



Chad Board
AssetRoof

November 4, 2025 | 33 Photos

Thermal Inspection Report

Aerial Thermal and On-Roof Assessment



Sample Thermal Inspection Property

Inspection date: November 4, 2025

Chad Board, RRO | Part 107 sUAS #5169912

Certified Level 1 sUAS Thermographer

Summary of Conditions and Observations

Property	Sample Thermal Inspection Property
Prepared for	Sample Client Name
Inspection date	November 4, 2025
Report date	November 5, 2025
Inspector	Chad Board, RRO. Part 107 sUAS #5169912, Certified Level 1 sUAS Thermographer

Roof assembly

Roof system type	EPDM over modified bitumen BUR
Top layer (recover)	EPDM membrane over 1/2 inch wood fiberboard
Original roof	1/2 inch modified bitumen BUR over 3 inch polyisocyanurate insulation
Approximate R-value	R-20
Roof deck	Metal
Area	71,200 square feet, approximate
Roof age	EPDM installed around 2007 based on Google Earth historical imagery
Building age	Constructed in 1989 per county records
Overall condition	Poor. Leaking.
Life expectancy	At end of useful life
Active leaks	Numerous active leaks observed

Component thicknesses above are approximate. The core cut returned a total assembly depth of 3.5 inches, which does not fully reconcile with the listed component thicknesses. Treat the core measurement as the controlling figure.

Equipment

- DJI Mavic 2 Enterprise Advanced with radiometric thermal sensor
- Tramex RWS handheld impedance scanner

Conditions at time of inspection

Time of scan	11:00 am to 12:00 pm, November 4, 2025
Sky	Mostly sunny
Overnight low	45 degrees F
Temperature at scan	66 degrees F
Wind at scan	6 mph
Surface condition	Mostly dry. Some surface water removed by the inspector and allowed to dry naturally to reduce surface moisture readings. One area retained standing water and is excluded from subsurface interpretation.

Method

The roof was scanned from the air with a radiometric thermal sensor, then walked and tested on the roof. Thermal indications were spot checked with a Tramex RWS impedance scanner. One core cut and two subsurface checks were taken to confirm the thermal reads.

Daytime scan note

This inspection was flown in daylight rather than after sunset. On a black EPDM surface with low reflectivity, dry roof heats quickly and reads warm. Areas holding water below the membrane stay cooler and read cool. Moisture indications in this report read cool, not warm, which is the reverse of a standard post-sunset scan.

Palette note

Thermal images in this report are shown in multiple color palettes. Different palettes emphasize different aspects of the thermal data, and switching between them helps confirm or rule out moisture anomalies. An area that reads as a strong anomaly across multiple palettes and temperature ranges is treated with higher confidence than one that appears in a single view only. Palette selection is a standard interpretation tool and does not alter the underlying temperature data.

Timestamp note

Where thermal images have been edited for palette or presentation, the file timestamp reflects the date and time of processing rather than the original capture time. Drone images additionally carry a +13 hour offset from CST due to a permanent setting in the drone equipment. All images in this report were captured during the inspection noted above.

Findings, flagged areas and recommendations are in the Analysis and Findings section.

1



Property

Front elevation, looking north from the parking lot.

Aerial Thermal Inspection

Drone operator	Chad Board, Part 107 sUAS #5169912
Thermography	Certified Level 1 sUAS Thermographer
Gimbal	64 degree angle for survey passes, 90 degrees for detail
Flight pattern	Northeast to southwest
Thermal read	Dry roof reads warm, shown yellow. Water in the insulation below the membrane reads cool, shown purple. Orange is transitional.

Observations

- Cool anomalies consistent with subsurface moisture cover an estimated 35 to 45 percent of the roof area, concentrated on the north and east sections and running through the center.
- The pattern is continuous across insulation board joints rather than isolated spots.
- Multiple punctures observed across the north and east sections. One is annotated in Image 1 (Thermal) below.



