



Assessing and Repairing Roof Leaks and Damage

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In a time of economic uncertainty, replacing a roof is not always a viable option, regardless of the number of leaks, because the money is just not there. Still, water intrusion must be stopped and the interior of the building must be protected. Repairing the roof becomes an attractive alternative to re-covering or replacing the existing system. But there are some things to think about before trying to repair the roof.

One approach that is often taken is to call a roofing contractor to fix the leaks. Certainly it is advisable to use a competent roofing contractor to repair problems properly. But unless you give the contractor some direction as to what you want done and how, you are relying on the roofers to do whatever they think best, which may not coincide with your plans for the building. The other problem is that sometimes, repairs are just not enough or may be the wrong approach entirely.

The first step should be to find out what you've got. If you have a warranty, the warranty will tell you who the manufacturer is and what kind of roof system is installed. If you don't have a warranty or you can't find it and you do not already know what kind of roof you have, your contractor or a roof consultant can help you identify the materials. Core cuts should also be done to determine the condition of the roof membrane itself and the construction under the roof membrane, including insulation type, thickness, attachment, deck type and attachment, and a snapshot of whether the roofing materials are damp.

A roof consulting architect or engineer can then tell you what can be repaired, and then give a professional opinion of what the construction costs will probably be — both for the repairs and the cost to replace it. The consultant can find problems that may seem small but can become major leaks if left untreated.

It is essential to ensure that leaks are really coming from the roof. Not all leaks come from the roof membrane. They can be a result of problems with parapet walls, windows, rooftop mechanical units, plumbing or other sources that disguise themselves as roof leaks. Once these have all been eliminated as the source of leaks, walk the rest of the roof to look for possible membrane leak locations. In general, most leaks occur at penetration and base flashings rather than the field of the roof. Look for cracks, scrapes, blisters, punctures or cuts in the membrane. Check seams to be sure they are adhered and



watertight. Check for erosion of the membrane, especially around drains and downspouts. Once the probable leak locations are identified, you can proceed to the next step, which is determining what problems can be solved by repairs, what repairs are needed, how the repairs should be conducted and what should be done if the roof can't be repaired.

DIY or Contract Out?

The best source of generic information on how a roof membrane should be properly repaired comes from the [National Roofing Contractors Association](#) (NRCA) Repair Manual. This book not only provides step-by-step instructions on how to do the repairs properly, but also provides photographs that illustrate the text. The manual has drawing details of how flashings should have been installed to begin with and how the repairs should look when they are done.

The question then becomes, who should do the repairs? Can you do it in-house to save money? If the roof is still under warranty, a contractor who is an authorized applicator for the roof system should definitely be the one to do it. Generally speaking, you are more likely to have proper repairs done if you use a contractor who is familiar with the type of roofing system that you have. Any modified bitumen repairs requiring torching and heat-welded PVC and TPO patches are best left to professional contractors who have the training and equipment to work with these membranes. If the problem is simple, such as refilling a pitch pan or a temporary patch, it can be done in-house. However, if this route is chosen to save money, be aware that there are pitfalls.

Too often, with roofs, repair means someone looks for a cut or puncture and smears roofing cement on it. This may be fine for an emergency situation where the only goal is to stop a leak immediately, but it is never a long-term repair. Roofing cement soon shrinks, cracks, and becomes brittle when exposed to ultraviolet radiation from the sun. If you are looking for a long-term patch, do not use roofing cement, especially on any metal details or PVC, TPO, or EPDM single-ply membranes. Roofing cement is not capable of withstanding the thermal expansion and contraction of the metal and will soon fail. PVC, TPO and EPDM are chemically incompatible and the roofing cement will actually damage them more.

Be sure that whatever membrane is used for the repairs is compatible with the existing roof material and suitable for the long-term repair. In general, asphalt-based roofing (modified bitumen membranes and traditional built-up roofs) can use almost any asphalt-based membrane. Not so with PVC, TPO and EPDM. These membranes must be matched with the existing material. PVC must be used on PVC, TPO with TPO, and so on.



If you are doing patches in-house, you may be tempted to use a peel-and-stick membrane for the repairs. When properly used these membranes can provide a tough, long-lasting repair, but be careful. Some peel-and-stick repair materials are asphalt-based and, like roofing cement, are not compatible with non-asphalt-based materials. Some non-asphalt-based peel-and stick repair membranes will not stick to asphalt-based roofing. Some peel-and-stick membranes are intended only for use as underlayments under metal, tile or shingle roofs and are not intended to remain exposed to sunlight. These materials will begin to deteriorate rapidly if not covered within their limited exposure time.

EPDM membranes and thermoplastic membranes such as PVC or TPO are not interchangeable and repair materials for one are not appropriate for the other because the techniques for attaching patches are not the same.

Some problems will never be cured with patching. The most common of these is expansion-joint terminations. If the original expansion joint installation stopped at the building walls and is not continuous with the rest of the building expansion joint, the ends will always crack and leak due to movement in the building.

Age-related splits in any type of membrane, whether asphalt-based, PVC, TPO, EPDM or other formulation, will simply continue to open at the ends of a patch and you will chase the split until it reaches the walls. When an EPDM roof begins to erode due to age (you will find a thick cover of black powder on the roof) you can't reverse it by patching it. When this begins to happen, coating it may extend the service life, but be sure the coating you choose has been developed specifically for coating EPDM. Not all coatings are the same.