

G&G Design Services Ltd

Giles Academy

Giles Academy – Maths Block, Heating and Hot Water(Plant only) Replacement

Tender - T01



12-06-2023

Contents

PM_10 Project information	2
PM_40 Design and approvals information.....	5
PM_70 Testing, commissioning and completion information	7
Ro Roles	12
Ss_55_70_38_15 Cold water supply systems	13
Ss_55_70_38_20 Direct hot water storage supply systems	18
Ss_60_40_37_48 Low-temperature hot water heating systems	23

PM_10 Project information

Project management

PM_10_10_60/10 Project description

1. **Project reference:** Giles Academy – Maths Block
2. **Project title:** Heating and Hot Water (Plant only) Replacement Works
3. **Project description:** The design, supply and installation of new heating and hot water plant and associated equipment, new hot and cold water domestic pipework installation (local works to plantroom only), new heat emitter installation, new heating pumps, new electrical power supplies for mechanical services and new automatic controls installation, summarised as follows:-
 - The strip out of the existing oil fired heating boilers, flues, associated services, pipework, valves etc. in its entirety.
 - The strip out of the existing external oil tank and associated oil feeds and other associated connections/equipment.
 - The strip out of the existing heat emitters and heating distribution pipework throughout the school.
 - The strip out of the existing hot and cold domestic water services pipework (local to plantroom only) i.e. existing hot water cylinder and associated hot and cold water pipework and valves to previous heating and hot water plant within boiler room.
 - The installation of complete new heating plant including air source heat pumps, buffer vessel, pipework, valves, pumps and associated controls.
 - The installation of new fan convectors, LST radiators and conventional radiators throughout the school, including new heating distribution pipework and thermal insulation.
 - The installation of a hot water calorifier for domestic hot water provision.
 - The installation of new domestic hot and cold water services pipework local works to plantroom only.
 - The installation of rotary isolators and associated wiring for all mechanical plant.
 - The installation of fused connection units for fan convectors and power supplies for heating zone valves and associated wiring.
 - Electrical load monitoring of the existing school supply, cables and boards for a minimum 7 day period when the school is fully occupied.
 - Provisional sum allowance for upgrading existing electrical infrastructure WHERE necessary.

PM_10_10_60/20 Drawings and other documents

1. **Details:** The tender performance drawings are as detailed below.

This specification details the performance requirements of the mechanical and electrical services installation associated with the CIF funded replacement works at the existing Giles Academy. The contractor shall be responsible for the surveying, design, approval and obtaining of all Statutory approvals for the completed installation of the works.

Where existing services are modified, diverted or extended, the contractor shall be responsible for testing and commissioning the complete installation to the satisfaction of the Client's representative.

The contractor shall be responsible for liaising with Building Control and the local fire authority on all matters relating to the electrical services installation works including any regulatory and planning approvals, and for providing and formally submitting any necessary certification.

The contractor shall be responsible for the design, development and co-ordinating their own working drawings for the project, based upon the design intent drawings forming this tender package.

2. **Reference:**

12-06-2023

230509-G&G-XX-XX-M-SC-1000 Indicative Plantroom Schematic

230509-G&G-XX-XX-M-DR-1100 Indicative Heating Layout

Status: Performance Design for Tender, for design development by the successful contractor

3. Format: Electronic.
4. Provision: Provided.
5. Contract drawings
 - 5.1. Generally: The same as the tender drawings.
 - 5.2. CAD data: In accordance with [BS EN ISO 19650-1](#).
6. Cross references
 - 6.1. Accuracy: Check remainder of the annotation or item description against the terminology used in the cited section or clause.
 - 6.2. Related terminology: Where a numerical cross-reference is not given the relevant sections and clauses of the specification will apply.
 - 6.3. Relevant clauses: Clauses in the cited specification section dealing with general matters, ancillary products and execution also apply.
 - 6.4. Discrepancy or ambiguity: Give immediate notice in writing setting out the nature and assessed impact of the conflict. Do not proceed until instructions are received.
 - 6.5. Document precedence: Specification takes precedence over referenced documents.
7. Dimensions: Use numbered dimensions only. Do not scale direct from drawings.

PM_10_10_60/30 Project locations

1. Details: Giles Academy
2. Address
 - 2.1. Number/ Street: Church Road,
 - 2.2. Town/ City: Old Leake, Boston
 - 2.3. Postcode: PE22 9LD

PM_10_10_60/60 Access

1. Details: A site visit may be arranged via the school or project manager

PM_10_10_60/80 The works/ services

1. Details: Design, supply, install, balance, test and commission the works defined in this specification and indicated on all design intent drawings, the extent of works is as follows:-
 - Stripping out of existing heat emitters
 - Stripping out of existing heating distribution pipework
 - Stripping out of existing domestic water services pipework (Plantroom only)
 - Stripping out of existing boilers and associated plant, pipework, valves and equipment (including controls) from within the boiler room
 - Stripping out of existing external oil tank, oil lines and associated equipment and connections.
 - Stripping out of existing hot water generator and associated plant, pipework, valves and equipment (including controls) from within the boiler room
 - Provision of new heat emitters and heating distribution pipework
 - Provision of new thermal insulation on all new heating pipework within the boiler room and inside the school on all pipework installed at high level and on all drops/pipework within boxings.
 - Provision of new domestic water services hot and cold distribution pipework (plantroom works only).

- Provision of new thermal insulation on all new domestic water services hot and cold water pipework within the boiler room.
- Provision of new hot water generator and associated equipment.
- Provision of new air source, buffer vessel, circulating pump, pressurisation unit, expansion vessel etc.
- Provision of power supplies to new mechanical plant and equipment both within the boiler room and remote from, including power supplies and control valves
- Testing, commissioning and demonstration of all systems on completion.
- Provision of test certificates, commissioning results, O&M manuals and record drawings as necessary.
- Detailed design of the above services and production of design drawings.
- Provision of any necessary builderswork and redecoration to facilitate the new installation.

The mechanical sub-contractor shall be responsible for the design, supply and installation of the above systems based upon this specification and the accompanying indicative performance tender drawings. The contractor shall be responsible for the production of detailed design/working drawing and for submitting the same to the Building Services Engineer for comment, prior to commencing installation. The approval period is 3 days (max) and this should be allowed for in the submission programme.

The sub-contractor should include within the tender sum, adequate allowance for weekend/out of hours working as necessary.

The sub-contractor must include for all associated items to provide a complete working installation, fully compliant with all appropriate regulations and codes of practice, whether implicitly detailed within this specification and on the drawings or not.

