

St. Oliver's CC – EWS 2026 – Building
Management System, Heating, Cold Water
Services and Roof Replacement Project,

Drogheda,

Co. Louth

Volume A 2.3 Mechanical Specification

Part 1 of 4: Project Particulars

Tender

Date: July 2026

Document History

Version	Issued	Comments
T	July 2026	Tender Issue

Contents

1 GENERAL INFORMATION..... 2

2 OVERVIEW OF MECHANICAL WORKS..... 5

3 NOTES ON TENDERING..... 12

4 REMOVALS (50) 15

6 (51) HEATING CENTRE INSTALLATION..... 19

7 (53) PLUMBING INSTALLATION 20

8 (56) SPACE HEATING 21

9 (65) BUILDING MANAGEMENT SYSTEM..... 22

10 FLAT ROOF INSTALLATION 29

1 GENERAL INFORMATION

1.1 SITE LOCATION

The site location is off the Rathmullen Road, Drogheda, Co. Louth. A92 D766



1.2 MECHANICAL DRAWING SCHEDULE

3279-SMK-ZZ-LL-DR-M-5100	Plant Room Schematic
3279-SMK-ZZ-LL-DR-M-5300	Plumbing Schematic
3279-SMK-ZZ-LL-DR-M-5600	Heating Installation
3279-SMK-ZZ-LL-DR-M-5900	BMS Installation
3279-SMK-ZZ-LL-DR-M-5300	Builders Works

Architect Drawing Schedule

- 21-43/TD-0100 Existing Plans, Sections & Site Plan
- 21-43/TD-1000 Proposed Plans & Section
- 21-43/TD-6000 Proposed Detail Sheet 1 - Roof Details

1.3 MECHANICAL WORKS

This document has been prepared using the Common Arrangement of Sections and this Mechanical Works Specification comprises the following:

- NBE 51: Heating Centre Installation
- NBE 52: Sanitaryware, Soils & Wastes Installations
- NBE 53: Plumbing Installation
- NBE 54: Natural Gas Installation
- NBE 56: Space Heating Installation
- NBE 56: Building Management System Installation
- NBE 57: Ventilation Installations
- NBE 67: Fire Systems

1.4 PROJECT TEAM

1.4.1 The Employer

The Employer is LMETB.

1.4.2 The Contract Administrator

The term Contract Administrator (CA) is used throughout this specification and his duties will be carried out by:

- The Engineer: ***Christopher McGinnity, Semple & McKillop Ltd,
Unit 6, Drumillard Retail Park, Castleblayney,
Co. Monaghan – Tel. 042-9749570***

1.4.3 Design Team

Building Services Engineer: ***Christopher McGinnity, Semple & McKillop Ltd,
Unit 6, Drumillard Retail Park, Castleblayney,
Co. Monaghan – Tel. 042-9749570***

PSDP: ***Síle O'Connor, Semple & McKillop Ltd,
Unit 6, Drumillard Retail Park, Castleblayney,
Co. Monaghan – Tel. 042-9749570***

Architect: ***McCarthy O'Hora Architects,
Old Church, Church Street, Portlaoise, Co. Laois
Tel. 057-8622566***

1.4.4 Employer's Site Staff

Principal : *Mr. John Halpin*

1.4.5 Statutory Undertakings

None.

1.5 DEFECTS LIABILITY PERIOD

The Contractor shall remain liable for any noted defects and latent defects which may arise from the Works for a period of 12 months from the date of Practical Completion. Contractual responsibilities in relation to the Defects Liability Period are detailed in the Conditions of Contract and in Part 2: General Responsibilities.

2 OVERVIEW OF MECHANICAL WORKS

2.1 GENERAL

Removals

- Removal of existing pumps
- Removal of existing CWS tank and associated pipework
- Removal of existing BMS
- Removal of existing steel plant room hopper and roof

Replacement of 3 No. Twin Head Heating Circuit Pumps

The works comprise of the full removal and replacement of four existing twin head heating circuit pumps serving the building's heating distribution system. Each existing pump assembly shall be carefully isolated, drained down, disconnected, and removed from site in accordance with environmental and waste disposal regulations.

New twin head pumps shall be supplied and installed, sized to match or improve upon the existing system duty (flow and head requirements), and selected for high energy efficiency and compatibility with the existing system.

Replacement of Main MCC BMS Panel and Plant Room Mechanical Wiring

This element includes the complete replacement of the existing MCC panel associated with the BMS, along with associated mechanical plant wiring within the plant room. All plant room mechanical wiring shall be upgraded/replaced, including cabling to pumps, valves, sensors, and associated plant. Cabling shall be installed in containment systems (tray, conduit, or trunking) to current standards.

Cold Water Storage Tanks, Tank Room Pipework, and Booster Pump

The works include the replacement and installation, of new cold water storage tanks, associated pipework within the tank room, and a booster pump set. The system shall be disinfected, flushed, and tested in accordance with relevant water hygiene standards prior to being brought into service. Commissioning shall ensure correct operation, pressure settings, and automatic sequencing.

Installation of Thermostatic Radiator Valves (TRVs) on South-Facing Classrooms

This scope involves the installation of Thermostatic Radiator Valves (TRVs) on radiators located within south-facing classrooms to improve thermal comfort and energy efficiency.

TRVs shall be installed and set to appropriate temperature ranges to account for solar gain in south-facing spaces, reducing overheating and unnecessary energy consumption.

Following installation, the system shall be refilled, vented, and balanced to ensure even heat distribution.

Replacement of Existing Steel Roof to Plant Room

The works comprise the complete replacement of the existing steel roof construction over the plant room, carried out strictly in accordance with the Architect's drawings and project specification.

