



Think Thermally®

Spring / 2006

Practical news for practicing thermographers

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World's First Thermal Image Stamp

One of the exciting developments at Thermal Solutions 2006 was the announcement that Bermuda has issued the world's first thermal image stamps! The news was brought to our attention by Mr. Abayomi Carmichael (shown below), Electrical Maintenance Engineer, Energy Supply, at Bermuda Electric Light Company Ltd. (BELCO).

The stamps were part of the celebration of BELCO's 100th anniversary providing utility services to the islands. In the past Snell Infrared has conducted several training classes for BELCO as part of the ongoing program to monitor the condition of their assets.

Abay, as we have grown to know him, brought examples of different stamps to share with conference attendees. Abay described how he took the images himself, including one of the light bulb in his daughter's room, which is displayed at the end of this article. The image of the building shown above is a mosaic that Abay created of twelve individual images, a technique he learned from Greg McIntosh of Snell Infrared Canada.



After capturing the images, Abay worked with the Bermuda Philatelic Bureau to make sure all of them were representative of the infrared work being done at BELCO and were reproduced accurately. He said it was quite a team effort to make this happen. We are sure you will find these stamps to be quite stunning!

If you would like to order copies of these historic stamps and First Day Covers, please contact the following addresses:

Mr. Stanley Taylor, Philatelic Coordinator
Bermuda Philatelic Bureau
56 Church Street, Hamilton HM 12
Email: staylor@gov.bm

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56 Church Street, Hamilton HM 12
Email: staylor@gov.bm

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Think Thermally® is a publication of Snell Infrared, providers of training, certification and support services for thermographers.

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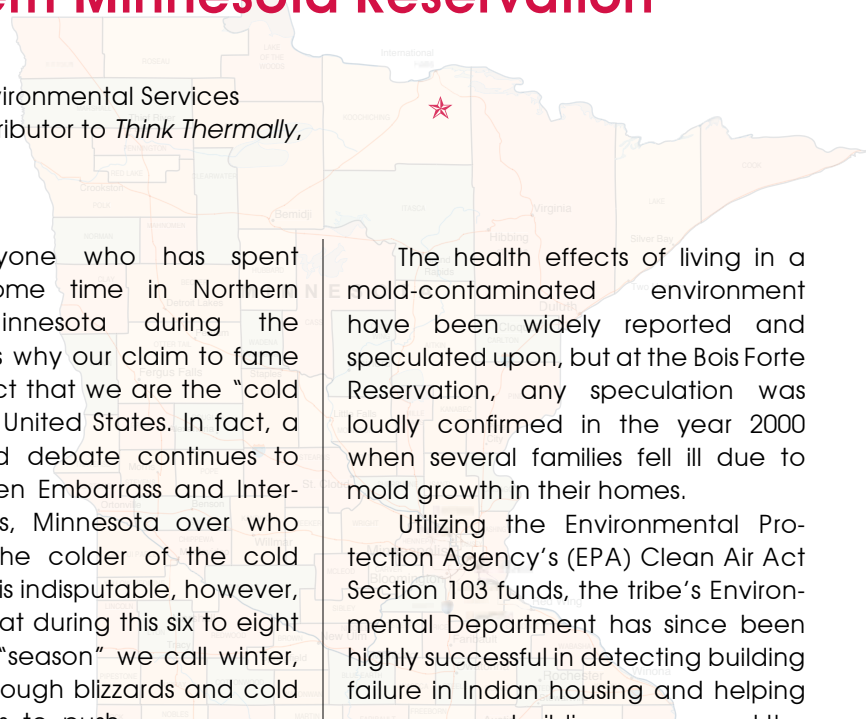
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Thermography Helping Diagnose Building Failures at Northern Minnesota Reservation

Kevin Koski
Bois Forte Environmental Services
Special Contributor to *Think Thermally*,
Spring 2006



Anyone who has spent some time in Northern Minnesota during the winter knows why our claim to fame lies in the fact that we are the “cold spot” of the United States. In fact, a decades old debate continues to rage between Embarrass and International Falls, Minnesota over who is actually the colder of the cold spots. What is indisputable, however, is the fact that during this six to eight month-long “season” we call winter, there are enough blizzards and cold temperatures to push our buildings to their performance limits.