2. **Related works:** Provide trades with necessary details of related types of work. Before starting each new type or section of work, ensure that previous related work is complete, in accordance with the project documents, to a suitable standard, and in a suitable condition to receive new work.

Ω End of Section

PM_40

Design and approvals information

Project management

PM_40_50_21 Design submittals

1. Design proposals
 - 1.1. **Requirement:** Provide electronic copies of all design drawings, calculations and technical submittals for review based upon the design intent shown on the Stage 3 performance tender drawings
 - 1.2. **Purpose:** All drawings shall be submitted for approval where they will be given a Status A, B or C.
Status A meaning no comments
Status B meaning proceed with installation but comments to be incorporated
Status C meaning no works to be progressed until changes are made to the design drawings
 - 1.3. **Submittals:** Schedules, technical information, calculations and manufacturer's literature.
 - 1.4. **Timing:** 5 working days are required for approval of all submittals
 - 1.5. **Format:** Electronic

PM_40_60_23 Description terminology

1. **Contractor :** The party who undertakes to perform the services, supply goods or carry out work defined in a contract. Includes main contractor, prime contractor, supplier, service provider, builder, subcontractor, etc. as the context dictates, which may be defined terms in certain standard contract forms.
2. **Contractor's choice:** Selection delegated to the contractor, but liability to remain with the specifier.
3. **Contractor's design:** Design to be carried out or completed by the contractor, supported by appropriate contractual arrangements, to correspond with specified requirements.
4. **Cost:** The amount paid or given by one party to another in exchange for goods, work, supplies or services.
5. **Designer:** A person or organization carrying out design on a project.
6. **Deviation:** Difference between a specified dimension or position and the actual dimension or position.
7. **Drawings:** Definitions as [BSRIA Building Applications Guide: Design framework for building services. 5th edition.](#)
8. **Employer:** The party to the contract for whom the goods, work, supplies or services are provided. Includes client (in consultancy contracts and CDM Regulations), the employer, building owner or purchaser (in construction contracts), the developer (in development agreements and funding agreements), or the 'Main' contractor in contractor/ subcontractor agreements – which may be defined terms in certain standard contract forms.
9. **Estimate:** An approximate evaluation of quantity, number, extent, time or cost of part or the whole of a project.
10. **Execute:** To complete a task fully and put into effect. To fix, apply, install or lay products securely, accurately, plumb and in alignment.
11. **Existing:** Items retained in place to receive new work.
12. **Manufacturer and Product reference:** Manufacturer – the person or legal entity under whose name or trademark the particular product, component or system is marketed.

Product reference – the proprietary brand name and/ or identifier by which the particular product, component or system is described.

References are as specified in the manufacturer's technical literature current on the date specified.

13. **Manufacturer's standard:** Where used in conjunction with a specified proprietary product, accessories to be those recommended by the product manufacturer.
14. **Permanent Work:** Work to be constructed and completed in accordance with the contract.
15. **Price:** An indication of the amount required to be paid by one party to another in exchange for goods, work, supplies or services.
16. **Product:** Material, both manufactured and naturally occurring, goods and accessories for permanent incorporation into the works.
17. **Requirements:** A description in outline or detailed form of the development, or a part of it, which one party wants another to undertake, design and/ or construct.
18. **Schedule of rates:** The subdivision of product and execution prices by a predetermined unit basis.
19. **Schedule of Work/ Work Schedule:** The subdivision of work items by a predetermined classification. Can form the basis of a pricing document where bills of quantities are not used.
20. **Schematic:** A drawing of a system showing components, products, systems and their interconnections.
21. **Specification:** Written description of requirements.
22. **System:** Products, components, equipment, accessories, controls, supports and ancillary items, including installation, necessary for that section of the work to function.
23. **Temporary work:** Incidental work to undertaken during construction but not intended to form part of the completed work.

PM_40_60_50 Master information delivery plan

1. **Compatibility with programme:** When submitting programme, confirm that it is compatible with the information release schedule.
2. **Alternative information release times:** Submit proposals.

Ω End of Section

PM_70

Testing, commissioning and completion information

Project management

PM_70_80 Commissioning information

1. **General:** Submit relevant drawings and preliminary performance data to enable users to become familiar with the installation.
2. **Submittal date:** At commencement of commissioning.

PM_70_85_10/30 The building manual

1. **Purpose:** The building manual is to be a comprehensive information source and guide for owners and users of the completed works. It must provide an overview of the main design principles and describe key components and systems within the finished works to enable proper understanding, efficient and safe operation and maintenance.
2. **Scope**
 - 2.1. Part 3 : Services.
 - 2.2. Part 4: The health and safety file
 - 2.3. Part 5: Building user guide.
3. **Responsibility for production:** The mechanical and electrical contractor(s)
4. **Date required:** 3 weeks prior to completion
5. **Compilation:** Prepare all information for contractor designed or performance specified work including as-built drawings. Obtain or prepare all other information to be included in the manual.
6. **Reviewing the Manual:** Prepare and circulate a complete draft. Amend in the light of any comments and recirculate. Do not proceed with production of the final copies until authorized.
7. **Final copies of the Manual**
 - 7.1. Number of copies: One
 - 7.2. Format: Electronic
 - 7.3. Latest date for submission: One week before the date for completion stated in the contract.
8. **As-built/ record drawings and schedules**
 - 8.1. Number of copies: One
 - 8.2. Format: Electronic

PM_70_85_10/100 Content of the building manual part 3: building services

1. **Content:** Obtain and provide the following, including all relevant details not included in other parts of the manual:
 - 1.1. **Detailed design criteria and description of the systems, including:** Including:
 - Services capacity, loadings and restrictions.
 - Services instructions.
 - Services log sheets.
 - Manufacturers' instruction manuals and leaflets index.
 - Fixtures, fittings and component schedule index.
 - 1.2. **Detailed description of methods and materials used:** For all items.

- 1.3. **As-built/ record drawings:** For each system recording the construction, together with an index, including:

Diagrammatic drawings indicating principal items of plant, equipment and fittings.

Record drawings showing overall installation.

Schedules of plant, equipment, valves, etc. describing location, design performance and unique identification cross referenced to the record drawings.

Identification of services – a legend for colour coded services.

- 1.4. **Product details:** Including for each item of plant and equipment:

Name, address and contact details of the manufacturer.

Catalogue number or reference.

Manufacturer's technical literature, including detailed operating and maintenance instructions.

