

Cork ETB

Heating Upgrade & Building Enabling Works
Electrical Specification



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1 Introduction

1.1 Introduction

This specification describes the mechanical works required for the biomass heating system upgrade forming part of the Cork ETB Biomass Pathfinder Programme under the SEAI/DEY Schools Energy Pathfinder Programme 2025/2026.

Fingleton White (FW) has been appointed as the design consultant. The contracting authority is Cork Education and Training Board (CETB) acting on behalf of the Department of Education and Youth.

The Specification shall be read in conjunction with the Works Requirements, the school-specific Equipment Schedule, the tender drawings, the Project Execution Plan and the Conditions of Contract. Where clauses in this Specification cross-reference other documents, those documents shall form an integral part of the Contractor's obligations.

1.2 Schools Covered by this Bundle

The schools currently identified within the Cork Biomass Bundle are listed below.

Table 1: Schools Covered by this Bundle

Ref	School	Roll Number	Eircode
BM3.1	Kinsale Community School	91499E	P17 R993
BM3.2	Carrigaline Community School	91388S	P43 XE06
BM3.3	St. Brogan's College	71020G	P72 X259
BM3.4	St. Colman's Community College	71050P	P25 W658
BM3.5	Davis College	70910L	P51 H589
BM3.6	Glanmire Community College	76064F	T45 W965

1.3 Abbreviations

The following abbreviations are used throughout this specification.

Table 2: Abbreviations

Abbreviation	Description
BMS	Building Management System
BS	British Standard
CETB	Cork Education and Training Board
DEY	Department of Education and Youth
ELV	Extra Low Voltage
EN	European Norm
ER	Employers Representative
FW	Fingleton White
HMI	Human Machine Interface
I/O	Input/Output
IP	Ingress Protection
IS	Irish Standard
ISO	International Organisation for Standardisation
LV	Low Voltage
SEAI	Sustainable Energy Authority of Ireland

1.4 Scope of Works

The works comprise the following:

- Supply and installation of LV cabling to the biomass container and new pumps / equipment installed within school boiler houses as part of this project
- Modification of existing school boiler house BMS panels to accommodate additional I/O where possible

- Supply and installation of replacement BMS panels where modification of existing boiler house control panels is not possible (existing power & control cables to old panel to be retained)
- Supply and installation of ELV cabling to new pumps / equipment installed as part of this project
- Supply and installation of cable management for new cables (excluding underground ducting – installed by others)
- Commissioning of electrical systems
- Commissioning of BMS systems
- Tamper proof tagging of metering equipment

1.5 Reference Documentation

The contractor shall execute the works in accordance with the following documents:

Table 3: Reference Material

Title	Document No.
Kinsale Community School	P&ID: 2314.01-DP-0001-R1
	Plantroom Layout Drawing: 2314.01-DG-0006-R1
	M&E Services Site Plan: 2314.01-DG-0010-R1
	BMS Drawing: 2314.01-DE-0001-R1
Carrigaline Community School	P&ID: 2314.03-DP-0001-R1
	Plantroom Layout Drawing: 2314.03-DG-0010-R1
	M&E Services Site Plan: 2314.03-DG-0009-R1
	BMS Drawing:

	2314.03-DE-0001-R1
St Brogan's College	P&IDs:
	2314.06-DP-0001-R1
	2314.06-DP-0002-R1
	2314.06-DP-0003-R1
	Plantroom Layout Drawings:
	2314.06-DG-0011-R0
	2314.06-DG-0012-R1
	2314.06-DG-0013-R0
	M&E Services Site Plan:
	2314.06-DG-0009-R1
St Colman's Community College	BMS Drawing:
	2314.06-DE-0001-R1
	P&IDs:
	2314.05-DP-0001-R1
	2314.05-DP-0002-R1
	2314.05-DP-0003-R1
	2314.05-DP-0004-R1
	Plantroom Layout Drawing:
	2314.05-DG-0007-R1
	2314.05-DG-0008-R0
Davis College	2314.05-DG-0010-R0
	2314.05-DG-0011-R0
	M&E Services Site Plan:
	2314.05-DG-0006-R1
	BMS Drawing:
	2314.05-DE-0001-R1
	P&IDs:
	2314.02-DP-0001-R2
	2314.02-DP-0002-R1
	Plantroom Layout Drawing:

	2314.02-DG-0010-R0
	2314.02-DG-0011-R1
	M&E Services Site Plan:
	2314.02-DG-0009-R1
	BMS Drawing:
	2314.02-DE-0001-R1
	P&IDs:
	2314.04-DP-0001-R1
	2314.04-DP-0002-R1
	Plantroom Layout Drawings:
	2314.04-DG-0006-R1
Glanmire Community College	2314.04-DG-0007-R0
	Pipe Route Drawing:
	2314.04-DG-0011-R1
	BMS Drawing:
	2314.04-DE-0001-R1
M&E Document Register	2314-TM-0000-R4
SSRH Heat Meter Tagging Guidance	Heat-Meter-Tagging-Guidance Version 1_Rev 2_April 2021
SSRH Heat Meter Commissioning Report	Heat-Meter-Commissioning-Report October 2021_Version 1

1.6 Standards and General Specifications

The equipment shall comply with relevant ISO, CENELEC, IS and BS standards. The equipment and system shall conform to the standards listed in Table 4.

Table 4: Applicable Standards

Item	Applicable Standard
Electrical Installation	IS 10101:2020 National Rules for Electrical Installations
Electrical Equipment	CENELEC
Electrical Equipment Conformity	CE Mark where applicable
Statutory Instrument	Safety Health and Welfare at Work (General Application) Regulations 2007
Statutory Instrument	European Communities (Machinery Regulations 2008
Emergency Lighting	IS 3217:2023
Fire Detection and Alarm Systems	IS 3218: 2024
Ingress Protection (IP Codes)	IS 60529 Degrees of Protection Provided by Enclosures (IP Code)

All works, materials and workmanship required under this Contract shall be in compliance with the requirements of the Works Requirements, these General Specifications and the Standards referred to therein.

Products and materials shall either be certified as complying with the latest relevant Irish Standard Specifications and shall bear the Irish Standard mark or shall be certified to a national standard of another member state of the European Union which provides an equivalent guarantee of safety and suitability.

Workmanship shall comply with the latest Irish or British Codes of Practice for the work involved. All work shall be carried out by suitable trained competent persons.

The contractor shall ensure they have the most current revision of the documents noted above.

The Contractor shall procure, supply and install all materials.

2 Decommissioning

A number of existing electrical installations are to be safely decommissioned and removed from site as part of the upgrade works. The removal of equipment must precede the installation of the new equipment due to space constraints. In these instances, the contractor shall ensure all preparatory work on new equipment is complete before decommissioning the existing equipment to minimise the effect of loss of use of the equipment. All equipment removed shall be brought to a licensed disposal facility and records of disposal are to be supplied to the Employers Representative (ER) for inclusion in handover documentation. The contractor must implement a waste management plan for the duration of the construction works.

Where required electrical equipment shall be disconnected and decommissioned by a suitably trained, qualified, and registered electrical contractor. Live electrical connections no longer in use or safe shall be isolated and all trailing cables shall be removed and made safe in accordance with I.S. 10101. All decommissioning works shall be planned or coordinated to minimise disruption of heating and hot water supply to the school.

3 Electrical Installation

3.1 General

Electrical installation and commissioning of new boilers, heating appliances, instrumentation, controllers, and BMS systems is required under the scope of this project. The contractor shall ensure that they are suitably experienced, competent, trained, qualified and registered to undertake the scope of electrical work.

The Contractor shall coordinate with the separately appointed Biomass Contractor and individual school authorities for site access and completion of all works.

Heating must be available to all schools by no later than 30 September 2027; Therefore, should the new heating system as part of the Works not be fully operational before this date, the Contractor shall provide all temporary equipment required to provide heating to the schools until the newly installed heating systems are commissioned.

The Contractor shall be responsible for mobilisation and demobilisation between works on site.

All electrical work undertaken must be in compliance with the National Rules for Electrical Installations I.S. 10101.

Every appliance requiring an electrical supply shall be connected via a double pole switched fused spur capable of interrupting the load current or a suitable socket as indicated by the manufacturer. Local isolators capable of interrupting the load current shall be installed for pumps or boilers installed as part of this scope of works. The spur / isolator shall be installed within 2 m of the appliance, at a height between 400 mm and 1200 mm above floor level, and where it can operate without danger.

Cables should be selected having the appropriate voltage and current-carrying capacities and shall have a cross sectional area not less than 1.5 mm².

Where 4-core cable is required, the phase shall be brown, the neutral blue, the earth green/yellow, the switched phase-conductor can be brown, black or grey. Sleeving of conductors is not permitted. Control cables carrying 12 V DC to 24 V DC should be shielded

and separated from power cables by at least 100 mm and should not cross directly over them.