Situated perfectly equidistant between these two battling towns is the Bois Forte Reservation in Nett Lake, Minnesota, where the effects of living in housing ill-suited for the harsh climate have been felt by local tribe members. The tribe has responded by launching a program to improve their buildings and the quality of life within them.

What any cold climate building inspector knows well is what these temperatures and snowfall can mean to our homes and buildings: frozen pipes, air leakage and heat loss, indoor condensation and frost, and damaging ice dams that can eventually lead to structural failures, rot, and mold growth.

The health effects of living in a mold-contaminated environment have been widely reported and speculated upon, but at the Bois Forte Reservation, any speculation was loudly confirmed in the year 2000 when several families fell ill due to mold growth in their homes.

Utilizing the Environmental Protection Agency’s (EPA) Clean Air Act Section 103 funds, the tribe’s Environmental Department has since been highly successful in detecting building failure in Indian housing and helping building owners and the tribe’s Housing Department prescribe remedies. The reservation’s program, which continues to be funded annually by the EPA, is unique to the region in that it has been granted the designation of a “Center of Excellence”, and has been equipped with a wide range of Indoor Air Quality diagnostic tools that, as of recently, includes infrared thermography.

“The sub-standard quality of housing on reservations throughout the United States is beginning to emerge as one of the major challenges that tribes are now facing.”

The sub-standard quality of housing on reservations throughout the United States is beginning to emerge as one of the major challenges that tribes are now facing. A combination of poor initial design, poor site preparation, and poor construction techniques has led to a wealth of under insulated, leaky homes and an accelerated number of cases of upper

respiratory illness in the Indian Community. Using infrared thermography in building inspections now enables Bois Forte Environmental Services to detect building failure before it leads to mold growth and illness.

The inspection services provided and training sessions offered to all EPA Region 5 tribes are beginning to include infrared thermography as a primary tool in the detection of cold climate building and weatherization flaws that so often lead to indoor air quality problems. In field use for six months now, our infrared camera has allowed us to illustrate to homeowners and housing staff what we could, in the past, only state as theory.

One condition diagnosed by infrared is the under-insulated attic edge, a common problem with cold climate homes (Figure 1). Where the sizing of the roof construction doesn't allow for sufficient space on the edges for batt or blown-in insulation, R-value is lost and a cold condition occurs. Couple this cold sheetrock surface with excess indoor humidity, and you have all the necessary ingredients for mold growth. It will always show up either as a thin line of mold along the entire perimeter or regularly spaced spots of mold beneath the cold joists (Figure 2).

Another problem being headed off with thermography is the common condition of moist, warm indoor air leaking into the attic (Figures 3 & 4), causing condensation and rot on structural members and worse, the dreaded ice dam. Ice dams are an all-too common situation where the warm attic first leads to snow melt on the roof. The runoff then flows down and proceeds to hit the still-frozen snow on the edges of the roof, where, having

nowhere to go, it makes its way back into the roof and wall construction, leading to significant structural damage and subsequent indoor air quality problems.

In the future, these problems will be avoided by employing thermography and ensuring proper insulating and air-sealing before the end of the construction process.

“A combination of poor design, poor site preparation, and poor construction techniques has led to a wealth of under insulated, leaky homes...in the Indian Community.”

Bois Forte Environmental Services is also currently in the process of using infrared thermography to diagnose the source of moisture in wet basements with preserved wood foundations (PWF's), to highlight HVAC problems in modular homes, as well as performing a round of inspections on the tribe's new homes completed in the last two years, where residents are complaining of draftiness and high heating costs.

While these detailing errors snuck under the radar during the construction of the new homes, Bois Forte's infrared thermography is catching them early and pointing towards remediation before they lead to indoor air quality problems.

