GUEST COLUMN

Better Roofs are Less Expensive

by Richard A. Boon, P.E., CCI

“The cost to install a roof is only a portion of the total cost of owning a roof”

The ultimate question for roofing is: "What is the best roof?" The accountants will tell you that the answer is simple: It is the roof that costs the least over its life. It really does not matter what material is used or how the roof is attached; the answer is the same. If the roof fails, then the cost of a new roof is added to the cost.

When most owners look at roofing, they look at the materials and the systems, and the only part of the cost they consider is the initial cost. But the cost to install a roof is only a portion of the total cost of owning a roof.

The practice of examining the cost of owning a roof over its entire life is called life-cycle cost analysis. This is the best way to truly compare the cost/value of roofing systems. Something that is crucial is: How long do you expect to own the building? If the answer is indefinitely, then the analysis should be run for at least 20 years. Some people will use 30 years. The standard depreciation for roofing is 39 years. There are very few systems that are functional at the end of this life expectancy.

The next consideration is the changing value of a dollar over time. One common method for relating future expenses to today's costs is to use the t-bill rate, minus the inflation rate. A time value of approximately 5 percent is a reasonable number for use in our analysis.

There are costs associated with other aspects of roofing, such as installation inspections, semi-annual inspections, the cost of leak-related repairs, costs associated with making the warrantor live up to the warranty, and so on. There are also routine maintenance expenses to consider, such as cleaning the drains, recaulking the flashings and performing general housekeeping.

With some systems, the costs of performing some of these items are covered by the warrantor as a part of a comprehensive service package. They can also be purchased from some contractors or roofing consultants for an annual service charge. All of these costs need to be known or estimated for the term of the study period.

The last item that needs to be known is the relative life expectancy of the roofs in question. There are sources for this information. The most conservative approach is to use the warranty life as the service life. This is generally shorter than the real life, except where there is no routine maintenance done. Then the life may well be shorter than the warranty.

Life-cycle Cost Scenario

Let's create a simple scenario that illustrates how these factors combine to produce a life-cycle cost:

The roof in question is bid using two different systems. The first is a commodity-grade roof with a 15-year warranty; the bid is $225,000. The second system is a premium roof, and the bid is $300,000.

We are assuming that the owner is a public entity, so that taxes can be ignored. We are using our 5 percent for the time value of the funds.

The cost to maintain the commodity- grade roof is at least $1,000 per year, to cover the costs of the required inspections for warranty and the cost of a consultant on the project during installation (many consultants are considerably higher).

When that roof is replaced, in its 15th year, its present value cost is $113,640, representing the initial cost adjusted by the time value of the funds. When you add the continuing cost of maintenance, the total-ownership cost for the commodity roof becomes $354,781.

With the second system, assuming that the premium roof is replaced in its 24th year, the present value cost is only $97,671. Since the system supplier provides the required inspections as a free service, there are no maintenance-related costs for the first 15 years of the roof. Let's assume as much as $1,500 in annual maintenance from years 15 through 23. Let's also assume roof replacement in year 24, a conservative estimate for a roof that was warranted for 20 years.

Even with these conservative estimates, the total-ownership cost for the premium roof is $346,273. As the federal interest rates drop, the difference in total-ownership cost increases, making the premium roof an even better buy.

Since the premium roof has a manufacturer's rep on site during installation, installation-related problems and add-on inspection costs are minimized. In addition, on-site manufacturer observation provides the benefit of single- source liability, should problems eventually occur.

The figures used in this illustration are in accordance with ASTM E-917, Standard Practice for Measuring Life-Cycle Costs of Buildings and Building Systems, which provides building owners with an excellent tool for comparing roofing options on a sound financial basis.

Other Factors

There are other factors that can be included in a model. These include a simple energy cost savings as well as the costs that are associated with any leaks in the system. If a roof leaks, then the wet areas need to be fixed, as does the damage done inside the building. The additional energy lost can be considered as well.

There is also a cost associated with disrupting the facility to put a new roof on. This should be added to the cost of the roof.

It has been reported that the return on an initial investment of $10 to $12 can be justified through the savings of a single dollar per year in maintenance.

Conclusion

So, which of these roofs saves the owner the most money? Clearly, the higher up-front costs of premium roofing systems can be fully justified through long-term savings.

By looking at more than just the initial cost of the roof, the owner is making a better financial decision. This same analysis is useful for making a multitude of construction-related purchasing decisions.

Are the published life expectancies of high-performance roofing products truly achievable? There is no question that if someone knowledgeable looks at the roof at least once a year (industry recommendation is twice a year), and the problem areas are corrected promptly, most commercial roofs will last significantly longer than their warranties. The exception is when defective materials cause the roof to shrink excessively or to shatter.

Life-cycle cost analysis is also the best way to discuss making roofing decisions with financial people. The one that makes the final decision is the one that signs the checks. Roofing people are great at providing technical information but poor at providing the financial information that supports the right decision.

Improve the quality of your data. Examine your own roofs or the roofs of others in your area and find out what is working and what's not. This data can then be used to better model the true life-cycle costs.

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