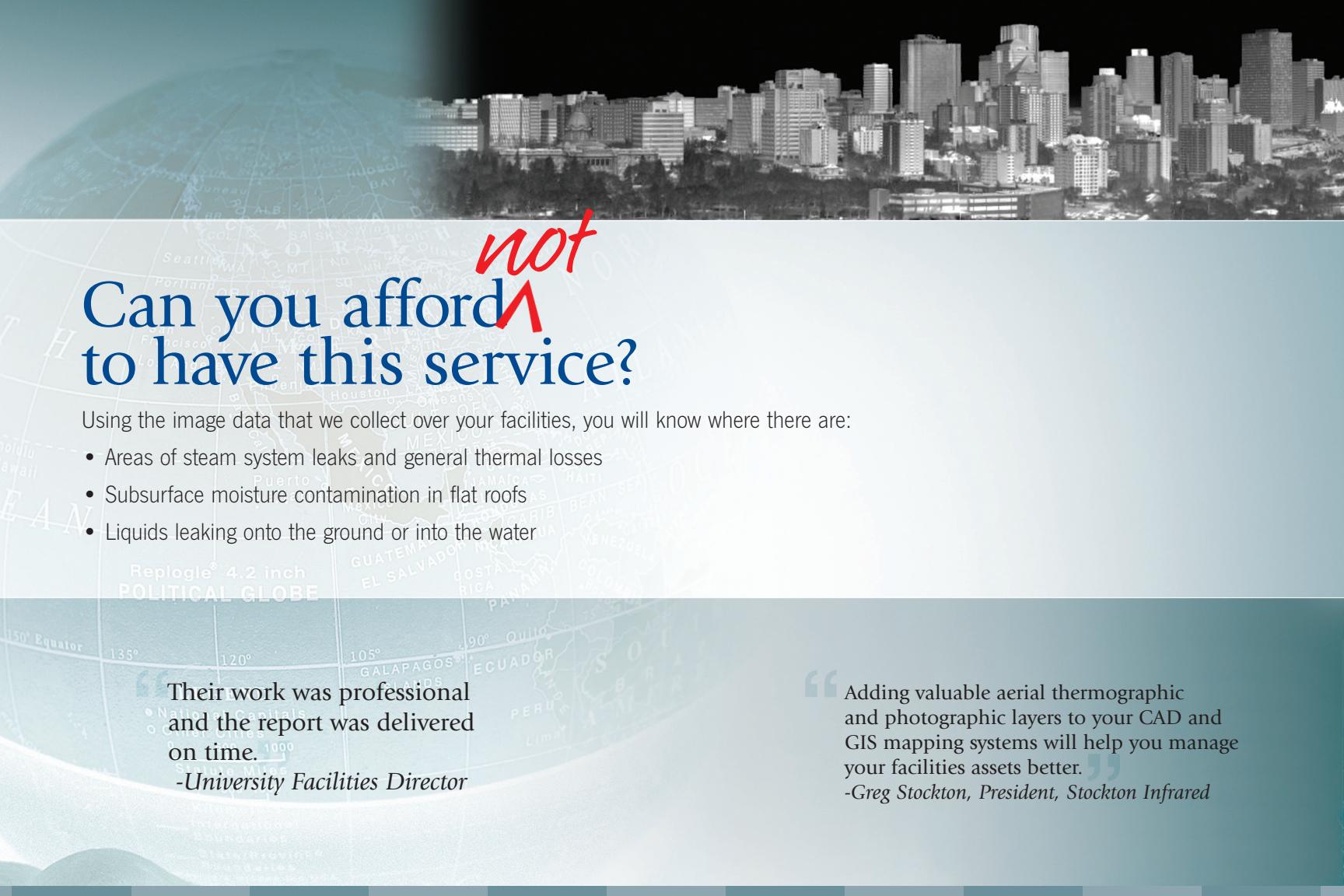




**Stockton**  
Infrared Thermographic Services



# Can you afford not to have this service?

Using the image data that we collect over your facilities, you will know where there are:

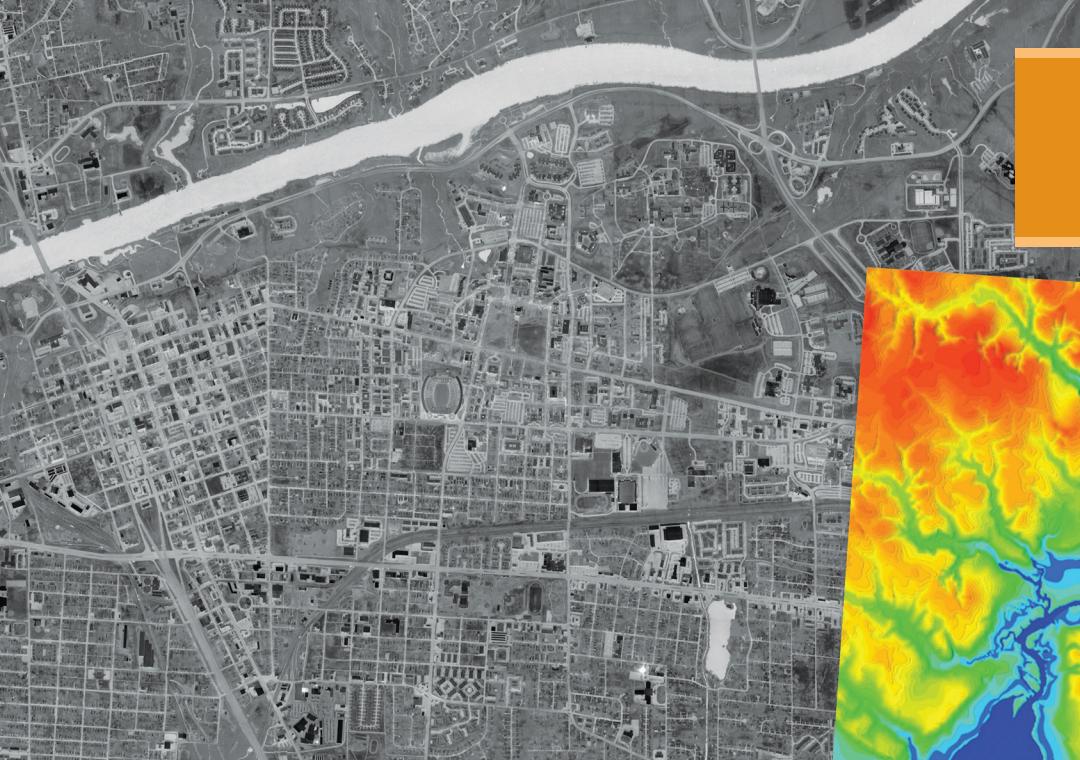
- Areas of steam system leaks and general thermal losses
- Subsurface moisture contamination in flat roofs
- Liquids leaking onto the ground or into the water

“Their work was professional and the report was delivered on time.

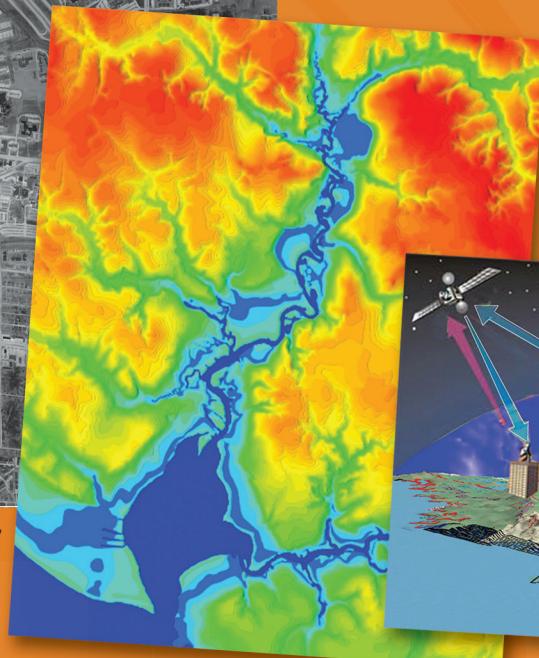
-University Facilities Director

Adding valuable aerial thermographic and photographic layers to your CAD and GIS mapping systems will help you manage your facilities assets better.

