Church of the Holy Cross, Sarratt, Hertfordshire

18th June 2024

Revised Proposals for Replacement Space Heating System

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Project reference: 4263/R1

Document Revision	Author	Checked By	Date
A	DG	NVB	June 2024

CONTENTS

1 Introduction

This revised report describes the latest proposals for a replacement space heating system for Holy Cross Church, Sarratt.
A previous report reference 4263 dated 24th July 2023 with Rev B August 2023 described a previous proposal for an "all electric" Far radiant heating installation incorporating overhead Herschel Halo heaters. A "fall-back" option was also included in this report for consideration in the event of the "all electric" Halo scheme proving to be unaffordable in capital cost terms. The "fall-back" option incorporated 2No Halo heaters in the Nave of the church which is currently the most deficient area in terms of heating, and the retention of the existing wet radiator system with certain upgrades including the provision of a new gas fired boiler plant for the remainder of the church.

The "fall-back" option was accepted in principle by the churches PCC and advice was sought from the Diocese of St Albans DAC as to the likelihood of a faculty being issued for the scheme on this basis. A response to this request for advice was received from Emma Critchley, the DAC Pastoral and Advisory Secretary, by email on the 20th December 2023 which expressed some concerns at the proposal to provide a new gas fired boiler when considered against the Synod of the Church of England's drive to Net Zero by 2030. Some suggestions were included on the 20th December 2023 email for other options to move directly to "all electric" heating. This advice was considered by the church's PCC and their building services consulting engineer David Gadsdon, and it was agreed to discuss the situation and the proposed alternatives at a virtual meeting which occurred on the 12th March 2024. Attendees at this meeting were as follows:

Emma Critchley – St Albans DAC Secretary

Tom Abraham - St Albans DAC Net Zero Carbon Officer

Neil Altman - Holy Cross PCC Representative

David Gadsdon – Environmental Engineering Partnership (EEP), Heating Consultant

The outcome of the meeting was that EEP should prepare a revised report for the heating system in the church based on the following: -

- 2No 'Far' Radiant Halo heaters for the Nave (as per the original report) for "Boost Heating" purposes.
- The existing wet radiator systems was to be retained with certain pipework modifications but the heat source for this system would now be air source heat pumps (ASHP) which would be used to provide background conservation heating generally.
- Consideration to be given to other forms of "boost" electric heating for other areas of its church possibly using electric under pew heating.

- The report should include details of the estimated running and capital installation costs for the revised all electric heating proposals.

2 Details of Revised Heating Proposals

2.1 Background Heating

- Provide 2No 8KW monobloc ASHP's externally in the open space to the North of the Chancel which is currently occupied by the plastic oil tank serving the existing oil-fired boiler. The new heat pumps would be located on the existing concrete base, supporting the existing oil tank. This is commensurate with the size of the heat pumps. Exposed weatherproofed and insulated pipework from the ASHPs would be run at low level back to the existing basement boiler room.

- The existing oil-fired boiler and flue pipe would be removed and the new pipework from the heat pumps would enter the boiler room using the existing flue pipe aperture as far as practical to cause the minimum of disturbance to the fabric of the church.

- The 2No heat pumps would have individual pumped hydraulic circuits into the basement boiler room where they would be connected to a 300 litre pre-insulated buffer tank located generally in the space vacated by the existing boiler. The heat pumps would be controlled in a reversable" Cascade" arrangement to even out the load on each unit and to match the conservation heating demand from the church.

- The type of ASHP's proposed would be similar/equivalent to the Mitsubishi PUZ-WZ800VAA(BC) units which use R290 refrigerant and are capable of "high" water temperature operation for short periods of time when the maximum conservation heating demand would occur in cold weather. (Details of this type of unit are included in Appendix 1 at the rear of this report.)

- The existing heating circuits would be connected to the new buffer tank in the basement boiler house and would incorporate a new pump set. The existing feed and expansion tank at high level in the Vestry would be removed and the system converted to a 'sealed' arrangement with a diaphragm expansion vessel located in the basement boiler room.

- A new digital control system would be provided for the installation with facilities for remote access for convenience if required. A data connection into the boiler house of the church would be required for this purpose.

- Part of the existing radiator pipework system in the church would be converted from a single pipe system to a two-pipe system to improve the general efficiency of the installation. It should be appreciated that the normal operating temperature of a heating system powered from a heat pump plant will be generally lower than an equivalent system powered by a boiler plant. This is to preserve the operating efficiency of the heat pump (known as the Coefficient of Performance COP). The heat output from the radiators and exposed pipework within the church will therefore be generally lower although the type of heat pumps selected do have the facility for a higher than normal operating temperature for short periods of time

(70°C) as previously referred to. However, as this part of the system is only intended to provide background conservation heating, the lower temperature water generated by the ASHPs should be generally acceptable, without needing to carry out costly radiator replacements and pipework modifications to achieve an increased heat output.

Drawings showing the layout of the background heating scheme as described above are included in Appendix 2 at the rear of this report.

2.2 Boost Heating

Nave

- The boost heating for the Nave would compromise of 2No single phase electric 4.8KW Herschel's Halo 'Far' Radiant chandelier type heater as per the "fall back" option described in the original EEP report. These would be suspended from the timber roof structure in the Nave area by load rated chains. The mounting height for these units would ideally be 3.5metres from floor level.

- The Halo heaters are able to be supplied in a variety of finishes appropriate to a church environment and can also have features/motif particular to the church incorporated in the perimeter surround. The PCC would need to suggest their requirements in both these respects.

- The Halo heaters can also incorporate LED up and downlights at the perimeter of the units and it is understood that the church would like to have this facility. Separate switching for the lighting and heating elements would be required from within the church from a convenient location.

- The control of the Halo's requires a main control box most likely incorporated on the wall in the Vestry. "Smart" wall mounted switches for local control would be located at convenient locations within the church at positions to be finally advised by the PCC. These "Smart" switches would incorporate the facility for remote operation if required which would require a data connection to be available in the church. Separate electrical wiring circuits would be required for the heating elements and lights in the Halo heaters and the wiring would be generally run at high level in the roof area and would run down the support chains to connect to the Halos. Particular care would be taken to conceal the cabling as unobtrusively as possible with careful consideration of the fixings utilised and the cable locations. The type of cables proposed would be FP200 which can be painted as necessary to match the existing paint/timber furniture in the church.

