Meath Heat Pump

Bundle 8

Volume A.2.3 Specification

Part 4 of 4: Equipment Schedules

Date: April 2026

Ref.: 3232/SK

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Document History

Version	Issued	Comments
T	08-04-2026	Issued for Tender

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1 HEATING CENTRE (51)

1.1 AIR SOURCE HEAT PUMPS

Reference: AHP-001 **Location: (External)**		
 *Typical Image* Air Source Heat Pump as per technical specification below.		
Element	**Specification**	**Proposal**
Description	Low Noise External Air Source Heat Pump	
Heating Capacity (kW)	See Drawings 20KW and Above	
CoP (W/W)	2.7	
SCoP (W/W)	3	
Efficiency (%)	117	
Compressor Type	Scroll or Screw	
Minimum Number of Compressors	2	
Source Heat Exchanger	Cu/Al pipes and fins with hydrophilic coating 'Blue Fins'	
User Heat Exchanger	Braze Welded Plate Heat Exchanger (AISI 316 Stainless Steel) c/w closed cell insulation and discharge temp sensor for anti-freeze protection	
Refrigerant Type	R290	
Outdoor Air Temp (°C)	-3oC	
Outdoor Relative Humidity (%)	80	
Fluid Type	Water	

In/Out Fluid Temp (°C)	50.0 / 55.0	
Super Low Noise	Required	
Max Fan RPM	900 (low noise)	
Construction	Galvanised Sheet Steel painted with polyurenate powder enamel c/w removable panels.	
Control & Protection Devices	Required	
Control Panel	Microprocessor based c/w display showing all operational icons and connections for MODBUS protocols	
Serial Interface Card RS485	Required to allow the controller to communicate using Modbus Protocol	
Head Pressure Control	This device, using a pressure probe installed on the source heat exchanger, controls the fan speed with respect to the ambient conditions.	
Accessories	• Rubber Anti-vibration feet/pad • Condensate Drip Tray • Anti Freeze Kit • Pressure Gauges • Master / Slave Cascade Control system • Outdoor Air Temperature Sensor for Weather Compensation • Hydraulic Kit comprising centrifugal circulating pump	

	c/w safety valve & fill/drain point	
Defrost Method	Reverse Cycle	
Defrost Control	Sensor for outdoor temperature	
Warranty	5 year parts and labour	
Standards/ Conformity	• Low Voltage Directive 2006/95/EC • EMC 2004/108/EC • PED 97/23/EC • WEEE 2012/19/EU • RoHS 2001/65/EU	
ErP Compliant	Fans / Pumps	

** Note – The contractor shall advise at technical submittal stage a statement regarding the service and maintenance of the heat pumps units to identify who can service and maintain the heat pump equipment i.e. any qualified F-GAS contractor or the manufacturers supplier who carries out the service and maintenance post-handover.

1.2 LPHW PRE INSULATED EXTERNAL PIPEWORK

Reference: Pre insulated heating pipe

Location: External from Heat pump to Plantroom



Typical Images

Element	Specification	Proposal
Manufacturer & Model	Uponor Ecoflex Thermo PRO Single or equivalent	
Pipe Material	PE-Xa with EVOH SDR 11	

Insulation material	PUR foam and Cross linked PE foam	
Jacket material	PE-HD (PE 80)	
Max temp	95 °C	
Max pressure	6 bar	
U value	0.195	

1.3 MONO BLOCK ASHP

Ref: HPO

Air Source Heat Pump, External Unit c/w manufacturer approved anti vandal enclosure / guard



Outdoor Unit

Element	**Specification**	**Proposal**
Type	Mono Bloc - Air Source Heat Pump	
Compressor	Hermetically sealed swing compressor	
Casing	Galvanised plate	
Heat Exchanger	Plate heat exchanger	
Fan	Propeller	
Fins	Anti-corrosion treatment (PE)	
Discharge Direction	Horizontal	
Rated Heat Output	As per contractor Design	
SCOP	4.1	
Seasonal Space Heating Efficiency Class	A+	
Water Heating Energy Efficiency Class	A+	

