to a maximum of 500mm in length, sized as detailed in the Distribution Board Schedules.

The Contractor shall include all cabling and equipment, containment, power supplies and earthing required.

Each surge protection unit shall be complete with a dedicated overcurrent protection device. Both the surge protection unit and over current protection device shall be mounted in a purpose enclosure mounted adjacent to each distribution board using the Schneider Electric surge protection device enclosure.

4.17 builder's work

The Contractor shall determine the final builder's work requirements associated with this installation. He shall provide this information in full to the Principal Contractor.

The Principal Contractor shall be responsible for sealing all holes after installation to prevent the ingress of weather and vermin including the provision of acoustic seals and fire stopping as required.

Any making good and sealing of holes shall be agreed by the Architect in the first instance and shall follow the recommendations of the Church Care Guidance Notes for Electrical Wiring Installations in Churches.

4.18 manuals and record drawings

The Contractor shall provide, at the completion of the Contract, Operation and Maintenance Manuals and Record Drawings of the installed services as detailed in Section 1 of this Specification.

4.19 labelling

The distribution boards shall be labelled to indicate the board reference and shall be fitted with numbered phase discs.

The labelling method shall be agreed with the Engineer.

Each conductor shall be provided with a corresponding ferrule type label at connection to the distribution board terminal. Circuit charts shall be provided in accordance with BS 7671 and shall be permanently fixed in a frame.

The submains and CPCs shall be identified/labelled by using tie-wraps or self-adhesive traffolite labels at all termination points – source and destination for each.

Each conductor shall be provided with a corresponding ferrule type label at connection to the distribution board terminals.

All isolators and fused connection units shall be **engraved** to indicate the equipment served. Stick on labels shall not be accepted.

All joint boxes shall be labelled to identify the voltage present within and apply an adhesive circuit reference identifying the connected DB and circuit that corresponds with the Record Drawings.

Each accessory plate i.e., light switch, socket outlet shall be provided with an adhesive circuit reference identifying the connected DB and circuit that corresponds with the Record Drawings.

The exact labelling format for each element of the electrical services shall be approved by the Engineer prior to installation and record drawing production.

4.20 testing and commissioning

The Contractor is reminded of the requirements of the Contract Document, Specification, Regulations, Codes of Practice, etc in connection with Testing, Commissioning and Hand-over, which will be rigorously enforced.

The Contractor shall test and commission the Electrical Services and shall issue Certificates of Completion, Testing and Inspection duly completed and signed.

All systems shall be tested in accordance with the relevant codes and standards and certificates issued.

This shall include NICEIC Electrical Installation Test Certificates for the complete installation.

This shall include the NICEIC/ECA Electrical Testing to BS7671.

All test certification shall be produced using computer software and both electronic and paper copies are required.

The test certificates shall be accurately produced, legible and issued to the Engineer.

The completed test certificates shall be submitted to the Engineer at least a week prior to handover in typewritten format. Test certificates, test results and readings for all systems shall be issued and included in the O&M Manuals.

The Contractor shall notify the Engineer of all tests, giving at least seven days' notice, affording the Engineer the opportunity to witness any such tests if they so desire.

4.21 contingency/provisional sums

The Contractor shall include the sums indicated in the Tender Summary as Provisional Sums. These sums shall be expended in part, or as a whole, or not at all, as directed by the Engineer.

appendix a.

