

---

# Building Environment and Services Engineers



**SKELLY & COUCH**

---

## Thermal Imaging Survey Report

---

### CLIENT

Historic England

### PROJECT

1703 – Decarbonisation of Cultural Heritage Buildings : Shire Hall Museum

Revision 1.0 - 03.03.2025 - For Information

## Contents

<b>1</b>	<b>INTRODUCTION AND PURPOSE</b>	<b>2</b>
<b>2</b>	<b>METHOD STATEMENT</b>	<b>2</b>
<b>3</b>	<b>OBSERVATIONS</b>	<b>3</b>
	<b>3.1 Internal images</b>	<b>3</b>
	<b>3.2 External Images</b>	<b>9</b>
<b>4</b>	<b>SUMMARY</b>	<b>12</b>

Rev	Date of Issue	Status	Issued by	Checked by	Summary of changes
1.0	03/03/2025	Information	FL/JA	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 Shire Hall Museum. The survey took place on the 3<sup>rd</sup> Feb 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 4.45pm and 6pm on Monday 3<sup>rd</sup> February. The survey was undertaken using the Fluke T110 thermal imaging camera.


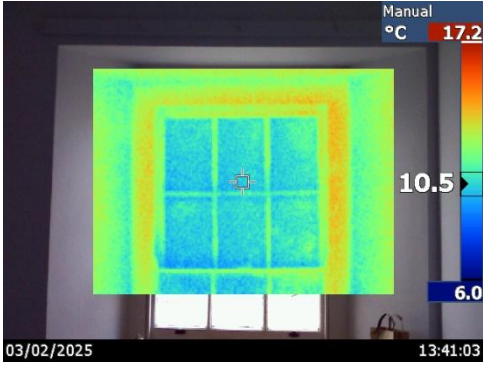

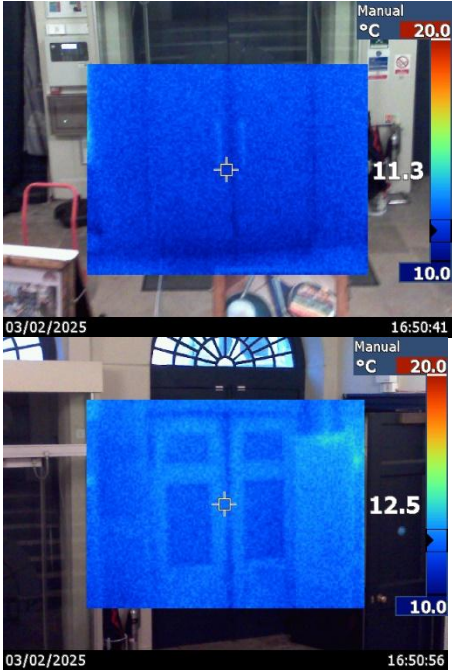
Temperature:


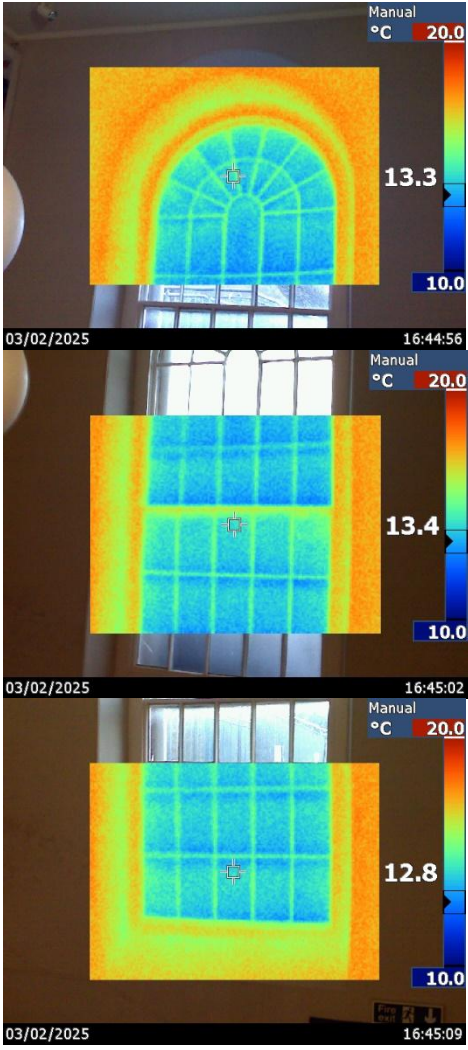

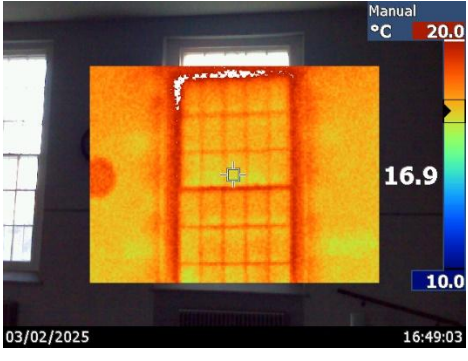
- External: Approx 9°C
- Internal: Approx 20°C




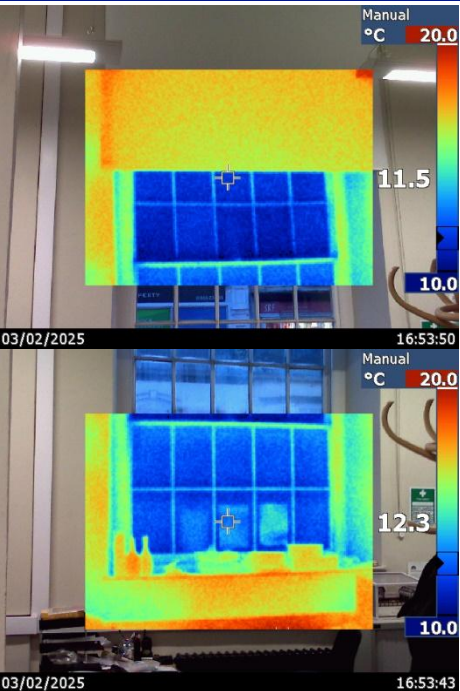
The weather conditions were dry when the thermal imaging survey was undertaken, and the heating system in the building was on. Note that the basement museum areas are unheated.


