

# TECHNICAL PUBLICATION

## BUILT-UP ROOFING

**Built-up roofing has been installed for several decades with proved performance and is widely installed in today's market.**

### **What Is Built-Up Roofing?**

Built-up roofing is a multi-layered roofing system constructed in place with bitumen as the waterproofing material sandwiched between layers of felt and installed primarily on flat roofs. The built-up roof is completed with a surfacing product. Surfacing of the built-up roof can consist of gravel, coatings, or a cap sheet. Base flashings are installed at vertical surfaces and consist of multiple layers of felt and asphalt or mastic or a modified bitumen sheet.

### **Bitumen**

The bitumen used as an interply mopping is derived from oil and is asphalt or coal tar pitch. The bitumen is shipped to the project site in either package or bulk form. Most contractors utilize package form as opposed to bulk because bulk requires additional equipment (tankers). The advantage of bulk is that the bitumen is already liquid, while packaged bitumen must be chopped and melted in a kettle.

Asphalt is more commonly used, has a higher melting point than pitch, and is less expensive. Pitch, however, has a track record of longevity. It is not uncommon for a pitch roof to last in excess of twenty years with proper maintenance.

As asphalt roof can be installed up to a 2" incline per foot, with special criteria required for backnailing of felts to eliminate slippage. A pitch roof, on the other hand, is limited to 1/4" incline per foot.

The quantity of bitumen between felt plies and the temperature of the bitumen in the kettle and at application is vital for performance of the roofing system.

### **Felts**

Felts are used between the interply moppings of the bitumen. Rag felts were used for decades and are still used in limited applications. Fiberglass felts are more commonly used because they resist rotting and are much stronger, resulting in a high tensile strength. The fiberglass felts are manufactured with a chopped strand or continuous strand method and coated with asphalt. Felt products, to include base sheets, finishing felts and flashing sheets are all used in the construction of a built-up roof and all are available in fiberglass.

# TECHNICAL PUBLICATION

## **Base Flashings**

The base flashing is the component of the built-up roof that extends up vertical surfaces. The components are typically multiple layers (two-three) or felts (finishing felts and flashing sheets) or a modified bitumen sheet and asphalt. Pitch is not used in the construction of base flashings.

Base flashings are highly vulnerable to deterioration because of their exposure to the environment. They are usually coated or are granulated to deter such deterioration.

The installation of the flashing system is critical for proper performance. Interply moppings of the asphalt or mastic must be adequate and the temperature regulated, in the kettle and at application. This applies to several layers of felts or an SBS modified bitumen. Mechanical fastening of the top of the flashing system is required to eliminate slippage. This is accomplished with the appropriate fasteners applicable to the underlying substrate.

Our specifications include an application of mastic and membrane over the mechanical fasteners, top edge of the sheet and on to the underlying substrate. This technique eliminates water intrusion behind the flashing system which is common on the Florida market relevant to stucco walls.

The first component of a built-up roofing system to deteriorate is usually the base flashings. Therefore, the product and application are extremely critical.

## **Surfacing**

The surfacing of a built-up roof is intended to protect the felts and interply moppings of bitumen from the environment. Common surfacing products are as follows:

- Gravel
- Slag
- Granulated Cap Sheet
- Emulsion
- Aluminum Coating

Gravel or slag is cast into a top pour of bitumen for embedment. A granulated cap sheet is applied in a mopping of bitumen, while emulsion of aluminum coating is installed by brush, squeegee or roller.

All surfacings act as a protector to the actual roof system. The surfacing material is the most visual part of a built-up roof and should be installed first for performance and then for aesthetics.

# TECHNICAL PUBLICATION

## **Quality Control**

Quality control in the field, on-site, is an integral part of a successful application. The bitumen temperatures must meet specifications and industry guidelines. For example, an overheated bitumen will result in premature failure. On site inspections will verify bitumen temperature, quantity of bitumen relevant to interply moppings, mechanical fastening of base sheets and flashing sheets, surfacing application and installation of flashing system.

Quality control is essential for verification of a properly installed built-up roofing system.

## **Proven Performance**

The concept of a built-up roof has been around for decades with impeccable success. The installation of a built-up roof requires knowledgeable installers, proper equipment, and excellent leadership in the field.

Many roofing contractors today have steered away from built-up roofing because of a lack of required equipment, expert leadership, installers, and a good basic knowledge of the industry. It certainly is much less costly for a roofing contractor to install single ply products. However, no other system has the proven performance for flat roof applications as built-up roofing.

A properly specified, designed and installed built-up roof will result in twenty years of service. The keys to a successful built-up roof are:

- Specifications
- Design
- Products
- Application
- On-Site Inspections

This proven concept will result in an installed roofing system that will deliver long-term performance.

## **Professional Services**

Professional services create competition in the marketplace with contractors and manufacturers. Alternate pricing can be implemented into the specifications to examine more than one type of roofing system or products. The consulting fees literally are absorbed into the entire roof replacement costs due to competition and momentum which is created. The design specifications eliminate all guess work and inflated pricing. This results in a savings to the client and the consulting fees really do become irrelevant.

**Scott D. Bonk and Associates, Inc.**