



Guidance Note 9
Certification Practice: 2010 Revisions to the Technical Handbooks

1.0 Introduction

The 2010 Technical Handbooks were published in April 2010 setting out the changes to building regulations and guidance that comes into force on the 1 October this year. Building Warrant Applications lodged with verifiers after 1 October will need to comply with the requirements of the new building standards and associated guidance.

There have been no changes to the mandatory structural standards 1.1 and 1.2. The main change to Section 1 has been the referencing of Eurocodes as the principal means of complying with the mandatory standards.

The purpose of this guidance note is to highlight issues that Approved Certifiers should be aware of when certifying projects under the revised guidance provided in the 2010 version of the Technical Handbooks. Full details of all the changes are available from the Scottish Government Building Standards Division website at www.scotland.gov.uk/bsd

2.0 Status of Eurocodes

On 31 March 2010 the British Standards Institution (BSI) were obliged to withdraw any UK national standards for which there exists a European standard with the same scope and field of application. Withdrawal of a standard implies that while documents will still be available there will be no five-year review by a BSI committee to consider the currency of the standard and to decide whether it should be confirmed, revised or withdrawn. British Standards relating to loading and structural design were replaced by the European standards and associated National Annexes.

The Scottish Government took the opportunity of a planned revision to the Technical Handbooks to revise the guidance to Section 1: Structure. The 2010 version of the Technical Handbooks for both domestic and non-domestic structures now lists Eurocodes as being the principal means of compliance with the relevant structural standards. SER has received enquiries from certifiers regarding the status of the European standards and whether it is necessary to undertake designs to these codes now that British Standards have been withdrawn.

It is important to appreciate that the use of a particular design methodology is not mandatory under the Scottish system of building regulation. Only the Standards 1.1 and 1.2 are mandatory and these are expressed in functional terms giving the designer freedom to choose an appropriate method of complying with the regulations. In the case of a structural design

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that is to be certified the designer must convince the Approved Certifier that the chosen method of design meets the requirements of the regulations.

Eurocodes have a particular status under the 2010 regulations in that the use of those European Standards listed as guidance within the Technical Handbooks carries a presumption that the design will comply with the requirements of the relevant regulations. This is set out in section 0.1.4 of the Technical Handbook, which states:

“...proof of compliance with the guidance may be relied on in any proceedings as tending to negative liability for an alleged contravention of the building regulations.”

Designers are however free to use any code that they consider appropriate provided that they are able to convince the Approved Certifier (or the Verifier in the case of uncertified designs) that the design meets the requirements of the relevant standards 1.1 and 1.2. Designs that do not use European Standards are known as “alternative approaches” and specific reference is made to these in clause 1.0.5 of the 2010 handbooks. Clearly the use of withdrawn British Standards will not produce unsafe designs overnight and there will be a period during which withdrawn standards will continue to deliver an adequate of level design reliability for a particular project.

The decision on whether the design code chosen by the designer will satisfy the requirements of the relevant mandatory standards (including the use of a withdrawn British Standard) lies entirely with the Approved Certifier. The local authority in its role as verifier cannot insist on the use of European Standards listed within the Technical Handbooks.

3.0 Certification Practice

The decision by a designer whether to use a European Standard or an alternative approach that may involve a withdrawn British Standard will be driven by a number of factors that may include the design specification issued by the client and the experience of the designer. Public sector clients, for example, may insist on the use of European Standards where they believe that this is necessary to comply with European public procurement legislation.

When certifying designs using European Standards certifiers should be aware of the level of familiarity with these new codes and associated software available within the design team. This may result in a requirement for a more detailed check of the design than would have been the case with British Standards that have been in use for some time.

Where a designer has chosen to use a withdrawn British Standard the certifier must be satisfied the design delivers at least the same level of design reliability as would have been achieved using the equivalent European Standard. Factors that the certifier should consider include:

- ❑ Whether the design incorporates innovations to material properties or technology that have arisen since the final update to the British Standard
- ❑ In the case of loading whether factors such as climate change have resulted in more onerous wind or snow loading conditions.

3.1 Wind Loading

A comparison between the basic wind speed contours given in figure 6 of BS6399-2 and the fundamental wind velocity given in figure NA.1 of the National Annex to BS EN 1991-1-4 shows an apparent increase in wind speed over most of Scotland when using the European Standard. While the two sets of values are not directly comparable it is probable that the European Standard has introduced a general increase in wind loading to be used for design. A calibration study commissioned by the UK government in 2007 compared wind loads calculated for buildings at various sites across the country however only one of these was located in Scotland at Glasgow. SER would recommend that certifiers take a cautious approach to the continued use of BS6399 to calculate wind loads until a wider calibration for Scotland has been undertaken.

