

## **Quality of timber construction - Guidance for buildings and load bearing structures**

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### **Summary**

This work is based on a finalized sub-project of a large Finnish-Swedish project: 'Innovative design, a new strength paradigm for joints of, quality assurance and reliability for long-span wood construction' 2004 -2006.

In this sub-project, quality requirements are set for the design and construction of timber buildings, so that sufficient reliability, durability and overall usefulness of the building can be ensured. These results are particularly meant for the design, construction, use and maintenance of high span or otherwise demanding timber structures and joints. However, the procedures developed may be used also for other structures as well. The background of this study is linked to the failures that have occurred in Europe during the past years and to the malfunctions in the building process recognised by the industry members of the project. The objective is to develop a procedure on how to produce high quality in timber building.

Considering timber buildings, the following should receive special attention:

- Handling of information and communication between the building project partners
- Security during construction, specially on temporary bracing of load bearing structures
- Considerations on performance of connections and how these are effected by variable humidity conditions
- Swelling and shrinking of timber elements
- Cracks caused by shrinkage of moist wood
- Orthotropic strength of wood
- Fire safety

The scope of this report is on the quality assurance of the end-product quality, which is achieved by a functional cooperation among the project partners, sufficient coverage and quality of design and on the documentation to be produced in a building project.

This report describes the following means for quality assurance:

- The project description
- The moisture control plan
- The assembly plan
- The security measures
- Tolerances of work, materials and building components
- The maintenance manual

New quality assurance methods were developed. The target levels of quality of a building project are drafted in documents together with the means on how these levels are achieved. Also in the usual design and building contract documents, quality is often referenced (for example in setting requirements, method descriptions and inspection plans).

This report describes the contents and implementation of some crucial tasks and documents with respect to quality assurance. These are:

1. Project description
2. Initial risk assessment
3. Structural design
4. Risk analysis and external supervision of the design
5. Moisture control plan
6. Assembly plan
7. Maintenance manual of the building

Figure 1. shows a schematic diagram on the timing of the drafting of these documents. Some of these documents for constantly updated as the project progresses from initial planning to design and execution. The main objective is that in every stage of the project, the documents have sufficient updated information that certain design or execution phases can progress. Such documents needing updating are the project description and the moisture control plan.

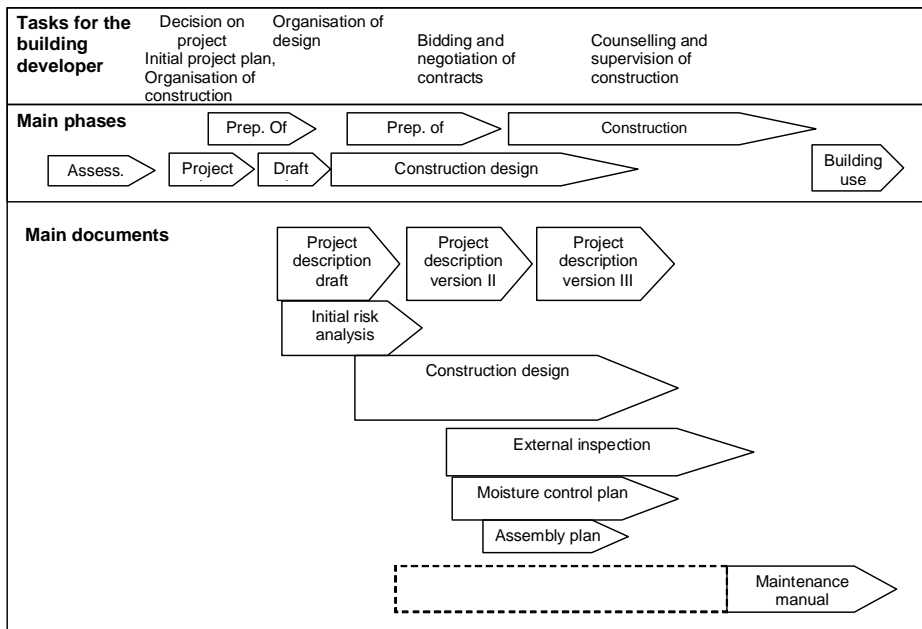


Figure 1. Plans and documents related to the quality assurance of a building project.

Reference: Puurakenteiden laadunvarmistus, Toratti T. . RIL 240-2006 (in Finnish, an English translation is available titled: Quality of timber construction - Guidance for buildings and load bearing structures. this report may be downloaded from the Cost E55 website.)