Thermal Imaging Report

Heat Loss & Insulation Survey

1-87 Regina Road, Croydon, SE25 4TY	
Survey Date	17/11/2021
Report Date	21/11/2021
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Reviewed	Jack Hannon

Contents

Introduction

We were instructed to carry out an External thermal imaging survey for 1-87 Regina Road, Croydon, SE25 4TY.

This survey was undertaken to provide enough thermographic information to confirm:

- Continuity of insulation.
- Identification of thermal bridging.
- Avoidance of air leakage paths through the fabric (except through intentional openings).

The criteria used have been a combination of objective testing and subjective comparisons of the building surfaces.

The dwellings were occupied during the test and for the proceeding 24hr period.

The dwellings were heated beforehand and the optimal pre survey conditions of no sunlight on the building for 2hrs beforehand and a temperature differential of ≥10°C were met.

The survey itself found some significant thermal bridges throughout the building fabric and there is an obvious lack of continuity of insulation in some areas incorporated within the building fabric.

Summary of Findings

External walls

The continuity of insulation within the walls is in line with what you might expect from a building of this age. The walls are presumed to be a precast concrete system build, which have been reclad in the late 1990's / early 2000s. There is also a significant amount of cold bridging around the perimeter of building where the walls meet the ground floor.

Floors

The intermediate floors appear to be creating a thermal bridge to the outside however it is not as prominent as you might expect from a building of this era. There is a significant amount of heat at the bottom of the building beneath the floor of the ground floor flats.

Windows

The thermal images show thermal bridges at all of the windows lintels which would be expected. To gauge a true performance of the windows it is important to focus on the bottom floors, the higher windows appear colder due to the reflection of the sky. The windows which appear to be losing the most heat may have been slightly open during the survey. The windows appear to be double glazed but pre-2002.

References

During surveys we aim to record temperatures as accurately as possible. However, any absolute values obtained during a survey should be considered as advisory only. Many factors, including distance, material change, emissivity and variable environmental conditions can all adversely affect results. Where possible, our surveys are carried out in accordance with the criteria set out in:

- BRE 176 (A Practical Guide to Infrared Thermography for Buildings)
- BRE IP 1/06 (Assessing the effects of thermal bridging at junctions and around openings)
- BS EN ISO 13187:1999 (Thermal Performance of Buildings - Qualitative Detection of Thermal Irregularities in Building Envelopes - Infrared Method)

Our reports are designed to provide sufficient data to allow a competent third-party to replicate both the process and findings presented in this report.

Camera Specification

This survey was undertaken using a **FLIR E60 BX** thermal imaging camera:

Serial Number: 49005137
UKAS Calibration Date: 22/03/2021
UKAS Calibration Number: C000030

Conditions Checklist

1.	Necessary surfaces free of direct solar radiation for at least one hour?	**Yes**
2.	Temperature difference across the building fabric ≥10°C?	**Yes**
3.	External air to ambient air temperature difference ≥5°C for at least 24 hours?	**Yes**
4.	Ambient air temperature within ±3°C for the duration of survey and preceding hour?	**Yes**
5.	Ambient air temperature within ±10°C for preceding 24 hours (12 hours for lightweight fabric)?	**Yes**
6.	Building surfaces free from precipitation just prior to or during survey?	**Yes**
7.	Are the building surfaces to be inspected dry?	**Yes**
8.	Is the wind speed below 5m/s (at 2m height)?	**Yes**