- A drawing showing the layout of the boost heating scheme is included Appendix 3 at the rear of this report.

North Aisle

- The West end of the North aisle contains the organ and there is no proposal to provide supplementary boost heating in this area other than to provide an electric under pew convector heater below the organist chair.

- The East end of the North aisle has 3No pews and at present the area has no heating at all. There is a potential to provide a series of electric under pew convector heaters below the seats of all three pews. It is however understood that the pews in this area are rarely occupied and therefore under pew heating is not considered to be a priority for this area.

South Aisle

- The East end of the South aisle has a limited amount of background heating provided by several cast iron radiators, but these are not ideally located to provide much comfort to the occupants of these pews. The pews in this area are apparently occupied more frequently and under pew heating is therefore proposed for the 5No banks of pews in the South aisle to improve the comfort for the occupants of this area.

Chancel Choir Pews

- There are 4no choir pews in the Chancel area (2no on either side). The 2no cast iron radiators in this area are located in the spaces between the altar rail and East end of the pews where they would have very limited effect on the occupants of the pews. There is therefore a potential need to also provide under pew heaters under all 4no banks of pews in this area, although the church advises that these pews are rarely occupied and hence may again not be a priority.

Control for Under Seat Electric Pew Heaters

- The type of pew heaters which would be proposed incorporate have integral internal thermostats which at preset to 21°C. These provide local temperature control on an individual basis to prevent overheating.

- It is proposed that each of the areas with the potential to have pew heaters would be served with a separate electrical circuits which would be switched from the Vestry via a timer switch to prevent them being left on accidentally. With this arrangement the pew heaters could be switched on for areas of the church pews that are occupied with the heaters serving the empty pews areas left switched off if the non-priority areas at present are ever installed.

Electric Wiring for Pew Heaters

- The locations where under pew heaters could be installed are generally in areas where timber floors with voids below exist. Therefore, the associated wiring and associated units for the pew heaters could be run with suitable cabling in the void areas with short connections from below to connect to the heaters. Steel wired armoured cables (SWA) would be proposed.

- The wiring for the potential pew heaters for the choir pews in the Chancel if these are ever required, could be installed under the rear pews against the perimeter walls with short branch connections to the front rows of pews.

- In summary, the wiring for the pew heaters should be able to be installed with the minimum disturbance and effect on the aesthetics of the church, which the cables being painted to blend into the finishes of the areas that they would be exposed.

2.3 Summary

In view of the advice from the church that only the pews in the South aisle are normally occupied, it is proposed to not provide for pew heaters in the North aisle or Chancel at this time.

The proposal for boost heating covered by this report is therefore summarised as follows:

- 2No 4.8KW single phase Halo heaters in the Nave
- 1No 250W single phase pew heater for the organist in the North aisle
- Under pew heating in the South aisle at lengths appropriate to avoid the timber seat supports. Total heating capacity 6KW single phase

The total single phase heating capacity for the boost heating is 16.1KW, equivalent to 67 Amps.

A drawing showing the electric boost heating proposals is included in Appendix 3 at the rear of this report.

3 Electric Loadings

- The existing incoming electrical supply capacity has been confirmed as being 100 Amp 240V single phase by UK Power Networks with a minor upgrade of the current service head in the Vestry. The additional electrical load from the proposed 2No ASHPs is 2x22 Amps plus an allowance for pumps say 50 Amps in total.

- The additional electrical load from the boost electric heating as proposed is 67 Amps.

- The combined load of the heat pumps and the boost electrical heating is 50 Amps + 67 Amps = 117 amps which exceeds the available electrical capacity without any allowance for the general electrical requirements for the church – lighting etc.

- It is therefore not possible or necessary to run the background heating and the boost heating simultaneously without a major upgrade to the incoming supply cable which is likely to cost

between £15,000 and £20,000 when excavation costs to cross the church yard (along the existing pathway) is taken into account.

- The proposal is therefore to arrange the new electrical switch gear so that the boost and background heating are unable to be operated together. The total load for each operating condition would therefore be as follows:

Boosting Heating: 67 + General Electrics for the Church < 100 Amps

Background Heating: 50 Amps + General Electrics for the Church <100Amps

4 Estimated Capital Costs of Proposed New Installations

4.1 General

The estimated costs detailed below are based on the revised way forward to provide a replacement "all electric" space heating system for the church. The proposals include the removal of the existing time expired oil-fired boiler plant, the provision a new air source heat pump installation to replace the existing boiler plant which would be connected to the existing pipework and radiators in the church. The interface between the heat pumps and the existing radiator system would be the proposed new buffer tank which would be located: in the existing basement boiler room.

The above-described installation would be used to provide background/conservation heating to protect fabric and contents of the church. Comfort heating for the benefit of the occupants of the church would compromise (2no) electric 'Far' radiant heaters (Halos) in the Nave and under Pew electric heaters in the Pews in the South aisle which are understood to be regularly occupied and also under the organist's seat. No under Pew heating is provided for under any of the other Pews at this stage as they are understood to be very rarely occupied.

4.2 Estimated Capital Costs

Contract Preliminaries and internal scaffold tower to install 2no high level 'Halo' heaters	£2,200.00
2 No single phase 4.8KW Halo chandelier heaters including installation, suspension tubes/chains and controls	£18,000.00
FP200 cabling containment and accessories to serve the new Halo heaters	£3,300.00
Upgrade of existing incoming service head to 100Amp single phase with switchgear modifications	£3,500.00
Earthing, Bonding and minor electrical modifications	£2,200.00

