

SPECIFICATION

FOR

MECHANICAL ENGINEERING SERVICES

AT

**WILLIAM TEMPLE C of E PARISH CHURCH,
ROBINSWOOD ROAD,
WYTHENSHAW,
MANCHESTER.
M22 0BU.**

PREPARED BY:

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SECTION 1.

GENERAL CONDITIONS & PRELIMINARIES

SECTION 1.

GENERAL CONDITIONS & PRELIMINARIES.

1.1 CONTRACT

The general conditions of contract as far as the mechanical services contractor is concerned will be as awarded against a direct instruction from the Client – the Manchester Diocesan Board of Finance, acting on behalf of the PCC of William Temple Parish Church, Wythenshawe.

The order of instruction to the successful tenderer will take the form of a simple letter from the Parish's representative, or alternatively from the Consulting Engineer acting as their agent, stating acceptance of the agreed tendered sum as identified on a completed Summary & Form of Tender included within this specification.

All aspects of the contract will in general terms be covered under English law, however the following matters will form the specific agreement basis;

- a) the tender shall be submitted on a Fixed Price basis to cover an overall period of 6 months.
- b) the Client will hold a retention of 2.5% against applications for payment and the final account sum for a period of 12 months from the date of practical completion.
- c) the date for practical completion shall only be determined by the Consulting Engineer, after satisfactory inspection and handover.
- d) the anticipated start & completion dates shall be as follows;

start on site	-	say July 2025
completion	-	say within 10 weeks of commencement
- e) prior to commencement on site the contractor must provide his own detailed work programme which must take into account consultation with the incumbent to take into account any specific arrangements that the Church may have. Additional liaison will be expected to be catered for without duress.

1.2 SCOPE OF WORKS.

The scope of works covered by this specification is for the supply and installation of mechanical services associated with the replacement of the existing electric floor heating system with a new electrically operated ASHP LPHW heating system, along with some electric radiant heating at William Temple Parish Church, Wythenshawe.

The definition of “works” shall include the stripping-out of the existing installation electrical supply points, and provision of new ASHP plant, and heating services and shall mean a complete installation including supply, installation, testing, commissioning, setting to work including full instructions to the Client as to the operation of the plant, equipment and controls.

1.3 SITE VISIT.

The prospective tenderer is advised to visit site to ascertain the full extent and nature of the works and to translate the information contained within this specification and detailed on the drawings to suit the particular implications of the site in general. Failure of the tenderer to acquaint himself fully with site conditions shall not form the basis of additional claims for monies whatsoever. Arrangements to visit site should be made by contacting Reverend Andrew Bird - andrew.bird578@gmail.com, telephone number 07767 304123

1.4 DOCUMENTATION.

To assist the preparation of a tender bid, the following documentation is provided:

a) Tender Drawings

The following drawings which accompany this specification to form the tender package are to be used at this time for tendering purposes only. They are diagrammatic only and must be read in conjunction with the specification. Site dimensions must not be taken from Tender drawings. The tenderer must include for all necessary fittings, offsets, components, bends, parts etc., as may be required to provide a full, comprehensive services installation even though they may not be indicated on the drawings due to their scale.

- 114.25.M1 - Proposed Heating Services within main Church area
- 114.25.M2 - Proposed Heating Services within the Chapel area.
- 114.25.M3 - Proposed Heating Services within the Ancillary Rooms.
- 114.25.M4 - Proposed Heating Services Schematic

b) Specification

Tenderers shall comply fully with the requirements of the Standard and Particular sections of the specification. Any anomalies or queries noted by the tenderer shall be relayed to the Consulting Engineer at tender stage.

c) Tender Breakdown & Form of Tender

A copy of the Tender Breakdown & Form of Tender, duly completed in all respects and signed, shall be submitted by the tenderer with the tender bid.

1.5 CO-ORDINATION OF SERVICES.

The mechanical services contractor shall be fully responsible for the co-ordination and integration of his installation with the electrical services and the structure/proposed internal arrangement of the building. In addition the mechanical contractor shall be responsible for the co-ordination of all activities and management of Sub-Contractors.

1.6 SCHEDULE OF RATES WITH QUANTITIES.

Within fourteen days of being notified that his tender bid is being considered for acceptance the sub-contractor shall submit a fully priced and detailed schedule of rates with quantities, the total price of which is to correspond with the tender amount. The schedule will be used, where applicable, for the preparation/pricing of variations.

1.7 WORKING PROGRAMME.

The mechanical contractor shall arrange his works to comply with an agreed programme of works to enable the areas to be completed in a phased areas as agreed. The contractor shall issue a draft programme with his tender return followed by a more detailed programme after order placement for discussion prior to any works being undertaken.

1.8 COMPLIANCE WITH REGULATIONS.

All parts of the installation shall comply with the following regulations current at the date of tender:

- a) Building Regulations – Current Edition at the time of tender.
- b) Statutory requirements including the Clean Air Acts.
- c) The Health and Safety at Work Act, 1974.
- d) The I.E.E. Regulations (18th Edition).
- e) Regulations under the electricity at work acts.
- f) Regulations and requirements of the Building Control/Fire Officer.
- g) British Standards ruling at the time of tender.
- h) C.I.B.S.E. guidance notes and codes of practice
- i) The Water Regulations 1999.
- j) The Current CDM Regulations
- k) Health & safety Plan.