Survey Environmental Data

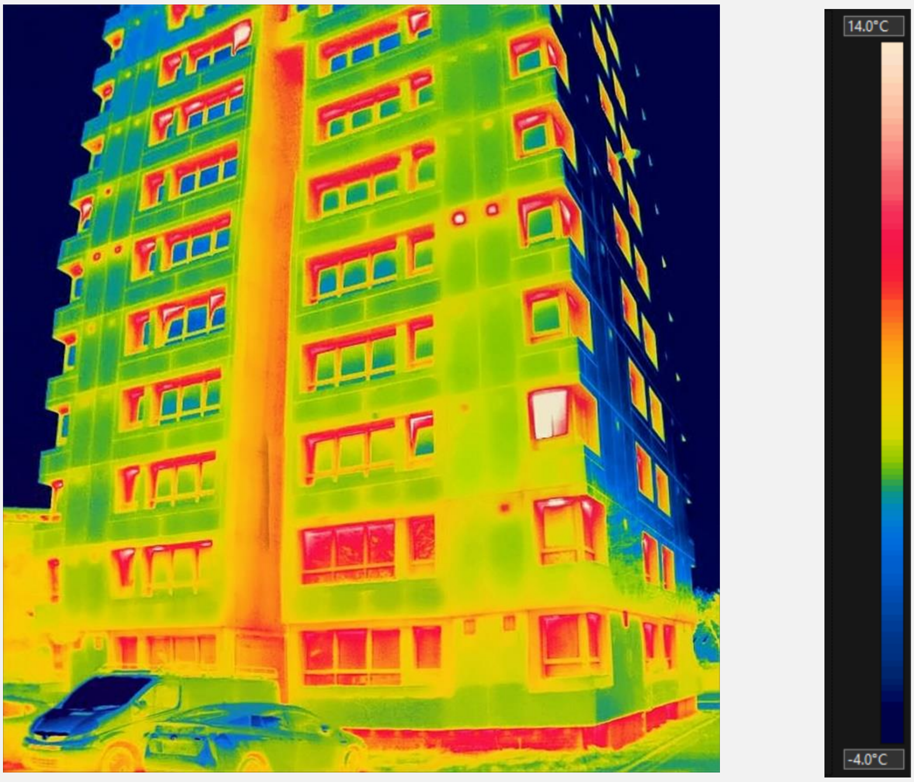
14th October 2021

Item	Start	Finish
Time	18:50	19:59
External Temperature (°c)	6.5	5.9
Internal Temperature	20 Assumed	20 Assumed
Wind Direction	East	East
Wind Speed (mph)	1.0	1.0
Precipitation	Nil	Nil
Building Surfaces	Dry	Dry
Cloud Cover	Clear Sky	Clear Sky
Sunrise / Sunset	7.55 AM	18.19 PM

R.A.T – (Reflected Apparent Temperature)	5.7°c
Emissivity	0.90
Distance	3-10m

Photographs

1: External – South Elevation



Air Temp: 6°C

Distance: 2 m

R.A.T. 5.7°C

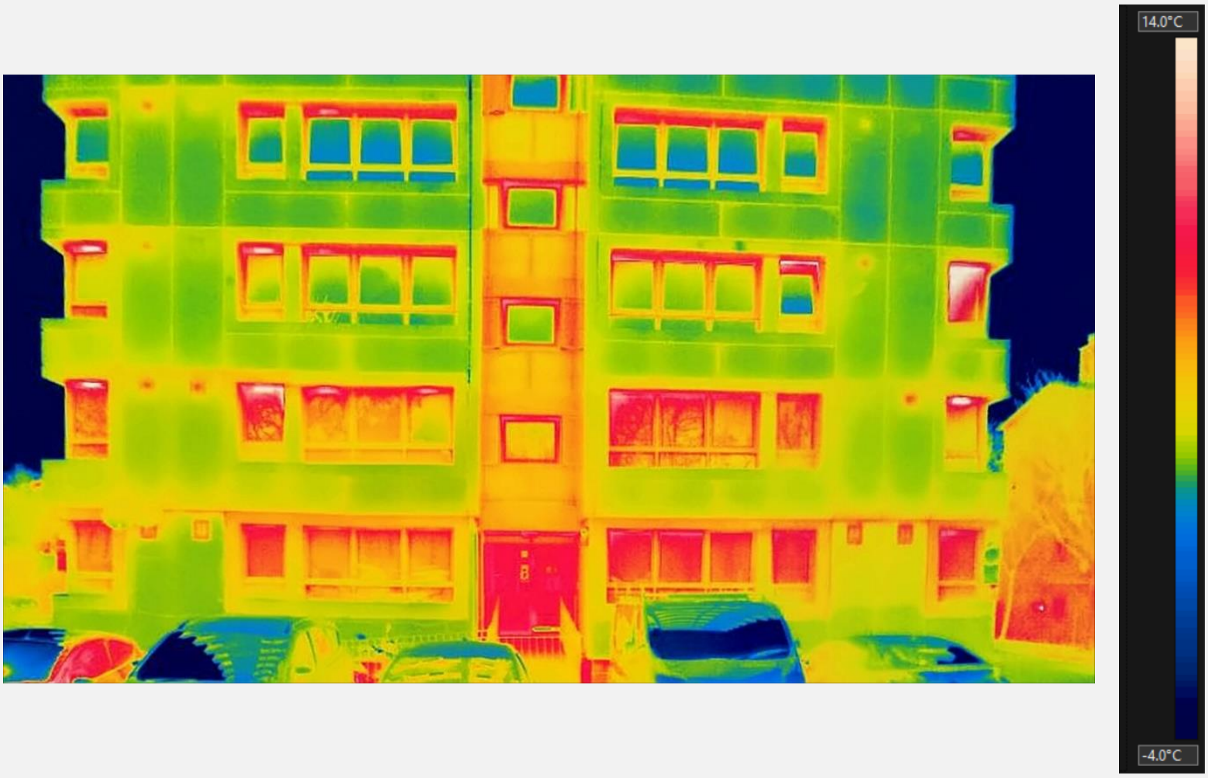
Wind Speed: 1 m/s

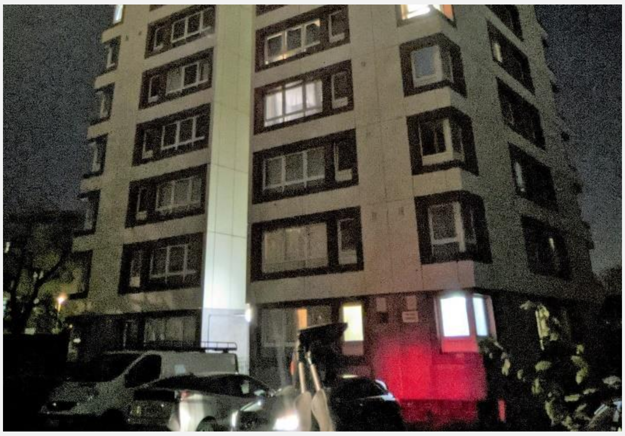
Emissivity: 0.90

Humidity: 78%

Observations: The variations in external surface temperatures are due as much to geometry, sheltered areas, as well as some differences in internal room temperatures. With the temperatures of the external walls being just above ambient (outside temperature) and very even over the cladding. The windows are displaying a relatively high level of heat loss.

