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# Commercial Roof Thermal Inspection Report

**SAMPLE REPORT**

Radiometric thermal and high-resolution visual survey
of a commercial premises, East of England

| | |
|---|---|
| **SURVEY DATE** | 11 March 2026 |
| **PLATFORM** | DJI Matrice 4T — 640 x 512 radiometric thermal |
| **SURVEY TYPE** | Full roof thermal + visual inspection (leak investigation) |
| **PREPARED BY** | Skyline Drone Services t/a Skyline Visuals |

1 · SURVEY DETAILS

# Survey Overview

Skyline Visuals was engaged to carry out a non-intrusive thermal and visual inspection of the roof of a commercial premises in the East of England, following reports of water ingress affecting the interior of the building. The objective was to identify the source and extent of moisture entry without scaffolding, access equipment, or disruption to the occupier.

| | |
|---|---|
| **Survey date** | 11 March 2026, late morning (approx. 11:30–11:40) |
| **Weather conditions** | Overcast with intermittent bright sun; ambient 10–11°C; light winds |
| **Aircraft** | DJI Matrice 4T — compact professional thermal platform |
| **Thermal sensor** | 640 × 512 radiometric, calibrated spot measurement |
| **Visual sensor** | High-resolution RGB, captured simultaneously with each thermal frame |
| **Capture pattern** | Nadir (top-down) passes over all roof areas, plus oblique detail passes |
| **Measurement parameters** | Emissivity 0.95 · humidity 50% · reflected temp 5–9°C · distance-calibrated |
| **Operator** | CAA GVC certified pilot · £10M public liability insurance |

## Methodology

Thermal imaging detects surface temperature variation. Moisture trapped within a roof build-up changes how the surface heats and cools: wet substrate holds a lower temperature than adjacent dry material during daytime warming, producing distinct cold anomalies. Each thermal frame is paired with a matching visual photograph, so every anomaly is cross-checked against what is physically visible — staining, ponding, organic growth, or previous repairs — before it is reported as a finding.

Analysis is AI-accelerated and pilot-verified: pattern detection across the full image set is performed with AI assistance, and every finding in this report has been reviewed and confirmed by our qualified operator. Findings in this survey were subsequently validated on site by the client’s contractor.

2 · EXECUTIVE SUMMARY

# Findings at a Glance

The survey identified three related defects. Together they describe a single moisture pathway: warm interior air and wind-driven rain entering at a failed clerestory junction, impeded drainage holding water on the flat roof, and sustained moisture retention within the membrane in the area where ingress was reported internally.

| # | Finding | Location | Severity |
|---|---|---|---|
| 1 | Moisture retention within flat roof membrane — confirmed ingress zone | Southern and western flat roof areas | High |
| 2 | Impeded drainage and standing water | Northern channel between rooflights and hipped roof | Medium |
| 3 | Heat loss and probable entry point at clerestory junction | Clerestory base, above reported ingress area | High |

| 1 | 0 | 100+ | 3/3 |
|---|---|---|---|
| SITE VISIT | SCAFFOLDING REQUIRED | CALIBRATED SPOT READINGS | FINDINGS CONTRACTOR-VALIDATED |

The ingress reported by the building occupier was confirmed to correspond to Finding 1. The recommended remedial sequence is set out in Section 7: reinstate the clerestory junction seal, clear and re-test the northern drainage path, then allow the affected membrane area to be re-surveyed to confirm dry-down or inform localised replacement.

