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Roof issues: Sink your budget or Save your job?

Solving potential roof problems using **roof restoration** *can sidestep costly roof replacements—and make your job easier*

Replacing a roof can bring a host of concerns and potential trouble areas. Repair costs. Odor and fumes. Building downtime. Long write-off periods. Safety concerns for workers and contractors. Debris removal. Weather. Lost customers. When it comes to roof care, the risks can be both abundant and daunting.

Fortunately, roof restoration can save you from many of the biggest pitfalls of re-roofing. Roof restoration, which includes conducting necessary repairs and maintenance and installing restorative and protective roof materials, is a faster, safer, easier and less costly alternative than roof replacement. First, let's discuss the numbers that justify

DOUBLE THE LIFE OF YOUR ROOF

Extending the life of your roof by restoring it is one of the smartest decisions a building owner, facility manager or property manager can make. Installing roof restoration systems can provide impressive increases in roof life expectancy, almost *doubling the life expectancy* of most roof substrates.

SUBSTANTIAL PROJECT SAVINGS

Roof restoration is extremely cost effective compared to replacing a roof. Further, you don't have to sacrifice performance. Most roof failures occur in less than 10% of the roof area. Yet amazingly, every day roofing materials in perfectly good working condition are torn off and replaced.

This throw-out-the-baby approach has long been seen as a "proper" way to ensure a roofing problem has been solved. But the costs to replace a roof rather than restoring it are strikingly high, especially considering the service life.

Most building operation budgets do not adequately support tear-offs and replacement. With an abundance of risks, disruptions and costs, successful building managers are looking for better alternatives like roof restoration. Let's look at a typical replacement on a 45,000 square foot roof (see Fig. 1). In this example, the cost of a tear-off or roof replacement is significantly higher than restoring the roof. Further,

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the costs for a restoration come from annual operating expenses, whereas a replacement is typically classified as a capital project.

Figure 1: Comparing Replacement with Restoration Costs

	Tear-Off / Replacement	Roof Restoration	1st Year Net Savings
Roof Surface Area	45,000	45,000	
Cost/sq ft	$ 4.11	$ 2.55	$ 1.56
Total Cost	$ 184,950.00	$ 114,750.00	$ 70,200.00

Further, roof restorations are fully tax deductible in the first year, whereas a new roof is considered a capital asset and must be amortized over a 39-year life.

Now let's step through the roof restoration process, and discuss sound roofing decisions that can save you time and money.

STEP 1: DIAGNOSING ROOF ISSUES

Start by determining the condition of the structural deck, insulation and roof membrane. Deck deterioration is greatly accelerated if there is water trapped in insulation sitting on top of the deck, so wet insulation must be located and removed.

Large roof areas are suited for aerial infrared photography, giving building owners a general idea of how the condition of the insulation. Small handheld infrared cameras work well for smaller roofs.

The next step is to create a detailed roof plan. Global Positioning Systems can speed the process on large industrial and warehouse facilities. Instruments used in surveying can be used to pinpoint roof equipment and leaks. Verify test results with roof cores taken all the way down to the structural deck level. Wind uplift tests can also be performed on the roof. Membranes can become delaminated during a storm yet stay in place; the next big storm could rip the membrane completely off the structure.

Visual inspection can also give clues to the overall condition of the roof. A soft area underfoot is an indication of saturated insulation. Rusted deck seen from inside the building may help locate the worst areas of deterioration. Ponding water could result from a sagging structural deck. An experienced eye can spot membrane problems without sophisticated equipment. A key cause for built-up roof membrane failure is splitting. Splits are easier to see if the roof is clean and has any gravel removed. Old repairs are easy to spot if the roof has had all the loose gravel removed. Contractor bids will tend to be lower if the estimator has access to the roof and the roof surface has been exposed.

A licensed structural engineer should be retained if there is any evidence of structural failure or additional loading of the roof. Additional loading can include materials stored on the roof, condensing units, blowers, metal screens, ballasted antennas, signs and decades of accumulated trash and debris.