1.9 BUILDERSWORK & ELECTRICAL WORKS.

The mechanical contractor shall be responsible for providing all necessary information for builderswork and electricians works to enable the services to be installed and to enable his sub-contractor to carry out the work. This shall apply to bases, holes through walls, floors, roofs etc. trenches, boxings and any other specific items.

Further specific details are included within Section 2.

In addition the mechanical contractor shall be responsible for the co-ordination of all activities and management of Sub-Contractors.

1.10 DEFECTS LIABILITY PERIOD.

The sub-contractor shall be responsible for the correct operation of the works for twelve months from the date of practical completion and shall make good at his own expense any defects which arise, fair wear and tear excepted. The sub-contractor shall inform the Consulting Engineer in writing of his final practical completion so that handing over of the works and commencement of the Defects Liability Period can begin.

1.11 OMISSION OF WORKS.

Omission of the works whether in part or whole shall not entitle the contractor to claim for anticipated overhead recovery and/or loss of profit.

1.12 OPERATING & MAINTENANCE INFORMATION.

The sub-contractor shall include for instructing the Client's representatives on the operating and maintenance of the installations and shall provide three copies of "as installed" drawings and operating/maintenance manuals at the time of handover.

All documentation should be in line with CDM regulations and should be produced for approval prior to final issue at handover stage.

1.13 SERVICE VISIT.

The Contractor is to allow within his tender for returning to site twice during the 12 months defects liability period to carry out service works.

The first visit shall take place after 6 months and the second after 12 months. Both visits are to be co-ordinated with the Client and their advisors.

SECTION 2.

PARTICULAR SPECIFICATION REQUIREMENTS

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PARTICULAR SPECIFICATION REQUIREMENTS.

2.1 STRIPPING-OUT EXISTING SERVICES.

Existing services to be stripped-out relate to existing electrical supplies to the existing electrical underfloor heating system which is presently installed within the Church. It is therefore essential that the contractor visits site prior to the submission of his tender to ascertain the full extent and nature of this work.

2.2 NEW HEATING SERVICES.

New heating services are to take the form of 2No. ASHP LPHW heating systems, serving the main Church Heating by the use 2No. Samsung DVM S2 heat pump condenser units, each connected to 2No. Samsung Hydro-Pack units, with pumped circuits into a 500litre buffer vessel, and a secondary pumped circuit to serve the new pipework system with Zehnder Nova steel radiators. Control of the heating installations shall be from 2No. separate Heatmiser version 3 programmable room thermostats, c/w hub for App connection availability, each contained within a TG.510A clear plastic lockable / ventilated enclosure.

The system to separately serve the Chapel shall comprise 4No. wall mounted electric infra-red heaters as supplied & installed by IHS of Hale, Control of the heating shall be from wireless sensors within the space c/w hub for App connection availability.

All radiators shall be provided with either wheel-head or thermostatic control valves and lockshield regulating valves as noted on the drawings. Where TRV's are being indicated it shall be a requirement to install a ballofix type service valve upstream of the TRV to allow replacement of this valve without affecting the system.

Radiators and pipework services shall be as indicated on the tender drawings.

The contractor shall be responsible for checking that the specified radiators can be installed in their intended location prior to ordering. The contractor shall include for taking down & re-fixing radiators twice for the benefit of other trades.

The radiators shall be as identified on drawing no. M1. These shall be as manufactured by messrs. Zehnder being their Nova horizontal type. These shall be supplied to an agreed RAL colour to be discussed prior to commencement on site.

2.3 COLD WATER SERVICES.

An existing incoming MCW supply exists within the existing Kitchen & Toilets location, from which the contractor shall include for connecting to a running a 15mm supply to the boiler / system location point. This MCW supply shall be connected to a system with a flexible filling loop and double check valve assembly. The contractor shall also include for 1No. expansion vessel as shown on the drawing to satisfy the expansion requirements of the system. All works must comply with The Water Regulations 1999.

2.4 TESTING & COMMISSIONING.

Testing and commissioning of all systems must be undertaken in accordance with the standard specification with only suitably qualified personnel being utilised. Full and documented instructions must be given to the Consulting Engineer and Client's representatives and a call back allowance must be included for, to cover the end user's understanding and comfort with the systems.

2.5 WATER TREATMENT.

The LPHW system shall be chemical cleaned and a suitable corrosion inhibitor added on completion of all works and a certificate issued. The inhibitor shall comply and be in accordance with the boiler manufacturer's requirements/instructions. Appropriate treatment is available from either messrs. Fernox or Sentinel. Sterilisation of domestic water supplies shall also be carried out in accordance with the Regulations and relevant BS.

2.6 AS-INSTALLED DOCUMENTATION.

As installed drawings and manuals shall be provided at the end of the contract in accordance with CDM regulations and standard specifications. Three copies of this documentation will need to be provided after one copy has been submitted for approval. The contractor shall also include for the provision of this documentation on a CD, with the format to be advised by the Client in due course. **It is important to know that this documentation being provided must be project specific and a simple generic format will not be accepted.** The contractor shall also make provision for providing all necessary information for the completion of a Building Log Book for this project in accordance with Part L2B of the current Building Regulations.

The contractor must take note of the sub-contract conditions which indicates that monies will be withheld if this documentation is not properly completed and issued well in advance of the contract handover.