Noise Levels at 1 metre	61 dBa Max	
Drip Tray	Yes	
Condensate Connection	40mm	
Operating Range	-15°C - +35°C	
Refrigerant	R290	
Drain	1 No. 15mm hole and 1 No. 20mm hole	
Vibration Mats/Feet	Required	
External cage	Manufacturer approved, galvanised & powder coated mesh, no sharp edges	
Maximum height difference between outdoor and indoor unit	As per contractor Design	
Defrost Method	Reverse Cycle	
Defrost Control	Sensor for outdoor heat exchanger temperature	
Capacity Control Method	Inverter controlled	
Control Operation	• On/off • 0-10V DC • High limit protection • Low water protection • Volt free common alarm and boiler run indication • Manual override • Modulating (18-100%) • Hot water priority facility (3way valve or pump) • Two safety interlocks • Hours run indication	
Standards/ Conformity	• ISO 9001 • EN/IEC 61000-3-12	
Warranty	• 5 year manufacturer's warranty for the complete heat pump package	

1.4 LPHW / LPHW BUFFER VESSEL

Reference: BUF-001

Location: Boiler House



Typical Image

Direct Buffer Vessel as per technical specification below

Element	Specification	Proposal
Description	Direct Heating Vertical Buffer Vessel	
Storage Capacity (L)	See Drawings	
Material	Mild Steel Construction with exterior paint	
Insulation	50mm soft polyester fibre insulation with high Thermal insulation to ErP class B or C. Fire Class: B-s2do to EN 13501	
Max Storage Temperature (°C)	99	
Max Working Pressure (bar)	3.0	
Warranty (years)	5	
Accessories	• Access hatch • Temperature Gauge • Pressure Gauge • Temp/Pressure Safety Valve & tundish • Immersion Pockets 200mm deep (min)	
Standards/ Conformity	CE / EN 13501 / ErP	

1.5 LPHW CIRCULATION PUMPS

Reference: circulation Pump (PMP-001) **Location: Boiler House**		
	*Typical Image* Single head pump as per technical specification below.	
Element	**Specification**	**Proposal**
Type	Single head, canned-rotor type c/w integral variable speed control & BMS connectivity	
Minimum Energy Class	A	
Design Flow-rate	See drawings	
Head	See drawings	
Pump Housing Material	Stainless Steel	
Impeller Material	PES 30% GF	
Maximum Operating Pressure	10 bar	
Maximum Ambient Temperature	40°C	
Enclosure Class	X4D	
Insulation Class	F	
Energy Efficiency Index (EEI)	0.18	
Compliance	Declaration of Performance / CE Certification See Part 3: Standard Clauses for appropriate standards ERP Directive (2009/125/EC) EU Regulation (813/2013)	

	Energy Labelling Framework Regulation (EU) (2017/1369) EU Regulation (811/2013)	

Reference: Circulation Pump (PMP-002)

Location: Boiler House



Typical Image

Twin head pump as per technical specification below.

Element	Specification	Proposal
Type	Twin head, canned-rotor type c/w integral variable speed control & BMS connectivity	
Minimum Energy Class	A	
Design Flow-rate	See drawings	
Head	See drawings	
Pump Housing Material	Cast Iron	
Impeller Material	Cast Iron	
Maximum Operating Pressure	10 bar	
Maximum Ambient Temperature	40°C	
Enclosure Class	X4D	
Insulation Class	F	
Energy Efficiency Index (EEI)	0.17	
Compliance	Declaration of Performance / CE Certification See Part 3: Standard Clauses for appropriate standards ERP Directive (2009/125/EC) EU Regulation (813/2013) Energy Labelling Framework Regulation (EU) (2017/1369) EU Regulation (811/2013)	

1.6 AUXILIARY HEATER

Reference: Auxiliary Frost Protection Heater **Location: Boiler House**		
Radiator as per technical specification below.		
Element	**Specification**	**Proposal**
Type	Oil filled electric radiator	
Mounting	Wall mounted c/w wall mounting brackets	
Finish	White stove enamel	
Fixings	Supplied with concealed wall mounting brackets	
Minimum Output	1 kW	
Controls	Remote Frost Thermostat	
Typical Height	659mm	
Maximum Length	870mm	
Weight	14 kg	
Compliance	Declaration of Performance / CE Certification EN 60335 ERP Directive (2009/125/EC)	

