

# BLAF Architecten

## Sustainable features

- Zero emission, carbon neutral house
- Passive house standards
- Solid construction materials for heat accumulation
- High-performance insulation
- Airtight construction
- Southern oriented glass façades for solar gain
- Mobile sunscreens
- Geothermal heat exchanger
- Renewable energy systems
- Natural ventilation

## Passive House with Textile Skin

Asse, Belgium

With a skin made from EPDM rubber, this interactive and airtight house enjoys a zero emission carbon rating. Sunscreens composed of fiberglass fabric keep the southern oriented and glazed upper story adaptive to the shifting path of the sun.

**B**elgium is one of the most dense, yet endlessly dispersed areas in Europe. This existing model for spatial development, often based on private ownership of land, no longer proves justifiable. Rather than criticize this unsustainable situation, the ambition of this inspiring residence instead explores an alternative and positive update to the local residential typology. The goal for this zero emission project provokes a behavioral shift in architectural discourse that extends across spatial, social, and ecological levels.

The residence repurposes a leftover lot from a 1960s housing development. Close to schools, work, and public transport, the sustainable house also promotes a sustainable lifestyle. This unconventional design returns the formally private front yard back to the community. By designing the front yard of the residence as a semi-public playground and by using the front façade as a larger-than-life drawing board, the house becomes a

more social and hospitable element in the neighborhood. The unexpected introduction of the semi-public space rejects the allotment's rigid concepts of privacy and territory.

Passive house principles, combined with the topography and orientation of the site, develop an efficient skin design that embodies the family's values for transparency, flexibility, and interaction. The ground-floor façade facing the basketball court features a sustainable EPDM rubber surface that forms a giant canvas for chalkboard artists and neighborhood children. An upper story, clad in a UV-resistant, glass-fiber fabric, presents a façade composed entirely of sunshades. These dark sunscreens become automated at window areas and otherwise stay fixed on wooden frames. Responding to both the daily climatic needs of the house and the personal needs of the occupants, these mobile textile shades assist with both privacy and solar filtering. The built-in flexibility of this shading system significantly changes the appearance of the house at different times of day.

Solid construction materials, including concrete and brick, aid in the accumulation and storage of heat. The bright interior engages a light color palette, directly contrasting with the slate black exterior. Living areas and the children's rooms are situated on the upper floor to enjoy an added heat gain of 2°C from the extensive glazing. Below, the parents' bedroom and bathroom nestle into the slope of the site. This ground level also holds a home office and a storage room.





The residence applies a wide assortment of sustainable features. Designed for a couple and their three children, the house was completed on a budget of approximately \$401,000. Cellulose and wood fiberboard make up the home's efficient insulation. These high-performance materials keep the walls, floor, and roof well insulated throughout the year. The airtight, carbon neutral dwelling utilizes generous glass façades along its south side to capture maximum solar gain. Built according to passive house standards, the home's yearly energy consumption for heating stays limited to an impressive 15 kWh per square meter. A geothermal heat exchanger further supports these efficient energy ratings.

A set back on the upper level creates space for an outdoor terrace. With floor-to-ceiling glazing on all three sides, the terrace keeps the family connected to the outdoors even on this elevated level. Promoting cross ventilation between the two sides of the house, the generous glazing framing this courtyard space also provides a visual link between the living and

The home's upper level, clad in floor-to-ceiling glazing, embeds operable sunscreens into the façade to control the amount of desired sun exposure.

