Computerized Roof Management Saves Money

By Fred King

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Computerized roof management uses the power of computers to effectively manage roof assets. Promoting proactive management, the system can prioritize repair/replacement requirements, avoid misdirecting funds and save the owner's money. Multiple facility properties, such as military, property management companies, city and state governments, and schools, may derive great benefit from computerized roof management.

As an example, a successful computerized roof management program was initiated at a large university. Years of under-funding and management-by-emergency had left many of the roofs of the facilities vulnerable to water entry; unplanned roof repairs were eating into the building maintenance budget. With no funds for preventive roof maintenance and no way to determine which roofs might fail next, the university was a good candidate for computerized roof management.

Today, the university's roofs are actively managed. The computer program quantifies problems for prioritizing. Repairs and/or roof replacement are now made by plan, with annual repair cost-prevention included, and the previous budget has been cut in half. Aggressive roof monitoring and replacement will leave all rooftops in good order and save $1.6 million in repair and replacement costs through 2005.

BASIC EQUIPMENT REQUIREMENTS

The minimal equipment required for using a computerized roof management (CRM) program is a computer and roof management software. To enhance the program, you may want to incorporate digital photography, CAD, and/or some form of non-destructive moisture detection equipment such as infrared, nuclear or capacitance measuring devices.

Software

As with most other computer software, the choices available to fulfill this small but important niche are varied. The styles range from very basic data storage and retrieval systems to full-blown networkable programs that store data, perform conditional analysis, determine life cycle costs, and perform economic analysis. The basic programs may prove to be adequate in providing all the assistance that is required, but the more capable programs can provide the same and then some. The user can extract the basic data and still maintain the enhanced capabilities in reserve for use should the need arise.

There is a tendency with the more sophisticated programs for the user to become overwhelmed by the availability of vast amounts of data presented in just as many different ways. Without proper instruction, whether self-taught or tutored, a user of the more powerful programs may become intimidated and discouraged with the program, passing it off as too difficult and complex to use. On the other hand, once familiar with the program, users can get so caught up in the ease and power of data retrieval and analysis that they lose sight of the task at hand - managing roofs. The inability to "see the forest for the trees" is generally short-lived, and can be considered a phase, or part of the learning process of the program, as the user progresses from intimidation to "Hey, this is great! Look what I can do!" back to focusing on roof management.

Very often, users of any roof management program, computerized or not, require differentiation between the various roof systems in use today. Different systems, such as built-up roofing, single-ply, modified bitumen and steep sloped systems, have varying performance expectations, differing defects and idiosyncrasies pertinent to specific installations. The CRM program, with the ability to handle large amounts of data, can easily accommodate this task, if properly designed to do so.

Human Touch

The user must realize that all programs, especially the ones that go beyond simple data retrieval into conditional and/or economic analysis, are not now and never will be the be-all and end-all to roof management needs. The programs are merely tools to assist in decision-making processes. They cannot

apply human judgment, only mathematical calculations that provide answers based on these numbers. These analysis processes are prescribed by the creators of the programs based on their experiences, skills, and opinions. The creators try to anticipate all variables that may be encountered and usually adopt a compromised philosophy. The user of the program must apply his or her judgment based on the specific needs and situations. Only you, as a user, know the performance history of your roofs, the occupancy of your buildings, and the acceptable risk levels you are willing to tolerate. The information provided by the programs is meant to enhance your decision-making process, not be your decision-making process.

There is an argument that human judgment is factored into a CRM program more than it first appears. Some programs are designed to allow the unskilled and uninitiated (regarding roofs) to accomplish an accurate and complete implementation of a roof management program. The outcome is usually quite different when the same program is performed by someone familiar with roofs and their associated performance problems. For example, a less informed inspector may see a ridge as simply that - a ridge - and document it as such. A more skilled and roof-familiar inspector may see the ridge as indicative of more serious, unseen problems and will take the steps necessary to insure the program acknowledges this fact by addressing attachment and movement issues. By doing this, the skilled inspector insures that the program will provide the proper recommendation and performance expectations.

We have found after years of using a particular program one can adapt it to coincide with one's philosophies. A familiarity with the program allows the inspector to anticipate the program output and evaluate this prior to inputting the data. The data may be "massaged" to achieve the goal of the inspector. This can be viewed as a benefit or a drawback depending on the skill, experience and luck of the inspector. Some may say that this method nullifies the accuracy of the program and raises the question of "Why use the program at all if the input data is not accurate?" Accuracy is the key. As long as the data is an accurate representation of the roof the output based on this information will be as accurate as the program is capable of providing.

There is also the tendency for the user to assume that, because the computer has the capability to store, process and provide reports on libraries of data, it must be right. It's easy to assume the data is correct and, when mistakes are found, mistrust in the program and its administrators is spawned. There should be a system of checks and balances incorporated with any CRM program to verify results. This quality control system should include random sampling of the output for close scrutiny for accuracy and compliance with your philosophies. If non-compliance is discovered, there are two choices - change programs or adapt the program to suit your philosophies or vice versa.