Demolition and safe removal of existing oil-fired boiler	£2,200.00
Removal and safe disposal of asbestos cement flue pipe by licensed specialist	£1,650.00
Pipework modification to single pipe radiator circuit	£1,300.00
Conversion of existing heating system to a pressurised system (1 bar maximum) including removal of existing feed and expansion tank in the Vestry, new mains fill connection and a new diaphragm expansion vessel in the basement boiler room	£900.00
General builders work in connection and making good	£500.00
Flushing through the existing radiator system heating pipework and radiators, refilling system with clean water with a 25% glycol mix to prevent freezing of the external heat pump pipework	£1,100.00
17no electric under Pew heater installation and fixings	£4,500.00
Steel wire armoured cabling and accessories to serve the new under Pew heaters	£4,250.00
2no ASHP's with external weatherproofed and pre-insulated pipework accessories and 2no circulation pumps installed in basement boiler room	£19,500.00
Electrical supply and accessories to ASHP's and pumps	£1,600.00
300 litre pre-insulated buffer tank located in basement boiler room, pump set and wiring	£3,500.00
Pipework connection and accessories in boiler room to connect to existing heating system connections (2 circuits) and thermal installation	£1,500.00
System controls and control wiring	£2,000.00
Commissioning and testing of new mechanical and electrical installation	£2,500.00
Operating and Maintenance manual and Health and Safety file	£1,000.00
Contingency	£1,500.00
Heating Subtotal	**£78,700.00**
Addition of Up and Down lighters to Halo heaters	£2,700.00
Wiring circuits to Halo lights, switching and accessories	£2,300.00
Total Estimated Capital Costs	**£83,700.00**

5 Estimated Operating Costs of Proposed New Installations

5.1 Basis of calculation – Electric Boost Heating

Service/Events:

4 regular services per month for 8 months	32
Allowance for particular additional events	6
4 weddings and 4 funerals per annum	8
Total Service/Events	46

Boost Heating Electrical loadings:

2 x 4.8KW Halos	9.6KW
1 Organists Heaters	0.25KW
Under Pew heater (South aisle)	6.25Kw
Total electrical Loading	16.10KW

Assumed maximum boost heating period: 2 hours

Electrical cost per KWH as per Dec 23 British Gas Electricity Bill: **26.14p (ex VAT)**

5.2 Boost Heating Electrical Consumption Calculation and Electricity Costs (Excluding Standing Charges)

Electricity: 16.1KW x 2 hours x 46 events/year = **1481.2KWhrs**

Costs: 1481.2 x 26.14p/Kwhr = **£388.00 (ex VAT)**

5.3 Basis of Calculation – Electric Background/Conservation Heating

- Minium Temperature in the church: 13°C
- Degree Day Adjustment Factors for 13°C: $\frac{0.57\ (12°C) + 0.82\ (14°C) \times 1}{2} = 0.695$
- Degree Days for Thames Valley: 2012
- Degree Days Adjustment for 13°C minimum temperatures = 2012 x 0.695 = 1399hrs
- Further Degree Day adjustment for heavy weight building and intermittent operation respectively 0.96 and 0.95 respectively
- Equivalent full load operation hours: 1399 x 0.95 x 0.96 = 1276 hours
- Average Coefficient Performance (COP) for ASHP's: 2.8

5.4 Background Heating Electrical Consumption Calculation and Electricity Costs (ex VAT)

- Annual Background Heating Requirement: 1276 x 16.4 = 20,927Kwhr
- Annual Electrical Consumption for ASHP's: $\frac{20,927}{2.8}$ = 7,474Kwhr

  Plus: Pipework/Buffer Tank Losses @ 10% = 748Kwhr

  Plus: Electricity Consumed by Pumps: 1.5KW x 1276 = 1914 Kwhr

Total = 10,136Kwhr/annum

Costs: 10,136Kwhr x 26.14p/kwhr = **£2,650 / Annum (ex VAT)**

5.5 Total Estimated Annual Electric Space Heating Costs (Ex VAT)

Background Heating : £2650

Boost Heating: £388

£3038 (ex VAT)

Appendix 1

Mitsubishi – Ecodan R290 Air Source Heat Pump

Heating | Product Information

MITSUBISHI ELECTRIC

PUZ-WZ80VAA(-BS)

Ecodan R290
Monobloc Air Source Heat Pump

R290

Key Features:	Key Benefits:
A+++ heating efficiency	Minimised energy consumption
Ultra quiet noise levels	Flexible product placement
MELCloud enabled	Remote control, monitoring, maintenance and technical support
High water temperature of up to 75°C	Ideal for energy storage
Fully electric source of heating and hot water	Zero carbon ready

MELCloud

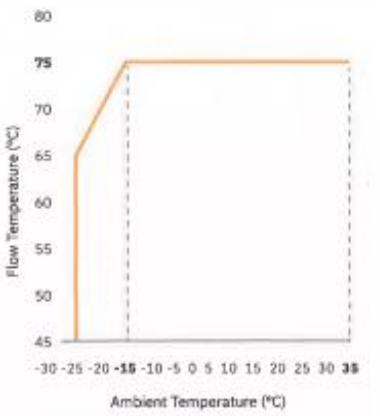
ecodan.co.uk

Heating | Product Information

PUZ-WZ80VAA(-BS)
Ecodan R290
Monobloc Air Source Heat Pump

OUTDOOR UNIT		PUZ-WZ80VAA(-BS)
HEAT PUMP SPACE HEATER - 35°C	ErP Rating	A++
	ηs	149%
	SCOP (MCS)	3.56
HEAT PUMP SPACE HEATER - 35°C	ErP Rating	A+++
	ηs	176%
	SCOP (MCS)	4.49
HEAT PUMP COMBINATION HEATER - Large Profile[1]	ErP Rating	A+
	ηwh	134%
HEATING[2] (A-7/W35)	Capacity (kW)	8.2
	Power Input (kW)	3.51
	COP	2.28
OPERATING AMBIENT TEMPERATURE (°C DB)		-25 ~ +46
MAXIMUM WATER OUTLET TEMPERATURE (°C)		75
SOUND DATA[3]	Pressure Level at 1m (dBA)	40
	Power Level (dBA)[4]	58
WATER DATA	Pipework Size (mm)	28
	Flow Rate (l/min)	23
	Water Pressure Drop (kPa)	32.22
DIMENSIONS (mm)	Width	1050
	Depth	480
	Height	1020
WEIGHT (kg)		117
ELECTRICAL DATA	Electrical Supply	220-240v 50Hz
	Phase	Single
	Nominal Running Current (MAX) (A)[5]	22
	Fuse Rating - MCB Sizes (A)[6]	25
REFRIGERANT CHARGE (kg) / CO2 EQUIVALENT (t)	R290 (GWP 3)	1.0 / 0.009

