Why does it sometimes seem that some roofs are like cheap suits? They don’t work very well and they don’t last very long.

Why do many roofs fail or begin to fail after only a few years of service?

Everyone has a roof, everybody needs one; there are a lot of choices, it costs a lot of money and there is a plethora of materials and products available to solve your problem.

I have inspected stone roofs in Switzerland which date from the 10th century. They still function. There are slate roofs in Germany which are 800 years old. They still function. There are thatch roofs in England which are 600 years old. They still function.

These are roofs that last and they show that almost anything can be a roof and they all exhibit the first secret of roofing success and that is:

1. DRAIN THE ROOF

All of the roofing materials described are assembled in a system or method that was developed and improved at least until something else that was demonstratively superior took their place. All of these systems and many similar ones did have one common denominator and that denominator leads us to the first step of the five steps to roofs that last.

2. DRAIN THE ROOF

A roof has certain simple functions. The roof provides protection from many elements but the primary function in most climates, is to protect the user from water. An umbrella therefore could be described as a portable roof.

Keeping out the water is only one function. The roof has to protect from the weather and at the same time it is protecting you, the roof has to itself withstand all the elements; frost and snow and rain and wind and hail and sun and UV and pollution and mechanical forces like kids and airliners dropping ice bombs.

It is important to note that not every roof serves every function. Some roofs may offer outstanding protection for some of the referenced elements and forces but no material is perfect and it is up to the purchaser or specifier to understand all the necessary forces and design to those requirements.

The choice of membrane product under certain circumstances could be the cause of major problems. For example, a high tensile strength membrane, in conjunction with a relatively weaker substrate may work fine in moderate Vancouver climate but with the colder climate in Edmonton, the tensile strength of the membrane would increase as the membrane temperature became lower and the differential stresses on membrane and substrate can lead to failure.

Other examples include membrane materials that may react differently when exposed to reflected heat situations in very warm and sunny locations. Some membranes react negatively when ponded water is present. Some thermo plastic membrane materials are chemically incompatible in contact with asphaltic membranes.

Manufacturers use long term warranties as a major marketing tool. The warranty does not keep the water out of your building. The warranty is not a panacea for good design, good construction and good installation. The owner is always responsible for maintenance.

There are many well proven roofing systems and assemblies and if you try and design within the parameters of this proven available technology then you will minimize problems. Remember that some materials work better than others in some instances. All materials are not “equal” no matter what the roofing sales person says! This knowledge and the use of common sense and experience bring us to the third step for roofs that last.

3. DRAIN THE ROOF

If the roof drains well, and a major problem like a membrane split occurs, the amount of water to enter the building can be relatively small, minimizing the damage or interruption to building operations.
In our 20 years of institutional and commercial consulting practice, we have seen a lot of roofs, many of which although failing, have functioned for a long time.

Why have these roofs lasted so long? The truth is more than the fact that the older buildings are of heavy construction and are poorly insulated.

The reason that many of these old roofs have not leaked is that the vapor retarder was a substantial one and usually built on a non-deflecting, dimensionally stable deck and this is the membrane that has provided the waterproofing function for years. And last but not least, many of these old building roofs have pretty good slope to drain.

Built-up roofing membranes did last a long time on the types of buildings for which quality built up roofing was suited. Buildings with rigid frames, usually concrete and sometimes heavy timber and roof assemblies with minimal insulation worked well and given a modicum of maintenance, 30 to 50 year lives were not uncommon.

Buildings have changed and so have the materials.

We are now seeing many of the so-called new materials (including single ply) entering their 25th year or more of service life and like everything, some do better than others. There is still no substitute for quality materials, quality of design and most important, quality of regular maintenance.

4. DRAIN THE ROOF

There are still some really poor roofing details being used in buildings today and they are not all the designer’s fault. There is no magic to good roofing details but there is common sense and logic.

Water will travel anywhere it likes to, including uphill. Water will go through stucco and poor concrete by capillary action if no other way exists.

The usual causes of roof leaks are poor workmanship and bad detailing exacerbated by poor maintenance. The designer can’t do much about poor workmanship, that is someone else’s responsibility. He can and should however, provide sensible, logical details that are buildable and accessible for repairs and long term maintenance.

Roof leaks rarely occur in the field or middle of a roof, rather leaks almost always occur at a flashing or termination or roof penetration and the causes as discussed, are poor workmanship and bad detailing.

Problems often occur when tenant improvement involve a new roof penetration for vents or HVAC. The roof penetrations must be performed by competent roofers to appropriate standards and this is often not the case. Attention must also be paid to roof warranties when such renovations are being performed. Communication between landlord and tenant and appropriate follow-up is essential.

Please, don’t depend on caulking of any kind to act as the only line of defense to keep water out of a roof system. Too many times we see a perfectly good roof system ruined because a perimeter detail ended with a caulked termination.

5. DRAIN THE ROOF

Consider the retention of an experienced qualified roof consultant to supply the independent expertise that you may not have in house. His or hers independent expertise in interpreting and defining your needs can be pretty helpful. The consultant’s credentials should include credible roofing industry experience and knowledge, independence from any one supplier or manufacturer and no direct links with any contractors. Ideally, the consultant has some professional education and experience, carries appropriate insurance to cover the work he or she performs and has wide industry affiliations with which to work.∞

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