2: External – South Elevation

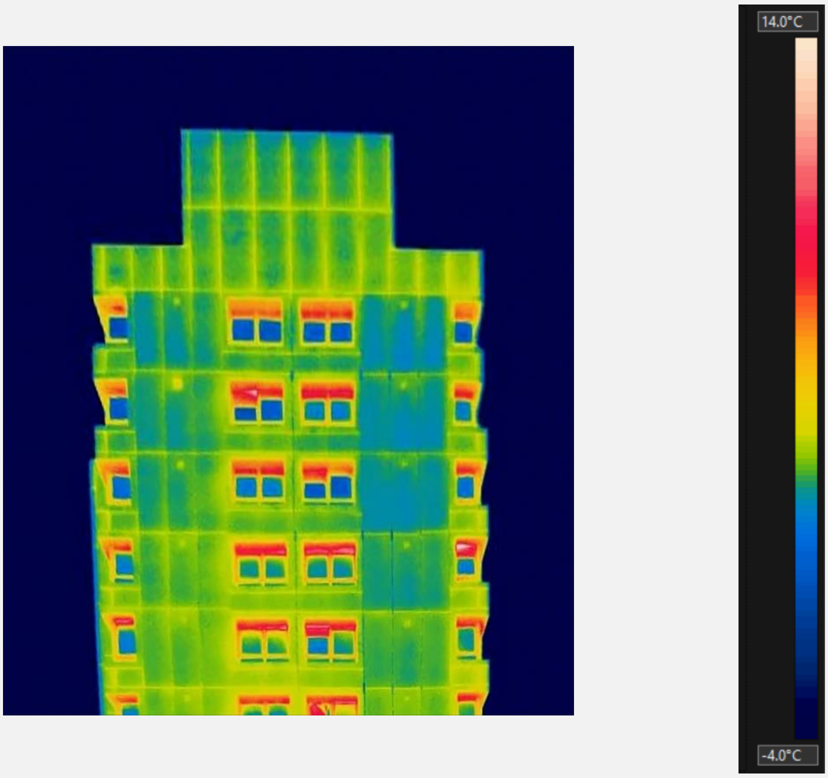




Air Temp: 6°C	
Distance: 2 m	
R.A.T. 5.7°C	
Wind Speed: 1 m/s	
Emissivity: 0.90	
Humidity: 78%	

Observations: There is even temperature distribution across the cladding, the highest heat loos is again from the windows. It is important to look to the windows on the first two floors for reference as the higher windows will be reflecting the sky.

3: External – West Elevation



Air Temp: 6°C

Distance: 2 m

R.A.T. 5.7°C

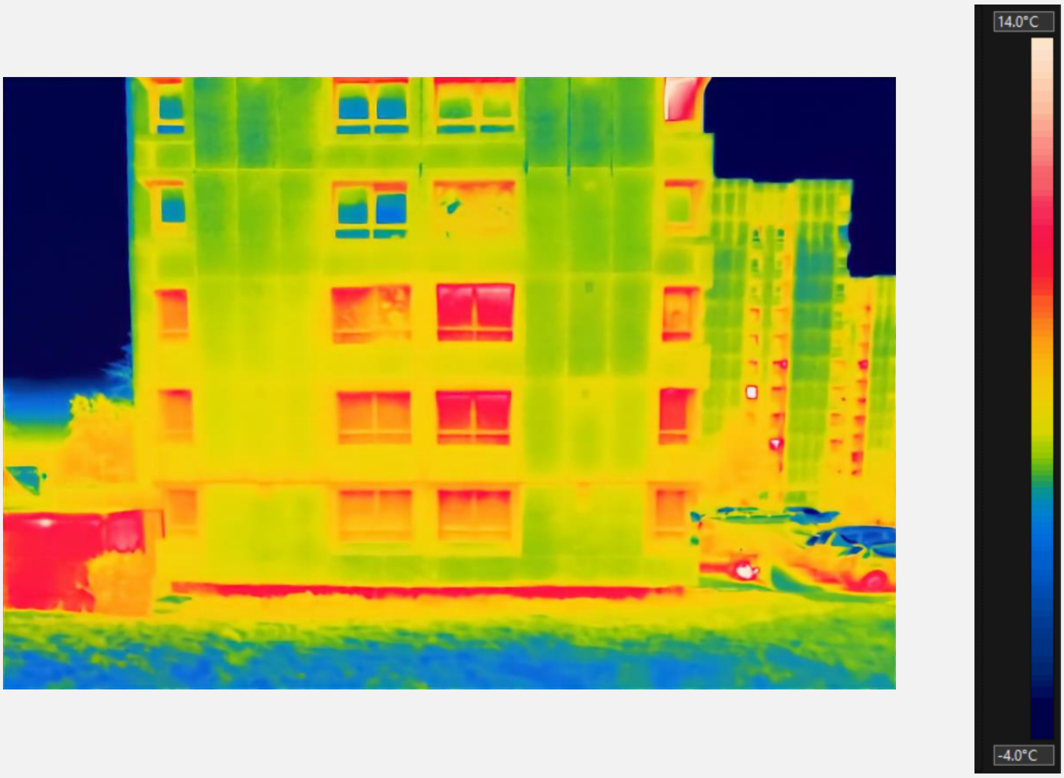
Wind Speed: 1 m/s

Emissivity: 0.90

Humidity: 78%

Observations: This image shows there is heat loss and bridging from the top of the windows and around the window soffits.