2.7 PIPEWORK

All internal heating pipework units shall be installed in Black 'Medium' Tubing to BS1387 complete with screwed or welded fittings as appropriate. **Crimped steel pipework systems will NOT be allowed.**

All gas pipework shall be installed similarly but with 'Heavy' grade mild steel.

All pipework must be adequately supported and arranged to accommodate pipe movement caused by thermal changes. Generally, allow the flexure at changes in direction and allow for movement at branch connections.

All pipework shall be graded to facilitate air venting and draining down and must be fitted with air vents and draincocks at all high and low points respectively.

2.8 VALVES

Bronze wheel head gate valves shall be fitted on flow pipework with lockshield type valves on the return. Draincocks shall be fitted at all low points with hose union connections. Valves shall be as manufactured by Hattersley Newman Hender Ltd., or approved equivalent.

Wheel Valves	fig. 33X DZR
Lockshield Valves	fig. 33XLS DZR
Draincocks	fig. 81HU
Commissioning Valve	fig. 2432 DRV/MS
Mains Cold Water	Yorks Fig. 501GM

Radiator valves shall be as supplied from the Peglers 'Belmont' range with matching TRV's where indicated.

2.9 THERMAL INSULATION.

The mechanical contractor shall include for the insulation of all heating pipework in voids, service ducts, within cupboards, purpose made boxings and in the plantroom throughout. All valves, flanged connections and the like shall be provided with aluminium insulation boxes. Insulation shall comply with BS5422 and the British Standards publications referred to therein. Also comply with BS5970 and BS3533. Materials must comply with BS476 part 4, non-combustibility test or obtain a Class 'O' fire rating. Insulation in plant-rooms, voids and spaces shall be foil faced phenolic foam pipe insulation to. All pipework shall be identified in accordance with BS1710.

Insulation shall be carried out by an agreed specialist insulation contractor.

Do not apply insulation until the installation has been fully tested and all joints proved sound. Insulation shall be carried out by an agreed specialist insulation contractor.

2.10 AUTOMATIC CONTROLS

Control of the heating installations shall be from 2No. separate Heatmiser version 3 programmable room thermostats, c/w hub for App connection availability, each contained within a TG.510A clear plastic lockable / ventilated enclosure.

2.11 PLANT ROOM INSTALLATION **ASHP's**

The plants providing the heat source to the CT system serving the radiators shall be provided by 2No. Samsunf DVM S2 – 45kW outdoor units, each connected to 2No. DVM 25kW indoor Hydro units as specified. The ASHP's shall be installed in accordance with manufacturer's instructions and shall be commissioned by the manufacturer or his representative on completion of the works.

The ASHP's externally are to be mounted on prepared 150mm high concrete bases, whilst the internal units are to be mounting on linings to the wall. The 500litre buffer vessel shall also be mounted on a 100mm high concrete base within the plant-room and have all standard mountings, including T & P safety valves with discharge pipes to terminate over a floor gulley at low level, drain-cock, thermometer and altitude gauge.

CIRCULATING PUMPS

The heating systems shall have pumped circulation throughout with single-pump sets being provided as noted on the drawings.

Pumps shall be as manufactured by Grundfos Pumps Ltd., with heating pumps being suitable for 240v/1Phase/50Hz. They shall be complete with anti-vibration mountings, isolating valves, altitude gauges and flexible connections as necessary.

PRESSURISATION UNIT

The Church heating system shall incorporate 1No. pressurisation unit system comprising 200 litre expansion vessel, automatic make-up unit, connecting group and high/low pressure switches all as manufactured by Mikrofill. The expansion vessel shall be mounted on a steelwork frame within the plant room area, whilst the actual Mikrofill unit shall be located within the internal toilet area at the rear of the radiator at the south west corner of the Church, and shall have the fill-point pipework connected into that 20mm F & R. The unit shall comply fully with all water regulation requirements.

2.12 SOLAR PV INSTALLATION

The element of works within this contract comprises of the provision of PV photovoltaic panels installed to the existing flat roof location as detailed on the drawing accompanying this document to the existing site of William Temple Church – Wythenshawe.

The Contractor shall obtain a quotation reference no. GW10348 from messrs Geowarmth Limited, - 0191 257 1704 or e-mail info@geowarmth.co.uk.

The contract comprises of the installation of all equipment and material to form a complete installation up to the point of connection as detailed in this specification which shall include all liaison with the project Consulting Engineer with the connection agreement without having the need for the DNO approval requirements. The definition of “works” shall include the provision of services, including all DC and AC installations up to the point of connection as defined on the tender drawings. This shall mean a complete installation including supply, installation, testing, commissioning, and setting to work, including full instructions to the Client as to the operation of the installation.

The installation works associated with this project are but not limited to the elements listed below.

- a) Full design & specification of the complete system
- b) Providing supporting documentation on material specification.
- c) Preparation of working installation drawings for construction.
- d) Providing builders work drawings.
- e) Supply and delivery and off-loading all panels.
- f) Installation of supporting systems and frames.
- g) Installation of panels including placing and fixing to new roof.
- h) Installation of all interconnecting cables AC & DC.
- i) Installation of internal wiring to invertors mounting & connection.
- j) Electrical Earthing and bonding.
- k) Testing and commissioning and client instruction.
- l) Provision of "As Fitted" drawings and maintenance manuals.

All parts of the installation shall comply with the following regulations current at the date of tender: -

- 1) The 18th Edition of the IET Wiring Regulations (BS.7671) including all current amendments and site guidance notes issued by the IET as applicable at the date of tender.