1.7 DOSING POTS

Reference: Dosing Pot (DSP-001) **Location: Boiler House**		
	*Typical Image* Details as per technical specification below.	
Element	**Specification**	**Proposal**
Capacity	11 litres	
Construction	Mild steel, welded	
Mounting	Wall mounted c/w wall mounting brackets	
Finish	powder coated	
Minimum Output	1 kW	
Connection Details	• Tundish • 1" fill valved connection • 1" drain valved connection • 1" flow valved connection • 12 return valved connection • Air vent	
Connection Sizes	1"	
Typical Height	880 mm	
Typical Diameter	200 mm	
Weight	16.5 kg	
Compliance	Declaration of Performance / CE Certification / Confirmation of CPR Exemption PED 2014/68/EU	

1.8 PRESSURISATION UNITS & EXPANSION VESSELS

Reference: Pressurisation Unit & Expansion (PU1)

Location: Plantroom





Typical Image

Pressurisation Unit & Expansion Vessel(s) as per technical specification below.

Element	Specification	Proposal
Type	Digital Floor Enclosed Standing	
Pumps	Twin	
Breaktank Connection	'AB' air gap to water supply	
Max Working Pressure	10 Bar	
Connectivity	Volt Free Contacts required for High/Low level fault output to BMS	
Digital Display	Required c/w password protection	
Independent High / Low Pressure Alarm	Hard-wired	
Auto Fill Capacity	Required	
Standards/ Conformity	ISO 9001, BSEN 60204 Part 1 WRAS approved, IMQ & VDE Standards, PED, EMC Directives	
Expansion Vessel	See drawings	
Max. Working Pressure of Expansion Vessels	10 bar	

1.9 AIR SEPARATORS

Reference: ARS-001 **Location: Boiler House**		
	Typical Image Air Seperator as per technical specification below.	
Element	**Specification**	**Proposal**
Description	Deaerator	
Application	LPHW Heating System	
Connection Size	See drawings	
Construction	Mild steel, welded	
Mounting	Inline	
Finish	Powder coated	
Compliance	Declaration of Performance / CE Certification / Confirmation of CPR Exemption PED 2014/68/EU	

1.10 DIRT SEPARATORS

Reference: ADS-001 **Location: Boiler House**		
	Typical Image Dirt Seperator as per technical specification below.	
Element	**Specification**	**Proposal**
Description	Magnet Dirt Separator	
Application	LPHW Heating System	

Connection Size	See drawings	
Construction	Mild steel, welded	
Mounting	Inline	
Finish	Powder coated	
Internal Magnet	Required	
Compliance	Declaration of Performance / CE Certification / Confirmation of CPR Exemption PED 2014/68/EU	

1.11 LPHW / LPHW PLATE HEAT EXCHANGER

Reference: PHE-001

Location: Energy Centre



Typical Image

LPHW Plate Heat Exchanger as per technical specification below.

Element	Specification	Proposal
Description	Counter Flow LPHW to LPHW Plate Heater Exchanger with IG Painted Frame	
Flow Plates	Stainless Steel Single pass solution Corrugated “herringbone” pattern AISI 316L (EN 1.4404) / 0.4mm	
Heat Load	See drawings	
Hot Side Inlet Temp	Varies	
Hot Side Outlet Temp	Varies	
Cold Side Inlet Temp	Varies	
Cold Side Outlet Temp	Varies	

Frame	Carbon Steel with clamping bolts around frame edge	
Design Pressure of Frame	10 bar	
Hot Side Connections	Carbon Steel rubber lined studded ports	
Cold Side Connections	Carbon Steel rubber lined studded ports	
Gaskets	NBR / Glue Free Plug In	
Dimensions	Varies	
Construction Standard	EN13455, ASME SecVIII, Div.1	
Additional Equipment	• Bespoke Insulating Jacket • Assembling Spanner • Foundation Feet • Instrument Flange • Thermometer & Manometer • Name Plate to indicate test and operating pressure	

1.12 HOT WATER CALORIFIER

Reference: Hot Water Storage Calorifier (CAL-001)

Location: Boiler House



Typical Image

Hot water calorifier as per technical specification below.

