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Education Design Showcase

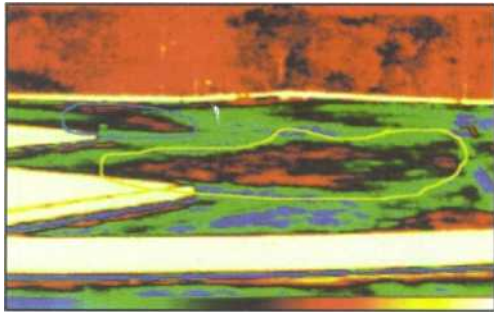
INFRARED2k, The Required Roof Inspection Practice

Getting A Clear Focus On Roof Replacement & Management With INFRARED2k

A new generation of X-ray like vision helps extend roof life, conserve energy and survey for mold-supporting environments, thereby improving indoor air quality.

How do most facility managers make roof replacement decisions, age, leak report frequency, political pressure? Now they can actually see extent of moisture inside their roofing systems with a once secret heat seeking technology first used by the military for missile guidance.

Peter Blaise, P.E., associate vice president for the five-campus community college in Jacksonville, Ff.. says he uses patented **INFRARED2k** reports from



Walkover infrared inspections became available over a decade ago The image above represents one of dozens of infrared photos that would have to be captured at less than a 60-degree angle to provide full roof documentation of a typical school The above image is subjective and often misinterpreted Vertical aerial imagery is required to accurately document the location of moisture

Infrared Concepts Corporation, and physical roof inspections, Blaise says he finds this combination produces "terrific results.

"**INFRARED2k** is the foundation intelligence for our roof management program, says Blaise. "We've learned that surgical and sectional roof replacement is indeed the best strategy to manage our entire roof inventory. Frequently, roofs have been treated as a unit that is either in good condition or ready to be replaced. Infrared has enabled us to treat roofs section by section, based on condition.

Blaise says that prior to accomplishing the roof assessment they knew there were severe problems, but did not have any details except endless complaints. "The vivid imagery contained in the **INFRARED2k** report helped convince senior administration to implement our roof management program. We are completing long-overdue roof replacements valued at more than \$2 million dollars.

Blaise has also used **INFRARED2k** in resolving a legal

dispute against a national contractor. "The aerial infrared2k reports documented visually what we already knew - our new fine arts center had overwhelming problems. The infrared2k data was then corroborated by an independent roof assessment by pulling cores from the roof and doing a moisture

*Demand A
5 Year
Applicator
Warranty &
Oversee with
INFRARED2k*



DUVAL COUNTY PUBLIC SCHOOLS did not believe the accuracy of the INFRARED2k report, since there was no indication of leaking or mold. They independently conducted invasive testing, confirmed the accuracy of the report and installed 67 vents to dry out this roof to extend roof life, conserve energy and eliminate the environment for mold growth

analysis: our legal counsel believes this information will be invaluable in negotiating a final settlement. Blaise says.

Facility managers also use INFRARED2k to document water infiltration into new roofing thereby forcing the applicator to resolve the problem under warranty.

Dale Hughes, facility roofing director of Duval County Schools in

Jacksonville, Florida is one of the few facility managers demanding a five-year applicator warranty from roofing contractors. Hughes says in this way he can transfer many repair and material costs back to the installing contractor for the five year warranty period.

Hughes says three years ago when he approached his roofing contractors they agreed if the roof is installed properly it should remain dry for its first 5 years. "This shift of requirement was done without an

increase in the average cost per square foot. What's amazing is how much water the roof can hold, much like a sponge, before any leaking is visible," says Hughes.

As a result of a recent INFRARED2k report, Hughes notes, the Biltmore School was found as having significant moisture infiltration. Because there were no visible indications of moisture,

Hughes considered the results suspect and proceeded to verify the INFRARED2k report with coring. "The core tests validated the infrared report and a 67-vent remedial system was implemented. Hughes says he knows that by keeping the roof dry he will enjoy longer roof life and significant energy savings.

Ken Trufant, Purchasing Director for Pasco County Public Schools in New Port Richey, Florida has used INFRARED2k on new schools to ensure the contractor has performed the roof construction correctly. "We then go back before the applicator warranty expires and conduct another infrared inspection," says Trufant. "In this way we can transfer labor and material repair costs back to the contractor during the applicator warranty period.

Trufant says one of their schools did have a minor leak problem about one year after construction was completed. "We called the contractor back out, showed him the INFRARED2k reports,

Significantly Reduce the Scope of Scheduled Roof Replacements

and we found him very cooperative in making the repairs," says Trufant.

"The cost of materials and making these repairs can be borne entirely by the contractor. Without the reports, moisture is not discovered until the water infiltration had become obvious and more serious. In that case, Pasco County Public would be paying the cost of restoration, which can progress considerably by the time leaking



Note the hidden moisture caused by the poor installation of satellite dishes

occurs and moisture has infiltrated the building, says Trufant.