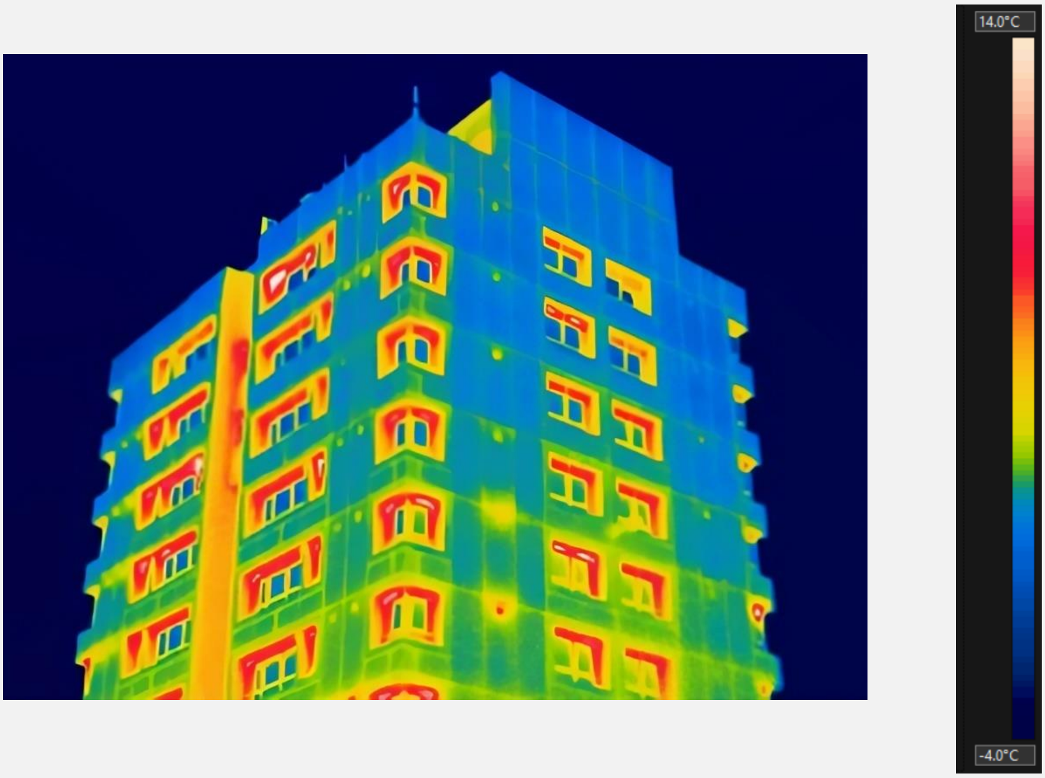
4: External – West Elevation



Air Temp: 6°C	
Distance: 2 m	
R.A.T. 5.7°C	
Wind Speed: 1 m/s	
Emissivity: 0.90	
Humidity: 78%	

Observations: This image shows the heat loss from the windows as well as the significant thermal bridge around the ground floor of the building.

5: External – East Elevation



Air Temp: 6°C

Distance: 2 m

R.A.T. 5.7°C

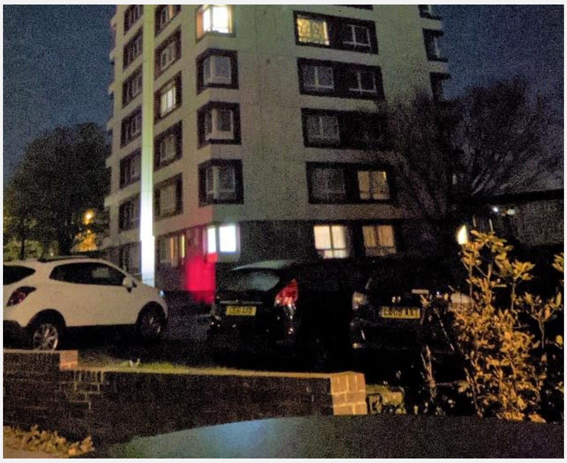
Wind Speed: 1 m/s

Emissivity: 0.90

Humidity: 78%

Observations: This image shows there is heat loss and bridging from the top of the windows and around the window soffits. Due to the angle of the image there is a lot of reflection from the sky onto the windows and to a lesser degree the cladding.

