

# new minimalism

langenkamp.dk architects



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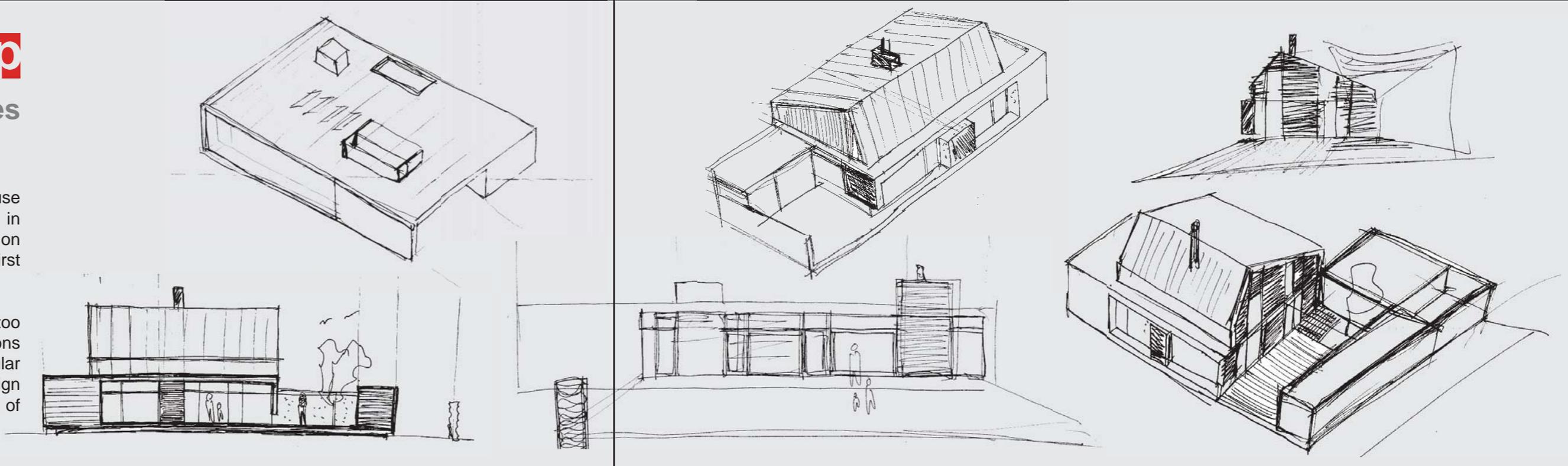
# villa langenkamp

## sketches

### concept – from complexity to simplicity

At first, a two-storey design was considered because of the energy benefits of a compact form, and in order to split the spatial layout into social rooms on the ground floor and more private rooms on the first floor.

However, the geometry of these sketches was too complex. The concept was that all the functions are contained and integrated in one unified, regular shape, for which reason a simpler geometrical design was chosen. A question of subtraction instead of addition.



# villa langenkamp

## construction

### foundations

First, the topsoil is removed until a stable layer of soil is reached. Next, the outline of the house is cast in concrete, with Lecaterm® blocks on top. 600 mm of insulation is then placed within this outline, and a layer of concrete cast on top to finish the foundations after a three-week construction period.

The only thing which is different to standard foundations is the use of Lecaterm® blocks and an additional 10 cm of exterior insulation. However, this means that the foundations are much better at retaining heat, with a U-value of  $0.05 \text{ W/m}^2\text{K}$ , which is twice as low as that required by the Danish Building Regulations (BR10).



*the levelled construction site*



*Lecaterm® blocks form an outline of the house*



*600 mm of insulation within the Lecaterm® blocks*

# villa langenkamp

## presentation

The following pages show photographs of villa langenkamp. The photographs mark the end of the process of building the first certified passive house in Denmark, and make it possible to compare the built project with the early sketches.



# villa langenkam

## technique

### technical equipment

Villa langenkam's technical installations consist of a *Paul ventilation system 200 DC*, with a heat recovery rate of 92% and which is certified by the *Passivhaus Institut* in Darmstadt. The 2.2 kW heat pump is used for hot water production and is connected to a 400-litre storage tank.

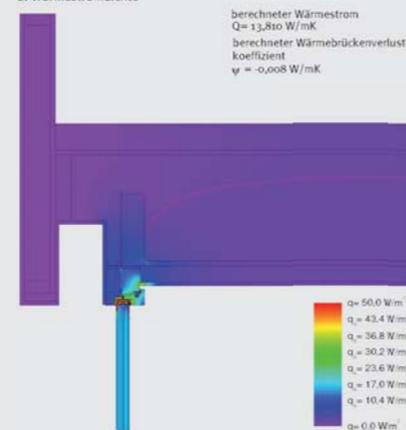
The red panels on the south elevation function as a passive solar wall. A thin honeycomb-like pattern of cardboard allows the low winter sun to pass through the cardboard pattern and indirectly heat the interior, while the pattern provides shade from the high summer sun to prevent overheating.

### thermisch hygrische Wärmebrückenanalyse

Villa Langenkamp, DK

#### Traufanschluss mit Fenster und Jalousiekasten (Stand: 13.Mai.2008)

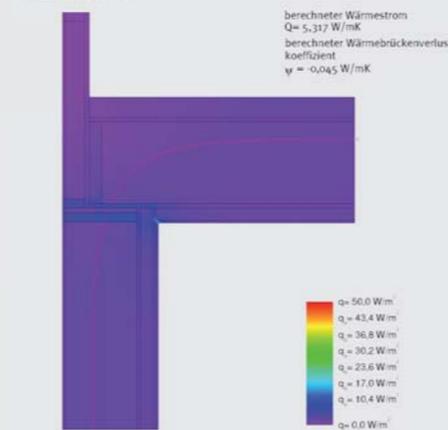
2. Wärmestromdichte



thermal analysis window - roof

#### Traufanschluss (Stand: 13.Mai.2008)

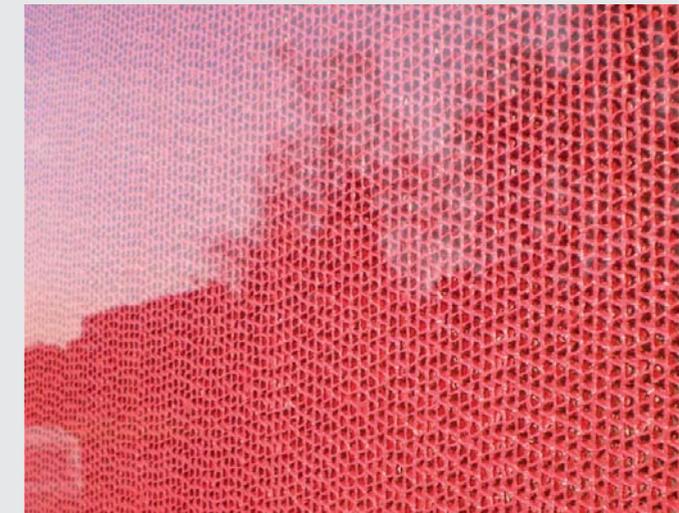
2. Wärmestromdichte



thermal analysis wall - roof



ventilation system, heat pump and hot water storage tank



detail of the red honeycomb-like passive solar wall