3.2 Site Specific Requirements

The contractor shall allow for any builders / mechanical works required to facilitate the electrical installation including but not limited to, moving / removal of equipment, modification to existing cable containment, increasing size of opes, cores through external / internal walls and making good of same to the relevant standards as required by Building Regulations.

The contractor shall run cables to the biomass boiler cabin location. The biomass boiler contractor shall gland the cables into the biomass boiler cabin and terminate the cables. The contractor shall allow sufficient spare cable length to allow the biomass boiler contractor to run the cable to the termination point.

3.3 Equipotential Bonding

For central heating installations, metallic pipework shall be cross bonded to the metallic heating and water pipes with green/yellow insulated 10 mm² cable and shall be labelled in accordance with I.S. 10101.

Where it is found that there is no evidence of equipotential bonding or the existing bonding is less than 6 mm²; the heating system installation shall not be commissioned until the bonding is upgraded to meet the requirements of I.S. 10101.

3.4 BMS Systems and Enclosures

Requirements for new BMS control panels are outlined in sections 0 and 3.4.2 below.

3.4.1 Controller

Table 5: Controller Requirements

Parameter	Value
Controller	
I/O	As per design drawings. 20% future spare capacity required.
Expansion / Distributed I/O	An I/O bus interface is to be provided to provide further expansion capacity by addition of I/O modules.
Supply Voltage	Contractor to specify
Mounting	DIN rail mounted
Minimum IP Rating	IP20
Connectivity	To be compatible with existing BMS systems on site. If no existing systems are present then contractor may specify the communication protocol.
Inputs / Outputs	To be compatible with the equipment installed. 0-10V and 4-20mA are the allowable options.
Programming	The controller must be programmable with openly available software. The controller must be selected from a product range used primarily for the intelligent control of HVAC systems.
Operator Controls / Graphical Interface	
Read / write control setpoints	Yes
Touchscreen	Yes

Parameter	Value
Minimum HMI Size	5.7"
Storage	2GB
Mounting	Panel Mounted (Door)
IP Rating (Front)	IP65
Tests, Certification and Warranty	
Relevant Installation Standards	IS 10101:2020
	Building Regulation 2017 – Technical Guidance Document L
	IS EN ISO 16484-2:2004
EMC Conformance	EN 61362-1:2013
Safety	EN61010-1:2010
	CE Approved
Warranty	Minimum 2 years

3.4.2 Panel / Enclosure

New control panels supplied as part of these works shall be installed in school boiler houses with the characteristics described in

Table 6. All equipment shall be selected and / or designed to be compatible with the proposed installation location.

Table 6: Environmental Ranges

Item	Description
Type of Location	Dry Indoor
IP Rating Required	IP54
Hazardous Area Classification	Not Applicable (All electrical connections to be located in a safe area, > 0.5m from any potential gas leak source)
Ambient Temperature Range	+0 to +30°C
Relative Humidity Range	60% to 90% non-condensing

Mains power will be 400V +10%, -15%. 24V DC will be 21 to 27.5V DC. The minimum rated operating voltage shall be 85% of 24V.

Control panels and enclosures shall be supplied with 15% spare DIN rail capacity to allow for future modification or addition of equipment.

The supplied equipment shall be immune to electromagnetic interference and shall not emit excessive electromagnetic radiation in accordance with the applicable standards.

All components equipment shall bear the CE mark where applicable. The panel builder must provide a CE mark for completed control panels.

4 Control System / BMS

Each school in this tender pack has existing conventional boilers. Where these boilers are controlled via a BMS, the additional equipment to be installed in the boiler house for the biomass project should be integrated into the existing BMS panel.

Where the boilers are controlled by timers, zone controllers or other non-BMS control systems the panel should be replaced with a BMS control panel, allowing the biomass to be integrated into the school heating system.

Where there is an existing BMS system on site, additional BMS controllers supplied as part of this project for other boiler houses should be of the same type.

4.1 Metering and Verification

MID Directive 2014/32/EU compliant heat meters (accuracy class 2 or better) shall be installed at various measuring points on the heating system for each school.

Pulse output cables from each meter (heat, gas and electricity) shall be routed back to a location where a datalogger will be installed. Approx. 750mm of cable should be left coiled and ready for the datalogger installer (completed by others).