Image 1
Northeast end of the building, visual reference image. Building front is to the right, rear to the left.

2

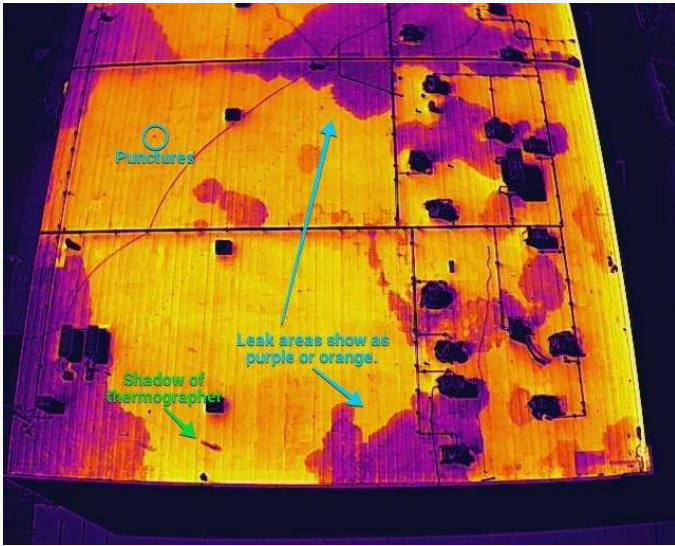


Image 1 (Thermal)

Northeast end, thermal. Dry roof reads yellow. Cool purple areas indicate water in the insulation below the membrane. One puncture is annotated at upper left. The dark shape at lower left is the thermographer's shadow, not an anomaly.

3



Image 2

North-central roof area, visual reference image.

4

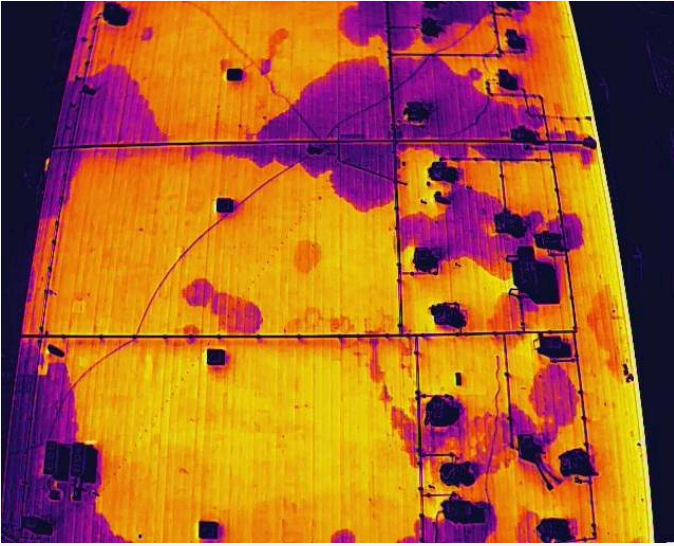


Image 2 (Thermal)

North-central roof area, thermal. Large connected cool areas cross insulation board joints, which indicates widespread subsurface moisture rather than isolated wet boards.

5



Image 3

North roof area continuing west, visual reference image.

6

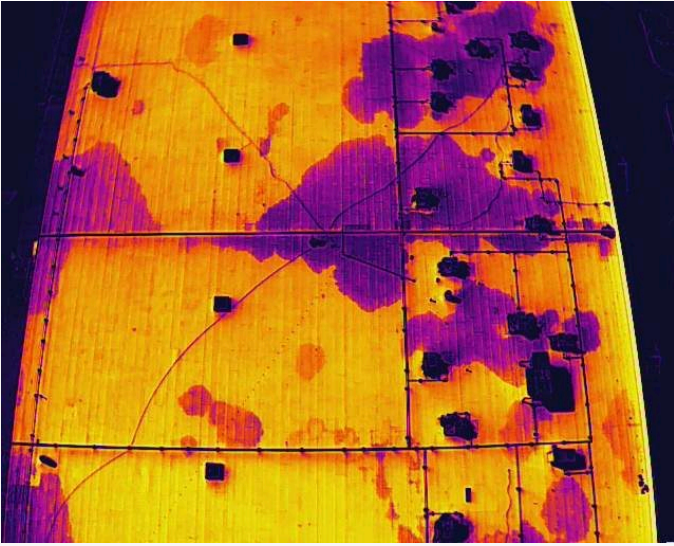


Image 3 (Thermal)

North roof area, thermal. Cool areas continue across the section with no clear boundary between them.