Element	Specification	Proposal
Description	Indirect hot water storage calorifier (vented)	
Qty. Of Heating Coils	1 no.	
Storage Capacity	246 litres	
Min. Peak Flow at 60°C	440 litres/hour	
Min. Constant Flow at 60oC	440 litres/hour	
Min. Recovery Time	37 mins	
Gross Heat Input (Net)	22 kW	
Max. Standing Heat Loss	2.09 kWh/24 hours	
Pressure Drop (Primary)	90 mbar	
Flow-rate (Primary)	440 litres/hour	
Max. Operation Temperature (Primary)	90°C	
Max. Operating Pressure (Primary)	3.5 bar	
Max. Operating Temperature (DHW)	70°C	
Max. Operating Pressure (DHW)	10 bar	

Diameter	560 mm	
Height	1335 mm	
Tank Construction	Coated Mild steel	
Coil Construction	316 L Stainless steel	
Insulation	Dense PU Foam	
High Limit Thermostat	Included	
Electrical Immersion Heater	Required – 3kW minimum	
Energy Rating	C	
Warranty	5 years	
Compliance	Declaration of Performance / CE Certification PED 2014/68/EU ERP Directive (2009/125/EC)	

Reference: DHW Return Pump (PMP-005)

Location: Boiler House



Typical Image

Single head pump as per technical specification below.

Element	Specification	Proposal
Type	Single-head, canned-rotor type c/w constant speed & 3 no. variable settings	
Minimum Energy Class	A	
Design Flow-rate	0.2 litres / sec	
Design Pressure	125 kPa	
Pump Housing Material	Stainless steel	
Impeller Material	PES 30%GF	
Maximum Operating Pressure	10 bar	
Maximum Operating Temperature:	110°C	
Maximum Ambient Temperature:	40°C	
Power Input	333 W	
Maximum Current Consumption	1.55 A	
Power Supply	50/60Hz	
Rated Voltage	230 V	
Enclosure Class	X4D	
Insulation Class	F	
Minimum Efficiency Index EEI	0.18	
Compliance	Declaration of Performance / CE Certification EN 12756 EN 1092-2	

2 BUILDING MANAGEMENT SYSTEM (58)

2.1 BMS CONTROL PANELS

Reference: BMS Panel

Location: Boiler House



Typical Image

BMS Panel as per technical specification below.

Specification	Quantity	Proposal
Door interlocked isolator	1	
Control circuit MCB	1	
Control panel live lamp	1	
Fire relay complete with status lamp	1	
IT Network connection	1	
SP MCB supplies for Boiler c/w • Control relays • Hand/Off/Auto control switches • Demand & Lockout lamps	1	
SP MCB Supply for Boiler Control Module c/w • Control relay • Status lamp	1	
SP MCB supplies for future Water Heater c/w • Control relays • Hand/Off/Auto control switches • Demand & Lockout lamps	1	
Pairs DOL Starters for Pumps complete with MCB's Thermal overloads c/w • remote resets • Status lamp • Alarm Active lamp	3 1 3 3	

• On/Off/Auto Switch	3	
SP MCB Supply for Pressurisation unit c/w • Control relay • Status lamp • Alarm Active lamp • Hand/Off/Auto Switch	1	
Selection Switch for Holiday Settings	1	
Selection Switch for Winter/Summer Settings	1	
240/24V Transformer complete with MCB	1	
Touch-screen interface panel mounted at 1500 AFFL	1	
Compliance	Full CE Marking	
BMS Control Points	Refer to drawings for Building Management System control points requirements. Full Panel drawings including wiring details and panel shop drawing to be submitted to the consultant engineer for review prior to manufacture.	

2.2 BOILERHOUSE DEVICES

2.2.1 Immersion Sensor

Reference: Ts

Location: See Drawings



Typical Image

Immersion Temperature Sensor as per technical specification below.