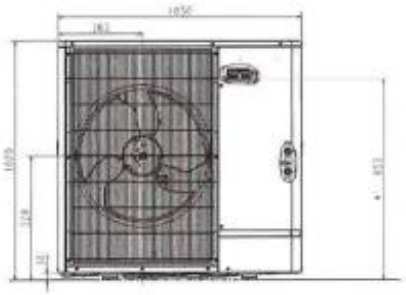
FLOW TEMPERATURE



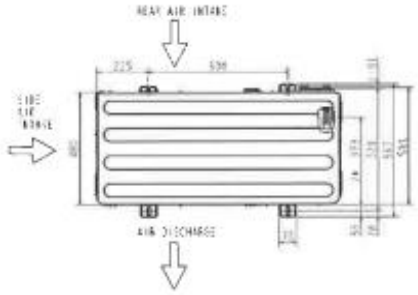
NOTES:
*1 Combination with EHPT20X-MEHDW Cylinder
*2 Under normal heating conditions at outdoor temp: -7°CDB / -8°CWB, outlet water temp 35°C, inlet water temp 30°C
*3 Under normal heating conditions at outdoor temp: 7°CDB / 6°CWB, outlet water temp 55°C, inlet water temp 47°C as tested to BS EN14511
*4 Sound power level tested to BS EN12102
*5 Under normal heating conditions at outdoor temp: 7°C, outlet water temp: 35°C
*6 MCB Sizes BS EN60898-2 & BS EN60947-2
η_s is the seasonal space heating energy efficiency (SCOP) η_{wh} is the water heating energy efficiency

PUZ-WZ80VAA(-BS) [illegible] All dimensions (mm)

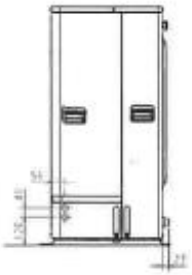
FRONT VIEW



UPPER VIEW



SIDE VIEW



MITSUBISHI ELECTRIC
Changes for the Better

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@Ecodanheating | Mitsubishi Electric Heating UK | Mitsubishi Electric Heating UK | Mitsubishi Electric Ecodan | Mitsubishi Electric Heating UK | lhihub-mitsubishielectric.co.uk

UNITED KINGDOM Mitsubishi Electric Europe Living Environment Systems Division, Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, England. Telephone: 01707 282880 Fax: 01707 278881
IRELAND Mitsubishi Electric Europe, Westgate Business Park, Ballymount, Dublin 24, Ireland. Telephone: (01) 419 8800 Fax: (01) 419 8890 International code: (003531)

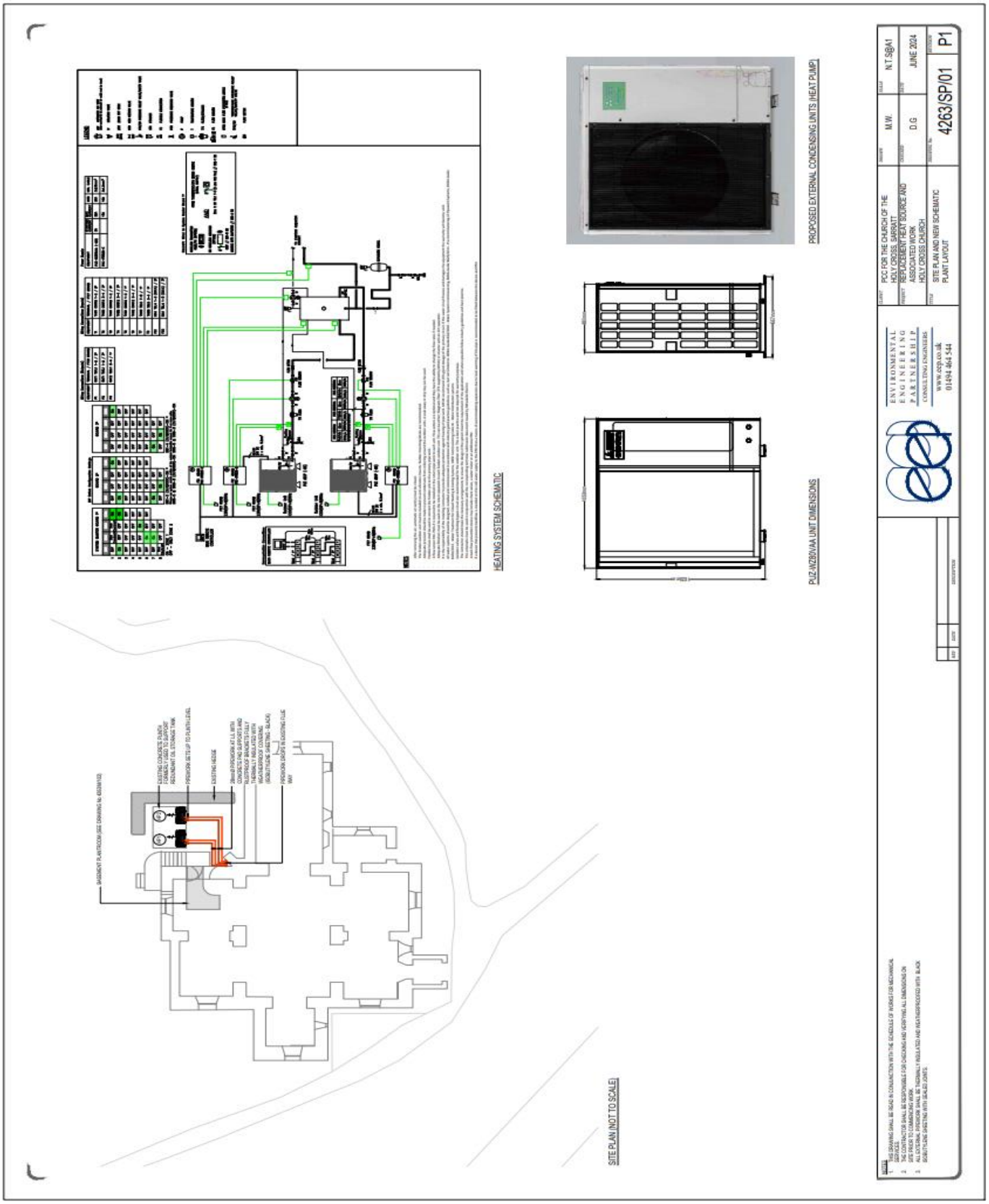
Note: Refer to 'Installation Manual' and 'Instruction Book' for further 'Technical Information'. The flow rating is for guidance only and please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas. R410A (GWP:2088), R32 (GWP:675), R407C (GWP:1774), R134a (GWP:1430), R513A (GWP:631), R454B (GWP:466), R1234ze (GWP:7) or R1234yf (GWP:4). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No 626/2011 from IPCC 3rd edition, these are as follows: R410A (GWP:1975), R32 (GWP:550), R407C (GWP:1650) or R134a (GWP:1300).