Computer

In addition to the software, the other essential part of a computerized roof management program is a computer. As in software, the choices are many. A laptop or portable computer can provide the user with a little more versatility. The capability to take the computer to the facility enables the user to enter data on site. This, in turn, can provide immediate results and alerts the user to any discrepancies. Errors are rectified on site, rather than discovered back at the office, whether across town or across the country. Associated drawbacks to portable computers are high prices and sometimes difficult-to-view monitors (screens). Our experience has shown that these drawbacks are minimized by saving additional trips to the site to gather missing data.

EQUIPMENT ENHANCEMENTS

Digital Photography

A recent technological advancement has been digital photography. The cost for digital cameras is falling rapidly, making it easier to justify their use. Digital photographs can be incorporated into some CRM programs, which further enhances the usability of the program. Whether the photo is an overall view of the entire roof or one of a particularly complex detail, the ability to view it in the CRM program can "bring the user to the roof", so to speak. The photographs, however, can take up a large amount of computer storage space. Discretion must be exercised to provide a balance of photos to available storage space.

CAD

Computer Aided Drafting (CAD) can and should be utilized in a CRM program. By using digital drawings, the creation, modification, and storage of th roof drawings is simplified and more effi cient than manually drawn sketches. Thi is generally a logical transition since computer is already required for the CRM program. The user must, however, bu CAD software. Again, the choices ar many depending on the user's require ments. For most programs, a lower en package will suffice.

An important aspect of using CAD i the ease of modifications to the drawings The success of any roof management pro gram, computerized or not, is the con tinuation of the process. The easier it is t use and modify, the better the chances o having a successful roof management pro gram. CAD lends itself to simple an quick changes, whether it be buildin additions, installation or removal of units or locating defects and repairs. Severa renditions of the roof sketch showing th history of a specific roof area are avail able with a few key strokes.

Drawbacks that have been associate with this technology are high cost an difficult learning curve. Some CAD pro grams are quite sophisticated and ca take longer to learn. These more comple programs, if obtained specifically for us on the CRM program, can be overkill i that only a small fraction of their capa bilities will ever be used.

Moisture Detection

A very important key to the accuracy o any CRM program is the use of non destructive testing (NDT) equipment t help locate and define wet materials con tained within the roof system. Withou performing this evaluation, a complet picture of the state of the roof cannot b developed. NDT can take on many forms nuclear, capacitance measuring and in frared. Of these three, only infrared ca provide the detection of wet materials o virtually 100% of the roof area at an time. Infrared thermography can be ac complished on the roof surface with hand held equipment or aerially from fixe wing or rotorcraft. The equipment can b very expensive, even more so if used on a aerial platform, but the detection of un seen wet materials in a roof system justi fies the expense.

Another option may be to subcontrac this process although you will be relyin on the skills of the technician to interpre the data in this small market of roo infrared thermography. A certain com fort level of the skills required to interpre

the data must be achieved between the user and technician. The skills should be demonstrated and references required before committing to these services.

A necessary part of any non-destructive testing is some destructive verification. Any and all areas of suspected wet materials must be intrusively cored or probed to verify suspicions of moisture. Without verification, the data is useless.

TRULY PAPERLESS?

The paperless office is a pipe dream visualized with the advent of computers in business. With CRM, it will probably remain a pipe dream. In most cases, the data from the program must be disseminated beyond the single user. Hard copy reports are generally required to accomplish certain tasks in CRM. Corrective action reports, computer developed budgets, simple database reports, and CAD sketches, must be passed on to the proper parties. The alternative is to gather everyone around the computer screen and show them the data, then expect them to remember all they saw. The hard copy reports allow everyone involved to benefit from the CRM program, which remains administered by a single entity.

SUMMARY

The use of personal computers has simplified once cumbersome work tasks. Likewise, roof management software was developed to provide the user with a friendly, efficient and organized system for managing roofs. While software available today greatly enhances the ability to efficiently organize database information and provide technical analysis, it requires the user to be proficient in basic personal computer use. In order to effectively implement a computerized roof management program, the user must know roofing technology, learn specific management programs, and possess personal computer skills.

Several roof management software programs are currently available. Each provides the user with either simple, basic management capabilities or more capable engineered management systems. In general, their capabilities fall into two categories: database management or database management and analysis. Some programs provide a good framework for a roof inventory database, but they lack conditional and cost analysis.

Many of the computerized roof management programs incorporate new and unique ways to manage and analyze roofs. Using more traditional, manual approaches often limits the ability of the user to perform more advanced analysis tasks. The choice of an effective roof management program depends on the user's overall needs and how each program's format fulfills those requirements.

There is no prerequisite for using a CRM program, although the most benefit may be derived by facility managers with several buildings under his or her guidance. Facility managers with fewer buildings can still benefit from the CRM