Element	Specification	Proposal
Output Type	Thermistor Resistive	
Measurement range	-30 °C to +110 °C	
Accuracy	±1.28 °C	
Probe	Brass	
Probe length	150mm	
Housing	Material ABS Ambient temp -10 °C to +40°C	
Cable entry	M20	
IP Protection	IP67	
Pocket	316 Stainless steel	
Compliance	Declaration of Performance / CE Certification EU Directive 2004/108/E	

2.2.2 Immersion Thermostat

Reference: Immersion Frost Thermostat

Location: See Drawings



Typical Image

Immersion Frost Thermostat as per technical specification below.

Element	Specification	Proposal
Switch rating	230Vac	
Sensing element	Copper	
Measurement range	0 °C -35°C	
Reset function	Automatic	
Temperature differential	0.5 °C	
Probe	Brass	
Probe length	120mm	
Housing	Material ABS Max Ambient temp 80 °C	
Cable entry	M20	
IP Protection	IP43	
Pocket	Brass	
Compliance	Declaration of Performance / CE Certification	

2.3 FIELD DEVICES

2.3.1 Room Thermostats

Reference : Space Digital Thermostat – Networkable (Ts)

Location: See Drawings



Typical Image

Space Digital Thermostat as per technical specification below.

Element	Specification	Proposal
Digital Display	Room temperature & Setpoint	
Temperature Display Format	Celsius	
Temperature Measurement Range	5°C - 95°C	
Temperature Adjustment Range	Lockable for adjustment only between 18°C - 22°C	
Output relay contact rating	10-250VAC, 50-60Hz, 16A SPST N/O	
Power Supply	230 VAC ± 10%, 50/60 Hz	
Output Signal	On/Off	
Output Signal Quantity	3 no.	
Output Signal Power Supply	230 VAC ± 10%, 50/60 Hz	
Maximum ambient temperature	0°C - 70 °C	
Communication	RS485 Modbus RTU	
Logical Address Range	1…32	
Modbus Settings	9600 Baud, 8 Data Bits, None Parity, 1 Stop Bit	
Low Temperature Protection	Required	
Low Temperature Protection Range	5°C - 17 °C	

Dimensions	85mm(W) x 86mm(H) x 14mm(D)	
Mounting	Flush mounting to electrical trunking or surface mounting to single gang electrical socket box.	
Housing	ABS Plastic	
Compliance	Declaration of Performance / CE Certification	

2.3.2 Run-on Timer

Reference : Electronic Run-on Timer (Over-ride Timer)

Location: See Drawings



Typical Image

Electronic Run On Timer as per technical specification below.

Element	Specification	Proposal
Power Supply	24VAC – 230VAC	
Relay contact rating	230VAC 10A	
Time selection	1-5hrs	
Max restriction times	1-2-3hrs	
Accuracy	<+/-1s/h	
Indication	LED	
Dimensions	85mm(W) x 86mm(H) x 14mm(D)	
Housing	White ABS	
Mounting	Flush mounting to electrical trunking/ control panel or surface mounting to single gang electrical socket box.	

2.4 UTILITY METERS

2.4.1 Water Meters

Reference: Cold Water Meter **Location: Boiler House**		
	*Typical Image* Cold Water Meter as per technical specification below.	
Element	**Specification**	**Proposal**
Description	Volumetric water meter	
Media	Mains water	
Visible Display	5 roller counter	
Pulse Output Requirements	Switch type - reed Contacts - VFC Pulse value – 1 per litre Load current - 500mA Max switch voltage - 180 Vdc Contact rating – 10W Flying lead - 2m	
Connection Type	As per Part 3: Standard Clauses	
Inline Strainer	Required	
Meter Size	Refer to drawing	
Installation Positions	Horizontal & vertical	
Valve Body	Epoxy resin coated brass to DIN 50 930 part 6	
Max Pressure	16 Bar	
Media Temperature	0 °C - 30°C	
Operating Temperature	-20 °C - 50 °C	

