VOLUME A – TENDER DOCUMENT

SPECIFICATION

FOR

MECHANICAL SERVICES INSTALLATION

AT

MIDLETON CBS PRIMARY SCHOOL, ROSARY PLACE, MIDLETON, CO. CORK (EWS 2NO. BOILER PLANT REPLACEMENT)

OUR REF: JG/MOS/E26.2879– Rev.0

	Approved By:	Date
Tender Issue:	John Geaney	02/11/2026

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SPECIFICATION AND FORM OF TENDER
FOR
THE MECHANICAL ENGINEERING SERVICES AT
MIDLETON CBS PRIMARY SCHOOL, ROSARY PLACE, MIDLETON, CO. CORK
(EWS 2NO. BOILER PLANT REPLACEMENT)

Date: 02/11/2026 **Revision No.:** 0

SECTION 1 INTRODUCTION

1.1 DEFINITIONS

EMPLOYER
Board of Management
Midleton CBS Primary School
Rosary Place
Midleton
Co. Cork

CONSULTING SERVICES ENGINEERS
Matt O'Mahony & Associates
8 Sidney Place
Wellington Road
Cork

ARCHITECT
Not Applicable

STRUCTURAL ENGINEER
Not Applicable

QUANTITY SURVEYOR
Not Applicable

1.2 INTRODUCTION

This project consists of the boiler replacement at Midleton CBS Primary School, Rosary Place, Midleton, Co. Cork including the removal of the entire plant from each boiler house, the provision of wall hung boilers and pipework, valves, pumps, headers, heat exchanger, insulation works and boiler house controls in both plant rooms. The works also extend to the installation of two port valves associated isolation valves and thermostat for 10No individual heated spaces. Mechanical Contractor to allow for all electrical and builder's attendances in their tender.

The contractor shall also allow for the testing and removal of asbestos as appropriate from the boiler plant rooms before decantation of plant begins.

The tender/ proposal will be accessed by MOMA under the MEAT (Most Economically Advantageous Tender) appraisal approach in making a recommendation to the BOM.

The contractor shall provide samples of all items of plant and equipment for the Engineer's approval prior to installation.
The Mechanical Contractor is fully responsible for coordinating the Mechanical and Electrical services throughout and fully coordinated drawings must be produced by the contractor of the boiler house layout, prior to works commencing on site.

It should also be noted that plant locations are imperative to leave space for a buffer vessel and all other equipment necessary to allow for a hybrid system of heating in the future with the incorporation of a biomass boiler plant and the provision of all necessary tapings/flanges/spigots to allow for a seamless integration of the hybrid system. The heating proposal must incorporate the installation of the new gas fired system while maintaining the present heating system in operation with all appropriate safety measures in place.

The contractor shall be, at the discretion of the Engineer, required to provide a fully and complete breakdown of all prices of equipment and services submitted regarding the entire services installation prior to the awarding of this contract.
The mechanical contractor shall note and allow for the consultant's design exclusions listed in the mechanical tender specifications.

The mechanical contractor shall note and allow for the consultant's design exclusions listed in the mechanical tender specifications.

In these specifications trade names and/or suppliers are sometimes used for the purpose of brevity and clarity of technical, aesthetic and functional intent. Such references are for the conveniences of the tenderer in clearly indicating the standard of technical, aesthetic and functional requirements sought by the specifier. The intention is not to favour one product over another or to eliminate other products/suppliers. Where the phrase "or equal to Engineers Approval" appears in the documentation, the following 5 no. paragraphs apply

Other materials/suppliers may be put forward for consideration as equivalent materials to those stated in the specification.

Approval for substitution of equivalent materials/suppliers will be given where the alternative material/supplier are demonstrably equal in full accord with the original specification.

Equivalence of an offered substitution will be judged on the basis of objective, clear and verifiable independent proof of similar compliance with equal standards to those specified.

Where appropriate verification is provided through a detailed technical dossier, drawings, data sheets and/or a test report from a recognised body, a material/product substitution will be permitted by the architect who is the client representative. Any increased costs arising whatsoever from such a substitution in terms of redesign, rescheduling, health and safety issues etc. shall be borne by the Contractor.

Alternative suppliers/installers will need to prove their ability to perform their sub-element part of the main contract through the submission of proof of their technical and/or professional capacity (education, experience, equipment etc.); including their ability to manage in an environmentally sound manner such as EMAS or other certified environmental management systems or details of such measures taken in previous contracts. The contracting authority, through its architect who is the client representative, will determine on a case by case basis, from a technical, aesthetic and functional perspective, what constitutes an equivalent standard/product. Verification will take place only after the award of contract, as part of the contract management regime. Sufficient time is to be allowed for the checking of the information provided for the purposes of verification of equivalent.

Triple E Register:

a) The European Union Energy Efficient Public Procurement Regulations or SI No 151 2011 and all subsequent versions published that come into force after publication of this document shall apply on this project.
b) These Regulations place obligations on the DoES and public bodies relating to the procurement of energy efficient products from a Triple E Register maintained by his Sustainable Energy Authority Ireland (SEAI) on building projects.
c) The aim of the register is to assist in the reduction of carbon footprints through investing in energy efficient equipment.
d) The contractor shall ensure that all products or equipment included in the mechanical services installation and installed are listed on the Sustainable Energy Authority Ireland's (SEAI) Triple E lists of energy efficient equipment or are compatible with the criteria of the Triple E evaluation scheme.

The contractor shall provide samples of all items of plant and equipment for the Engineer's approval prior to installation.

The Mechanical Contractor is fully responsible for coordinating the Mechanical Electrical and building services throughout and fully coordinated drawings must be produced by the mechanical contractor prior to his works commencing on site

The contractor shall be, at the discretion of the Engineer, required to provide a full and complete breakdown of all prices of equipment and services submitted with regard to the entire installation prior to the awarding of this contract.

The mechanical contractor shall note and allow for his design exclusions listed in the mechanical tender specifications.

1.3 WARRANTY

All components of the mechanical services installation must have individual current independent third party approval certificates. The installed systems and equipment shall come with individual manufacturers warranties in all cases. Each warranty shall guarantee compliance with the relevant standards and statutory bodies as set out. Where required, proof of installer's manufacturer training shall be provided and shall be less than 2 years old.

1.4 DESIGN EXCLUSIONS

The following is a list of Design Exclusions for which the Mechanical Contractor shall take full responsibility:

1. Fabrication drawings and the co-ordinated installation / working drawings and record drawings.
2. Drain and vent location and pipework gradients in accordance with BSRIA Application Guide 1/89 – 'Flushing & Cleaning of Water Systems'.
3. The locations of all drains (low points on system) and vents (high points in system) will be agreed with the Mechanical Contractor. All pipework must be installed as per the Mechanical Specification and to current guidelines. It is the responsibility of the Mechanical Contractor that all pipework is installed correctly.
4. Bracket and support detailed design and location (All types, loads and locations must be declared to the Contractor Administrator prior to installation for comment.
5. Compliance with the Construction, Design and Maintenance (CDM) Regulations.
6. Details of all equipment component design and selection.
7. Automatic controls detailed design to meet the full physical requirements of the specification.
8. Design of boiler flue support system as per the manufacturer's instructions.
9. Thermal expansion.
10. Valve, damper and access location.
11. System water capacities and chemical additives
12. Selection of all anti-vibration mountings as per the manufacturer's instructions.
13. Final exact location of control sensors, detectors and thermostats.
14. Selection of regulation devices to comply with CIBSE Technical Memorandum TM8.
15. Detailed design of earthing and bonding requirements

SECTION 2 GENERAL DESCRIPTON OF WORKS

PROPOSED SCOPE OF WORK

2.0 Services (Mainly Piped and Ducted)

2.1 Heating Centre (Element 51)

Please refer to enquiry drawing for full details of plant and equipment and no's required

MCA 65 (3 NO)
Gas condensing boiler for heating, with total premix gas burner modulating.

Brand :	**De Dietrich INNOVENS**
Model :	MCA INNOVENS PRO 65
Nominal output :	65 kW
Used gas :	Natural Gas
Gas pressure :	20 mbar
Gas flow :	19.6 m3/h
Flue gas pressure available :	200 Pa
Operating pressure :	4 bar
Water capacity :	17 litres
Max.operating temperature :	110 °C
Dimensions :	1045(L) x 600 (l) x 602 (p) mm
Gas inlet :	1 ''
Ø Flue gas nozzle :	150/150 mm
Ø Departure/return :	R 1 ¼"
Net weight :	147 kg

Description:

- Complies with requirements of European Directives
- Classification : B23, B23P, C13, C33, C53, C63, C83, C93
- Very high annual operating efficiency up to 110 % NCV, **** CE
- Compact monobloc heating body in aluminium/silicium
- Gas premix burner in stainless steel with a surface in woven metallic fibres, Modulating from 18 to 100 % output, fitted with a silencer on the air intake.
- Gas line with non-return valve

Boiler Control Panels:

- - Boiler 1 Control Panel: DIEMATIC Evolution iSystem control panel (Master) to control and regulate slave boilers.

- - Boiler 2, Control panel: Ini 2 control panel (Slave)

Boiler Hydraulic Cascade Kit

- Hydraulic Pipe kit, flow, return, gas & condensate, safety valves.

- BUS communication cables, common temperature sensor
- De Coupling cylinder
- Boiler injection pumps
- Hydraulic kit insulation

PHE

Alfa Laval Plate Heat Exchanger

TL6-BFM

TYPE TL6-BFM
REF. plates, ALLOY 304
OUTPUT 400kW.HP1 100KW HP2
Including Heat Insulation Jacket

Chemical Dosing Pot

DP15 15Ltr Dosing Pot

- Stainless Steel Shell
- Valve size 25mm BSP female for all dosing pots
- Welded to BS EN 287
- All dosing pots that are designed to PD 5500:2009 category 3 (C E marked) have the following Max. Working pressures: 10 bar
- Matt Stainless Steel finish

Pass air/dirt separator

On the return to the boiler you should install a 1Pass Air, Dirt & Microbubble Separator –

1PASS-100

This will remove the dirt and magnetite circulating in the system. Removing 100% of circulating magnetite and other metal particles and dirt particles down to 2-3 micron and less, protecting the boiler and other system components from the harmful and clogging effects of both circulating dirt and magnetite this can be easily demounted for heavy dirt and particle removal and should be installed before any equipment that needs protecting such as pumps.
The 1PASS has a removable top to clean the internal filter when the building is serviced.
The estimated pressure drop will be 1.03 kPa.

Air separator

On the flow out as close to the boiler, you should install a CleanVent Air (Microbubble) Separator –

CVA-100

To remove Air (Microbubbles). To de-aerate the system of air (microbubbles) and other dissolved gases, protecting the boiler and pipework from the harmful and corrosive effects of air and other gases. This should be

installed preferably at the highest temperature, before any equipment that needs protecting e.g. Pumps Etc. The estimated pressure drop will be 1.03 kPa.

Gas Detection

2 No. GS300M 3 Zone Detection Panel
4 No. SGM595 Natural Gas Sensor
2 No. Co100ar Carbon Monoxide Sensor
4 No. DFL10 electro-Thermal Fusible link
2 No. 300VMR Slam Shut Valve 3” (Size TBC)
2 No. KOB21 Emergency Stop Button
2 No. AF126 Audible flashing alarm

Plant Heat Exchanger Specification 2No

Model: TL6-BFM

		Hot side		Cold Side
Fluid:		Water		Water
Density:	kg/m³	976.8		979.4
Specific heat capacity:	kJ/(kg*K)	4.18		4.18
Thermal conductivity:	W/(m*K)	0.661		0.657
Viscosity inlet:	cP	0.3534		0.5031
Viscosity outlet:	cP	0.4653		0.3767
Mass flow rate:	kg/s	3.59		3.59
Inlet temperature:	°C	80.0		55.0
Outlet temperature:	°C	60.0		75.0
Pressure drop:	kPa	21.9		24.4
Heat exchanged:	kW		400/100	
LMTD:	K		5.0	
Heat transfer coefficient:	W/(m²*K)		6,920.4	
Heat transfer area:	m²		8.67	
Relative directions of fluids:			Countercurrent	
Connection positions and flow directions:		S1 -> S2		S4 <- S3
Connections: S1,S2,S3,S4		FLANGE EN 1092-1 DN50 PN16 Unlined		
Number of passes:		1	1	
Design pressure (MAWP):	bar	10.0		10.0
Test pressure:	bar	13.0		13.0
Design temperature max:	°C	80.0		75.0
Design temperature min (MDMT):	°C	0.0		0.0
Pressure vessel code:			PED	
PED Category:			Article 4.3	
Fluid danger group:		No danger		No danger
Has risky vapour pressure:		No		No
Extension capacity:				
Plate material/thickness:			ALLOY 304/0.40 mm	
Gasket material and attachment:		NBRB Clip-on		NBRB Clip-on
Approx. unit dimension (L x W x H)	mm		615 x 320 x 1,264	
Net weight, empty / operating:	kg		218 / 233	
Weight full of water:	kg		234	
Type of package:			PLYWOOD BOX OCEAN LYING	
Packed length x width x height:	mm		1,390 x 420 x 840	
Packed volume:	m³		0.490	
Packed weight:	kg		238	

Accessories added to configuration	**Quantity**
Accessories	
Equipment	
Feet FIXED	1
Insulation HEATING	1

Gas Governor SPECIFICATION

Ref: TS 001 Issue Date: 10.08.17	**Equipment:** Natural Gas Governor	**Supplier:** HEVAC Ltd.