6: External – South and East Elevation



Air Temp: 6°C

Distance: 2 m

R.A.T. 5.7°C

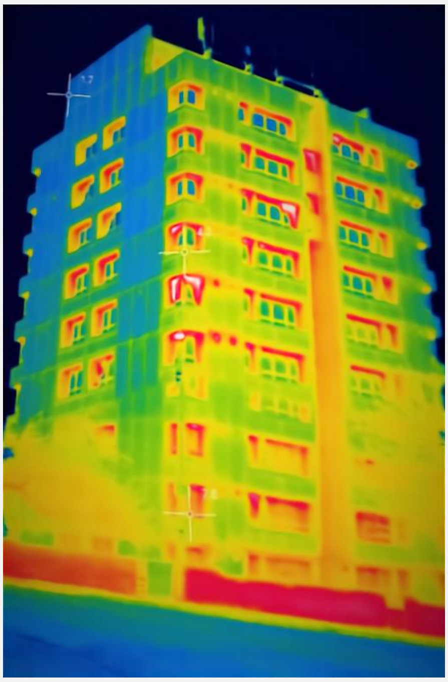
Wind Speed: 1 m/s

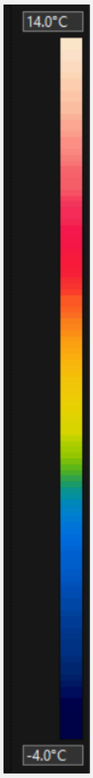
Emissivity: 0.90

Humidity: 78%

Observations: This image shows the heat loss from the windows.

7: External – South and West Elevations





Air Temp: 6°C

Distance: 2 m

R.A.T. 5.7°C

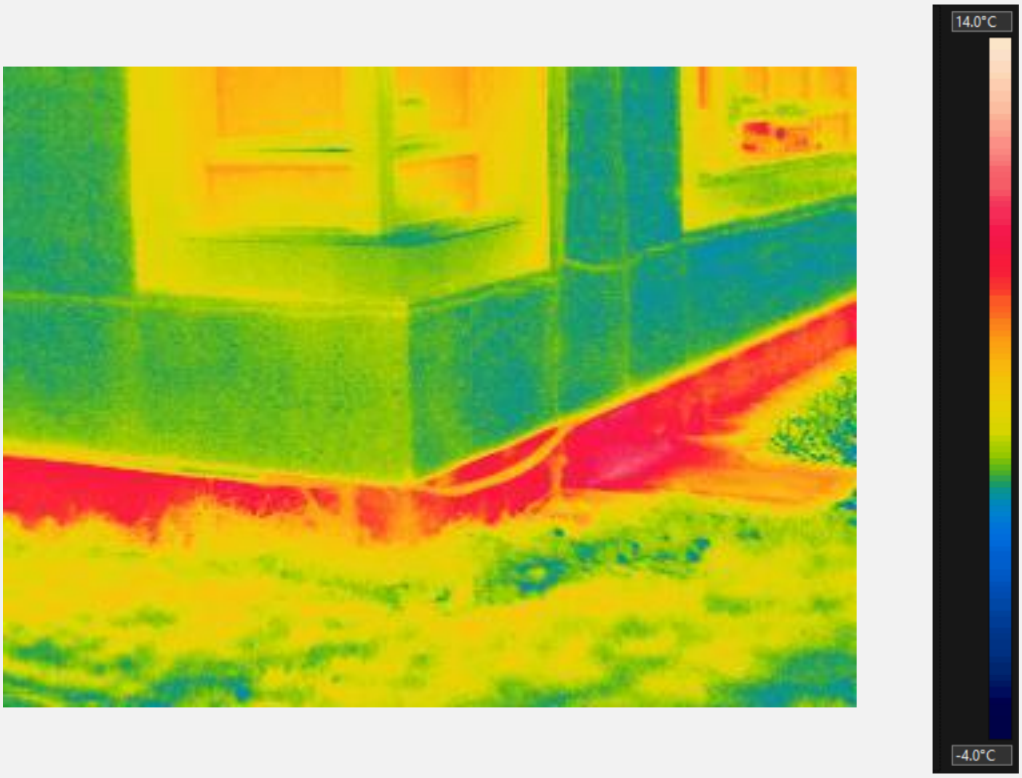
Wind Speed: 1 m/s

Emissivity: 0.90

Humidity: 78%

Observations: This image shows the heat loss from the windows, the corner windows appear to be loosing the most heat which would be expected due to the additional thermal bridging element.