Information and guidance concerning dismantling, repair, renovation or decommissioning.

- 1.5. **Operation:** A description of the operation of each system, including:

Starting up, operation and shutting down.

Control sequences.

Procedures for seasonal changeover.

Procedures for diagnostics, troubleshooting and fault-finding.

- 1.6. **Guarantees, warranties and maintenance agreements:** Obtain from manufacturers, suppliers and subcontractors.

- 1.7. **Commissioning records and test certificates:** List for each item of plant, equipment, valves, etc. used in the installations, including:

Electrical circuit tests.

Corrosion tests.

Type tests.

Work tests.

Start and commissioning tests.

- 1.8. **Equipment settings:** Schedules of fixed and variable equipment settings established during commissioning.

- 1.9. **Preventative maintenance:** Recommendations for frequency and procedures to be adopted to ensure efficient operation of the systems.

- 1.10. **Lubrication:** Schedules of all lubricated items.

- 1.11. **Consumables:** A list of all consumable items and their source.

- 1.12. **Spares:** A list of recommended spares to be kept in stock, being those items subject to wear and tear or deterioration and which may involve an extended delivery time when replacements are required.

- 1.13. **Emergency procedures :** For all systems, significant items of plant and equipment.

- 1.14. **Annual maintenance summary chart:** For all systems.

PM_70_85_10/110 Content of the building manual part 4: the health and safety file

1. **Content:** Obtain and provide the following, including all relevant details not included in other parts of the manual, including:

Residual hazards and how they have been dealt with.

Hazardous materials used.

Information regarding the removal or dismantling of installed plant and equipment.

Health and safety information about equipment provided for cleaning or maintaining the structure.

The nature, location and markings of significant services.

Information and as-built drawings of the structure, its plant and equipment.

PM_70_85_10/120 Content of the building manual part 5: the building user guide

1. **Content:** Obtain and provide the following:

Building services information.

Emergency information.

Energy and environmental strategy.

Water use.

Transport facilities.

Materials and waste policy.

Re-fit/ re-arrangement considerations.

Reporting provision.

Training.

Links and references.

PM_70_85_10/140 Presentation of building manual

1. **Format:** A4 size, plastics covered, loose leaf, four ring binders with hard covers, each indexed, divided and appropriately cover titled
2. **Selected drawings :** Where these are needed to illustrate or locate items mentioned in the manual: if larger than A4, to be folded and accommodated in the binders so that they may be unfolded without being detached from the rings.
3. **As-built/ record drawings:** The main sets may form annexes to the manual.

PM_70_85_20 Defects rectification report

1. Non-compliant items
 - 1.1. **Opening up, inspection, testing, making good, adjustment of the Contract Sum, or removal and re-execution:** Submit proposals
 - 1.2. **Submittal date:** As soon as possible after discovery of items which are, or appear to be, non-compliant.

12-06-2023

2. **Acceptability:** Such proposals may be unacceptable, and contrary instructions may be issued.

PM_70_85_20/30 Measures to establish acceptability

1. **General:** Wherever inspection or testing shows that the work, materials or goods are not in accordance with the contract, and measures (e.g. testing, opening up, experimental making good) are taken to help in establishing whether or not the work is acceptable, such measures will be at the expense of the contractor, and will not be considered as grounds for revision of the completion date.

PM_70_85_20/40 Rectification and defects

1. **Notice:** Give reasonable notice for access to the various parts of the works.
2. **Completion:** Give notice when remedial works have been completed.

PM_70_85_30/10 Tests and inspection schedule

1. **Timing:** Agree and record dates and times of tests and inspections to enable affected parties to be represented.
2. **Confirmation:** Provide one working day prior to each test or inspection. If sample or test is not ready, agree a new date and time.
3. **Records:** Submit a copy of test certificates and retain copies on site.

PM_70_85_45/10 Tools and consumables

1. **General:** Provide tools and portable indicating instruments for the operation and maintenance of all services plant and equipment (except any installed under named subcontracts) together with suitable means of identifying, storing and securing.
2. **Quantity:** Two complete sets.
3. **Consumables:** Supply a complete list of all consumables necessary for the operation.
4. **Submittal date:** At completion.

PM_70_85_45/20 Schedule for spare parts

1. **General:** Prepare a priced schedule of recommended spare parts that should be obtained and kept in stock for maintenance of the services installations.
2. **Content:** Include in the priced schedule for:

Manufacturers' current prices, including packaging and delivery to site.

Checking receipts, marking and numbering in accordance with the schedule of spare parts.

Referencing to the plant and equipment list in part 3 of the building manual.

Painting, greasing, etc. and packing to prevent deterioration during storage.
3. **Latest date for submission:** Two weeks before completion.

PM_70_85_52/10 Manufacturer's recommendations and instructions

1. **General:** Comply with manufacturer's printed recommendations and instructions current on the date of the invitation to tender.
2. **Exceptions:** Submit details of changes to recommendations or instructions.
3. **Execution:** Use ancillary products and accessories supplied or recommended by main product manufacturer.
4. **Products:** Comply with limitations, recommendations and requirements of relevant valid certificates.

PM_70_85_64/20 Mechanical and electrical services

1. **Final tests and commissioning:** Carry out so that services are in full working order at completion of the works.
2. **Confirmation:** Provide a Building Regulations notice, signed by a suitably qualified person, to Building Control, confirming that systems have been commissioned in accordance with approved procedures.
3. **Records:** Include in the building manual

PM_70_85_90/10 Training

1. **Objective:** Before completion, explain and demonstrate to designated maintenance staff the purpose, function and operation of the installations including items and procedures listed in the building manual.
2. **Time allowance (minimum):** Two days.

PM_70_85_96 Works completion certificate

1. **Requirement:** Give notice of the anticipated dates of completion of the whole or parts of the works.
2. **Associated work:** Ensure necessary access, services and facilities are complete.
3. **Period of notice (minimum):** Two weeks.

PM_70_90/20 Technical information

1. **Availability:** Retain on site for reference by supervisory personnel.
2. **Information:** Manufacturer's current information and relevant British Standards, relating to products to be used in the works.

