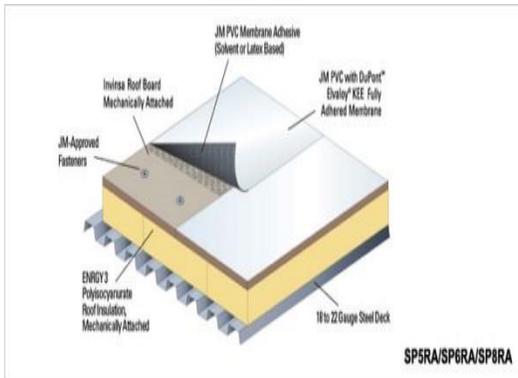




Roofs Revisited



In previous issues, we have discussed the key issues you will face if you need to undertake a major roof replacement. Since building science continues to evolve, we thought it would be a good idea to talk about roof replacements considering a broader range of system options.

Let's begin by identifying conditions on a given building that could contribute to the failure of a roof system.

Like any building system, age is a factor. On average, a properly specified and installed roof can last between 10 and 15 years. Even if it is properly maintained, every roof will ultimately reach the end of its service life. In other words, your roof may just simply wear out. However, in most cases, when a roof fails, there is a root cause(s) beyond simply "old age".

From my experience, there are 3 primary reasons why roofs fail; poor design, poor installation, poor maintenance, or in some cases, a combination of all three.

As a design professional, I have found it critical to work with a roof system manufacturer early in the design process. Meet them at the site, review the existing conditions, look at "tricky conditions" that need high-level manufacturer's input. After all, if the manufacturer does not approve how to install it, you will not be able to obtain a roof warranty. No warranty, no roof.

Built-up tar and gravel roofs have been in use in the United States for more than 100 years. Built-Up Roofs (BURs) generally are composed of alternating layers of Bitumen (Hot Tar) and Reinforcing Fabrics (Felts) that create a finished membrane.

BURs have been around a long time, long enough for their short comings to become well known. In BUR applications, it can be very difficult to create a proper seal at all seams and connection points. This can cause a roof to leak early in the life span. Repairs for BURs can also be problematic because it is difficult to locate the exact point of a leak.

Originally, asphalt required a layer of gravel above it for two reasons. First, if asphalt is exposed directly to sunlight it degrades much faster due to UV exposure and expansion/contraction. Secondly, asphalt needs weight above it to hold it down because it generally sits "on top" of a building instead of being physically attached to it.





Around the middle of the last century, membrane roofing began to emerge as an alternative to BURs. EPDM membrane formulations have remained relatively constant for the past 40 years, with roof systems installed in the 1970s still performing well. In recent years, technological advancements in membranes and accessory products are producing roofs that are more durable, energy efficient and easier to install.



Membrane roofs are most commonly made from synthetic rubber (Thermoset), Thermoplastic (TPO or PVC) or, modified Bitumen. Generally membranes are placed in large sheets that are lapped and seamed.

Compared to BURs, all 3 types of membrane systems contain materials that resist expansion/contraction and reflect much of the UV Radiation. Additionally since membrane seam technology results in very strong seams, what expansion/contraction that does occur does not create leaks at these seams. Membrane systems are also attached directly to the building which eliminates the need for excess weight above.

Recent technological advances in membrane composition and seaming accessories are literally pushing the envelope further.

In the 1980s seam tapes replaced liquid adhesive and increased installation productivity and system performance. Now, the common usage of self-adhering components (components that have factory-applied tape) have further increased roof system performance especially in more problematic areas such as flashing installations. Installation equipment has evolved as well; reducing crew force fatigue and installation time (Labor costs).

Component and installation advances have definitely raised the bar, but it is innovations in the membranes themselves that is redefining the roofing industry. Traditionally membrane thicknesses have ranged from 30 Mils to 60 Mils (Thousandths of an inch). New 90 Mil membranes are proving to be so durable and high performing that 30-year warranties are now available. This is the only long-term performance guarantee in the roofing industry and can include warranty coverage for punctures, hail and wind speeds up to 100 MPH.

So if you need to replace your roof, the durability energy efficiency and faster installation cycle of membrane roofs make them the obvious choice for your building.

