



ENVIRONMENTAL
ENGINEERING
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CONSULTING ENGINEERS

Re-ordering Scheme (Project Inspire)

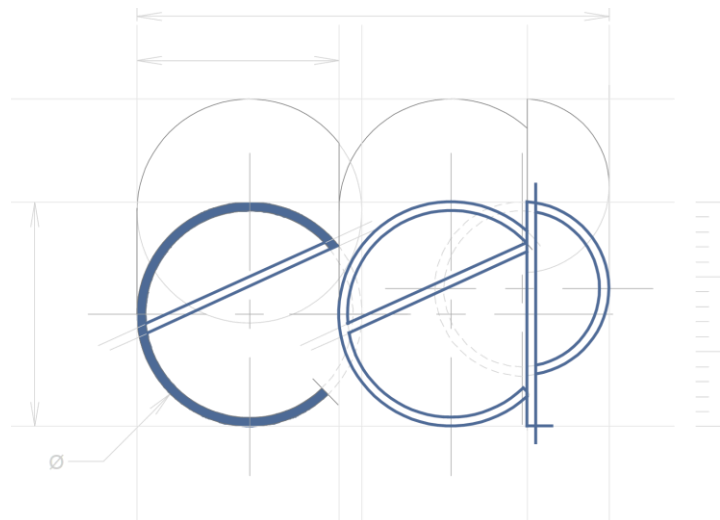
St Lawrence Church, Lechlade

Response to observations from Historic England

with regard to proposals for a replacement heating system

May 2023

Project reference: 4184



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Document Revision	Author	Checked By	Date
A	DG	NVB	May 2023

1 Introduction

The PCC for St Lawrence Church, Lechlade appointed building services engineers – Environmental Engineering Partnership (EEP) to prepare designs to Stage 3 of the RIBA plan of work for the mechanical, electrical and public health services in July 2022 for the re-ordering of the Church. This included a new space heating system based upon providing underfloor heating for the main areas of the Church to provide background heating. This system incorporated an external air to water heat pump plant (ASHP) within an acoustic enclosure. The proposal was to locate the enclosure and heat pump plant adjacent to the South wall of the tower at the West end of the Church.

Following the submission of the scheme proposals to the DAC a response from one of the interested parties – Historic England, had included various observations regarding the location of the ASHP. The PCC have asked EEP to provide this short paper to explain the decision process behind the selection of the location for the ASHP and the need for the associated acoustic enclosure.

2 General Background Information

The PCC commissioned building services engineers – Martin Thomas Associates (MTA) to prepare a feasibility report for the building services systems associated with the proposed re-ordering scheme for the Church. The report considered various options for the new space heating installation, including biomass boilers, electric boilers, ground source heat pumps, gas boilers and air source heat pumps. Consideration was also given in the MTA study to the use of Solar PV panels on the Church roof in conjunction with battery storage. The PV's/battery storage that were considered were a small scale installation to provide a very limited proportion of the Church's annual electrical consumption. Reference was also made to a more extensive installation but it was pointed out that with the Church's low electricity consumption in the summer and intermediate seasons when most of the solar energy is available, the installation would be exporting the majority of the electricity generated. The conclusion arrived at was that without a substantial base electrical load in the summer and the intermediates season the provision of a substantial PV installation would not be viable. Similarly, the amount of electricity generated by the installation in the winter, when the majority of space heating is required, would be insufficient to power electric boilers or direct electric resistance heating. Accordingly the report and the associated sketch drawings provided by MTA concluded that the most viable type of background heating for the Church would be underfloor heating served by an air source heat pump.

This conclusion was broadly endorsed by the current building services consultant engineers EEP and this has formed the basis of the current Stage 3 design.

3 Consideration of the Location of the ASHP and Acoustic Enclosure

During the Stage 3 design process there was considerable input from the Client body and the Church's consultant architect – Chedburn Codd regarding the location of the ASHP. Several

alternative locations to the current proposal were considered including against the South wall of the South Aisle above the external stairwell to the existing boiler room, against the perimeter wall of the Church Yard to the South of the Church and also within a small courtyard of an adjacent building owned by the Church. These were all rejected by at least one or a combination of the following reasons:

- Insufficient space to provide for servicing of the ASHP and access to the basement boiler room
- Close proximity of Church windows to the ASHP risking noise intrusion to the Church interior
- Close proximity to adjacent properties/neighbours to the Church risking disturbance particularly as the ASHP would at times operate at night to maintain minimum background temperatures in the Church
- Too greater distance for external pipework to enter the Church in a suitable and convenient location

4 The Current ASHP Location

The current ASHP location was selected for the following reasons:

- Close proximity to the convenient pipework entry point to the Church (short pipe runs thereby minimising disturbance to the Church Yard)
- Convenient recess being available between the corner buttress of the tower and the structure at the West end of the South Aisle
- No adjacent windows to sensitive areas of the Church
- Sufficient space available to construct an acoustic ventilated screen around the ASHP to reduce noise that would potentially cause nuisance at the first floor windows of the adjacent properties facing the South West end of the Church
- Sufficient space being available to plant a screening hedge around the acoustic screen
- The acoustic screen would be positioned such that it was not obvious to persons entering the Church from the main West and North entrances to the Church
- The ASHP and associated screen would be completely reversible in the future if alternative heating strategic becomes available

5 Summary

In summary, the observations raised by Historic England are fully appreciated, but the detailed consideration given to the proposed option and the impracticality of other alternatives demonstrates the reason behind and the care taken in selecting the currently proposed location.

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25 May 2023