



Proposal for a failure assessment template

T. Toratti*

VTT Technical Research Centre of Finland, P.O. Box 1000, FIN-02044 VTT, Finland

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ABSTRACT

The present paper describes the benefits of using a common failure assessment template when carrying out failure assessments of buildings. A common failure template is proposed. This template is targeted for failures which occur in timber buildings. This template has been tested by various experts in Europe and positive feedback has been received so far. However, it is foreseen that further developments on this procedure will probably need to be done.

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1. Introduction

Previous studies on failures of buildings, mostly other than timber buildings, have been summarized in Ref. [1] and, in general it may be stated that about half of these failures were related to the design phase and the other half to the construction phase. Almost all cases were caused by human errors. Failure studies on timber structures have recently been carried out in various countries in Europe. One main Nordic study is presented in Ref. [1]. It became evident in early stages that these failure assessments have not been done in a uniform manner, which make comparisons between the studies and the development of common procedures a difficult task. The purpose of this paper is to propose a common format on gathering information from failure cases of timber structures. The origin of this paper date to a Finnish–Swedish project [1] and this has further been discussed in the research network Cost action E55 ‘Modelling the performance of Timber structures’.

2. Objectives of a failure template

The objectives of a failure template are as follows.

- To help the expert carrying out the assessment to find the relevant questions that need answers. This is mainly when new cases are assessed, but it may be used also for a re-evaluation of past failure cases.
- To produce a failure assessment that is more uniform and which is less dependent on human factors, professional involvement or personal characteristics of the expert carrying out the assessment. Clearly the human factor cannot be fully ruled out.

- Produce material for further analysis to pinpoint weaknesses in the construction process, which need attention or further research. This may be to identify whether, design procedures need improvement, our construction material is getting weaker, and there are not enough human resources allocated for specific tasks such as structural design, and lack of communication in the construction site or misunderstandings, or other similar deficiency.

3. Some points to clarify on failure data

Durability cases.

It is clear that not all structural failures have or can be reached with these expert assessments. It is suspected that in many cases failures are simply not assessed and/or that very few persons know about them. It may be assumed that one such group of cases on timber structures could be the case related to durability. This suspicion comes from the fact that there are not many durability cases in at least the Nordic cases. It is here suspected that such cases are not always assessed and that these are often not even regarded as failures, but as normal end of service-life situations.

Serviceability cases.

Another aspect which has not been considered in these failure studies (in at least the Nordic study) is those cases related to serviceability failures. There are many such failure cases related to, for example, excessive vibration of floors. These are troublesome in many ways: first, most often these are not public cases, and the assessment is carried out as a private commission and such material may not be used, except in a disguised way not revealing the building and sometimes not even the floor structure. Another problem with many of these cases is that floor vibration design procedures in the current codes are very liberal. Recent vibration studies in Finland [2] on the subjective assessment of floors and measurements of floor vibrations due to walking have revealed

* Tel.: +358 20 722 4631; fax: +358 20 722 7007.

E-mail address: tomi.toratti@vtt.fi.