The scope includes the careful dismantling and removal of the existing roof structure, including steel sheets, insulation, flashings, rainwater goods, and any redundant structural or secondary support elements. All materials removed from site shall be disposed of in compliance with current environmental and waste management regulations.

The new roof construction shall be supplied and installed to meet the performance and detailing requirements set out in the design documentation.

2.2 SCOPE OF CONTRACT WORKS

2.2.1 Mechanical Works

Mechanical works required to facilitate the works include:

Replacement of 3 No. Twin Head Heating Circuit Pumps

- New Twin Head Grundfos MAGNA3 D 50-150F Variable Speed Pumps
- New flanged connections, gaskets, and bolts
- Vibration isolation mounts where required
- Reinstatement of associated pipework and supports
- Electrical connections to the local power supply and control systems

Each pump set shall be commissioned, including balancing, flow verification, and rotation checks. Integration with the Building Management System (BMS) shall be ensured to allow automatic duty/standby operation, fault indication, and energy monitoring where applicable.

Replacement of Main MCC BMS Panel and Plant Room Mechanical Wiring

- Safe isolation and decommissioning of the existing MCC panel
- Removal and disposal of redundant panel components
- Design, supply, and installation of a new MCC panel

All plant room mechanical wiring shall be upgraded/replaced, including cabling to pumps, valves, sensors, and associated plant. Cabling shall be installed in containment systems (tray, conduit, or trunking) to current standards.

The new MCC panel shall provide enabling monitoring, control, alarms, and remote operation of all connected plant. Testing and commissioning shall include I/O checks, functional testing, and verification of control sequences.

Cold Water Storage Tanks, Tank Room Pipework, and Booster Pump

- Drain down and removal of existing tanks
- Supply and installation of new cold water storage tanks, complete with:
 - Float valves and level controls
 - Screened overflows and warning pipes
 - Access hatches
- Installation of new tank room pipework, including:
 - Supply and overflow pipework
 - Isolation valves, non-return valves, and drain valves
 - Pipe supports and identification labels

- Supply and installation of a booster pump set designed to maintain adequate pressure and flow to the building water system. This shall include:
 - Duty/standby pump configuration
 - Pressure vessels and controls
 - Integrated control panel

Installation of Thermostatic Radiator Valves (TRVs) on South-Facing Classrooms

The works include:

- Isolation and partial draining of the heating system as required

Removal of existing manual radiator valves

- Supply and installation of new TRVs, including:
 - Valve bodies and thermostatic heads
 - Lockshield valves where required for balancing

2.2.2 Builders Works

Builders works required to facilitate the works include:

3279-SMK-ZZ-LL-DR-M-5300 Builders Works

Architect Drawing Schedule

21-43/TD-0100 Existing Plans, Sections & Site Plan

21-43/TD-1000 Proposed Plans & Section

21-43/TD-6000 Proposed Detail Sheet 1 - Roof Details

The Contractor shall provide all labour, plant, materials, supervision and temporary works necessary to complete the builder's works indicated on the drawings, including but not limited to:

- Demolition and removal of existing structures (hoppers, steelwork, ladders, mesh coverings, fences, access hatch, etc.)
- Structural alterations including new reinforced concrete slab infill and RC band beam
- Formation of new flat roof structure and associated supports
- Installation of fencing, guardrails, gates, and cladding systems
- Drainage connections to existing surface water systems
- Making good, finishes, and all associated ancillary works

Existing Site & Structures

- The Contractor is deemed to have inspected the site and satisfied themselves as to all existing conditions, access constraints, levels, and interfaces with existing structures.
- Existing elements to remain (e.g., concrete plinths, boundary fence sections) shall be protected at all times.
- Allow for working within and around an existing plant room environment.

Demolition & Removal

The Contractor shall:

- Carefully demolish and remove:
 - Existing hopper structures and supports
 - Steel framing, channels, and attached elements
 - Existing metal sliding lid and rail system
 - Access hatch and ladder
 - Metal railings and mesh coverings
 - Existing timber fencing where indicated
- Allow for:
 - Disposal off-site to licensed facilities
 - Segregation of waste materials
 - Removal of up to **1 tonne of residual solid fuel** from hopper areas
- Ensure:
 - No damage to retained structures
 - Temporary propping where required
 -

Structural Works/Concrete Works

- Provide new reinforced concrete slab (250mm thick) to infill existing hatch opening:
 - Reinforcement: A393 mesh top and bottom
 - Bearing on existing walls
 - Include temporary propping and shuttering
 - Include waterproof tanking to slab
- Provide new reinforced concrete band beam (215 x 215mm) to top of wall as indicated.
- All concrete design and execution to comply with Engineer's specifications.

Fixings & Anchors

- All structural fixings to concrete to include:
 - Resin-anchored bolts (e.g., Fischer FIS system or equal approved)
 - Stainless steel anchors where specified
- Remove render locally where required to ensure direct fixing to structural concrete.

Roofing Works (Builder's Elements)

- Form structure to support new flat roof including:
 - Timber wall plates (100x100mm C16 timber)
 - Anchored at 750mm centres
 - Joists installed using timber-to-timber hangers
- Contractor to allow for:
 - Loadings as indicated (dead, live, and service loads)
 - Coordination with specialist roofing contractor

Metalwork & Barriers

- Supply and install galvanised mild steel components including:
 - SHS rails, posts, and frames (50mm and 80mm sections)
 - Guardrails and safety barriers
 - Freestanding collapsible guardrail system
- Fixings:
 - Posts fixed at approx. 1.0m centres
 - Anchored into RC band beam or existing structure

- Allow for:
 - Fabrication, galvanizing, delivery, and installation
 - Compliance with required loadings for guarding

Fencing, Cladding & Gates

- Install new fencing and gate systems comprising:
 - Galvanised steel frames
 - Western Red Cedar shadow gap cladding (19x105mm)
 - Wired mesh panels where indicated
- Include:
 - Lockable gate with handles
 - All mechanical fixings
 - Alignment with existing boundaries

Drainage

- Provide builder's work in connection with:
 - New downpipes
 - New rainwater gullies
 - Surface water connections to existing drainage system
 - New access junctions (AJs) as per engineer details
- Confirm invert levels and routing prior to installation.