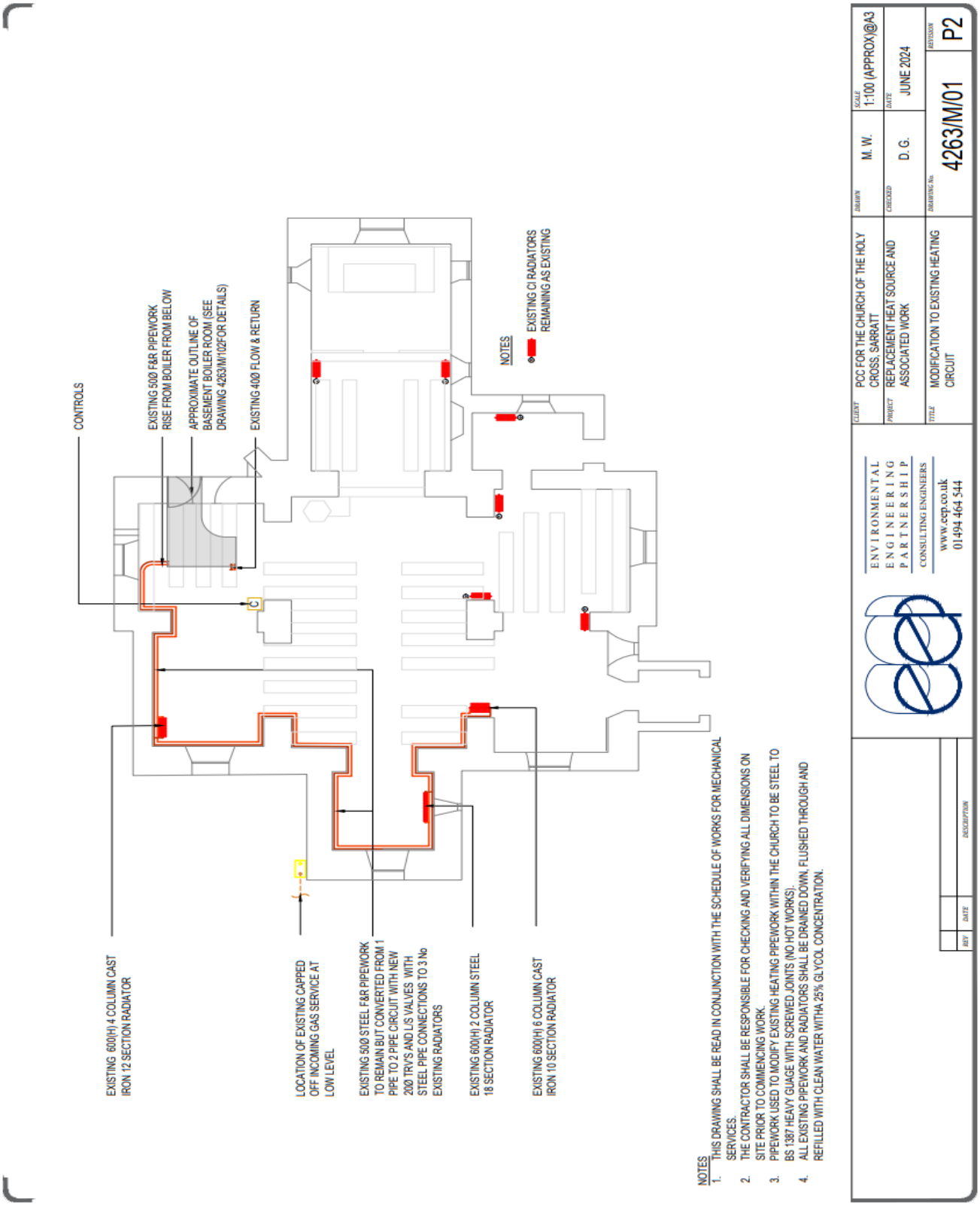
Effective as of October 2023

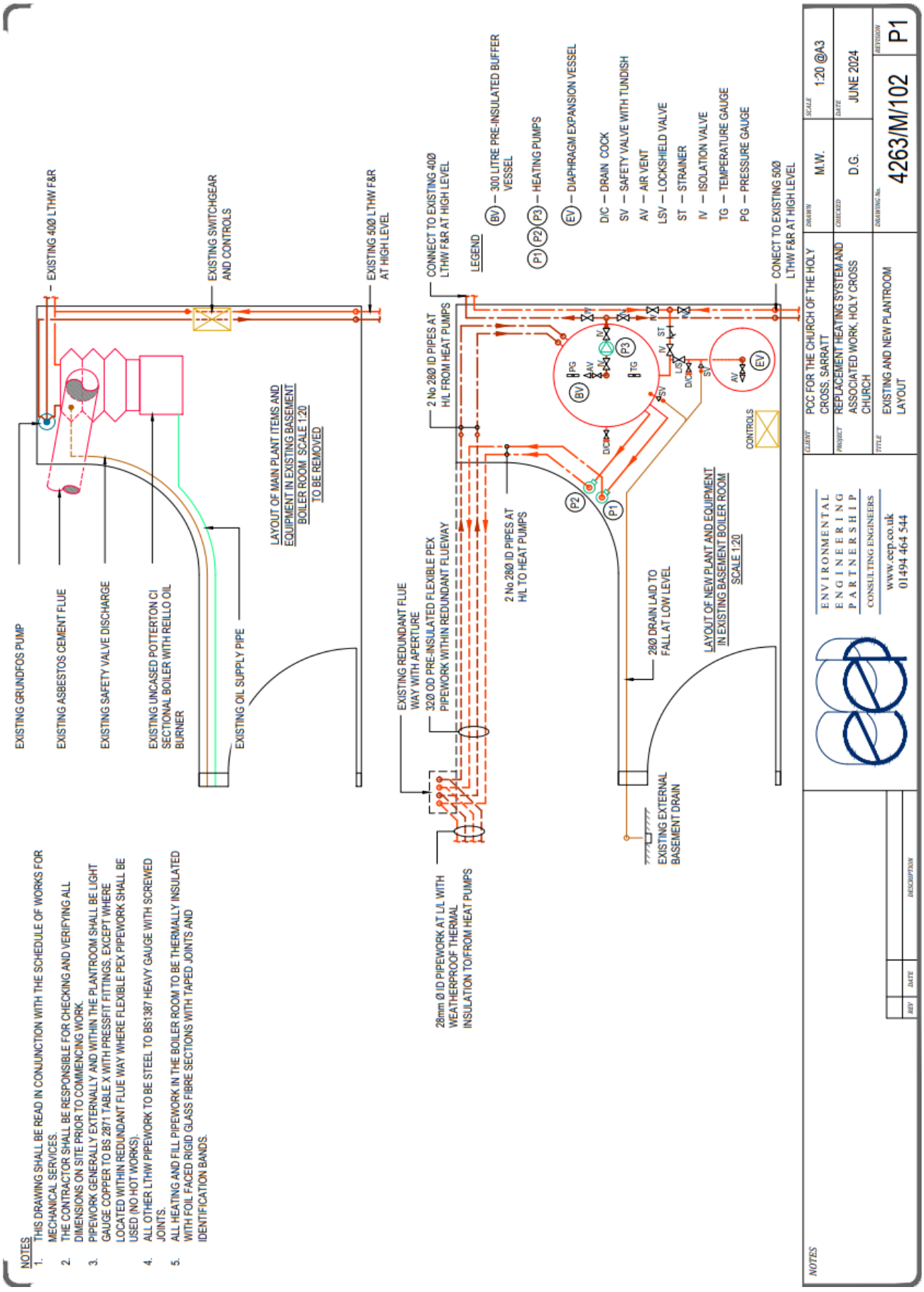
Green Gateway greengateway.mitsubishielectric.co.uk

Appendix 2

Background Heating Drawings (3NO)