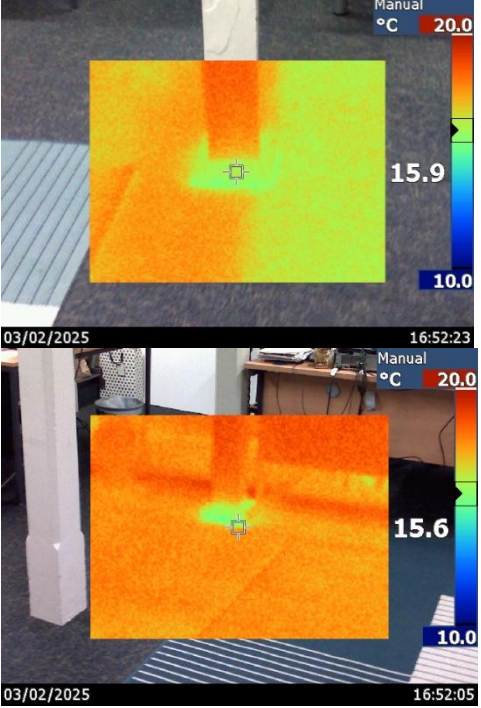

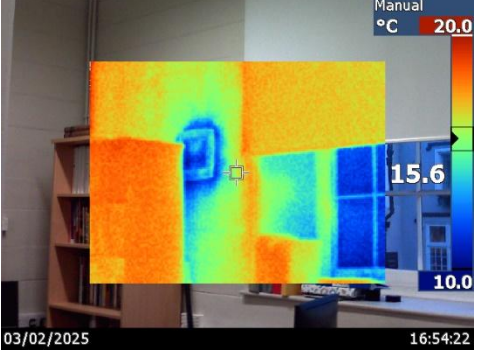


### 3 Observations

#### 3.1 Internal images


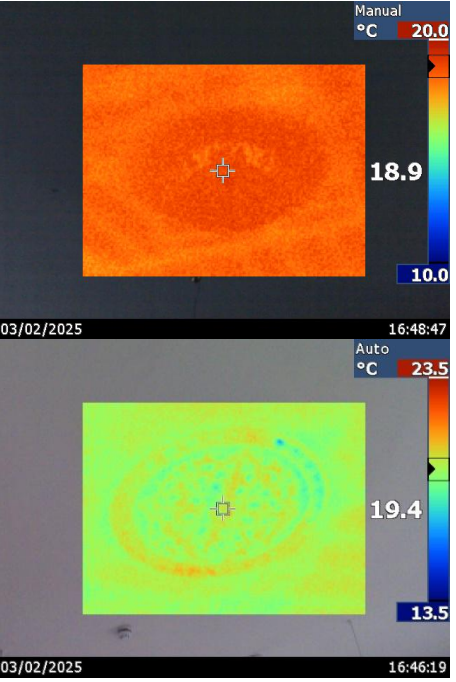

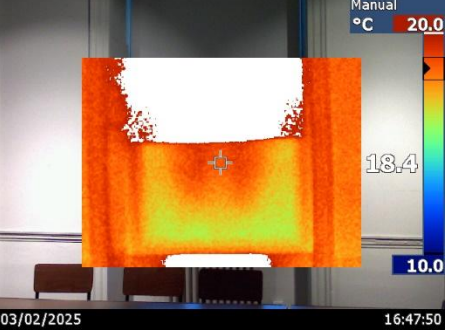


Location	Reference photo	Thermal image	Notes
Flat 1 bedroom		 <p>03/02/2025 13:41:03</p>	<p>Thermal images showing heat loss through the single glazed sash window in the flat. Single glazing performing significantly worse than the solid walls.</p>
Entrance lobby		 <p>03/02/2025 16:50:41</p> <p>03/02/2025 16:50:56</p>	<p>Unheated entrance lobby. Doorway is cold but likely owing to there being no heating</p>

Location	Reference photo	Thermal image	Notes
<p>Top of central staircase</p>			<p>Thermal images showing heat loss through the single glazed sash window in the central stair. Single glazing performing significantly worse than the solid walls.</p>
<p>Crown court South</p>			<p>Thermal imaging showing secondary glazing to the south façade of the crown court performing fairly well thermally.</p>