Making Good

- Make good all disturbed surfaces including:
 - Ground finishes (tarmac to match existing)
 - Walls, edges, and openings
 - Interfaces between new and existing construction

Temporary Works & Protection

- Provide:
 - Temporary propping for structural alterations
 - Safe access and working platforms
 - Protection to adjacent structures and services
- Maintain:
 - Weather protection where required
 - Site safety in accordance with regulations

2.3 DESIGN CRITERIA:

The criteria listed below apply to all Sections included in the Contract unless specified otherwise:

Department of Education & Skills Technical Guidance Documents

SDG: 02-03: Post Primary School Design Guide

SDG 02-04: Primary & Post Primary School Specialist Accommodation for Pupils with Special Educational Needs

SDG 02-06: Sanitary Facilities

SDG 02-05-03: Acoustic Performance in New Primary & Post Primary Schools

- TGD003: Mechanical & Electrical Building Services Engineering Guidelines for Post Primary School Buildings
- TGD005: Information and Communication Technology (ICT) Infrastructure Guidelines for Post Primary School Buildings
- TGD020: General Design Guidelines for Schools - Primary & Post-Primary
- TGD031.1: Guidelines on Mains Water Distribution Systems in Post Primary Schools
- TGD033: School Building Projects and Compliance with Part L of the Building Regulations 2017

Design Note 202001 July 2020: Energy Conservation for Mechanical & Electrical Building Services

Statutory Requirements & Regulations

- European Energy Performance of Buildings Directive – Nearly Zero Energy Building (NZEB) Standards
- EU Directive 514/2024 – F Gas Regulations
- All Building Control Regulations 1997-2022, in particular Parts F, J, L & M
- Building Control (Amendment) Regulations 2014
- Construction Product Regulations 2013
- Electricity Regulation Act 1999
- ET101:2008 ETCI National Rules for Electrical Installations & Amendment A1:2011
- Safety, Health & Welfare at Work (General Application) 2007
- Department of Environment, Community & Local Government Fire Safety Codes of Practice
- Waste Management (Amendment) Act 2001
- Institute of Gas Engineers and Managers Utilisation Procedures (IGEM/UP1 Ed2)
- National Guidelines for the Control of Legionellosis in Ireland 2009
- EC European Compatibility Regulations 2007
- IS 265: Installation of Gas Service Pipes
- IS 266: Polyethylene (PE) pipes and fittings for Liquidfied Petroleum Gas
- IS 3216: Code of Practice for the Bulk Storage of Liquidfied Petroleum Gas
- IS 820: Non-Domestic Gas Installations
- Fire Officer Requirements
- Relevant (IS), (EN) & (BS) Standards

N.B. Harmonised European Standards (hENs) shall be applied where available. Where no hEN is applicable, order of preference is for appropriate Irish Standards and then British Standards.

2.4 BREXIT IMPLICATIONS FOR CE MARKING AND DEPLOYMENT OF PRODUCTS FOR CONTRACTS WITHIN THE EU MEMBER STATES INCLUDING REPUBLIC OF IRELAND

The UK left the EU on the 31st January 2020. The contractor shall be aware of the implications and non-compliance since this date for them or any of their sub specialists to install products which are CE marked under UK notified bodies. Post Brexit, UK notified bodies used for certification of conformity for 'CE' marking proposes have lost their status as EU Notified bodies and are/in the process of being removed from the EU Nando website. In such instances the manufacturer of the product now need to obtain alternatives for certification of conformity for 'CE' marking.

The contractor shall be aware that any product CE marked under a UK notified body post Brexit will no longer be accepted. Any products failing to meet this requirement shall be removed and replaced on the project with EU conforming products. All costs associated with removal and reinstatement shall be the responsibility of the contractor. No claims for costs shall be considered.

3 NOTES ON TENDERING

3.1 GENERAL

The Tenderers shall complete all attached schedules and shall undertake to fill in any additional schedules required. Failure to complete these schedules shall render the tender void.

It is unacceptable to add a note in cash column such as 'included' or similar wording.

The employer will not be obliged to accept the lowest or any tender.

On submission of a tender, the tenderer will be deemed to have visited and examined the site as no extras will be allowed due to lack of knowledge of site conditions.

The Contract is on a FIXED PRICE basis for labour and materials.

The Certificate of Substantial Completion for the works shall not be issued until the Engineer has received Maintenance Manuals, 'As Installed' Drawings and Completion and Inspection Certificates.

The tender shall remain open for acceptance for a period of 90 days from return date.

3.2 COMPULSORY DOCUMENTATION IN ACCORDANCE WITH PUBLIC WORKS CONTRACTS

In accordance with public works contracts it is compulsory that the contractor at the time of tendering is in the position to provide and meet the following listed criteria. Please be advised that if the contractor cannot, or does not provide all of the required evidence then their tender will be deemed to be invalid and will be excluded from consideration.

- **Evidence of compliance with Signed Suitability Assessment Declaration:**

- (i.) **Certified turnover**

An original letter (or colour photocopy of an original letter) from the firm's accountant (signed by that accountant) stating the Certified turnover for the last 3 years financial years (which must not be less than an average of 1.5 times the sum tendered for this project). If for any valid reason this evidence cannot be provided then alternative evidence considered appropriate by the Contracting Authority demonstrating the same level of turnover must be provided.