- 2) The Health & Safety at Work Act 1974 and CDM Regulations 2015 current at the date of tender.
- 3) The Factories Act 1961.
- 4) Electricity at Work Regulations 1989.
- 5) Code of practice for earthing BS 7430
- 6) MCS guidance and standards documentation.
- 7) The Electrical Supply & Quality Regulations 2003.
- 8) WEEE Directive 2006 and subsequent amendments.
- 9) DNO Requirements and compliance.

2.13 ELECTRICAL INSTALLATION

To follow under separate cover

MECHANICAL SERVICES EQUIPMENT SCHEDULES.

ASHP's	- Easyair Limited quote no. EACQ5983 Contact – Mark Chattwood 07813 709478
Pump Sets	- Grundfos Pumps Limited, contact – local distributor
Buffer Vessel	- McDonald Cylinders quote no. SQ25/0541 contact no. 01592 611123
Radiators	- Zehnder Group Ltd.. contact – Alex McDonald – 07795 361643
Infra Red Heaters	- IHS Ltd., Hale, quote no. QU-0226 contact – Stephen English – 0161 929 7070
Solar PV system	- Geowarmth Limited, quote GW10348 Contact – John Withers - 0191 257 1704

SECTION 3.

QUALIFICATION SHEETS FOR ENGINEERING INSTALLATIONS IN ACCORDANCE WITH STANDARD SPECIFICATION M & E No. 3 & 100

Qualification Sheets,
For
Engineering Installations,
in accordance with
Standard Specification-M & E No.3

SECTION ONE-GENERAL REQUIREMENTS

1.1	Scope	applicable
1.2	Definitions	applicable
1.3	Related documents	applicable
1.4	Proven performance	applicable
1.5	Standards	applicable
1.6	Regulations	applicable
1.7	Drawings	applicable
1.8	As installed drawings	applicable
1.9	Maintenance and operating documents	applicable
1.10	Electricity supply	240v/1ph/50hz 415v/3ph/50hz
1.11	Painting	applicable
1.12	Asbestos material	applicable
1.13	Schedules	applicable

SECTION TWO-CENTRAL PLANT

2.1	BOILERS	n/a
2.1.1	General	n/a
2.1.2	Steam boilers	n/a
2.1.3	Hot water boilers	n/a
2.1.4	Domestic hot water heaters	n/a
2.1.5	Boiler equipment	n/a
2.2	INSTALLATION	n/a
2.2.1	Solid fuel installations	n/a
2.2.2	Oil fired installations	n/a
2.2.3	Gas fired installations	n/a
2.2.4	Dual fired installations	n/a
2.3	COMBUSTION CONTROLS	n/a
2.3.1	General	n/a
2.3.2	Oil burners	n/a
2.3.3	Gas burners	n/a
2.3.4	Solid fuel installations	n/a
2.3.5	Dual and multi-boiler installations	n/a
2.3.6	Electric boilers	applicable
2.3.7	Multi-boiler installation	n/a
2.4	SAFETY CONTROL	applicable
2.4.1	Steam boiler systems	n/a
2.4.2	Hot water boiler systems	applicable
2.4.3	General requirements	applicable
2.5	PROTECTION CONTROL	applicable
2.5.1	General	applicable
2.5.2	Preheating	n/a
2.5.3	Overheating	n/a
2.6	INDICATOR LIGHTS AND ALARM	applicable
2.7	CHIMNEYS, FLUES & FLUE DUCTS	n/a
2.8	DAMPERS	n/a
2.9	HOT WATER SYSTEM PRESSURISATION	applicable

2.9.1	General	applicable
2.9.2	Gas pressurisation systems	n/a
2.9.3	Sealed diaphragm vessel systems	applicable
2.9.4	Constant or intermittent running pump	n/a
2.10	WATER TREATMENT	applicable
2.10.1	General	applicable
2.10.2	Water treatment	applicable
2.10.3	Steam boiler blow-down	n/a
2.10.4	Chemical conditioning equipment for steam systems	n/a
2.10.5	Filling hot water installations	applicable
2.11	INSTRUMENTATION	n/a

SECTION THREE-PUMPING EQUIPMENT

3.1	Circulating pumps	applicable
3.1.1	General	applicable
3.1.2	LTHW & MTHW heating & DHWS systems	applicable
3.1.3	HTHW heating systems	n/a
3.2	Boiler feed pumps	n/a
3.3	Condensate pumps and receiver sets	n/a
3.4	Semi-rotary hand pumps	n/a
3.5	Oil circulating & oil transfer pumps	n/a
3.6	Fire protection system pumps	n/a

SECTION FOUR-DISTRIBUTION INSTALLATION

4.1	Tubes and pipes	applicable
4.2	Pipework joints and fittings	applicable
4.2.1	LTHW & MTHW systems	applicable
4.2.2	HTHW systems	n/a
4.2.3	Steam systems	n/a
4.2.4	Condensate systems	n/a
4.2.5	DHWS systems	applicable
4.2.6	Cold water services	applicable
4.2.7	Natural gas services	n/a
4.2.8	LPG vapour distribution systems	n/a
4.2.9	Oil fuel systems	n/a
4.2.10	Fire protection systems	n/a
4.3	Welding	n/a
4.4	Brazing	n/a
4.5	Ancillary equipment	applicable
4.5.1	Pipework	applicable
4.5.2	Anchors	n/a
4.5.3	Expansion devices	n/a
4.5.4	Air venting	applicable
4.5.5	Emptying down, draining & flushing	applicable
4.6	General	applicable

