

## MEMO FROM THE PRESIDENT

### The Three-Pronged Approach to Asset Management

As all experienced Facility Managers know, in these challenging times, it is becoming more relevant to develop a successful "Long Range Asset Management Program" with regard to the building envelope. Budget cuts and downsizing of the maintenance team are just two of the challenges we encounter on a regular basis. More than ever, miscommunication with upper management and insufficient due diligence when planning for general restoration or repairs, along with "band-aid" solutions, are creating the most havoc on cost effectiveness and longevity with regard to maintaining building envelopes. So what measures can be taken to avoid these common pitfalls in developing a comprehensive program? We suggest practicing what most Fortune 2000 companies already know -- the essential three-pronged approach -- which is:

**Prioritization** - The key to recognizing and understanding the deficiencies of the facilities portfolio and what their long term building envelope goals and objectives are.

**Cost reduction** - Only after a proper evaluation has been performed and your immediate concerns have been assessed can you determine whether you need to develop a maintenance budget, deferred capital expenditure or major capital budget.

**"Sustainability"** - Whatever the Long Range Asset Management Program that has been implemented, sustainability will become a reality.

Best of success in managing your facilities portfolio.

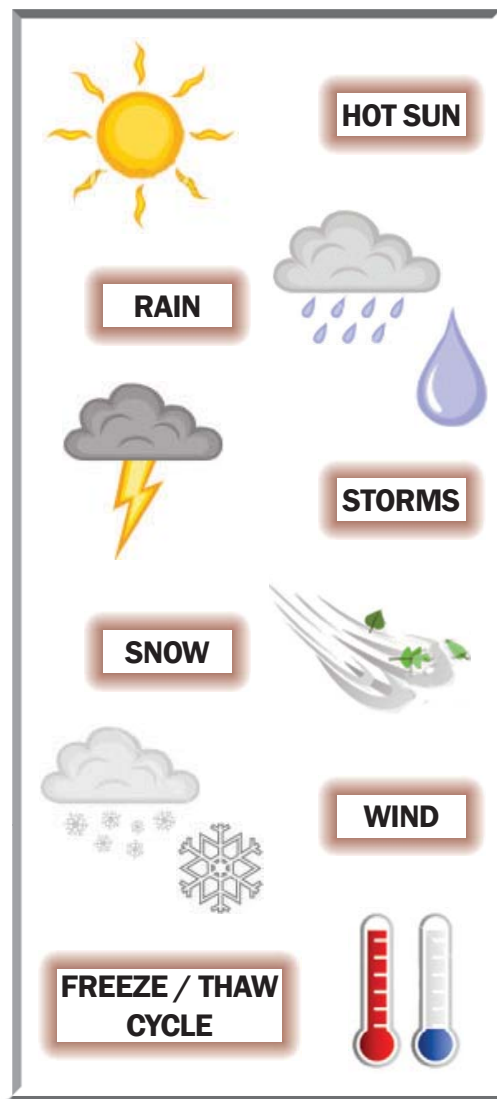


Jeffrey L. Brittan  
Chief Executive Officer

## DAMAGING EFFECTS TO YOUR ROOFS

### WEATHERING THE STORMS

Your buildings' roofs may be your organization's most valuable asset and, at the same time, your most vulnerable asset. Being exposed to weather 24 hours a day, 7 days a week, 365 days a year is the reason no roof system lasts forever.



Keeping the elements outside of your building, while protecting all of the valuable inside components such as furniture, electronics, carpeting, etc., is the reason for making sure your roof is in peak condition. Neglecting your roofs can mean leaks, degradation or major damage. Without proper inspections and maintenance, your roofs will prematurely fail, and with spring on the way, now is the time to start preparing for your roof evaluation.

It is very important to understand that there are certain indicators or conditions that should be addressed when inspecting a roof. Most roofing systems have specific guidelines for inspecting the condition of all aspects of the roof.

Being proactive in the roof evaluation process will allow the facility manager or building owner to be effective in managing the roofing assets on a prioritized basis and developing a successful long-range roofing program.



