

WHAT ONE NEEDS TO KNOW FOR THE ASSESSMENT OF TIMBER STRUCTURES

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ABSTRACT

The assessment of old timber structures is normally a great source of problems for building interventors and a frequent justification for integral replacement of structures that would otherwise be kept in service.

It requires understanding the original structural system behaviour, the estimation of strength and stiffness properties of the timber in use, the evaluation of individual timber members' quality and effective cross section dimensions. Due to the natural variability of timber, unknown load and environment history, and common biological damage, assumptions have to be made, frequently with a high degree of uncertainty.

This paper discusses the common approach in the assessment of timber structures in service and tries to identify advances, problems, knowledge gaps and research needs related to this activity.

1. INTRODUCTION

Repair, strengthening and upgrading of old buildings are and will represent in the future a large share of building contractors activity, as the urge for new construction is diminishing due to population stabilization in most developed countries, and the economical benefits, historical or environmental concerns justify the maintenance, as opposed to replacement, of existing structures.

Nevertheless, civil engineering and architectural teaching has been mainly directed towards new construction, thus ignoring the old materials and construction techniques. This is now changing, especially at the level of post-graduate studies or optional courses, but even so the time dedicated to timber structures is in most cases negligible.

At the same time, professional carpenters, in the traditional sense of long-gained practical experience and father-to-son transmitted knowledge, no longer exist. Often, so-called carpenters do not really understand the material, and frequently base their activity on erroneous principles applied with a frightening sense of self-confidence.

This scenario compromises the conservation of old timber structures where specific expertise and knowledge are essential for obtaining data on timber members and joints mechanical behaviour, which is directly linked with wood species used and structural system under evaluation.