SECTION FIVE-CALORIFIERS, CYLINDERS, CISTERNS AND WATER TANKS

5.1	Calorifiers	n/a
5.2	Cylinders	n/a
5.3	Electrically heated hot water storage vessels	applicable
5.4	Cisterns & cold water tanks	n/a
5.5	Feed/expansion and spill vessels for boilers	n/a
5.6	Hot-wells for steam boiler	n/a
5.7	Blow-down tanks for steam boilers	n/a

SECTION SIX-SPACE HEATING EQUIPMENT

6.1	Radiators	applicable
6.2	Convectors	n/a
6.3	Continuous perimeter heating	n/a
6.4	Radiant panels, strips, ceilings & floors	n/a
6.5	Unit heaters	n/a
6.6	Equipment for steam and HTHW heating appliances	n/a
6.7	Surface temperatures	n/a

SECTION SEVEN-VALVES, TAPS AND COCKS

7.1	General	applicable
7.2	Safety and relief valves	applicable
7.3	Pressure reducing valves	n/a
7.4	Thermostatic control valves	n/a
7.5	LTHW radiator valves	applicable
7.6	Regulating valves	applicable
7.7	System commissioning valves sets	n/a
7.8	LTHW & MTHW heating systems	applicable
7.9	HTHW heating systems	n/a
7.10	Steam systems	n/a
7.11	Condensate systems	n/a
7.12	DHWS & cold water supply systems	applicable
7.13	Natural gas services	n/a
7.14	LPG vapour distribution systems	n/a
7.15	Oil fuel services	n/a
7.16	Fire protection systems	n/a
7.17	Valve labelling	applicable

SECTION EIGHT-AUTOMATIC CONTROLS, CONTROLLERS, CUBICLES & PANELS

8.1	GENERAL	applicable
8.2	SPACE HEATING & DOMESTIC HOT WATER CONTROL	applicable
8.2.1	Primary temperature control	applicable
8.2.2	Time programme control	applicable
8.2.3	Space temperature control	applicable
8.2.4	Thermostats & temperature detectors	n/a
8.2.5	Heating calorifiers	n/a
8.2.6	Combined heating & DHWS systems	n/a
8.2.7	DHWS systems	n/a
8.3	CONTROLLERS	n/a
8.3.1	Types and construction	n/a
8.3.2	On/off controllers	n/a
8.3.3	Integral controllers	n/a

8.3.4	Proportional plus integral controllers	n/a
8.4	CONTROL CUBICLES & PANELS	n/a
8.4.1	Construction	n/a
8.4.2	Indicator lamps	n/a
8.4.3	Wiring	n/a

SECTION NINE-MISCELLANEOUS EQUIPMENT

9.1	THERMOMETERS	applicable
9.1.1	General	applicable
9.1.2	LTHW heating & DHWS systems	applicable
9.1.3	MTHW & HTHW heating systems	n/a
9.2	PRESSURE GAUGES	applicable
9.3	STEAM TRAPS	n/a
9.4	STRAINERS FOR HOT WATER HEATING SYSTEMS	applicable
9.5	HOT & COLD WATER MIXING VALVES AND FITTINGS	n/a
9.6	GAS METERS	n/a
9.7	PLATFORMS, GALLERIES, STAIRWAYS & LADDERS	n/a
9.7.1	General	n/a
9.7.2	Flooring, landings & stair treads	n/a
9.7.3	Handrail systems	n/a
9.7.4	Stairways	n/a

SECTION TEN-THERMAL INSULATION

10.1	GENERAL	applicable
10.2	TYPES OF INSULANT	applicable
10.2.1	Within buildings	applicable
10.2.2	External to buildings	n/a
10.3	METHODS OF APPLICATION	applicable
10.4	FINISHES	applicable
10.4.1	General	applicable
10.4.2	In boiler houses and plant rooms	applicable
10.4.3	In buildings other than boiler houses and plant	applicable
10.4.4	External to buildings in open air or in ducts	n/a
10.4.5	Painting	n/a
10.4.6	Colour code	n/a

SECTION ELEVEN-ELECTRICAL EQUIPMENT & WIRING

11.1	General	applicable
11.2	Electric motors	applicable
11.3	Control Gear	applicable
11.4	Enclosures	applicable
11.5	Immersion heaters for hot water	n/a
11.6	fan convectors	n/a
11.7	Bonding	applicable
11.8	Testing	applicable

SECTION TWELVE-INSPECTION, TESTS & COMMISSIONING

12.1	Inspections by Competent person	applicable
12.2	Responsibility for reporting infringement of regulations	applicable
12.3	Cleanliness	applicable
12.4	Inspection & tests on completion	applicable
12.5	Tests generally	applicable
12.6	Commissioning	applicable
12.7	Boiler performance test	applicable

SCHEDULES

No.1	M&E3: Particular application to this contract	applicable
No.2	Information to be supplied by the tender	applicable

APPENDIX: COMMISSIONING & TEST CERTIFICATES

Form W2200: Commissioning certificate for heating, hot & cold water, steam & gas installation	applicable
Form W1930: Detail sheet & initial test certificate for steam & hot water	applicable
Form W1910: Detail sheet & initial test certificate for Electrical installations	applicable
Form 1910A: Continuation sheet	applicable
Form W1538: Certificate of pressure test of part of a system	applicable