Ω End of Section

Ro Roles

Roles

Ro_10_20_14 Client (K)

1. Name: Giles Academy
2. Address: Church Road, Old Leake, Boston, PE22 9LD

Ro_10_20_26 Employer

1. Name: South Lincolnshire Academies Trust

Delivery team roles

Ro_30_10_19 Contract administrator

4. Name: MAC Construction Consultants
5. Address: Suite 207, Cooper Buildings, Arundel Street, Sheffield S1 2NS
6. Contact: Paul Booth
7. Telephone: 07930 277 795
8. Email address: paulbooth@macconsultingltd.com

Ro_30_10_67 Project manager

1. Name: MAC Construction Consultants

Official roles - No Amendments

Design roles

Ro_50_20_54 Mechanical services engineer (M)

1. Name: G&G Design Services Ltd
2. Address: 8 Marketstede, Hampton Hargate, Peterborough PE7 8FA
3. Contact: Kieran Gregory
4. Telephone: 07928 696704
5. Email address: kieran@gandgdesignservices.co.uk

Ω End of Section

Ss_55_70_38_15

Cold water supply systems

Systems

Ss_55_70_38_15 Cold water supply systems

4. **Description:** From the existing retained water main, design, provide and install a new mains cold water installation to serve the new pressurisation unit and the new hot water generator within the boiler room.

All new mains cold water distribution pipework within the boiler room shall be carried out in copper tube and be thermally insulated.

New Distribution pipework shall be carried out in copper tube which shall be thermally insulated.

Design, provide and install all necessary tees, bends, valves, backflow prevention devices etc. necessary to provide a complete working installation in compliance with all regulations and codes of practice.

The contractor shall make adequate allowance within his programme for the submittal of working drawings and relevant details to the local water authority for approval under the Water Supply (Water Fittings) Regulations scheme.

Design, provide and install fire stopping where all mains cold water pipework passes through a fire barrier.

Design, provide and install a new magnetic water conditioner on the mains cold water supply serving the hot water generator, to prevent the build-up of scale.
5. **System performance:** [Ss_55_70_38/250 Pipeline sizes for hot and cold water systems](#)
6. **Arrangement:** Mains.
7. **Pipelines**
 - 7.1. **Above ground:** [Pr_65_52_63_17 Copper pipes](#)
8. **Pipeline accessories**
9. **Valves**
 - 9.1. **Backflow prevention devices:** [Pr_65_54_95_05 Backflow prevention check valves](#)
 - 9.2. **Isolating valves:** [Pr_65_54_95_06 Ball valves](#)
 - 9.3. **Draining devices:** [Pr_65_54_95_27 Draining taps](#)
10. **Fire-stopping:** Multiple services penetration fire-stopping system. Individual services penetrations fire-stopping system.
11. **Thermal insulation**
 - 11.1. **Pipelines:** [Pr_80_77_76_62 Phenolic foam insulation](#)
12. **Plant and equipment identification:** [Pr_40_10_57_78 Self-adhesive colour pipe bands](#)
13. **Execution:** [Ss_55_70_38/620 Installing hot and cold water systems generally](#); [Ss_55_70_38/650 Hydraulic pressure testing of hot and cold water supply systems](#); [Ss_55_70_38/660 Flushing hot and cold water systems](#); [Ss_55_70_38/670 Disinfection of hot and cold water systems](#)
14. **System completion:** [Ss_55_70_38/810 Commissioning of hot and cold water supply systems](#); [Ss_55_70_38/850 Water quality tests](#)

System performance

Ss_55_70_38/250 Pipeline sizes for hot and cold water systems

- **Sizing:** Calculate sizes to meet simultaneous demand for the building in accordance with [BS EN 806-3](#).

12-06-2023

- Proposals: Submit drawings with pipe sizes shown.
- Performance
 - Water velocity (maximum): 1.3 m/s for hot water and 2.0 m/s for cold water.

Products

Pr_40_10_57_78 Self-adhesive colour pipe bands

8. Manufacturer: Contractor's choice
9. Standards: To [BS 1710](#).
10. Identification type: Adhesive colour bands.

Pr_65_52_63_17 Copper pipes

3. Manufacturer: Contractor's choice
4. Standard: To [BS EN 1057](#).
5. Third-party certification: [Kitemark](#)-approved. [WRAS](#)-approved.
6. Finish: Plain.
7. Execution: [Pr_65_52_63/635 Brazed joints in copper and copper alloy pipes](#)

Pr_65_54_95_05 Backflow prevention check valves

2. Manufacturer: Contractor's choice
3. Standard: To [BS EN 13959](#).
4. Third-party certification: [WRAS](#) approval.
5. Family and type: EC – verifiable double check valve.
6. Pressure class: PN 10.

Pr_65_54_95_06 Ball valves

3. Description: Lever operated
4. Manufacturer: [Crane Fluid Systems](#)
5. Contact details
 - 5.1. Address: Crane House
Epsilon Terrace
West Road
Ipswich
Suffolk
IP3 9FJ
 - 5.2. Telephone: [+44 \(0\)1473 277300](#)
 - 5.3. Web: [www.cranefs.com](#)
 - 5.4. Email: [enquiries@cranefs.com](#)
6. Material: Brass copper alloy.
7. Finish: Chrome-plated.
8. Execution: [Pr_65_54_95/610 Installation of valves generally](#)

Pr_65_54_95_27 Draining taps

- Manufacturer: [Crane Fluid Systems](#)
- Contact details
 - Address: Crane House
Epsilon Terrace

West Road
Ipswich
Suffolk
IP3 9FJ

- Telephone: [+44 \(0\)1473 277300](tel:+441473277300)
- Web: www.cranefs.com
- Email: enquiries@cranefs.com
- Product reference: [D340 Drain Taps \(DN15\)](#)
- Standard: To BS EN 10226-2, BS EN 12165, BS EN 12164 and BS 2879.
- Size: DN15.
- Arrangement: Type 2.
- Material: DZR Brass BS EN 12165 CW602N, Brass BS EN 12164 CW614N, EP80 (EPDM-WRAS Approved) and EP70 (EPDM-WRAS Approved).
- Connections: Threaded joints to BS EN 10226-2 (taper).
- OperationTemperatureRange: 0 to +110°C.
- Pressure: 16 BAR.
- Operator: Lockshield.
- Approvals: WRAS approved.

Pr_80_77_76_62 Phenolic foam insulation

2. Manufacturer: [Kingspan Insulation](#)
3. Contact details
 - 3.1. Address: Kingspan Insulation Ltd
Pembroke
Leominster
Herefordshire
United Kingdom
HR6 9LA
 - 3.2. Telephone: [+44 \(0\)1544 388601](tel:+441544388601)
 - 3.3. Web: <https://www.kingspan.com/gb/en-gb>
 - 3.4. Email: info@kingspaninsulation.co.uk
4. Product reference:
5. Standard: To [BS EN 13166](#).
6. Form:
7. Thermal conductivity: 0.018 W/m·K at 0°C.