GENERAL DESCRIPTION OF EQUIPMENT OFFERED FOR SPECIFICATION /APPROVAL:

- NATURAL GAS GOVONOR

Drawing: Dims. as per drawing below.	**Drawing Ref: N/A**

DOCUMENTATION ISSUED:

SPECIFICATION	**GECA Gas Governor**
TYPE	RG050FT
REF.	GECA 50mm Gas Governor with filter
Note	1 No. required on each boiler module spring setting to 20mbar working pressure
	Manufacturer to be Fabricated Products UK as supplied by Hevac Ltd., Muirfield Drive, Naas Rd., Dublin 12. Tel. 01 – 419 1919 .



TECHNICAL FEATURES	
Pmax	inlet max – 500 mbar
Setting outlet	10 – 300 mbar – Standard spring supplied 10 – 27 mbar – Other spring on request
Filtering	≤ 50µm – Viledon cartridge
Inlet- Outlet Connection	Thread gas 2" - ISO 228 DN50 - Sliding Aluminium flange PN10
Test point	Inlet / outlet on request – Test point 1/8" NPT
Working Temperature	- 20 °C – + 60 °C
Use	Not aggressive gases of three families – Natural Gas – LPG – Town Gas
Approval	UNI EN 88-1:2011

Materials:	
Complete Body	Die – Cast Aluminium Gd – AlSi12Cu - EN AB 46100
Diaphragms	NBR 60Sh – DvGW EN 549
Plastic components	White POM / Pa 66 + 25% Gf

Spring Range:	**Color**	**Range mbar**
	White	5 - 14 mbar
	Yellow	6 - 22 mbar
	Neutral	10 - 27 mbar
	Red	28 - 70 mbar
	Black	60 - 130 mbar
	Blue	120 - 300 mbar

Natural Gas & CO Detection SPECIFICATION

Ref: TS 001 Issue Date: 10.08.17	**Equipment:** Natural Gas & CO Detection SPECIFICATION **Supplier:** HEVAC L

GENERAL DESCRIPTION OF EQUIPMENT OFFERED FOR SPECIFICATION /APPROVAL:

- NATURAL GAS & CO DETECTION

Drawing: Dims. as per drawing below.	**Drawing Ref: N/A**

DOCUMENTATION ISSUED:

SPECIFICATION	**Duomo Natural Gas & CO Detection SPECIFICATION**
Model ref:	Duomo
Natural Gas Detector:	SGM595
Number of Natural Gas Detectors:	2
CO Detector:	CO100ar
Number of Natural CO Detectors:	1
Electro-Thermal Fusible link:	DFL10
Number of Electro-Thermal Fusible link:	2
Control Panel:	GS300M
Zones:	3
Emergency Stop Button:	KOB21
Audible Flashing Alarm:	AF126
electro-Thermal Fusible link:	DFL10
Power Open Slam Shut Solenoid Valve	VMR
Note	Manufacturer to be Duomo UK as supplied by Hevac Ltd., Muirfield Drive, Naas Rd., Dublin 12. Tel. 01 – 419 1919.

Boiler house

An Natural Gas and Carbon Monoxide Detection system shall be installed so as to shut off the gas supply in the event of:

- An Natural Gas leak
- A leakage of Carbon monoxide
- An over temperature situation
- Emergency stop being pressed

The main Controller shall be the Duomo GS300M. This will provide power to, and interpret the signal from the THREE sensors. 2 off SGM595 and 1 off CO100Ar; for Natural Gas and Carbon monoxide respectively.

The sensors shall have a protective rating of at least IP54. The sensors shall have the capability to log alarm events. The sensor must be mounted in accordance with the manufacturer's instructions.

The Carbon Monoxide sensor shall have a Time weighted average alarm functionality. This will automatically alarm sooner at higher concentrations but also if prolonged low levels of CO are recorded the sensor will trigger a main alarm.

Emergency stop push button(s) shall be located by the exit(s) from the Boiler House. Pressing this button will isolate the fuel supply to the appliances.

A Duomo DFL10 electro-Thermal Fusible link shall be mounted above each boiler and in the event of an over temperature situation (>72oC), within the Boiler house, close the main fuel supply valve.

The Audible flashing Alarm is to be positioned on the external wall to the Boiler House.

Note: All gas detection systems need periodic maintenance and function testing. The installer must contact the supplier of such equipment upon completion of the install and obtain further details.

Flue SPECIFICATION

Ref: TS 001 Issue Date: 10.08.17	**Equipment:** Flue	**Supplier:** HEVAC Ltd.

GENERAL DESCRIPTION OF EQUIPMENT OFFERED FOR SPECIFICATION /APPROVAL:

- FLUE

Drawing: Dims. as per drawing below.	**Drawing Ref: N/A**

DOCUMENTATION ISSUED:

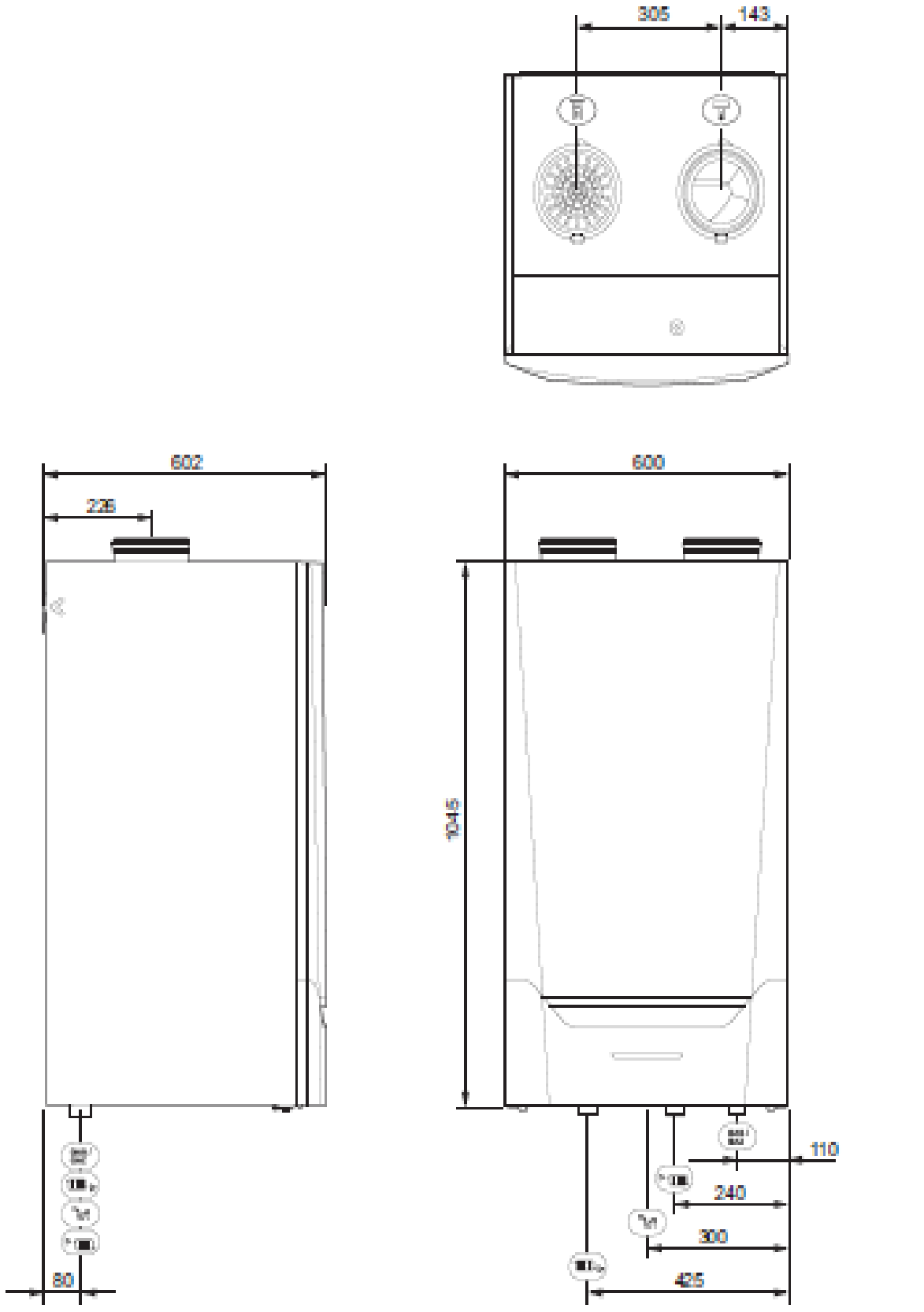
SPECIFICATION	**Jeremais 316 SS Twin Wall Insulated Flue**
Model ref:	Jeremias DW ECO 2.0
Type:	Ridged Twin Wall Insulated
Material Internal: **Material External:** **Insulation Type:** **Insulation Thickness (mm):** **Insulation density (kg/m3):** **Joining system:**	Stainless Steel AISI 316 Stainless Steel AISI 304 (1.4301) Homogenous high density rock wool 25 120 Open ended push-fit joining system, secured by locking band.
Note	Manufacturer to be Jeremias as supplied by Hevac Ltd., Muirfield Drive, Naas Rd., Dublin 12. Tel. 01 – 419 1919.
1.	Flue to be installed 350mm (400 o/d) from boiler rising vertical, terminating above building. Survey will be required prior to installing to confirm flue route and diameters.
2.	Flue to be installed in accordance with current regulations
3.	Flue to be certified to EN 1856-1/2.
4.	Flue to be suitable for use with all Gas.
5. .	Flue to have continuous insulation: No thermal bridge between inner and outer casing.
6.	Flue to have free expansion of inner flue liner
7.	4 hour fire rated to BS 476 part 20
8.	Flue lengths suitable for cutting

Boiler Specification

BOILER SPECIFICATION	
Equipment: BOILERS **Supplier:** HEVAC Ltd.	
GENERAL DESCRIPTION OF EQUIPMENT OFFERED FOR SPECIFICATION /APPROVAL: • BOILER SPECIFICATION	
Drawing: Dims. as per drawing below.	**Drawing Ref: N/A**

DOCUMENTATION ISSUED:	
SPECIFICATION	**DEDIETRICH FLOOR WALL HUNG GAS CONDENSING BOILER**
TYPE	INNOVENS PRO
REF.	MCA 65
NOMINAL OUTPUT @ 50/30°C	65kW
Full load central heating efficiency (Hi) (80/60°C) (92/42/EEC)	97.5 %
Full load central heating efficiency (Hi) (50°C/30°C) (EN15502)	103.6%
Low load central heating efficiency (Hi) (return temperature 60°C)	98.4 %
Part load central heating efficiency (92/42/EEC) (return temperature 30°C)	108.5 %
NOX annual emissions G20 (H-gas) (EN 15502: O2 = 0%)	39 Mg/kWh
NOMINALWATER FLOW RATE @ ΔT = 20K	1.82 l/s
MIN. NECESSARY WATER FLOW	0.4 m3/h
MIN. /MAX NOMINAL OUTPUT @ 50/30°C	34.6/161.5 kW
MIN. /MAX NOMINAL OUTPUT @ 80/60°C	31.5/152.9 kW
MIN. /MAX GAS FLOW – NAT. GAS	3.4-16.5 m3/hr
MIN. /MAX GAS FLOW – PROPANE	1.4 – 6.3 m3/hr
MIN / MAX FLUE GAS MASS FLOW RATE	57 / 277 kg/h
PRESSURE AVAILABLE AT BOILER OUTLET	200Pa
WATER CONTENT	17 L
NET WEIGHT	147kg
Triple E No. (ACA)	HWG68880
Note 1.	Boiler to be wall hung gas condensing
Note 2.	Useful efficiency at 30 % of rated heat output 97.8% GCV according to commission regulation (EU) n° 813/23013
Note 3.	Boiler to have monoblock heating body in aluminium/silicium
Note 4.	Boiler, gas premix burner in stainless steel with a surface in woven metallic fibres, modulating from 18 to 100% of output.
Note 5.	Boiler fan to be fitted with air intake silencer.
Note 6.	Boiler t obe supplied with MK2 or MK3 controller
Note 7.	Manufacturer to be DeDietrich as supplied by Hevac Ltd., Muirfield Drive, Naas Road, Dublin 12. Tel. 01-419 1919

Fig.1 Dimensions



Flue gas discharge connection; Ø 150 mm
Air supply connection; Ø 150 mm
Siphon connection
CH flow connection; 1¼ inch male thread
CH return connection; 1¼ inch male thread
Gas connection; 1 inch male thread

Dosing Pot SPECIFICATION

Ref: TS 001 Issue Date: 10.08.17	**Equipment:** Dosing Pot	**Supplier:** HEVAC Ltd.

GENERAL DESCRIPTION OF EQUIPMENT OFFERED FOR SPECIFICATION /APPROVAL:

- DOSING POT

Drawing: Dims. as per drawing below.	**Drawing Ref: N/A**

DOCUMENTATION ISSUED:

SPECIFICATION	**Fabricated Products DP Dosing Pot**
TYPE	SS DP 15
REF.	Chemical Dosing Pot – DP15
Volume	15L
Material	Stainless Steel
Location	Between flow and return
Weld Standard	BS EN 287
Design Standard	PD 5500:2009 category 3 (CE marked)
Test Pressure	21 bar
Max working pressure	10 bar
Valve size connection	25 mm
Note	Manufacturer to be Fabricated Products UK as supplied by Hevac Ltd., Muirfield Drive, Naas Rd., Dublin 12. Tel. 01 – 419 1919 .



