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# Architettura e sostenibilità

Innovazione e sperimentazione  
tra ambiente costruito e paesaggio



SKIRA







The flexibility afforded by prefabricated wood systems is also explored in the design by the AATA Arquitectos practice for the Morerava Cabins on Easter Island (2013). In the case of these family-sized tourist residences in what is an unusual, and fragile, set of environmental conditions, the flexibility offered by the chosen prefabricated wood technology has made it possible to minimise the consumption of local materials and eliminate unnecessary additional layers of thermal insulation. The modular units, whose dimensions were determined by the size of components already available on the market, were designed so that the finished cabins would connect with the ground at isolated points, thus reducing the impact on the soil. The design also included a lightweight roof canopy that enabled, and even induced, natural ventilation in the interior, thus avoiding the need for powered ventilation or other supplementary services systems.

The ability to visualise, simulate and test the behaviour of materials, components and systems in virtual models has improved the reliability of the versions of traditional construction technologies produced by modern industry, offering new experimental opportunities and applications in different types of building. This is certainly the case in the LifeCycle Tower project (Austria, 2013) designed by Hermann Kaufmann + Partner, which explores the potential of wood as a building technology by creating Austria's first eight-storey largely-wooden building. Indeed, apart from the so-called *services core*—built in reinforced concrete, which was cast on-site—the design makes extensive use of wood throughout the building, with the components meticulously engineered so that the design would meet current fire-safety standards. Here again, by working closely with the suppliers of the technology (the Czech Pavus company), the designers were able to carry out the numerous tests required on the wooden joints of the facade structure. At the same time, the automated, serial production process meant that, once the appropriate tests had been carried out in relation to the stability of the chosen design in real-world conditions, the process of installing the intermediary floors within the steel-reinforced wooden structure was remarkably rapid.

## Enabling technologies and building and services systems

This dialogue between designers and the producers of materials, components and technologies—and the consequent possibility of using modern visualisation, development and simulation technologies to integrate and then measure and evaluate new functionalities and properties within a building technology at the design stage—appears to have been conducive to the adoption of ever-more integrated building services. Indeed, we find this preference in projects developed years apart and in quite different contexts.

The choice of highly energy-efficient technologies, together with prefabricated systems that encourage greater efficiency during the construction phase, results in a greater level of energy efficiency across the whole of the building/building-services system. In the design for the New Mayr Melnhof-Kaufmann Administrative Centre (Attergau, Austria, 2011), the use of the external windows to collect solar energy enabled the designers, Hermann Kaufmann + Partner, to optimise the process of heating the air inside the building by efficiently recovering thermal energy from the exterior. And although in this case any eventual demand for additional energy is met by a biomass installation, using a method that can respond to seasonal variations to regulate the temperature gradient in relation to the outdoor conditions is effective in reducing the amount of energy required to ensure indoor comfort.

The morphology of the “Kid University” in Gandía, designed by Paredes Pedrosa Arquitectos, is representative of a different strategy, that of limiting the amount of energy used by the system in the first place. With its opaque exterior shell operating as both an enclosure and a barrier to solar radiation, as well as ensuring the privacy and intimacy of the interior space, the school building opens on to a large internal courtyard which itself has a function in regulating the interior microclimate over the course of the year. The deciduous trees in the courtyard also have a role in this process: these trees, which predated the building, were deliberately preserved and incorporated into the design as an aid to maintaining the quality of the interior environment and microclimate.





Casa di cura Erika Horn. Vista di uno dei patii  
interni / *Erika Horn Residential Care Home.*  
*View of one of the internal courtyards*

Casa di cura Erika Horn. Distribuzione  
planimetrica / *Erika Horn Residential Care*  
*Home. Floor plan*