7



Image 4

West end of the north roof area, visual reference image.

8

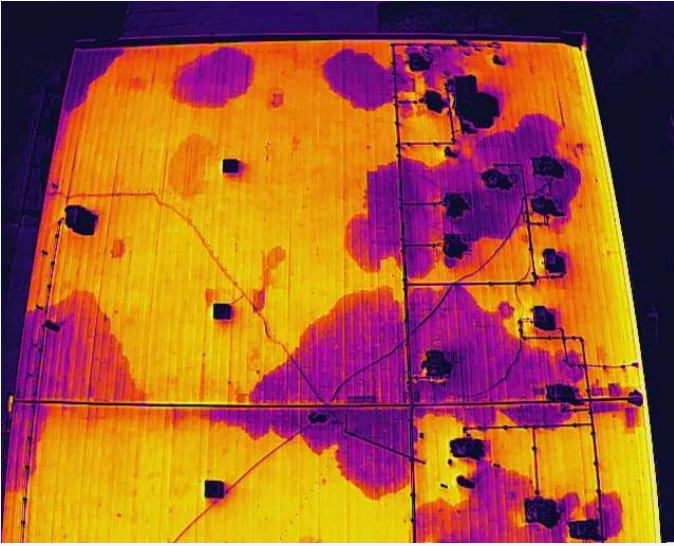


Image 4 (Thermal)

West end of the north roof area, thermal. Moisture indications extend to the roof perimeter in several places.

9



Image 5

Center roof area, visual reference image.

10

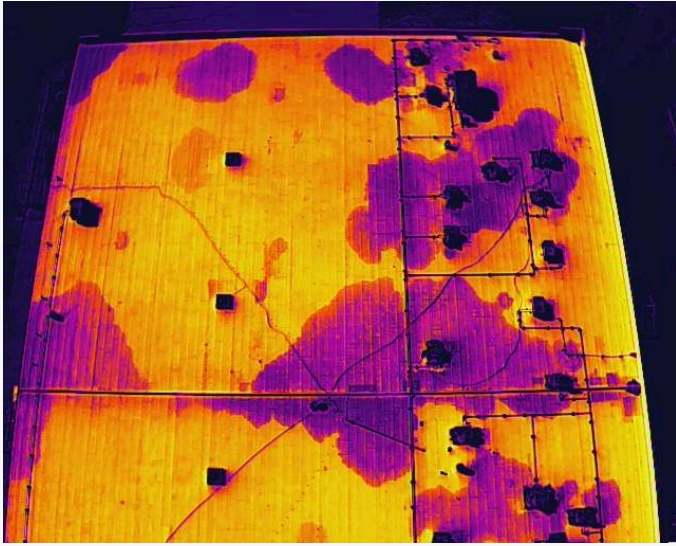


Image 5 (Thermal)

Center roof area, thermal. Cool areas run through the middle of the roof and connect to the north section indications.

11



Image 6

Center roof area, visual reference image for the detail that follows.