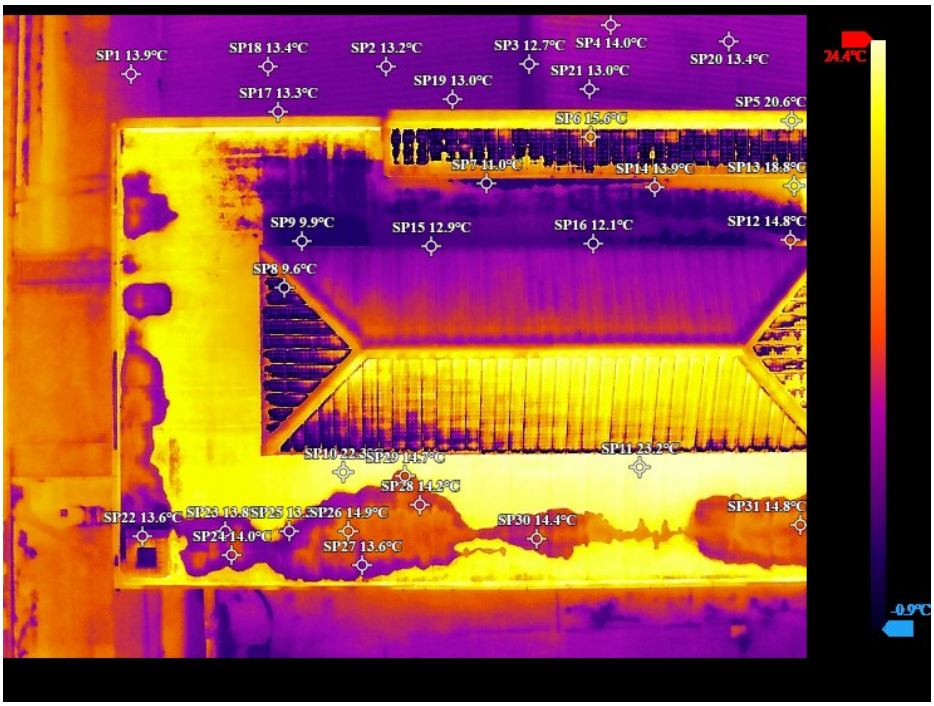
3 · FINDING 1

# Moisture Retention Within Flat Roof Membrane

**SEVERITY: HIGH**

Irregular cold anomalies were recorded across the southern and western flat roof areas, reading **9.6–9.9°C against adjacent dry membrane at 13–14°C** — a sustained deficit of 3.5–4.5°C. The anomalies correlate precisely with dark staining visible in the paired photographs, persist across frames captured at different sun angles, and follow the pattern of the staining rather than any structure or shadow line. This is the characteristic signature of moisture retained within the roof build-up: wet substrate cools through evaporation and holds temperature through thermal mass.

**This area corresponds to the location where water ingress was reported inside the building**, and was subsequently confirmed as the ingress zone by the client's remedial contractor.




*Thermal frame — annotated spot measurements. Cold anomalies (dark purple) at SP8 9.6°C and SP9 9.9°C against dry membrane at 13–14°C. Range –0.9 to 24.4°C.*

*Paired visual frame — dark moisture staining matching the thermal anomaly pattern.*

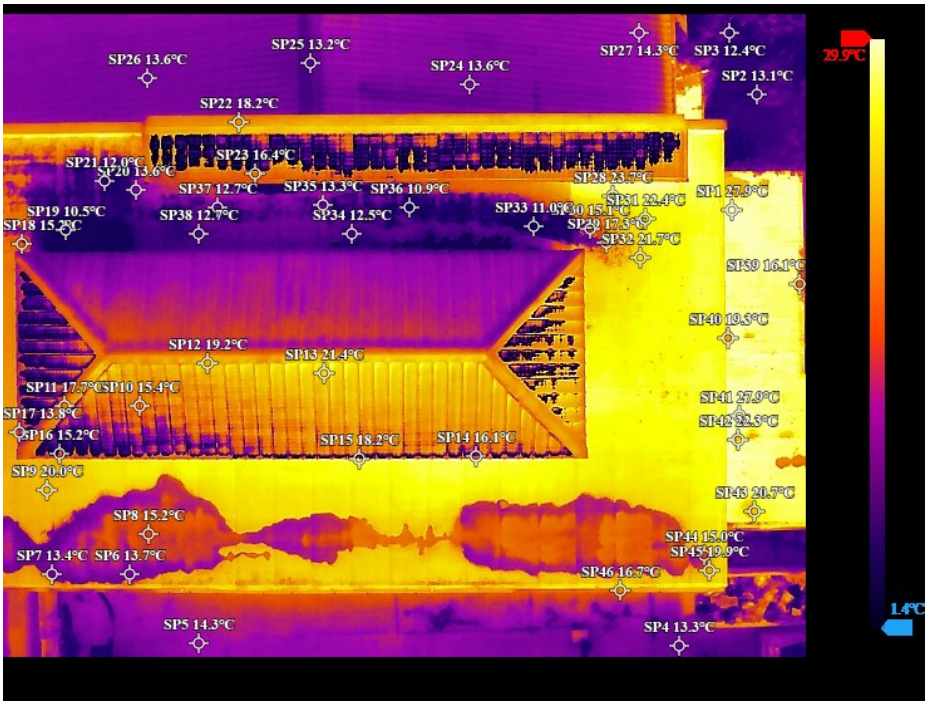
4 · FINDING 2

# Impeded Drainage — Northern Channel

**SEVERITY: MEDIUM**

The drainage channel between the north rooflights and the hipped metal roof shows a continuous cool, damp band, with the coldest roof-surface readings of the survey recorded here (**10.5–11.0°C**). The paired photographs show moss and organic growth along the channel — physical evidence of persistent standing water and slow drainage. The single visible outlet serving this run sits within a stained zone and should be rodded and inspected.

Impeded drainage does not itself constitute ingress, but it loads the roof with standing water and feeds the moisture retention recorded in Finding 1. Clearing this drainage path is a low-cost action that directly reduces the driving head of water over the affected membrane.




*Thermal frame — cold band along the northern channel (SP33 11.0°C, SP36 10.9°C, SP19 10.5°C). Bright zones at right are solar loading, not defects (see Section 6). Range 1.4 to 29.9°C.*

*Paired visual frame — organic growth and wet staining along the channel; outlet visible lower right within a stained zone.*

5 · FINDING 3

# Clerestory Junction — Heat Loss and Probable Entry Point

**SEVERITY: HIGH**

An oblique detail pass over the louvred clerestory recorded a strong linear warm signature at its base, with fan-shaped warm streaking running down the surface below. This pattern is consistent with warm interior air escaping through a failed seal or flashing at the clerestory-to-roof junction. A defect of this kind is also a likely water entry route under wind-driven rain.