-Greg Stockton, President, Stockton Infrared



For systems specifications log onto  
[www.ThermalMapIR.com](http://www.ThermalMapIR.com)



Thermal MapIR™ Ortho-rectified thermal image (Geo-TIFF) of small city



*Thermal Mapping...*

Uses for

# Thermal MapIR™

**Steam Leak Surveying**

**Roof Moisture Surveying**

**Liquid Leak Surveying of Water Utilities**



## How Can Aerial Thermal Mapping Help You?

We produce high quality digital thermal and photographic ortho-rectified maps that can be added as layers to your existing CAD and GIS map systems. These maps will help you manage your facilities assets.

We fly over a given area with an infrared camera mounted, oriented looking straight down (NADIR) to the ground. We store the digital IR imagery on a computer hard drive and later copy it to a convenient deliverable, such as a DVD.

The collected and post-processed imagery may then be modified in a number of ways to enhance its value to you, such as adjusting the brightness and contrast and/or zooming in on an area of interest. These processed images can be used to prepare predictive maintenance reports on the various systems.

Three examples are given on the following pages...

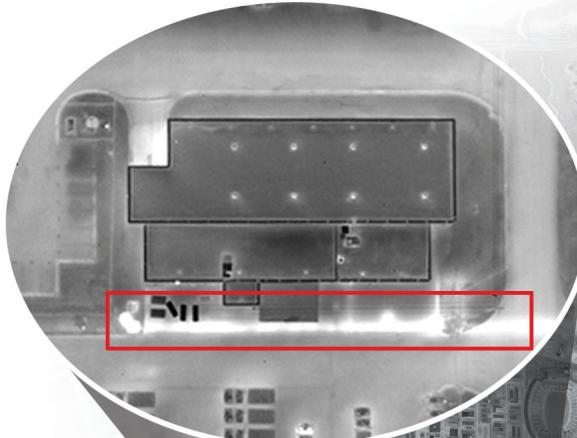
# Steam Leak Surveying

**Steam and Hot Water lines** are almost always readily visible with infrared imaging, even when no notable problems exist. This is due to the fact that no matter how good the insulation, there is always heat loss from the lines which makes its way to the surface.

Problem areas are generally quite evident, having brighter infrared signatures that exceed the norm. Steam line faults normally appear as an overheated line or as a large hotspot in the form of a bulge or balloon along the line. Overheated lines often occur when the steam line is located in a conduit or tunnel. If there is a leak in the line it will heat up the conduit with escaping steam. If a steam line is buried directly in the ground with an insulating jacket, a leak will usually saturate the insulation, rendering it largely ineffective and will begin to transfer heat into the ground around the leak, producing the classic bulge straddling the line.

Some leaks may show up as an overheated manhole or vault cover. Manholes or vaults that contain leaking steam system control apparatus will often heat the covers to warmer than normal temperatures.

Steam line imagery can be a little misleading, unless one understands and interprets the relative brightness and temperature of a given line correctly. For example, a steam line with the same temperature from one end to the other that passes under different surfaces and materials can exhibit a variety of temperature variations. So, five different apparent temperatures will result from the same temperature line that runs under a grass-covered field, an asphalt parking lot, a concrete loading dock, a gravel-covered area and bare earth pathway.



## *Find your steam leaks...*

**AITSCAN**  
STEAM LEAK FINDIR™

# Roof Moisture Surveying

**Subsurface wet areas** in a flat or low-sloped roof show up as lighter areas in the IR imagery at night because the latent heat (from daytime heating) in the trapped water mass is greater than in the dry, functioning insulation or roof substrate.

After sunset when the entire roof structure cools down, wet areas of roof insulation and other materials continue to radiate heat. We capture these images and make scaled drawings of the wet areas so that surgical repairs can be accomplished.