- (ii.) **Public Liability Insurance and Employer's Liability Insurance**

Originals or validated copies of the Public Liability Insurance policy (with a minimum level of cover of €6,500,000) and the Employer's Liability Insurance Policy (with a minimum level of cover of €13,000,000) in accordance with the conditions stated in the Instructions to Tenderers.

(iii.) Contracts Manager, Health & Safety Manager, Foreman, and PSCP

Evidence that each of the above personnel (who all may be the one person) have previous experience on 2 projects of a similar nature, size and complexity in the assigned role satisfactorily completed. The evidence must include contact details for the Contracting Authorities and consultants.

(iv.) Examples of previous work over the past 7 years

3 examples of works of a similar nature, size and complexity, each carried out and satisfactorily completed within the last 7 years including the start and finish dates for the projects, the name of the Foremen, the scope of work completed by you, and contact details (including phone numbers) for the Contracting Authorities and the Consultants in charge. This information may be checked with the Contracting Authorities and/or the Consultants in charge.

3 examples of works (which may be the same as the projects above) of a similar nature, size and complexity completed within the last 7 years in a satisfactory manner in compliance with the Safety, Health and Welfare at Work Construction Regulations 2006 - 2013, with details as above and the record of enforcement actions, legal proceedings accidents, fatalities or incidents for those projects and (where applicable) measures that have been put in place by the above named Contractor to address any deficiencies in H&S procedures.

Previous works of a similar nature must have been completed by the principal contractor tendering for this project to be deemed acceptable. Any works completed by a subcontractor on previous projects will not be considered as relevant experience.

(v.) An organisation chart showing the duty holders responsible for Health and Safety

This organisation must show how responsibility for Health and Safety is allocated (in a satisfactory manner) within the firm.

(vi.) Signed Health and Safety Declaration

Signed Health and Safety Declaration in the form at Appendix C1 to QW2 available at www.constructionprocurement.gov.ie

(viii) Tax Clearance Certificate/evidence of compliance with Tax Clearance Procedures.

(ix) Evidence of compliance with your legal obligations in regard to Sick Pay/Pensions.

(x) a copy of the contractor's Child Protection Policy.

3.3 SITE VISIT PRIOR TO TENDER SUBMISSION

Tenderers shall visit the site and carry out in-depth internal and external surveys in order to ascertain for themselves the full extent and nature of the existing building and to familiarise themselves with the general site conditions, to its accessibility and the supply of and conditions affecting labour and of executing the contract generally. It is only during such a visit that the contractor can fully ascertain the extent of mechanical services required, the congested nature of the proposed new mechanical services installation and the access limitations to ceiling voids, roof-spaces etc. All allowances shall be made accordingly at tender stage.

During the site visit, the contractor shall also identify and familiarise themselves with all proposed service routes. Any queries regarding service routes or other design queries shall be raised during the tender period.

Tenderers shall note that no claim in respect of lack of knowledge of the existing buildings, prevailing site conditions, builders work or existing services can be considered.

3.4 FIRESTOPPING

Refer to **Part 3: Standard Clauses** of the specification for details on fire-stopping of services.

3.5 WORKING DRAWINGS

The contractor shall be responsible for producing a full set of coordinated mechanical and electrical working drawings. These drawings shall be produced in AutoCAD and issued to the Design Engineer for comment.

3.6 M&E CO-ORDINATOR

The contractor shall employ a full-time M&E coordinator for the duration of the project.

3.7 SITE SET-UP

The mechanical contractor shall provide a site office and materials storage facilities for their own installations. The office shall be complete with telephone connection, a computer with Auto-Cad and email facilities together with broadband connection for receiving documentation/communication from the design team electronically.

All drawings shall be issued to the contractor by email or on disk in Auto-Cad 2015 format

4 REMOVALS (50)

4.1 GENERAL

The following information details the requirements for all mechanical removals works necessary for the completion of this Contract. Where shutdowns of existing services are required to facilitate the works, the Contractor shall agree these with the School in advance. All disposals shall be carried out in accordance with current legislation.

4.2 ASBESTOS REMOVAL

An asbestos survey was carried out in March 2026. The areas of works have been surveyed and shows the presence of asbestos rope seal on the steel hopper as indicated in the Asbestos Survey Report included in the Preliminary Health & Safety Plan.

The Contractor shall include for the following:

- Provision of a method statement for removal of ACMs.
- Notification to HSA of removal works OR provide written confirmation that works are non-notifiable.
- Removal and bagging of ACMs by OPW Approved Asbestos Removals Contractor (see list included within tender package).
- Confirmation to Consultant of details of removals company, transportation company and disposal site.
- Provision of disposal certification.
- Appointment of OPW-approved asbestos consultant to provide Final Clearance Certificate and Updated Asbestos Register.

The Contractor should continue to act with due diligence as to the presence of undetected asbestos

4.3 MECHANICAL REMOVALS

4.3.1 Removal of Existing LPHW Pumps

The Contractor shall allow for the disconnection, removal, and disposal of four (4 No.) existing twin-head Grundfos Low Pressure Hot Water (LPHW) circulation pumps, complete with associated valves, pipework, supports, and ancillary items, as outlined below.

Removal Requirements

The works shall include, but not be limited to, the following:

- Isolate the pumps from the LPHW system, including draining down of local pipework as necessary.
- Safely disconnect electrical supplies and controls back to the point of isolation.
- Remove pumps, motors, couplings (if applicable), base frames, pipe connections, local isolating valves, supports, and fixings.
- Cap off, blank, or make safe redundant pipework and electrical connections in a neat and permanent manner.

- Remove all redundant materials from site and dispose of them in accordance with current waste management and environmental regulations.

