BLOWING OF MASTIC ASPHALT

Mastic Asphalt is relatively stiff and heavy compared to other flat roof waterproofing systems. It is not prone to blistering, but the potential effect of trapped moisture and air must be allowed for in the application of the asphalt

BLOWING

During the initial application of mastic asphalt the heat of the asphalt expands the air quickly and raises the temperature of any moisture above boiling point. The result is the formation of blows or bubbles on the surface as the gas forces its way through the asphalt.

For horizontal areas, mastic asphalt is applied on top of a loose laid separating layer of either sheathing felt or glass fibre tissue. This allows the air and water vapour pressures to escape laterally beneath the asphalt as it is applied, virtually eliminating the risk of blowing. Any blows which do occur, can easily be noted by the asphalter, and made good by piercing the blows whilst the asphalt is still hot and working over the asphalt to prevent voids from forming.

On vertical brick or concrete substrates, mastic asphalt is applied directly to the primed surface, without a separating membrane, to achieve a soundly bonded interface. Again, any blowing is controlled by the asphalt spreader. Blowing is most likely to occur during the application of the first coat of asphalt and although it can be expected that imperfections of bond or permanent air pockets will occur, they should be small in scale. The first coat will form an ideal dry smooth surface for the second coat which will be free of significant imperfections.

It is important that the second coat is applied as soon as possible after the first coat, preferably on the same day, to minimise deposits of dirt and dust or contamination from foot traffic which could prevent the formation of a full adhesion between the coats. Most blows are visible and easily corrected but some small scale blows can stop short of showing on the surface of the asphalt but leave a small hidden void. This may not be immediately visible after the asphalt has cooled but gradual settlement of the unsupported asphalt above will take place to leave a depression on the surface, known in the trade as a ‘sinker’. Sinkers are not a defect likely to lead to leakage, but remedial action will normally be taken to make good the surface of the asphalt if the incidence is widespread.

FULL MEMBRANE BLISTERING

Full membrane blistering of the mastic asphalt covering starts from the expansion of trapped pockets of air and moisture. The blister will only be formed when dense substrate materials, such as concrete, allow them to pass through them at a slow rate of flow. Under these circumstances, temperatures from the heat of the sun can rise too quickly for trapped and air and water vapour to escape back through the substrate. Pressures will then develop in are pockets and cause an expansion which drives the beginning of a blister.

If the mastic asphalt suffers irreversible stretch during the process, the subsequent cooling when the sun goes in will not cause the air pocket to return to the original size and a partial vacuum occurs in the partly formed blister. Air and water vapour may be drawn slowly through the substrate to re-fill the original pocket of air, now slightly enlarged and ready to start another cycle when the sun appears again. The amount of expansion possible in a single cycle can be in the order of 35% by volume for a temperature change of 50c.

Sheathing Felt and Glass Fibre Tissue are both efficient separating layers for the flat areas of a roof. Air and vapour pressures in service will be released by lateral escape under the membrane, thereby eliminating the risk of blistering. However, Mastic Asphalt which is bonded directly to the substrate provides no such escape routes for trapped air and moisture other than through the substrate itself. In these cases, the cyclic formation of blistering can be set up as described above.

As a full adhesion will only be formed on details or vertical or sloping surfaces, it is only in these situations where the mastic asphalt is at risk of blistering.

As with any blistering the process must start from a small nucleus of unbonded material, and the incidence of blistering will be reduced by a positive and continuous adhesion of the asphalt to the concrete. Unfortunately building construction can never be so accurate that 100% adhesion is achieved and even though blistering is not very likely with asphalt, it is always possible for a certain amount to take place on large bonded areas which are exposed to the sun. Whilst A solar reflective finish will minimise this effect, it cannot be relied on in isolation to prevent blistering.

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