0.018 W/m·K at 10°C.

0.023 W/m·K at 50°C.

0.025 W/m·K at 75°C.
8. Finish: Plain.
9. Insulation thickness (minimum): To [BS 5422](#).

Execution

Pr_65_52_63/635 Brazed joints in copper and copper alloy pipes

24. Preparation, marking and sealing: In accordance with [BS EN 14324](#).

Pr_65_54_95/610 Installation of valves generally

3. Installation: In accordance with [BS 6683](#).
4. Isolation and regulation valves: Provide at equipment and on sub-circuits.
5. Access: Locate valves so they can be readily operated and maintained. Locate next to equipment which is to be isolated.
6. Connection to pipework: Fit with joints that suit the pipe material.

Ss_55_70_38/620 Installing hot and cold water systems generally

3. Standard: To [BS 8558](#) and [BS EN 806-4](#).
4. Performance: Free from leaks and the audible effects of expansion, vibration and water hammer.
5. Fixing of equipment, components and accessories: Fix securely, parallel or perpendicular to the structure of the building.
6. Preparation: Immediately before installing tanks and cisterns on a floor or platform, clear the surface completely of debris and projections.
7. Corrosion resistance: In locations where moisture is present or may occur, avoid contact between dissimilar metals by use of suitable washers, gaskets, and the like.

Ss_55_70_38/650 Hydraulic pressure testing of hot and cold water supply systems

9. Standard: To [BS 8558](#) and [BS EN 806-4](#).
10. Notice (minimum): One week.
11. Pressure: 2 times working pressure.
12. Duration of test: One hour

Ss_55_70_38/660 Flushing hot and cold water systems

2. Standard: To [BS EN 806-4](#).
3. Water analysis: Analyse water samples before treatment.
4. Preliminary checks: Thoroughly inspect pipework. Complete pressure tests before cleaning or chemical treatment.
5. Waste products : Neutralize, and dispose of to drain. Preferably direct to manhole.

Ss_55_70_38/670 Disinfection of hot and cold water systems

2. Standard: To [BS EN 806-4](#).
3. Samples for analysis: Provide after disinfection and flushing.

System completion

Ss_55_70_38/810 Commissioning of hot and cold water supply systems

2. Pre-commissioning: In accordance with [BSRIA BG 2/2010](#) and [CIBSE Commissioning Code W](#).
3. Commissioning: In accordance with [BS EN 806-4](#), [BSRIA BG 2/2010](#) and [CIBSE Commissioning Code W](#).
4. Notice (minimum): One week.
5. Equipment: Check and adjust operation of equipment, controls and safety devices.
6. Outlets: Check operation of outlets for satisfactory rate of flow and temperature.

Ss_55_70_38/850 Water quality tests

4. Standard: To [BS EN 806-4](#).

5. Samples

5.1. Samples for analysis: Submit samples for bacteriological analysis.

6. Water temperature: Record at each sampling point at the time of taking the sample.

7. Test results

7.1. Record: Details of all analyses.

7.2. Submit: On completion.

7.3. Number of copies: One.

Ω End of System

Ss_55_70_38_20

Direct hot water storage supply systems

Systems

Ss_55_70_38_20 Direct hot water storage supply systems

3. **Description:** Design, provide and install a new hot water generator to be located within the boiler room where it shall connect to the new hot water flow and return pipework.

The new hot water generator shall be supplied from a series of high temperature air source heat pump to be located externally within a compound (final location to be agreed and subject to planning).

Design, provide and install a bronze or stainless steel hot water return circulating pump within the boiler room. Where the pump is fixed to the building fabric, it shall be fitted on anti-vibration mountings. The pump is to be installed complete with flexible connections on both the suction and discharge side of the pump.

Design, provide and install all necessary tees, bends, valves, backflow prevention devices etc. necessary to provide a complete working installation in compliance with all regulations and codes of practice.

The contractor shall make adequate allowance within his programme for the submittal of working drawings and relevant details to the local water authority for approval under the Water Supply (Water Fittings) Regulations.

Design, provide and install double regulating valves on the hot water return for balancing purposes.

4. The contractor shall ensure that all water systems in the building are designed in compliance with the measures outlined in the health and safety Executive's 'Legionnaires' disease - the control of Practice and Guidance, 2000 and, where relevant, other industry/sector best practice guidance.

Design, provide and install fire stopping where all hot water pipework passes through a fire barrier

5. **System performance:** [Ss_55_70_38/240 Centralized hot water storage system](#); [Ss_55_70_38/210 Design and detailing hot and cold water systems](#); [Ss_55_70_38/250 Pipeline sizes for hot and cold water systems](#); [Ss_55_70_38/255 Draw off requirements for hot and cold water systems](#)
6. **System:** Unvented.
7. **Pumps:** [Pr_65_53_86_15 Close-coupled in-line pumps](#)
8. **Pipelines:** [Pr_65_52_63_17 Copper pipes](#)
9. **Valves**
- 9.1. Isolating valves: [Pr_65_54_95_06 Ball valves](#)
- 9.2. Regulating valves: [Pr_65_54_95_26 Double regulating valves](#)
- 9.3. Draining devices: [Pr_65_54_95_27 Draining taps](#)
10. **Thermal insulation**
- 10.1. **Pipelines:** [Pr_80_77_76_62 Phenolic foam insulation](#)

System performance

Ss_55_70_38/210 Design and detailing hot and cold water systems

2. **Design:** Complete the design and detailing of the hot and cold water supply.

3. Standard: To [BS 8558](#) or [BS EN 806-2](#) and in accordance with [HSE publication L8: Legionnaires' disease. The control of Legionella bacteria in water systems. Approved Code of Practice and guidance on regulations.](#)
4. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturer's literature.

Ss_55_70_38/240 Centralized hot water storage system

3. System design: Design the system to meet the following requirements.
4. Storage capacity
 - 4.1. Standard: In accordance with [CIPHE Plumbing engineering services design guide.](#)
 - 4.2. Type of building: School.
5. Primary heat source: Capable of raising temperature of water from 10°C to 60°C within one hour.
6. Water supply: Mains.

Ss_55_70_38/250 Pipeline sizes for hot and cold water systems

4. Sizing: Calculate sizes to meet simultaneous demand for the building in accordance with [BS EN 806-3.](#)
5. Proposals: Submit drawings with pipe sizes shown.
6. Performance
 - 6.1. Water velocity (maximum): 1.3 m/s for hot water and 2.0 m/s for cold water.