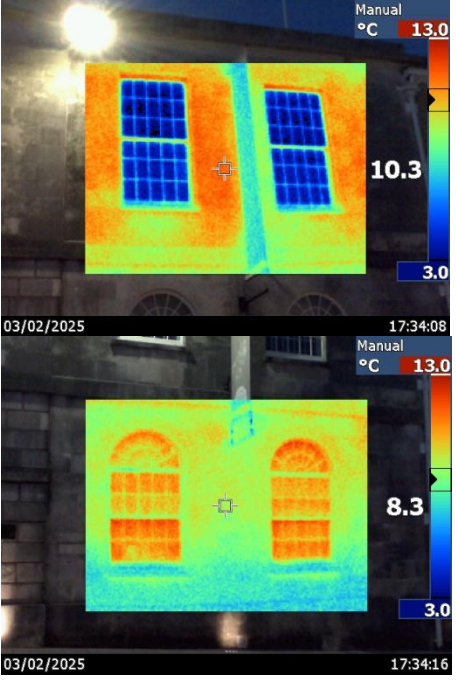
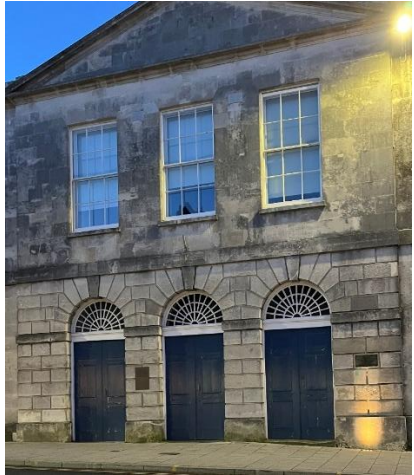
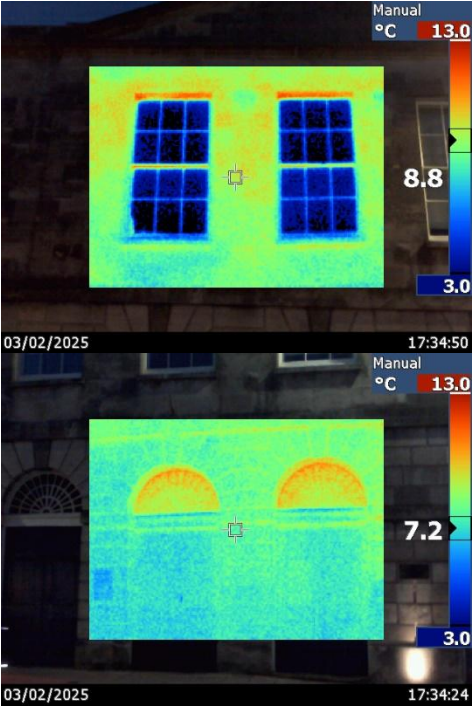
Location	Reference photo	Thermal image	Notes
Crown court North			<p>Thermal imaging showing secondary glazing to the north façade of the crown court. Secondary glazing to north façade performing slightly worse than that to the south façade.</p>
Staff office			<p>Single glazing to the staff offices performing poorly thermally.</p>


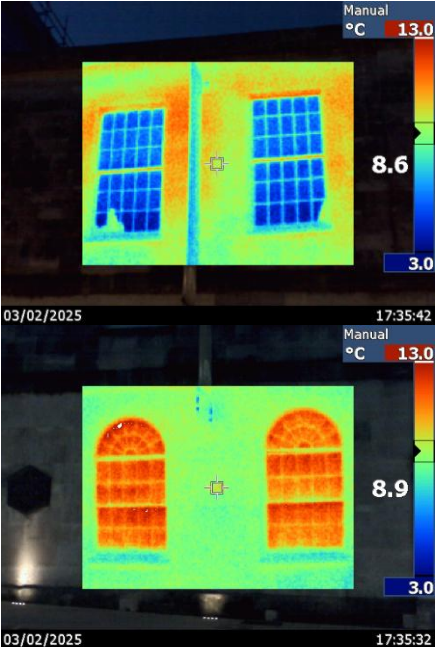

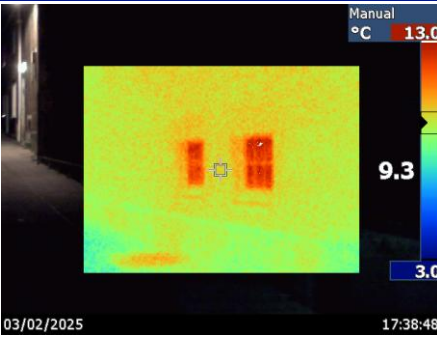

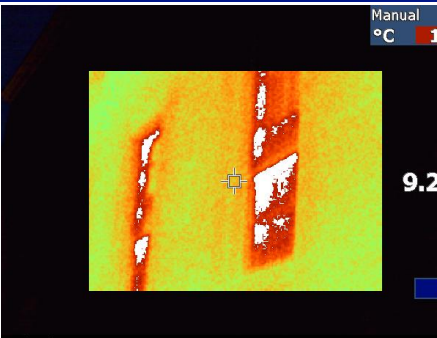
Location	Reference photo	Thermal image	Notes
Staff office			<p>Thermal imaging showing thermal bridging at the base of the columns supporting the crown court above. Areas of poorly performing building fabric at floor level between columns also evident.</p>
TIC continued			<p>Thermal imaging showing heat loss through a ventilation unit in the wall.</p>
Store room off introduction area			<p>Poorly performing single glazing in store room off introduction area. Note permanently open ventilation to</p>


