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# Building Environment and Services Engineers



**SKELLY & COUCH**

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## Thermal Imaging Survey Report

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### CLIENT

Historic England

### PROJECT

1703 – Decarbonisation of Cultural Heritage Buildings : Lit & Phil Library

Revision 1.0 - 03.03.2025 - For Information

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Rev	Date of Issue	Status	Issued by	Checked by	Summary of changes
1.0	03/03/2025	Information	RRJ	DH	

## 1 Introduction and purpose

Skelly and Couch have been appointed by Historic England, as part of the umbrella project ‘Decarbonisation of Cultural Heritage Buildings, to undertake a thermal imaging survey of the building fabric at the Lit & Phil Library. The survey took place on 28<sup>th</sup> Jan 2025.

The purpose of the survey was to identify a base point of the existing building fabric, identifying any weak areas such that practical solutions may be proposed to reduce energy use and improve thermal comfort with empathy to the historic nature of the building.

## 2 Method statement

The assessment was undertaken between 4.30pm and 6pm on Tuesday 28<sup>th</sup> January. The survey was undertaken using the Fluke T110 thermal imaging camera.


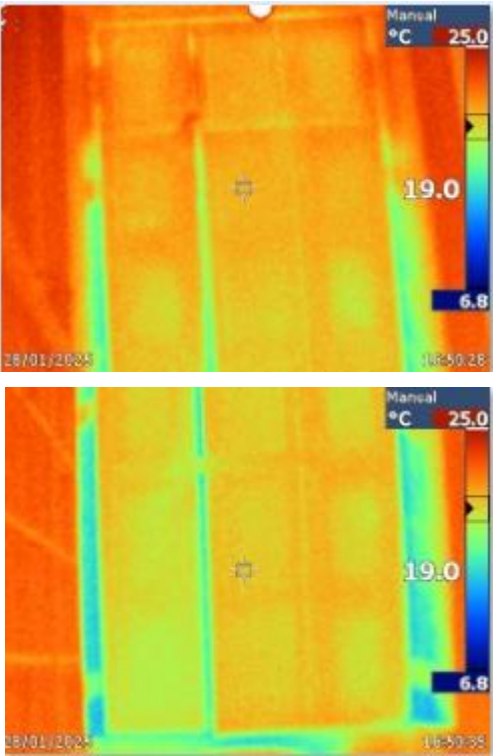

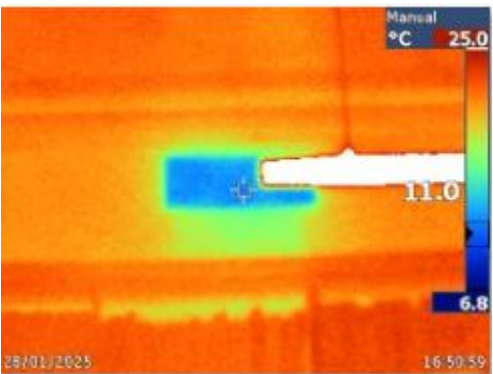
Temperature:


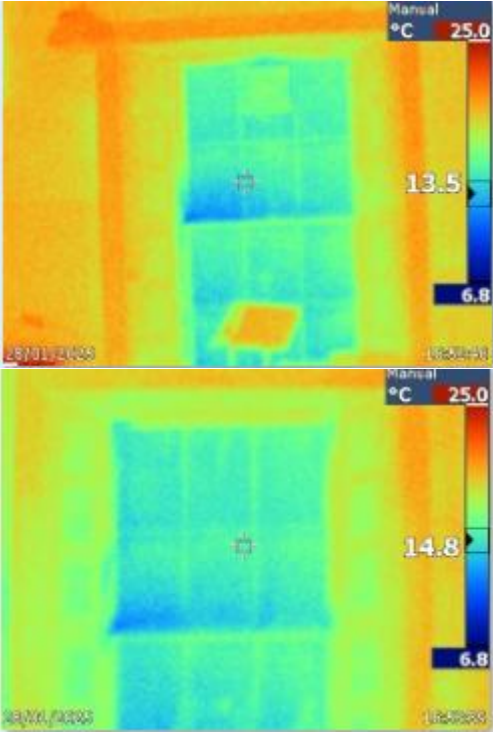

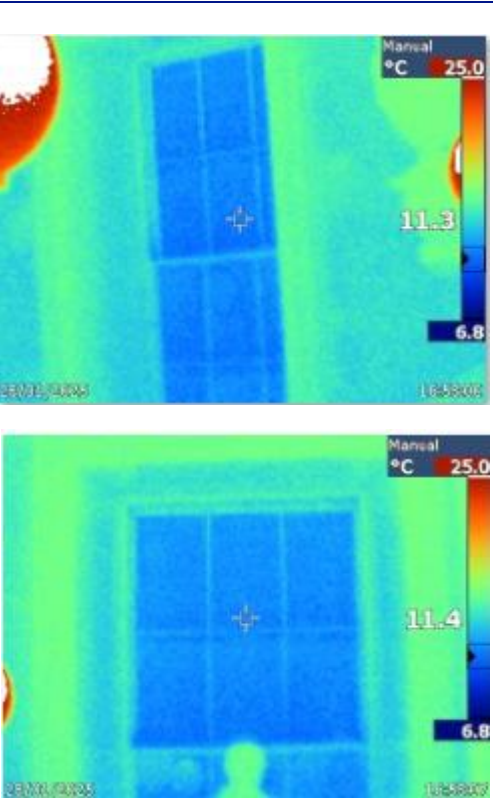
- External: Approx 4°C
- Internal: Approx 20°C


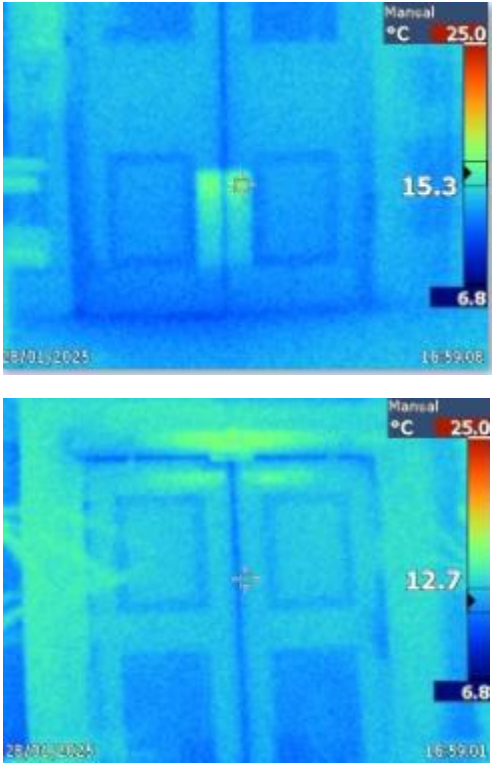

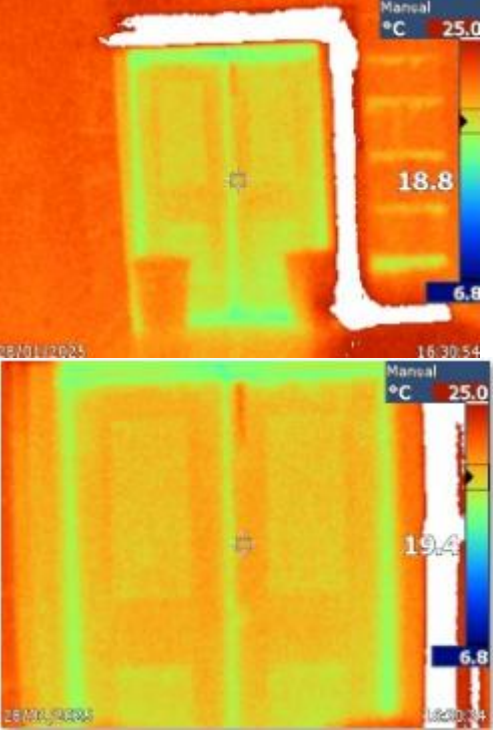
The weather conditions were dry when the thermal imaging survey was undertaken but there had been rain earlier in the day. During the survey the heating system in the building was on.