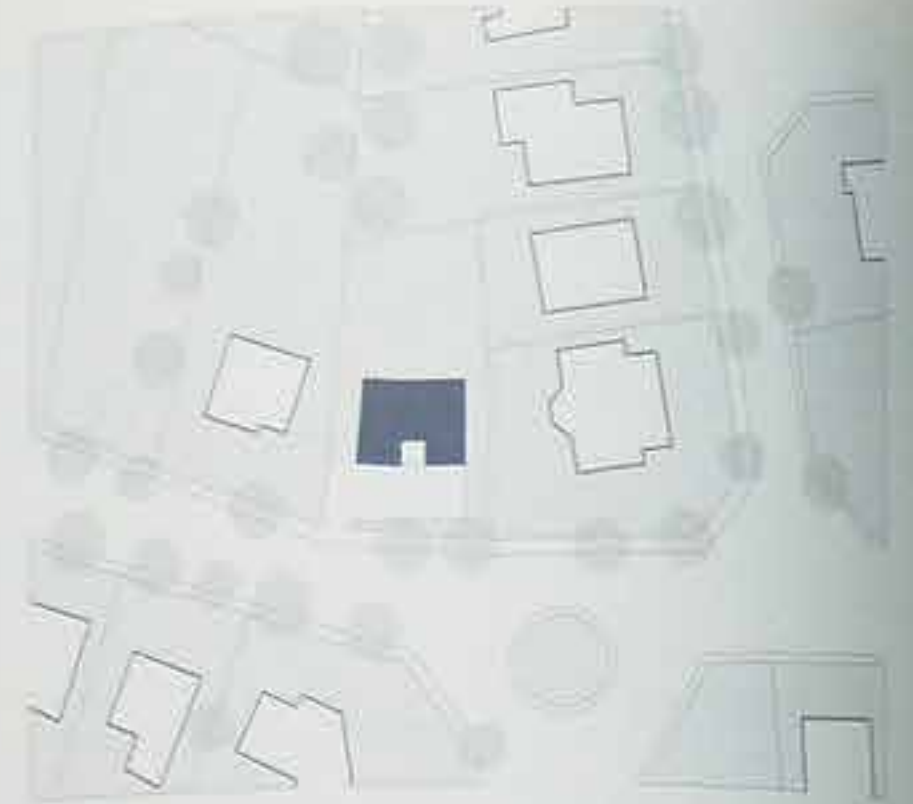


children's area. A glazed central stairwell brings light into the lower part of the house. Golden curtains line this glazing to regulate the amount of privacy and climate control desired between floor levels. Circular skylights punched out of the roof add further illumination to the social family spaces over the year.

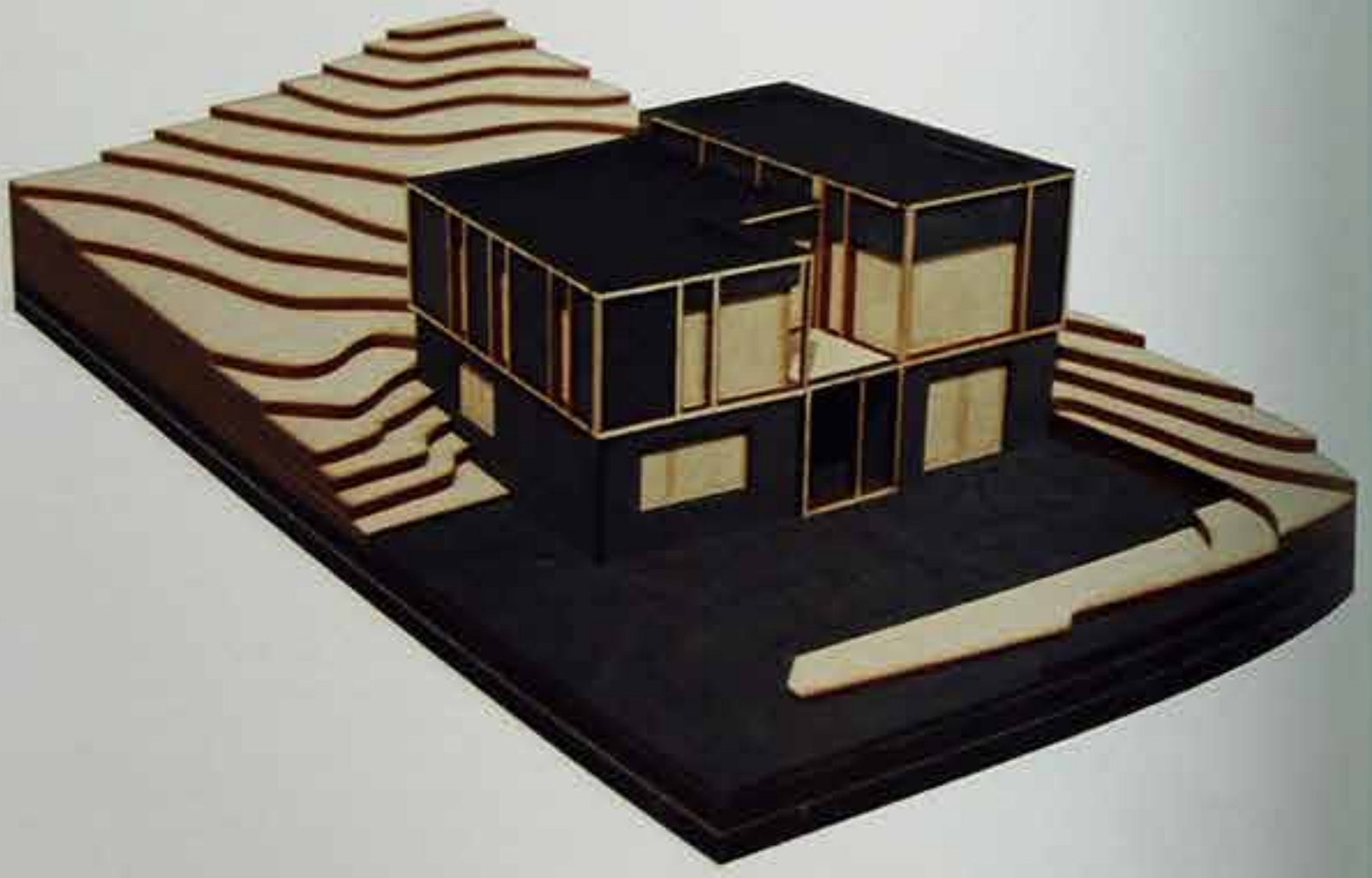
The ability to easily transform the exterior of the house combined with an inviting basketball court marked by vibrant neon lines encourages an active outdoor lifestyle. As the family and local community begin to engage with the chalkboard house, what begins as a stark, black, monolithic residence evolves into a whimsical social canvas for creativity and interaction. The home's malleable exterior finishing allows it to remain responsive to the changing sentiments, aesthetics, and dreams developing between the family and their neighborhood.

