

Successful Roof Management Starts with an Aerial Infrared Scan

By Brian Butkowski

Managing a portfolio of roofs can be challenging. With so much happening, in and around facilities, roofs are often overlooked until leaks or serious problems present themselves. Not to mention, even diligent facility managers have to keep up with roofs being divided into many sections with varying installation dates, contractors, and material manufacturers. As a full service Roof and Building Envelope Consultant, RAM USA has developed tools and solutions to help in the management of roof assets. One solution unique to the industry is RAM's proprietary Aerial Infrared Inspection Process. Whether starting from scratch, or complimenting existing plans, RAM USA's Aerial Infrared Moisture Scans can be a vital part of any Roof Asset Management Program. Simply put, Aerial Infrared Inspections are the fastest, most accurate, and most cost effective way to pinpoint moisture in roof systems, and get a bird's-eye-view of the health of your roofs.

Those familiar with the use of infrared (IR) on roofs understand that the IR camera is used at night to pick up the thermal signatures of moisture trapped inside roofing materials. This moisture absorbs heat during the light of day, and retains it much longer than the dry materials around it at night. The temperature differential allows for easy detection of suspect areas, especially since the IR cameras RAM USA uses can distinguish temperatures down to hundredths of a degree. Our cameras mounted in fixed-wing aircraft offer some amazing advantages, mostly based around speed. "Infrared cameras are so fast, we can take thousands of frames per second, in high resolution, even from an airplane," says Joe Cobb, VP of Operations at RAM USA. "Aerial inspections are typically less expensive, safer, and more accurate than traditional IR walk-over inspections, and they cover every square inch of each roof being scanned for a more comprehensive analysis."

Buildings in close proximity, like campuses, can often be scanned in a single night. A task like this could take a team doing "walk-over" IR inspections weeks, or even months. Flying over also eliminates the inherent risks involved with "walk-over" inspections, since no one needs to actually go up on the roofs in the dark. This obviously provides much more scheduling flexibility, as well.

After flights collecting both "Visual" (daytime) and "Infrared" images, the key is in the processing and analysis of the images. Our team, which has over 25 years of



Aerial Infrared Roof Scans Identify Thermal Anomalies

Success Stories

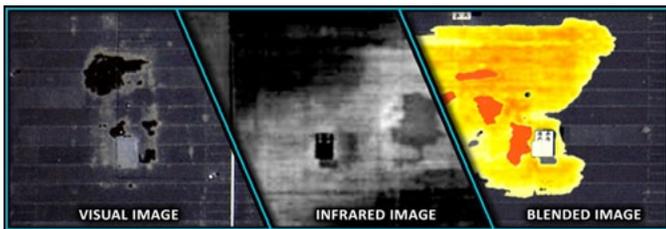
Checks and balances of their current roof management programs was a necessity, for a large government client with hundreds of buildings. RAM USA's expertise was called upon to compliment their program of roof re-covers and replacements based on each roof's age. RAM performed Aerial Infrared Roof Scans on 49 such facilities, and determined that less than 15% of the roofs would actually need to be re-covered or replaced. The majority of their roofs could be maintained in water-tight condition through Maintenance, Repair, and Restoration, which would result in millions of dollars of savings!

A large mid-west healthcare system with 14 hospital campuses and 100+ buildings was growing tired of reactionary and costly roofing programs. One of their projects was a \$600,000 roof section replacement, at a 180,000 sf facility. This roof section had been posing some problems, and replacement was determined by the roof manufacturer's age-based recommendations. Upon an initial Aerial Infrared Inspection and visual roof survey, RAM determined that only 20% of the roof's insulation had light moisture saturation, and that replacement wasn't necessary. However, the Aerial Infrared Scan revealed that a different roof section had severe moisture damage, and their original funds were redirected for that project.

