

Rethinking Building in the Existing: From Experiment to Transferable Practice

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The transition towards sustainable architecture requires a shift in focus from new construction to transforming the existing built environment. Although there is extensive knowledge on sustainable building, practical methods for transforming existing structures are underdeveloped.

The teaching and research project ReLAB (Real World Laboratories for Sustainable Building) at the School of Architecture Bremen, Germany, addresses this gap through an experimental, hands-on learning format with Master's students in architecture. It investigates how material-based transformation approaches can generate transferable strategies for the adaptive reuse of buildings at risk of demolition. The project frames transformation under conditions of necessity not as a constraint, but as a design field shaped by uncertainty, incomplete knowledge, and open-ended futures. Its central contribution lies in producing transferable knowledge through full-scale interventions in existing buildings. Following expert workshops on ecological materials, six student teams developed and implemented interventions in a vacant post office building in Bremen. In a four-week realization phase, students designed and built reversible assemblies, repairable details, and adaptable spatial strategies directly on site, using regional and ecological materials such as clay, hemp, straw, seaweed, cork, and reclaimed timber. Conceived as 1:1 hypotheses rather than final solutions, these interventions tested how architecture can fit existing conditions and inform larger-scale transformation strategies.

The prototypes were iteratively tested, compared, and refined in response to site-specific conditions. By comparing the built outcomes and reflecting on decision-making processes on site, the project identifies robust approaches that integrate material constraints, spatial adaptation, and stakeholder negotiation. In doing so, it reframes sustainability as a situated practice.

ReLAB proposes a model of practice-based knowledge production linking education and research. It advances low-tech, context-specific transformation strategies based on reduced, reused, and locally sourced materials, and tests how interventions can fit structures materially, spatially, and socially, offering insights for architectural education and practice.