The pulse output cable for the biomass heat meter shall be run from the heat meter to the BMS panel in the room with the datalogger. A pulse splitter shall be installed in the BMS panel to provide one output for the BMS and one output for the datalogger. The output for the datalogger shall be run to the proposed datalogger installation location with approx. 750mm of cable left coiled and ready for the datalogger installation (by others).

A power cable shall be run from the local BMS panel to the proposed datalogger installation location with approx. 750mm of cable left coiled and ready for the datalogger installation (by others). The power cable shall be glanded into the BMS panel but left in the trunking, with termination to be completed by the datalogger installer. A label shall be affixed to the field end of the cable to confirm that the cable has not been terminated within the BMS panel.

Metering equipment shall be tagged in accordance with the SSRH Heat Meter Tagging Guidance to ensure that it is tamper proof.

All datalogger cables shall be labelled at both ends to identify the meter / datalogger that they are associated with.

4.2 Kinsale Community School

Table 7: Kinsale Community School Control Systems

Building	Control System	Action
Main School	Cylon controller	Integrate additional I/O and implement control philosophy
3-Storey Building	Cylon controller	Integrate additional I/O and implement control philosophy
PE Hall	Cylon controller	Integrate additional I/O and implement control philosophy

4.3 Carrigaline Community School

Table 8: Carrigaline Community School Control Systems

Building	Control System	Action
Main Building	TBC – being replaced as part of separate emergency works	Integrate additional I/O and implement control philosophy
PE Hall	TBC – being replaced as part of separate emergency works	Integrate additional I/O and implement control philosophy

4.4 St. Brogan's College

Table 9: St Brogan's College Control Systems

Building	Control System	Action
Original Building	Zone controller	Replace with new BMS panel
First Extension	Zone controller	Replace as single zone in Original Building BMS panel
New Building	Regin EXOclever	Integrate additional I/O and implement control philosophy
PE Hall & ADS Building	Timers	Replace with new BMS panel

4.5 St. Colman's Community College

Table 10: St. Colman's Community College Control Systems

Building	Control System	Action
Original Building	2 x Sauter Equitherm EQJW95 heating controllers	Replace with new BMS panel
First Extension	Satchwell boiler controller	Replace with new BMS panel
New Extension	ISMA-B-MIX38 Controller with TREND TONN-8 Network Node	Integrate additional I/O and implement control philosophy
PE Hall	ISMA-B-MIX38 Controller	Integrate additional I/O and implement control philosophy

4.6 Davis College

Table 11: Davis College Control Systems

Building	Control System	Action
Old Building	Siemens – Landis & Staefa RVP200	Replace with new BMS panel
New Building	Cylon controllers	Integrate additional I/O and implement control philosophy

4.7 Glanmire Community College

Table 12: Glanmire Community College Control Systems

Building	Control System	Action
Block B	Schneider M221 PLC	Integrate additional I/O and implement control philosophy
Block C	Cylon Controller	Integrate additional I/O and implement control philosophy

5 Commissioning & Handover

The contractor shall ensure that the automation / programming and commissioning of electrical and automated systems is carried out by a suitable competent person. The contractor shall verify the operation of each piece of equipment and signal in each heating system and confirm each control function in accordance with the control philosophy. These checks shall be recorded on commissioning sheets. A commissioning sheet with information and checks relevant to each piece of equipment is to be provided as part of the handover documentation. The contractor shall allow for the employer's presence during commissioning. Plant setpoints established during commissioning shall be recorded and documented as part of the handover documentation. The contractor shall provide operator training for HMIs and workstations.

Electrical checks and testing of equipment's electrical installation are to be carried out by a qualified, competent electrician during plant commissioning. These checks shall be recorded on the equipment commissioning sheets.

Meter pulse signals shall be tested and verified during commissioning to ensure that pulses generated by the meters are detectable at the proposed datalogger location without signal loss or degradation. Test results shall be recorded and submitted as part of the commissioning documentation.

The contractor shall complete the SSRH heat meter commissioning report for each heat meter.

5.1 Documentation

The handover documentation shall include, as a minimum: every testing and commissioning certificate, every electrical test certificate, every flue test certificate, the controls description and points list, the BMS graphics package, the as-installed drawings (AutoCAD DWG and PDF), the Operations and Maintenance Manuals, manufacturer data sheets, warranty certificates, the spares schedule and the Declarations of Performance for every construction product incorporated into the Works. Documentation shall be issued in two bound hard copies and indexed electronic copies.