Brad Hays

Both Sides of the Storm

Silver Bullet Checklists™

SBC Roof Series: BUR Roofing Systems

A built-up roof system, also known as BUR, is a popular choice for low-slope or flat roofs. It is constructed using multiple layers of bitumen surfaces and reinforcing fabrics, topped with a layer of aggregate, gravel, or a mineral cap sheet. The bitumen can be either asphalt or coal tar, and the layers are alternated to create a durable, waterproof membrane. These roofs are known for their longevity and resistance to damage from foot traffic or weather conditions. Additionally, they provide excellent fire and UV resistance.

A built-up roof (BUR) typically consists of several key components:

1. **Insulation**: This provides thermal resistance and helps regulate the temperature within the building.
   Insulation used in built-up roof (BUR) systems varies, but common types include:

   - **Polyisocyanurate (Polyiso)**: This type of insulation offers a high R-value per inch, making it effective for BUR systems. It's available in various thicknesses.
   - **Expanded Polystyrene (EPS)**: EPS insulation is lightweight and can come in various densities and thicknesses, making it suitable for BUR applications.
   - **Extruded Polystyrene (XPS)**: XPS insulation is known for its high compressive strength and moisture resistance, making it a suitable choice for BUR roofs.
   - **Fiberglass Insulation**: This type of insulation is available in batts, rolls, and rigid boards, offering varying R-values and thicknesses for BUR applications.

   The style and size of the insulation can vary based on factors such as building codes, local climate, and the specific requirements of the BUR system being installed. Common styles include board, batt, and rigid insulation, and sizes can range from thinner boards for fine-tuning the insulation thickness to thicker boards for more substantial insulation needs.

2. **Vapor Retarder**: A layer that prevents moisture from penetrating into the roofing system. The vapor barrier used in a built-up roof (BUR) system is typically a critical component in managing moisture. Common types of vapor barriers include:

   - **Polyethylene Sheeting**: This is a cost-effective and common choice for BUR systems. It comes in various thicknesses, often measured in mils, and offers excellent moisture resistance.
   - **Modified Bitumen Membrane**: This can serve both as a waterproofing layer and a vapor barrier. It often comes in roll form and can be torch-applied or self-adhered.

- **Rubberized Asphalt Membrane**: Another effective option that offers not only vapor resistance but also enhances the overall waterproofing of the BUR system.

The choice of vapor barrier thickness and style can depend on factors such as building codes, local climate, and the specific requirements of the BUR system being installed. Vapor barriers are typically available in varying thicknesses, commonly measured in mils or as a thickness range, to accommodate different moisture protection needs.

3. **Membrane**: Built-up roofs use layers of bitumen-saturated felt or fabric as a waterproofing membrane.
   - The membrane used in a built-up roof (BUR) system is a key component for providing waterproofing and structural integrity. It typically consists of multiple layers of reinforcing fabrics or felts, which are then saturated with bitumen (either asphalt or coal tar) to form a durable, waterproof membrane.

   - The reinforced layers, commonly referred to as ply sheets, are alternated with layers of bitumen to build up the membrane. The number of ply layers can vary based on the design requirements and desired level of protection for the roof.

   - The membrane is designed to resist water penetration and provide long-term weather protection for the building. It's this layered construction that gives BUR systems their distinct durability and ensures they can withstand the rigors of weather, foot traffic, and other potential sources of wear and tear.

4. **Bitumen**: This sticky and highly viscous substance acts as the adhesive that holds the layers of membrane and roofing materials together.

   Bitumen, also known as asphalt black liquid or semi-solid form of petroleum. It is a naturally occurring substance or can be produced as a byproduct of the refining process for crude oil.

   In the context of roofing, bitumen is a vital component used in various roofing systems, including built-up roofs (BUR), modified bitumen roofs, and others. It is commonly used as an adhesive or binding agent in roofing applications.

   Bitumen has excellent waterproofing properties, which makes it ideal for roofing applications. It is also known for its durability and ability to withstand temperature extremes and weathering. In roofing, it is often used in conjunction with reinforcing materials such as fiberglass or polyester to create a strong and resilient waterproofing layer.

There are different types of bitumen used in roofing, including oxidized bitumen, which is heated to increase its softening point, and polymer-modified bitumen, which incorporates additives to enhance its performance characteristics. Each type has distinct properties that make it suitable for specific roofing applications.

5. **Flashing**: Metal strips or other materials used to seal and protect joints, chimneys, walls, or other roof penetrations.
Flashing in a built-up roof (BUR) system is a crucial component for preventing water infiltration at vulnerable points such as roof edges, penetrations, and junctions. The flashing material is typically made of metal, such as galvanized steel, aluminum, or copper, and is designed to provide a watertight seal at these critical areas.

   Common types of flashing used in BUR roofs include the following:

   - **Base Flashing**: This type of flashing is used to seal the base of roof projections, such as pipes, conduits, or HVAC units, to prevent water from seeping into the roof structure.
   - **Counter Flashing**: Counter flashing is installed over the top of base flashing to provide an additional layer of protection. It is usually integrated with the masonry or other exterior cladding to create a secure seal.
   - **Edge Flashing**: Installed along the perimeter of the roof, edge flashing prevents water from infiltrating the edges and eaves of the roof.

   Flashing is installed using techniques such as overlapping, caulking, and fastening to ensure a secure and watertight seal. Properly installed flashing is critical for the long-term performance and waterproofing integrity of a BUR system.

6. **Surfacing**: This is the top layer of the built-up roof system, which can consist of gravel, mineral cap sheets, or a reflective coating to protect the layers underneath and provide UV protection.

   The surfacing for a built-up roof (BUR) system serves as the topmost layer and is essential for protecting the underlying layers from weathering, UV radiation, and mechanical damage. Common types of surfacing for BUR roofs include:

   - **Aggregate Surfacing**: This involves embedding a layer of gravel, crushed stone, or slag into hot asphalt or cold-applied adhesive to create a durable and weather-resistant surface. Aggregate surfacing provides excellent protection against UV rays and helps to extend the lifespan of the roof.

- **Mineral Cap Sheet**: A mineral cap sheet consists of a layer of asphalt-saturated felt, which is then surfaced with mineral granules. This provides an additional layer of protection against weathering and sun exposure.
- **Reflective Coatings**: Some BUR systems utilize reflective coatings, often made from acrylic or aluminum, to minimize heat absorption and provide energy efficiency benefits. These coatings can also extend the lifespan of the roof by reducing UV damage.

The choice of surfacing for a BUR roof depends on factors such as climate, building use, and desired longevity. Each type of surfacing offers specific benefits in terms of durability, weather resistance, and energy efficiency.

These components work together to create a durable and weather-resistant roofing system.

* Check with a licensed roofing contractor for additional information.