
CASE STUDY: INFRARED IMAGING IN A MULTI-LEVEL OFFICE COMPLEX

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In the last fifty years infrared imaging has been used in a wide variety of applications and by many different organizations including NASA and the United States Military. There seems to be an infinite use to the benefits that infrared imaging technology brings to the human existence on this planet. This case study will focus on one such aspect of infrared imaging that is used to detect moisture intrusion into buildings.

Indoor Environmental Consultants, Inc. (IEC) was recently contracted with a national realty corporation to conduct a limited indoor environmental assessment in several multiple level office facilities located in Austin, Texas. The client was in the process of purchasing this multi-million dollar property and wanted assurance that there were no underlying problems with moisture intrusion and related IAQ-problems. Additionally, the presence of moisture intrusion problems could potentially change the overall value of the property and subsequently impact the real estate transaction.

Standard visual investigation techniques and infrared imaging in conjunction with moisture meter measurements were utilized to evaluate the potential of moisture intrusion into the facilities. The areas evaluated included the operating heating, ventilating, and air-conditioning (HVAC) systems, interior plumbing systems, and the perimeter walls and envelope of each building.

An individual trained in thermal imaging is capable of evaluating and interpreting the individual heat signatures emitted by different building products and assemblies. Infrared imaging performed at the facilities did not reveal thermographic signatures that would indicate elevated levels of moisture in the perimeter wall and ceiling areas (Fig 1). However, infrared imaging did reveal a hidden problem with the electrical wiring in an interior wall of one of the office buildings. Specifically, a “hot spot” was detected on an interstitial wall electrical flex line that served two computer workstations (Fig 2). The electrical distribution system was not part of the inspection; however, the relative ease of using thermal infrared technology allowed for the routine scanning of some of the interior walls and assisted in the identification of this potentially serious problem.

Infrared imaging of the restroom areas in each building revealed thermographic signatures under the toilet of one of the women’s restrooms that were consistent with moisture intrusion (Fig 3). Further inspection of this area revealed an ongoing Category 3 (black water) event that was virtually undetectable by the naked eye. The use of infrared technology greatly improved the investigator’s ability to locate this hidden water intrusion event and facilitated a prompt repair that stopped the hidden water intrusion.

from escalating into a more costly repair.

In summary, the incorporation of infrared imaging technology in these investigations served as the basis for the identification of two, completely different types of hidden problems in these buildings. The infrared technology allowed for a “non-destructive” means to evaluate for the presence of water intrusion, but in this case, also identified heat signatures related to faulty and failing wiring. Left undiscovered, the hidden electrical and plumbing problems that these buildings were experiencing could have escalated into major problems if not identified and promptly corrected.

As a direct response to the data obtained from thermal imaging, the property management company that handled the buildings was able to promptly initiate repair. The owners were so impressed by the ability to identify these hidden problems that IEC was immediately contracted to provide proposals to inspect other properties in their possession. Our client was greatly impressed by our company’s ability to identify these hidden problems and was extremely pleased in the value of the services rendered.

Infrared imaging technologies offer an improved, non-destructive means to evaluate buildings for a variety of potential hidden problems. The technology can be utilized to evaluate the building envelope, slab, roof systems, electrical distribution systems, mechanical systems, and plumbing systems. Benefits to this type of proactive infrared imaging inspection include a non-destructive inspection methodology that does not require down time on major mechanical equipment or operations. In this case the results provided by infrared imaging technologies provide potential energy savings to the owner and future owner lower costs related to the prompt identification and repair of hidden water damage, and the identification of potential electrical problems that reduced the potential occurrence of a future fire.

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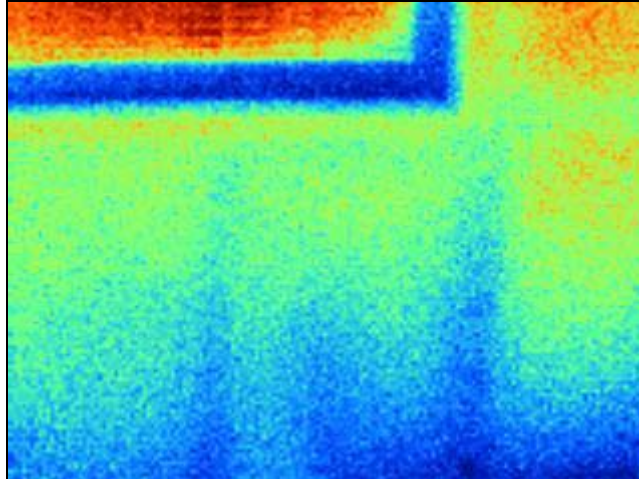


Figure #1

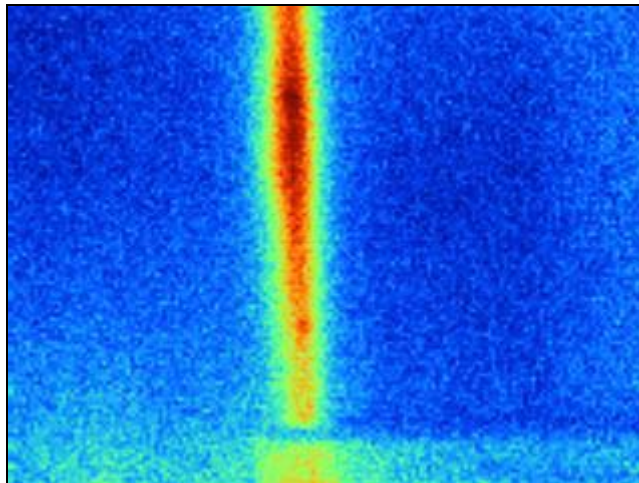


Figure #2

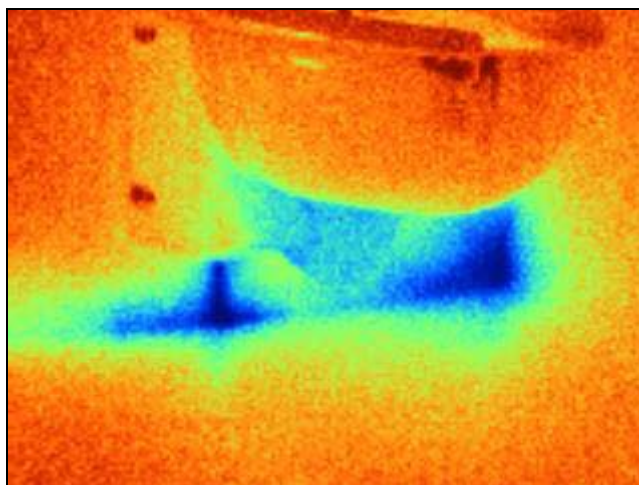


Figure #3