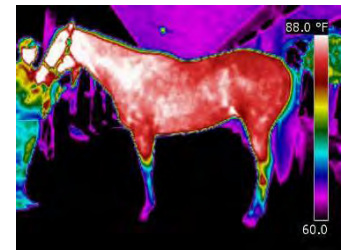
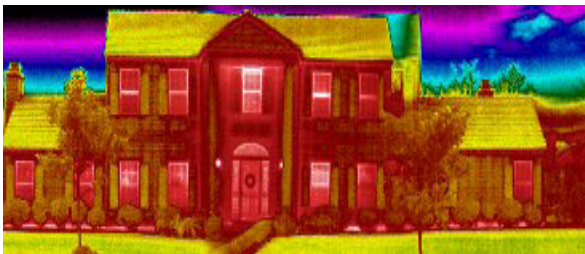


From Houses to Horses

*Peter Hopkins, Certified Thermographer
SoCal Infrared (www.socalinfrared.com)*

ABSTRACT

You've heard about infrared, or you may have even seen some famous movie with an alien that you can't hide from. You may have even wondered how you can have the ability to see what human anatomy did not allow. These are the things that fascinated Peter Hopkins prior to starting his own infrared business. That 1987 movie may have been the start of the little bug inside that kept getting bigger. Some may think that starting a business of their very own is a far reach from just an idea. I hope this paper brings it just a little closer to home for you and helps you understand how we went "From Houses to Horses."



INTRODUCTION

A building inspector by trade, Peter Hopkins has been in the business of locating and identifying defects for real estate investors and home buyers alike. Having come from a large family of entrepreneurs, Hopkins always looked to how he could build businesses, or make existing ones better. Of course, as with every business, there are limitations to what we can and cannot do. With infrared being one of the hottest trends in the building science sector, it seemed to be the perfect expansion and complement to the existing Real Estate Inspection business. Infrared allowed us to see what we could not previously, hence giving us an edge in the market. Initially it was building science that was our focus, and with that we purchased our very first infrared camera in 2005.

HOW IT ALL STARTED

Aside from the fascination twenty years ago, infrared first came to my interest back in 1999 when a subcontractor informed me that he had picked up a night job doing thermography. In the quest of learning more about this technology, I asked a lot of questions. The first question of course was the cost- "How much?" The camera he was using was noted to him as costing in excess of \$75,000, although he said there were cheaper ones, and of course more expensive ones. In his case they were scanning electrical panels in hotels and they needed a high end camera. A \$75,000 investment in 1999 was too steep at that time, considering we were looking at purchasing our first home. My wife did not understand spending 25% of the cost of a new home on a "toy." Well, that's at least how she perceived it.

As time progressed, I decided to do more research and I even wrote a one page business plan. My business plan had potential ideas and the areas that we would focus on. The areas of focus we had at that time were moisture, energy loss/leaks and electrical (because that is what my subcontractor did). I performed more research on the internet and even requested quotes from various distributors on the costs of cameras. The price was a little better than I initially thought with quotes now in the range of \$20,000 - \$50,000 for our specific uses. Of course it was still a little steep, because now I had to landscape the brand new home we just purchased.

TIME IS NEEDED

The year 2000 started a wonderful time in my home inspection business. The real estate market had started to really take off. People were buying homes faster than inspectors were available to inspect them, and of course I had many weeks where it was 7-10 days just to get an appointment with my company. We didn't have time to consider new ventures. Fascinations, however, are not that easy to let go of. Infrared was just put on the back burner for the time being.

THE "TIME HAS COME"

The year 2004 was the beginning of what we thought was the end of the real estate boom. Our inspection company had now grown to four inspectors, and it was possible to get us the next day for an appointment. Changes had to be made, and the infrared idea surfaced again. I feverishly started up the process, and in 2005 finally made the decision with one of my other inspectors to take the plunge and purchase our very first infrared camera, a FLIR E65 thermal imager.

Our first decision was not so simple. I have always had a hard time with the thought that I might be limiting my business. With most people in the home inspection sector having purchased the building type series of cameras, I wondered about electrical type inspections that might not work with those cameras due to temperature limitations. It was the electrical scans that my previous subcontractor had performed in the first place that had enticed me. The "E" Series was slightly more expensive, but appeared to be the choice for our company. It allowed us to view higher temperatures that might be present in electrical inspections, along with all the other needed features of the building type cameras. With the camera purchase, training was going to be a necessity. With the uncertain Real Estate market conditions ahead, we decided to train three of our inspectors to Level I certification.