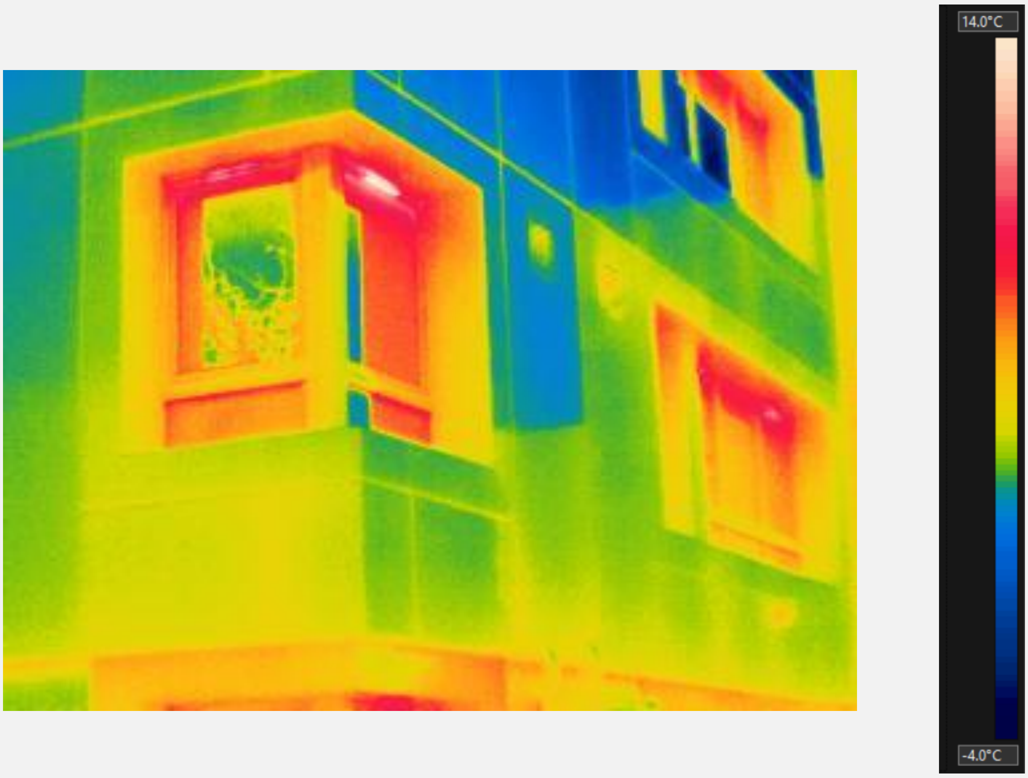
8: External – Corner or the South and West Elevations



Air Temp: 6°C	
Distance: 2 m	
R.A.T. 5.7°C	
Wind Speed: 1 m/s	
Emissivity: 0.90	
Humidity: 78%	

Observations: This image shows the significant thermal bridge around the ground floor of the building.

9: External – South and West Elevation First Floor



Air Temp: 6°C

Distance: 2 m

R.A.T. 5.7°C

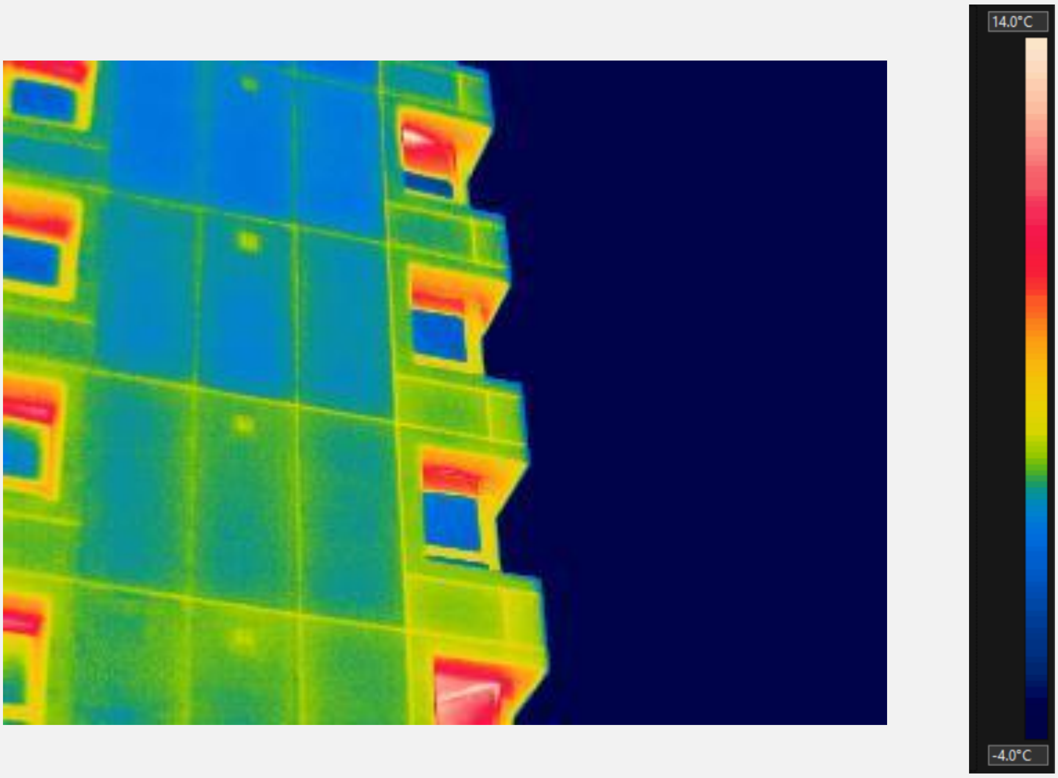
Wind Speed: 1 m/s

Emissivity: 0.90

Humidity: 78%

Observations: This image shows the heat loss from the windows and the window soffits closer in.