Qualification sheets,
for
ENGINEERING INSTALLATIONS
in accordance with
STANDARD SPECIFICATION-M&E No.100

SECTION ONE-GENERAL REQUIREMENTS

1.1	Scope	applicable
1.2	Definitions	applicable
1.3	Related Documents	applicable
1.4	Proven performance	applicable
1.5	Standards	applicable
1.6	Acts & Regulations	applicable
1.7	Electricity supply	240v.1 ph & 415v.3ph.50Hz
1.8	Electrical equipment & wiring	applicable
1.9	Drawings	applicable
1.10	Calculations	n/a
1.11	Maintenance & operation documents	applicable
1.12	Corrosion prevention & painting	applicable
1.13	Chlorofluorocarbons	applicable
1.14	Identification of services	applicable
1.15	Storage and protection	applicable
1.16	Rationalisation of supplies	n/a
1.17	Samples	applicable
1.18	Schedules	applicable

SECTION TWO-REFRIGERATION PLANT

2.1	General	applicable
2.2	Reciprocating compressors	n/a
2.3	Centrifugal compressors	n/a
2.4	Screw compressors	applicable
2.5	Water chilling evaporators (shell & tube type)	applicable
2.6	Air cooling evaporators (DX coolers)	applicable
2.7	Air cooled condensers	n/a
2.8	Evaporative condensers	applicable
2.9	Condensers (shell & tube type)	n/a
2.10	Pressure testing	applicable
2.11	Refrigeration plant accessories and controls	applicable
2.12	Refrigerant piping	applicable
2.13	Thermal insulation	applicable
2.14	Cooling towers	n/a

SECTION THREE-FANS

3.1	General	applicable
3.2	Centifugal fans	applicable
3.3	Axial flow fans	n/a
3.4	In-line centifugal & mixed flow	n/a
3.5	Propeller fans	n/a
3.6	Mechanical roof extract units	n/a
3.7	Packed duplicate-fan extract unit	n/a
3.8	Protectively coated fans and fans for corrosive hazardous applications	n/a

SECTION FOUR-AIR FILTERS

4.1	General	applicable
4.2	Filter cell holding frames, seals & gaskets	applicable
4.3	Fire properties	applicable
4.4	Performance certification	applicable
4.5	Filtered grades	applicable
4.6	Bag or extended surface type filters	applicable
4.7	Panel filters	applicable
4.8	High efficiency particulate air (HEPA) filters	n/a
4.9	Activated carbon & adsorption filters	n/a
4.10	Grease eliminators	n/a

SECTION FIVE-AIR HEATER AND COOLER BATTERIES

5.1	General	applicable
5.2	Tests	applicable
5.3	Hot water heater batteries	applicable
5.4	Steam heater batteries	n/a
5.5	Electrical heater batteries	applicable
5.6	Chilled water cooler batteries	n/a
5.7	Direct-expansion refrigerant cooler batteries	applicable

SECTION SIX-AIR WASHING AND HUMIDIFYING PLANT

6.1	General	n/a
6.2	Steam humidifiers	n/a
6.3	Spray type air washers	n/a
6.4	Capillary type air washers	n/a
6.5	Spinning disc humidifiers	n/a
6.6	Sprayed coil units	n/a
6.7	Ultra-sonic type humidifiers	n/a
6.8	Drainage	n/a

SECTION SEVEN-AIR HANDLING UNITS

7.1	General	applicable
7.2	Construction	applicable
7.3	Thermal and acoustic insulation	applicable
7.4	Dampers	n/a
7.5	Fans	applicable
7.6	Provisions for automatic controls	applicable
7.7	Outdoor units	n/a

SECTION EIGHT-DUCTWORK, DAMPERS & TERMINAL DAMPERS

8.1	Fabrication drawings	n/a
8.2	Sheet metal ductwork	n/a
8.3	Installation	n/a
8.4	Inspection & tests	n/a
8.5	Plastic ductwork	n/a
8.6	Aluminium ductwork	n/a
8.7	PVC coated sheet steel ductwork	n/a
8.8	Steel ductwork, Galvanised after manufacture	n/a
8.9	Stainless steel ductwork	n/a

8.10	Bendable ducts & flexible ducts	n/a
8.11	Dampers	n/a
8.12	Access opening & inspection covers	n/a
8.13	Hoods	n/a
8.14	Test holes	n/a
8.15	Identification	n/a
8.16	Air terminal devices	n/a

SECTION NINE-AIR CONTROL DEVICES, INCLUDING INDUCTION, TERMINAL REHEAT & VAV UNITS

9.1	General	n/a
9.2	Induction units	n/a
9.3	Single & dual duct terminal units	n/a
9.4	Variable air volume (VAV) units	n/a
9.5	Underfloor fan-assisted air units	n/a
9.6	Constant volume flow regulators	n/a

SECTION TEN-FAN COIL UNITS

10.1	General	applicable
10.2	Casings	applicable
10.3	Components	applicable
10.4	Arrangement of unit	applicable
10.5	Controls, dampers & grills	applicable