Size in Litres	Product Code	A	B	C	D	Max working pressure	Tested to
15	DP 15	320	570	1022	220	10 bar	21 bar

Air Separator SPECIFICATION

Ref: TS 001 Issue Date: 10.08.17	**Equipment:** Air Separation	**Supplier:** HEVAC Ltd.

GENERAL DESCRIPTION OF EQUIPMENT OFFERED FOR SPECIFICATION /APPROVAL:

- AIR SEPERATOR

Drawing: Dims. as per drawing below.	**Drawing Ref: N/A**

DOCUMENTATION ISSUED:

SPECIFICATION	**Fabricated Products CVA AIR Separator (de-aerator)**
TYPE	SS CVA 100
REF.	Microbubble AIR Separator (de-aerator) – SS CAV 100
Material	Stainless Steel
Location	On flow pipe before PHE
Pressure drop (this project)	1.03 kPa
Test Pressure	21 bar
High capacity auto air vent	Included
Fast Bleed valve	Included
Drain point	Included
Note	Manufacturer to be Fabricated Products UK as supplied by Hevac Ltd., Muirfield Drive, Naas Rd., Dublin 12. Tel. 01 – 419 1919 .

On the flow out as close to the boiler, you should install a CleanVent Air (Microbubble) Separator - CVA-100

To remove Air (Microbubbles). To de-aerate the system of air (microbubbles) and other dissolved gases, protecting the boiler and pipework from the harmful and corrosive effects of air and other gases. This should be installed preferably at the highest temperature, before any equipment that needs protecting e.g. Pumps Etc.



	Dimensions (mm)						
Model No.	A	B	C	D	F	G	Tested to
CVA-100	100	490	154	220	446	600	21 Bar

Dirt Separator SPECIFICATION

Ref: TS 001 Issue Date: 10.08.17	**Equipment:** Dirt Separation	**Supplier:** HEVAC Ltd.

GENERAL DESCRIPTION OF EQUIPMENT OFFERED FOR SPECIFICATION /APPROVAL:

- DIRT SEPERATOR

Drawing: Dims. as per drawing below.	**Drawing Ref: N/A**

DOCUMENTATION ISSUED:

SPECIFICATION	**Fabricated Products 1 PASS Dirt Separator**
TYPE	1PASS 100
REF.	Dirt & Microbubble Separator - 1PASS-100
Material	Stainless Steel
Location	On return pipe before PHE
Dirt removal	≤ 2/3 Micron
Dirt removal in 1 Pass	99%
Flow	One directional
Pressure drop (this project)	1.03 kPa
Test Pressure	21 bar
Max Operation Temperature	110°C
High capacity auto air vent	Included
Fast Bleed valve	Included
Drain Valve	Included
Note	Manufacturer to be Fabricated Products UK as supplied by Hevac Ltd., Muirfield Drive, Naas Rd., Dublin 12. Tel. 01 – 419 1919 .

On the return to the boiler you should install a 1Pass Air, Dirt & Microbubble Separator - **1PASS-100**

This will remove the dirt and magnetite circulating in the system. Removing 100% of circulating magnetite and other metal particles and dirt particles down to 2-3 micron and less, protecting the boiler and other system components from the harmful and clogging effects of both circulating dirt and magnetite this can be easily demounted for heavy dirt and particle removal and should be installed before any equipment that needs protecting such as pumps.

The 1PASS has a removable top to clean the internal filter when the building is serviced.



Dimensions (mm)								
Model No.	A	B	C	D	E	F	G	Tested to
1 Pass-100	100	490	408	220	25	440	848	21 bar

2.1.2 Heating Controls

The heating system shall be controlled by the main control panel to be located in the boiler house and a remote heating panel to be located in the Office for occasional after hours use.

The control system shall consist of self learning optimum start / stop manual control, Flow temperature compensation based on internal, external temperatures, motorized valve zone control, internal and external temperature automatic cut out, holiday switch, time clock and with a two stage frost protection control which will have automatic optimum start override. The remote panel will consist of manual over-ride and run on timer.

2.2 Mechanical Site Services (Element 50)

2.2.1 Gas Supply

The site works shall include for the gas supply pipework from the proposed gas meter location to each plant room HP1 and HP2 to include all necessary valves.

All the builders work to be dealt with by the mechanical contractor.

SECTION 3 CONTRACTUAL INFORMATION

3.1 INSTRUCTION TO TENDERERS

Please acknowledge receipt of this enquiry by return of mail and confirm that you will be submitting your tender within the time stated.

If the tenderer is in doubt as to the meaning of part of this document he should ask, in writing, for an explanation form the Consulting Engineer **not later than three days after receipt of the tender documents**.

No claims will be permitted on the grounds of lack of knowledge or information.

Tenders must be returned strictly by the appointed time and date and extensions of that time will not be allowed.

The Contractor to take note that the tender submitted shall be a fixed price lump sum tender with a contract period extending 4 months.

The School Board of Management could also cater for working after hours of school from 3.30pm.

It is imperative that the contractor maintains the existing systems in working order until new systems are installed and commissioned.

The successful tenderer must hold the minimum Insurance cover as set out in the attached Appendices.

The contractor shall include for procuring that insurance cover required to be obtained and maintained by the contractor pursuant to Clause 21 of the main contract and shall provide indemnity in respect of any claim for bodily injury or property damage which the contractor may incur by reason of the performance of the functions and duties of the Project Supervisor for the Construction Stage of the project.

The tenderer shall submit with his tender a programme of works for the implementation of the electrical services taking into account associated suppliers etc.

Long delivery items should be highlighted and details of their effect on the programme should be detailed.

Persons engaged upon the works should be from the tenderer's core workforce. Where additional personnel are required and insofar as practicable and without affecting the efficiency of the work they should be recruited from the local offices of the FAS.

The Tender shall take note that it is a condition for the award of this

contract that the tender must comply with the Tax Clearance Procedures of the Department of Finance in respect of Public Sector Contracts.

The successful tenderer shall hold a current Tax Clearance Certificate and same shall be submitted to the Engineer for verification.

The contractor shall include for acting in the role of PSCS and for complying with the Safety Health & Welfare at Work Acts and Regulations current on the date of tender.

The contractor shall include for providing all necessary information as requested by the Project Supervisor for Design Stage to enable the preparation and completion of the Safety File excluding drawings and specifications which shall be provided by the appropriate member of the design team and relevant nominated sub-contractors. The contractor shall also act as Project Supervisor at Construction Stage for the project.

The contractor shall include for providing assistance to the appropriate member of the design team (and to relevant nominated sub-contractors) in preparing 'As Built' drawings for inclusion in the Safety File.

Information in relation to this tender may be made available on demand in accordance with Freedom of Information Act 1997. You are asked to consider if any of the information supplied by you in this (tender) should not be disclosed because of its sensitivity. If this is the case, you should, when providing the information, identify same and specify the reasons for its sensitivity. The Department of Education and Science will consult with you about sensitive information before making a decision on any Freedom of Information request received.

The Tenderer should take note that it is a condition for the award of this Contract that the tenderer is a member of the C.I.F. Pension/Sick Pay Scheme.

The lowest or any tender submitted will not necessarily be accepted by the Contracting Authority. No Contractor will be remunerated for any expense which he may has incurred in the making up of his tender.

Any unauthorized amendments or qualifications to the Form of Tender, Bill of Quantities or any other tender document such as specification changes, changes to the conditions of contract or qualifying slips attached to the Form of Tender or any other tender document must be withdrawn - failure to do so may result in the tender being disqualified.

Where qualifications have been attached to all or some of the tenders submitted and the tenderers have refused to withdraw their qualifications, the contracting authority, in order to secure the most economically advantageous price, reserves the right to deal with the

most acceptable offer submitted.

The tenderer shall include in his tender for the preparation of construction drawings for the entire works completed in the complex for verification by the Engineer. These drawings shall identify the routes of conduits, cable trays and equipment to serve the entire complex. The contractor shall also allow for the provision of samples of equipment / fittings specified for inspection by the Client / Engineer for the entire project.

The installation shall be surface mounted with no exposed cabling. The entire installation to be installed in steel conduit and trunking.

Claims for lack of knowledge will not be entertained. Arrangements to visit site can be made by contacting Ms. Niamh O'Leary (Principal) on (021) 4631419.

The latest time and date for return of Tenders is **on or before 12 noon on Tuesday, 24 November 2026.**

Tenders to be returned by email to info@mattomahony.ie.

3.2 GENERAL CONDITIONS AND CONTRACT PARTICULARS

3.2.1 Main Contract

The Form of Contract will be The Agreement and Conditions of Contract for Building Work (GDLA 82 for use when quantities do not form part of the Contract) carried out as a direct contract with the Department of Education & Skills.

N.B. - This is a fixed price lump sum contract.

Nature of Contract

The Contract will be a lump sum fixed price contract.

The successful tenderer will be the Main Contractor who shall complete the Form of Contract as described under ' Form of Contract'.

Main Contract, Parties and Consultants:

EMPLOYER	Board of Management Midleton CBS Primary School Rosary Place Midleton Co. Cork
CONSULTING SERVICES ENGINEERS	Matt O'Mahony & Associates 8 Sidney Place Wellington Road Cork
ARCHITECT	Not Applicable
STRUCTURAL ENGINEER	Not Applicable
QUANTITY SURVEYOR	Not Applicable
MAIN CONTRACTOR	Not Applicable

Appendix to Main Contract (As advised by Quantity Surveyor)

:

The appendix to the Conditions of the Main Contract is completed as follows:

Designated Date:	5 Days before tender receipt
Percentage for Professional Fees:	16.2%
Minimum Sum for Public Liability Insurance:	€6,350,000
Employer's Liability	Unlimited
Contract Period	4 weeks
Liquidated & Ascertained Damages:	€5,000.00 per week
Defects Liability Period:	12 Months
Period of Interim Certificates:	Calender Monthly
Time for issue of Interim Certificates by the Architects:	15 Working Days
Percentage of Certified Value Retained:	5%
Limit of Retention Fund:	5%
Period of Final Measurement:	6 Months
Period of Serving Notice of Arbitration:	21 Days

Any other details of the Contract, if required, may be obtained from the Engineers and the Contractor will be deemed to have made himself familiar with all aspects of the Contracts, which influence his tender.

3.2.2 General Attendance

Special Attendance:

Order of Work:

The Contractor shall execute the works in conformity with an order of work to be agreed with the Engineer.

Other Particulars:

The tenderer will be deemed to have satisfied himself concerning any other particulars which may effect his tender.

Endorsements:

The submission of a tender will be deemed to constitute an undertaking that any qualifications or conditions attached to the tender which conflict with this Specification, will be waived.

Acceptance:

The lowest or any tender will not necessarily be accepted. No tenderer will be remunerated for any expense incurred in making up his tender.

The tender, if appointed, will be required to complete the Standard Form of Contract as described under 'Form of Contract'.

Submission of a tender will be deemed to constitute acceptance of this condition.

Disclosing of Tender

Acceptance of tender documents by a tenderer will be held to imply a guarantee that the amount of his tender will not be disclosed by the tenderer to any person or body prior to the lodgement of the tender and that a wholly bona fide tender will be submitted in default of which the tender shall be deemed invalid.

Insurance Requirements:

Public Liability Insurance policies are to be maintained until the issue of the Final Certificate under this Contract.

Before the work commences on the site the Contractor will be required to produce a letter in clear terms from his insurance company or brokers to the effect that he is insured in accordance with the terms of this Contract. In the event of the Contractor's failure to satisfy the Engineer that he is so insured the Employer will immediately revocate any agreement verbal or written.

3.3 PREAMBLES

3.3.1 DEFINITION OF TERMS

The Contract shall include all as described in the following:

Introduction	Section 1
General Description of Works	Section 2
Contractual Information	Section 3
Scope of Work	Section 4.
General Specifications	Section 5
Schedule of Drawings	Section 6

and any drawings and schedules or documents that may be referred to within the Specification.

The "**Specification**" shall mean the documents or documents specifying or describing the materials to be supplied and fixed and the work to be executed for the required works.

"**Tests on completion"** shall mean such tests that are described by this Specification, to be made by the Contractor, before the plant is taken over by the Employer

"The Plant Works" or required works shall mean/include plant and materials to be supplied and fixed, and work to be carried out by the Contractor under the Contract.

"The Site" shall mean the actual place or places to which the Plant is to be delivered or where work is to be carried out by the Contractor, together with the area surrounding the said place or places as the Contractor, shall, with the consent of the Main Contractor, actually use in connection with the works otherwise than merely for the purpose of access to the said place or places.

***"*The Tender"** shall mean the Tender which shall have been submitted by the Contractor to the Main Contractor containing the offer of the Contractor to provide and execute the specified works.

The Employer	means	Board of Management Midleton CBS Primary School Rosary Place Midleton Co. Cork
The Structural Engineer	means	Not Applicable
The Architect	means	Not Applicable
The Quantity Surveyor	means	Not Applicable
The Services Engineer	means	Matt O'Mahony & Assoc 8, Sidney Place Wellington Road Cork
The Sub - Contractors	means	the person who having submitted a tender for Sub - Contract work shall have been selected by the Employer.
Sub - Contracts Works	mean	all plant to be provided and work to be done by the Sub – Contractor under the Sub - Contract.

3.3.2 OUTLINE

3.3.2.1 This Project consists of the new boiler house installation at Midleton CBS Primary School, Rosary Place, Midleton, Co. Cork.

The mechanical services installation shall consist of full boiler house installation to the school.

This design and specification to be carried out shall be in total accordance with all relevant standards, local authority requirements and acts of the Oireachtas.

