

# BUILT-UP ROOF



The built-up roof, sometimes called a “tar-and-gravel” roof, is the oldest and most common flat roofing system.

## DEFINITIONS

- **BUR:** The short form for “built-up roof”, pronounced “bee-you-are.”
- **Asphalt:** A tar-like material used as the waterproofing component for built-up roofs.
- **Coal tar pitch:** Used years ago as the waterproofing component for built-up roofs. Often called “pitch” for short, coal tar is no longer used because the fumes from the hot coal tar are hazardous to the roof installer’s health. Today, asphalt is used instead.
- **Roofing felt:** Like very thick paper impregnated with asphalt. Roofing felts give strength to the roof membrane, holding the built-up roof together.
- **Plies:** The layers of a built-up roof. A four-ply roof has a base sheet with four layers of felts, embedded in asphalt, successively applied on top of each other.

## BUILT-UP ROOF SYSTEM

This system is called the ‘built-up’ roof because it is made of successive layers of asphalt and roofing felts. After a base layer of roofing felt, a coat of hot asphalt is applied. While the asphalt is still hot, a layer of felt is embedded, then another layer of hot asphalt, and so on, until the roof is built up to the desired number of layers or plies. A residential home can have three to five plies, four being typical. A flood coat of asphalt is spread on top of the final ply of felt. Gravel is then raked into this coat while the asphalt is still hot.

## PURPOSE OF THE GRAVEL

Direct sunlight on asphalt deteriorates the roof very quickly. Gravel reflects the sun’s ultra-violet radiation, thereby protecting the roof surface. Gravel also helps spread rain-water across the roof and around the gravel, increasing surface area for faster evaporation.

## ARE BUILT-UP ROOFS PRONE TO LEAKAGE?

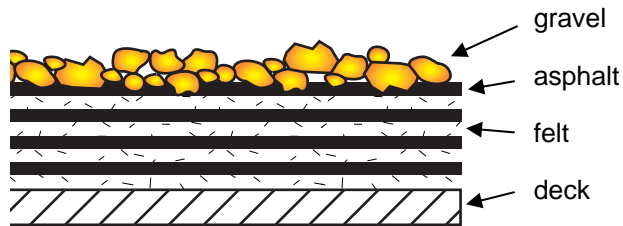
**Flat roofs are not prone to leakage so much as they are prone to neglect.** While it is true that a neglected flat roof is more likely to leak than a conventional sloped roof, a *well-maintained* flat roof is generally reliable. Unfortunately, because most home-owners can’t see the flat roof, these roofs tend to get neglected.

## MAINTENANCE

Maintenance is the key to a lasting, built-up roof. Since a flat roof tends to collect debris, the roof should be checked twice a year to clear debris from its surface, gutters and drains. At the same time, check to ensure all areas are well covered with gravel.

With periodic maintenance, minor issues can be addressed before they become major problems. Repairs to built-up roofs are not a do-it-yourself project. You need a roofing contractor familiar with BUR.

# BUILT-UP ROOF



Cross Section



Top View

## Three Ply, Built-Up-Roof

### COMMON BUILT-UP ROOF DEFECTS

**Blisters:** Blisters are bubbles under or between plies of a BUR. Blistering is usually the result of moisture trapped between the plies. Blisters show up when the roof surface is warm from the sun. Heat causes moisture to turn into water vapor, which expands and creates a blister. Blisters can be as small as a couple of inches or as large as a few feet. Blisters expand and contract with the heat of the sun. The gravel breaks free from the asphalt, and eventually, the roof breaks apart at the blister. If a BUR has a couple of blisters, a competent roofer can repair them. If there are many blisters, it's probably time to resurface the roof.

**Exposed asphalt:** Asphalt should be protected from the sun. Exposed areas will deteriorate very quickly. A roofing contractor can add gravel to exposed areas.

**Ponding:** Even a 'flat roof' should have a slope towards a drain or the roof gutters. A BUR may not have sufficient slope to drain or may have low spots that do not drain. A ponding roof is a flat roof that has standing water 48 hours after a rain. Ponding reduces the life of the roof, and if there is a leak, it's significant. Before going any further, try clearing debris from the roof drains. A BUR roof can be re-sloped while re-surfacing the roof. Occasionally, adding a drain at the low spot can solve a ponding problem.

**Old:** When a built-up roof gets old, it becomes unreliable just like any other roof. Over time, heat and ultra-violet radiation degrade the asphalt. The asphalt shrinks and becomes brittle. Eventually, it cracks, exposing the felts. Water gets into the seams and between the plies, causing blisters.

**Leaks:** Leaks on a flat roof are difficult to trace because water doesn't always come into the home directly below the leak. Tracing and repairing the leak is work for a competent roofer.

**Flashing defects:** Flashings are what keep water from leaking into the roof at roof joints and roof penetrations. Most roof leaks occur at the flashings. Either the flashing is damaged or it was never installed properly. Flashing details on flat roofs are very complex and analysis is best left to a competent roofing contractor.