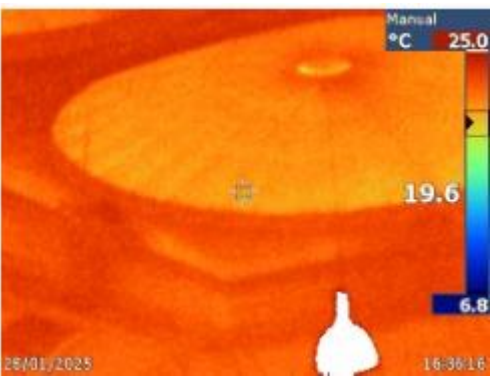

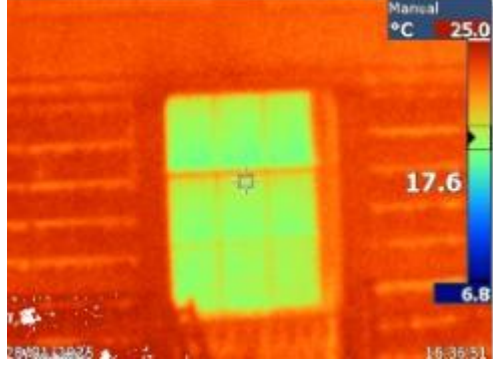

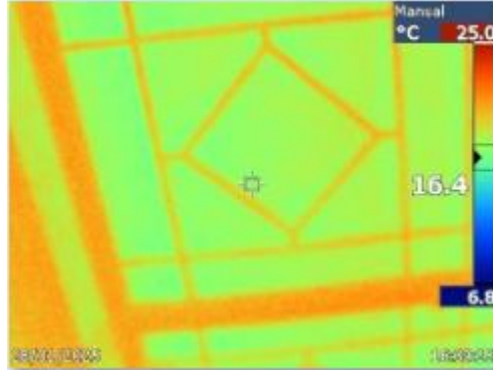
### 3 Observations


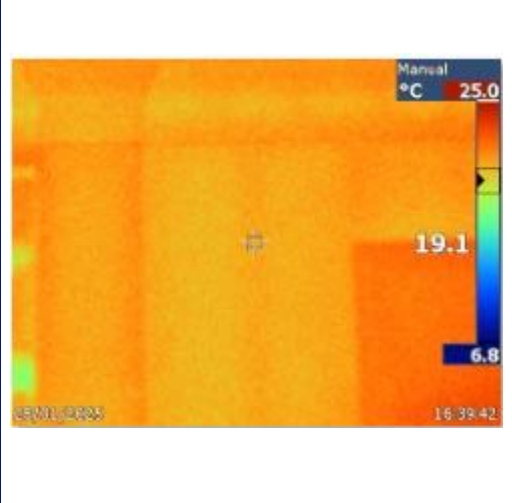

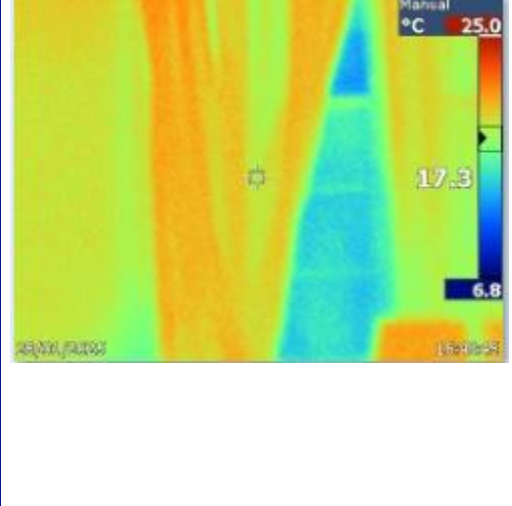
#### 3.1 Internal

Location	Reference photo	Thermal Image	Notes
Silence Room			<p>Thermal imaging showing heat loss through gaps in the window shutters, although the shutters themselves reduce heat loss</p>
Silence Room Vent			<p>Thermal imaging showing heat loss through a ventilation grille in the wall.</p>