The Employer, seeks tenders from competent Mechanical Contractors to carry out the complete procurement, delivery, supply, handling, erection, installation and commissioning of the Mechanical Services as hereunder described, or as may be seen or inferred from the enclosed drawings and documents. The Contractor shall carry out the works as generally described in this Specification and in strict accordance with the clauses included in the Particular Specification of this Specification.

3.3.2.2 The expression 'work' includes putting all items of the mechanical installation into satisfactory running condition at the above site, making the tests and fulfilling the requirements and guarantees, all in accordance with the provisions contained within this Specification.

With regard to tendering, tenderers are obliged to note carefully the following sections which will become conditions of the Contract.

3.3.2.3 The Sub-Contractor shall here and after be called the Contractor.

3.3.2.4 The Contractor shall be required to ensure proper co-ordination between himself and other trades on site. It shall be the responsibility of the Contractor to ensure that adequate co-ordination takes place, to the extent that adjustments to uncoordinated services which are installed will have to be carried out at the Contractors expense.

If required the Contractor will be required to submit to the Engineer detailed co-ordinated drawings in heavily serviced areas where clashes are likely to occur between the mechanical Contractor and other trades. It is required that proper and thorough co-ordination is agreed between all trades prior to installation work. Submission of a

tender for this Contract will be taken as a statement by the tenderer that he has the capacity and intention to carry out the installation with respect to the foregoing. To this end tenderers are requested to point out to the Engineer any areas where they have difficulty in this regard.

3.3.2.5 Tenderers are requested to submit to the Engineer on the required date a full and completely filled Form of Tender. Tender submissions which are incomplete will be considered null and void. It is also required that tenders be submitted in the form of a fully bound document as issued by the Engineer. In regard to the interpretation of a completely filled in Form of Tender, this shall be taken to mean a sum of money against each item in the Form of Tender. Late tenders will not be accepted. The tenderers shall refer to the Engineer with regard to any queries which arise out of any item of these tender documents during the tendering period.

3.3.2.6 It is required that all tenders are submitted on the basis of precisely those items that are detailed within the specification. Where a Contractor feels that it shall be of benefit to the installation in general or the Client, he may submit for a specification substitution for which a particular procedure is required as detailed below. The Contractor shall be entitled to make such a substitution as an addendum to the Form of Tender during the tendering period provided the procedure is followed, or alternatively the Contractor may follow the required procedure, submit a substitution at any point during the Contract provided such substitution shall not cause delay or nuisance to either the Client or the Contract. The substitution procedure is as follows. Submission for substitution can only be made to the Engineer in writing. Such substitution shall include all of the following data.

The Engineer will reserve the right to ignore incomplete submissions for substitutions.

a) A quotation from the supplier of the item to be substituted. This quotation should bear a date which falls within the tendering period.

b) A quotation for the substitute specification item.

c) Details of the substitute specification item which shall include dimensional data, model number, supplier, manufacturer and details of all electrical data pertaining to that item.

d) If the substitute item is dimensionally different from the item to be substituted, the Contractor shall show a working drawing to a suitable scale detailing how the substitute item can be accommodated within the existing design.

e) The Contractor shall state the reason for the substitution.

f) The Contractor shall submit also a written confirmation from the supplier stating that the proposed substitute can be delivered within a time frame which does not conflict with the contract programme.

3.3.2.7 The Mechanical Contractor shall on appointment, supply to the Engineer the names of the proposed Site Foreman and one other senior representative from his company who shall act in the role of Contracts Manager. The Site Foreman should be a senior time served tradesman who has the ability to take responsibility for general liaison on site for organisation for the Contractor employees, liaison with all other trades on site and the Main Contractor, organisation of specialist Sub Contractors to the Contractor and attendance at all site meetings. The person nominated to fulfil the role of Contracts Manager is required to be a very experienced individual capable of dealing with control of the overall site, nomination of specialist Sub Contractors, agreement of accounts variations etc. and attendance at site meetings.

It will be required that such person be available for attendance at site meetings in addition to co-ordinating with other trades on site and shall also have the ability and authority to make fundamental decisions on behalf of the company he represents. It is required that the Contracts Manager shall be accessible to the Engineer and other members of the design team and the Main Contractor in a manner which is appropriate to the needs of the Contract.

3.3.2.8 The Contractor shall be required to submit for approval to the Engineer any working drawings which may be required to the Engineers satisfaction prior to commencement of works on site. Areas requiring this treatment shall be agreed between the Contractor and the Engineer.

3.3.2.9 Tenderers should note that this contract will be let strictly on the basis of a fixed price lump sum which shall be held until contract completion. In the interpretation of the

above, it shall be taken to mean increased costs due to labour and prices of materials will not be negotiable after appointment. The Contractor will be required to make due allowance for these items within his tender submission.

3.3.3 Form of Contract and Contract Conditions

3.3.3.1 The contract shall be carried out as a sub-contract to the Main Contractor in accordance with the Conditions of contract contained in the sub-contract form.

3.3.3.2 Builders Discount is not applicable.

3.3.3.3 The Conditions of contract for the Main contract shall be the GDLA 82 for use when quantities do not form part of the Contract carried out as a direct contract with the Department of Education & Skills.

3.3.4 SCOPE OF WORK GENERALLY

3.3.4.1 The work to be carried out under this contract consists of the supply, installation, testing and commissioning, ready for use of the complete mechanical installation including accessories, fittings and apparatus together with all sundry materials and items of equipment whether specifically mentioned or not as may be required for the safe and satisfactory operation as more particularly described hereinafter and as shown in the drawings.

3.3.5 FORM OF TENDER

3.3.5.1 Tenders are to be submitted by completing the Standard Form of Tender for Nominated Sub-Contractors and the form of Agreement between the Employer and the Sub-Contractor and are to be governed by the Conditions of Tender as set out in the Forms. In addition, the following conditions shall apply :-

(i) The Contractor is required to price the items within this Specification wherever possible and to produce and return with his tender a Bill of Quantities or a Quantified Schedule of items monied out all to total the amount tendered.

(ii) The Employer may not examine any tender which does not comply in every respect with these Conditions or for which the Tender Documents have not been duly signed and in all respect completed.

(iii) All taxes other than VAT in respect of any articles or labour required in execution of the Sub-Contract works are to be included in the Tender Price but the Tender is to be exclusive of Value Added Tax.

(iv) The Tenderer will be deemed to have full knowledge of the Specification and drawings supplied to him and to have fully acquainted himself with all requirements and to have obtained clarification on any detail or matter which may be obscure to him.

(v) Should there be any detail or matter which the Tenderer may deem to be obscure he is to submit in writing for an explanation from the Consulting Engineer **not later than three days after receipt of the tender documents**.

(vi) The Tenderer will be deemed to have visited the site and to have taken into consideration all local and existing conditions and prevailing Trade and National agreements relating to employment of labour and the rates and prices included in the Tender are to be exclusive of all establishment charges and profit, fares and out of town allowances, travelling time and any other charges arising out of possible lack of accommodation in the immediate vicinity of the site. The Employer will not subsequently entertain any claim by the Contractor arising as a result of building location condition or nature.

(vii) The Tender Price is to be based on the Sub - Contract works being carried out at rates of pay during working hours and under conditions of labour not less favourable than those established for the trade or industry in the district where the Works are to be carried out. If the Contractor finds it necessary to employ his workmen for more hours per week than the standard number of hours per week at the basic rate of pay, in order to recruit them then the cost of the non-productive time involved will be deemed to be included in the Tender Price

3.3.6 WORKING DRAWINGS AND SETTING OUT DRAWINGS

3.3.6.1 The contractor shall be responsible for the setting out of Plant services and for the dimensional accuracy of the work and shall check all dimensions on site and where

necessary inspecting the drawings and work of other trades.

3.3.6.2 Where installation are to be carried out in congested area the contractor shall be responsible for determining the final positions in relation to other services.

3.3.6.3 The drawings accompanying this Specification indicate generally the arrangement of the installation and are for assistance in tendering. The position of points, outlets, apparatus, may be altered during the course of the Contract and the Contractor shall allow for minor deviations from the preliminary drawings. The Contractor shall submit to the Engineers, detailed drawings of the project. Such drawings shall be submitted two weeks from the date of the Engineers request and the Engineers will not be responsible for work carried out before they have commented on the drawings.

3.3.6.4 When the installation is complete the Contractor shall supply three sets of record / as built drawings showing the layout of the installation. The drawings shall be digital format type and shall be handed to the Consulting Engineers for approval before final printing.

3.3.7 HEALTH & SAFETY ON SITE

3.3.7.1 The Contractor shall ensure that all work carried out by his operatives or on his behalf complies with the requirements of the Health & Safety at Work Act. The Contractor shall display in his site office a copy of his Safety Statement.

3.3.8 SCHEDULE OF PRICES/BILL OF QUANTITIES

3.3.8.1 The successful Contractor shall provide the Engineer with a priced Bill of Quantities prior to the signing of the Subcontract documents. The bill shall list separately the material and labour costs with the number of man-hours included for in the tender.

3.3.8.2 The complete Bill of Quantities shall be furnished by the successful tenderer within one week of acceptance of his tender.

3.3.8.3 (The number of items and quantities shall be given and extended to form a Bill of Quantities adding up to the total as indicated in the Form of Tender.) The Schedule and Bill shall remain with the Engineer until the works are completed.

3.3.8.4 In the event variations arising and their substance involves items the majority of which are included in such bills the value of the variation shall be determined by the application of these rates to the quantities involved.

3.3.8.5 Suggested rates for any items not included in the bills shall be submitted to the Engineer for agreement when presenting the variation.

3.3.9 VARIATIONS

3.3.9.1 Any work which is not inferred by this specification or shown on the drawings and is deemed necessary for the satisfactory completion of the Contract shall be termed Variations.

3.3.9.2 No variations are to be carried out to the Contract which will cause the Contract to be exceeded without prior and specific approval.

3.3.9.3 The layout and detailed arrangements shown on the contract drawings and specification herein represent the requirements of the works so far as can be present be foreseen but may be modified by the Engineer from time to time during the currency of the Contract as necessary either by alteration, addition or omission without prejudice to the contract obligations of the Contractor. All such modifications shall be known as Variations.

3.3.9.4 These variations will not be entertained by either the Engineer or the Client unless they are substantiated by written instructions from the Engineer. Variation submissions made to the Engineer on the basis of verbal instructions only which are not substantiated by written confirmations will not be entertained.

3.3.9.5 It therefore shall be the responsibility of the Contractor to ensure that such written instructions and confirmation of variations are maintained.

3.3.9.6 Instructions will not be issued by the Engineer unless a written cost has been submitted by the Contractor in respect of the item for the Engineers approval.

3.3.9.7 It is the responsibility of the Contractor to submit costs for any such variations to the Engineer for approval in a timely manner, such as will not obstruct the progress of the installation.

3.3.9.8 Claims for delay or disruption arising out of untimely written confirmation in regard to variations, excluding

variations covering additional works or new items will not be entertained. Variations shall not violate the Contract.

3.3.9.9 These variations and their value whether in the form of alterations conditions or omissions determined by either one of the following methods as directed by the Engineer.

(a) By Measurement

(i) The successful Tenderer will be equipped to submit to the Engineer a complete schedule of the quantities and prices of all sections of the Contract as set out there under. Where the variation involves items the majority of which are included in such bills the value of the variation shall be determined by the application of these rates to the quantities involved. Suggested rates for any items not included in the bills shall be submitted to the Engineer for agreement when presenting the variation.

(ii) The quantities involved in such variation shall be measured and agreed with the engineer on completion of the variation.

(b) By Quotation

(i) Where the variation involves such items all or the majority of which are not included in the Schedules of Rates and/or the work involved is not a matter of urgency the Contractor shall submit for the consideration of the Engineer a quotation or quotations thereof.

(ii) Commencement of work involved shall be deferred until the Contractor is in receipt of the Engineer's written acceptance of the Quotation and instructions to proceed.

c) By Daywork

(i) Where in the opinion of the Engineer extra work cannot be measured and valued the Contractor shall be allowed Daywork at the rates to be detailed in the Schedules at the rear of the Form of Tender.

(ii) No daywork shall commence without written

authority from the Engineer.

(iii) Fully priced and extended daywork sheets must be submitted for signature by the Engineer's representatives no later than the end of the week during which the work was done and must be priced and submitted to the Engineer within a period of 30 days.

(iv) With the exception of minor deviations which in consultation with the Engineer on site it may be considered expedient to adopt to further the progress of the Works no variation shall be undertaken without the written instructions of the Engineer will be admitted.

(v) No variation shall vitiate the Contract and no allowance will be made for loss of profit on omitted work.

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3.3.10 MASTER PROGRAMME

3.3.10.1 The contractor shall be required to submit a Programme of Work and keep up to date a Progress Chart during the course of the contract. The Contractor shall be required to maintain liaison with the Engineers throughout the duration of the Contract. The Contractor must complete the work as specified within the time allowed for in his Programme.

3.3.10.2 The Contractor will be expected to attend regular meetings as required by the Engineer to ensure proper co-ordination, sequencing and attendance's for their work.