It was during training that I first began to think about horses. Every day during training at the Boston Infrared Training Center, I would walk the hallway to the classroom and pass by the brochure stands. Specifically, there was a brochure on horses that fascinated me. Around this same time period, we moved to a new community in North San Diego, where horse ranches were common and a training facility for race horses was just 4 miles from my home. The entrepreneur light bulb had come on, but was not yet fully realized. Of course, I knew nothing about horses aside from having ridden a mule or so at the Grand Canyon or in the Yosemite Valley. While I kept considering, I didn't feel that this was our company direction. Each day during training breaks while I was in the hallway, I would continue to grab a few horse brochures for a reason not yet known to myself.

THE START OF "SOCAL INFRARED"

Coming back from training, I had to finalize a company prior to grand opening. With the horse thing tinkering around in my mind, I knew that the Real Estate Inspection company would not be the ideal name if I was to ever expand into "horses" or other unrelated territories. I was convinced that infrared would be a dominant business of its own, and it needed to be its own entity. Creating a name was a priority. With the pen and paper in hand, I thought of all the possible names for an infrared company. When I had generated 10 names, I talked to my wife about what names she liked. Then, I went to the internet to see what was available. As a marketing concept, I wanted to have a name that tied the whole company together, be it name, website, phone number etc.

The final deciding factor for the name ended up being the toll free number. I found a phone number that matched with my company name and it was available: "1-888-SO-CAL-IR". I ordered the new phone number and started up shop. Of course, it was only later that I found out there was a previous business owner who had used this phone number. I do get orders for flowers about twice a month on my business line, but as the entrepreneur in me, I take infrared pictures of flowers and send them off. The business name SoCal Infrared was ordered, as well as the website www.socalinfrared.com. I couldn't stop there; I even ordered custom plates for my truck (right photo).



Figure 1. The SoCal Infrared truck.

A company not only exists based on a name but also its image with information. I knew my next step was to start the process of a company brochure. I had the brochure written, but then rewritten because I just couldn't get the horse thing off my mind. I felt if my brochure limited my business to building science, how was I ever going to add horses to the mix? I settled on adding a small section at the end of my brochure describing additional services with an infrared picture of a horse. I decided that I could create an insert to place inside of my brochure for equine use as well as other areas that we did not detail in brochure. My brochure took about 8 months of time from concept to printing, an unplanned delay, but well worth the wait. Believe it or not, the horse thing is what creates the most conversation interest when I talk to people about infrared. Most people know my background is all related to construction inspection, and when they see the horse in my brochure it is always something like "What do you do with horses?" You're lucky to get a minute with someone on small talk about your business, now I get two!

LEAKS, LEAKS, AND MORE LEAKS

Plumbing *leaks*, roofing *leaks* & energy *leaks* were stated to be the focus of our business from the beginning. To this day, the majority of our business has stemmed from being able to expand our construction inspection business into a forensic specialty and help people figure out why the *LEAKS* are happening. Our first case happened to be a personal experience. My own new home had a major energy leak. During construction of my new home, I found a flaw in the design process that was sure to be an energy leak. Although there were repeated attempts to notify the builder to rectify the fault, it was never repaired until we finally proved our case with a FLIR Infrared camera. We wrote a full story on our experience which was presented in 2006 on a paper called "Thermal Imaging Scan Reveals the Truth Behind the Wall". The image that revealed the truth is below.

The first case: "Energy Leaks" Insulation Verification

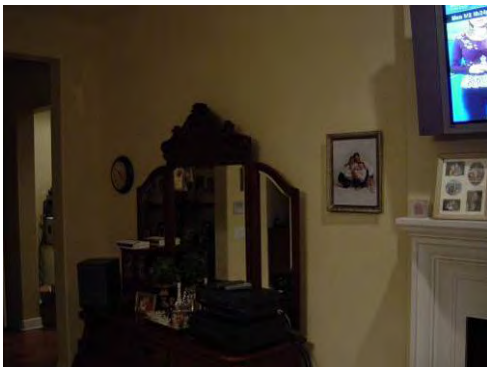


Figure 2. Visual image of missing location.