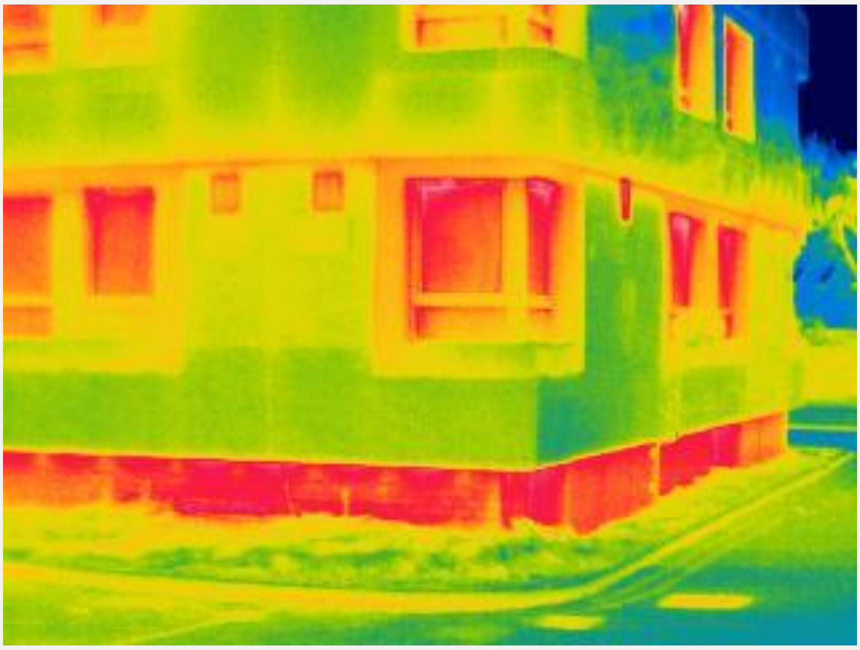
10: External – South Elevation



Air Temp: 6°C	
Distance: 2 m	
R.A.T. 5.7°C	
Wind Speed: 1 m/s	
Emissivity: 0.90	
Humidity: 78%	

Observations: This image shows the heat loss from the windows and the window soffits closer in.

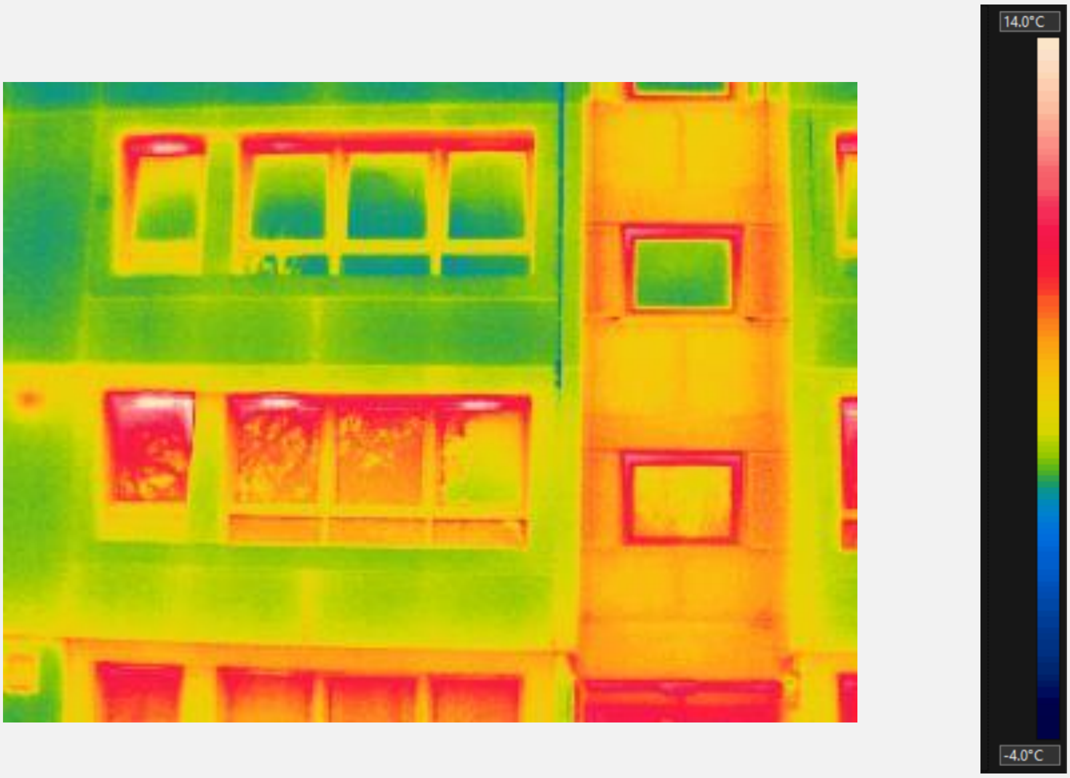
11: External – South Elevation



Air Temp: 6°C	
Distance: 2 m	
R.A.T. 5.7°C	
Wind Speed: 1 m/s	
Emissivity: 0.90	
Humidity: 78%	

Observations: This image shows the significant thermal bridge around the ground floor of the building.