3.3.10.3 The Contractor will be required to provide the following:

(a) Management Chart for the Project

(b) A Plant and Labour Histogram

(c) Delivery dates of materials and latest ordering dates

3.3.11 ARBITRATION

3.3.11.1 Provided always that in case any dispute or difference shall arise between the Engineer on be half of the

Employer, the Contractor and the Main Contractor, either during the progress of the works or after determination, abandonment, or breach of the Contract as to the construction of the contract or to any matter or thing arising thereunder (except as to the matters left to the sole discretion or the Engineer, and to the Architect) then either party shall forthwith give to the other notice of such dispute or difference, and such dispute or difference shall be and is hereby referred to the arbitration and final decision of a person agreed between the parties or in the event of disagreement, to be nominated at the request of either party by the President, for the time being, of the Institution of Engineers of Ireland, and the award of such Arbitrator shall be final and binding on the parties. Such reference, except on the question of the certificate, shall not be opened until after the completion or alleged completion of the work, on behalf of the Employer unless with the written consent of the Employer or Engineer and the Contractor and the Client.

3.3.11.2 This submission shall be deemed to be submitted to arbitration within the meaning of the Arbitration Act 1954 or any subsequent Act of the Oireachtas, and both this submission and any award to be made thereunder may be made a Rule or Order of the High Court of Justice of Ireland.

3.3.11.3 Upon every or any such reference the costs incidental to the reference and award respectively shall be at the discretion of the Arbitrator, who may determine the amount thereof, or direct the same to be taxed as between solicitor and client or as between party and party, and shall direct by whom and to whom in what manner the same shall be borne and paid.

3.3.12 GUARANTEE PERIOD

3.3.12.1 All items of plant, equipment, apparatus or materials supplied under this Contract, whether of the Contractor's own make or supplied by a Contractor, shall be guaranteed against faulty workmanship or materials for a period of twelve (12) months from the date of the Engineer's certificate of virtual completion.

3.3.12.2 If any equipment or part thereof shows signs of weakness owing to faulty design, materials or workmanship, or to neglect on the part of the Contractor, or which, in the opinion of the Engineer is unsatisfactory, the Contractor shall, at his own expense, repair or remove such equipment or articles and substitute others for them if the

Engineer thinks fit, and the Contractor shall bear all the costs thereof.

3.3.12.3 The cost of making good any defects which may arise from fair wear and tear or from want of proper care or management by the Employer in the running of the plant shall be excluded from this guarantee.

3.3.12.4 The Engineer's decision as to what is fair wear and tear shall be final.

3.3.13 IMPROPER WORKS AND MATERIALS

3.3.13.1 The Engineer shall have the power to order during progress of the works :-

a) Removal from site of any materials which in his opinion are not in accordance with the Contract.

b) Substitution of proper materials.

c) Removal and proper re-execution (not withstanding and previous test thereof or interim payment therefore) of any work which in respect of materials or workmanship is not in accordance with the Contract.

3.3.14 LIABILITY FOR DEFECTS

3.3.14.1 Any work showing defects or any other damage, whether such defects or damage were caused by or consequential upon the negligence of the Contractor or not and whether the discovery of such defects was made during the progress of the works or upon completion of the works, or whether payment has been fully certified or the works approved, the Contractor shall make good, at his own expense, such defects or damage complained of, or in his refusal to do so the Employer shall be entitled to carry out the work and recover expenses in accordance with the Conditions of the Client.

3.3.15 INSPECTION OF WORK

3.3.141 Before proceeding with work that will cover and conceal previous work, or allowing other trades to do so the contractor shall give early notice in writing to the Engineer and shall afford him the opportunity of inspecting the work.

3.3.15.2 Approvals given at such inspections will not relieve the

Contractor from full responsibility for the quality of the work throughout. Works covered in by the Contractor without notice shall be exposed as directed by the Engineer at the expense of the Contractor.

3.3.15.3 The Engineer and any person authorised by him shall at all times have access to the works and the site and to all workshops and places where work is being prepared or whence materials, manufactured articles and machinery and being obtained for the works and the Contractor shall afford every facility for the every assistance in obtaining the right to such access.

3.3.16 SUPERVISION ON SITE

3.3.16.1 The Contractor shall give all necessary personal supervision during the execution of the works and shall have charge of all drawings, specification, documents as may be delivered to or for the use of the Contractor. He shall be required to maintain liaison with the Main Contractor and the Engineers and be on site during normal working hours to ensure that the works are carried out in a correct and efficient manner. The Foreman shall not be changed without the consent of the Engineers, should they deem it necessary to do so.

3.3.16.2 In the event of Engineers issuing such a directive the Contractor shall immediately replace that person with a person of the calibre previously outlined and shall do so as often as the occasion may reasonably require.

3.3.17 STANDARDS

3.3.17.1 Where national standards to which equipment or materials must comply are cited materials meeting other authoritative standards which ensure an equal or higher quality than the standards mentioned may also be accepted.

3.3.17.2 Supporting documentation in the English language shall be furnished.

3.3.18 ALTERNATIVES

3.3.18.1 Where reference is made in the specification to specific brand names, catalogue numbers or type of equipment, articles of a specific manufacture, offers of alternatives equipment, articles or materials which have similar characteristics and provide equal performance and quality to these specified may also be accepted.

3.3.18.2 Approval in writing prior to tender must be received for all such alternatives. Supporting documentation in the English language shall be furnished.

3.3.19 BUILDERS WORK

3.3.19.1 The Contractor shall submit a complete set of Builders Work Drawings after his notification of his nomination. He shall be totally responsible for all builders attendances. The Engineers will not entertain additional costs to the Contract for unnecessary cutting and making good of the Building fabric / structure.

3.3.20 CO-ORDINATION

3.3.20.1 It shall be the Contractor's responsibility to ensure the effective co-ordination of his services with those of the other disciplines on site.

3.3.20.2 The Contractor shall, in liaison with the other disciplines on site, produce co-ordinated services drawings (layout and section) of all areas where co-ordination is required.

3.3.20.3 These drawings shall be submitted for the approval of the Engineers in sufficient time to be checked, returned for modification (if necessary) and final issue to site.

3.3.20.4 The Contractor shall, on request, provide detailed drawings (1:50 and 1:20), where, in the opinion of the Engineer congestion of services is likely to occur.

3.3.20.5 Typical areas where co-ordinated services drawings will be required, but not limited to, are as listed in the Particular Specification Part III.

3.3.21 INSURANCE

3.3.21.1 The Contractor shall provide for all insurance under the Workmen's Compensation, of Employment, Widows and Orphans, and Accidents Acts and any other Acts that may be in force at the date of tendering.

3.3.22 ASSIGNMENT AND SUB-LETTING

3.3.22.1 The Contractor shall not assign the Contract any part thereof or any benefit or interest therein or thereunder without the written consent of the employer.

3.3.23 INTERPRETATION

3.3.23.1 The Contractor shall provide for all that may reasonably be inferred from the Specification in order to leave the installation safe, complete, efficient and clean.

3.3.23.2 The Contractor shall consider the Specification and drawings jointly and any point arising out of discrepancies between these shall be queried before tendering.

3.3.23.3 The drawings accompanying this Specification indicate generally the arrangement of the installation and are for assistance in tendering only. The position of points and apparatus shown thereon are approximate only. The exact positions will be advised during the course of the Contract.

3.3.23.4 Where a specific item or part is not available the Contractor shall point this out when tendering and agreement shall be reached as to its replacement.

3.3.23.5 The Contractor shall be deemed to have inspected the site prior to tendering. In any event it shall be deemed that the Contractor will have allowed for runs of pipe, supports, trunking etc., in a manner suited to the Building Construction.

3.3.24 VALUE ADDED TAX

3.3.24.1 The addition for Value Added Tax shall be regarded as provisional and shall be adjusted pro-rata to the amount of the final account before tax. It shall be calculated at the rate properly decided by the Revenue Commissioners under the powers vested in them by the Oireachtas but shall exclude any overpayments made or penalties incurred under the Act.

3.3.25 RECORD DRAWINGS AND INSTRUCTION

3.3.25.1 During the progress of works the Contractor shall record on drawings in an approved manner, the information necessary for preparing the installation record drawings. The marked up drawings shall be made available to the Consulting Engineer for inspection and checking upon request.

3.3.25.2 When the installation is complete the Contractor shall supply three sets of record drawings showing the layout of the installation. The drawings shall be reproducible type and shall be handed to the Consulting Engineers for approval before final printing.

3.3.25.3 The installation record drawings shall be completed by the date of Practical Completion and shall include :-

a) Position of all apparatus and equipment
b) Size and type of all pipe
c) Schematics diagrams of equipment

3.3.25.4 The Contractor shall during the course of the works, maintain a fully detailed record of all changes form the 'tender' drawings to facilitate easy and accurate preparation of the 'As Built' drawings and to ensure that these drawings are in all respect a true record of the installation.

3.3.25.5 If the Contractor fails to produce to the Consulting Engineers for approval either :-

a) The marked up drawings as required during the progress of the works

or

b) The 'As built' drawings at the date of Practical Completion.

3.3.25.6 The Employer may instruct the Consulting engineer to provide these drawings with whatever assistance the Consulting Engineer deems necessary.

3.3.25.7 The cost of preparing such drawings will be deducted from the outstanding monies due to the Contractor.

3.3.26 MAINTENANCE MANUAL/OPERATING INSTRUCTIONS

3.3.26.1 Upon practical completion of the Contract works the Contractor shall furnish to the Consulting Engineer a minimum of 3 bound copies in suitable hard covers, properly labelled, of a Maintenance/Operating Manual and Instructions.

3.3.26.2 The instructions shall include the following :-

a) Description of all system and equipment, together with a full description of the method of operation.

b) Details of and frequency required for all Maintenance Operations.

c) List of recommended spares.

d) Details of all setting up procedures, adjustments and calibrations.

e) Schedule of all equipment and materials supplied including manufactures name and address, ordering reference or catalogue number.

3.3.27 MAIN CONTRACTORS ATTENDANCE'S

3.3.27.1 The builders shall provide, free of charge, to the Contractor the following :-

a) Temporary electrical supply.

b) Provide dry, level and firm hard standing area of at lease 20 sqm. adjacent to the site, for the location of the Contractor's site office.

c) Provide hard-core roads from the public roadway to the site and in and around site as necessary, for the ease of access of plant and vehicles around site.

d) Provide adequate toilet and washing facilities on site for the Contractor's staff. These are to be kept in a clean and hygienic state at all times by the Client.

3.3.28 SITE MEETINGS

3.3.28.1 When so requested by the Client, the Architect or the Engineer, the Contractor shall attend site meetings which shall be held at regular intervals. He shall also attend the Engineer on site when so requested.

3.3.29 SAMPLES

3.3.29.1 The Contractor shall submit to the Engineer, for approval such samples of workmanship, materials or equipment which he proposes to use in the execution of the works, as the Engineer shall direct.

3.3.29.2 Where in the opinion of the Engineer the samples submitted are not of an acceptable standard or are unsuitable for use in the proposed circumstances, he shall have the right to instruct the Contractor to obtain an

alternative material or equipment form such sources as the Engineer shall decide.

3.3.29.3 All expenditure in connection with samples submitted for approval shall be borne by the Contractor.

3.3.29.4 Samples approved by the Engineer may with his permission be embodied in the works.

3.3.29.5 Where special plant or equipment is required for which samples cannot be obtained, the Contractor shall submit to the Engineer for approval such detailed dimensioned drawings as the Engineer may request

3.3.29.6 The Engineer shall indicate on the drawings submitted such modifications as he may consider necessary and the Contractor shall modify the said drawings accordingly and shall resubmit them for final approval.

3.3.29.7 No manufacture of special plant or equipment shall be proceeded with until the detailed drawings have been approved in writing by the Engineer.

3.3.30 INTERIM CLAIMS

3.3.30.1 All interim claims for payment shall be submitted to the Engineer at least two weeks prior to the issue of the certificate.

3.3.30.2 Interim claims shall follow the same format as the Summary of Tender and the Contractor shall indicate the percentage complete for each element of the works. Claims for materials or equipment on site which have not been fitted shall be detailed separately.

3.3.30.3 No payment shall be made for materials or equipment purchased but not delivered to site without the permission in writing of the Employer.

3.3.30.4 Where payment is make for equipment or materials stored elsewhere than on site the Contractor shall be responsible for bonding and insuring such goods and vesting them in the Client or the Employer as the case may be.

3.3.30.5 The Contractor shall not be reimbursed for any expenses incurred in carrying out the above.

3.3.30.6 Claims for expenditure against PC and Provisional sums shall be separately detailed and substantiated by suppliers or nominated Contractor's quotations where

appropriate. They shall include the appropriate percentages for profit, handling, erection and connection, etc.

3.3.31 FINAL ACCOUNT

3.3.31.1 To ensure that there is no delay in clearing the final account the Contractor should submit his final account not later than six weeks after hand over of the works.

3.3.31.2 The format for the final account should follow that outlined in 1.35 above.

3.3.31.3 The final account shall not be cleared until the following have been carried out to the satisfaction of the Engineer

a) Final testing and commissioning

b) Clearance of all snags or faults as identified by the Engineer

c) Submission of final approved record drawings and instruction manuals to the Employer and the Engineer.

d) Provision of all tools and accessories necessary for the operation and maintenance of the works.

3.3.32 HEALTH & SAFETY ON SITE

3.3.32.1 The Contractor shall ensure that all work carried out by his operatives or on his behalf complies with the requirements of the Health & Safety at Work Act. The Contractor shall display in his site office a copy of his Safety Statement.

3.3.32.2 All accidents on site shall be formerly reported to the Contractor and Engineer. The Contractor shall ensure that all his site staff wear safety helmets and safety boots at all times and that safety harnesses are worn by all staff working off scaffolds or on roofs or platforms.

3.3.32.3 The Contractor shall maintain on site a minor accident first aid kit.

3.3.32.4 Pressure testing shall only be carried out by trained and experienced staff working under the foremans supervision.

