



THE Superinsulated and
Passive House Design
GREENEST
HOME Julie Torres
Moskovitz

TEXTILE HOUSE

The Textile House, completed in 2008, is a detached Passive House in Asse, Belgium, on the outskirts of Brussels. Because of the sloping site, the house sits on two levels, with the first floor, which contains private bedrooms at the back and a home office facing the street, partly underground. Calling the need for enclosed private property into question, BLAF Architecten added a public front-yard basketball court on the leveled portion of the property that invites the neighborhood to play.

The first-floor facade fronting the basketball court has an ethylene propylene diene monomer rubber (EPDM) surface, creating a canvas for chalkboard artists and neighborhood children. As Lieven Nijs, a partner at BLAF Architecten, explains, the material was an economical way to avoid thermal bridging at the facade, because it is light and thin and adheres easily without fasteners to the exterior insulation. The chalkboard concept evolved accidentally one day when the owner, an architect at BLAF Architecten, used the facade to leave a message, writing "I'll be back in five minutes" on the rubber surface. Soon, neighborhood children and artist friends, including Belgian artist Eva Mouton, began to draw on the walls.

The lower level of the house, composed mainly of poured concrete and masonry blocks with XPS insulation, is buried into the hillside, and its thermal mass retains both heat and cold. The upper story is clad in a UV-resistant glass-fiber fabric, resulting in a facade made up entirely of sunshades, automated at window areas and otherwise fixed on wooden frames. Part of the architects' decision to limit the exterior cladding to the glass-fiber fabric that gave

the project its moniker, Textile House, was to avoid the blatant material dissonance between the moveable shading device and the building facade. Behind the textile panels is a masonry and timber-frame wall filled with dense-packed cellulose insulation; the roof employs a tapered rigid insulation.

The interior plan layout is unusual in that the private spaces are on the darker, massive lower level, while the living room and kitchen are on the upper level, overlooking the basketball court with lots of windows and natural light. In addition to the operable sunscreen shades at the upper-level windows, golden curtains are strategically located to easily close off portions of the full-height glass facade for more privacy. A skylight and open-stair core bring light into the center of the home. The custom-designed stair includes built-in seating benches at the bottom that lend themselves to entertainment or play areas.

The residence is outfitted with a Magic Box that provides ventilated air through an HRV and hot water via a heat pump. There is no gas service to the building, and a rainwater-collection tank in the front yard provides water for the toilets and irrigation. BLAF Architecten designed the home to be an Energy Plus House. In addition to meeting Passive House standards, the house is outfitted with twenty solar photovoltaic panels that generate an excess of 6302 kWh, which is fed back into the power grid. While solar panels are most effective after a building's energy consumption has already been greatly reduced through other sustainable practices (and the Passive House standard does not list solar photovoltaic

50° 54'

Asse, Belgium

BLAF Architecten

2008

Certified by the
Flemish Passive House
Platform

OPPOSITE: Temporary wall art by the Belgian artist Eva Mouton



power as part of the certification criteria), the Belgian government, in an effort to reduce CO₂ emissions and to comply with the Kyoto Protocol, has created a program that offers large subsidies to home owners who add solar panels to their houses. The paradoxical outcome of this well-intentioned government program is that the cost of electricity has actually increased in Belgium, since power distribution companies must write checks to home owners who feed the grid.

With their Textile House and other recent Passive House projects, BLAF Architecten are a key part of

the recent push for sustainability in and around Brussels, which has achieved more than 2,500,000 square feet of Passive House construction in only four years, well ahead of the goals set by the EU Performance in Building Directive.¹

¹ Wolfgang Feist, "Press Release for the 4 May 2012 Press Conference on the 16th International Passive House Conference 2012, Conference Master Plan for the European Energy Revolution," May 9, 2012, www.passivehouseconference.org.

BELOW: The rear facade features a private wood deck, and the lower level of the house is nestled into the land.



RIGHT: The upper level of the facade is formed by wood-frame panels that hold fiber-fabric panels, and the lower level has rubber roofing material used as cladding.



TOP: High-performance glazing brings in natural light from the front and rear facades.

BOTTOM: Interior curtains provide privacy in the very open house, where light fixtures are minimized because daylight has been maximized.



RIGHT: The central stair is a gathering space and brings natural light down to the ground floor, which is partly bermed.



OPPOSITE: Larger corner windows are set with an overhang to hide the operable shading device and avoid overheating in summer.



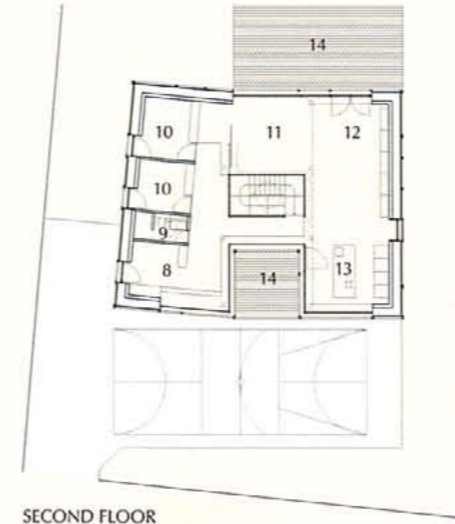
THE CHALKBOARD CONCEPT evolved accidentally one day when the owner, an architect at BLAF Architecten, used the facade to leave a message, writing "I'll be back in five minutes" on the rubber surface. Soon, neighborhood children and artist friends began to draw on the walls.

LEFT: Glass in the building's core helps carry natural light into all areas of the home.

