Jersey Scheme For Certification of Design (Building Structures)

SER Jersey Technical Bulletin Number 3

Certification of the Design of Timber Framed Structures

1.0 Introduction

Timber framed construction occupies a distinctive niche within the construction market. The superstructure is generally manufactured off site and supplied in kit form having been designed by a specialist engineer employed by the kit manufacturer. The qualifications and experience of timber kit designers can vary. Foundations are often designed by a different engineer from the designer of the timber frame and this engineer may have limited knowledge of timber design methods.

Procurement procedures frequently result in the appointment of a timber frame supplier some time after the client has made application to the local authority for a building permit.. This means that much of the detailed structural design may not be available to the Certifier at the time of the permit application being lodged.

SER are frequently approached for advice on how the Certifier can accommodate both industry working practices and the responsibilities to ensure that the design complies with building bye-laws before a certificate is signed. This technical bulletin has been prepared to offer guidance to Certifiers and their clients on how the certification of timber framed structures can be effectively managed.

2.0 The Role of the Certifier

The basic duties and responsibilities of the building Certifier are no different for timber frame design than for any other form of construction. In the case of timber frame buildings these will include ensuring that:

- Design assumptions on loading and stability are consistent between different designers.
- The timber frame design is compatible with other building elements, such as foundations and cladding, which are also covered by the design certificate.
- Designs have been prepared and checked by competent people.
- Structural elements have been designed and detailed 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 to show that the building will be constructed in accordance with the appropriate bye-laws and standards.

3.0 Certification Methods

Methods for ensuring that duties described above are properly discharged can, depending on the experience and knowledge of both the Certifier and the timber frame designer, be tailored to accommodate the particular circumstances of timber frame construction. Some of the more common circumstances that can arise are described in this section of the guidance.

3.1 The Certifier is employed by an Approved Body that is also the design consultant for the building. The consultant will develop the design and specification for all structural elements including the timber frame. Sufficiently detailed drawings will be prepared and submitted along with the design certificate.

3.2 The Certifier is employed by an Approved Body that is also the design consultant for the non-timber elements of the building. The timber frame is designed and manufactured by a specialist kit supplier. The Certifier will need to obtain sufficient information from the kit manufacturer to approve the timber frame design and specification and to ensure that loads from the superstructure have been accommodated by the foundation design. Sufficiently detailed drawings will be prepared and submitted along with the design certificate.

3.3 The Certifier is employed by an Approved Body that is also the design consultant for the non-timber elements of the building. The timber frame is designed and manufactured by a specialist kit supplier who is not appointed until after the the foundation design has been completed. This approach carries some risk for the applicant that foundations may need to be modified to accept the timber frame kit.

In this situation the certification will require to be staged. Normally stage 1 would cover the design of the foundations and subsequent stages will cover the design of the superstructure. For complex multi-storied buildings involving steel or concrete elements more than one superstructure stage may be required. It is the responsibility of the lead designer to ensure that the foundation layout is able to accommodate the kit design and Certifiers should pay particular attention to how this is being achieved. Sufficiently detailed drawings will be prepared and submitted along with the design certificate to accompany each stage of the project.

3.4 The Certifier is employed by an Approved Body that is also the design consultant for the non-timber elements of the building. The timber frame is designed and manufactured by a specialist kit supplier but the Certifier has little experience of timber frame design. The Certifier will retain overall responsibility for the reliability of the building design but will be unable to carry out checks on the timber design personally. He/she may rely on the experience of another checker within his/her employers organisation or be satisfied that the design checks carried out by the kit manufacturer are adequate. If neither of these options is available the Certifier must seek the assistance of a suitably experienced third party.

4.0 Options for checking the timber kit design

General guidance on options is provided in SER Jersey Guidance Note 2[1]. This document makes clear that while certification cannot be delegated to a third party design checks can only be undertaken by an individual with the necessary experience in the particular aspect of the check. The Certifier must therefore consider whether he/she has the necessary experience of timber frame design to undertake the check personally or whether to rely on the experience of others.

It is the responsibility of Certifiers however to satisfy themselves as to the competence of those undertaking the design and check and to establish an appropriate level of check based on the guidance provided in SER Jersey Technical Bulletin 2[2]

Where the kit manufacturer has employed suitably qualified and experienced engineers it may not be necessary for the Certifier to obtain copies of all of the design calculations. In this situation the Certifier may rely on the design reliability procedures or QA systems applied by the kit manufacturer in the preparation of the design. It is important to appreciate that merely obtaining a design certificate from the kit manufacturer is unlikely to be sufficient. The Certifier will have to make enquiry regarding the competence of the design and checking team, evidence that checks

[1] Options for Certification - Available from the SER website
[2] Guidelines for Checking the Structural Design of Buildings - Available from the SER website

have been undertaken and obtain sufficient calculations to be able to ascertain that the timber kit design is compatible with other building elements, such as foundations and cladding, which will also be covered by the design certificate.

5.0 Permit Plans

A certificate for a timber framed building should be accompanied by plans of the proposed structure. The PED has discretion over the amount of information that should be shown on
the plans, however the following is a guide:

- Plans of foundations, each floor and roof
- The position, materials and dimensions of foundations, walls, floors, roofs, stairs, landings, balconies and protective barriers
- Details of construction including any frame and size and position of reinforcing material

As a general rule of thumb the plans should contain sufficient information for the PED to undertake a site inspection to check that the building has been constructed in accordance with the structural design[3].

6.0 Conditional Approvals

SER Jersey Technical Bulletin 1[3] describes a procedure to be adopted for construction details that are still to be designed at the time that the permit application is lodged. If details of the kit design are not available at the time the permit application is made then the conditional approval procedure must be used..

7.0 Summary

The Certifier must obtain from the building designers sufficient drawings, calculations, specifications and details to enable the design to be checked for compliance with the relevant building bye-laws. The Certifier may carry out the design check personally or rely on the experience of others for particular aspects of the design. The Certifier cannot however delegate authority for assessing the competence of the checker or the reliability of the design and should also take responsibility for ensuring the compatibility of designs made by different designers. The plans submitted with the certificate must contain sufficient detail for the PED to undertake a site inspection to check that the building has been constructed in accordance with the structural design.

Certifiers may wish to advise their clients of the type of information that they expect kit manufacturers to make available so that a requirement to produce the necessary information can be made a condition of the kit manufacturers contract.

September 2007

[3] Procedure for the submission of Structural Design Information – Available from SER website