SECTION ELEVEN-VENTILATING CEILINGS & PLATFORM FLOORS

11.1	General	n/a
11.2	Ventilating ceilings	n/a
11.3	Ventilating platform floors	n/a

SECTION TWELVE-IN-ROOM AIR CONDITIONING UNITS

12.1	General	applicable
12.2	Construction	applicable
12.3	Insulation	applicable
12.4	Grilles	n/a
12.5	Air filters	n/a
12.6	Fans	n/a
12.7	Refrigeration equipment	applicable
12.8	Humidifiers	n/a
12.9	Heaters	applicable
12.10	Coolers	n/a
12.11	Controls	applicable
12.12	Electrical requirements	applicable

SECTION THIRTEEN-WATER PUMPS

13.1	General	applicable
13.2	Centrifugal pumps	applicable
13.3	Twin pump sets	n/a
13.4	Canned roof pumps	n/a
13.5	Stand-by pumps	n/a
13.6	Gauges	applicable
13.7	Drives	n/a

13.8	Sump pumps	n/a
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SECTION FOURTEEN-PIPEWORK

14.1	General	applicable
14.2	Materials	applicable
14.3	Joints	applicable
14.4	Flexible piping connections	applicable
14.5	Flexible connectors	applicable
14.6	Welding	applicable
14.7	Brazing applicable	applicable
14.8	Ancillary equipment	applicable
14.9	Draining & flushing provisions	applicable
14.10	Installation	applicable
14.11	Provisions for test	applicable
14.12	Provisions for chemical cleaning & water treatment	applicable

SECTION FIFTEEN-VALVES, COCKS & STRAINERS

15.1	General	applicable
15.2	Material & construction	applicable
15.3	Isolating valves	applicable
15.4	Check valves	applicable
15.5	Regulating & double regulating valves	applicable
15.6	System commissioning valve sets	applicable
15.7	Drain valves	applicable
15.8	Air cocks	applicable
15.9	Valve operation	applicable
15.10	Strainers	applicable
15.11	Valve labelling	applicable
15.12	Valve schedules	applicable

SECTION SIXTEEN-WATER STORAGE VESSELS

16.1	Cisterns & cold water tanks	n/a
16.2	Chilled & condenser water buffer	applicable

SECTION SEVENTEEN-THERMAL INSULATION

17.1	General	applicable
17.2	Ductwork & air handling plant- Insulation materials & finishes	applicable
17.3	Ductwork & air handling plant- methods of application	applicable
17.4	Chilled water pipework & equipment- Insulation materials & finishes	applicable
17.5	Chilled water pipework & equipment- method of application	applicable
17.6	Vapour barriers	applicable
17.7	Painting & identification	applicable

SECTION EIGHTEEN-WATER TREATMENT

18.1	General	applicable
18.2	Pre-treatment plant	n/a

18.3	Water sampling & test equipment	applicable
18.4	Chemical dosing & bleed-off	applicable
18.5	Corrosion monitoring equipment	n/a
18.6	Storage	applicable

SECTION NINETEEN-HEAT WHEELS, HEAT PIPES, AIR & WATER PLATE HEAT EXCHANGERS & RUN-AROUND COIL

19.1	General	applicable
19.2	Heat wheels	n/a
19.3	Heat pipe units	n/a
19.4	Plate heat exchangers (air)	applicable
19.5	Plate heat exchangers (water)	n/a
19.6	Run-around coils	n/a

SECTION TWENTY-BELT DRIVES, VARIABLE SPEED DRIVES & GUARDS

20.1	Belt drives	n/a
20.2	Variable speed drives	applicable
20.3	Belt drive pulleys	n/a
20.4	Guards	applicable
20.5	Electric motors	applicable

SECTION TWENTY-ONE-VIBRATION, ISOLATION & NOISE INSULATION

21.1	Anti-vibration provisions	applicable
21.2	Noise	applicable
21.3	Noise insulation (airborne noise)	applicable
21.4	Circular & rectangular attenuators	applicable
21.5	Sound absorbent ductwork linings	n/a
21.6	Fixings of thermal & acoustic linings	n/a
21.7	Acoustic enclosures	applicable

SECTION TWENTY-TWO-INSTRUMENTS

22.1	General	applicable
22.2	Air system pressure gauges	n/a
22.3	Air system thermometers	n/a
22.4	Water system thermometers	applicable
22.5	Pressure gauges	applicable
22.6	Filtered differential pressure indicators	n/a
22.7	Remote reading thermometers	n/a

SECTION TWENTY-THREE-AUTOMATIC CONTROLS

23.1	General	applicable
23.2	Air compressor plant for pneumatic control systems	n/a
23.3	Control equipment features	applicable
23.4	Sensing elements	applicable
23.5	Motorised dampers	n/a
23.6	Air heater control	applicable
23.7	Air cooler control	n/a
23.8	Humidifier control	n/a
23.9	Controls for water cooling & chilling	n/a

SECTION TWENTY-FOUR-STARTER & CONTROL PANEL

24.1	General	applicable
24.2	Panel arrangement	applicable
24.3	Materials & construction	applicable
24.4	Panel wiring	applicable
24.5	Identification labels	applicable
24.6	Ventilation	applicable
24.7	Instruments & indication	applicable
24.8	Starters & control gear	applicable
24.9	Automatic control	applicable
24.10	Testing	applicable
24.11	Screening & interference	applicable

SECTION TWENTY-FIVE-ELECTRICAL EQUIPMENT & WIRING

25.1	Scope	applicable
25.2	General	applicable
25.3	Electrical motors	applicable
25.4	Electrical wiring	applicable
25.5	Screening & interference	applicable