3.3.32.5 No oil fired, gas fired or electrically driven equipment supplied or installed under this contract shall be started

up without the suppliers commissioning staff present and then only on their instruction.

3.3.32.6 Gas pipework shall be tested and purged in accordance with Irish Standards and Codes and gas shall only be turned by agreement with the supply authority.

3.3.32.7 The Contractor shall liase with his Electrical Subcontractor and advise his operatives when the installation shall be regarded as live.

3.3.32.8 Storage and transport of gas bottles for welding and purging shall be in accordance with Safety Regulations. All hot water shall be properly planned, and protective blankets and fire extinguishers shall be to hand.

3.3.32.9 No work shall take place in confined or stagnant air areas until adequate temporary ventilation has been put in place. Any area in which gas may collect shall be checked with portable gas detector, and confirmed safe before any work takes place.

3.3.32.10 The Engineers will require any operative observed working in an unsafe manner to be ordered off site.

3.3.32.11 The Contractor shall nominate a member of his site management staff as safety officer, whose duty it shall be to ensure that safety standards are maintained.

3.3.3.12 A Safety Report, including, all plant inspection sheets, shall be submitted at each site meeting.

SECTION 4 SCOPE OF WORK & PROJECT PARTICULARS

Note : This specification is prepared using the National Standard Building Elements and Design Cost Control Procedures. All the following references relate to that document and its contents

Services (Mainly Piped and Ducted)

This section includes the provision of a new boiler house installation system to building detailed in the drawings and specifications. The entire installation to be affected by 2 no Heating plants HP1 AND HP2

4.1 Heating Centre (Element 51)

4.1.1.1 Supply and Return Headers

New black iron supply and return headers to be provided as per the enquiry drawings..

4.1.1.2 Insulation to Boiler house pipework

All pipework in the boiler house to be fully insulated by the Mechanical Contractor. Shall be Crown, density 80 kg/m^3 with foil covered or equal to approval.

4.1.3 Control Systems

4.1.3.1 BOILER HOUSE CONTROL

The control system shall comprise of self learning optimum start/ stop control, flow temperature compensation based on internal, external temperature, motorised valved zone control, maximum internal and external temperature automatic cut out and automatic frost protection.

The controls shall include a manual override with run on timer so that heating is available for occasional out of hours use. This shall be located within the admin. office. This unit shall be of a type appropriate for its location in terms of aesthetics and size. Industrial type housing shall not be acceptable.

Holiday switching shall also be provided on the heating centre plant room control panel.

The heating centre plant room control panel (and

secondary plant rooms) shall incorporate a BMS outstation. Holiday switching shall also be provided on the heating centre plant room control panel.

All wording on the control panels shall be agreed with the Engineer beforehand. The actual zones shall be defined on a colour coded A3 drawing, which is to be laminated, framed and fixed on, or immediately adjacent to the panel on a timber backing screwed to the wall. No abbreviations are to be used on the panels without an explanation in full provided on the drawing.

Two-stage frost protection shall be provided and be so arranged as to activate the circulating pumps at internal temperatures below 5 ºC and fire the boiler burners when system return temperature drops to 2ºC. The frost protection system shall be independent of optimum start controllers.

A room thermostat is to be located in the north facing classroom to control the heating zone.

Boiler Control Panel (located in the boiler houses)

- Boiler / Burner
- Shunt Pump
- Heating Circulation pump (heating circuits individually controlled)
- Heating Zones as per existing in boiler house
- Hot Water Zone(boiler plant no 2 only)
- Time clock control 7 day 24 hour (including automatic water / Summer time change)
- Room Thermostats (3no.)
- Frost Thermostat
- Heat Dissipation Thermostat
- Holiday switch (to allow for the non-operation of the heating system but to maintain frost protection

Remote panel (located in the Principals office)

- Controls to operate heating circuits
- Hot water systems controls
- Summer / Winter Switch
- Holiday / Override
- Booster and advance settings to each individual zone

The Contractor must allow for the installation of all

equipment associated with the control system. All items of equipment to be wired by the nominated electrical sub contractor shall be handed over and as well as all explanatory literature.

Controls to be supplied and commissioned by Satchwell Grant, Ace Controls, Sygma Controls or equal to approval.

4.1.4 Testing and Commissioning

4.1.4.1 Commissioning of Boiler and Burner

The Contractor shall arrange with the suppliers of the boiler / burner units or its manufacturers to have it commissioned and to obtain from them a certificate that the burner had been set to the correct air adjustment. The certificate received should be forwarded to the Engineer responsible for the job and marked for his attention.

The Contractor is to arrange with the manufacturers for an inspection of the burner within one month after the date of commissioning to ensure that all necessary adjustments for the satisfactory and efficient running of the burner are made.

COMMISSIONING OF INSTALLATION

The Contractor is to be present when the system is being put into commission and will be responsible for balancing the various circuits. He shall give full instruction to the School Authorities regarding the operation of the heating and oil burning equipment and shall hand over to them all the printed instructions pertaining to the operations and maintenance of the plant, which are supplied by the manufacturers with the equipment. The Contractor is to hand over to the School Manager three radiator vent keys and three keys to operate all lock-shield valves.

4.2 Water Distribution (Element 53)

Not Applicable.

4.3. <u>Space Heating (Element 56)</u>

Extent of Work in this Section

The contractor shall carry out a survey/ test of function of the existing heating systems in each of the buildings of their operation and following completion of works shall

balance and commission all heating and hot water circuits.

4.3.1.1 Isolating Valves

Isolating valves shall be provided where shown on the drawings and shall be bronze solid wedge gate valves with non-rising stems, and shall conform to BS. 5154 : R1977 (PN20).
Valves up and including 50 mm ø shall be screwed to BS. 21 : R1977 and shall be 'Crane' Model D151 'H.N.H.' Model Fig 33X.

Valves 65 mm and over shall conform to BS. 5154 : R1977 (PN16) and flanged to conform to BS. 4504 : Part 2 : R1981. They shall be 'Crane' Model DM160 'H.N.H.' Model Fig 35 (PN16).

4.3.1.2 AUTOMATIC AIR VENTS

The contractor is to supply and install Winns Patent Automatic Air Eliminators or equal to approval at the high points on all heating mains running through the roof spaces as specified on drawing. An overflow pipe is to be carried through the roof space from these to discharge outside the building. Before installation the contractor is to ensure that there is a gradual and continuous rise along these pipes to prevent air locks and to ensure adequate venting.

4.3.1.3 CIRCUIT VALVES

Circuit control valves shall be fitted where the contractor deems appropriate and where indicated on the drawings and shall be full-way pattern with gland surfacing boxes and iron hand wheels screwed or flanged as required with cast iron bodies gunmetal wearing parts and bronze seatings. In each flow and return circuits a "T" piece with a 25mm draw-off cock with hose connections to be provided.

4.3.1.4 FLUSHING OUT OF SYSTEM

On completion of pipework the complete system is to be thoroughly flushed out with clean water, until clean water comes through. Under no circumstances is the accelerator to be installed without this work being carried out.

4.3.1.5 TESTING

The pipework and fittings shall be subjected to a hydraulic test of 100lbs per sq/inch/7 bar for a period of not less than 2 hours. During this period the system shall remain drip tight.

The Contractor is to give at least 10 days notice of when a pressure test is being carried out so as to allow time for the Engineer or his representative to arrange to be present and witness the test. Two to three days notice is unacceptable.

4.3.1.6 Commissioning

The complete installation is to be tested and commissioned as previously outlined

4.4 Other Services (Element 58)

4.4.1 Fire Protection Services

4.4.1.1 The fire protective services consist of the supply and installation of automatic fire extinguishers in the boiler house. Extinguisher to be Champion manufacture or equal to approval.

4.5 Mechanical Site Services (Element 50)

4.5.1 Fuel Supply

The existing oil supply to each of the 2 no boiler plants to be maintained as necessary for the time to accommodate the new heating plants.

Ensure that adequate access is provided for maintaining the system and bring to the attention of the Contractor, any access requirements to allow the system to be maintained, before the tank and its supports are installed. Supply and install the boiler to the manufacturer's recommendations. Commission and test the boiler prior to practical completion and submit certificates to the Employer's Representative.

Consult with the boiler and flue supplier to determine the correct size and details for the flue arrangement, including support details, supply install and test the flue installation.

Gas Pipework Location - Coating Of Pipes And Fittings

All areas - Paint with undercoat (Zinc chromate primer) and overcoat in yellow paint. All paint to be neat, drip and ripple free and to be suitable for the temperature of the pipe to which it is applied.

Heating Pipework Location - Coating Of Pipes And Fittings

Un-insulated Pipework - Visible - Paint with undercoat (Zinc chromate primer) and overcoat in paint. All paint to be neat, drip and ripple free and to be suitable for the temperature of the pipe to which it is applied.

Insulated Pipework - Paint with undercoat (Zinc chromate primer). Recoat fittings and welds within four weeks of their installation. Wire brush welds before painting.

Preparation for Painting

Ensure metal surfaces are thoroughly cleaned, all mill and weld scale removed and finally degreased. Clean steel surfaces in accordance with IS EN ISO 8503 and prepare surfaces for painting in accordance with IS EN ISO 4618-3

Materials

Use the following materials as appropriate Solvent borne priming paint to BS 7956 for bare woodwork.

Red Oxide priming paint for bare iron and steelwork. Zinc Chromate priming paint for bare ferrous and non-ferrous metals.

Calcium Plumbate priming paint to BS 3698 for galvanized steel or composite wood/metal components.

Undercoating paint for previously primed or painted surfaces before the application of finishing coats.

Gloss finishing paint for previously primed or painted/undercoated surfaces.

Epoxy resin paint for Specialist coatings requiring resistance to acids, alkalis, oils, solvents, abrasion or high humidity.

Aluminium paint to BS 388 for structural steelwork, storage vessels, heated metallic surfaces and similar applications where moisture and heat resistant properties are required.

Cold galvanizing paint for making good damage to previously galvanized surfaces and protection to galvanized materials modified during installation.

Zinc-rich metallic to BS 4652 for bare iron and steelwork where electrical conductivity has to be assured.

Black tar-based paint to BS 1070 for moisture resistant protection to metal surfaces where decorating appearance is not important.
Bitumen based coatings for cold application to BS 3416 protection to iron and steel, particularly pipelines and fittings for use in contact with potable water.
Bitumen based coatings for cold application to BS 6949 not to be used in contact with potable water.

Paint Quality
Ensure paints used are of quality and type to suit application and that:
primers have good adhesion, covering power, rust-inhibiting and grain filling properties. Gloss finishing paints are of machine finish grade having high adhesion and high resistance to solvents, mineral oils, cutting oils, detergents, chipping and impact damage.

Heat Resistant Paint
Use heat resistant paints for applications to surfaces over 70^{o}C.

Workmanship
Ensure paints are applied in accordance with manufacturer's instructions and to BS 6150.

Weather Conditions
Do not apply paints where weather, temperature, humidity or other conditions may have a damaging effect upon finish or paint.

Cleaning and Preparation
Cleaning and preparing for painting Steel surfaces - Ensure metal surfaces are thoroughly cleaned, all mill and weld scale removed and finally degreased. Clean steel surfaces in accordance with IS EN ISO 8503 and prepare surfaces for painting in accordance with IS EN ISO 4618-3.
Surfaces - Ensure metal surfaces are thoroughly cleaned, all mill and weld scale removed and finally degreased. Prepare surfaces for painting in accordance with IS EN ISO 4618-3. For steel pipework, remove scale, rust or temporary protective coating by chipping, wire brushing or use of approved solvents and paint with one coat of red oxide primer, as work proceeds.

Application Off Site
Wherever possible ensure paint finishes applied by component manufacturers are spray applied. Apply paint evenly and ensure finish shows no excessive brush

marks, grinning, runs, sagging, ropiness or other application defects.

Cold Galvanizing
Repair damage to galvanized components due to installation process, i.e. following cutting, drilling or welding, by applying 2 no. substantial coats of cold galvanizing paint.

Identification

Pipework
Clearly label all pipework using colour bands to BS 1710.
Apply colour bands, 300mm wide, to each pipe at least
Once in every room or enclosed area.
At intervals not exceeding fifteen metres.
At every junction.
At every valve.
At every inspection and access position into service shafts, false ceilings, bulkheads etc.

Secondary Identification
Apply colour bands, 50 mm wide, and superimpose a legend identifying circuit, direction of fluid or gas flow, and nominal pipe bore.
Apply to colour bands by transfers of an approved type.
Ensure that all labels are securely fixed in a manor that will not allow them to peel off over time.
Orient all labels so that the can be clearly viewed from a normal position of observation.

Valves
Identify each valve, cock, stop valve, air vent, drain cock etc. with disc engraved with numerical reference except where the valve is within 2m of the final outlet or termination.
Use primary and secondary identification colours of associated system for painted or self colour discs.
Securely attach metal or laminated plastic discs, minimum diameter 35mm, to each item.

Legends
Engrave discs with permanent characters, minimum height 6mm.
Incorporate in operating instructions relating to regulating valves and flow measuring equipment, details of flow rate, pressure differential and setting, as appropriate.

Commissioning

Preliminary checks
Follow the procedures laid down for carrying out Preliminary Checks and Start
Operation in accordance with CIBSE Commissioning Code B and manufacturers instructions.

Apparatus and Instruments
Use Apparatus and Instruments detailed in CIBSE Commissioning Code B, Appendix B3.1. Apply tolerances defined in Appendix B3.2.

