

**IMA ID/3/2009**

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## **Information document**

# **Green roofs and ballasted roofs: Protocol for the securement of rigid polyisocyanurate (PIR) and polyurethane (PUR) roofboards beneath single-ply waterproofing membranes**

## **Introduction**

The choice of Green roofs can vary significantly from sedum roofs to roof terrace. Green roofs fall into four general categories Extensive, Intensive, Semi-intensive and Biodiverse Brown roofs, relating to the amount of maintenance each option requires, depth of growing medium and choice of plant material or habitat the roof will support.

The general construction of these roofs and traditional ballasted roofs normally includes thermal insulation in the form of Rigid Polyisocyanurate (PIR) and Polyurethane (PUR) roofboards thus forming the essential components of a warm deck green roof.

## **Scope**

The purpose of this document is to define the recommendations for securing the rigid Polyisocyanurate and Polyurethane roofboards to a deck, when the roofboards are to be used in combination with single-ply membranes beneath green roofs and ballasted systems.

## **Guidelines**

These guidelines apply where either the growing medium and its associated drainage layers etc. forming the green roof ballast or the traditional stone or paving ballast is not installed immediately following the application of the roofboards and waterproofing layers. In such cases there is a requirement for the roofboards to be either mechanically fixed in accordance with the IMA Information Document ID/1/2009 'Mechanical fixings for Rigid Polyisocyanurate (PIR) and Polyurethane (PUR) roofboards beneath single-ply waterproofing membranes' or alternatively if the roofboard facings are suitable for an adhered installation, adhesion of the roofboards must be in accordance with the adhesive manufacturers specification to achieve the appropriate wind uplift requirement.

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If the green roof ballast or traditional ballast is installed immediately the roofboards can be loose laid. In loose laying the roofboards the green roof system is required to have a minimum dry weight of 80 Kg/m<sup>2</sup> to ballast the roofboards beneath them. However, the total required dry weight will vary with the geographical location of the building, local topography and the height and width of the roof concerned. The necessity for any additional dry weight should be assessed in accordance with BS EN 1991-1-4: 2005<sup>(Ref 1)</sup> used with the UK National Annex<sup>(Ref 2)</sup> which should be considered independently of these guidelines, to demonstrate that the calculated wind load values fall within the accepted maximum design resistance of the proposed green roof ballast.

It is recognised that extensive green roofs are designed to be light in weight adding little resistance to wind load due to their shallow growing medium supporting low maintenance plants such as sedums, vegetation and grasses.

This low resistance to wind where the approximate weight of the system can be as little as 60 Kg/m<sup>2</sup> when dry, may necessitate in supplementary attachment of the roofboards in the form of either mechanical fixings or suitable adhesive to supplement the wind uplift resistance.

Note. The advice of the appropriate single-ply waterproofing manufacturer should always be sought for their recommended requirements for the means of attaching the waterproof membrane.

## References

1. BS EN 1991-1-4:2005+A1:2010  
Eurocode 1. Actions on structures. General actions. Wind actions
2. NA to BS EN 1991-1-4:2005+A1:2010  
UK National Annex to Eurocode 1. Actions on structures. General actions. Wind actions

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