DISTRIBUTION BOARD SCHEDULE

Three Phase Distribution Board Ref: DB1 Isolator Size: 125A TPN 12 Way						Location: External Electrical Cupboard		Sheet No. 1/1
Circuit Way/Phase	**MCB Size**	**MCB Type**	**Cable Size**	**Cable Type**	**AFDD**	**RCD**	**Description**	**No. of Points**
1/L1	63A	B	16mm²	SWA	N	N	Distribution Board DB5 Submain Supply	1
1/L2	63A	B	16mm²	SWA	N	N	Distribution Board DB5 Submain Supply	1
1/L3	63A	B	16mm²	SWA	N	N	Distribution Board DB5 Submain Supply	1
2/L1	10A	B	Existing	Existing	N	N	Distribution Board DB2 Submain Supply	1
2/L2	63A	B	Existing	Existing	N	N	Distribution Board DB3 Submain Supply	1
2/L3	63A	B	16mm²	SWA	N	N	Distribution Board DB4 Submain Supply	1
3/L1	20A	B	Existing	Existing	N	N	Existing Radial Supply Church Organ Blower	1
3/L2	20A	B	Existing	Existing	N	N	Existing Radial Supply Church Organ Blower	1
3/L3	20A	B	Existing	Existing	N	N	Existing Radial Supply Church Organ Blower	1
4/L1	45A	C	Existing	Existing	N	30mA	Existing Radial Supply Under Pew Heaters LHS	21
4/L2	45A	C	Existing	Existing	N	30mA	Existing Radial Supply Under Pew Heaters RHS	20
4/L3								
5/L1	25A	C	4.0mm²	Tuff	N	30mA	Radial Under Pew Heaters South Aisle	6
5/L2	25A	C	4.0mm²	Tuff	N	30mA	Radial Under Pew Heaters North Aisle	14
5/L3	25A	C	4.0mm²	Tuff	N	30mA	Radial Under Pew Heaters Chancel	12
6/L1	16A	C	2.5mm²	Tuff	N	30mA	Radial Plinth Heater South Transept	1
6/L2	16A	B	Existing	Existing	✓	30mA	Existing Radial Circuit Socket Switchroom	1
6/L3	16A	C	2.5mm²	Tuff	N	30mA	Radial Plinth Heater North Transept	1
7/L1	10A	C	2.5mm²	Tuff	N	30mA	Radial Run Down Timers for Pew Heaters and Contactor Control Circuits	3
7/L2	6A	B	Existing	Existing	N	30mA	Existing Lights Plantroom / Electrical Cupboard	2
7/L3								
8/L1	20A	C	2.5mm²	Tuff	N	30mA	Electric Fan Convector Heater FCH2	1
8/L2	20A	C	2.5mm²	Tuff	N	30mA	Electric Fan Convector Heater FCH1	1
8/L3								
9/L1	20A	C	16mm²	6491B	N	N	Surge Protection	1
9/L2	20A	C	16mm²	6491B	N	N	Surge Protection	1
9/L3	20A	C	16mm²	6491B	N	N	Surge Protection	1
10/L1								
10/L2								
10/L3								
11/L1								
11/L2								
11/L3								
12/L1								
12/L2								
12/L3								

Notes:
Incomer Device - 125A Switch Disconnector 3P+N
Type 1+2 Surge Protection and Energy Meter Kit located internally within the Distribution Board