STEP 2: ESTIMATING REPAIR COSTS

Contractors should be selected to estimate:

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- Cost to remove and replace the entire roof
- Cost to remove and replace only the wet insulation areas
- A unit cost to remove and replace deteriorated decking & smallest unit replaced
- Cost to make repairs to the roof membrane
- Cost to restore roof with solvent or emulsion based coating

Research building codes to see if a deck inspection is required and if so what the average wait is once the building department is notified.

Slope may need to be increased which could require greater insulation depths at the perimeters and in turn increase costs of perimeter flashing systems and required parapet height increases. Additional wood blocking at the perimeter is required if there are no parapet walls. If the building uses a guttered edge design instead of an internal drain system, additional costs are incurred replacing the gutter and flashing the new gutter to the new membrane.

STEP 3: DECIDING THE BEST SOLUTION.

With all the facts, it's time to decide how to proceed. Factors like how long you plan to be in the building and whether a long term amortization of a replacement (reroof) or a single year write off repair would favor the business financial plan will impact the choice of solutions.

Are there plans to expand in the near future? It is more economical to reroof during an expansion rather than to split the projects into different years. Roof access and impact to building operations are greatly reduced if you can double up.

What is the weather like will the work be done? Wind, thermal shock, thermal bridging and UV exposure issues can impact when and how to apply a solution.

Compare solutions by cost per year of expected life. Trusted contractors, architects and consultants can provide a realistic idea of life expectancy for each system in your geographic area.

You may have to budget to protect pedestrians with a sidewalk bridge, or redirect pedestrian traffic, to support materials on a failing deck, or prevent dangers from dropped materials. Noise from demolition efforts can bother neighbors, drive away customers and force other businesses to close. Will work be performed at night or during holidays to avoid nuisance or dangers? Jobsite appearance can be a factor as well if it's a retail business.

BEWARE OF A RECOVER

A re-cover is defined as leaving the existing membrane and insulation in place while installing a new layer of insulation board and membrane over the existing surface. This is a bad idea for because wet insulation left on the deck will cause the deck to continue to deteriorate. Maintenance workers can through weak decking, causing injury and death. Further, the extra weight of snow load or flooding can create catastrophic failure.

The biggest reason to resist re-covering is that finding and locating future leaks is nearly impossible. If leaks in the roof membrane cannot be found, the roof must be torn off—and now there are two roofs to tear off, not just one.

RESTORATIVE COATING SYSTEMS

Roofs expand when heated and contract when cooled. This cycling occurs on a daily cycle from day to night; weather induced from clear skies to cloudy with chilling rain and seasonally winter to summer. This can greatly shorten the life of a roof.

There are coating systems available today that, when applied to an acceptable substrate, will add back 10 to 15 years to the existing roof membrane by acting as an extra layer of UV protection. They can close up small punctures that may have been missed in the repair phase. They will act as an adhesive if the roof is re-graveled. On smooth surfaced roof membranes, aluminum and white coatings greatly reduce the surface temperature compared to black surfaces or gravel. But coatings are not a cure-all: they will not fix splits; they will not substitute for a sound roof membrane.

The variety of roof coating solutions has exploded in less than 20 years. New coatings are highly rubberized and blended with compatible asphalt. Aluminum coatings are now available in polymer modified versions that will expand and contract with temperature changes that occur every day. White surfacing materials are tough, durable, and able to retain color, in addition to being elastomeric.

THE ADVANTAGES OF A RESTORATION

So there are many reasons to restore a roof. Consider these:

1) Financial – Totally deductible in year work is done. No need to amortize cost over 39 years according to current IRS law.
2) There are no lateral pathways for water to travel
3) There is minimal noise and disruption to the business
4) Fast – less work than a tear off and reroof
5) Less dust and debris in the building – critical in plants and processing facilities
6) The quality of the coatings and mastics has greatly improved

AFTERCARE: MAINTENANCE

Any roof repair can be undone without a sound long term maintenance approach. Drains and gutters must be checked annually to ensure they are free of debris at the strainer or in the drain pipe. Most roofs are damaged by repair trades, storms and vandals. Pitch pans need periodic resealing. Metal copings loosen in the wind, and expansion joint covers need regular maintenance.

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