Ss_55_70_38/255 Draw off requirements for hot and cold water systems

5. Dish-washing machines
 - 5.1. Type of supply: Cold from mains.
6. Handbasin (spray or spray mixer taps)
 - 6.1. Type of supply: Hot and cold water, blended to 43°C
7. Kitchen sinks (G¾)
 - 7.1. Type of supply: Hot and cold water
8. WC cisterns (to fill in 2 minutes)
 - 8.1. Type of supply: Cold from mains.

Products

Pr_65_52_63_17 Copper pipes

9. Manufacturer: Contractor's choice
10. Standard: To [BS EN 1057.](#)
11. Third-party certification: [Kitemark](#)-approved. [WRAS](#)-approved.
12. Finish: Plain.
13. Execution: [Pr_65_52_63/635 Brazed joints in copper and copper alloy pipes](#)

Pr_65_53_86_15 Close-coupled in-line pumps

5. Description: Twin head variable speed
6. Manufacturer: Grundfos
7. Arrangement: Pipeline mounted twin.
8. Duties
 - 8.1. Operation: Duty.
9. Speed control: Variable.

12-06-2023

10. Execution: [Pr_65_53_86/610 Installation of pumps generally](#)

Pr_65_54_95_06 Ball valves

- 4. Description: Lever operated
- 5. Manufacturer: [Crane Fluid Systems](#)
- 6. Contact details
 - 6.1. Address: Crane House
Epsilon Terrace
West Road
Ipswich
Suffolk
IP3 9FJ
 - 6.2. Telephone: [+44 \(0\)1473 277300](#)
 - 6.3. Web: [www.cranefs.com](#)
 - 6.4. Email: enquiries@cranefs.com
- 7. Material: Brass copper alloy.
- 8. Finish: Chrome-plated.
- 9. Execution: [Pr_65_54_95/610 Installation of valves generally](#)

Pr_65_54_95_26 Double regulating valves

- 3. Manufacturer: [Crane Fluid Systems](#)
- 4. Contact details
 - 4.1. Address: Crane House
Epsilon Terrace
West Road
Ipswich
Suffolk
IP3 9FJ
 - 4.2. Telephone: [+44 \(0\)1473 277300](#)
 - 4.3. Web: [www.cranefs.com](#)
 - 4.4. Email: enquiries@cranefs.com
- 5. Standard: To [BS 7350](#).
- 6. Arrangement: Globe.

Pr_65_54_95_27 Draining taps

- 4. Manufacturer: [Crane Fluid Systems](#)
- 5. Contact details
 - 5.1. Address: Crane House
Epsilon Terrace
West Road
Ipswich
Suffolk
IP3 9FJ
 - 5.2. Telephone: [+44 \(0\)1473 277300](#)
 - 5.3. Web: [www.cranefs.com](#)
 - 5.4. Email: enquiries@cranefs.com
- 6. Product reference: [D340 Drain Taps \(DN15\)](#)
- 7. Standard: To BS EN 10226-2, BS EN 12165, BS EN 12164 and BS 2879.
- 8. Size: DN15.

12-06-2023

9. Arrangement: Type 2.
10. Material: DZR Brass BS EN 12165 CW602N, Brass BS EN 12164 CW614N, EP80 (EPDM-WRAS Approved) and EP70 (EPDM-WRAS Approved).
11. Connections: Threaded joints to BS EN 10226-2 (taper).
12. OperationTemperatureRange: 0 to +110°C.
13. Pressure: 16 BAR.
14. Operator: Lockshield.
15. Approvals: WRAS approved.

Pr_80_77_76_62 Phenolic foam insulation

3. Manufacturer: [Kingspan Insulation](#)
4. Contact details
 - 4.1. Address: Kingspan Insulation Ltd
Pembroke
Leominster
Herefordshire
United Kingdom
HR6 9LA
 - 4.2. Telephone: [+44 \(0\)1544 388601](tel:+441544388601)
 - 4.3. Web: <https://www.kingspan.com/gb/en-gb>
 - 4.4. Email: info@kingspaninsulation.co.uk
5. Product reference:
6. Standard: To [BS EN 13166](#).
7. Form:
8. Thermal conductivity: 0.018 W/m·K at 0°C.

0.018 W/m·K at 10°C.

0.023 W/m·K at 50°C.

0.025 W/m·K at 75°C.
9. Finish: Plain.
10. Insulation thickness (minimum): To [BS 5422](#).

Execution

Pr_65_52_63/635 Brazed joints in copper and copper alloy pipes

3. Preparation, marking and sealing: In accordance with [BS EN 14324](#).

Pr_65_53_86/610 Installation of pumps generally

2. Pipeline connections: Arrange to prevent transmission of pipeline forces to pump casing.
3. Pressure gauge tapings: Provide in flow and return pipeline connections and in common suction and delivery pipeline.
4. Brackets: Support pipeline mounted pumps on purpose made brackets lined with vibration absorbent material.
5. Alignment: Align and balance to minimize vibration.
6. Access: Provide adequate space for service and maintenance.

Pr_65_54_95/610 Installation of valves generally

1. **Installation:** In accordance with [BS 6683](#).
2. **Isolation and regulation valves:** Provide at equipment and on sub-circuits.
3. **Access:** Locate valves so they can be readily operated and maintained. Locate next to equipment which is to be isolated.
4. **Connection to pipework:** Fit with joints that suit the pipe material.

Ω End of System

Ss_60_40_37_48

Low-temperature hot water heating systems

Systems

Ss_60_40_37_48 Low-temperature hot water heating systems

2. **Description:** Design, provide and install a new LTHW heating system to serve the school. New heating shall be supplied from a series of high temperature air source heat pump which shall be located externally in a location to be agreed, within a new compound which shall have acoustic fencing installed around the perimeter. All air source heat pumps shall be located on a concrete base.

Note that the mechanical contractor shall carry out an assessment in the form of load monitoring prior to designing the air source heat pump system, to ensure that sufficient spare capacity exists within the schools electrical supply system. If there is inadequate supply capacity, then new electrical infrastructure shall be installed (existing supply upgraded).

From each air source heat pump, design, provide and install a system of flow and return pipework to route into a buffer vessel to be located within the boiler room as part of this project. The heat pumps shall be piped in a reverse return arrangement with 2 No. circuits taken directly off the buffer vessel.