Figure 2a. Thermal image of missing insulation

If you would like to know why the middle of the wall was missing insulation, look up the reference at end of this paper.

My personal story about insulation problems in my own home has lead to many more inspections. I have been able to share first hand how my brand new home was flawed. New construction has traditionally made up about 10% of my Home Inspection business, adding an insulation inspection from SoCal Infrared proved to be a great add-on and a moneymaker. From the inception of our Infrared business in late 2005 until the writing of this paper mid-2007, we have not had a home inspected by SoCal Infrared fully comply with the insulation installation standards set forth in the Title 24 Energy Code in California. We have also not had a home that complied with the “25 CHECKPOINTS for Inspecting Insulating Jobs” produced by the North America Insulation Manufactures Association. With these statistics, it is **not** hard to sell an additional service of an Infrared Scan when people are ordering New Construction Home Inspections.

Roof Leaks

Our first roof scan was quite an experience- an apartment building that had continuous roof leaks and had supposedly undergone recent roof repair.



Figure 3. Roof with problem spots.

You probably know there is a problem when you arrive on the job and find five cans of roof repair left on top of the roof. What was most interesting was that these patches didn't address the water intrusion, but actually sealed it in to create another problem that was more costly to repair. An initial infrared scan would have shown the building owner and roofing repair contractor exactly where to repair or replace the roof. Roof scans appear to be a much larger opportunity than what appears to be used our market today. It is only a matter of time before the awareness in the commercial market fully recognizes the benefits of infrared. I hope to expand this paper in time to include from Houses to Horses, from “Roofs to Hoofs.”

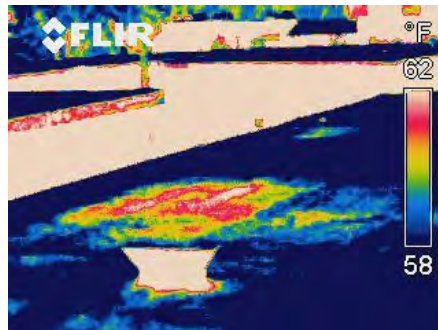


Figure 4. Visual of substandard roof patch *Figure 4a. Thermal image of substandard roof patch.*

“The sky is falling and it’s coming in my house!”



Figure 5a. The house in Rancho Santa Fe.



Figure 5b. Improperly installed drain allowing moisture intrusion.

One of our more notable moisture jobs happened early on during our 3rd month in business. We were referred by a remediation company who was repairing an 8000 sq. foot home in an exclusive area of San Diego called Rancho Santa Fe. The home was under remediation due to previous leaks. Current rain had opened up 4 more locations and the remediation company recommended that a specialist come to isolate the actual cause and affected areas.

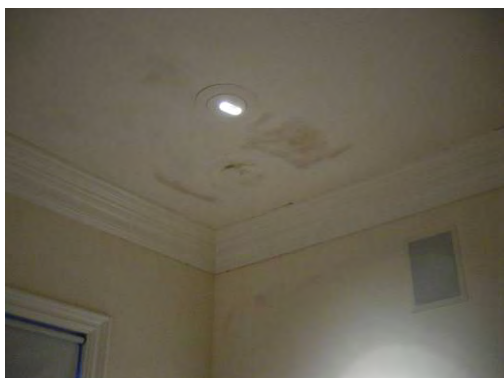


Figure 6a. Visual of water damaged areas.

