

## SERVICE WORKS

## "UP ON TOP" NEWS

## Are Built Up Roof (BUR) Systems Still Popular?

While single-ply systems have captured much of the recent press, bituminous roofing systems (including modified bitumen) still represent a significant share of all low-slope roofing activity. With nearly 150 years of experience and proven performance, BUR systems are still preferred by many building owners and operators, especially if they have an inventory of BUR systems in place.

Two basic components – felts and bitumen – are laminated in the field (built-up) to form a roofing membrane. The bitumen is usually asphalt (or coal tar pitch). The bitumen serves as both the system adhesive and the waterproofing agent. Reinforcing felts of glass fiber, organic fibers, or non-woven synthetic fibers provide strength and stability to the membrane. Surfacing provide UV resistance as well as fire protection.

Because the built-up roof membrane is field assembled, field quality control is very important to its success.

A BUR membrane is stiff and inelastic when cold, and relies upon uniform and firm restraint in order to avoid localized concentrated stress, such as at insulation joints, or stresses that accumulate over distance until they exceed the limits of membrane strain. If the membrane is not well anchored, roof splits can occur or the membrane can pull away from flashings and curbs. Suitable substrates that provide such stability include well-attached, shear-resistant insulation boards and stable roof decks, both nailable or non-nailable.

On nailable decks such as wood, Oriented Strand Board, plywood, and structural wood fiber, a nailed base felt is first applied to the deck, bridging deck joints in order to accommodate changes in deck dimensions. Remaining layers over the base sheet are solidly adhered with bitumen.

Membranes are fully adhered to thermal insulation and non-nailable decks such as structural concrete.

Key steps in hot-applied BUR include heating the bitumen adequately to insure fluidity, uniformly spreading the bitumen to avoid skips and voids, and embedding the reinforcing felts while the bitumen is still hot. Cold adhesives and self-adhering bituminous sheets have gained a modest percentage of the BUR market, but are generally only specified when the odors of solvents or bituminous fumes might be objectionable.

BUR membranes with aggregate surfacing are reasonably resistant to foot traffic and hail impact. For heavy foot traffic, walk pads can be installed.

A minimum design slope of 0.25 inches per foot is recommended for all membrane roof systems. On occasion, codes will permit aggregate-surfaced coal-tar roofs down to 0.125 inches per foot because tar can flow and allow slippage at greater slopes. Major codes now require "positive drainage" rather than a specified minimum slope. Plumbing codes also require at least two means of draining each roof area in case the primary drain becomes plugged.

Since the withdrawal of reinforced asbestos flashing sheets from the market in the 1970s, modified-bituminous flashing systems generally are used with BUR membranes. Typical wall construction would include a cant strip, a backer layer that starts about 4 inches out on the membrane, up the Cant, and 8 to 12 inches up the vertical wall or curb. This backer layer may consist of a ply sheet or special base sheet, and is followed by a MB flashing sheet (generally one with a mineral granule surfacing). The flashings may be installed in hot asphalt, asphalt mastic, or by torch application.

Well-maintained BUR systems can be expected to last 20 to 30 years. Recover with a second bituminous roof is generally permitted by building codes once surfacing gravel is removed (spudded) and wet areas replaced.

Although BUR systems are losing market share they remain a popular choice for many owners.



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