

Aarhus School of Architecture // Design School Kolding // Royal Danish Academy

Towards a new tectonics in bamboo

Høgfeldt Hansen, Leif; Kim, Sara

Publication date:
2016

Document Version:
Peer reviewed version

[Link to publication](#)

Citation for pulished version (APA):

Høgfeldt Hansen, L., & Kim, S. (2016). *Towards a new tectonics in bamboo: A comparative cross-cultural case study in development and construction of different split bamboo constructions with arbitrary double curved forms*. Abstract from Annual International Conference on Applied Engineering and Applied Science, Athens, Greece.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Towards a new tectonics in bamboo

– A comparative cross-cultural case study in development and construction of different split bamboo constructions with arbitrary double curved forms.

Leif Høgfeldt Hansen, architect, associate professor - leif.hansen@aarch.dk

Sara Kim, architect, visiting lecturer - sara.inthesky@gmail.com

- Studio Context, Aarhus School of Architecture, Denmark

Abstract

The idea of this project called COCOON is to investigate architecture designed with split bamboo from a sustainable low-key point of view, but with an experimental approach to material, form, construction and space, that involves architects and architectural students from different places and cultures with their unique individual backgrounds.

The project consists of three different built case studies 1:1. The first in South India, the second in Italy and the third in South Korea, which explores the use of split bamboo constructions to make arbitrary double curved forms in buildings.

COCOON I is a climate responsive building, that serves as an alternative learning centre for none educated farmers in Trichy, South India (Figure 1, 2). Cocoon II is a mobile and folding construction used as a pavilion at the Milan design week 2015 in Italy. COCOON III is built in South Korea as a doubled curved installation constructed in set pieces, that can be assembled in various combinations to adapt to different spatial situations.

The results show a unique approach to different split bamboo construction methods, were it is possible to merge new digital computer techniques with a craftsman's understanding of the bamboo material. The main design tools have been analogue models and digital computer models generated in the programs of Revit, Rhino, T-spline and Grasshopper. Inspirations have been light lattice structures by Frei Otto and organic split bamboo constructions by professor Auwi Stübbe, Germany. The project proves it is possible in the future to investigate and use the potentials of arbitrary double curved forms in split bamboo constructions for new sustainable architectural solutions.

Keywords: Bamboo, tectonics, cross-cultural investigation

Literature

Paudel, Shyam, Greenberg, David, Henrikson, Robert: Visionary Bamboo Design for Ecological Living, Hymos Advertising Co. LTD Beijing, P.R. China 2006

Minke, Gernot: Building with Bamboo, Birkhauser 2012

Dunkelberg, Klaus: Bambus – Bauen mit pflanzlichen Stäben. Bamboo. Dt.-Engl. Hrsg. von Frei Otto. Krämer, Stuttgart 1996, Conrad, Roland: Frei Otto – Spannweiten. Ideen und Versuche zum Leichtbau. Ullstein, Berlin 1965.

Otto, Frei: Gestaltwerdung. Zur Formentstehung in Natur, Technik und Baukunst. Müller, Köln 1988

Illustrations

Figure 1: COCOON I. Bamboo building seen from southwest with shingle roof in bark and granite plinth

Figure 2: COCOON I. Interior with split bamboo construction, wall/ceiling and central woven bamboo column



Figure 1



Figure 2