

U.S. ARMY CORP. OF ENGINEERS

Civil Engineering Research Division

Roof Moisture Surveys

Moisture in roofs wastes energy and the deterioration it causes leads to expensive repair or premature replacement.

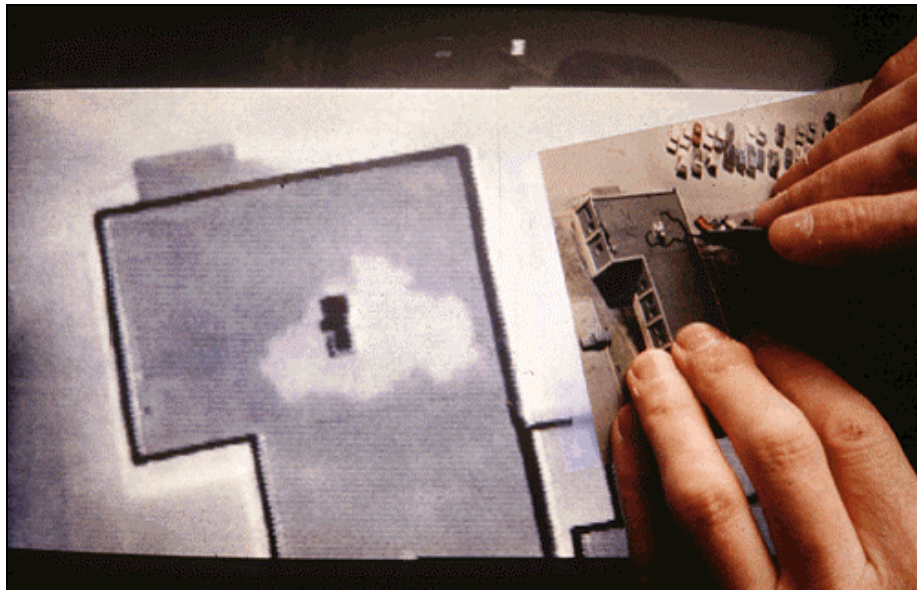
AERIAL THERMOGRAPHY

With more than 300,000 roofs to care for at Army installations worldwide, and helicopters readily available to us, we also promoted airborne roof moisture surveys to drastically reduce survey time when many roofs need to be surveyed in one location. Our colleagues at the Army's Center for Public Works conduct roof moisture surveys this way at many Army bases each year.

This helicopter-mounted infrared scanner can examine all roofs of a typical Army base in a matter of hours.



Manual Transferring infrared findings onto an aerial photo of a roof for use by inspection and maintenance personnel



INFRARED CONCEPTS CORP. has replaced the manual transfer of information from what is readily visible on the original infrared imagery to:

- 1) The application of the U.S. Patented process to enhance the imagery **EXPOSING INVISIBLE ANOMALIES INDICATIVE OF MOISTURE.**
- 2) Overlaying the enhanced infrared imagery on a scaled daytime digital image to ensure the exact registration or accurate location of the anomalies;
- 3) and **REMOVING THE FALSE POSITIVES** which compromise the accuracy of the final report.
- 4) ICC provides an additional option of preparing true AutoCAD data files and calculating the percentage of the total roof area that is suspect and the square footage of that area.

VERIFICATION

Findings are verified by coring areas that the infrared survey indicated are wet and others expected to be dry. Such verification often is done in conjunction with visual inspection of the roofing system. Aerial resurveys every few years are a cost-effective way to uncover small problems before they become serious.



Coring a roof to verify infrared findings.



Patching a roof after coring.

ROOF WARRANTIES

New roofs are seldom perfect, and cancers of wet insulation may grow in them soon after construction. CRREL has developed guide specification language for performing infrared inspections while the roof is under warranty and the cost of repairs is still the responsibility of the contractor. The cost of an infrared inspection runs from \$0.02 to \$0.05 per square foot and can save roof replacement costs, which may be 100 - 600 times that amount.