4.3.2 Removal of Existing BMS Panel

The Contractor shall allow for the safe disconnection, removal, and disposal of the existing Building Management System (BMS) control panel, and associated mechanical services wiring within the plant room, as described herein.

Removal Requirements

The works shall include, but not be limited to, the following:

- Liaise with the Client/Engineer to agree shutdown periods and confirm systems are no longer live prior to commencement.
- Isolate and safely disconnect all electrical supplies at their point of origin.
- De-energise, label, and make safe all power, control, and BMS circuits prior to removal.
- Remove the Main BMS panel, enclosures, backboards, containment, local isolators, interface devices, and all associated redundant mechanical services cabling within the plant room.
- Remove redundant cabling back to the nearest suitable termination or agreed isolation point.
- Blank off, cap, or terminate remaining cables, glands, and containment in a neat and permanent manner.
- Remove all redundant equipment, fixings, and materials from site and dispose of in accordance with current environmental and waste management legislation.

4.3.3 Removal of Existing Tank Room Services

The Contractor shall allow for the disconnection, removal, and disposal of the existing cold water storage tank (CWST), associated cold water pipework, and existing booster pump set, complete with all ancillary components, as described herein.

Removal Requirements

The works shall include, but not be limited to, the following:

- Liaise with the Client/Engineer to confirm shutdown arrangements and ensure no live services remain prior to commencement.
- Isolate the cold water supplies and fully drain down the cold water storage tank and associated pipework.
- Safely disconnect and isolate all electrical supplies serving the booster pump back to the point of isolation.
- Remove the cold water storage tank, including all supports, plinths, liners, insulation, covers, level switches, and ancillary fittings.

- Remove the booster pump, including pump units, motors, base frames, flexible connections, local isolators, and associated controls.
- Remove redundant cold water pipework, valves, and fittings back to the nearest suitable termination or agreed isolation point.
- Cap off, blank, or permanently isolate all redundant pipework and electrical connections in a neat and secure manner.
- Remove all redundant materials from site and dispose of in accordance with current environmental and waste management legislation.

4.4 BUILDERS REMOVALS

4.4.1 Removal of Steel Hopper

The Contractor shall allow for the disconnection, dismantling, removal, and disposal of the existing steel coal hopper, previously used for supplying solid fuel to the boiler plant, together with all associated supports and ancillary items.

Removal Requirements

The works shall include, but not be limited to, the following:

- Ensure the hopper is fully empty and free from residual coal, dust, or debris prior to removal.
- Implement appropriate dust suppression and containment measures during dismantling works.
- Isolate and remove any redundant mechanical fixings or connections associated with the hopper.
- Dismantle the steel hopper and associated steelwork in a safe and controlled manner, allowing for cutting or sectioning as required for removal.
- Remove associated supports, brackets, and fixings back to the base structure, unless otherwise instructed.
- Remove all dismantled materials from site and dispose of in accordance with current environmental and waste management legislation.

Making Good

- Make good all disturbed builders' work, including walls, floors, plinths, fixings, and penetrations, to match existing finishes.
- Reinstall fire stopping, structural protection, and surface coatings where affected by the removals.
- Leave the area clear of debris, sharp edges, and trip hazards.

Health, Safety, and Compliance

- All works shall be carried out in accordance with current Health & Safety legislation and site-specific risk assessments and method statements.
- Appropriate precautions shall be taken for manual handling, working at height, hot works, and dust exposure.
- All cutting and dismantling works shall be undertaken by competent personnel using suitable equipment.

4.4.2 Removal of Steel Hopper Lid (Existing Roof)

The Contractor shall allow for the dismantling, removal, and disposal of the existing steel hopper lid, currently acting as a roof element to the plant room, together with all associated fixings and interfaces, as described herein.

Removal Requirements

The works shall include, but not be limited to, the following:

- Confirm structural stability of the remaining structure prior to commencement of works.
- Provide temporary weather protection and/or temporary roof covering as necessary to maintain the building envelope during the removal works.
- Safely release and dismantle the steel hopper lid, including all fixings, brackets, sealants, flashings, and associated steelwork.
- Carefully remove the lid in sections as required to allow safe handling and lifting.
- Prevent ingress of water, dust, or debris into the plant room throughout the works.
- Remove all dismantled materials from site and dispose of in accordance with current environmental and waste management legislation.

Making Good and Weatherproofing

- Make good all disturbed edges, upstands, penetrations, and interfaces following removal.
- Provide a permanent roof construction as per drawings and specification.
- Reinstall insulation, fire stopping, vapour barriers, and weatherproof finishes to maintain the integrity of the plant room envelope.
- Ensure all works are left wind- and watertight on completion of each working shift, where reasonably practicable.

5 Health, Safety, and Compliance

- All works shall be carried out in accordance with current Health & Safety legislation, including regulations for working at height and lifting operations.
- Appropriate risk assessments, method statements, and permits (including hot works or lifting plans where applicable) shall be in place prior to commencement.
- Works shall be undertaken by competent personnel experienced in structural steel dismantling.

6 (51) HEATING CENTRE INSTALLATION

6.1 PUMPS

3 No. new pumps shall be installed on the circuits derived from the low loss header serving the school, LPHW circulation pump shall be installed in the Plant room as detailed on the drawings and in Part 3: Standard Specification and Part 4: Equipment Schedule. Pump shall be supplied with Differential Pressure Transducer Kits for sealed circuits and volt free contacts for connection to the BMS.

The pump shall be twin head high efficiency constant pressure variable speed pumping units, which shall utilise their own on board variable speed drives to minimise energy consumption associated with pumping water at part load capacities and shall be arranged for duty / standby operation.

Comply with manufacturer's recommendations regarding application and installation of pumps. For in-line pumps ensure that motor is positioned in accordance with manufacturer's requirements. Use anti-vibration mounting arrangements in all installations.