This chalkboard house offers a refreshing reminder of the aesthetic and social possibilities that can be harnessed through sustainable design. Carbon neutral and environmentally conscientious, the lighthearted design seamlessly bridges technical specifications with a childlike sense for the imaginal. Strengthening both the neighborhood and the family unit, the interactive residence casts off the stuffy preconceptions associated with sustainable design. Instead, this playful project demonstrates that ecologically-minded architecture can capture both a high energy rating and one's imagination.

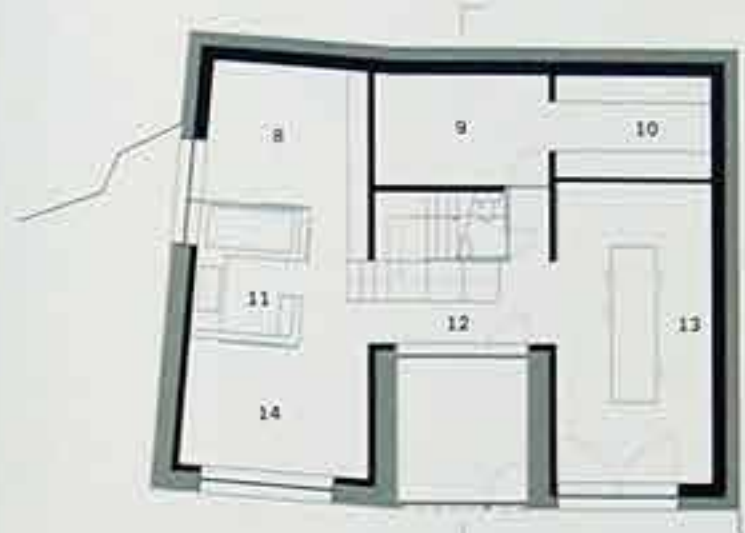
- Sustainable features:**
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  - Solid construction materials for heat accumulation
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- Sustainable materials:**
- Cellulose and wood fiberboard insulation
  - EPDM rubber cladding
  - Glass fiber fabric
- City/country:** Assen, Belgium
- Year:** 2009
- Plot size:** 680 m<sup>2</sup>
- Building size:** 184.1 m<sup>2</sup>
- Number of rooms/residents:** 4 bedrooms/5 residents
- Overall budget:** \$401,000



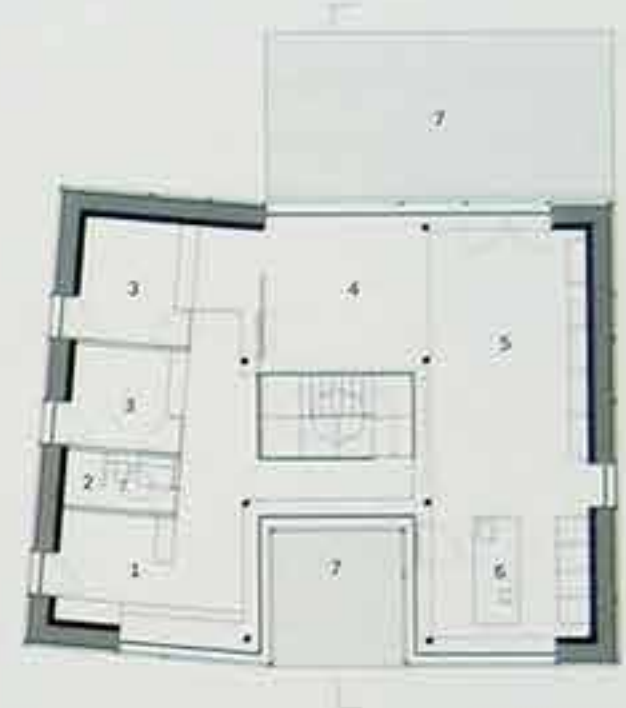
Site plan



- Ground floor plan**
1. Children's area
  2. Children's bathroom
  3. Children's bedroom
  4. Living room
  5. Dining room
  6. Kitchen
  7. Terrace
- First floor plan**
8. Master bedroom
  9. Technical room
  10. Storage room
  11. Master bathroom
  12. Entrance
  13. Office
  14. Spare bedroom



Ground floor plan



First floor plan



North elevation      South elevation      East elevation      West elevation



Transverse section



Longitudinal section