Kevin Koski has been working for the Bois Forte Band of Ojibwe in Nett Lake, MN for the past year. He is a member of the Local #1097 Laborers Union and has previous experience performing hazardous materials abatement, including environmental inspections for asbestos, lead and mold, and was educated and trained as an architect.

The Bois Forte Indoor Air Quality program is in its fifth year of funding from EPA Region 5 which performs inspections and provides training and technical assistance to all Region 5 tribes in Minnesota, Wisconsin and Iowa.

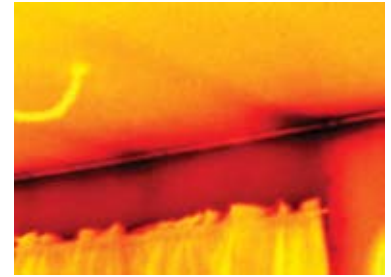


Figure 1

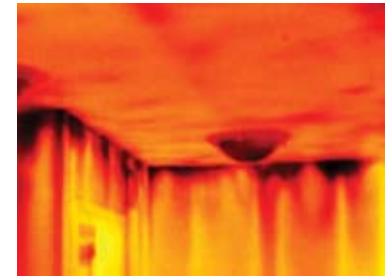


Figure 2

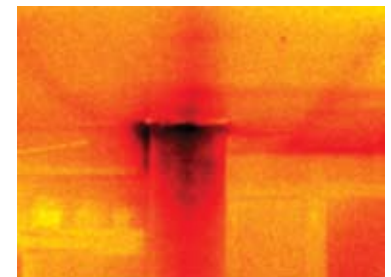


Figure 3



Figure 4

Thermal Solutions® 2006: Record Attendance, Industry's Largest Exhibit Hall



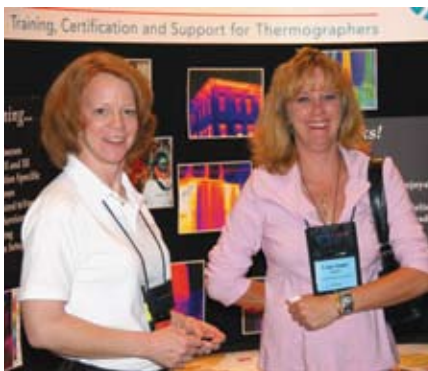
Over 250 people attended Thermal Solutions® 2006 in Sarasota, Florida.

Everything fell into place this year for the annual **Thermal Solutions Conference**, including the weather. Over 250 participants enjoyed the warm Sarasota sunshine, great food and, most importantly, the industry's largest infrared-specific conference with record-breaking attendance.

This year's event featured a variety of paper presentations from two tracks (Condition Monitoring and Building Thermography), our largest exhibit hall ever, the popular Ask the Expert session and countless networking sessions.

Activities began in earnest on Monday, January 23rd with eight separate short courses covering a wide variety of topics for various skill levels.

That evening's opening dinner reception was an exciting mix of tech talk, good, hearty laugh-



ter and exceptional food. Not only were attendees treated to a great meal, but also a fascinating discussion by Dr. Michael Walsh, DDV – head of Veterinary Services at Seaworld – about his application of infrared thermography to help manage the health care of animals.

Tuesday started off with a Keynote Address in the Condition Monitoring track by John Schultz of Allied Reliability. This well attended presentation discussed how to run reliability maintenance like a business. For building thermographers, world-renown scientist Dr. Joseph Lstiburek of the Building Science Corporation spent the morning sharing his insights on moisture in buildings.

This year's Exhibit Hall featured over two dozen firms showcasing

the latest in infrared technologies. Also included were industry publishers and related equipment vendors. The conference Exhibit Hall was once again the largest gathering of exhibitors at any infrared specific conference.

Tuesday concluded with what has become one of the more popular events at Thermal Solutions, the annual Exhibitor Appreciation Reception. Prizes of all sorts were sponsored by both Snell Infrared as well as many of the Exhibitors in attendance.

