CINARK Centre of Industrialised Architecture
The Royal Dansih Academy of Fine Arts, School of Architecture

WORK IN PROGRESS – September 2009

- Architecture between Sustainability and New Industrialisation
- System Design and System Concepts in Industrialised Architecture
- Architectural Processes and Organization in the Building Industry
- Architectonic Potentials in the use of Industrial Robots in Concrete Building Production
- Adaptive Architecture and Sustainability
- Revitalization of the Brick Wall
- Fabric Formwork for Concrete Structures
- Architectural Perspectives in the use of Wood

- Completed works
- Publications

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Research Project

ARCHITECTURE BETWEEN INDUSTRIALIZATION AND SUSTAINABILITY

Associate Researcher, M. Arch Ulrik Stylsvig Madsen
and Professor, PhD, Architect Anne Beim

The project aims at developing new models for dwellings focusing on sustainable solutions based on industrialized production technologies.

The project is divided into three parts.
Part one and two is based on case studies of Danish dwellings from 1969 until now. The analyses are based on studies of the building as structure and as a framework for the everyday life of the occupants. Through interviews with a number of occupants the projects seeks to discuss the different structures ability to change over time and adapt new functions and new kinds of meaning. In the last part of the project these analyses will create the base for the discussion of and developing of new building types and technologies focusing on a sustainable use of the worlds resources by looking at the building and its structure in a long time perspective.

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PhD Project

SYSTEM DESIGN AND SYSTEM CONCEPTS IN INDUSTRIALISED ARCHITECTURE

M. Arch, B.A. in sociology. Kasper Sánchez Vibæk

The aim of the PhD study is to examine the role of system design, system thinking and system concepts within modern industrialised building. A main focus will be how this world of ideas is articulated in architecture.

System design, system thinking and system concepts are here understood as concepts relating to: Tectonic patterns, platform architecture, building standards, integrated product delivery and mass customisation.

With point of departure in various cases the project seeks to clarify to what extend new digital tools as well as contemporary construction processes and building technologies are essential for the development of architectural potential.

Other important aspects as organisation (project/cooperation/business concepts) are also within the scope of the research but plays secondary role in relation to their impact on architectural processes and results.

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Research Project

ARCHITECTONIC POTENTIALS IN THE USE OF INDUSTRIAL ROBOTS IN CONCRETE BUILDING PRODUCTION

Industrial PhD-student, M. Arch Johannes Rauff Greisen

The form potentials of self compacting concrete are not being fully utilized today and there is a gap between the architect visions and the contemporary production methods.

Architectural value could benefit from use of industrial robots in the production of concrete elements and formwork, since architectonic and constructive form potentials can be released, individually shaped concrete constructions can be realised with a smaller environmental footprint and finally the interface will reduce the distance between architect and building.

The goal is making the industrial robot feasible for the building industry, including both prefabricated concrete elements and formwork systems for in-situ casting. Robot produced formwork for individually shaped, visible concrete elements with complex geometry and varying surfaces will be explored.

Throughout experiments and a catalogue of terms the research project will discuss and evaluate the architectonic and environmental relevance of the industrial robot in connection to concrete.

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Research Project
ADAPTIVE ARCHITECTURE AND SUSTAINABILITY

M. Arch, master in design (MD), Industrial Phd student Søren Nielsen

The project poses the question: What does buildings ability to adapt mean in terms of sustainability? It is the aim of the project to develop multifunctional types of buildings, suitable for a northern European market that put a minimal load on climate and environment by optimizing the energy consumption over the entire life span of the buildings.

By considering buildings as living organisms with a lifetime many times longer than a human, models are examined for planning, load-bearing structures, access systems, and facades that make changes and further development possible and at the same time allow the users to exert influence on their physical environment.

The balance between general usability and architectonic identity is critically assessed as parameters for the durability of buildings.

Industrial part: Tegnestuen Vandkunsten.

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Research Project

FABRIC FORMWORK FOR CONCRETE STRUCTURES

M. Arch, Industrial Phd student Anne-Mette Manelius

Woven textiles can be used as a flexible, strong, lightweight and affordable alternative to conventional methods of casting concrete.

The method shows great perspectives regarding design and production of concrete structures.

The aim of the programme is to develop new fabric formwork technologies and methods as an alternative to conventional concrete formwork.

The research question goes:
When combining combining advanced technologies within textiles and concrete in an industrialised, buildable context, how can architectural perspectives regarding structure, form and surface be met.

Several perspectives have not yet been investigated fully – this in regard to architectural form, tactility, optimisation of materials used, production methods and possible connection to extisting practice and form systems etc.

Industrial parts: E. Pihl & Søn og Schmidt Hammer Lassen Architects.

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Research Project

ARCHITECTURAL PERSPECTIVES IN THE USE OF WOOD

M. Arch, Assistant Researcher Rikke-Julie Schaumburg-Müller

The project aims to describe the current status of the industrial state of wood and its use in a present architectural context. The intention is to provide various means to intensify the dialogue and development by defining the perspectives of the use of wood in architecture.

The project focuses on several questions:
How advanced is the wood industry at using high developed technology in wood constructon and how does new wood technologies lead to new architectural perspectives regarding structure, form, surface, and issues such as energy reduction and sustainability etc.

Part of the project is to make a catalogue based on the work of innovative architects/engineers that also holds and a critical analysis of wood as a building material.

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COMPLETED WORKS

- Architectural Quality, User Requirements and Mass Customisation in Industrial Building Systems
- Automated Building Construction
- Robust Architecture
  - Architecture as an active part of the process of creating identity of organizations
- Master Degree in Industrial Architecture
- Creative Systems - Architecture in a new industrialized context
- Architecture and Mass Customization
- Architectural Perspectives in the use of Concrete
- Architectural Perspectives in the use of Block Masonry

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Publications

- **CINARK**REASEARCH
  Three Ways of Assembling a House. April 2009

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