SECTION TWENTY-SIX-INSPECTION, TESTING & COMMISSIONING

26.1	Definitions	applicable
26.2	General	applicable
26.3	Cleaning	applicable
26.4	Testing	applicable
26.5	Commissioning of water & air distribution systems	applicable
26.6	Commissioning of specialist equipment	applicable
26.7	Commissioning results	applicable
26.8	Performance testing	applicable
26.9	Sound level measurements	applicable

SECTION TWENTY-SEVEN-MAINTENANCE & OPERATION PROCEDURES & DOCUMENTS

27.1	Installer maintenance procedures	applicable
27.2	Instruction procedures	applicable
27.3	Maintenance and operation documents	applicable

SCHEDULE NO.1-INFORMATION FOR THE TENDERER SUPPLIED BY THE DESIGN OFFICE

applicable

SECTION 4.

MECHANICAL SERVICES DRAWING LEGEND

and

TESTING / COMMISSIONING SHEETS.

MECHANICAL SERVICES DRAWING LEGEND

	Pipework in Floor Duct / Trench
	Pipework At Low Level
	Pipework At High Level
	Pipework In Roof / Ceiling Void
	Change In Pipework Level
	Radiator
	Wheel Valve Or Stopcock (SC)
	Lockshield Valve (LSV)
	Motorised Valve
	Air Vent (AAV)
	Draw Off Cock (DOC)

Abbreviations

RTA	-	Rise to above
DFA	-	Drop from above
DTB	-	Drop to below
RFB	-	Rise from below
DTLL	-	Drop to low level
RTHL	-	Rise to high level

Mechanical and Electrical Services

COMMISSIONING CERTIFICATE

for

HEATING, HOT AND COLD WATER, STEAM AND GAS INSTALLATIONS.

1. Establishment (Full Address)

2. Drawings

3. Specification

4. External Conditions At Times of Thermal Tests

Date

Air temperature (average) during test

°C

“ “ (mean) day before

°C

“ “ (mean) two days before

°C

General synopsis f Wet f Dry f Sunny f Overcast

Wind force Wind direction

Any unusual conditions

Note: Temperature and other data relevant to the thermal performance of Central and Sub-Plants shall be recorded subsequent to any boiler combustion efficiency trials.

5. Deficiencies

List any significant aspect, either physical or operational, in which the installation fails to comply with the specification or the safety requirements.

6. Remarks

List any points likely to be helpful to the user in operating or maintaining the plant.

7. Marked Drawings

* This certificate is to be read in conjunction with marked drawing(s) Nos.(a)

* Delete if not applicable

8. General Notes

(1) The evidence of satisfactory test results shall not supplant the requirements of any relevant specification.

(2) Acceptance of this Certificate by the Consulting Engineer shall not imply acceptance of the installation.

(3) All sections of this Certificate must be completed, where appropriate, write NT (not tested), or NA (not applicable) or none.

(4) On completion, this Certificate shall be signed by the authorised representative of the Contractor or his appointed Specialist and countersigned and retained by the Consulting Engineer.

9. Declaration

I am satisfied that the information given in this certificate is an accurate record of the results obtained and a true statement of plant settings etc., during commissioning on.....(dates)

The installation was complete/incomplete when commissioned.

Signed.....

for and on behalf of.....

Date.....

Witnessed by.....
for and on behalf of the Consulting Engineer

Date.....

CERTIFICATE OF PRESSURE TEST OF PART OF A SYSTEM

Contract No..... Main Contractor.....
Sub Contractor.....

Project Title.....

Location.....

Service Under Test.....

Relevant Contract Drawing.....

Relevant Clause(s) in Standard and Supplementary Specification.....
.....

Specification Working Pressure.....(state units)

Test Pressure.....(state units)

Nature of Test.....(state air, hydraulic, etc)

Duration of Test.....hours/minutes

Remarks

Identification Sketch

.....
Witnessed by

.....
Foreman for Contractor

SECTION 5.

SUMMARY OF TENDER.

SECTION 5.

SUMMARY OF TENDER.

MECHANICAL SERVICES – WILLIAM TEMPLE C of E PARISH CHURCH

1.1. PRELIMINARIES	£
1.2. STRIPPING-OUT WORKS	£
1.3. NEW ASHP INSTALLATION	£
1.4. NEW PLANT-ROOM INSTALLATION	£
1.5. NEW HEATING SERVICES WITHIN MAIN CHURCH AREA	£
1.6. NEW HEATING SERVICES WITHIN THE CHAPEL AREA	£
1.7. MCW INSTALLATION	£
1.8. AUTO-CONTROLS	£
1.9. THERMAL INSULATION	£
1.10. TESTING & COMMISSIONING	£
1.11. AS-INSTALLED DRAWINGS/MANUALS	£
1.12. BUILDERSWORK SERVICES	£
1.13. ELECTRICAL SERVICES	£
1.14. SOLAR PV SYSTEM	£
1.15. SERVICE VISITS	£ _____
1.16. Sub-Total	£
1.17. Any other items not included above;	
i)	
ii)	£
1.18. Sub-Total	£ _____
1.19. Provisional Sums and Contingency Sums	
a) Possible works to existing electrical distribution	£ 4,500.00
a) Contingency	£ 2,500.00

1.19. TOTAL MECHANICAL SERVICES TENDER	£ _____