

Design brief, Living community in Arden.

The aim of this project module is to develop an integrated building design for sustainable-tectonic residential and other buildings for a living community in a forest environment in Arden south of Aalborg. The project applies the knowledge and skills acquired through the two MSc1-courses; AST concerning structure, site and climate, and AGB concerning green building strategies with particular focus on adaptive thermal comfort. The project module itself provides learnings regarding social sustainability and user participation as well as regarding contemporary sustainable-tectonic architecture. This way the project encompasses a multitude of architectural, engineering and sustainable aspects, and requires application of advanced integrated design methodology in order to succeed.

The sustainable-tectonic agenda

Sustainability has been on the Danish building agenda for several decades resulting in new buildings having low energy consumption for building operation. The general focus has been on environmental sustainability and climate mitigation. Now the focus is widening which is also reflected in this project:

The buildings designed must still have an energy efficient building operation, in this case zero-energy, but rather than fixed indoor climates, there is focus on adaptive thermal comfort and user control.

Besides building operation, the project will look to matters of sustainable materials and construction, and beside climate mitigation, the project will deal with the matter of climate adaptation seeking to embed the houses into the local ecology. These issues call for innovative tectonic approaches seeking for new sustainable and organic building practices that may mitigate and adapt to climate change.

Social sustainability is a key issue of the project, from the question of spatial organization of an inclusive community to the question of user control of indoor climates. This way, the sustainable approach is broad calling for many skills and competencies in the group work leading to a strong architectural design.

The settlers

A group of people (hereafter: the settlers) seeks to establish a so-called 'living community' in the form of a residential settlement including opportunities to work at home as well as producing own food on site and having other local working opportunities. The settlers want to establish an inclusive community with people of all ages and professions. They want the community divided into clusters each containing 20 to 25 grown-ups plus children.

The settlers aim to build small and cheap homes not becoming too dependent on work incomes from outside. They want the settlement to be plus energy, and the materials used for construction must be predominantly organic in order to ease the ecological footprint.

The site

The settlers aim to buy a piece of land in Arden 40 km south of Aalborg. Arden lies on the outskirts of Rold Skov, considered the largest forest in Denmark. The site is situated 1.5 km from Arden train station, thus within bicycle distance from public transportation. At the center of the elongated site, there are small farm

buildings that may transform to common houses and small enterprises in the future. The area north of the farm serves agro-cultural purposes, while approximately two acres of land south of the farm (hereafter: the site) shall contain forest-gardens as well as buildings for human settlement.

Design brief (short version)

Design a sustainable settlement for Brovej 7, Arden. The settlement includes three clusters of housing each of which with homes for 20-25 grown-ups plus children. Only one cluster is detailed. Each cluster must have three sizes of housing units. Each housing unit must offer opportunities to work at home, while still maintaining a size resembling the standards of Danish social housing. One of the housing units is for a children family of four people and a maximum size of 115 m².

The residential buildings mainly consists of organic materials. They must be flexible over time in terms of space, construction or general functionality.

Each cluster must have common facilities for 40 people meeting and dining including kitchen and toilets, a common cold store and laundry facilities including space for line drying of clothes. The cluster must reach zero energy standards. The cluster must also encompass green houses and sheds for individual and common gardening.

All clusters must embed within the local environment including rainwater treatment, considering the shading from trees and enabling forest gardens for food production including vegetables, berry bushes and fruit trees.

Besides three residential clusters, forest gardens and rainwater facilities, the site must include an amphitheater and a site for tiny homes. Cars park at the perimeter of the site. There must be 0.5 car parking lots per housing unit and adequate parking for bicycles.

Learning goals and PBL

Students will work in project groups applying the PBL (Problem Based Learning) perspective to their work in order to obtain ability to integrate aesthetic, spatial, social, functional, logistical and technical aspects in the design of a sustainable settlement. The combination of realism and vision is a cornerstone in the learning strategy of this semester.

Method

The project is conducted as group work and includes the following main phases as described in

Hansen, H.T.R. & Knudstrup, M. (2005):

[https://vbn.aau.dk/ws/portalfiles/portal/1624830/The Integrated Design Process IDP A more holistic approach to sustainable architecture](https://vbn.aau.dk/ws/portalfiles/portal/1624830/The_Integrated_Design_Process_IDP_A_more_holistic_approach_to_sustainable_architecture)

1. Problem formulation/project idea
2. The Analysis Phase includes analysis of site, local plans, user profile, aesthetical approaches,

functions, energy, indoor-environmental and constructional systems. This result in description of building aim, sub methods and tools applied in all design phases, result of analyses, determination of building performance targets as well as determination of design criteria and schedules of accommodation including room program and functional diagram. Upload a program to moodle no later than Friday 6. November 15:00. Name the file with the group number.

3. The Sketching Phase, where architectural ideas develops linking matters of site, users, functions, space, form, construction and climate applying a number of different sketching methods, helped along through workshop activities. The solutions are continuously evaluated against design criteria and performance target values, resulting in a concept (or two) presented at the Midway critique.
4. The Synthesis Phase, where the buildings, based on solutions from the sketching phase, find their final form based on an optimization of the considered parameters and with the fulfilment of design criteria and performance target values, resulting in a solution that meet the demands stated in the Analysis Phase.
5. The presentation phase, where the final project unfolds in a report, drawings, cardboard models and computer visualization.

In the beginning of the sketching phase, two workshops facilitates the first concepts to be developed.

A midterm seminar summarizes the work performed so far and offers opportunity to receive feedback and guidance for the remaining project period from external critics, supervisors and fellow students.

Michael Lauring, 18.08.20