Compliance	Declaration of Performance / CE Certification IS EN 14154	

2.4.1.1 Heat Meters

Reference: Heat Meter (HM) **Location: Boiler House**		
	*Typical Image* Cold Water Meter as per technical specification below.	
Element	**Specification**	**Proposal**
Description	Heat meter	
Media	LPHW	
Visible Display	Digital	
Pulse Output Requirements	Switch type - reed Contacts - VFC Pulse value – 1 kw/h per pulse Load current - 500mA Max switch voltage - 180 Vdc Contact rating – 10W Flying lead - 2m	
Requirements	- Class 2 Ultrasonic flow sensor - Calculator with integral hardware and software for measuring flow rate, temperature and energy consumption - Temperature sensors - Pulsed Input interface card for water sub-metering	

	- Remote reading via M-Bus or similar interface - Power save mode - 24 month memory - Extensive diagnostic displays	
Connection Type	As per Part 3: Standard Clauses	
Inline Strainer	Required	
Meter Size	Refer to drawing	
Installation Positions	Horizontal & vertical	
Max Pressure	16 Bar	
Media Temperature	1 ^{o}C – 90/130^{o}C	
Operating Temperature	1 ^{o}C – 90/130^{o}C	
Compliance	Declaration of Performance / CE Certification IS EN 14154 MID (Measuring Instrument Directive) 2004/22/ EC, CEN EN 1434 (2007) and OIML R5 (2002)	

3 FIRE PROTECTION EQUIPMENT (67)

3.1 CO_2 FIRE EXTINGUISHER

Reference: CO_2 Fire Extinguisher (C)



Typical Image

CO2 Fire Extinguisher as per technical specification below.

Element	Specification	Proposal
Type	CO_2 Aluminium	
Capacity	2 kg / 9kg (Boiler House)	
Fire Rating	55B	
Cylinder Dimensions	Ø110mm x 540mm	
Filled Weight	5.3kg	
Range of Throw	>4m	
Duration of Discharge	12 seconds	
Working pressure (at 20° C)	62 bar	
Temperature range	-20°C to +60°C	
IS EN3-7 approved	Required	
Swivel horn	Twin wall frost free black polyethene	
Squeeze grip operation	Required	
Corrosion resistant finish	Required	
Wall-mounting bracket	Required	
Guarantee	5 years	
Cylinder BS 5045-8:2000	Required	

3.2 FOAM EXTINGUISHER

Reference: AFFF Extinguisher (W)





Typical Image

Foam Fire Extinguisher as per technical specification below.

Element	Specification	Proposal
Type	AFFF Foam Extinguisher S/P	
Capacity	5 litres	
Fire Rating	13A 144B	
Cylinder Dimensions	Ø160mm x 565mm	
Filled Weight	10.09kg	
Range of Throw	>4m	
Duration of Discharge	30 seconds	
Working pressure (at 20°C)	15 bar	
Temperature range	0°C to +60°C	
BS EN3 approval	Required	
Non-conductive, frost-free, anti-static horns	Required	
Squeeze grip operation	Required	
Corrosion resistant finish	Required	
Wall-mounting bracket	Required	
Audible Anti-tamper Device	Required – battery powered, 105 dBA alarm	
Guarantee	5 years	
Manufactured to BS 5423	Required	

3.3 FIRE BLANKET

Reference: Fire Blanket (FB)		
 *Typical Image* Fire Blanket as per technical specification below.		
Element	**Specification**	**Proposal**
Type	Woven fibreglass fire blanket	
Size	1.2m x 1.2m	
Wall-mounting bracket	Required	
Guarantee	5 years	
Manufactured to IS 1869:1997	Required	
Adhesive Wall Signage	Required	

4 ELECTRICAL INSTALLATION

4.1 ELECTRICAL METER

Ref: Electricity Meter		
	*Typical Image* Electrical Multi-meter as per technical specification below.	
Element	**Specification**	**Proposal**
Measuring Capability	**Primary**: up to 9999 **Secondary:** 5 A	
Current Transformers	Required	
Voltage Range	100V -500V	
Display	Backlit LCD illuminated 3-line display with control buttons below	
Tariff Capability	Facility for setting a minimum of 2 No. tariffs and internal Clock for tariffs and monthly values	
Connectivity	RS485 serial link	
IP Rating	IP52	