Comply with the manufacturers recommendations for the commissioning of boiler plant and controls.

Ensure instruments used for testing and commissioning are correctly calibrated.

Record details of instruments on record sheets.

Submit evidence of correct calibration of instruments to be used in connection with commissioning and testing.

Performance Test Records
Keep a systematic record of tests. Include the test record with the O&M's and submit directly to the Employers Representative, certificates detailing the flue gas analysis and boiler efficiency.

Commissioning Boiler Plant
Follow the procedures laid down for carrying out Preliminary Checks and Start
Operation in accordance with CIBSE Commissioning Code B and manufacturers instructions.

Use Apparatus and Instruments detailed in CIBSE Commissioning Code B, Appendix B3.1. Apply tolerances defined in Appendix B3.2.

Fully complete all boiler commissioning sheets. Sheets shall clearly indicate boiler efficiency and emissions of NOx and other emissions. Fully completed results sheets shall be sent to the Employers Representative for comment.

Standards and Regulations

Comply with all of the requirements within following standards:

IS EN 12266-2	Testing of valves at manufacturers works	09/2011
IS EN 1213 /ASSE 1003 / IS EN 13959	Valves	09/2011
IS 5154 / IS EN 12149	Globe valves	09/2011
BS 2456	Plastic floats for float valves	09/2011
IS EN 593	Butterfly valves between mechanical joints	09/2011
IS EN 1092-I,2,3,4	Butterfly valves between flanges	09/2011
BS 21/IS EN 10226-1	Threaded connections	09/2011
IS EN 1254-3	Compression connections	09/2011
BS 845–1/IS EN 483	Thermal performance of boilers	09/2011
IS EN 1491 / BS 6283 / IS EN 1490	Boiler safety devices	09/2011
BS 759-1/IS EN 303	Boiler Mountings	09/2011
BS 6759-1	Boiler Safety valves	09/2011
BS 5885/IS EN 676	Manufacture of gas burners	09/2011
BS 5854	Coad of practice for the installation of flues	09/2011
	Dilution flues (if specified)	09/2011
BS 5410-1, 2	Oil fired boiler installation	09/2011
ASTM UOP 172	Analysis of flue gases	09/2011
BS 7566 / IS EN 1859 /IS EN 1856-1	Chimney installation	09/2011
IS EN 1555 -1, 2, 5	Polyethylene pipe below ground	09/2011
IS EN 1171	Gate valves	09/2011

Note: Use latest edition of beach standard, containing all revisions available at the time that the project was issued for tender.

The contractor shall also allow for the relocation of the existing gas tank to the new location indicated. The contractor shall liaise with Calor Gas to ensure that all Technical, Health & Safety requirements are met. The contractor shall install all appropriate valves and pipework to allow the gas systems within the Community Centre to be operated, commissioned and certified.

4.6 Electrical Services

4.6.1 The mechanical contractor shall allow for all electrical attendances required to complete the contract.

4.7 Builders Work

The mechanical contractor shall allow for all builder's work required under the contract including the following:

4.7.1 Plinths

The mechanical contractor shall allow for the installation of plinths to accommodate the new boiler house plant.

4.7.2 Oil tanks removal.

The mechanical contractor shall allow for the decantation of the two no. oil tanks and environmentally disposed of, and certified. The works shall also for the removal of the concrete surrounds in each case with the area filled back and top soiled and seeded at HP1 and the area tarmacked with the higher ground sloped back to prevent a child from falling from a high level at HP2.

SECTION 5

GENERAL SPECIFICATION

The successful Mechanical Contractor must ensure that all work undertaken and executed in this contract shall comply with all relevant statutory instruments and regulations current at the date of tender, and in particular the following:-

1. The Safety Health and Welfare at Work Act 1989, the Factories Acts and all current Statutory Instruments and Regulations.

2. Any special regulations issued by the local electricity, gas or water authority.

3. Manufacturer's recommendations and requirements.

4. The i.e. Regulations for the Electrical Equipment of Buildings and the E.T.C.I. Regulations.

5. All relevant Irish Standards or where not applicable the British Standards and Codes of Practice.

5.1.1 MATERIALS

5.1.1 All materials used in the Contract and all of the work done shall be fully in accordance with the qualities and tolerances and all other requirements of the relevant Standards and Codes Practice.

5.1.2 The Contractor shall submit lists of alternative materials for approval at or shortly after the time of tender but he must allow in his tender for the inclusion of the specified materials and materials from nominated manufacturers.

5.2 PLANT

5.2.1 The Contractor shall provide for the delivery and erection of the plant on site except where otherwise specified together with all labour, tools, erection materials, scaffolding and instruments and all other apparatus necessary for the completion of the Contract.

5.3 STORAGE

5.3.1 All goods which are normally stored in the open shall be adequately protected from the weather and from all other damage. Materials which are not adequately protected shall be removed from site on receipt of instruction from

the Consultants and replaced by new materials, all at the 7Contractor's expense.

5.3.2 The Contractor shall provide storage and working areas necessary for the smooth continuity of the works. Materials are not to be stored and preparatory work is not to be carried out within the building, without the express agreement of the Consultants.

5.4 SETTING OUT

5.4.1 The Contractor shall set out the whole of the works and be responsible for the correct positioning of all equipment, bases, plinths and for any other builder's work which is necessary for the mechanical contract. The exact courses of all pipe fittings, valves and other items of equipment shall be approved by the Consultant before erection. The Contractor will be liable for making good any work incorrectly carried out by him or by others due to an error on his part.

5.5 BUILDING PROTECTION

5.5.1 The Contractor shall be liable to make good any damage which he causes to the building structure or the finishes there of, to the satisfaction of Architect, Engineer and shall remove all rubbish, plant and unused material from the site on completion.

5.6 PIPEWORK GENERALLY

5.6.1 All pipework shall be neatly installed to follow the contours of the building vertically and horizontally.

5.6.2 Where this pipework passes through the structure it shall do so at an angle of 90 degrees unless approved otherwise by the Consultant.

5.6.3 Pipework which does not conform to these requirements or which is misaligned or unsightly shall not be accepted.

5.6.4 Pipework must be free to expand or contract throughout the whole of its working temperature range.

5.6.5 All components of the installation shall be protected against the ingress of dirt or foreign matter both before and after erection.

5.6.6 The piping installation shall be so fitted that no air locking can occur.

5.7. Fitting of Copper Pipework

5.7.1 Only top quality workmanship will be acceptable. All bends shall be carefully formed to the exclusion of elbows, so that the section is not altered nor the ends damaged, if any ripples are formed in copper pipe the bends will be rejected.

5.7.2 Where pipes pass through walls, floors, ceilings, etc., copper sleeves shall be fitted from next largest size piping. The pipework shall be spaced and supported by polished cast brass clips with fixing generally built in to suit the location.

5.7.3 PVC pipework shall be installed as per BS. 5255:1976.

5.7.4 In ducts bearer angle irons or channels shall be used for mounting rollers.

5.7.5 Bracket spacing for copper pipe shall be:

Bore:	15/22mm	28mm	35/42mm	54mm	65mm	76mm
Horizontal bare:	1.2m	1.8m	2.4m	2.7m	3.0m	3.0m
Horizontal lagged:	1.2m	1.2m	1.8m	1.8m	2.4m	2.4m
Vertical :	1.8m	2.4m	3.0m	3.0m	3.7m	3.7m

5.7.6 For C.I. piping generally it shall be supported every two meters.

5.7.7 The minimum clearance between pipework and other surfaces shall be 35mm

5.8 Expansion

5.8.1 Pipework shall be arranged to allow freedom of movement for expansion. Fixed anchor points as necessary shall be provided to direct expansion towards expansion loops / bellows as required. All pipe work shall be arranged to prevent expansion stress on all connections to equipment. Drawings showing the position of all anchor / guide points together with anchor and guide details shall be submitted to the Engineer for approval prior to installation.

5.8.2 The Contractor shall be liable for any damage or injury caused by failure or the pipework during the course of the contract or before the end of the Defects Liability Period.

5.9 HYDROSTATIC TESTING

5.9.1 On completion of the works or sections of the works the Contractor shall hydraulically test the various installation to the pressure specified in the presence of the Engineer.

5.9.2 The Contractor shall inform the Consultants reasonably in advance of the time of all hydrostatic testing.

5.9.3 A particular hydrostatic pressure as tabled by the Consulting Engineer shall be applied to pipework and selected plant only and any flaw apparent shall be rectified and the test repeated.

5.9.4 Adjusting valves, controls, circuits, balancing, commissioning of equipment shall be carried out to the satisfaction of the Engineer.

5.9.5 The Contractor shall not attempt to repair faulty welds but cut out the leaking section of pipework and renew same unless authorised otherwise by the Consultant.

5.9.6 Pressures shall not be exerted on any plant or equipment other pipework unless so scheduled or mentioned herein.

5.9.7 It shall be noted that for reasons outside the control of the Engineer he may not be in a position to witness pressure tests. The contractor in this case shall provide a certificate of test to the Engineer at completion of the project.

5.9.8 Pressure testing shall only be carried out by trained and experienced staff working under the foremans supervision.

5.9.9 Records of all tests shall be supplied by the Contractor to the Engineer.

5.10 FLUSHING OUT OF PIPEWORK

5.10.1 The contractor shall flush out the whole of the pipework installations with fresh water once on completion of testing and adjusting procedures and once at the end of tuition period in addition to any plumbing and cleaning necessary during the installation of the works.

5.11 FAN & DUCTWORK INSTALLATIONS

Not Applicable.

5.12 TESTING & COMMISSIONING

5.12.1 Commissioning and Testing Definitions

(i) Commissioning - the advancement of an installation from the stage of static completion to full working order to the specified requirements.

(ii) Testing - the evaluation of the performance of a commissioned installation.

(iii) Preliminary Checks - are those checks necessary to be carried out by the Contractor to ensure that the system(s) are in a satisfactory and safe condition for start-up.

(iv) Setting to Work - is that work necessary by the Contractor to achieve system(s) operation in conformity with the design intent.

(v) Performance Evaluation – Is that work necessary by the Contractor to ensure that the performance of the system is in accordance with the design intent.

(vi) Demonstration - is that work necessary by the Contractor in showing the Engineer that the system(s) installed operate in conformity with the design intent.

(vii) Acceptance Checks - shall be the witnessing by the Engineer of demonstrations arranged by the Contractor or independent checks carried out by the Engineer.

5.12.2. Commissioning Records and Test Certificates

5.12.2.1 The Contractor shall provide the Engineer with detailed record sheets (three copies) including test certificates showing the results of all construction tests, regulation procedures and performance tests properly related to the specified requirements. These shall subsequently be modified by the Contractor as necessary to reflect any further adjustment to test results arising from Demonstrations and/or Acceptance Checks as witnessed by the Engineer.

5.12.2.2 Similarly three copies of manufacturers test certificates for all items of plant and equipment

whatsoever supplied under this Contract shall be provided to the Engineer at the time such plant and equipment is delivered to the site.

5.12.2.3. In addition further copies of- all final test certificates shall be included in the Maintenance and Operating Instructions.

5.12.2.4 Each Test / Commissioning Certificate shall contain the following minimum information:-

- Project Name.
- Identification or equipment / identification of installation and section of installation being tested.
- Date tests carried out.
- Results.
- Observations / Comments.
- Tests carried out by.
- Tests witnessed by.

5.12.3 Construction Tests

5.12.3.1 Any item of plant and equipment supplied and installed by the Contractor shall be capable of withstanding the pressures and temperatures under which they are required to operate, and shall be works tested in accordance with the relevant Local Authority or Statutory Requirement and British and Irish Standard specifications. In addition site testing shall be carried out in the presence of and to the satisfaction of the Engineer or his appointed representative.

5.12.3.2 Tests may be carried out in sections as the work proceeds, but a final test of each installation will be required on completion.

Construction tests shall include:-

5.12.3.2.1 Pipework Distribution Systems (Water)

Hydraulic tests shall be carried out on all distribution pipework systems prior to the application of thermal insulation / finishing and or

before the system or any part thereof is concealed in any other way. Such tests shall include all plant, equipment and components incorporated in the systems unless otherwise agreed by the Engineer.

5.12.3.2.2 Hydraulic tests shall be applied at the test pressures scheduled hereunder or as laid down in the appropriate section of Part 4 of this document for a period of not less than 2 hours.

LPHW pipework	10	bar
Mains water pipework	6	bar
Domestic cold water pipework	6	bar
Domestic hot water pipework	6	bar
Chilled water pipework	10	bar
Condenser water pipework	6	bar
Gas	6	bar
Oil	6	bar
Fire Fighting	1.5	bar

5.12.3.2.3 Water Storage Tanks, Cisterns and Condensate Drainage Pipework

All tanks, cisterns and drainage pipework shall be filled with clean water and subjected to a standing leak test for twenty four hours. Such tests shall be completed prior to the application of any thermal insulation/finishing.

5.12.3.2.4 Safety Relief Valves

All safety/relief valves shall be checked by hydraulic pressure test to ensure lift at normal working pressure plus 115% of working pressure.

5.12.3.2.5 Ductwork Distribution Systems

Systems under this heading shall be deemed to include all items of plant and equipment and connections thereto, plant and equipment and sheet metal ductwork connections to external louvers and builders work structures, timber frames and the like, all ductwork fittings, components, access doors, controlling or sensing element penetrations, terminal devices and test holes.

5.12.3.2.5 The sheet metal ductwork systems shall be visually inspected for air tightness before any insulation is applied and prior to running the fans.