12

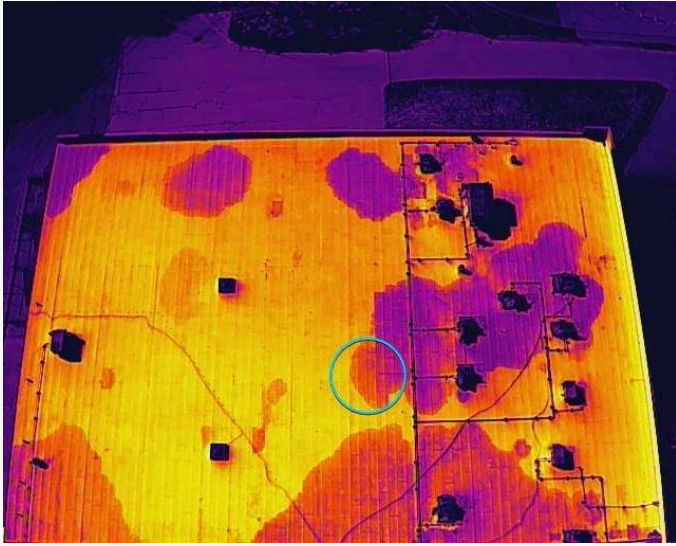


Image 6 (Thermal)

Center roof area, thermal. The circled area is shown in detail in Images 13 and 14.

13

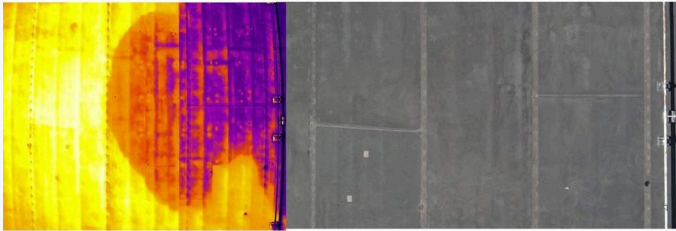


Image 6 detail, side by side

The same location shown side by side, thermal on the left and visual on the right. The underlying metal deck is visible in the right image. Moisture reads on the metal deck itself, which indicates intrusion at all levels of the roof assembly.

14

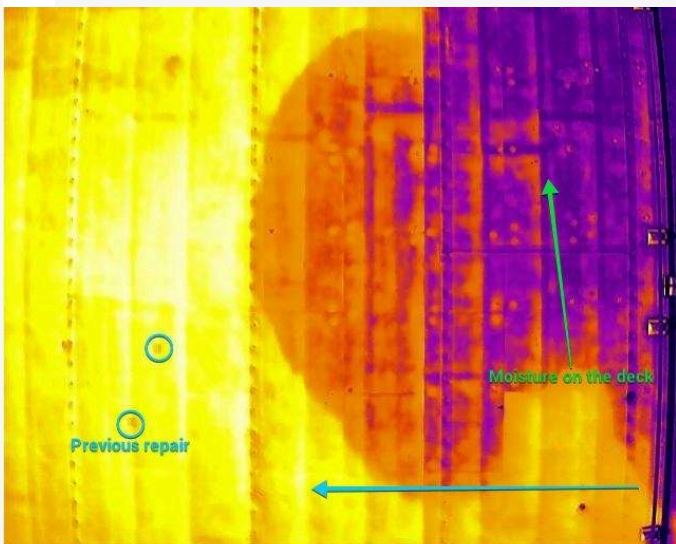
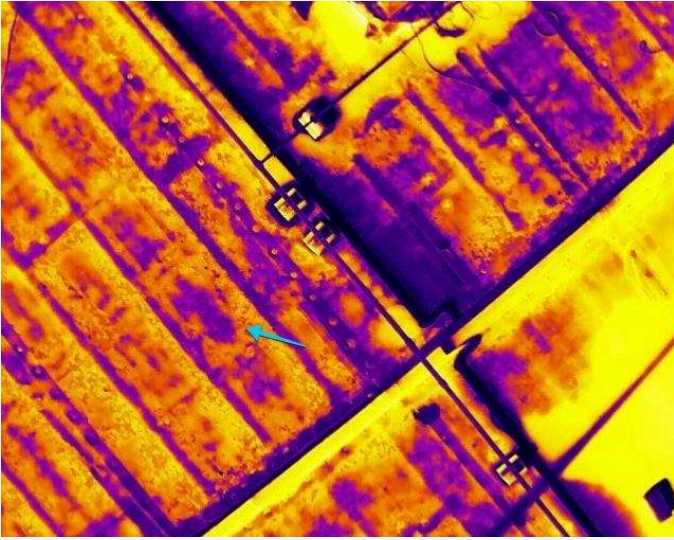