6.2 DOSING POT

The Contractor shall supply and install 1 no. chemical dosing pot as indicated on the design drawings and schematics which shall come complete with fill point and all necessary isolating valves.

6.3 MAGNETIC FILTRATION UNIT

Supply and install 1No. Magna Clean Magnetic Filtration Unit in the heating plant room as denoted on the schematics and as outlined in Part 4: Equipment Schedules.

6.4 CORROSION INHIBITOR

Prior to substantial completion a corrosion inhibitor shall be added (At a 5% system content ratio) to the system by a specialist sub-contractor. The mechanical contractor shall note all types of heat emitters, heating plant and heat exchangers associated with the systems. The type of inhibitor used should not adversely affect such equipment, in particular the heat exchanger within the boilers.

7 (53) PLUMBING INSTALLATION

7.1 WATER STORAGE TANKS

A new cold water storage tank is to be installed, the tank shall be pre-insulated, sectional, GRP type suitable for the provision of potable water to Format 30.

A new 18, 000 litre potable cold water storage tank shall be located in the dedicated water tank room at GF level.

Cold water storage tanks shall be installed to Format 30 and split in two equal halves to facilitate maintenance and shall be provided with a single piece drip tray underneath and have adequate access all round for future maintenance.

Refer to Part 4: Equipment schedules for technical performance specification on the water storage tanks.

7.2 COLD WATER BOOSTER SET

Cold water booster sets shall be supplied, installed, tested and commissioned under this contract. The booster sets shall be the twin pump model and shall be a packaged unit with all integral valves, drains, pressure vessels etc and shall be supplied with volt free contacts for connection to the BMS. The booster set shall provide boosted cold water to all sanitaryware throughout the school building with a separate boosted cold feed to the gas fired hot water heater which in turn shall provide boosted hot water to all sanitary fittings as required. Pressure reducing valves shall be provided as required to reduce the pumping pressure in the distribution system.

8 (56) SPACE HEATING

8.1 GENERAL

This scope involves the installation of Thermostatic Radiator Valves (TRVs) on radiators located within south-facing classrooms to improve thermal comfort and energy efficiency.

8.2 TRV's

The works include:

- Isolation and partial draining of the heating system as required
- Removal of existing manual radiator valves
- Supply and installation of new TRVs, including:
 - Valve bodies and thermostatic heads
 - Lockshield valves where required for balancing

TRVs shall be installed and set to appropriate temperature ranges to account for solar gain in south-facing spaces, reducing overheating and unnecessary energy consumption.

Following installation, the system shall be refilled, vented, and balanced to ensure even heat distribution. End-user guidance may be provided on the correct operation and adjustment of TRVs. Refer to drawing 3279-SMK-ZZ-LL-DR-M-5601 for rooms that require TRV's and sequence of works.

9 (65) BUILDING MANAGEMENT SYSTEM

9.1 GENERAL

A Building Energy Management Systems shall be supplied, installed, tested and commissioned as part of this contract in each main school building.

The BMS specialist will supply a new MCC01 BMS control panel, complete with Tridium Niagara N4 Jace 9000 controller with iSMA IO modules as required. 1 x 10.1" Touch Screen HMI installed on MCC door.

The new MCC will be a Form2 MCC approx. 1000h x 1600w x 260d.

New Outside Frost Stat, OAT temp sensor, 6 x Immersion Temperature Sensors, 6 x Replacement Valve Actuators.

A BMS network topology and IO schedule will be issued for review with Panel drawings issued for approval for MCC01, on receipt of PO.

Contractor to allow for:

INCLUSIONS

- Supply of new MCC01 BMS panel (c/w Jace & Isma controllers), inc 10.1" HMI Touch Screen.
- Jace9000 includes web client access from any PC on the BMS IP Network.
- Supply of new OAT Sensor & OAT Frost Stat.
- Supply of new Immersion Frost Stat.
- Supply of 6 Immersion Temp on Sensors for Boiler Flow & Return and VT Circuit flow Temperature
- Monitoring
- Supply and Refit of 6 new Zone Valve actuators in boiler house for Variable Temperature circuits.
- Supply of 5 no. Space Temperature Sensors for Internal Building Zone monitoring.
- Hardware design to include new MCC1 panel drawing, IO Schedule, Cable Schedule, and Network
- Topology.
- Software design, Graphics, etc.
- Commissioning & testing & Demonstration.
- O&M Package
- Connection to front end PC within school

9.2 DESCRIPTION OF WORKS

The BEMS systems shall be an open protocol computer based systems that monitors and initiates stop and start sequences for all the mechanical plant and equipment. The systems shall permit the end user to login to the system accessing plant time scheduling and operational status, together with temperature values and data logging. All alarms shall be available for review on the School's front end and all temperatures shall be logged and extracted graphically for review. All logging data shall be stored in a SQL database for external use.

The following information details the requirements for the controls installation works necessary for the completion of this Contract including the schools Heating Plantroom and field controls.

The BEMS systems must be able to be integrated and accessed/interrogated by the School's new front end. Upon completion of the works, graphics shall be provided on the schools front-end PC's indicating all new plant and setpoints.

The Contractor shall take special care when setting the controllers and actuators up to ensure that the actuator responds in a linear fashion to the output.

All BEMS mechanical field equipment including but not limited to control panel, control valves, sensors, meters etc shall be supplied & installed by the mechanical contractor but wired and terminated by the electrical contractor. Final terminations at the MCC Control Panel and field equipment to be carried out by the electrical contractor.

The contractor should note that whilst every effort has been made to pick up all control points required for the installations on the line drawings, these may not be exhaustive. To this end, the specialist contractor must allow for any additional controls required to ensure the controls functionality described within this specification is achievable. The mechanical contractor should ensure that the controls specialist has full information required, that is all parts of the specification and all drawings and is included within the contract team project meetings from an early stage.

