



Certification Practice Note 9

Guidance on the certification of cavity wall ties for outer leaf masonry cladding

1.0 Background

- 1.1. Masonry is frequently used on the external facades of buildings as rainscreen cladding to the primary structure or cladding supports behind. The masonry is predominantly built of brickwork or concrete blockwork, occasionally of stonework, and may have a wet or dry dash render finish. The masonry cladding will normally form the outer leaf of a cavity wall with ties between the outer cladding and the inner supporting structure which can itself be masonry, concrete, timber, or metal framing.
- 1.2. The Building (Scotland) Regulations 2004 require in Mandatory Standard 1.1 that the building is designed so that the loadings that are liable to act on it will not lead to:
 - a) the collapse of the whole or part of the building
 - b) deformations which would make the building unfit for its intended use, unsafe, or cause damage to other parts of the building or to fittings or to installed equipment, or
 - c) impairment of the stability of any part of another building.
- 1.3. As part of the building, the masonry cladding and its supports must be designed to meet these requirements, and it is critical therefore that the ties to the masonry components are appropriately designed and specified.

2.0 General Guidance

- 2.1 Wall ties come in a variety of materials, shapes and sizes, and will be subjected to different loadings depending on factors such as their position in the building and the building's location and orientation.
- 2.2 There is a wide array of wall tie products from which standard and bespoke ties can be chosen.
- 2.3 Ties are often specified by type and density, expressed as number of ties per m². They can also be specified in terms of horizontal and vertical centres.
- 2.4 Design of the ties is often based on manufacturer's published tables and/or certification from a recognised testing authority such as the BBA. Published tables may describe a generic tie density, the density of ties in certain locations around the building, or the load capacity of ties at various spacings.
- 2.5 In some publications the basic load capacity of the ties is described. In such circumstances the design of the ties is based on calculations in which the published load capacity of the ties is used to determine the density of ties required.

2.6 Occasionally the design of the ties may be based on calculations from first principles using the material and tie properties of a particular product.

3.0 Guidance on certification of the design of the wall ties

3.1 It is important that Certifiers take an organised approach to certification of the design of the wall ties, and should see that the design has taken account of factors such as:

- a) Location of the building and local topography, etc
- b) Position of the masonry cladding in the building, both vertically and horizontally
- c) Any load concentrations arising from window/door/other cladding supports, or other configuration of the wall panels
- d) The width of the cavity and required embedment depth
- e) The method of determining density/centres of the ties, and its suitability for the particular setting
- f) The product selected and its classification
- g) Compatibility issues such as tolerances, deflections and differential movements of inner and outer leaves, etc

3.2 Calculations may work from first principles, or may be based on other justification for the design, such as BBA certificates or other recognised test certification, manufacturers literature, etc. Certifiers should see that the method of determining the density/centres of the wall ties is appropriate to the particular setting.

3.3 In all cases the Certifier must be satisfied that the design meets the requirements of Mandatory Standards 1.1 and 1.2. This may be achieved by reviewing structural calculations together with drawings showing the construction.

4.0 Certification Performance Criteria

4.1 Certifiers must retain a detailed record of how compliance with Standards 1.1 and 1.2 was established.

4.2 Certifiers should also refer to the Certification Performance Criteria, which can be found on the SER website.

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