

DON'T SEAL THE PARAPET

Rain, the primary source of water, is driven by wind through permeable masonry units, mortar joints and cracks in the wall. It is the wind pressure that causes the majority of wall leaks—not water flowing down the wall.

On the other hand the roof doesn't know which direction the rain is coming from - its function is to withstand the vertical force of a head of water sometimes several inches deep. (The equivalent of a wind pressure of more than 90 MPH.) To do this, it must maintain its watertight integrity uniformly over the roof surface. Masonry differs from roofing in many respects. The most obvious is that masonry walls are composed of individual units "glued" together with mortar.

In a square foot of brick wall, the mortar joints contain a potential 13 ft. of cracks. If the cracks are only 1/64" wide, they will equal a slot of 1/4" X 8" in each square foot of wall—an intolerable condition in a roof. Additionally, both mortar and masonry have a degree of porosity that would be unacceptable in a BUR.

How then does a masonry wall remain watertight? The answer is, by permitting a limited amount of water to enter the masonry assembly and then allow evaporate from the wall surface. A "solid" brick wall limits the amount of water entry through pores and cracks by reducing the capillarity in somewhat of a blotting action. After the rain stops, the vapor pressure differential allows the wall to dry by evaporation.

Another approach is to relieve the wind pressure—the main driving force of the water, by building two connected walls or "wythes" with an air space between them. This construction permits water to enter the exterior wythe and then drain through the cavity. The water is now not under pressure and can be intercepted by the flashing at the bottom of the cavity and evacuated through weepholes. Parapet walls may be constructed as a solid or cavity wall, or in the case of concrete masonry units, as a single wythe wall. Regardless of the type of construction,

Parapet walls may be constructed as a solid or cavity wall, or in the case of concrete masonry units, as a single wythe wall. Regardless of the type of construction, they are often a source of leaks and, in the opinion of this writer, are best eliminated whenever possible. Parapet walls are exposed to the weather on both sides and are subjected to the full range of temperature extremes. Thus they move more axially and in bending from differential exposure to the sun. Additionally, they are deprived of the building's heat to aid in drying after a rain. To compound the problem, these walls which are so susceptible to failure, are frequently laid up overhand from the roof deck, which results in poor workmanship.

There are three requisites for a leak: a driving force, water, and an opening. In a wall, the driving force is mainly wind pressure; in a roof it is a hydrostatic head. Because these driving forces differ, the approach toward solving the leak similarly differs. The objective with a roof is to stop the water at the surface by means of a water proof penetration but reduce the pressure by use of a rainscreen or by minimizing openings and by providing drainage and evaporation. Because flat roofs are elastomeric or visco-elastic, they can absorb thermally induced movement without rupture. However, masonry walls must be strengthened with reinforcing and control joints must be used to relieve stresses.

These differences must be taken into account when remedial work is required. When a black bituminous coating or a membrane system is applied to one side of a parapet wall, it increases the differential movement due to the greater heat absorption. This movement frequently causes wall coatings to crack or flake off. Surface treatments also inhibit evaporation from the wall after a rainfall.

If the coating cracks or flakes, water will penetrate through these openings and soak into the masonry. When the rain stops, this moisture cannot escape at the same rate at which it entered. Trapped in the wall the water will freeze and spall the coating and the masonry. A more serious situation occurs if the water can dissolve salts as the water in

the wall evaporates from the surface. These would normally appear on the face of the wall as efflorescence. When the salts are trapped behind the surface of the wall, they crystallize and this force of crystallization - which is more than ten times the force of freezing - can severely damage the wall. Additionally, these salts are hygroscopic and retard the rate of moisture release from the wall. When you are faced with a parapet wall over 12" high which appears to be leaking or is the source of leaks into the base flashing, never coat it with a vapor impermeable material such as roofing cement or a membrane. First: determine if the wall is adequately reinforced and designed with sufficient control or expansion joints. If this is not the case, no amount of surface treatment will stop the leaking. Second: check the copings to see if they are the source of leakage. Finally, if all is in order, repair the wall or eliminate the pressure with a wind screen. Acceptable treatments include special coatings and repair of cracks and joints. The latter can be accomplished by raking out the joints and tuckpointing or sandblasting the wall and grouting.

Coatings should be breathable and reasonably elastic with some ability to bridge minor cracks. They can include vinyls, stearates, silicones, urethanes, acrylics, resins and paraffins. Generally, they will only bridge cracks less than .02". Wider cracks must be cut out and filled. Alternately, heavy bodied coatings such as a cement plaster containing stearates or latex water repellents may be used. It is not within the scope of this article to discuss the merits of the various coatings available. When the wall is badly deteriorated or has been coated with bituminous materials that are deteriorated, the best solution is a rainscreen. This can be accomplished by furring either or both sides of the wall and then installing lath and stucco or panels of cement-asbestos or metal which will act as a wind screen and still allow the wall to breathe. The next time you are convinced that the parapet is contributing to your leaking problems, treat the parapet as a wall - not as a roof!