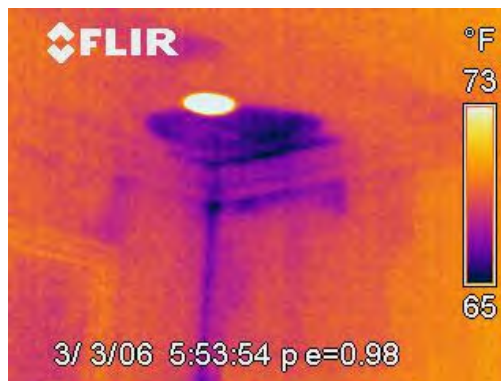
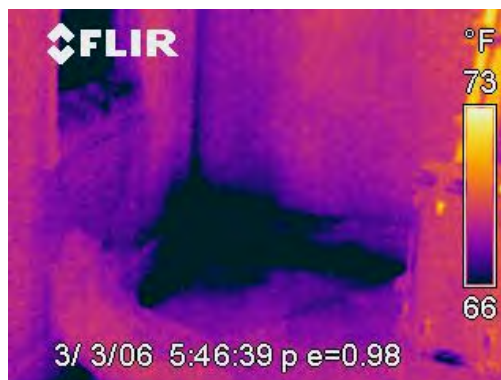
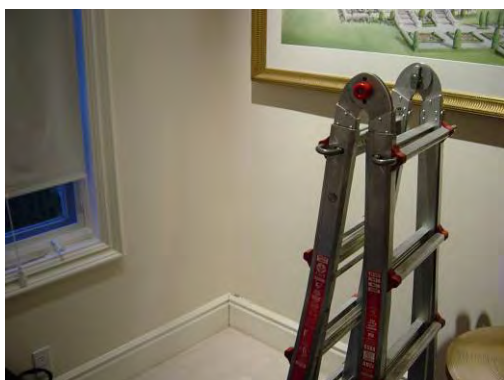


Figure 6b. Thermal images of water damaged area.



As part of our service, Isolating the cause and delivering a remediation plan is our goal. Upon arrival at residence, the client described areas of concern. Upon review with a thermal imager, we were able to document the affected areas. Upon review of roof above affected area, water ponding was noted on the roof and a drain was installed improperly right through the parapet wall flashing. It was our recommendation to

properly adjust roof slope and to reconfigure and seal the roof drain. A secondary drain was present as well but was capped, which was just making the problem worse.

“The mystery leak”

Midway through 2006, a large television based Christian organization heard about SoCal Infrared and our ability to isolate mystery leaks with Infrared technology. We were contracted as part of their effort to figure out why water was showing up in one of their buildings periodically. The tenant complained that several times a week, water was present at the floor in one of the rooms, and by afternoon, it was dry. As part of our investigation, we will ask what takes place in a typical day and night at the location. The building was being used for printing operations during the daytime. During evenings there were no workers except the cleaning crew that came through a couple times a week. Stains were present on the floor, as referenced in pictures below, but the surface of the floor appeared dry. The area was thermal imaged to map the moisture. Although the thermal anomaly was very light, it was enough for us to map the moisture and identify cause.



Figure 7a. Stains on the floor.

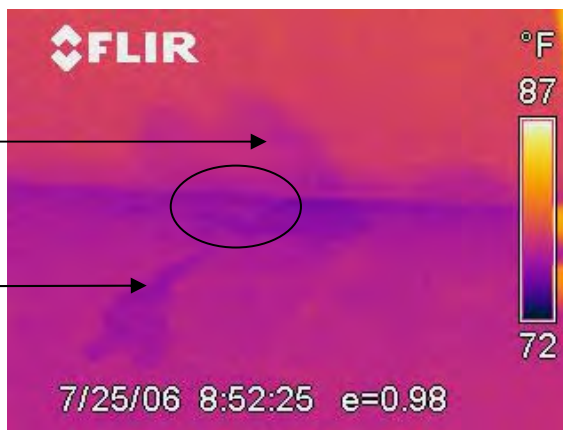


Figure 7b. Thermal image mapping of the stained floor area.

Upon review, a large stainless sink was noted at other end of room. Considering that water was a concern, I decided to run the sink for several minutes, after about 5 minutes, water was coming from floor (circle area at above thermal). This sink was not a regularly used area for the printing process, so this is why they had not seen this problem during the daytime. Building maintenance personal attended our inspection review and immediately started to remove floor tiles. Upon their removal a small hole was noted in floor that was opened further to expose a drain pipe that was not properly capped or sealed. Knowing that a properly installed drain will travel downhill, there should have not have been water traveling up a pipe unless there was some sort of clog. I advised them that a plumber should come in to snake line. A plumber happened to be onsite who came right over. Upon the snaking of line, mop strings were removed from the drain line (right picture below).



Figure 8a. Leak found.



Figure 8b. Hole uncovered.

