

Contribution to sustainable management of materials and components resulting from demolition and disassembly of old buildings

Summary

The old buildings, built predominantly until the 50s of the last century and without the use of reinforced concrete structures, make up an important part of the Portuguese building stock, not only for their quantity (about 15% of Portuguese buildings), but also for their intrinsic values associated with Portuguese history and culture. Such values are attached to the buildings themselves and to the elements and materials that compose them and are lost when the buildings are demolished, and their components discarded in landfills.

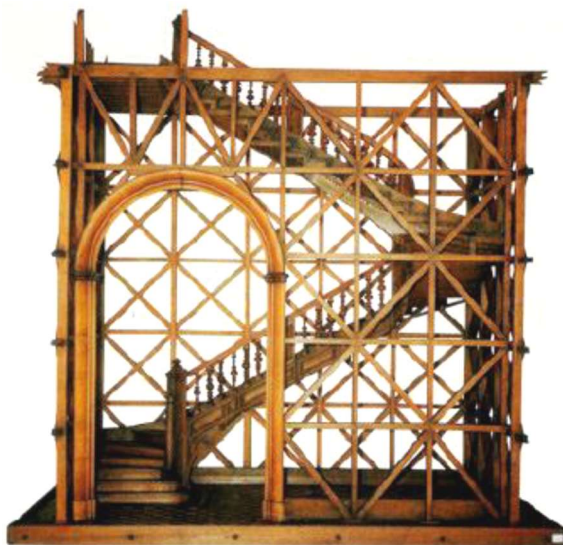
Deconstruction is the process through which buildings are systematically dismantled, often manually or using basic tools, in order to preserve the maximum intrinsic values of the recovered materials. Adopting this form of building decommissioning creates jobs, reduces the need to extract and manufacture new building materials, creates a new economic flow through the resale of recovered materials and reduces waste going to landfill, in other words, it aligns with the principles of environmental sustainability, economic viability and social justice.

This work aims to contribute to the conservation of the intrinsic values of old buildings by proposing a methodology for evaluating not only their deconstruction capacity, but also the alternatives for reusing materials and components resulting from the adoption of deconstruction as an alternative for building decommissioning.

A summarized version of the proposed methodology was applied to 4 buildings, among which the Dr. Manuel Tápia Children's Sanatorium was selected for in-depth application. The application of the proposed methodology to quick case studies and in-depth case study showed that it is possible to identify the deconstruction capacity of old buildings through the analysis of the integration of building systems, which determines not only the type of deconstruction - if structural or non-structural – but it also encourages buildings to be primarily rehabilitated. In addition, the ability to recover elements and materials was evaluated and treatments were indicated to maintain or increase intrinsic values, as well as a strategy for tracking recovered components through the use of material passports accessible by QR Codes and a strategy for making the recovered materials available through an online exchange and sale platform.

Keywords

Sustainable management, circular economy, disassembly, old buildings.



Pombaline Cage Structure. Source: Lopes and Bento (2005).



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