## Roof Evaluations - "The Right Way"

Nicholas J. O'Hare – Client Relations Specialist

Prior to starting a roof evaluation, it is important to review any existing information relative to the current roofing system. Drawings and specifications should be reviewed to understand what materials were used and how various details were designed. Any warranties should also be reviewed to understand the time remaining and various restrictions that could void the warranty.

You should establish a rating system based on two main components: The first component would be the age of the roof vs. the expected design life. The second, and more important component, is the actual conditions that are identified on the roof. Each rating has its own individual definition -- making it easy to understand the overall condition of the roofs after the evaluation. The rating system should also supply a timeframe within which the roof will require corrective action.

To start the evaluation, it is important to divide the building's roof areas into manageable sections. Areas should be sectioned off by natural separations such as parapet walls, expansion joints, etc.



*Overview of aged ballasted EPDM single-ply roof system*

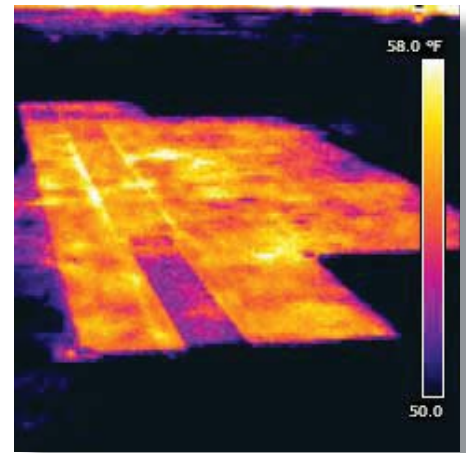
Each individual section will be treated as a separate roof and assigned an appropriate rating upon completion of the evaluation.

As the evaluation begins, the surface conditions should be reviewed first. While inspecting the surface of the roof, look for conditions such as coating deterioration, loss of the protective coating and stained surfaces indicating ponding water conditions. Ponding water is defined as any

standing water remaining on the roof surface 48 hours after a rain. Other issues, such as shaling ballast which could damage and puncture the membrane, debris on the roof system and significant levels of dirt and fines within the stone ballast, must be recorded. All surface conditions must be taken into account when developing your condition ratings.

Membrane conditions should also be reviewed. The roofing membrane is the weatherproofing layer that is designed to keep the elements out of your building. Two major types are built-up systems and single-ply systems. Built-up systems are constructed with multiple plies of a felt material, then saturated with coal tar pitch or hot asphalt. The benefit of a built-up roof system is the redundancy, with multiple plies of weatherproofing protection. Typical conditions seen within a built-up system are blisters, which indicate that there is entrapped moisture within the roofing system, alligatoring of the membrane, voids which could be caused from a lack of bitumen within the plies, and bare or exposed felts. The single-ply roofing systems primarily consist of EPDM, TPO, and PVC membranes. In single-ply roofing systems, you should be very cautious of membrane deficiencies since there is only one layer of protection. Typical conditions that affect the various single-ply systems are open lap seams, thermal membrane shrinkage with EPDM membrane and plasticizer migration within the PVC/TPO systems which causes brittleness of the membrane. Fastener backout and punctures in the membrane are also typical deficiencies of PVC and TPO systems.

There should be a strict review of all components such as perimeter edges, copings, base flashings, counterflashings and area dividers. Areas such as these require a high attention-to-detail during construction and tend to become problematic as time passes. All flashings should be inspected to ensure that they are properly sealed and are free of voids, punctures and blisters, and that there are no open laps. Sealants should be inspected for voids and deterioration at every coping joint and coping end. Termination bars and counterflashings should



*Infrared photo revealing wet/saturated insulation below roof membrane*

also be inspected to evaluate current conditions. Make sure to inspect flashing and sealant conditions around every penetration, rooftop unit, skylight, and any other projections.

