
Infrared Thermography and Water Damage Assessment

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ABSTRACT

Thermal imaging devices have many uses across a wide spectrum of industries. Using infrared thermography to address, assess and remediate water damage claims is one of the most effective ways to minimize costs, maximize dry-down effectiveness and provide your client with thorough documentation of the damage caused by water loss.

INTRODUCTION

Infrared thermography can help address water damage claims effectively and efficiently when coupled with the accurate use of moisture meters, digital photographs, diagramming and thorough note taking. A trained thermographer using infrared thermography to assist in documenting and assessing large water loss claims can be one of the most effective and efficient ways to mitigate water damage of commercial/residential buildings. The use of thermal imaging devices can save many hours of labor and help to allocate drying equipment more effectively, resulting in cost savings to the client. Thermal imaging is also a very effective tool to diagram the dry down process or map the affected areas. This paper will discuss the process and proper documentation when using infrared thermography to effectively assess water damage claims.

WATER DAMAGE INITIAL ASSESSMENT SMALL LOSS

Figures 1 and 2 show a thermal and digital image of water damage that occurred following a severe rain storm. The homeowners had called complaining that their carpet was wet. Inspection with use of infrared thermography revealed a much greater problem than just wet carpet. Several large areas of affected wallboard were detected in both their 1st floor living room as well as their second floor bonus room. This detection of water intrusion using infrared thermography allowed for the timely placement of drying equipment as well as material removal in the most severely affected areas.

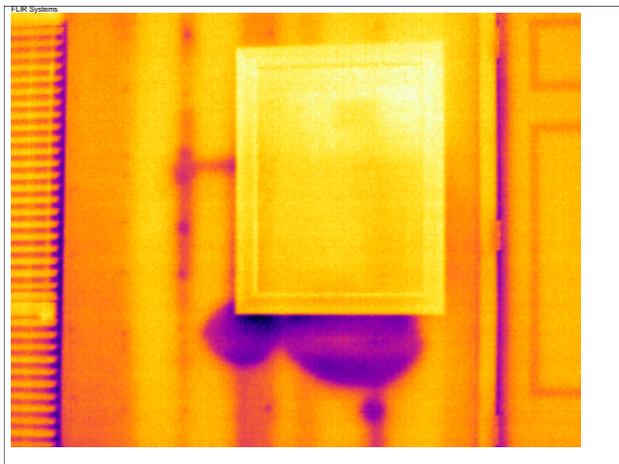


Figure 1. Thermal image of water intrusion.



Figure 2. Digital image of water intrusion.

Water damage assessment is far easier with today's current availability of infrared imaging. What could take several workers a day to assess, can now be completed in a matter of hours if not minutes. The thermal imaging device is simply directed at the surface and an image is immediately presented to the thermographer

in the viewfinder. As with any tool it is always prudent to support your findings with other tools such as moisture meters, diagrams/mapping, hygrometer and digital photographs.

Once areas of water damage have been detected, taking an infrared picture as well as a digital picture from the same vantage point are key elements to proper documentation for your client. Once areas of water damage have been located by use of your thermal imaging device (often times by a general walkthrough prior to beginning the documenting procedure), use of moisture meter is always a good way to support your findings. The thermographer will want to spot check areas where thermal anomalies are present to accurately record moisture percentages. This will typically be checked throughout the course of drying down the affected area to accurately determine moisture percentage decrease.

WATER DAMAGE INITIAL ASSESSMENT LARGE LOSS

Use of handheld thermal imaging devices has changed the way the restoration industry does business. Walking into a 20 story high rise is no longer as much of a daunting task as it once was. Using the thermal imager during a general walk through the thermographer is able to locate affected areas without content removal or lift systems. Inspection of difficult to reach walls or ceilings can easily be observed. Infrared thermography helps facilitate the placement of drying equipment at the most appropriate (affected) areas. Figures 3 & 4 show a 20 foot ceiling over a large stairwell, creating an almost impossible place to reach. Use of a FLIR B-20 camera showed the extent of damage within seconds.