Three Phase Distribution Board Ref: DB4 Isolator Size: 125A TPN 8 Way						Location: Chancel		Sheet No. 1/1
Circuit Way/Phase	**MCB Size**	**MCB Type**	**Cable Size**	**Cable Type**	**AFDD**	**RCD**	**Description**	**No. of Points**
4/1	20A	C	Existing	Existing	✓	30mA	Existing Radial Circuit Sockets North East and Side	2
4/2	20A	C	Existing	Existing	✓	30mA	Existing Radial Circuit Socket North West, Access	3
4/3	20A	C	Existing	Existing	✓	30mA	Existing Radial Circuit Sockets Cupboard and Organ	3
4/4	20A	C	Existing	Existing	✓	30mA	Existing Radial Circuit Socket South East	1
4/5	20A	C	Existing	Existing	✓	30mA	Existing Radial Circuit Socket South West	1
4/6								
4/7	32A	C	2.5mm²	Tuff	✓	30mA	Ring Main Circuit Sockets Vestry	4
4/8	16A	C	2.5mm²	Tuff	N	30mA	Electric Panel Heater EPH2 Vestry	1
4/9	16A	C	2.5mm²	Tuff	N	30mA	Electric Panel Heater EPH1 Accessible WC	1
4/10	20A	C	2.5mm²	Tuff	N	30mA	Water Heater Accessible WC	1
4/11	20A	C	2.5mm²	Tuff	N	30mA	Power for Lighting	2
4/12	16A	C	2.5mm²	Tuff	N	30mA	Call alarm System Accessible WC	1
4/13	10A	C	Existing	Existing	N	30mA	Lights Chancel	6
4/14	10A	C	Existing	Existing	N	30mA	Lights North Aisle	3
4/15	10A	C	Existing	Existing	N	30mA	Lights South Aisle	3
4/16	10A	C	Existing	Existing	N	30mA	Lights Tower	8
4/17	10A	C	Existing	Existing	N	30mA	Lights North Nave	3
4/18	10A	C	Existing	Existing	N	30mA	Lights South Nave	3
4/19	10A	C	Existing	Existing	N	30mA	Lights Porch, Pathway and Grounds	5
4/20	10A	C	Existing	Existing	N	30mA	Light Churchyard Floodlight by Alter Window	1
3/21	10A	C	Existing	Existing	N	30mA	Lights Churchyard Floodlights	2
4/22	10A	C	1.5mm²	Tuff	N	30mA	Lights Vestry and Accessible WC and Extract Fan	5
4/23					N			
4/24	20A	C	16mm²	6491B	N	N	Surge Protection	1

Notes:
Incomer Device - 125A Switch Disconnector 3P+N and Single Phase Conversion Kit
Type 1+2 Surge Protection and Energy Meter Kit located within the Distribution Board

Three Phase Distribution Board Ref: DB5 Isolator Size: 125A TPN 8 Way						Location: West Nave		Sheet No. 1/1
Circuit Way/Phase	**MCB Size**	**MCB Type**	**Cable Size**	**Cable Type**	**AFDD**	**RCD**	**Description**	**No. of Points**
1/L1	16A	C	2.5mm²	Tuff	N	30mA	Radial Halo Heater 1	1
1/L2	16A	C	2.5mm²	Tuff	N	30mA	Radial Halo Heater 1	1
1/L3	16A	C	2.5mm²	Tuff	N	30mA	Radial Halo Heater 1	1
2/L1	16A	C	2.5mm²	Tuff	N	30mA	Radial Halo Heater 2	1
2/L2	16A	C	2.5mm²	Tuff	N	30mA	Radial Halo Heater 2	1
2/L3	16A	C	2.5mm²	Tuff	N	30mA	Radial Halo Heater 2	1
3/L1	16A	C	2.5mm²	Tuff	N	30mA	Electric Under Floor Heating Matting Northwest Aisle	1
3/L2	16A	C	2.5mm²	Tuff	N	30mA	Electric Under Floor Heating Matting Southwest Aisle	1
3/L3	16A	C	2.5mm²	Tuff	N	30mA	Electric Under Floor Heating Matting West Nave	1
4/L1	16A	C	2.5mm²	Tuff	N	30mA	Control Panel for Halo Heaters	1
4/L2	32A	C	2.5mm²	Tuff	✓	30mA	Ring Main Circuit Floor Sockets	4
4/L3	32A	C	2.5mm²	Tuff	✓	30mA	Ring Main Circuit Sockets in Servery	6
5/L1								
5/L2	16A	C	2.5mm²	Tuff	N	30mA	Water Heater Servery	1
5/L3	16A	C	2.5mm²	Tuff	N	30mA	Automatic Doors - North Parch Entrance	1
6/L1								
6/L2								
6/L3								
7/L1								
7/L2								
7/L3								
8/L1	20A	C	16mm²	6491B	N	N	Surge Protection	1
8/L2	20A	C	16mm²	6491B	N	N	Surge Protection	1
8/L3	20A	C	16mm²	6491B	N	N	Surge Protection	1

Notes:
Incomer Device - 125A Switch Disconnector 3P+N
Type 1+2 Surge Protection and Energy Meter Kit located within the Distribution Board

appendix b.