The UK government calibration study highlighted a concern over the use of eurocode values for the calculation of external pressure coefficients. This has resulted in the inclusion of an Advisory note within the UK National Annex to BS EN 1991-1-4 sections 7.2.3 to 7.2.6 recommending the continued use of BS6399 pressure coefficients. SER would recommend certifiers to refer to this recommendation.

3.2 Snow Loading

During the winter of 2009 / 2010 Scotland experienced one of the most severe weather events encountered for many years. Met Office data on snowfall and low temperatures experienced between 17 December 2009 and 15 January 2010 showed this to be the most prolonged spell of low temperatures and significant snowfall since the winter of 1981/82. Night time temperatures in the Scottish Highlands regularly fell to -15°C or lower and daytime temperatures struggled to rise above freezing. A large number of buildings, mainly agricultural and industrial single storey storage buildings, are known to have collapsed across the country though only one is known to have resulted in injury to a person.

Based on reports of agricultural building collapses it would appear that heavy snow affected buildings across Scotland with the worst effects being experienced in the northeast with the Aberdeenshire and Moray Council areas containing 59% of the total buildings affected. The south east of Scotland also was badly affected with Borders Council area having 18% of the total.

Initial evidence would suggest that snow loads calculated using the current edition of BS6399 gave reasonable design loads in other than exceptional circumstances. There is however some concern that the replacement of the contour lines in the British Standard 6399-3 with zone numbers within the UK National Annex to BS EN 1991-1-3 will lead to lower predictions of snow load than was previously the case. A calibration exercise is required to clarify the situation.

3.3 Agricultural Buildings

During the winter condition described in 3.2 above agricultural buildings suffered particularly badly. Information on the type of damage experienced by buildings has been provided by a number of certifiers who have investigated failures. There is wide agreement among Engineers that the snow conditions were exceptional however it is

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less clear whether the snow loads causing collapse exceeded those that would be predicted by current loading standards combined with suitable factors of safety. A number of engineers have investigated situations where the constructed building varied significantly from the original design or where poor attention to structural detailing had been a possible contributory factor.

Problems with the installation of purlins is a recurring theme, several reports citing insufficient section, excessive spacing or lacking continuity over rafter sections. Purlin failure is often seen as a significant contributor to building instability and hence collapse. The absence of stays providing buckling stability to rafter flanges is also a common theme.

The revised guidance accompanying standard 1.1 in the Technical Handbook allows the design loading to be sustained by an agricultural building to be calculated in accordance with the requirements of BS5502. Under this code agricultural buildings are classified into four categories depending primarily on the level of anticipated human occupation. The most common used is class 2, which permits a snow load of 78% of that calculated using BS6399.

The 2010 revision of the Technical Handbooks cites BS 5502: Part 22 2003 as an alternative approach to the design of agricultural buildings with the following provision:

“Designers using this approach must be satisfied that the reduced loads permitted by this Standard are appropriate for the location of the building and for the intended use.”

The BS5502 reduction in the design snow load for agricultural buildings is justified on the basis that agricultural buildings have a relatively low level of human occupation and consequently the risks associated with failure are smaller. There is some support amongst the engineering community for the view that this reduced load should not be applied to agricultural buildings at a site elevation at more than 200m above ordinance datum or used at all in the design of purlins.

4.0 Other Matters

A full list of all the changes within Section 1 of the technical Handbooks can be obtained by visiting the Scottish Government website referred to above. Some issues of particular relevance to Approved Certifiers are as follows:

4.1 Construction procurement

The revised Technical Handbooks have included new advice that contractual arrangements used by clients to procure a building can influence the reliability of the design and construction. SER believe that the use of an Approved Certifier of Design together with the arrangements in place to accommodate specialist contractor designs will have a significant effect in mitigating the risks identified by Scottish Government.

4.2 Certification

The revised guidance has for the first time included a specific reference to Certification which acknowledges that “*Checking procedures adopted by Approved Certifiers will deliver design or installation reliability in accordance with legislation.*”

4.3 Fixings

The Technical Handbooks guidance has been revised to include specific reference to the need for proper design of safety critical fixings. This has been included in the light of SCOSS concerns that safety critical fixings do not always receive the attention that they deserve. SER has consistently promoted the view that fixings are an important aspect of the design to be addressed by the Approved Certifier who must be satisfied that adequate attention has been paid to their selection, design, installation, inspection and testing. A SCOSS ALERT “The Selection and Installation of Construction Fixings” has been issued and can be found on the SCOSS website. www.cross-structural-safety.org

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