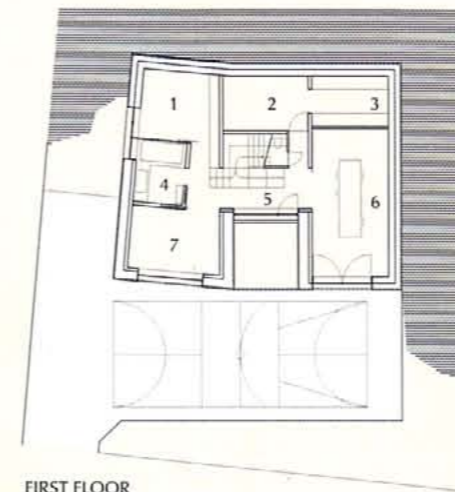
RIGHT: Gathering spaces, such as the open kitchen and dining area, are located along the front facade, allowing for direct interplay with the neighborhood.



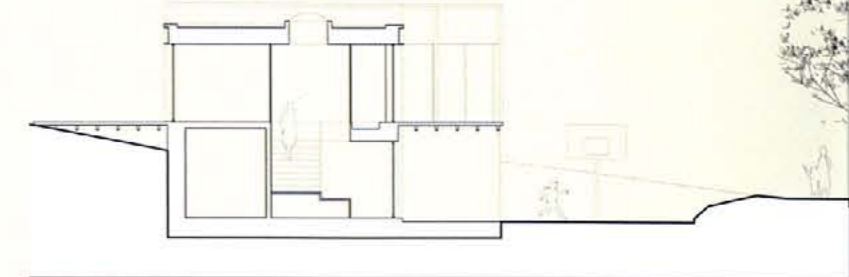
- | | |
|------------------|-----------------------|
| 1 MASTER BEDROOM | 8 CHILDREN'S AREA |
| 2 TECHNICAL ROOM | 9 CHILDREN'S BATHROOM |
| 3 STORAGE ROOM | 10 CHILDREN'S BEDROOM |
| 4 MASTER BEDROOM | 11 LIVING ROOM |
| 5 ENTRANCE | 12 DINING ROOM |
| 6 OFFICE | 13 KITCHEN |
| 7 SPARE BEDROOM | 14 TERRACE |



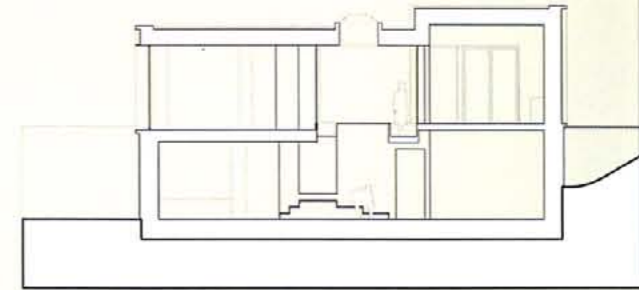
SECOND FLOOR



FIRST FLOOR



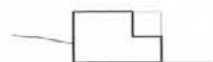
SECTION



SECTION

TEXTILE HOUSE

BLAF Architecten

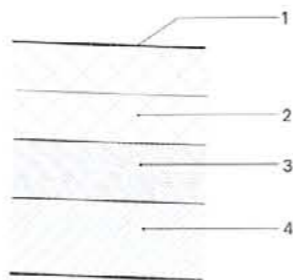


OPPOSITE: Taped window openings within the exterior wooden framing are visible in blue, with the fiber-fabric facade behind.

Project location	Asse, Belgium
Climate zone	temperate maritime climate
Heating degree days	5211°F-days/yr (2895 K-days/yr)
Cooling degree days	140°F-days/yr (78 K-days/yr)
Treated-floor area	1981 ft ² (184 m ²)
Airtightness	0.3 ACH at 50 Pa
Number of blower-door tests	1
Primary energy demand	n/a
Wall R-value and U-value	R-47.7, U=0.021 btu/ft ² -hr-°F (0.119W/m ² -K)
Roof R-value and U-value	R-52.6, U=0.019 btu/ft ² -hr-°F (0.108W/m ² -K)
Floor R-value and U-value	R-49, U=0.020 btu/ft ² -hr-°F (0.116W/m ² -K)
Window U-value (installed)	0.13 btu/ft ² -hr-°F (0.75W/m ² -K)
Space-heating demand	4.4 kbtu/ft ² -yr (14.0 kWh/m ² -yr)
Space-cooling demand	n/a
Heating-equipment type	air-source heat pump
Heating-equipment efficiency	13.5 HSPF; 3.95 COP
Cooling-equipment type	Cooling equipment type: none
Cooling-equipment efficiency	n/a
Hot-water-equipment type	heat pump
Hot-water-equipment efficiency	3.95 Energy Factor; 3.95 COP
Ventilation-system type	HRV
Ventilation-system efficiency	78%
Renewable-energy systems	8.4kW PV

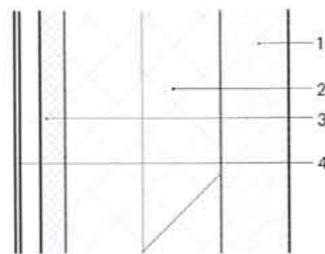
ROOF R-52.6

- 1 EPDM sealant
- 2 2x100 mm polyiso
- 3 insulating mortar
- 4 200 mm concrete



WALL R-47.7

- 1 masonry units
- 2 380 mm timber frame with cellulose
- 3 20 mm wood-fiberboard insulation with air cavity
- 4 glass-fiber textile



SLAB R-49

- 1 topping screed
- 2 insulation
- 3 200 mm cast concrete
- 4 Two layers XPS
- 5 concrete
- 6 compacted rock fill