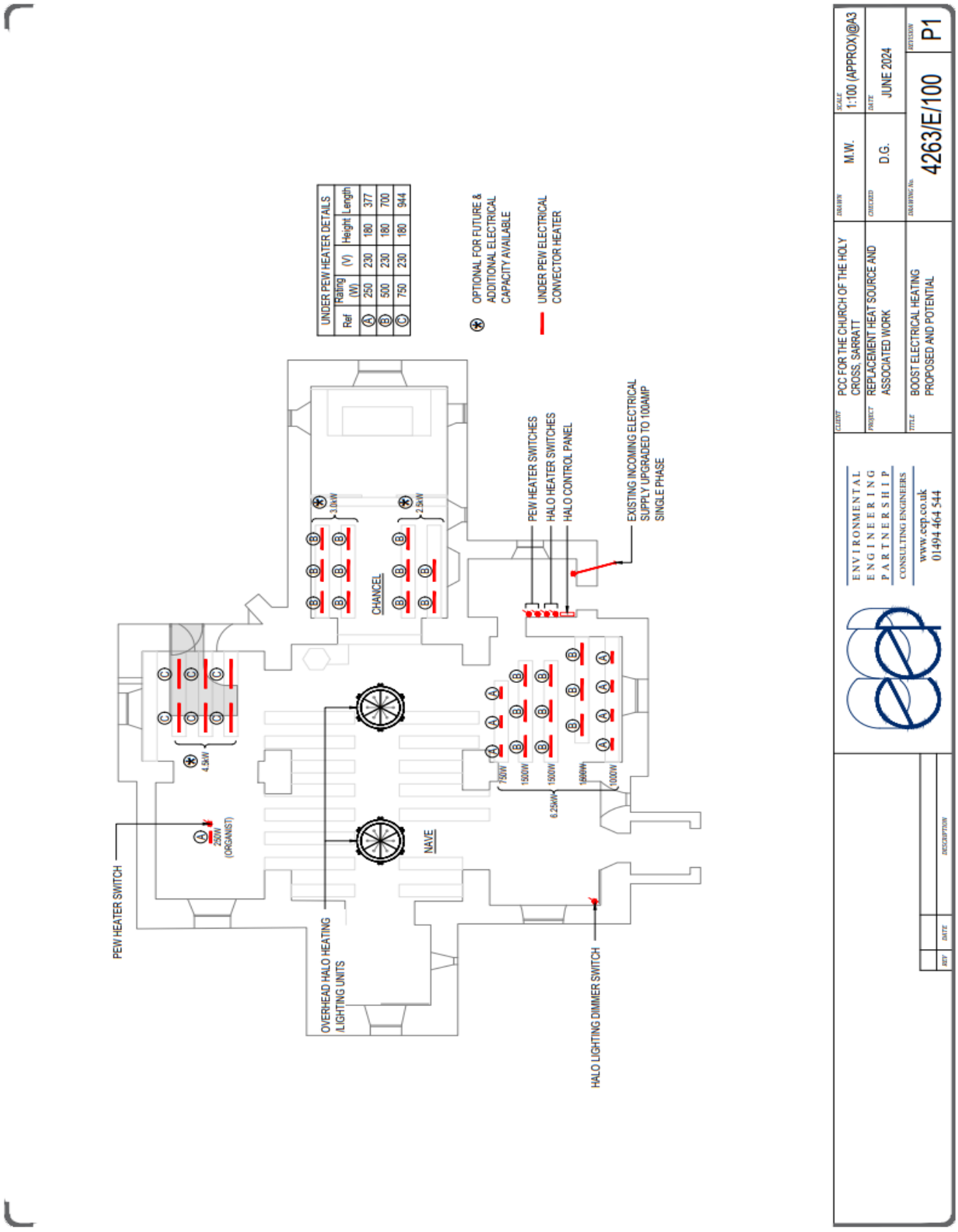

HEATING SYSTEM SCHEMATIC
PROPOSED EXTERNAL CONDENSING UNITS (HEAT PUMP)
PUZ-WZ80VAA UNIT DIMENSIONS
SITE PLAN (NOT TO SCALE)
ENVIRONMENTAL ENGINEERING PARTNERSHIP
CONSULTING ENGINEERS
www.eep.co.uk
01494 464 544
PCC FOR THE CHURCH OF THE HOLY CROSS, SARRATT
REPLACEMENT HEAT SOURCE AND ASSOCIATED WORK
HOLY CROSS CHURCH
SITE PLAN AND NEW SCHEMATIC PLANT LAYOUT
M.W.
D.G
N.T.S@A1
JUNE 2024
4263/SP/01
P1


CONTROLS
EXISTING 50ØD F&R PIPEWORK RISE FROM BOILER FROM BELOW
APPROXIMATE OUTLINE OF BASEMENT BOILER ROOM (SEE DRAWING 4263/M/102FOR DETAILS)
EXISTING 40ØD FLOW & RETURN
NOTES
EXISTING CI RADIATORS REMAINING AS EXISTING
EXISTING 600(H) 4 COLUMN CAST IRON 12 SECTION RADIATOR
LOCATION OF EXISTING CAPPED OFF INCOMING GAS SERVICE AT LOW LEVEL
EXISTING 50Ø STEEL F&R PIPEWORK TO REMAIN BUT CONVERTED FROM 1 PIPE TO 2 PIPE CIRCUIT WITH NEW 20Ø TRV'S AND L/S VALVES WITH STEEL PIPE CONNECTIONS TO 3 No EXISTING RADIATORS
EXISTING 600(H) 2 COLUMN STEEL 18 SECTION RADIATOR
EXISTING 600(H) 6 COLUMN CAST IRON 10 SECTION RADIATOR
NOTES
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SCHEDULE OF WORKS FOR MECHANICAL SERVICES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.
3. PIPEWORK USED TO MODIFY EXISTING HEATING PIPEWORK WITHIN THE CHURCH TO BE STEEL TO BS 1387 HEAVY GUAGE WITH SCREWED JOINTS (NO HOT WORKS).
4. ALL EXISTING PIPEWORK AND RADIATORS SHALL BE DRAINED DOWN, FLUSHED THROUGH AND REFILLED WITH CLEAN WATER WITHA 25% GLYCOL CONCENTRATION.
REV
DATE
DESCRIPTION
ENVIRONMENTAL ENGINEERING PARTNERSHIP
CONSULTING ENGINEERS
www.cep.co.uk
01494 464 544
CLIENT PCC FOR THE CHURCH OF THE HOLY CROSS, SARRATT
PROJECT REPLACEMENT HEAT SOURCE AND ASSOCIATED WORK
TITLE MODIFICATION TO EXISTING HEATING CIRCUIT
DRAWN M. W.
CHECKED D. G.
DRAWING No. 4263/M/01
SCALE 1:100 (APPROX)@A3
DATE JUNE 2024
REVISION P2


EXISTING 400 LTHW F&R
EXISTING SWITCHGEAR AND CONTROLS
EXISTING 500 LTHW F&R AT HIGH LEVEL
EXISTING GRUNDFOS PUMP
EXISTING ASBESTOS CEMENT FLUE