The contractor shall allow for all associated builderswork, trenching and making good for any associated works with routing the air source heat pump equipment and associated pipes from the external compound to the boiler room, where all internal associated equipment shall be located.

Any necessary weathering, builderswork and making good (internally) shall also be the responsibility of the contractor.

Design, provide and install a twin head (duty/standby) variable speed primary heating pump between the air source heat pumps and the buffer vessel in the boiler room.

Design, provide and install from the buffer vessel, 2 No. secondary heating circuits, one to serve the school and one to serve the hot water generator, which shall be carried out in medium grade steel pipework. All steel pipework shall be given a cover paint of red oxide prior to being thermally insulated.

All thermal insulation within the plantroom shall be provided with a protective Isogenopak covering. All external thermal insulation shall be provided with a weatherproof covering of PIB or similar.

Heated water shall be distributed through a medium grade steel two pipe conventional distribution system. All pipework above 50mm shall be welded. Pipework up to and including 50mm may be screwed. Any exposed pipework serving radiators shall be installed in medium grade steel tube, thermally insulated and boxed in.

Design, provide and install the necessary anchor points, bellows and expansion loops to accommodate all pipework expansion at intervals not exceeding 24m on any pipe operating at 38 C or above.

All heating distribution pipework shall be given a cover paint of red oxide prior to being thermally insulated (following completion of a successful pressure test).

Flow and return pipework shall distribute within ceiling voids within the school to serve the new radiators.

Design, provide and install within the plantroom a pressurisation unit and expansion vessel to serve the new heating system.

Design, provide and install within the plantroom a twin head (duty/standby) variable speed heating pump to serve the new heating circuit. Design, provide and install commissioning sets on the

heating distribution pipework to enable commissioning (balancing) of the heating system. Commissioning sets to be installed in accordance with manufacturers instructions with the requisite length of straight pipe of the same bore as the valve on either side; ten diameters upstream, five diameters downstream of all measuring stations and double regulating valves.

Installation to include all pipework, valves, fittings, insulation, air vents, drain cocks etc. necessary to provide a fully working system but attention is drawn to the following points of detail:-

- a) All binder test points shall be installed in accessible positions and at pump suction and delivery flanges.
- b) Gauges shall be selected to suit the pressure range and when in operation shall be read with needles registering close to the mid-point of the scale range.
- c) Care shall be taken to ensure that all valve handles are easily operable.

Design, provide and install foil faced phenolic foam insulation on all heating mains. All pipework within the boiler room shall be insulated with foil faced phenolic foam and finished with an Isogenopak covering. Identification banding shall be applied to all insulation incorporating direction of flow arrows and abbreviated description of services. Include for insulated valve boxed within the boiler room.

Design, provide and install pulsed type heat meters on the following circuits:

- Primary heating circuit
- Secondary heating circuit serving the school heating systems

Design, provide and install within the boiler room a dosing pot for chemical dosing of the heating system and a combined dirt/air separator.

All overflows, safety valve discharges, drains from dirt/air separators and dosing pots etc. shall be piped to low level for discharge over a floor gulley

The contractor is to install an external temperature sensor, linked to the three-port weather compensation valve (where installed), in a location acceptable to the client on the North face of the building.

Design, provide and install a new wall mounted automatic control panel (Trend IQ or equivalent) to serve the heating and hot water plant within the plantroom.

The panel shall be complete with indicator lamps and hand/off/auto switches.

The panel shall be complete with a time-clock, over-run extension timer, summer/winter switch and audible alarm.

The controls shall offer 2 stage frost protection and weather compensation, as well as night set back for the heating system.

All power and control wiring, including provision of isolators and fused spurs shall be provided as part of this contract.

Design, provide and install conventional temperature radiators and low surface temperature radiators in areas as indicated on the tender drawings.

Design, provide and install a thermostatic radiator valve on the flow connection to each radiator and a lockshield valve on the return connection.

Design, provide and install fan convectors in areas as indicated on the tender drawings, allowance shall be made for standalone thermostat controls or master/slave configuration when two convectors are installed within a room.

The contractor shall be responsible for the production of heat loss calculations, or the assessment of required heating loads on a Watts/m basis in order to size all new heat emitters.

The contractor shall be responsible for local making good and redecoration where existing heat emitters have been stripped out, including any pipework penetrations.

The contractor shall be responsible for the boxing in of pipework where agreed with the school. Any boxing in shall be decorated.

- System performance: [Ss_60_40_37/210 Design of heating systems](#);
[Ss_60_40_37/220 Basic design temperatures for heating systems](#); [Ss_60_40_37/220 Basic design temperatures for heating systems](#)
- Arrangement: Two-pipe. Reverse return.
- Distribution: Variable temperature.
- Heat source: High temperature air source heat pumps, as manufactured by Mitsubishi, Lochinvar, Daikin or Clade.
- Fuel: Electricity.
- Feed and expansion: [Pr_65_53_86_68 Pressurization units](#)
- Pumps: [Pr_65_53_86_15 Close-coupled in-line pumps](#)
- Pipelines: [Pr_65_52_63_82 Steel pipes](#)
- Pipeline ancillaries
 - a. Venting devices: [Pr_65_54_93_05 Automatic air vents](#)
- Valves
 - a. Isolating valves: [Pr_65_54_95_06 Ball valves](#)
 - b. Check valves: [Pr_65_54_95_11 Cast iron check valves](#)
 - c. Regulating valves: [Pr_65_54_95_26 Double regulating valves](#)
- Heat emitters: [Pr_60_65_37_47 Low-temperature hot water heating coils](#);
[Pr_70_60_36_73 Radiators](#)
- Controls: Heating systems control.

System performance

Ss_60_40_37/210 Design of heating systems

1. Design: Complete the design of the heating systems.
2. Method: In accordance with CIBSE [AM11](#).
3. Requirement: Submit proposals including detailed design drawings, technical information, calculations and manufacturers' literature.
4. Computer calculations
 - 4.1. Submittals: U-values and heat loss calculations for each room. Pump sizing calculations. Pipe sizing calculations.
 - 4.2. Format: HEVACOMP.

Ss_60_40_37/220 Basic design temperatures for heating systems

1. Design temperatures: 19°C classrooms, circulation areas and toilets.
20°C offices
2. External air temperature: -4°C.
3. Air changes per hour: 0.5 infiltration

Products

Pr_60_65_37_47 Low-temperature hot water heating coils

1. Description: Within each hybrid ventilation unit

2. Manufacturer: Supplied with hybrid ventilation units
3. Standards: To [BS 5141-2](#) and [BS EN 1216](#).

Pr_65_52_63_82 Steel pipes

1. Description: Medium grade steel tube
2. Manufacturer: Contractor's choice
3. Third-party certification: [Kitemark](#)-approved.
4. Finish: Varnish.