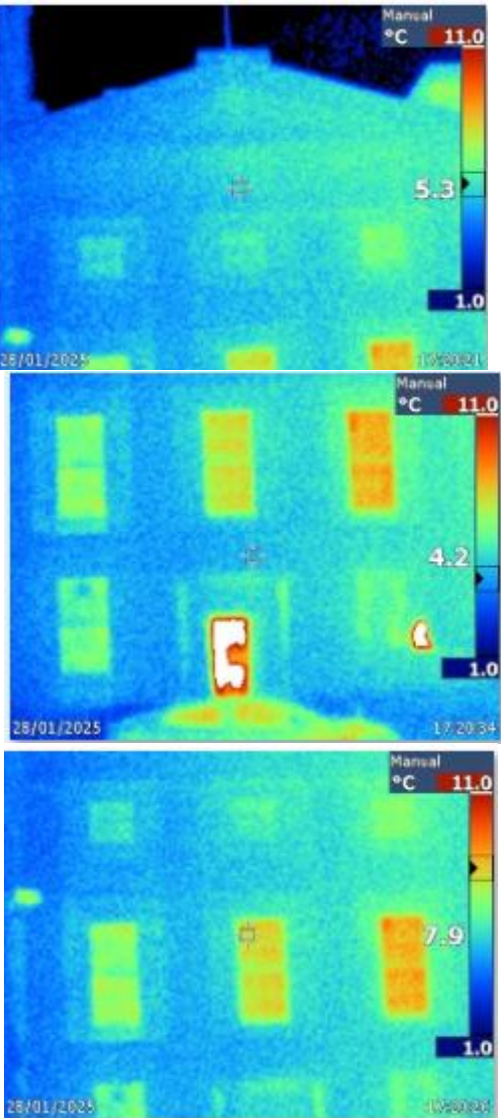
<p>Lotus Room</p>			<p>Lotus room glazing displaying heat losses</p>
<p>Entrance Hall</p>			<p>Glazing and framing displaying heat losses</p>


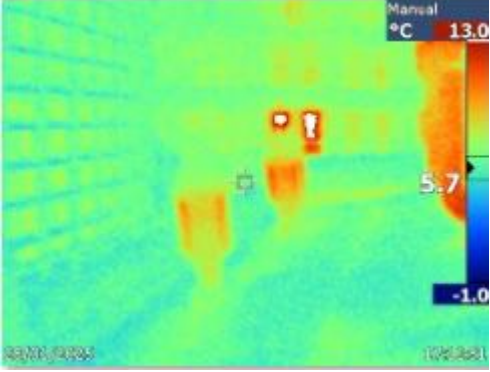

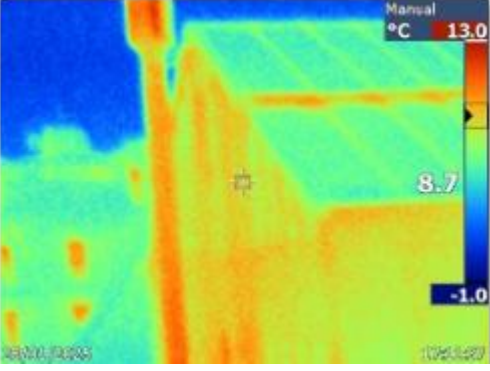
<p>Entrance Hall</p>			<p>Evidence of heat loss through doors</p>
<p>Library 1<sup>st</sup> floor</p>			<p>Thermal imaging showing exposed pipework emitting into library</p>


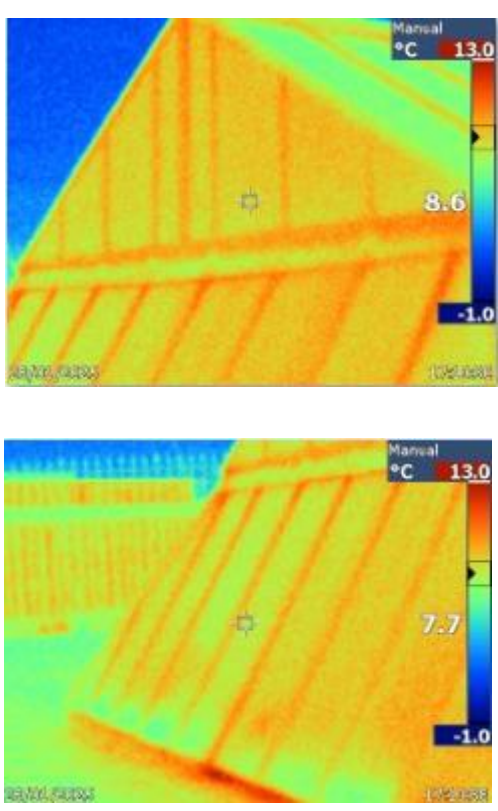
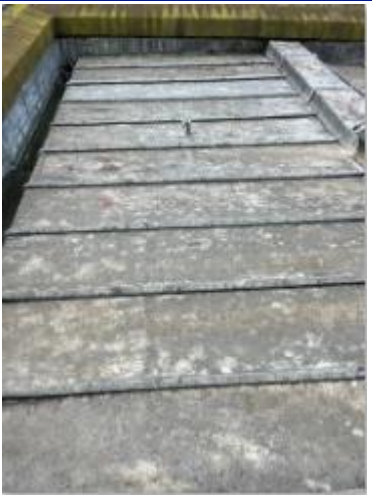
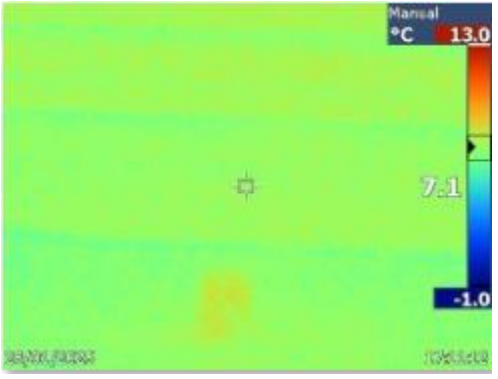
<p>Library Roof</p>			<p>Glazed roof domes thermally appear to be performing well</p>
<p>Library Balcony</p>			<p>Library windows appear to be performing well</p>
<p>Committee room Roof</p>			<p>Thermal imaging showing lightwell rooflight performing well</p>