EXISTING SAFETY VALVE DISCHARGE
EXISTING UNCASED POTTERTON CI SECTIONAL BOILER WITH REILLO OIL BURNER
EXISTING OIL SUPPLY PIPE
LAYOUT OF MAIN PLANT ITEMS AND EQUIPMENT IN EXISTING BASEMENT BOILER ROOM SCALE 1:20 TO BE REMOVED
CONNECT TO EXISTING 400 LTHW F&R AT HIGH LEVEL
LEGEND
BV — 300 LITRE PRE-INSULATED BUFFER VESSEL
P1 P2 P3 — HEATING PUMPS
EV — DIAPHRAGM EXPANSION VESSEL
DIC — DRAIN COCK
SV — SAFETY VALVE WITH TUNDISH
AV — AIR VENT
LSV — LOCKSHIELD VALVE
ST — STRAINER
IV — ISOLATION VALVE
TG — TEMPERATURE GAUGE
PG — PRESSURE GAUGE
CONECT TO EXISTING 500 LTHW F&R AT HIGH LEVEL
2 No 280 ID PIPES AT H/L FROM HEAT PUMPS
EXISTING REDUNDANT FLUE WAY WITH APERTURE
320 OD PRE-INSULATED FLEXIBLE PEX PIPEWORK WITHIN REDUNDANT FLUEWAY
2 No 280 ID PIPES AT H/L TO HEAT PUMPS
28mm Ø ID PIPEWORK AT L/L WITH WEATHERPROOF THERMAL INSULATION TO/FROM HEAT PUMPS
280 DRAIN LAID TO FALL AT LOW LEVEL
LAYOUT OF NEW PLANT AND EQUIPMENT IN EXISTING BASEMENT BOILER ROOM SCALE 1:20
EXISTING EXTERNAL BASEMENT DRAIN
CONTROLS
NOTES
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SCHEDULE OF WORKS FOR MECHANICAL SERVICES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.
3. PIPEWORK GENERALLY EXTERNALLY AND WITHIN THE PLANTROOM SHALL BE LIGHT GAUGE COPPER TO BS 2871 TABLE X WITH PRESSFIT FITTINGS, EXCEPT WHERE LOCATED WITHIN REDUNDANT FLUE WAY WHERE FLEXIBLE PEX PIPEWORK SHALL BE USED (NO HOT WORKS).
4. ALL OTHER LTHW PIPEWORK TO BE STEEL TO BS1387 HEAVY GAUGE WITH SCREWED JOINTS.
5. ALL HEATING AND F LL PIPEWORK IN THE BOILER ROOM TO BE THERMALLY INSULATED WITH FOIL FACED RIGID GLASS FIBRE SECTIONS WITH TAPED JOINTS AND IDENTIFICATION BANDS.
NOTES
REV DATE DESCRIPTION
ENVIRONMENTAL ENGINEERING PARTNERSHIP
CONSULTING ENGINEERS
www.eep.co.uk
01494 464 544
CLIENT PCC FOR THE CHURCH OF THE HOLY CROSS, SARRATT
PROJECT REPLACEMENT HEATING SYSTEM AND ASSOCIATED WORK, HOLY CROSS CHURCH
TITLE EXISTING AND NEW PLANTROOM LAYOUT
DRAWN M.W.
CHECKED D.G.
DRAWING No. 4263/M/102
SCALE 1:20 @A3
DATE JUNE 2024
REVISION P1