Ensuring that their roofs were in good shape and water-tight was a priority, for a mid-west realty group that was preparing two of their buildings for future sale. They went so far as to commission a walk-over infrared survey, but it was performed by an inexperienced tech that lacked roofing experience. His faulty analysis led a contractor to state that both buildings' roofs needed to be replaced, at a cost of \$1,400,000. Before making such a large capital

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experience in Infrared Thermography and how it relates to roofs, uses a proprietary process to analyze the infrared imagery seeing if thermal anomalies meet specific criteria to be considered moisture. Then, a “Blended” image is created, by merging the data from the visual and infrared images. This image depicts the severity of any moisture that was detected, as well as potential problem areas that don’t quite meet all of the criteria to be considered moisture. RAM USA’s blended images serve as a guide to begin to prioritize which roofs need the most attention. Not only that, they are basically a road map for semi-annual visual roof inspections that can point the technician to the areas in need of further investigation. This is the starting point for a Roof Asset Management Program.



RAM USA’s Proprietary Process of Infrared Analysis

In Summary

Aerial Infrared Roof Scans are safe, proactive, cost-effective, efficient, and an excellent first step in understanding your portfolio of roofs. RAM USA’s scans find even the smallest issues, and allow them to be remedied before they become major problems. Being proactive pays. “Our experience has shown that you could fix 6 potential leaks at the same cost as 1 emergency leak,” says Jeff Cacioppo, President of RAM USA. Additionally, at a fraction of the cost of visual roof inspections, Aerial Infrared Roof Scans are the most cost effective way to get an overview of all of your roof assets. Aerial Infrared Inspections are very efficient, as they are the quickest and most accurate way to begin prioritizing which of your roofs require the most immediate attention and resources. As the starting point for our comprehensive Roof Asset Management Programs, after Aerial Infrared Inspections are completed, the next step is performing visual roof surveys with Registered Roof Consultants (RRC’s). The analysis of the data collected by the scans and surveys is compiled into a report providing objective options, recommendations, and budgets outlining proper maintenance, repair, and replacement actions, for the next 5 years. This report can be viewed through our web-based management tool, RAM Command, which offers many ways to drill down and sort the findings. Conventional, bound hard copies are also available, if they are preferred. RAM USA recommends Roof Asset Management Programs, to anyone who has the important task of managing roofs.

expenditure, the client called upon RAM USA’s consulting expertise. RAM’s initial action was an Aerial Infrared Inspection. The resulting analysis was verified through RAM’s visual/physical roof surveys, and it was determined that neither roof had reached the end of its useful service life and they did not need to be replaced. Instead, RAM recommended roof restoration on the 6 sections of roof, at a much lower cost. By utilizing less than 1% of the original proposed replacement cost, on RAM’s inspection services, their total expenditure could be reduced by 57%.

A leading consumer products company requested an Aerial Infrared Inspection to check the condition of its roofs, at one of its campuses. RAM USA performed a diagnostic Aerial Infrared Scan on all 20 of their buildings. Analysis revealed areas of wet insulation in a roof system that the client was set to re-roof, at a cost of roughly \$500,000. It had been recommended by a contractor that due to the roof’s age it should be replaced/re-roofed, and a previous nuclear scan deemed the roof insulation dry. RAM followed the Aerial Inspection with a comprehensive visual survey and core analysis, and determined much of it was still in excellent condition. RAM USA recommended implementing a repair and maintenance strategy to gain 5-10 years of life extension, at about 10% of the cost of the original re-roof. Saving the client \$450,000.

Understanding the true condition of its fairly new roofs was critical, for a central Ohio school district with 18 buildings. They were also looking to develop a plan to manage their roofs moving forward. RAM USA began implementing a comprehensive Condition-based Roof Asset Management Program starting with Aerial Infrared Roof Scans. Next visual roof surveys were performed, by RAM’s Registered Roof Consultants (RRCs), on each roof. The information collected by the scans and surveys was analyzed and compiled into a comprehensive report. The report provided objective options, recommendations, and budgets outlining proper maintenance, repair, and replacement actions, for the next 5 years. The final piece to the program was a 5-Year Maintenance Contract, under which RAM USA managed the appropriate maintenance actions based on its initial report, and continued surveys to oversee the health of the roofs.



RAM USA is a national roof and building envelope consulting and engineering services firm focused on cost effective asset life extension solutions. Our goal is to help preserve and protect your portfolio of buildings – Whether you have 1 or 100+ sites.