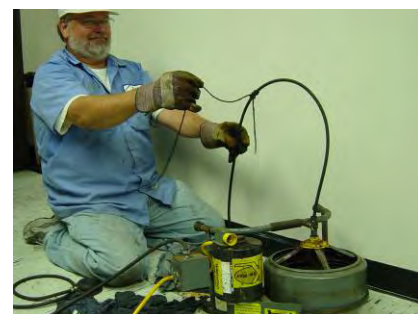


Figure 8c. Plumber

INFRA^MATION

Our investigation concluded that the night cleaning crew was utilizing the large stainless sink as their mop wash station and the mop strings had traveled and clogged the drain line hence causing the back up. Another satisfied customer, onto the next!

“By the way, did you know your plumbing leaks?”

During a home inspection, I came across an area that had a plumbing supply leak and a drain line leak about twenty feet from each other, as viewed from exterior. Neither leak was known or disclosed by the home seller or agent. Obviously, the infrared confirms any suspicions and allows for the proper mapping of the moisture intrusion.



Figure 9a. Visual of pipe leak at stucco wall.

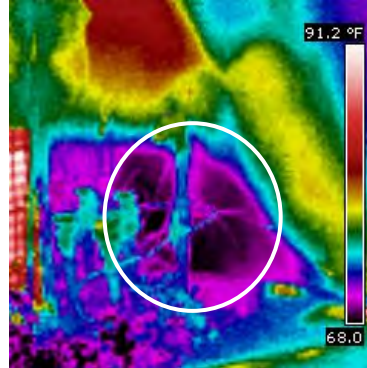


Figure 9b. Thermal of pipe leak in stucco.



Figure 10a. Visual of sewer cleanout leak.

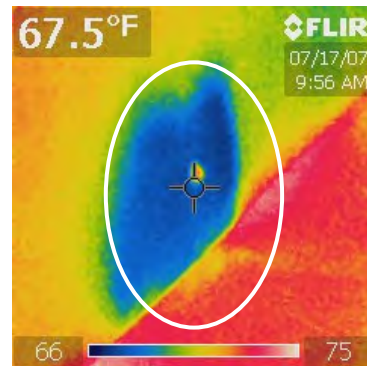


Figure 10b. Thermal of sewer cleanout leak.

THE HORSES HAVE ARRIVED THE STARTING GATE

Our first year had passed and we now figured it would be time to determine if the horse opportunity would be a realistic one. I had just attended Infracation 2006 where I met Dr. Jim Waldsmith and took his clinic on equine thermography. I figured this would be a start.



Figure 11a. Nearby race horse training facility.



Figure 11b. Guest speaking opportunity.

A month went by and I decided to give it a go. I set aside a day and decided to make time to stop by San Luis Rey Downs in Bonsall, CA and try to meet with management. San Luis Rey Downs is a race horse training facility that happens to be located about 4 miles from my home. I arrived and met with the director, who openly allowed me in to pitch my business. I presented our infrared company brochures and asked if they had ever heard of using infrared in equine applications. To my surprise, the response ended up being quite positive. In fact, they had been introduced to infrared by one of the track trainers, who had purchased an infrared camera for herself and, they had heard good things about it. The director proceeded to introduce me to key people at the facility, including local veterinarians practicing there, to get their opinions on Infrared. One veterinarian I met responded that this sounded great as now he would not have to make the investment in new equipment and since I was trained to do this, I would hopefully make his job easier. During my site visit, I was introduced to the General Manager, who must have been convinced of my ability as she asked me to speak at their next association meeting of horse owners. I accepted the challenge, figuring there's no time like the present to get this going. I left the facility pretty happy, but then realized on my drive home that I had just accepted a speaking opportunity on something that I really did not know that much about. What was I going to talk about in front of a group of horse experts?

A couple weeks later I stopped by to drop off some brochures and look for any marketing opportunities. I ran into the General Manager who gave me a "By the Way" statement that I would of course need to be licensed prior to any work being performed at this facility, as it was governed by the California Horse Racing Board. I figured that this would be no problem, not fully understanding what I was getting myself into.

"The Featured Speaker"

The speaking engagement was to take place about a month after my initial visit to the training facility. The pressure was on, as I knew I had no protocol in place or the know-how to do these types of inspections. I planned on signing up for a class on Equine Thermography to be held in April of 2007, but somehow I had just agreed to speak several months before that, what was I thinking? I spent the next few weeks on the internet to gain knowledge. Dr. Jim Waldsmith, who I had met at the 2006 Inframation seminar, offered to lend me a presentation on equine thermography that I could use for my speaking engagement I had booked. The agreement was that I would only read from the PowerPoint and not try to interpret. Deal! This was easy as I knew less than my audience.