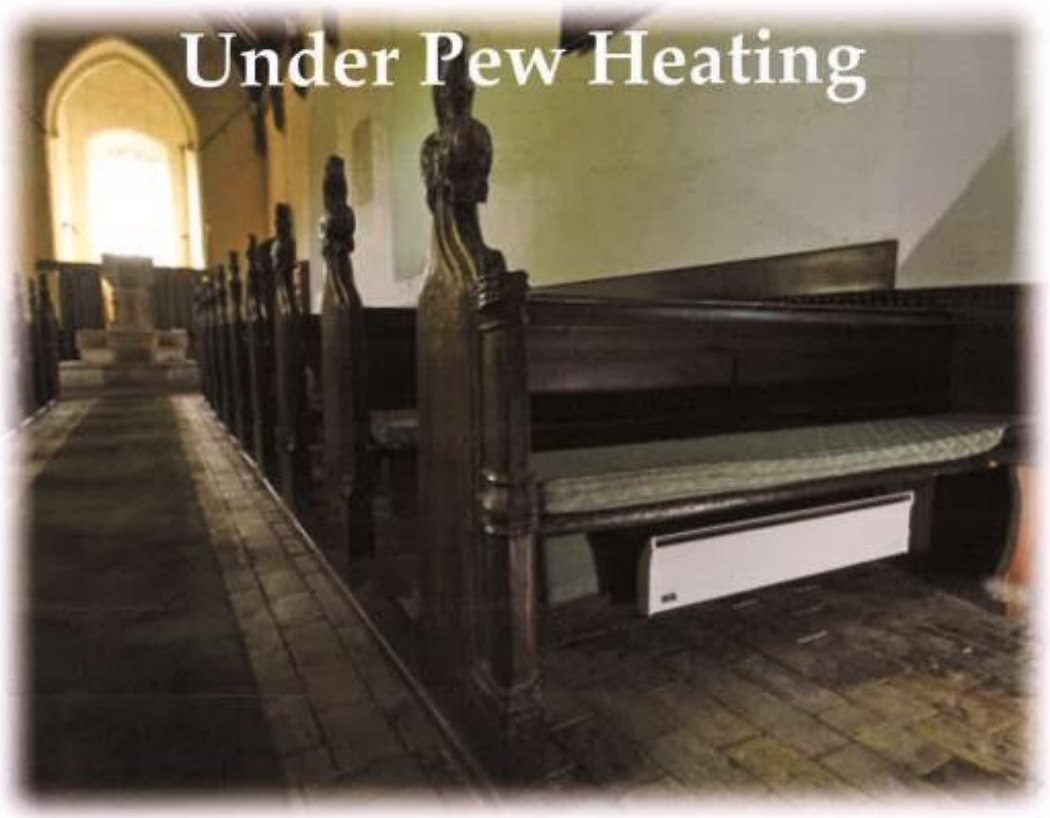
Appendix 3

Boost Electric Heating (Proposed and Potential Drawing)


UNDER PEW HEATER DETAILS
Ref
Rating (W)
(V)
Height
Length
A 250 230 180 377
B 500 230 180 700
C 750 230 180 944
OPTIONAL FOR FUTURE & ADDITIONAL ELECTRICAL CAPACITY AVAILABLE
UNDER PEW ELECTRICAL CONVECTOR HEATER
PEW HEATER SWITCHES
HALO HEATER SWITCHES
HALO CONTROL PANEL
EXISTING INCOMING ELECTRICAL SUPPLY UPGRADED TO 100AMP SINGLE PHASE
CHANCEL
NAVE
3.0kW
2.5kW
4.5kW
250W (ORGANIST)
750W
1500W
1500W
1500W
1000W
6.25kW
PEW HEATER SWITCH
OVERHEAD HALO HEATING /LIGHTING UNITS
HALO LIGHTING DIMMER SWITCH
ENVIRONMENTAL ENGINEERING PARTNERSHIP
CONSULTING ENGINEERS
www.cep.co.uk
01494 464 544
CLIENT
POC FOR THE CHURCH OF THE HOLY CROSS, SARRATT
PROJECT
REPLACEMENT HEAT SOURCE AND ASSOCIATED WORK
TITLE
BOOST ELECTRICAL HEATING PROPOSED AND POTENTIAL
DRAWN
M.W.
CHECKED
D.G.
DRAWING No.
4263/E/100
SCALE
1:100 (/APPROX)@A3
DATE
JUNE 2024
REVISION
P1
REV
DATE
DESCRIPTION

Appendix 4

Typical Under Pew Electric Convector Heater



Having been involved in successfully heating churches and places of worship all over the UK for more than 30 years with our short wave radiant heaters, we were often asked about replacing old inefficient tubular heaters fitted to the bottom of the rear of a pew or under the seat. It was about 10 years ago that a heating advisor to a large Diocese, that often recommended our radiant heaters, noticed a panel convector heater in our literature that we supplied for use in conservatories, apartments, bedrooms etc in domestic situations. He found that it fitted neatly under the seat or pew and could be fixed with its lightweight bracket to the back of the pew or using feet to the floor. It produces warm air to the underside of the pew seat, which then disperses and drifts around the legs and body of the person seated in that pew.

Long pre-heating is not required therefore running costs are low. They are completely silent and are available in various wattage from 250W-1400W to suit all sizes of pews. Currently available in black with no controls.

This system is proving very popular and there will be an installation near you. They can be used in conjunction with Solaire radiant heaters for a very effective "High and Low" system.