The final controls and operation strategy shall be agreed with the Consulting Engineer / School on site but the contractor is to ensure that sufficient costs are included to cover minor alterations to functionality that can be achieved via re-programming.

All time and temperature settings shall be agreed with the Consulting Engineer during commissioning. The specialist sub-contractor shall make allowance for 2no. demonstrations and training the School in the use of the new controls installation. A period of not less than 3 days should be allowed for this purpose.

During demonstration stages at the end of the project the contractor shall be responsible for manually checking the space temperatures in the areas where BEMS temperature stats are installed when operational with separate calibrated hand held monitoring devices to confirm the accuracy of the BEMS sensors and should at this point control sensors be not recording accurate data they shall be replaced at the contractors cost.

The controls specialist shall allow for a full service and checking of the BEMS system at the end of the defects liability period and updating the Energy Monitoring traffic light system based on the schools usage over the first 12 months of usage.

9.3 BEMS CONTROL PANEL

A new wall-mounted Mechanical Control Panel complete with a BEMS outstation and GSM module shall be provided in the new Heating Plantroom of the main school.

The control panel shall be provided with a touchscreen interface for access to setpoints, sensor readings and alarms. The touchscreen must be installed at 1500mm AFFL and should be supplied for on-site installation to allow for varying panel mounting heights. The touchscreen shall indicate all functionality controlled by the BEMS panel.

The Motor Control Centre (MCC) panels shall be type Form 2b Classification, in accordance with IEC 61439 and IS 10101:2020 and shall be protected by a Miniature Circuit Breaker. Fuses are not acceptable. Panel labels and wording shall be agreed with the Engineer during the Technical Submittal process.

The MCC control panels shall be complete with Hand/Off/Auto selector switching for all items of plant with full functionality and indicator lamps, red for fault, green for healthy.

The BEMS control system shall relay all information back to the central monitoring system / front end and the electrical metering system.

The schools BEMS system shall have the facility to allow the School Principal / Building Manager to remotely access their system for the purpose of controlling and monitoring the system. A fault alert facility shall be provided within each BEMS which allows faults to be reported to designated persons via text message and email.

All alarms shall be available for review on the school front-end and all temperatures shall be logged and extracted graphically for review. All logging data must be stored in a database for external use.

An energy monitoring and targeting system shall be provided for the school. The BEMS systems shall be based on a simple traffic light system. The BEMS system shall provide an overview of the building energy usage for heating fuel, electricity, mains water. This information shall be available on the BEMS control panel, the Principal's PC on start-up, over the school's ICT network and remotely. Monitoring and alarm via a Global System Mobile Communication system (GSM) alert required personnel of any problem shall also be provided.

The new BEMS panel shall incorporate 30% additional spare capacity on the requirement detailed within this specification to allow for future expansion.

9.4 CONTROL PANEL COMPONENTS

All control panel MCB's and contactors must be either ABB, Siemens, Sprecher-Schuh or Square D. All other components within the control panel must be manufactured within the EU.

9.5 MECHANICAL WIRING

The electrical contractor shall install all power and controls wiring as indicated on the drawings and shall carryout all final terminations at field devices and at the BEMS panel.

The ASHP shall be provided with its own proprietary controller which shall maintain a primary LPHW heating flow temperature of 55°C. The BEMS shall monitor temperature in the flow & return pipework via immersion sensors.

If the water temperature in the LPHW buffer vessel is not achieving a design temperature of 55°C during the cooler months, then the BEMS shall enable the LPG boiler plant and heating circulating pumps to provide assistance in achieving the 55°C flow to the heating header. This will supply LPHW heating water from the boiler circuit to help satisfy the heating demand. When the BEMS sensor sees that the target temperature has been achieved, it shall stop the assistance heating circulating pump.

On ASHP shutdown, the heating circulating pumps shall continue to operate to dissipate heat in the system.

9.6 FROST PROTECTION

Two Stage Frost Protection shall be provided for the heating installation.

First Stage Frost Protection shall enable the LPHW heating circulating pumps when the internal space temperature drops to 5°C. Controls for second stage frost protection shall be hard-wired only – software control is not acceptable.

Second Stage Frost Protection shall enable the boiler plant when the temperature of the water in the LPHW return system drops to 2°C. The control valves will go to the fully open position to allow the circulation of hot water. Controls for second stage frost protection shall be hard-wired only – software control is not acceptable.

The BEMS shall log activation of frost protection to provide information on boiler operation during out of hour periods.

9.7 OPTIMISED START/STOP

The BEMS shall include an optimised self-learning start/stop facility based on internal and external temperatures so that it will automatically start and stop the system at optimum times to provide a heated building during occupied periods only. Each zone within the building shall have optimised start stop time schedules, the optimiser will be set to start with a maximum warm up period of 3 hours and a maximum cool down period of 2 hours.

9.8 HEAT DISSIPATION

At the end of each time programme when the boiler is turned off, all control valves shall be fully opened and pumps shall remain activated for a period of 20 minutes to allow residual heat to be dissipated from boilers.

9.9 PRESSURISATION UNIT

The BEMS panel shall provide a power supply to a pressurisation unit and monitor low and high pressure fault signals from the set complete with fault indicators on the front of the panel. Pressure switches shall be directly hardwired to the control panel and control within the panel shall be hard-wired only – software control is not acceptable. Fault signals shall shut down boiler and pumps. If pressurisation set has been electrically isolated, both fault lamps shall be activated. A panel pressure alarm lamp will be illuminated to indicate a pressure condition alarm.