Patent holder and Director of Aerial Operations for INFRARED2k, LLC, Stan McDougall says the patented **INFRARED2k** service makes good sense for those who are managing buildings with an asset protection mindset. "The DOE says the national median price of total removal and replacement of flat roofs is approximately \$9 a square foot or \$900,000 for every 100,000 square feet of roofing (does not include disposal). By maintaining a dry condition, roof life can be extended as many as 15 years. That savings translates into reallocated funds and more real problems solved.

McDougall says that using the calculation above and a 100,000 square foot

roof with an estimated 15 year roof life means that each square foot is valued at \$.60 per year. Every year a 100,000 square foot roof replacement is avoided means \$60,000 in avoided maintenance dollars. The impact of this equation over 5 million square feet is \$3 million in savings in only one year. Multiplied by 5 years or 10 years this equation could amount to \$15 or \$30 million dollars.

In 10 years of doing business, Infrared Concepts Corp. has discovered that roof problems are often multi-spot related and that roof replacement occurs when frustration levels escalate. "We all know that leaks rarely occur from the same place they infiltrate the roof. This patented infrared technology is the only way to obtain a photographically accurate picture of the

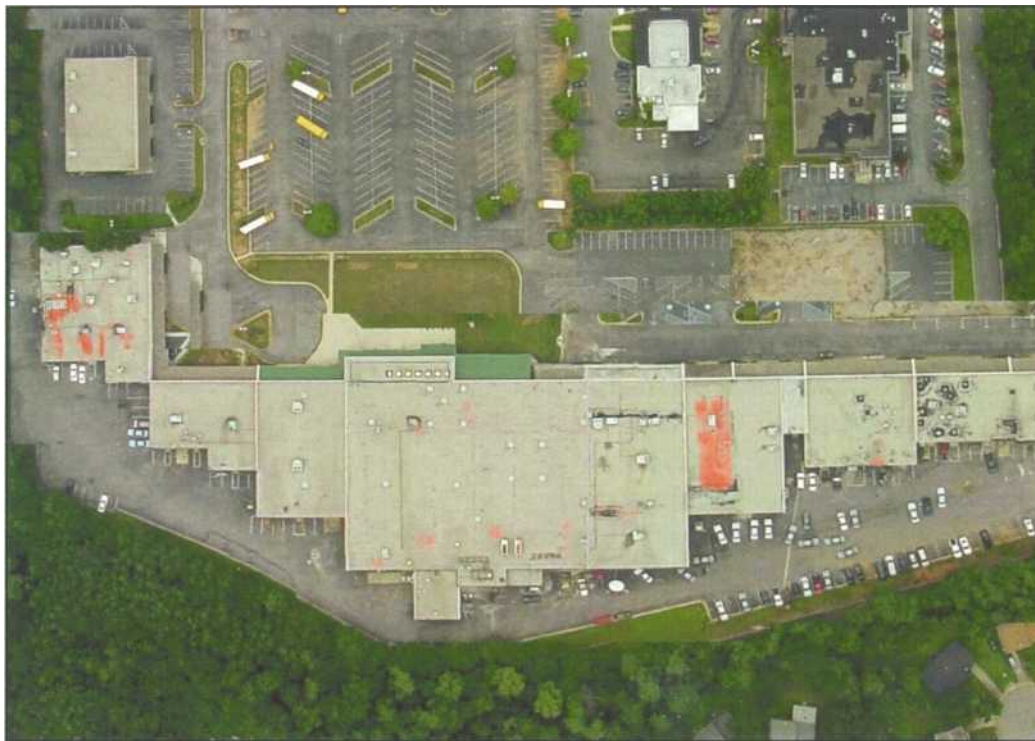
roof instead of relying entirely on the volume of leak complaints or the age of materials, says McDougall.

Moisture inside roof insulation also has major impact on energy use. In hot weather, wet insulation is similar to having a hot water heater in the roof. The air conditioning system must work overtime to overcome that heat.

Florida Board of Regents Engineer, Tom Shewan, P.E., analyzed the energy savings associated with keeping roofs dry. Shewan determined that although R-19 insulation is required by the State University System, the average roof R-value has degenerated to R-11.

"This is based on the US Department of Energy's claim that R-values nationwide have been reduced by over 43% due to moisture. I determined that over the anticipated 15 year roof life for every 1,000,000 square feet of roof area energy waste would amount to over \$1,200,000 based on Florida Power's GSTD-1 rate schedule, says Shewan.

If asset protection and energy conservation weren't enough, **INFRARED2k** can also assist in the nagging issue of mold and poor indoor air quality. The source of air quality problems is very difficult to identify but infrared can certainly track down wet insulation in the roof with X-ray like accuracy. A moist environment is a prerequisite to supporting biological growths. Air quality specialists recommend starting with the building envelope including roof and external walls. Should the building envelope not prove to be the moisture source, the next step would be to explore internal sources.



Scheduled for complete tear off, the INFRARED2k reports can focus resources on those roof areas in need of immediate restoration Five individual IRA report pages were combined to enable this view of the facility.

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