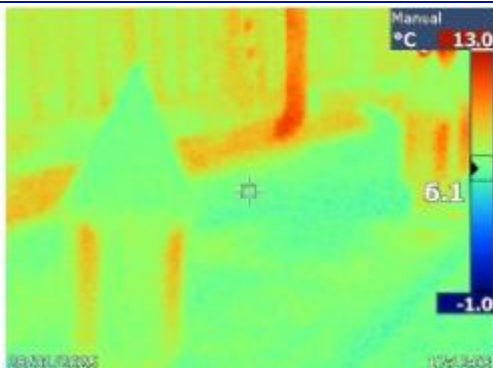
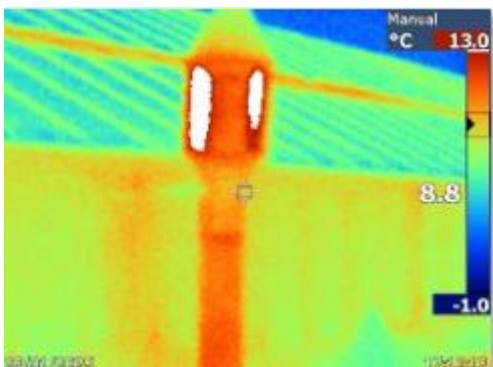

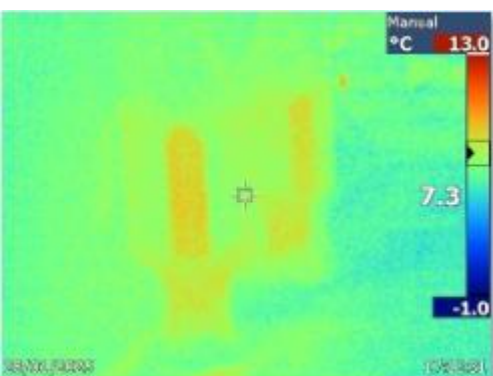
<p>Committee Room Wall</p>			
<p>Ladies room</p>			<p>Uncovered window displaying heat losses</p>

### 3.2 External Images

	Reference photo	Thermal Image	Notes
Front façade			<p>Thermal imaging showing front façade glazing performing poorly</p>

<p>Roof over 3 domes in library</p>			<p>Ventilation turret exhausts showing heat losses from library</p> <p>Library roof well insulated however showing minor losses</p>
<p>Roof over 3 domes</p>			<p>Heat losses through glazing shown, but measured temperatures are relatively low suggesting reasonable buffering</p>

<p>Roof over 2 domes</p>			
<p>Flat roof over 2 domes</p>			<p>Thermal imaging showing good performance in roof</p>

		 	<p>Roof natural ventilation ducts showing heat losses</p>
			

## 4 Summary

- Glass roofs over library domes give good performance in library spaces
- Exposed pipework with heat loss is unfavourable but they are in a heated area
- Thermal imaging showed that glazing with coverings (curtains, shutters) had better performance than solely glazing when in good condition and utilised effectively. Coverings were generally used permanently if present, improving performance of rooms.
- Natural ventilation in library space located at high level had large heat losses as open to external air.
- Heat loss is evident from the front façade glazing.