Pr_65_53_86_15 Close-coupled in-line pumps

1. Description: Twin head variable speed
2. Manufacturer: Grundfos
3. Arrangement: Pipeline mounted twin.
4. Duties
 - 4.1. Operation: Duty.
5. Speed control: Variable.
6. Execution: [Pr_65_53_86/610 Installation of pumps generally](#)

Pr_65_53_86_68 Pressurization units

1. Description: Wall mounted or floor standing
2. Manufacturer: Contractor's choice
3. Standards
 - 3.1. General: To [BS EN 13831](#).
 - 3.2. Domestic heating and hot water supply: In accordance with [BS 7074-1](#).
 - 3.3. Low and medium temperature hot water heating: In accordance with [BS 7074-2](#).
 - 3.4. Chilled water and condenser water: In accordance with [BS 7074-3](#).
4. Format: Fully automatic pre-wired packaged unit on common base plate.
5. Execution: [Pr_65_53_86/630 Installing pressurization units](#)

Pr_65_54_93_05 Automatic air vents

1. Description: To be provided at all system high points for venting
2. Manufacturer: Contractor's choice

Pr_65_54_95_06 Ball valves

1. Description: Lever operated
2. Manufacturer: [Crane Fluid Systems](#)
3. Contact details
 - 3.1. Address: Crane House
Epsilon Terrace
West Road
Ipswich
Suffolk
IP3 9FJ
 - 3.2. Telephone: [+44 \(0\)1473 277300](#)
 - 3.3. Web: [www.cranefs.com](#)
 - 3.4. Email: [enquiries@cranefs.com](#)
4. Material: Brass copper alloy.

12-06-2023

5. Finish: Chrome-plated.
6. Execution: [Pr_65_54_95/610 Installation of valves generally](#)

Pr_65_54_95_11 Cast iron check valves

1. Manufacturer: Contractor's choice
2. Standard: To [BS EN 16767](#) and [BS EN 16668](#).
3. Arrangement
 - 3.1. Type: Swing.
 - 3.2. Body pattern: Straight.

Pr_65_54_95_26 Double regulating valves

1. Manufacturer: [Crane Fluid Systems](#)
2. Contact details
 - 2.1. Address: Crane House
Epsilon Terrace
West Road
Ipswich
Suffolk
IP3 9FJ
 - 2.2. Telephone: [+44 \(0\)1473 277300](#)
 - 2.3. Web: [www.cranefs.com](#)
 - 2.4. Email: [enquiries@cranefs.com](#)
3. Standard: To [BS 7350](#).
4. Arrangement: Globe.

Pr_70_60_36_73 Radiators

1. Description: Low Surface Temperature and Conventional temperature
2. Manufacturer: Contractor's choice
3. Standards: To [BS EN 442-1](#) and [BS EN 442-2](#).
4. Radiator type: Low surface temperature.
Double panel single convector.
Double panel double convector.
Single plain panel.
Single convector panel.
5. Finish: White stove enamelled.
6. Connections: 15 mm B.O.E.
7. Accessories: Infill and end panel system.

Execution

Pr_65_53_86/610 Installation of pumps generally

1. Pipeline connections: Arrange to prevent transmission of pipeline forces to pump casing.
2. Pressure gauge tappings: Provide in flow and return pipeline connections and in common suction and delivery pipeline.
3. Brackets: Support pipeline mounted pumps on purpose made brackets lined with vibration absorbent material.
4. Alignment: Align and balance to minimize vibration.
5. Access: Provide adequate space for service and maintenance.

Pr_65_53_86/630 Installing pressurization units

1. **Standards:** Low and medium temperature hot water heating systems in accordance with [BS 7074-2](#).
2. **Location of expansion vessel:** In the system return pipeline close to the heat source or chilled water unit.

Pr_65_54_95/610 Installation of valves generally

1. **Installation:** In accordance with [BS 6683](#).
2. **Isolation and regulation valves:** Provide at equipment and on sub-circuits.
3. **Access:** Locate valves so they can be readily operated and maintained. Locate next to equipment which is to be isolated.
4. **Connection to pipework:** Fit with joints that suit the pipe material.

Ω End of System

CLIENT:	MAC CONSTRUCTION CONSULTANTS/GILES ACADEMY – MATHS BLOCK	
PROJECT:	HEATING SYSTEM, HEATING PLANT & DOMESTIC WATER SERVICES REPLACEMENT	
MECHANICAL SERVICES INSTALLATION COST:		
Section:	Element/Description:	Cost:
1.0	Preliminaries and Site Set Up	£
	Section 1.0 Sub-Total	£
2.0	Strip-out/Enabling Works	£
	Section 2.0 Sub-Total	£
3.0	Domestic Water Services	
3.1	New Calorifier	£
3.2	Electro-magnetic water conditioner	£
3.3	Hot & cold water pipework & valves within plant room	£
3.4	Hot water secondary circulation pump	£
3.5	Thermal Insulation	£
	Section 3.0 Sub-Total	£
4.0	Low Temperature Hot Water Heating	
4.1	Air Source Heat Pump and Buffer Vessel Installation	£
4.2	Heating circulation pumps/Dosing Pot/Magna Clean/De-Aerator	£
4.3	Pressurisation unit & expansion vessel	£
4.4	Radiators/Fan Convectors/Radiant Panels & valves	£
4.5	Zone Control Valves	£
4.6	Heating pipework in plant room	£
4.7	Heating pipework in school	£
4.8	Thermal Insulation	£
	Section 5.0 Sub-Total	£
5.0	Electrical Services for Mechanical Installation	
5.1	Rotary Isolators and fused spurs	£
5.2	Power Wiring	£
5.3	Containment	£
	Section 6.0 Sub-Total	£
6.0	BWIC & Local Redecoration	£
	Section 7.0 Sub-Total	£
7.0	Automatic controls & wiring	£
8.0	Testing & Commissioning	£
9.0	Water Treatment/Chlorination	£

10.0	Operation & Maintenance Manuals	£
11.0	As Installed Drawings	£
12.0	Design Costs	£
13.0	Provisional Sum for Incoming Electrical Supply Upgrade if required	£35,000.00
TENDER TOTAL (Section 1.0 – 13.0 Inclusive)		£



Specification created using NBS Chorus