Drains, scuppers and gutters must be inspected to ensure that water has a route to exit the roof. On a typical low-sloped or "flat" roof system, it is recommended that the roof has no less than  $\frac{1}{4}$  inch per foot slope to drain to allow adequate drainage. Signs of inadequate drainage could be standing or ponding water on the roof surface. Staining on the roof surface is an indication of ponding water conditions. All drains should be inspected and cleaned of any debris, ensuring all drain strainers and bolts are present and tight. Drains should also be inspected for adequate flashing and sealants. Scuppers and gutters should be inspected to ensure that they are free of debris, properly flashed and sealed. Adequate drainage plays a key role in the longevity of the roofing system, ensuring that water is not standing on the roof.

The transitions at the roof/wall tie-ins tend to be particularly problematic. These would include parapets, penthouse walls, and the walls at the roof line. It's easy to mistake water leakage in the roof system and make roof repairs when the water is actually entering into the wall system and eventually finding its way into the building.

The data that is collected should be used to drive future decisions by letting conditions dictate the recommendations; you can develop a three-pronged approach



## Article Continued ...

for corrective action. First decide which roofs are candidates for preventative maintenance. These roofs will have been rated in good to excellent condition, and all minor deficiencies should have been addressed. The second option would be roofs that have been rated in poor to failed condition, and are in need of a major capital replacement. The third and final approach is to decide if any of the areas are candidates for roof restoration or deferred capital expenditures. Roof restoration is a process that, when done correctly, can double the life of your existing roof for about 25% of the cost of full replacement.

## StructureScan® Project Profiles



**Project:** INX International Ink Company, Chicago, IL  
**Profile:** Approx. 80,000 sq. ft.  
**Procedures:** Roof Evaluation & *StructureScan*®



The INX International Ink Company in Homewood, Illinois was in need of a review of their existing roof system. StructureTec provided a *StructureScan*® to evaluate if there were any areas of wet insulation. During the evaluation, StructureTec discovered that the roof was in poor condition and was beyond its useful service life. In regard to the poor condition of the roof, StructureTec advised that restoring/repairing the existing roof would not be a viable approach and an entire replacement would be ideal to prevent additional deterioration and water leakage.



**Project:** Mitsubishi Electric, Chicago, IL  
**Profile:** Approx. 271,000 sq. ft.  
**Procedures:** Roof Evaluation & *StructureScan*®

A *StructureScan*® was performed on designated areas of the Mitsubishi Electric facility in Chicago, Illinois to locate energy loss and designate locations of wet insulation on the roof surface. Once the *StructureScan*® was performed, it was determined that although there were large amounts of water present on the mechanical screen wall areas of the roof, there was no moisture found within the roof insulation. StructureTec helped create a preventative maintenance program to extend the life of the roof another 5 years.

**Project:** Precision Printing & Packaging, Clarksville, TN  
**Profile:** Approx. 200,000 sq. ft., multiple types of roofs with retrofit layers of roofing, extensive rooftop equipment  
**Procedures:** Roof Evaluation & *StructureScan*®



Precision Printing & Packaging's facility in Clarksville, Tennessee was experiencing significant leakage conditions. These conditions were occurring intermittently throughout the entire facility. Their existing plan involved merely chasing and patching the leaks. StructureTec was contracted to perform an evaluation and a *StructureScan*® survey of the roof, and develop a strategic program for repair and replacement.

# StructureTec<sup>®</sup>

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**HIGH PERFORMANCE PEOPLE ... HIGH PERFORMANCE RESULTS!**

## If you have Roofs, and you have Walls, then you have Parking Lots!



*Surface deterioration -  
potholes and severe cracking*

Your pavement and parking lots are also being exposed to weather 24 hours a day, 7 days a week, 365 days a year.

Fatigue-type cracking is generally caused by surface failure due to traffic loading; very often due to inadequate subbase support. Storm water seepage into the subbase can exacerbate pavement failure with each annual freeze and thaw cycle.



*Improper drainage  
causing ponding water*



*Restored parking lot.*

Climatic conditions; i.e., freeze and thaw cycles, will severely increase the rate of pavement deterioration. Pavement life can be significantly increased with a well-engineered economical maintenance plan.

Crack sealing, seal coating, structural patching and resurfacing are all feasible options to prolong pavement life. You can significantly reduce the overall annualized cost with a proper maintenance program.

**Pavement Management Group<sup>SM</sup>**

A Division of **StructureTec**.