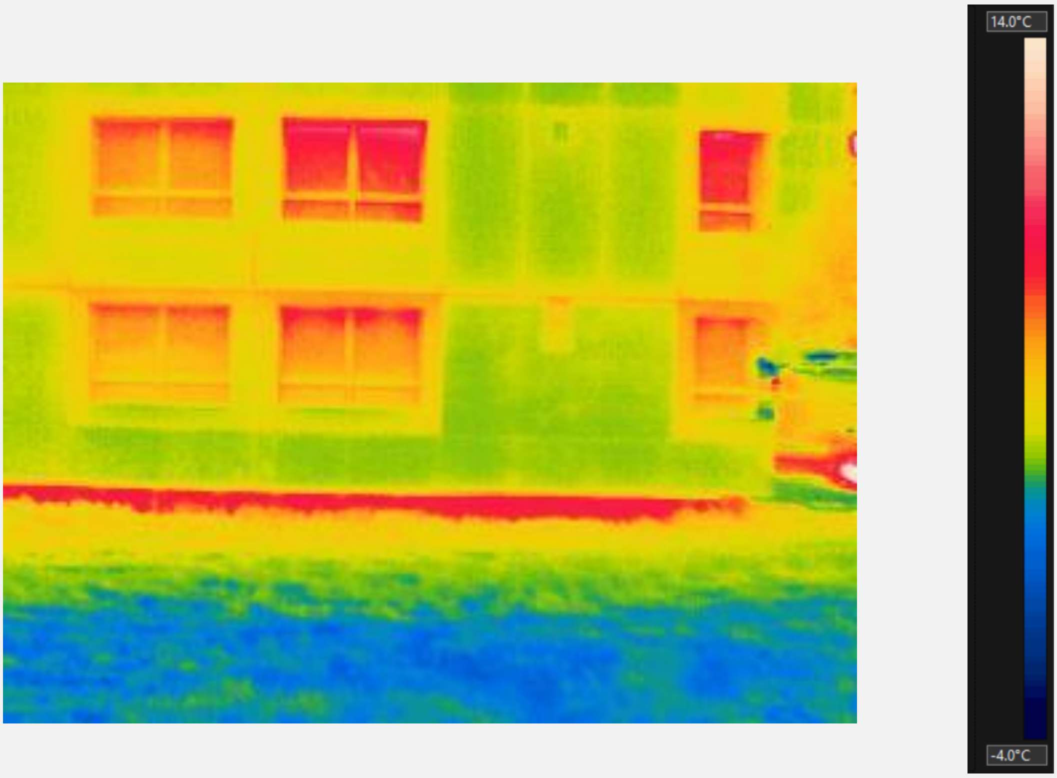
12: External – South Elevation



Air Temp: 6°C	
Distance: 2 m	
R.A.T. 5.7°C	
Wind Speed: 1 m/s	
Emissivity: 0.90	
Humidity: 78%	

Observations: This image shows alcove on the front of the building as being warmer than the rest of the façade. This could be largely due to the shelter factor.

13: External – South Elevation



Air Temp: 6°C

Distance: 2 m

R.A.T. 5.7°C

Wind Speed: 1 m/s

Emissivity: 0.90

Humidity: 78%

Observations: This image shows the significant thermal bridge around the ground floor of the building.

Conclusions

There are some significant thermal bridges at the ground floor, the lintels and the corners. The images show the impact of the thermal bridges on the External surface temperature of the walls.

The thermal performance of the windows appears to be below that of effective modern double glazing.

The thermal bridge at the ground floor level could be being caused by a lack of a thermal break from insulation between the External wall and the cold ground and uninsulated floor.

Glossary

T.I. (Thermal Index)
Thermal Indexing is a formula used to calculate the thermal performance of an area. It's used to quantify subjective images by accounting for air and surface temperatures during a survey. A Thermal Index value of 0.75 is the recommended lowest value that should be achieved within a building to negate the possibility of condensation and mould.

Infrared
Infrared radiation (IR) is a type of radiant energy that's invisible to the human eye, but can be felt as heat. Any object with a temperature above absolute zero (-273.15°C) emits infrared radiation. The higher the temperature of an object, the greater the intensity of infrared radiation.

R.A.T. (Reflected Apparent Temperature)
Reflected Apparent Temperature is the average temperature of all background infrared radiation in a scene. Once calculated, this value is used to compensate for any significant heat sources - allowing for more accurate temperature measurements.

Emissivity
All materials absorb, reflect and emit radiant energy - emissivity is the measurement of how well the surface of a particular material emits heat in the form of infrared energy. We use known emissivity values to adjust our thermal cameras for specific building materials, allowing for more accurate readings.

U-Value
A U-Value is the measure of heat transfer through an object or structure. U-Values are generally used to define thermal performance (heat loss) and assess the performance of a building.

Thermogram
A thermogram, otherwise known as a thermal image, is a graphic or visual record produced from a thermal imaging camera.

Solar Gain
Also known as 'solar heat gain' or 'passive solar gain', solar gain is the increase in thermal energy of an object, structure or space as it absorbs solar radiation (heat from the sun).

Thermal Bridging
A thermal bridge - also called a cold bridge, heat bridge or thermal bypass - is an area of a buildings construction that has a significantly higher heat transfer than its surrounding materials. Thermal bridging can be responsible for up to 30% of a dwelling's heat loss (BRE).

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If you have any questions or queries about your report, send your questions to
info@asbuilttesting.co.uk

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