



## SER TECHNICAL BULLETIN NUMBER 4

### Certifying the Structural Design of Conservatories

#### 1.1 Introduction

1.1.1 SER is frequently asked to advise on the responsibilities of a Certifier when he /she is certifying in relation to the structure of a conservatory. As with all certification, the duties of the Certifier are driven by the requirements of legislation. Conservatory structures that are used in domestic situations can be difficult to evaluate using normal structural techniques and the Certifier may have to place greater emphasis on engineering judgement and an assessment of the risks associated with failure when certifying the design of this type of structure. This Technical Bulletin has been prepared to assist certifiers and their clients on how the structural certification of this type of building may be approached.

1.1.2 A conservatory is defined by the Building Scotland Act 2003 as follows:

**Conservatory** means a building attached to a dwelling with a door and any other building elements dividing it thermally from that dwelling and having translucent glazing (including frames) forming not less than either:

- a) 75% of its roof area and 50% of its external wall area; or
- b) 95% of its roof area and 35% of its external wall area.

(Note – the definition of ‘conservatory’ was amended on 1 May 2007.)

1.1.3 In the Building Regulations it is recognised that some small conservatories do not need to be brought under building regulation control and these have been excluded from the requirement to obtain a building warrant. This class of small conservatory, not exceeding 8 square metres in floor area, is described in type 18 to schedule 1 of the Technical Handbook<sup>1</sup> and is exempt from the requirements of the regulations by Regulation 3. All other conservatories are therefore considered to fall within a class of building that should be controlled by building regulations and for which a building warrant must be obtained. A warrant is also required when the construction of the conservatory is being carried out at the same time as other warrantable works, in which case the conservatory will be included within the scope of the design certificate.

1.1.4 Of those conservatories that do require a building warrant a significant proportion will fall within the scope of the Scottish Building Standards Technical Handbook on Conservatories. This group of conservatories represents a further class of building where the legislation has recognised a low risk category of building that does not require to be subject to rigorous structural evaluation. Designs that follow the guidance contained within

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<sup>1</sup> The Technical Handbooks are issued by the Scottish Government Building Standards Division and provide guidance with respect to the requirements of the Scottish Building Regulations.

the Technical Handbook on Conservatories may be granted a warrant by the Verifier without the need for a structural assessment beyond that which demonstrates compliance with the guidance.<sup>2</sup>

1.1.5 The remaining group fall into the category of small buildings that are required by the legislation to undergo a more detailed structural appraisal before a building warrant can be granted. Clients may choose to have conservatory designs that are not covered by the guidance in the Technical Handbook on Conservatories, supported by an SER certificate, or may choose to have the design submitted to the Verifier for checking. Typically conservatories that fall into this group include those:

- That have an internal floor area in excess of 20 sq. m.
- Where ground conditions preclude the use of traditional strip foundations.
- Where the conservatory is located close to a boundary.

## 1.2 General Approach to Certification

1.2.1 On occasions the Certifier will also be appointed to design the foundations of a conservatory, the superstructure of which is to be supplied and erected by a specialist contractor. The superstructure may be supplied as a complete unit that has been subject to independent testing and certification by a UKAS accredited scheme (BBA for example). In this instance the Certifier may only need to check that any requirements/limitations relating to the test certification are properly taken into account in the design being certified and that the superstructure is adequately restrained against uplift.

1.2.2 More usually the conservatory will be assembled from individual window and roof components that are separately covered by certification from a UKAS accredited scheme, but have not been tested to work together as an assembled building. In this situation the certifier must pay particular attention to the ability of the conservatory to resist racking loads and uplift. Traditionally, conservatories have relied on the glass to provide diaphragm action within the glazing unit, and the roof sheeting to provide similar stressed skin action for the roof structure. For this to be successful it is clearly necessary for the glazing to be adequately fixed within the frame. The test certification should provide evidence that the individual units can resist racking forces.

1.2.3 For the glazed units to provide stability to the conservatory it is necessary for them to be properly tied together and to the roof. Some manufacturers provide joint details that are also covered by their BBA certification. Where this is not available engineering calculations or acceptable test certification will be necessary to justify the design. Adequate fixing of the conservatory to the house wall is also important. Some Guidance on stability issues is provided in the Glass and Glazing Federation publication: *Guide to the Assessment of Stability Requirements for Conservatories GGF Data Sheet 5.7.10 December 2001*

1.2.3 Where the conservatory is to be assembled from components that do not have appropriate test certification it will be necessary for the certifier to be satisfied that the design can be justified by calculation.

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<sup>2</sup> The Scottish Building Standards Technical Handbook on Conservatories does not provide specific guidance in relation to design for overall stability and uplift of the conservatory. Approved Certifiers should be aware of this when using it to certify a design.

### 1.3 Conservatories below Escape Windows

1.3.1 Section 2.9.4 of the Domestic Technical Handbook accompanying the Building Regulations provides guidance on the provision of emergency escape windows from dwellings. Where a conservatory is to be located below an escape window this has implications for the design of the conservatory roof. The following guidance is provided within the Technical Handbook:

*“Where a conservatory is located below an escape window consideration should be given to the design of the conservatory roof to withstand the loads exerted from occupants lowering themselves onto the roof in the event of a fire. However, the choice to construct a more robust roof and frame is a matter of preference and the decision to do this should remain with the owner”*

### 1.4 The Role of the Certifier

1.4.1 The basic duties and responsibilities of the building structure Certifier are no different in principal for conservatory design than for any other form of construction and include being satisfied that:

- The correct loadings have been used.
- The design of individual wall and roof elements for both bending and racking resistance can be substantiated by test or by calculation.
- Individual components are being used in a way that is consistent with any test certification.
- Racking loads can be transferred between individual glazing units and to the structure of the building to which the conservatory is attached.
- The conservatory superstructure is adequately designed to resist overturning.
- The design is compatible with other building elements, such as foundations, which are also covered by the design certificate.
- Any structural calculations are in accordance with appropriate codes and standards
- Specifications for materials and components are consistent with assumptions contained in the design calculations.
- Construction drawings are sufficiently detailed at building warrant stage to show that the building will be constructed in accordance with the appropriate regulations and standards.

### 1.5 Warrant Plans

1.5.1 A building warrant application for a conservatory should be accompanied by plans of the proposed structure. The Verifier has discretion over the amount of information that should be shown on the plans, however information listed in the Procedural Handbook<sup>3</sup> that is of relevance to structural plans includes:

- Plans of foundations, floor and roof
- The position, materials and dimensions of foundations, walls, floors, roofs,
- Details of construction including any frame and connections
- Tie down details

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<sup>3</sup> The Scottish Building Standards Procedural Handbook, second edition May 2007

- Details of any alterations to an existing structure

As a general rule the warrant plans should contain sufficient information for the Verifier to undertake a site inspection to check that the conservatory has been constructed in accordance with the structural design.

## **1.6 Use of Contractor Designed Details Option**

1.6.1 Though the use of this option is possible, and has the attraction of allowing the design of other warrantable work to proceed while the design of the conservatory is resolved, Certifiers should make their clients aware of the risks associated with entering into a contract for the purchase of a conservatory which may prove to be uncertifiable and for which a warrant may therefore prove difficult or impossible to obtain. While this is true for all contractor designed elements there is a particular risk in the case of conservatories where there is a high probability of encountering designs that will be difficult to justify by normal structural calculation and/or where the manufacturer will have limited test certification available. If the conservatory is listed within schedule 1 of the design certificate, then sufficient construction detail must be available at building warrant stage to enable the submission of an adequate package of warrant plans. This may preclude using schedule 1 as a practical approach.

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