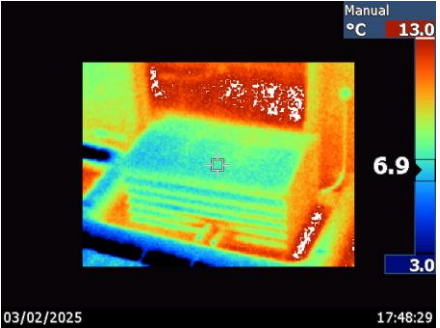

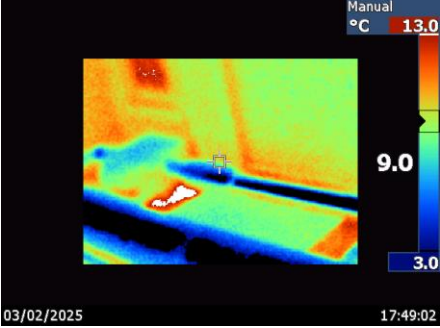
Location	Reference photo	Thermal image	Notes
			outside for gas meter located in this room.
Introduction area			Poorly performing single glazing to induction area.
Cells			<p>Historic ventilation grilles in basement cells.</p> <p>Basement unheated.</p>

Location	Reference photo	Thermal image	Notes
Grand Jury room			<p>Historic ceiling grille in grand jury room. Grille &amp; ceiling performing well thermally.</p> <p>Automatic scale used in bottom image to highlight features.</p>
Grand Jury room			<p>Secondary glazing to Grand Jury room evident.</p>
Roof access hatch in store off Grand Jury room			<p>Thermal imaging showing the access hatch into roof void. This was not found to be a weak point. Thermal imaging showing evidence that roof is insulated.</p>

### 3.2 External Images

Location	Reference photo	Thermal image	Notes
Front façade (Right)			<p>Difference in performance of windows with and without secondary glazing evident from thermal imaging of façade.</p> <p>Top: Crown Court windows with secondary glazing.</p> <p>Bottom: Staff offices without secondary glazing</p>
Front façade (Centre)			<p>Difference in performance of windows with and without secondary glazing evident from thermal imaging of façade.</p> <p>Top: Grand Jury room windows with secondary glazing.</p> <p>Bottom: Entrance hall without secondary glazing</p>

Location	Reference photo	Thermal image	Notes
Front façade (Left)			<p>Difference in performance of windows with and without secondary glazing evident from thermal imaging of façade.</p>
			<p>Poorly performing single glazed windows to West façade.</p>
			<p>Poorly performing single glazed windows to West façade.</p>

Location	Reference photo	Thermal image	Notes
<p>Rear roof – roof cowl over ventilation opening into basement plant room</p>			<p>Thermal imaging showing heat loss through roof cowl over ventilation opening into basement plant room</p>
<p>Rear roof</p>			<p>Thermal imaging showing poorly performing roof to the rear of the building, including heat loss around services.</p>

## 4 Summary

- Secondary glazing is present to some of the spaces in the Shire Hall. The age and configuration of the secondary glazing is variable, however, the windows with secondary glazing were found to perform well thermally compared to the areas with single glazing only. This is evident from the thermal imaging.
- The main pitched roof was found to be insulated, performing well thermally. No significant heat loss was evident from the ornate ventilation grilles in the ceilings of the Crown Court or Grand Jury Room.
- The thermal imaging shows thermal bridging around the structural columns in the staff office, which is located above an unheated undercroft.
- Heat loss is evident around services penetrations on the rear flat roof.