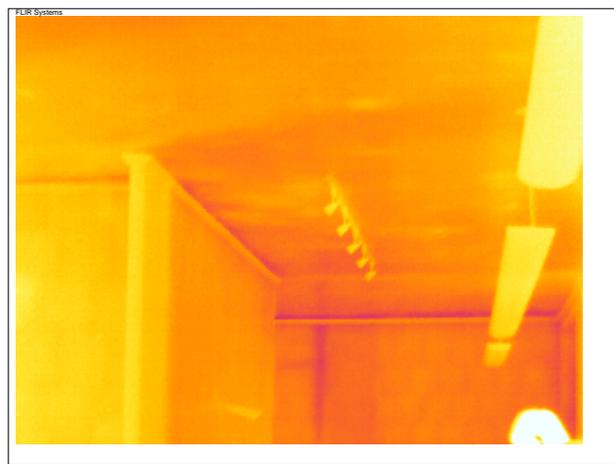
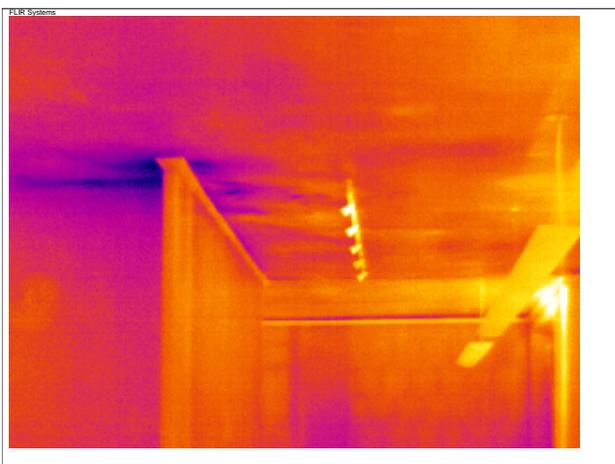
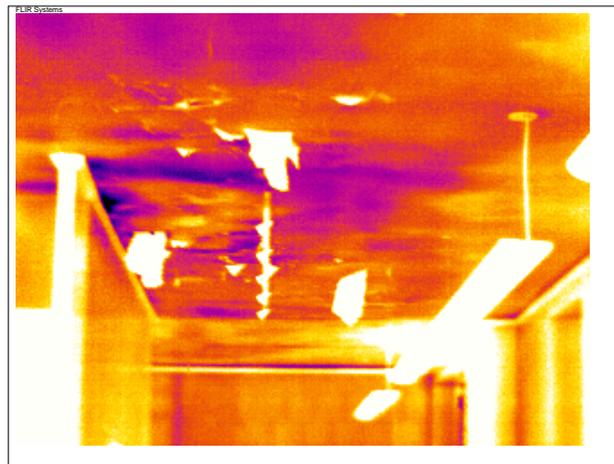
Figures 3-4, Shown above are a digital and thermal image of a library in Northern California affected by a large rain storm

DOCUMENTING THE DRYING PROCESS

REQUIREMENTS by Industrial standards: IICRCS500 ("Upon entering the building, professional moisture detection equipment should be used to evaluate and document ...")

