LABC Technical Guidance Note

Subject :	Tapered Roofing Insulation Thermal Performance Design Guidance			In conjunction with Kingspan	
Date :	November 08	Ref No:	08/03	Revision :	-

Purpose

LABC technical guidance notes are for the benefit of it's members, to provide information, promote good practice and encourage consistency of interpretation for the benefit of our clients. They are advisory in nature, and in all cases the responsibility for determining compliance with the Building Regulations remains with the Local Authority concerned.

This guidance note is based upon information available at the time of issue and may be subject to change. The Approved Documents should be consulted for full details in any particular case.

Background

The limiting U-value requirement given in approved documents L1A (table 2 col. B) and L2A (table 4 col. B) should **not** be interpreted as a requirement for calculating the minimum thickness of insulation to a flat roof where the insulation is tapered to create the necessary water run off for the roof.

It would also be reasonable to consider the insulation to guttering created from the same construction build up and designed as part of the tapered roofing to be part of the roof element and not calculated as a separate entity.

BR443 Conventions for U-value calculations indicates that the thermal transmittance for tapered insulation layers to flat roofs can be calculated using the methods described in Annex C of BS EN ISO 6946

This guidance note is designed to outline the correct U-value calculation method for tapered roofing insulation.

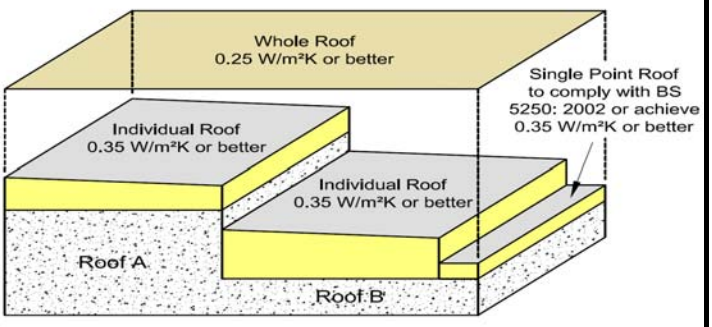
Check List

1. **"Single point"**
   Ensure that interstitial, surface condensation and mould growth are not predicted to be problematic within the constructions for the single worst point, e.g. following the guidance of BS 5250:2002 alternately a U-value of 0.35W/m²k should be taken as a default.

2. **"Individual roof"**
   Ensure each individual roof has a U-value of better than 0.35 W/m^{2}K calculated in accordance with BS EN ISO 6946 Annex C (Also called the Limiting U-value)

3. **"Whole roof"**
   Ensure that the whole roof of the building achieves at least 0.25 W/m^{2}K. (Also called the area weighted average U-value).

N.B.
All U-value calculations should be undertaken in accordance with the calculation procedure set out within BS EN ISO 6946 Annex C. And should meet any improved values as determined through the approved calculation tools, namely Standard Assessment procedure (SAP 2005) or Simplified Building Energy Model (SBEM).



Key Considerations

Relevant Building Regulations

Approved Documents L1A, L2A and L1B, L2B. (Conservation of Fuel and Power) *refers to:*

BR443: 2006 Edition (Conventions for U-value calculations) *which refers in turn to:*

BS EN ISO 6946: 1997 Annex C (Building components and building elements. Thermal resistance and thermal transmittance. Calculation Method)

Annex C outlines the calculation procedure to determine the total thermal transmittance of tapered insulation – what is termed the **'Annex C U-value'**

DESIGN LIMITS FOR ENVELOPE STANDARDS

Approved Documents L1A, L2A and L1B, L2B, refer to both 'Limiting U-values' and 'Area Weighted U-values'. There has been some confusion over these terms and their use in the past. *To clarify:*

1. Limiting U-values

Limiting U-values relate to individual roofs contained within a whole building roof area. The default figure is a U-value of 0.35 W/m²K. No individual roof should have a U-value worse than this e.g. the Annex C U-value should be 0.35 W/m²K or better for any roof using tapered insulation layers.

2. Area weighted average U-value calculation

The area weighted average U-value refers to all the roofs of an individual building. The default figure is a U-value of 0.25 W/m²K. Therefore the area weighted U-value for all of the roofs combined on that building should be no worse than 0.25 W/m²K.

3. Interstitial, surface condensation and mould growth.

Approved Document C of the Building Regulations sets a conservative U-value to 0.35 W/m^2K to ensure the avoidance of surface condensation and mould growth on the internal finishes for a wide variety of building uses.

Compliance may also be demonstrated by calculation to BS 5250: 2002 (Code of practice for control of condensation in buildings) and reference to the guidance in BS 6229: 2003 (Flat roofs with continuously supported coverings - Code of practice) to show an acceptable condensation risk for buildings for a given construction build-up and specific internal building use.

Multiple Occupancy Buildings (blocks of flats, mixed use developments)

Where multiple units occur beneath a roof with tapered insulation, the limiting and area weighted average U-values described above should either be applied to each unit individually or to the worst case unit beneath the thinnest part of the system, on the basis of the other units having better performance.

Definition of a roof area to include gutters

Where gutters are created within the roof area and have the same construction make-up as the rest of the roof areas, the gutter is to be considered part of the overall roof element and not an individual element in its own right.

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