On Wednesday morning both tracks convened for a Panel Discussion on where the infrared industry is going in the next five years. This well attended dialogue included a number of valuable questions from the audience. The Panel, which included a camera supplier, end users, program managers and a business expert gave a variety of insights in to the future of the predictive maintenance industry, specifically with infrared.

Finally on Thursday, January 26, all attendees returned for one final general session of papers that included five presentations with topics common to the needs of all

thermographers. The session began with a fascinating keynote by Charlie Paxton of the National Oceanic & Atmospheric Administration (NOAA) on how imaging is used in weather forecasting and climate analysis.

Planning is already well underway for Thermal Solutions 2007. If you are interested in participating with a paper presentation of your own, please feel free to submit an abstract to abstracts@thermalsolutions.org. Among the many benefits of presenting a paper, authors also receive a significantly discounted attendance fee.

For more information on Thermal Solutions 2007, stay tuned to the conference web site at www.thermalsolutions.org for updates throughout the spring and summer. If you would like to see for yourself just how valuable this event really is, we encourage you to view the complete photo album from this year's event which is available online.



“Thermal Solutions provided a valuable opportunity to learn new material and speak with experienced thermographers.”
 ~ Buddy Hodgson, DuPont



Call for Papers: Thermal Solutions® 2007

Abstracts Due June 2, 2006

Submit to abstracts@thermalsolutions.org

Papers are sought in the following areas:

- ▶ Electrical Applications
- ▶ Mechanical Equipment
- ▶ Building Diagnostics
- ▶ Moisture Intrusion
- ▶ Mold Detection
- ▶ Roof Moisture Surveys
- ▶ Medical Thermography
- ▶ Process Monitoring using Infrared
- ▶ Program Management
- ▶ Case Studies in Thermography



All papers must be non-commercial in nature and will be published in the Thermal Solutions Proceedings in both print and electronic format. Details regarding format, presentation, etc. will be sent upon acceptance of your abstract. To compensate authors for their presentation, Snell Infrared offers a discounted attendance fee.

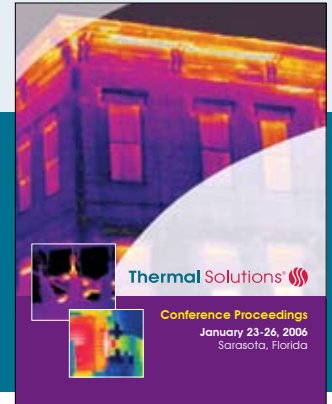
Thermal Solutions 

January 22-25, 2007
www.thermalsolutions.org
 Sarasota, Florida

Thermal Solutions™ Conference Proceedings are available for purchase from the Snell Infrared Web Store

- ▶ Over 150 papers available from the last seven years of Thermal Solutions.
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Looking Back: 2006 Thermal Solutions Conference

View the entire photo album online at www.thermalsolutions.org



Snell Companies International: Enabling the World to Think Thermally®!



Dr. Roderick Thomas
of Snell Companies
International

Snell Infrared is pleased to announce the opening of a new company, **Snell Companies International, Inc.**, which offers training and support services for thermographers world-wide. Regularly scheduled thermography classes are now available in the United Kingdom and South Africa.

Dr. Roderick Thomas, who has worked with Snell Infrared in various capacities for several years, joins Snell Companies International as a General Manager and will help run operations from his Swansea, Wales (UK) office.

Dr. Thomas has Masters Degrees in Opto-Electronic Engineering (CNAAB), Educational Research (University of Wales) and a PhD in Condition Monitoring from the University of West of England. He is a Chartered Electrical Engineer and a Fellow of the Institution of Electrical Engineers (IIEE). Dr. Thomas is also Conference Organizer of the International Conference Series Quality Reliability and Maintenance (QRM) hosted by St. Edmund Hall, University of Oxford, UK.

