

## The Sheaf: Expressive Geometry Through Collaborative Computational Design and Low-Tech Construction Methods

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### Abstract

This paper presents the design development of The Sheaf — a 12-meter-high iconic timber-diagrid hyperboloid lookout tower, from concept to detailed design. The Sheaf was the winning proposal in an architectural competition in 2019 for a lookout tower in Varberg, Sweden. A close dialogue between architect and engineer propelled the iterative design development, initially exploring the concept and later solving details leading to a sustainable, material-efficient, and expressive tower using simple, affordable building elements. The alternating use of digital parametric models and physical model tests supported the decision-making, allowing quick exploration of viable alternatives and the client to get involved.

**Keywords:** timber tower; design work; reciprocal; parametric design; sustainability



Figure 1. Competition entry rendering of The Sheaf, a hyperboloid timber-diagrid lookout tower.