The night had come and I was now to speak in front of about 30 people. I had reviewed the presentation over and over again but the nervousness was there, with the thought that someone was going to ask me a technical question. I was able to play that evening off and it seemed to go very well. I must have done something right as the very next day; two paid horse scans were booked for the following week. The pressure cooker was now fully steaming. I had to open my big mouth, now I got a job doing it. I had to create a full protocol within a week and be ready to stand behind a horse in harm's way to take pictures. The information available out there on equine thermography was very limited, and I had to create a protocol based on what I could find. I worked many long nights before my first scan, but was able to settle on a protocol and imaging procedure just prior to my first scheduled session.

“The First Scan”

In a bad kind of way, I remember the night before my first scan saying, “Lord, I really don’t wish any harm on these horses I am about to scan but should there be an injury unbeknownst, please bring it to light”...infrared light that is. The next day came and I was as ready as a guy could be in a week. I convinced everyone that I knew what I was doing, and went about my scan. The scan part turned out to be pretty smooth. I asked the trainer and owners representative if there were any specific areas of concerns with the horses. In both cases, these were going to be baseline imaging, with no known problems. About 26 images were taken from various angles, and it only took about 20 minutes per horse. I returned home that afternoon to organize the images. I started to span adjust images and something just popped out. Was my prayer being answered?

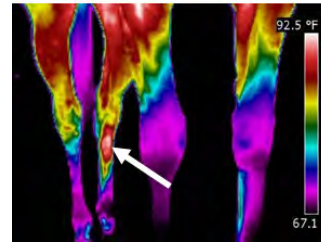


Figure 12a. Visual image

Figure 12b. Thermal image of first horse scanned.

Figure 12c. The problem area..

As a non-veterinarian, it’s likely you will be skating thin ice if you try to diagnose medical problems. However, as a Thermographer, I am able to distinguish hot and cold. I just need to leave the interpreting up to the experts. An anomaly definitely existed in the left rear leg, and was reason enough for further review. The owner was pleasantly impressed and decided to order an x-ray with his veterinarian later that week. The veterinarian informed me that there in fact was an injury identified in this location. This veterinarian was now pretty convinced there was some room left in the horse health care business for thermography.

“Licensing is a must to work at the track”

Now that I had completed my first two scans, I figured the licensing process must be completed if I intended on working at the training facility or any other race track in the State of California. This proved to be the biggest challenge yet. I went to the licensing facility, which happened to be located about 1.5 hours north of my home, and approached the license board to request a license application. I then found out that it was not a sign up, pay a fee and get your license procedure. I would have to convince four different people that what I would like to do is something that was needed at the track. I put on my best and approached each signature, one by one. The security signature was supposedly the easiest so I went there first. I explained what I did and requested his signature. He signed no problem. My next signatures were the Racing Secretary and the Steward. These turned out to be marketing opportunities, as they were very interested and they had never heard of equine thermography before. These signatures were a slam dunk. The State Veterinarian was our last signature, and then we were in. This proved to be the hitch. The State Veterinarian responded that they would not sign anything, as they perceived me to be practicing medicine without a license. I pleaded and explained our actual procedure with no luck. I left the facility trying to plan my next step. Not being one to give up easily, I decided to make a second attempt to get the needed signature. I drove back again after a couple weeks and tried to convince the State Veterinarian that I was not practicing medicine, but rather a photographer. He didn’t buy it but due to my persistence, he agreed that he would do research and consult with the higher ups. Two weeks later I returned and met with him again where he still stood on his decision after talking to his boss, and once again refused to sign for my license. I needed this signature so I decided to take things into my own hands and actually try a different route. I created a recommendation for licensing form. I approached multiple veterinarians from the local training facility near my home and showed them the results of my infrared scan. I asked them for their endorsement for my licensing, and they agreed to endorse my request for a license. I returned to the track with my recommendation form and once again was shot down. I was battling in my mind on where to go next. I decided to go up the chain of command and asked the State Veterinarian who his boss was. He agreed to provide me with his name and number and said if I could get past him, he would sign. This is exactly what I did and after a 15 minute conversation, I was

successful in pleading my case. The main director's concerns were the same, but after explaining my process, I believe my winning statement was that I was not capable of interpreting my own images and didn't know a thing about horses. With that they agreed they would sign and allow my license. When I returned to the licensing office a few days later with my fully signed approval, I was congratulated; I had passed the biggest test of getting past the big guy. They told me that to their knowledge, I was being awarded the first non-Veterinary license for performing this type of procedure on the race track. What a proud moment that was.