Image 6 detail, close up

Close up of the same location. Moisture is heaviest on the right and decreases moving left. Yellow is largely dry. Moisture on the deck stops at the low rib. Purple, indicating moisture, sits on the right side of the rib. The area on the left side of the rib is drier. A previous repair is circled at left.

15



Ponding

Water ponding on the roof surface, which indicates saturation of the roof material below. No subsurface reading is possible through standing water, so this area is excluded from subsurface interpretation. Flight height 62 feet, gimbal at 90 degrees.

On-Roof Inspection

Observations

- Several rooftop HVAC units have been dismantled and left covered. Confirm with the owner whether this work is complete and whether any curbs or penetrations were left open.
- Scrim is exposed across widespread areas of the EPDM. Where the top ply has worn through to the reinforcing scrim, the membrane no longer provides a watertight surface. These are probable leak entry points.
- Presence of water confirmed by impedance scanning, core cut and visual inspection. See Verification and Testing.

1



Roof overview

Looking across the roof field toward the perimeter.

2



Roof overview

Rooftop HVAC units and drain locations.

3



Roof overview

Looking along the main roof section.

4



HVAC units

Rooftop HVAC units, several dismantled and covered.

5



HVAC units

Additional rooftop HVAC units in the same condition.

6



Scrim failure

EPDM worn through to the reinforcing scrim.

7



Scrim failure

Scrim exposure near a curb and transition detail.

8



Scrim failure

Scrim exposure in the open field of the membrane.

9



Scrim failure

Scrim exposure with surrounding weathering and surface deterioration.

10



Scrim failure

Close up of exposed scrim. The reinforcing grid is fully visible, meaning the top ply of the EPDM is gone at this location.

Verification and Testing

Thermal indications were verified on the roof by impedance scanning, one core cut and two subsurface spot checks. All three methods confirmed water in the areas identified by the thermal scan.

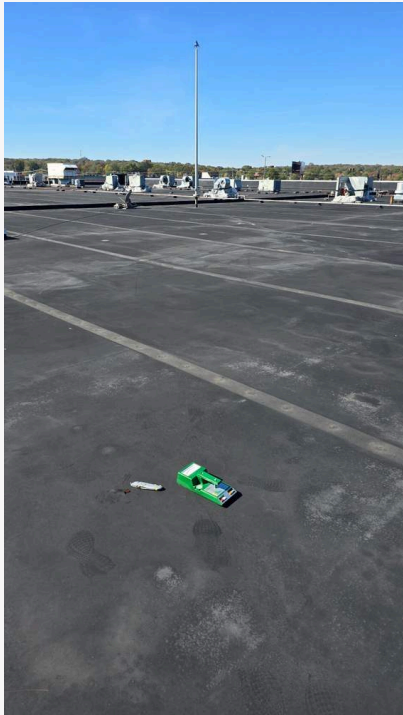
11



Impedance scan

Tramex RWS reading confirming moisture in an area identified by the thermal drone scan.

12



Impedance scan

Tramex RWS in position on the roof at a thermal indication, showing the area tested.

13



Core cut

Core cut. The roof was wet at all levels. Metal decking observed at the base of the core. Total assembly depth 3.5 inches.

14



Core sample

Core sample showing the original modified bitumen BUR. This roof carries two systems, a modified bitumen BUR with a recover of fiberboard and EPDM over it.

15



Spot check 1

Spot check confirming the impedance and thermal indications of water. The fiberboard is completely saturated.

16



Spot check 1, sample

Saturated and deteriorated fiberboard removed from the spot check. The board has lost its structure and no longer provides usable insulation value or substrate support.

