



ADVISORY NOTICE BUILDING

12/05

Advisory Notices are issued to assist in the interpretation of the Development Act 1993

December 2005

PROFESSIONAL PRACTICE: Coroner's Riverside Recommendations:

Background:

On 1 June 2005, the Coroner handed down his findings on the cause of death regarding the two people killed when the roof of the Riverside Golf Club collapsed in April 2002. The Coroner found that the deaths were avoidable and included a number of recommendations to the industry and Government in his findings to prevent a repeat of such an event.

In the Executive Summary the Coroner observed that-

'.....neither the builder nor the architect, engineer, software designer, truss manufacturer, roof contractor, roof tiler or Local Government authority took any responsibility for the overall integrity of the roof structure'

Accordingly the last of the recommendations is that-

'.....all participants in the industry concerned with the design, manufacture and erection of roof trusses be reminded that they all should carry responsibility for the integrity of the roof as a whole. In particular, in accordance with the ordinary engineering principles, designers and manufacturers of roof trusses should incorporate into their designs a system for the lateral restraint of roof trusses, particularly heavily-laden girder trusses, which has a reasonable margin of safety. The system should allow for and guard against defective or inadequate installation rendering the roof construction potentially unsafe.'

To give effect to this recommendation, and drawing from attendance by Planning SA personnel at the Inquiry, this Advisory Notice is intended to provide guidance on the responsibilities of everyone involved in the process of designing and installing timber roof trusses.

Discussion:

COMMUNICATION

The Inquiry highlighted the diverse range of people who are involved in the construction of a modern building and the need for everyone to communicate effectively. Simply conveying a piece of information to another party may not be sufficient if the other party is not aware of the information's significance. Accordingly, it is suggested that the following should be actively considered:

- What is the information that needs to be conveyed?
- How critical is the information?
- What is the best means of delivering the information?
- How can I be sure that it has been received?
- How can I be sure that the importance of the information will be understood and acted upon?

The effectiveness of communication will underpin considerations of risk management and prime responsibilities as discussed below.

RISK IDENTIFICATION & MANAGEMENT

In assessing the risks associated with a building the critical nature of certain building elements need to be recognised (for instance, if an entire roof falls down it can kill somebody but if a strip footing fails it may only cause some cosmetic damage). This means developing a good appreciation for the potential risks and implementing appropriate control mechanisms for managing those risks. Factors impacting on risk management include:

- **Level of redundancy** – with a large number of closely spaced parallel trusses, if one of them has a weakness then there may be some load shedding to the other trusses to take up the load and the likelihood of catastrophic collapse is reduced. However, if there is a single highly loaded girder truss then there is no capacity for redistributing the load and the possibility of catastrophic collapse is much higher. Accordingly, it is reasonable to expect more stringent margins of safety for single, highly loaded, structural members.
- **Potential consequences** – the failure of a roof to a normal house certainly has the potential for fatalities, but these are likely to be limited to a few people (houses are cellular in nature in bedroom areas and living areas are not occupied for the whole day or night), whereas in commercial (or public) buildings there is a significantly greater potential (high populations and large open areas) for a large number of people to be involved. Hence standards often require an extra margin of safety for commercial and public buildings. Designers and people responsible for checking designs should therefore ensure that the safety margins used are appropriate for the use of the building.
- **Stability of materials** - there needs to be an understanding of materials behaviour. One of the characteristics of the Riverside collapse was the significant lapse of time (7 years) from construction to failure. It highlights that timber does have long term effects such as deflection, splitting and dimensional changes that can result in connection or member failure of highly loaded components unless there is an adequate margin of safety.
- **Level of independent checking** – this is an important mechanism for controlling and managing identified risks. The level to which independent checks are utilised during both the design and the construction process will determine the level of certainty that the risks have been adequately managed. If a relevant authority does not have the skills to check if a system meets the requirements of the Building Code of Australia for structural adequacy then they may engage a person with appropriate skills or rely on a certificate from an independent technical expert.

Hence there is provision for certification of designs by independent technical experts in the Development Regulations and consideration should also be given to specialist checking of critical components during construction. It is noted that in relation to lateral bracing for girder trusses the Coroner proposed that the “... *the installation of such bracing should be adequately supervised and certified by properly qualified technicians.*”

- **Training** - Trades personnel on the job need to be appropriately trained to undertake the proposed work. If the method of installation is particularly critical to structural stability then it may be necessary to query the skills of the people involved. If those skills are inadequate then it may be necessary to initiate some training programs to make certain that they are capable of carrying out the work. This needs to be considered by the designer as it may be necessary to specify that certain aspects of the work must be done by specialist persons.

The designer also needs to highlight any special requirements to the builder who can then ensure appropriately trained people are engaged, or that training occurs. For example - a standard truss roof with a large number of parallel trusses usually relies on the tile battens/purlins and in-plane bracing to provide stability. Provided this is done to AS 4440, which most tradespeople are familiar with, the roof will be stable.

However, a heavily loaded girder truss is a primary structural member that carries other trusses and a large area of the roof. Such a truss is critically dependent on the effectiveness of the lateral bracing for stability and may require special attention to detailing and care in installation. Tradespeople on site need to be trained in proper truss installation so that they understand the importance of the lateral bracing requirements particularly for single, heavily loaded girder trusses.

PRIME RESPONSIBILITIES

The *Development Act and Regulations 1993* aim to ensure that the appropriate person takes responsibility for their aspect of the work. Put very simply:

The designer takes responsibility for the design.

The relevant authority (including a private certifier) takes responsibility for verifying the regulatory compliance of the design.

The builder takes responsibility for the construction.

The building owner takes responsibility for the ongoing management of the building to meet any legislative requirements.

This is done in a number of ways throughout the legislation but it is made very evident in section 72 of the Act dealing with the negation of joint and several liabilities in certain cases. This enables the court to make judgements for defendants that are equitable having regard to the extent to which they contributed to the loss.

Into this framework we now need to add:

The building systems/software designer takes responsibility for the system/software.

The component manufacturer takes responsibility for the construction of a component.

The installer (if not the builder) takes responsibility for the correct installation of a component.

A copy of the Coroner's findings and recommendations can be found on the Courts website at www.courts.sa.gov.au/courts/findings/findings_2005

Further information

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