SUSTAINABLE BUILDING TECHNOLOGIES: THEORETICAL EXPERIMENTS AND IN PRACTICAL PARTNERSHIPS

ETH Zurich / ETHiopia Urban Laboratory (2010)

Coordinated by ETH Sustainability and the ETH North-South Center, research conducted by the Chair of Building Structures at the Department of Architecture was developed from an experimental theory to a practical strategy for sustainable construction in developing countries. Thin-shell vaulting is a primary focus of Professor Philippe Block's work at the ETH, including thin-tile brick masonry. Utilzing recyclable cardboard formwork rather than those with greater environmental impact (e.g. wood), efficient alternatives to vernacular building methods were tested on-campus, for example with the construction of a free-form catalan vault.

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In the summer of 2010, eighteen ETH students participated in a summer workshop in Addis Ababa to assist the Ethiopian Institute of Architecture, Building Construction and City Development in the production of a Sustainable Urban Dwelling Unit (SUDU). A single-barrel catalan vault was part of the design for this low-income housing prototype, which also used rammed-earth and plastering techniques in an attempt to reintroduce practices which were traditional for thousands of years in Ethiopia. Because the nation suffers from extreme deforestation and the resulting desertification, the thin-tile brick vaulting technique presents a viable alternative to timber construction, or the importing of expensive metal or concrete building parts.

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This project, which merges experimental teaching with practical applications, is an example of how the ETH activates its students reach out to the global community and share its knowledge on sustainable topics.