9.10 HEATING CIRCUITS

Start/stop operation of the LPHW Pump sets is determined by the BEMS on the basis of the Time Schedule or as dictated by the Fabric Protection routine, in conjunction with the LPHW Boiler or as dictated by the Air Handling Unit time schedule.

The LPHW Pump sets shall operate on a Duty/Standby Auto-Rotation basis, on successive weeks of a fortnightly cycle.

For the first week of the cycle, Pumps P01 will be the Duty Unit and Pump P01A shall be the Standby Units for the duration of that week.

For the second week of the cycle, Pump P01A shall be the Duty Unit and Pump P01 shall be the Standby Unit for the duration of that week.

Automatic advance of this Rotation Cycle shall occur each Sunday at Midnight. This sequence may be manually advanced by one week at any time, via a software switch at the BEMS Supervisor. On start-up, the BEMS shall enable the Duty Pump.

On shutdown, the BEMS shall run-on the Duty Pump for a minimum of 15 minutes (adjustable), after the LPHW Boiler has been disabled, to dissipate heat in the system. Then the BMS shall disable the Duty Pump.

When the Duty Pump is enabled, the BEMS will continuously compare the condition of its Start/Stop Command and Run Status.

If a mismatch occurs, after a 30 second delay to prove the mismatch, an alarm will be raised to the BEMS Supervisor PC. The Duty Pump will be disabled and the Standby Pump will be enabled in its place.

If while the Standby Pump is enabled, a similar mismatch occurs, it will also be disabled and an alarm will be sent to the BEMS Supervisor PC.

The heating flow and return immersion temperature sensors will have their temperature values logged and will be available for graphical display for review of history readings.

Current switches within the MCC panel shall monitor each set of heating pumps for run/fault indication. In the event of no flow across the duty pump, an alarm will be generated to indicate Pump flow failure and the standby pump shall energise. A red fault lamp shall illuminate on the fascia of the BEMS panel.

9.10.1 Cold Water Booster Set

A duty / assist cold water booster set shall be powered, controlled and monitored via the BEMS. The pumps shall normally operate and in the event of a pump failure a RED lamp shall energise on the BEMS panel and alarm.

Float switches shall be provided in each section of the cold water storage tanks and if the stored water levels reach a pre-determined low level set point shall disable the pumps for protection to prevent running on dry.

9.10.2 Energy Monitoring and Targeting

An energy monitoring and targeting facility shall be incorporated within the BEMS. The system shall provide monitoring of the building energy usage for heating fuel, electricity, mains water. This information shall be available on the Boiler Room control panel, the Principal's front end PC on start-up, over the school's ICT network and remotely. Weekly usage figures shall be calculated and displayed. Values shall be compared against target figures provided by the Consulting Engineer and a traffic light system shall be utilised as follows:

- | | |
|--------|---|
| Green: | Usage figures fall within set parameters. No usage detected outside of school working hours. |
| Amber: | Usage figures rise to within 125% of set parameters or short-term usage (no. of hours to be agreed with Consulting Engineer) detected outside of school working hours. |
| Red: | Usage figures rise above 125% of set parameters or full-time usage detected outside of school hours as indicated by the activation status of the building security alarm. |

N.B. The BEMS shall include the facility to calculate 'degree days' in order to assess reasonable gas usage. It will also include a calendar facility to change set parameters according to month. A 'red' activation will trigger instant alerts via a GSM module to a designated mobile phone number.

9.10.3 Summer/Winter Switch

Each BEMS system shall be provided with a summer/winter switch, mounted on the fascia of the control panel. On summer setting, the switch will de-activate the heating circuits time control and retain DHW operation. The frost protection system shall still be active during the summer-selected periods.

9.10.4 Holiday Switch

Each BEMS system shall be provided with Holiday switch, mounted on the fascia of the control panel. The switch shall override the time control and turn off the heating & DHW. The frost protection system shall still be active during the holiday-selected periods.

Holiday switching and overtime switching (up to five hours) shall be provided on the heating centre control panel and the Principal's remote out of hour's switches for occasional out of hours use.

9.10.5 Local User Interface

A touchscreen display panel shall be provided on the fascia of the BMS panels which shall allow full access to setpoints and time schedules and allow the user to graph sensors as required.

Lamps, Hand/Off/Auto switches shall be provided on the fascia of the panel as described here before in this specification.

10 FLAT ROOF INSTALLATION

The Contractor shall allow for the construction, and completion of a new flat roof over the existing plant room, following the removal of the former steel hopper lid, to provide a fully weatherproof, durable, and compliant roof structure. See architectural drawing and specifications for further details.

General Description

The works shall comprise the formation of a new flat roof construction to fully enclose and protect the plant room, including all structural supports, decking, waterproofing layers, insulation, drainage, and finishes, complete with all necessary builders' work and interfaces.

Roof Construction

Unless noted otherwise, the flat roof shall include the following elements:

- Structural support framework or infill construction as required to span the existing opening and integrate with the existing structure.
- Roof deck as per drawings and specifications.
- Vapour control layer (VCL), insulation, and waterproofing membrane suitable for a flat roof application.
- Finished waterproof roof covering system as per drawings and specifications installed in accordance with the manufacturer's recommendations.
- Formation of roof falls to ensure effective drainage towards outlets or gutters as per drawings and specifications

Interfaces and Details

The works shall include:

- Upstands, flashings, edge trims, and terminations to all perimeters, penetrations, and abutments.
- Integration with existing walls, parapets, and structures to provide a continuous weather-tight envelope.
- Allowance for any plant penetrations, ducts, or cable routes, complete with proprietary weather-tight seals.
- Reinstatement of thermal, acoustic, and fire performance where affected.

Drainage

- Provide new or modified rainwater outlets, gutters, or downpipes as required to suit the new roof layout.
- Connect into existing rainwater systems where available, ensuring adequate capacity and compliance.