Since our first two scans, we have completed our training with The Equine Center in San Luis Obispo, CA. I have updated several of our protocols after attending the class as it was a great learning experience. I recommend the class highly for those who wish to enter the equine scanning field. Just prior to the completion of this paper, we were hired for two additional equine scans with both clients being very impressed with the results. With good promotion, I believe that equine thermography can be a business completely on its own, as I have been told this by many people in the business. Because we have been promoting all the areas of infrared and not just one source, this may take longer for our company. Just prior to the completion of this paper, our company helped sponsor a local equine charity event that was attended by many members of the horse community. In an effort to promote our services to the many potential new clients, we donated a full Equine Scan to their auction to benefit the charity. Surprisingly enough, our scan sold for the full retail value with several people in a bidding war. It seemed to have the most interest of all items available. During the event, I set up a small booth with brochures and information. The booth turned out to be a popular spot where many people came by to find out about this new technology. One potential client was so impressed that she was looking to set up scans on 4 of her horses. Hopefully by the time this paper is presented, we will have many more stories to share.

SUMMARY

It was my intent with this paper to share with you how a home inspection company was able to expand into a field that was completely different, and show you some of the experiences along the way. Although everything within me was geared towards building science, I had the one tool (an infrared camera) that allowed me to do so much more. SoCal Infrared started in the business with an idea. With that idea, SoCal Infrared today has proven to itself that this is a viable business all on its own. We anticipate additional growth in the days to come and since have purchased two additional FLIR cameras. With proper training, imagination and the right tools, there is no end to the possibilities with Infrared. I encourage you to take your next step and go beyond your comfort zone.

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ACKNOWLEDGEMENTS

The author would like to thank the Infrared Training Center for putting up the brochure in the hallway about horses. It was this brochure that started this whole thing and made this paper possible. I would like to thank Dr. Jim Waldsmith for his help with my first presentation and for teaching the class on Equine Thermography.

To Malcolm West, a Thermographer from down under whom I met at 2006 Inframation, you have a great story and I appreciate your knowledge and marketing ideas. I look forward to our years to come and the relationships we build.

The author would like to thank the California Energy Commission and the US Department of Energy for utilizing Infrared imaging in their research on quality of insulation installation. It is these references I make on a daily basis in regards to the authenticity of our process.

The author would like to thank Flir Systems for creating such a great Infrared Camera and for giving us the opportunity to be a part of the future growth of our profession.

ABOUT THE AUTHOR

Peter Hopkins, a Level I Certified Thermographer (Level II certification August 2007) is the President of InspecDoc Inspection Services, Inc., the parent company of SoCal Infrared. Peter has been in the building inspection and evaluation business for over 11 years. Currently servicing most of Southern California as multi-inspector firm with several of the inspectors certified in thermography. Peter completed a certificate major in Construction Inspection with academic honors from Palomar College in Southern California. Peter was the recipient of a Scholarship from ICC (International Code Council, www.iccsafe.org) and currently holds five certifications as a Residential Combination Inspector, Building Inspector, Electrical Inspector, Mechanical Inspector and Plumbing Inspector. Peter in addition is a Certified Electrical Inspector with IAEI (The International Association of Electrical Inspectors) and is a Certified HERS energy rater. Peter is a Certified CREIA Inspector and a New Construction Specialist with The California Real Estate Inspection Association (www.creia.org) and has served in various volunteer leadership positions within organization. Peter has personally performed over 5000 Real Estate evaluations and over 1000 energy audits in Southern California. Peter has been trained in Equine Thermography practices and is licensed as an Assistant to Veterinarian with the California Horse Racing Board. Peter resides in Southern California along with his wife and two children.