17



Spot check 2

Second spot check at an identified leak area, confirming saturated fiberboard below the membrane.

Analysis and Findings

What the scan found

The scan covered roughly 71,200 square feet. Large connected cool areas appear across most of the roof, concentrated on the north and east sections and running through the center. The pattern is continuous saturation crossing insulation board joints rather than isolated wet spots.

Thermal indications were spot checked on the roof with the impedance scanner, one core cut and two subsurface checks. All confirmed water. The core showed the roof wet at all levels down to the metal deck, with the fiberboard saturated and broken down. Surface water was removed before scanning and allowed to dry, but any area still holding standing water at the time of the flight returns no usable subsurface data.

All findings are screening-level and should be verified by on-roof moisture metering or test cuts before repair decisions.

Flagged areas, highest priority first

North and east sections. Large connected subsurface moisture. **HIGH**

Cool areas span multiple insulation boards without a clear boundary. Confirmed wet by core cut to the metal deck, wet at all levels, with saturated fiberboard.

Recommended action: Treat as saturated. Scope replacement or full tear-off of this area. Spot repair is not a reasonable fix at this extent.

Center of roof, circled area in Image 6. Moisture on the metal deck. **HIGH**

Moisture is visible on the metal deck itself, decreasing to the left across the low rib and stopping at the rib. This indicates intrusion through every layer of the assembly.

Recommended action: Core cut to confirm deck condition and check for corrosion. Deck condition changes the repair decision.

Widespread scrim exposure across the EPDM field. HIGH

The membrane has worn through to the reinforcing scrim in multiple areas. These are open or near-open water entry paths regardless of what the thermal shows. Confirmed visually and by hand.

Recommended action: Document and map each location. Treat as active entry points.

Punctures, north and east sections. MEDIUM-HIGH

Multiple punctures observed. One is annotated in Image 1 (Thermal). A full count was not taken during this inspection.

Recommended action: Count and map the punctures, then compare their locations against the wet areas below.

Ponding area, thermal Image 15. HIGH ponding, NO SUBSURFACE DATA

Water standing on the surface. The ponding itself is confirmed. No subsurface reading is possible through standing water, so the condition below this area is unknown.

Recommended action: Check drainage at this location and re-scan once dry.

Perimeter, edge metal and transitions. NOT ASSESSED

Not separately scanned or evaluated during this inspection. This means not assessed, not found sound.

Recommended action: Include in any follow-up inspection.

Excluded and non-anomalous

- Areas under standing water. No subsurface reading is possible through ponded water. These areas are shown but not interpreted.
- HVAC units, curbs and their shadows. Equipment and shadow lines read cool and are not moisture. The thermographer's own shadow is annotated in Image 1 (Thermal) for the same reason.
- Warm reflected surfaces at parapets and wall returns.

Recommendation

Verify the largest connected cool area on the north and east sections first. The core cut already taken in that area returned wet at all levels with saturated fiberboard, so the question there is extent, not presence. Map the boundary with the impedance scanner and pull a second core at the edge of the indication to fix the line between wet and dry.

Second, core the center area circled in Image 6 where moisture reads on the metal deck. Deck corrosion changes the repair decision and the budget.

Third, document and map the scrim exposure and the punctures. Those are verifiable by eye and do not require testing.

Given the roof age, the two-system buildup, saturation at roughly this extent and confirmed deterioration of the fiberboard, spot repair is unlikely to be the economical path. Replacement scope and budget pricing should be developed alongside the verification work rather than after it.

No thermal finding should be treated as a confirmed defect without physical verification.

Chad Board, RRO

Registered Roof Observer | Certified Level 1 sUAS Thermographer | Part 107 sUAS #5169912

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Understanding This Report

Why the wet areas read cool instead of warm

Most people who have seen a thermal roof scan have seen a night scan, where wet areas read warm. Water absorbs heat all day and holds it longer than dry roof, so after sunset the wet areas glow.

