What Waterproofing An Architects' Viewpoint

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An Architect in his conceptualization process when putting ideas together for a building invariably has his attention focused on the manipulation of spatial requirements and the moulding of external forms. The farthest thing from his mind at that stage is what to use to make his building watertight, roof-wise. This consideration gets his attention probably when design development is fairly advanced and he has to seriously think of how it will be built and how much it will cost.

At this point there could be different possibilities as to what waterproofing system gets to be placed on the roof.

Possible Scenarios:

(1) Same thing as last time- i.e. "Why change if it has not failed?"

(2) Leave it to specification writer - Who could be the cost consultant providing such additional service.

(3) Use the first supplier who meets the budget and offers a ten-year warranty, since what is used often cannot be seen.

The point is that in most instances, for this part of his professional responsibility the amount of attention provided by the key decision maker in an architectural practice could be very close to being described as neglect.

Unless the architectural firm has established a working procedure that is sufficiently stringent in selecting what goes into a specification, the general tendency is that building materials and products would end up being repeatedly used without realization until confronted with building performance failures, when by then it has become too late.

The world of waterproofing for roofs have undergone significant changes and it would be wise for practicing architects to be more critical when considering their choices.

As an architect and not being a building materials technologist or manufacturer, the following experience, shared within its limitations, may serve as useful food for thought:

Some Personal Thoughts / Experience

My initial interest in waterproofing can be traced back to the time spent as a Project Site Architect having a horrendous time dealing with several different types of roof waterproofing systems that did not perform adequately one way of another. No doubt when I got a chance to talk to somebody with a relatively new product all the shortcomings of roof waterproofing was voiced most emphatically. It is through a process of breaking down each and every bit of product information or lack of it that this first test of whether a product is any good begins to provide answers.

My contention had been that the evaluation of any waterproofing product in additional to being watertight, is how well the completed job finally shapes up to in terms of appearance and quality of workmanship particularly in resolving all the difficult areas involving junctions, penetrations and terminations. Yet there are other factors that may not be that apparent without the passing of time.

This is where the initial selection process of which membrane to use, puts each potential waterproofing candidate through the grinder.

When considering what to use for roofing the following factors should come to mind:

a. We are dealing with buildings in an area where humidity is very high and raining is a common occurrence.

b. The level of skills and workmanship available, though improving, requires extra effort to reach an acceptable level.

c. The tropics is a zone of high temperature, high UV radiation and home of numerous forms of fungi, bugs and rapid growing vegetation.

We need to make sure that whatever waterproofing membrane we place on the roof will survive it all, warranty notwithstanding.

My experience with plasticized polyvinyl chloride or PVC-P membrane as a waterproofing system for roofs has undergone a slow process of change since my first encounter with it some ten years ago.

PVC-P can be classified as monomeric or polymeric depending on the nature of the plasticizers incorporated in the membrane. Plasticizers are necessary since PVC in itself is a hard material and has to be made flexible to be suitable for use as a roofing membrane. A PVC-P membrane that has good water vapour permeability allowing trapped water vapour to permeate through the membrane into the atmosphere and is not vulnerable to dimensional inconsistency and deterioration through loss of plasticizers would be an ideal waterproofing system when coupled with good application accessories and practice.

Making a Choice

I had come to put my trust in using a polymeric PVC-P after satisfactorily going through a number of projects with it. Polymeric PVC-P has the following properties:

- It is more stable and can be placed directly in contact with bitumen and insulation materials such as polystyrene.

- It has good resistance to UV radiation and therefore it can be used exposed.

- It can be welded to form a homogeneous totality.

As discussed earlier, in complementing the material of the membrane there must also be good fundamental workability of the membrane to ensure that all circumstances of roofing water-tightness compliance are effectively met. The membrane should beable to be easily bonded together to form a homogeneous totality. When used in situations where there are large planter boxes, the membrane should be root impenetrable. The German FLL is a stringent test where the membrane is used as a watertight lining inside a transparent planter box, filled with soil and growing plants and then observed over a number of years to see if roots could penetrate the membrane.

The incorporation of EVA (ethylene vinyl acetate) instead of plasticizers in PVC results in a terpolymer membrane with outstanding performance characteristics.

Unlike conventional PVC-P which uses plasticizers that remains in liquid form within the membrane and has a different polarity from the PVC solids, EVA exists as solids in the membrane and has the same polarity as PVC. Hence this "alloy" retains its high strength, good vapour diffusion resistance and good elasticity even after many years and has none of the problems of plasticizer loss in PVC-P, albeit polymeric plasticizer loss occurs at a slower rate than monomeric plasticizers.

An added bonus of EVA terpolymer PVC is its availability in a wide range of colours. This will make the exposed membrane roof another design element in the building.

Conclusion

The thought process in making a decision on waterproofing is no different from that for other building components and in evaluating alternatives, it would certainly pay to methodically go through each piece of the technical data supplied with the manufacturer's representative, and have questions answered comprehensively. There may be copious standards quoted and data provided which may be of little significance. You are unlikely to require a membrane to be able to elongate ten times its length but would certainly like to know if it can recover back to its original state without damage and after how long. Or there may be test reports submitted for a material different to that being offered.

Finally when given re-assurance of quality and provision of warranty, make sure that what is accepted has the necessary substance. When dealing with products from the European Union, the presence of Agrément certification which in effect gives it a seal of quality is a plus factor. In the case of waterproofing for roofs, the Agrément certificate's assurance statement of expected number of years of performance life is even more significant when used as comparison between the various roofing membranes being considered.