Areas of roof moisture contamination can be nebulous in shape and sometimes mottled in appearance, although they are commonly found in linear or puddle-like shapes. The linear shapes many times follow low areas, drainage routes, roof edges and seams. Puddle-like round or oblong shapes often form around roof penetrations such as mechanical equipment, standpipes, vents and drains.

## Advantages of Aerial IR Imaging of Roofs

High-angle, straight-down infrared images capture large areas at once, making the imagery easier to analyze and the report clear and concise. Because infrared images, visual images and AutoCAD® drawings are reconciled, it is less expensive to produce detailed reports.

Plan view imaging allows for accurate marking of areas of suspect roof moisture contamination. AutoCAD® drawings are made by drawing 'over' the captured visual and infrared image on the screen.

Logistical, imaging, access and security problems-common with on-roof IR surveys, are eliminated. The printed AutoCAD® drawings can be used on the roof to paint areas of moisture contamination directly on the roof, if desired.

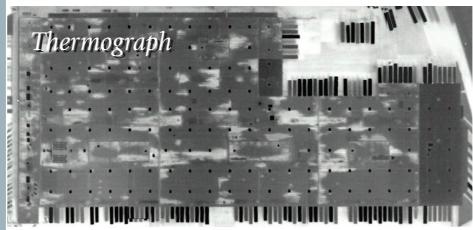
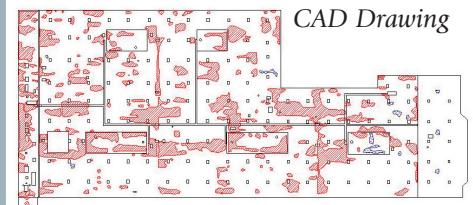
Existing CAD drawings can be corrected, updated, saved and then layered into your GIS mapping system.



High-Resolution Thermal Image of a Roof

“ By reviewing the IR and photo data, we will tell you exactly which roofs will benefit from a roof survey, which are in good shape and which cannot be surveyed using infrared thermography. ”

- Alejandro Tache, Division Manager of AITscan



# Liquid Leak Surveying of Water Utilities

**Leaking sewage collector lines**, storm water drain discharges, water main breaks and taps into storm water drainage lines can often be identified by their thermal infrared signatures during colder times of the year. As these sources of waste or pollution leak, seep or empty into creeks, streams, rivers and lakes, their thermal signatures vary from their surroundings and they can be pinpointed accurately from the air. Cool temperatures and dry conditions are required. As a general rule, the lower the ground surface and the water surface temperatures, the more contrasting the image.

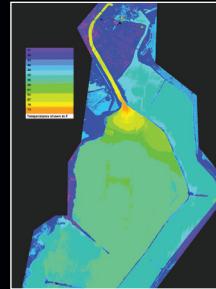
A given area of any waterway will exhibit near homogenous temperature patterns except for areas where another liquid has joined the flow.

This flow of liquid typically appears warm as compared to the surface water in a waterway due to the relative warmth of the ground a short distance below the surface. Leaks from nearby lines often come to the surface through lateral transfer to a creek, stream, river or lake bed, or to a slope leading down to the surface of the water. These leak areas and the warm plume of liquid joining and flowing downstream with the body of water are visible in the thermal infrared spectrum due to the difference in temperatures of the two liquids. Late fall, winter and early spring are well suited to this type of inspection because of the cooler water temperatures (ground and surface waters) and because the interference to view by foliage is minimized. Ground water seeps and outfalls of all types are also easily distinguishable for similar reasons.

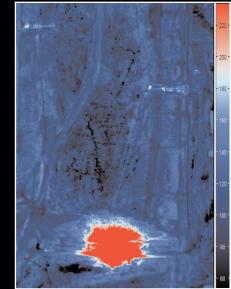


# Find your water leaks...

## Other FindIR™ Services



Cooling Lakes, Waterways



Landfill Fires



High Voltage Electric Lines



Animal Counts

## Other Infrared Services Offered by Stockton

- Electrical Mechanical Systems Analysis
- Building Heat Loss, Moisture and Structural Surveys
- IR Research and Process Improvement

**Stockton**  
Infrared Thermographic Services

# Stockton

Infrared Thermographic Services

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