This scan was flown in daylight. On a black EPDM surface with low reflectivity, dry roof heats fast in direct sun while areas holding water below the membrane stay cooler. The read is reversed. In this report, cool areas are the moisture indications.

What the colors mean

Yellow is dry roof. Purple is cool, which in this scan means water in the insulation below the membrane. Orange sits between the two and is treated as transitional, not as a confirmed wet area. The palette is an interpretation tool. Changing it changes the picture, not the temperature data behind it.

Why the image timestamps do not match the inspection time

Two things affect the stamps. The drone carries a permanent +13 hour offset from local time. And any image edited for palette or annotation is re-saved, which resets the file stamp to the processing time. Every image in this report was captured during the inspection window listed in the Summary.

What a thermal scan can and cannot tell you

A thermal scan finds temperature differences. It does not measure water directly. It tells you where to look, and it covers a large roof quickly and without cutting it open. That is what makes it worth flying.

What it cannot do is confirm water by itself. Shadows, wet surface debris, equipment, reflections and recent rain all produce temperature differences that have nothing to do with subsurface moisture. That is why every indication in this report was checked against the impedance scanner, a core cut or a spot check before it was called a finding, and why the ones that could not be checked are labeled as such.

What the confidence ratings mean

- **HIGH.** The thermal indication was confirmed by a core cut, spot check or impedance reading, or the condition is visible and physical.
- **MEDIUM-HIGH.** A clear thermal indication that is consistent across palettes but was not physically verified at that specific location.
- **NOT ASSESSED.** The area was not evaluated during this inspection. This is not a statement that the area is sound.

What happens next

Nothing in this report is a repair specification. It is a condition record and a verification plan. The next step is to verify the strongest indications in the order listed in the Recommendation, then decide on repair or replacement with that information in hand.

Scope and Limitations

Scope of this inspection

This inspection consisted of an aerial thermal scan of the roof surface, an on-roof visual inspection, impedance moisture scanning at selected locations, one core cut and two subsurface spot checks, all performed on November 4, 2025. The report covers the roof surface and rooftop conditions visible and accessible on that date.

What was not included

- Structural evaluation of the roof deck, framing or building structure.
- Interior inspection, ceiling or insulation conditions inside the building.
- Evaluation of walls, windows, flashings below the roofline or any other building enclosure component.
- Mechanical, electrical or plumbing equipment, including the condition or operation of rooftop HVAC units.
- Testing for asbestos, mold or any other hazardous material.
- Code compliance review or warranty adjudication.
- Separate evaluation of perimeter details, edge metal and transitions.
- Repair pricing, scope of work or contractor selection.

Limitations

Thermal imaging is a screening method. It identifies temperature differences that are consistent with subsurface moisture. It does not measure moisture and does not confirm its presence. Findings in this report are screening-level and require physical verification before any repair decision.

No subsurface reading is possible through standing water. Areas holding water at the time of the scan are excluded from subsurface interpretation and their condition is unknown.

Debris, shadows, rooftop equipment, reflected heat and recent weather all affect thermal readings and can produce apparent anomalies that are not moisture. Areas affected by these conditions are identified where recognized.

The core cut and spot checks represent conditions at those specific locations on that date. Conditions elsewhere on the roof may differ. Roof conditions change with weather, use and time, and this report reflects the roof as it existed on the inspection date only.

Assembly composition, roof age and building age are based on the core sample, county records and historical aerial imagery. They are approximate and were not verified against original construction documents.

Independence

AssetRoof performs no repair or replacement work and accepts no compensation from any contractor in connection with this property. Compensation for this inspection came from the client only. The findings and recommendations here carry no financial interest in whether work is performed or who performs it.

Use of this report

This report was prepared for the named client for the purpose stated above. It is not a guarantee or warranty of roof condition, watertightness or remaining service life, express or implied. Reliance by any other party is at that party's own risk. Reproduction in part, or use of individual images or findings separated from the full report and its limitations, is not authorized.

Chad Board, RRO

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Report date: November 5, 2025