The junction sits directly above the area of reported internal ingress, and we assess it as the **probable entry point**, with Findings 1 and 2 representing the accumulation and retention of the water that enters here. This assessment was borne out by the remedial contractor's subsequent investigation.

*Left: oblique thermal frame — linear hot signature at the clerestory base with warm streaking below (heat escaping the building envelope). Right: paired visual of the junction area.*

6 · NON-DEFECT OBSERVATIONS

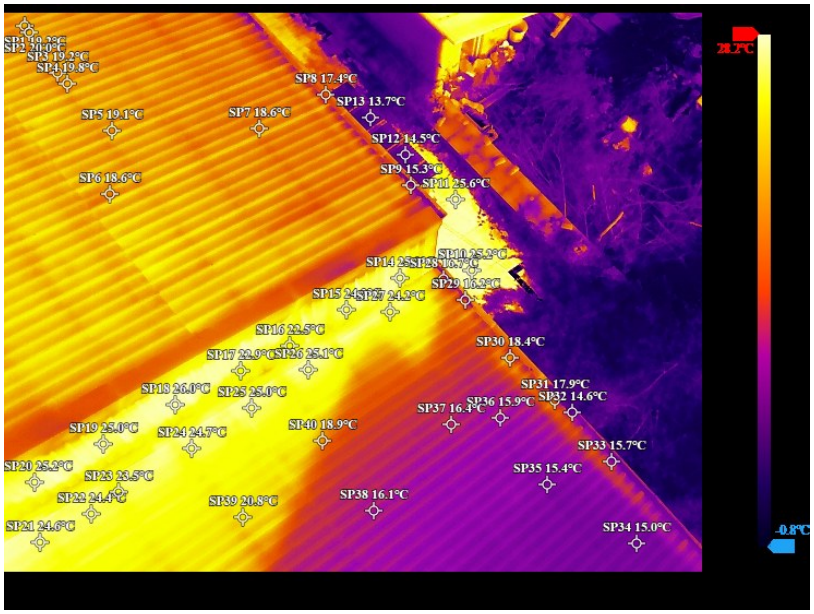
# What Is Not a Fault — and Why

A credible thermal report must separate genuine defects from normal thermal behaviour. The following features appear prominent in the imagery but are **not** defects, and were excluded from the findings:

**Solar loading.** The survey was flown in late morning with intermittent bright sun. Sunlit surfaces read up to 10°C warmer than identical shaded surfaces (e.g. 25°C vs 15°C either side of a shadow line on the pitched roof). These warm zones follow sun angle, not construction, and are excluded.

**Low-emissivity metal.** The hipped standing-seam roof appears cold and dark in thermal imagery. Bare and coated metal reflects the cold sky rather than emitting its true surface temperature — expected behaviour, not a fault.

**Previous repairs.** Patch repairs visible in the photographs read warm relative to the surrounding membrane. These are noted as maintenance history and monitored, not reported as active defects.




*Solar loading example — the sharp 25°C / 15°C split on this pitched roof follows the shadow line, not the construction. Correctly identifying non-defects prevents unnecessary remedial spend.*

7 · RECOMMENDATIONS

# Prioritised Remedial Actions

| # | Action | Detail | Timeframe |
|---|---|---|---|
| 1 | **Reinstate the clerestory junction seal (Finding 3)** | Engage a roofing contractor to open up, inspect and re-seal the clerestory base flashing. This closes the probable entry point. | Priority — immediate |
| 2 | **Clear and re-test the northern drainage path (Finding 2)** | Rod the outlet, clear organic growth from the channel, and water-test to confirm free discharge. | Priority — immediate |
| 3 | **Monitor the affected membrane (Finding 1)** | Once items 1–2 are complete, allow a dry-down period and re-survey the affected area. If cold anomalies persist, localised membrane replacement over the wet substrate is likely to be required. | Within 3 months |
| 4 | **Routine thermal monitoring** | An annual thermal survey (ideally in similar spring conditions) provides early warning of new moisture entry at a fraction of the cost of reactive repair. | Ongoing |

## Limitations & Conditions Statement

Thermal survey is a non-intrusive diagnostic method: it identifies temperature anomalies consistent with moisture and heat loss but does not physically open up the roof construction. Findings should be confirmed by intrusive investigation before major remedial works. This survey was flown in late morning with intermittent sun; solar effects were present and have been explicitly accounted for in the analysis (Section 6). Moisture findings in this report are based on cold anomalies corroborated by visible surface evidence, which are not produced by solar loading. Optimal conditions for moisture surveys are dry weather following rainfall, with an overcast sky or early/late flight times.

This sample report has been anonymised for publication. Client reports additionally include per-image GPS coordinates for every finding, allowing a roofing contractor to locate each defect precisely on the roof, together with the full frame set from the survey.