5.12.3.2.6 All high velocity/high pressure ductwork and low velocity/pressure ductwork when so indicated shall be tested for air leakage. Air leakage tests shall be carried out in accordance with HVCA standard specification DW 143.

5.12.3.2.7 Whether or not duct pressure tests are specified, the Contractor shall be responsible for sealing all ducts and for ensuring that excessive air leakage does not occur.

5.12.3.2.8 All connections to airways of builder's work construction and points of penetration through the enclosing structure shall be sealed at the time of construction by the Building Contractor. Thereafter the Contractor shall inspect such joints up to the time of handover and shall report any failure of the sealed joints due to building shrinkage, vibration or any other cause to the Engineer.

5.12.4. Pre-Commissioning Cleaning and Checks

5.12.4.1 The Contractor shall ensure that all equipment included under this Contract is thoroughly cleaned, lubricated and checked for serviceability immediately before setting to work. Particular attention is drawn to the removal of dust and debris from the air system, motors, fan bearings, pipework systems etc.

5.12.4.2 All safety devices shall be inspected and checked for proper operation before the electricity is applied to the system, or it is started up.

5.12.4.3 All pipework systems shall be thoroughly flushed to ensure that all foreign matter is removed prior to filling the systems.

5.12.4.4 If abnormal deposits continue to collect after such cleaning the Engineer reserves the right to call for further cleaning and flushing operations until the systems are free from foreign matter. The costs of such further cleaning operations, the refilling of systems and application of water treatment, shall be borne by the Contractor.

5.12.5 Setting to Work and Regulation

5.12.5.1 The Contractor shall satisfy himself that the internal cleanliness and general conditions of the system(s) is satisfactory before they are set-to-

work. He shall also arrange for any necessary temporary protection of anything within the spaces served by the system, which could be damaged by the operation of the system.

5.12.5.2 Setting-to-work, regulation and calibration of all systems shall then be carried out in accordance with specified or appropriate procedures.

5.12.5.3 Setting to work and regulation procedures shall include, but is not limited to the following:-

5.12.5.3.1 Heating Systems and Equipment

Heating systems shall be balanced with all circulation rates being set to accord with the respective design values. All heating equipment; radiators, fan convectors, convectors, pipe coils etc. shall be checked for satisfactory operation. All associated controls (environmental and safety) shall be calibrated, set and checked to ensure their operation meets the specified requirements.

5.12.5.3.2 Domestic Hot and Cold Water Services

Circulation rates shall be checked and adjusted as required to achieve satisfactory flow at all outlets. The secondary HWS flow rates shall be adjusted using the regulating and flow measurement facilities provided.

5.12.5.3.3 Air Distribution systems and Equipment

Air distribution systems shall be proportionally balanced using the volume control dampers to achieve the specified air volumes. The duties of all pre-set terminal units shall be verified and reset if required.

5.12.5.3.4 Motorised volume control dampers shall be set in their optimum positions during balancing operations. All associated controls (environmental and safety) shall be calibrated, set and checked to ensure their operation meets the specified requirements.

5.12.5.3.5 Chilled Water System and Equipment

As per heating system and equipment.

5.12.5.3.6 Condenser Water system and Equipment

As per heating system and equipment.

5.12.5.3.7 Fire System

Check and adjust for satisfactory flow rates at all outlets.

5.12.5.3.8 Gas Installation

Check and adjust for satisfactory flow rates and pressures at all gas burning appliances; record gas pressure at each appliance. All associated safety controls shall be calibrated, set and checked to ensure their operation meets the specified requirements.

5.12.5.3.9 Boiler Room

A boiler combustion efficiency test shall be carried out based on the flue gas analysis taken at the flue gas outlet from the boiler.

5.12.5.3.10 Instruments and Gauges

All instruments, gauges and other indicating or measuring devices shall be checked for accuracy of reading.

5.12.5.3.11 Electrical Equipment

All associated electrical equipment, control panels etc. shall be checked in conjunction with electrical contractor for satisfactory operation including all switching, control and indicating circuits. Motor starter overloads shall be correctly adjusted in relation to normal running current. All interlocks with fire alarm and BMS systems shall be used. Electrical equipment shall generally be checked in accordance with the requirements of the documents referred to in Clause C.14.1 of this Section of the specification.

5.12.5.3.12 Performance Evaluation

Before offering the installations to the Engineer for acceptance the Contractor shall satisfy himself that the systems are

achieving the design intent by carrying out such performance tests as he may deem necessary.

5.12.5.3.13 The Contractor shall provide all necessary test instruments, measuring point adapters, and equipment required in carrying out regulation, calibration and performance tests and shall provide same for the Engineers use to check tests which have been carried out.

5.12.5.3.14 Performance testing shall be deemed to include any tests which are requested by the Engineers, to demonstrate compliance with the Specification.

5.12.5.3.15 The performance of the systems shall be monitored under normal Winter and Summer weather conditions and with the building in normal occupation. Following Winter and Summer performance monitoring the Contractor shall submit a written report to the Engineer recording all measurements taken against appropriate design values. The Contractor rust allow in his Tender for returning to site to comply with this requirement.

5.12.6 Acceptance Checks

5.12.6.1 On completion of the commissioning process the Contractor will be required to demonstrate to the Engineer that the systems are operating in accordance with the design intent.

5.12.6.2 The contractor shall give the Engineer at least ten days notice in writing when requesting acceptance tests on any portion of the works. The application must certify that the agreed commissioning procedures and performance tests have been carried out.

5.12.6.3 The application must be accompanied by a complete set of records which shall include all plant settings, fluid flow rates, temperatures and pressures, space conditions and noise levels as adjusted by the Contractor, related to the respective design values and all pump and fan characteristics.

5.12.6.4 Any application that is not accompanied by the test records may be rejected.

5.12.6.5 The precise nature, methods of measurement and presentation of commissioning record information, shall be the subject of prior agreement between the Contractor and the Engineer.

5.12.6.6 The Contractor shall demonstrate to the Engineer the satisfactory operation of all systems. He shall also demonstrate that adequate access for inspection and maintenance has been provided.

5.12.6.7 When all demonstrations have been completed and accepted by the Engineer the commissioning record information shall be updated as necessary and such records shall form part of the manual of Operating and Maintenance Instructions, called for elsewhere in this document.

5.12.6.8 Whilst acceptance checks are in progress the Contractor shall have staff available (including representatives of specialist suppliers as necessary) to operate and adjust the systems as may be required by the Engineer. The staff available shall be fully conversant with the installations and the commissioning and testing procedures. The period during which staff must be available shall include that required for any preliminary operation of the plant in preparation for demonstrating the installation to the Engineer.

5.13 ELECTRICAL WORK

5.13.1 Electrical wiring shall be carried out by the contractor Electrical equipment, other than that forming part of Mechanical Engineering plant, shall be handed to the Electrical contractor on site who will erect it to the Mechanical Contractor's instructions and the Consultant's approval.

5.13.2 The Contractor shall liase with his Electrical Subcontractor and advise his operatives when the installation shall be regarded as live.

5.14 PROTECTION OF THE INSTALLATION AGAINST DAMAGE

5.14.1 The contractor is to take all necessary precautions to protect the installation against damage from any cause including frost up to the time the building is handed over to the school manager.

5.15 COMPLETION

5.15.1 The Contractor shall complete the work in strict accordance with the specification and drawings, apart from any authorised variations and shall leave same in working order to the entire satisfaction of the Architect or Heating Engineer within the period of the building contract.

5.16 OPERATING INSTRUCTIONS

5.16.1 The Contractor shall allow for operating the complete works under full working conditions and for instructing the person nominated by the Employer

5.16.2 The employers staff shall be instructed in the correct and most efficient manner for operating installation for a period of one week. He shall give instruction on the maintenance of the plant and equipment etc., including handing over drawings, charts etc., showing pipework as fitted, number and location of each valve, pump etc.

5.16.3 No oil fired, gas fired or electrically driven equipment supplied or installed under this contract shall be started up without the suppliers commissioning staff present and then only on their instruction.

5.16.4 Gas pipework shall be tested and purged in accordance with Irish Standards and Codes and gas shall only be turned by agreement with the supply authority.

Storage and transport of gas bottles for welding and purging shall be in accordance with Safety Regulations.

5.16.5 All hot work shall be properly planned, and protective blankets and fire extinguishers shall be to hand.

5.16.6 No work shall take place in confined or stagnant air areas until adequate temporary ventilation has been put in place. Any area in which gas may collect shall be checked with portable gas detector, and confirmed safe before any work takes place.

5.17 Utilities Providers

5.17. 1 The Contractor shall be responsible for liasing with local providers of both Gas (Bord Gais) and Water (Local Water Authority) in relation to the provision of these services including all associated costs in connection with obtaining a supply of these services and for actually making the connections under the supervision of the providers representatives.

5.18 Painting

5.18.1 All hanger, supports, steelwork etc., unless galvanised shall be thoroughly wire brushed and given one priming, one flat and one gloss coat of heat resisting paint.

5.18. 2 All plant items in boiler house, tank room etc., shall be repainted as directed as well as all exposed uninsulated pipework.

5.1 The contractor shall paint the walls and floors of both boiler houses

5.19 Labels and Identification

5.19.1 All valves, stopcocks and items of plant shall be clearly labelled in material suitable for the location and to the approval of the Engineer to indicate their purpose. Each shall be numbered, the number to agree with that shown on the valve or other equipment chart. All pipework or its covering shall be painted with identification bands generally to BS. 1710 so as to enable the pipe to be readily recognised at any position.

5.20 Spares and Tools

5.20. 1 A list of recommended spares obtained from the various plant suppliers shall be supplied not later than the physical completion date for the plant.

5.20.2 All tools necessary for operation and maintenance of the plant shall be supplied to the Client not later than the termination of the maintenance period.

5.20. 3 The Contractor shall also supply as part of this Contract any special tools or appliances necessary for easy dismantling and re-assembly of the equipment.

5.21 Schedule and Charts

5.21.1 Schedules and charts of all equipment and valves shall be provided in the boiler room or elsewhere as may be directed. These shall be mounted in a glazed hardwood framed display along with a diagrammatic or similar drawing of the complete installation.

5.22 Operating & Maintenance Manuals

5.22. 1 The mechanical contractor shall produce the Operating & Maintenance Manuals and hand 1no. copy to the Engineer for comment within14 days of the handover of the project. This copy will be returned with comments and the mechanical contractor shall correct the Manual and resubmit the corrected copy of the Manual to the Engineer within 7 days.

5.22.2 The mechanical contractor shall submit to the Engineer the other 2no. copies of the corrected information for distribution to the relevant parties.

5.22. 3 The contents of the Manual shall be in a logical sequence, each section being indexed for easy reference.

5.22.4 The Manual shall be fully indexed and the whole contained ring binder format of good quality. The Manual shall include the following sections:-

(i). Introduction
(ii). General Description of Systems
(iii). Design and Performance
(iv). Technical Data
(v). General Operation & Maintenance Notes, including Operation of Controls
(vi). Procedure for Operating & Maintenance
(vii). Emergency Procedures
(viii). Fault Tracing
(ix) Maintenance Schedules and Recommended Interval Periods

(x). Commissioning Reports
(xi). Spares
(xii) Test Certificates
(xiii) Valve Charts
(xiv). Manufacturer's Literature and Schedule of Equipment
(xv). As Fitted Drawings

(i) Introduction:
This shall include the preamble, together with a list of abbreviations and a schedule of record drawings. A list of contact names and addresses of installers and other 'helpful' companies or authorities are to be included.

(ii) General Description of Works:
A full description of the whole system together with schematic sketches to enhance the explanatory notes. This section should be written in a form that could be easily understood by non-technical persons.

(iii) Design and Performance:
This shall show full details of equipment performance, together with the design operation temperatures

(iv) Technical Data:
This shall identify the technical data for each item of equipment. General Operations & Maintenance Notes:

This section shall indicate measuring techniques and necessary equipment to check the equipment performance on a periodical basis. This section shall also give safety precautions, planned maintenance and equipment log.

(v) Procedure for Operating & Maintenance:
This section shall cover normal operation, initial setting up, routine inspection, draining down water systems (if applicable), replacement and adjusting for drive belts, renewing filters, greasing filters, greasing motor bearings etc.

(vi) Emergency Procedure:
This section shall demonstrate isolation procedures of all equipment, together with all First Aid actions.

(vii) Fault Tracing:
A general description of how to locate faults with the equipment, including a description of fault diagnostic systems of individual systems.

(viii) Maintenance Schedules and Recommended Interval Periods:
This section shall give frequencies of inspection, lubrication, adjustment, replacements, overhaul, together with log sheets which shall have the headings date, details, action taken, signature'.

(ix) Commissioning Reports:
Within this section shall be placed copies of all the commissioning and test results.

(xi) Spares:
This section shall list all the spares recommended by the equipment manufacturers.

(xii) Test Certificates:
This section shall contain all the test certificates as detailed within this specification

(xiii) Valve Charts:
If applicable to the project, this section shall contain the valve charts and schedules.

(xiv) Manufacturer's Literature:
This section shall contain all manufacturer's literature applicable to the installation

(xv) As Built Drawings:
All "As Built" drawings shall be placed in this section

SECTION 6 SCHEDULE OF DRAWINGS

Mechanical

M1 Heating Centre 1 & Heating Centre 2
M2 Heating Centre 1 Schematic
M3 Heating Centre 2 Schematic
M4 Heating Centre 1 Controls
M5 Heating Centre 2 Controls
M6 Mechanical Site Services

Electrical

E1 Power, Lighting and Fire Alarm Services