Moisture Mapping

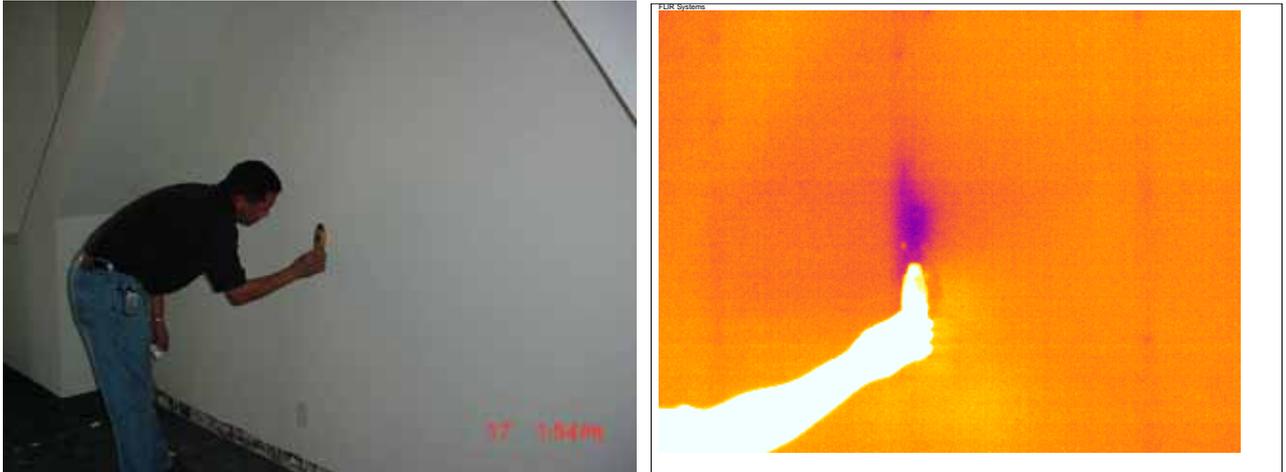
Moisture mapping (thermal and digital images showing affected areas) is an extremely valuable procedure for many clients affected by water damage. Moisture mapping provides conclusive documentation of affected areas. This process documents effectiveness of the dry down process and provides effective proof that the site was dry when the job is completed helping to release you of liability. Moisture mapping provides additional documentation to prove whether materials are dry, whether to add additional equipment or if removal of affected material is needed. By careful use of noting your vantage point, images can be taken to show your client the dry-down process during each inspection. Using a good frame of reference the thermographer can usually take images from roughly the same vantage point, creating a great summary of the dry-down process. The images below show thermal images from roughly the same vantage point, however some differences are noted in each thermal image.



Figures 5-8: Thermal images of water damage over the course of two weeks.

Note Taking/Documentation

Good note taking is the key to providing a good report for your client. Taking note of the indoor/outdoor temperature, outdoor conditions during the time of inspection, moisture meter readings and thermal/digital image numbers are all useful pieces of information for your report. Using a moisture meter will help substantiate the findings while using the infrared imaging device. Shown below is use of a moisture meter to verify the cooler spot found by infrared thermography on a wall, verifying it to be moisture.



Figures 9-10: Missed areas easily found with infrared thermography and verified with moisture meter survey.

Mapping/Diagramming:

Being able to diagram what areas have been affected by water is another useful way to provide documentation of your findings. If you are fortunate enough to obtain a copy of building blue prints, it can make the mapping process that much easier. However, in many cases when called to a large loss claim in the middle of the night, it is sometimes impossible to get blue prints or maps on the spot. In these cases a hand drawn map will suffice. Providing a map/diagram of findings can not only be useful when providing a report to the client but also helpful to the inspector. Taking note of your image numbers and the areas of the building to which they correspond, can provide a clear overview of the project.

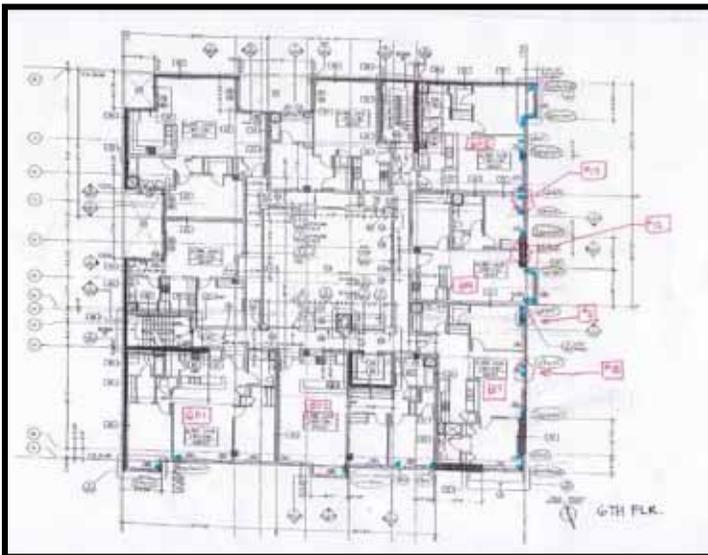


Figure 11-12: Above is an example of a map/diagram showing areas of water damage

SUMMARY

With proper documentation procedures and infrared training, your ability to assess and remediate water loss projects is only a push of a button away. Water detection is one of the simplest applications of thermography when coupled with training, experience and use of other tools to help substantiate your findings.



REFERENCES

IICRC S500, **Standard and Reference Guide for Professional Water Damage Restoration**, 3rd addition
April 2006

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