In addition to over forty papers that he has written on condition monitoring, Dr. Thomas is author of the *Thermography Monitoring Handbook*. He is a passionate believer in the potential of the technology and is also widely respected for his work with medical thermography.

For more information visit www.snellinternational.com or call 1-800-636-9820 (+1 802-229-9820).

LEVEL I

Manchester, United Kingdom	June 5-9
Bridgend, United Kingdom	October 16-20
Johannesburg, South Africa	November 6-10

LEVEL II*

Milton Keynes, United Kingdom	May 15-19
Manchester, United Kingdom	October 23-27
Johannesburg, South Africa	November 13-17

LEVEL III BEST PRACTICES

Johannesburg, South Africa	March 15-17
Johannesburg, South Africa	November 22-24

ELECTRICAL APPLICATIONS*

Manchester, United Kingdom	December 4-5
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DATE

MECHANICAL EQUIPMENT*

Johannesburg, South Africa	November 20-21
Manchester, United Kingdom	December 6-7

BUILDING SYSTEMS*

Milton Keynes, United Kingdom	May 9-10
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NDT LEVEL I

Location TBA	September 25-29
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* Level 1 or Introduction to thermography training required.



World's First Thermal Image Stamp Continued from page 1

The cost per sheet is \$17.50 for .35¢ stamps, \$35.00 for .70¢ stamps, \$42.50 for .85¢ stamps, \$50.00 for \$1.00 stamps and \$4.00 each for First Day Covers. Shipping to the United States is \$2.50 for each sheet of stamps. Glass paperweights, each containing a stamp, are also available for \$12.00 each or \$48.00 for set of four.

Thanks very much to Abay and BELCO (www.belco.bm) for sharing this historic event with us as well as congratulations on 100 years of providing gas and electricity to the Bermuda Islands.



Upcoming Training Opportunities

► LEVEL I

	DATE	\$1,495
Toronto, Ontario	April 24-28	
Cincinnati, Ohio	May 15-19	
Minneapolis, Minnesota	June 5-9	
Toronto, Ontario	June 19-23	
Montpelier, Vermont	July 17-21	
Portland, Oregon	August 14-18	
Toronto, Ontario	August 28-September 1	
Indianapolis, Indiana	September 18-22	
Charlotte, North Carolina	October 16-20	
Toronto, Ontario	October 23-27	
San Antonio, Texas	November 6-10	
Montpelier, Vermont	December 4-8	
Toronto, Ontario	December 11-15	

► LEVEL II*

	DATE	\$1,495
Toronto, Ontario	May 1-5	
Minneapolis, Minnesota	May 8-12	
Montpelier, Vermont	July 17-21	
Indianapolis, Indiana	September 18-22	
Toronto, Ontario	October 30-November 3	
Charlotte, North Carolina	November 6-10	

► LEVEL III BEST PRACTICES

	DATE	\$1,495
Montpelier, Vermont	May 15-18	
Toronto, Ontario	November 6-9	

► BUILDING SYSTEMS*

	DATE	\$995
Indianapolis, Indiana	June 8-9	
Charlotte, North Carolina	October 25-26	
Toronto, Ontario	December 6-7	

► ELECTRICAL APPLICATIONS*

	DATE	\$995
Toronto, Ontario	May 8-9	
Indianapolis, Indiana	June 6-7	
Calgary, Alberta	June 8-9	
Montreal, Quebec (French)	June 15-16	
Toronto, Ontario	September 25-26	
Charlotte, North Carolina	October 24-25	
Toronto, Ontario	November 29-30	

► MECHANICAL EQUIPMENT*

	DATE	\$995
Toronto, Ontario	May 10-11	
Indianapolis, Indiana	June 8-9	
Toronto, Ontario	September 27-28	
Charlotte, North Carolina	October 26-27	

► RESEARCH & DEVELOPMENT*

	DATE	\$995
Available by Request	Please Call	

* Level 1 or Introduction to Infrared training required.



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Thermal Solutions 2006: A great success!
See page 4.

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