SCHEDULE OF MOUNTING HEIGHTS

appendix b.

SCHEDULE OF MOUNTING HEIGHTS FOR ELECTRICAL EQUIPMENT

Unless indicated otherwise, the Contractor shall use the following guide for the mounting heights, above the finished floor level, for all electrical equipment. The mounting heights refer to the base of equipment but shall be verified with the Engineer before commencement of any works: All dimensions are in millimetres. Dimensions shall be checked against the Architects elevation details prior to installation.

ITEM	**MOUNTING HEIGHT (mm) AFFL**
Distribution Board DB1	800mm to underside to fit in existing switch room (exact location TBA on site)
Distribution Board DB4	800mm to underside to fit in new timber cupboard (exact location TBA on site)
Distribution Board DB5	800mm to underside to fit in new store cupboard (exact location TBA on site)
Heating Control Panel for Halo Heaters	800mm to underside (exact location TBA on site)
Switch Disconnector Fuse	150mm above worktop or as indicated on drawings
General Purpose Socket Outlet/FCUs	150mm above worktop and 450mm as indicated on drawings
Data Outlet/Audio Outlet	No works (retain existing)
Single Socket at low level directly behind appliance	450mm
Light Switch	1200mm
Water Heater/Fan Isolators	1300mm to underside or as indicated on drawings
Under Floor Heating Matting Isolators and Controls	1200mm
Fan Convector Heater Isolators	1200mm
Plinth Heater Isolators	1200mm
Pew Heater Isolators	450mm to underside (exact location TBA on site)
Pew Heater Controls	800mm
Infrared Halo Heaters	4000mm to underside
Infrared Halo Heater Isolators	1200mm
Panel Heater Isolators	1200mm

The location of all electrical accessories i.e. switches, socket outlets and heaters shall generally match existing installation mounting heights and positions to minimise damage to fair faced stonework and timber cabinetry.

section five.

ELECTRICAL SERVICES TENDER SUMMARY

section five.

ELECTRICAL SERVICES TENDER SUMMARY

1.00 measured works

1.01	Preliminaries	£
1.02	Arrange with SSEN the change of Fuses in the existing Service Head	£
1.03	Distribution Boards	£
1.04	Energy Metering in the Distribution Boards	£
1.05	Submain Cabling	£
1.06	Trunking, Tray and Conduit Systems	£
1.07	Internal Lighting and Wiring	£
1.08	Small Power Installation	£
1.09	Mechanical Services Wiring and Controls	£
1.10	Earthing and Bonding	£
1.11	Supply and Installation of the Halo Heaters and Controls	£
1.12	Supply and Installation of the Electric Underfloor Heating, Matting and Controls	£
1.13	Supply and Installation of the Pew Heaters and Controls	£
1.14	Supply and Installation of the Plinth Heaters and Controls	£
1.15	Supply and Installation of the Fan Convector Heaters and Controls	£
1.16	Supply and Installation of the Electric Panel Heaters and Controls	£
1.17	Adaption of Existing Fixed Final Circuit Wiring to Suit New Distribution Boards	£
1.18	Accessible WC Call Alarm System	£
1.19	Surge Protection	£
1.20	Enabling Works, Tracing, Identification, Disconnections, Strip Out and Removal of Existing	£
1.21	Testing, Commissioning and Labelling	£
1.22	Record Drawings and O&M Manuals	£
1.23	Other Items Not Listed Above (Define)	£
	Sub Total for measured works	**£**

2.00 provisional sums

2.01	Modifications to the existing AV Equipment and Cable Installation	£	3,000.00
2.02	General Contingency	£	4,000.00
	Sub Total for Provisional Sums	**£**	**7,000.00**

3.00 twelve months' maintenance

3.01 Twelve Months' Maintenance .....£

GRAND TOTAL (Including Provisional Sums)..... £_____

Signed .....Position.....

Company ……

Address ……...