THE EMILE BOCKSTAEL SCHOOL [002]:

A SCHOOL OF 3,400 M² AIMING AT PASSIVE STANDARDS

NURSERY SCHOOL – NEW CONSTRUCTION

13
kWh/m² year
Brussels average
106

U_{Wall}: 0.15 W/m²K
U_{Roof}: 0.11 W/m²K

η 75 %
n50= 0.6/h

Exterior sunshades
Passive cooling

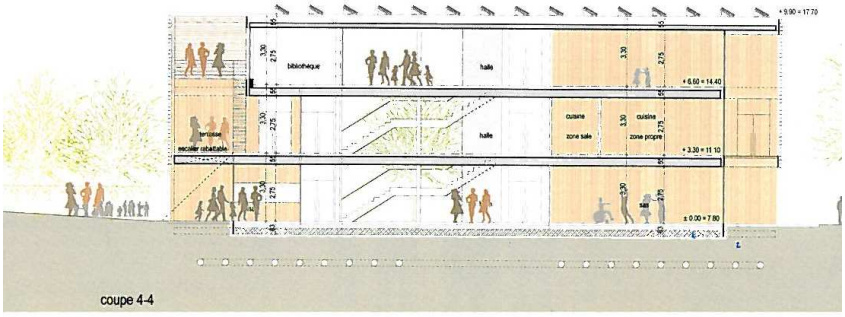
Photovoltaic system
(6,300 kWh per year)
Thermal panels (70 m²)

Green roof
(887m²)

Rainwater tank
(40 m³)

green finishes

Rue du Heysel 104, 1020 Laeken
Client: City of Brussels Urban Development Dept.
Architects: Bureau NVT, Bureau Bouwtechniek
Engineers: Schmidt Reuter, Weinand

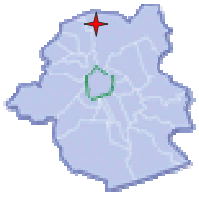


The building for the new Emile Bockstael nursery school is a three-floor unit divided into a school with an accommodation for the caretaker. From the beginning, high levels of sustainability were planned for this project. As a result, a net energy consumption target of 15kWh/m² per year was set, which corresponds to the Passivhaus standards. This is also achieved by a compact buiding form, an optimized envelope and a carefully designer air-conditioning system.

In this case, heat production is geothermal, obtained by using a heat pump equipped with a horizontal collector and completed by a gas-fired condensing boiler. Hot water is obtained from solar thermal panels and rainwater is recovered wherever possible. Electricity consumption is optimized by the use of high-performance lighting and photovoltaic panels.

IN FIGURES

Gross area	3,358 m²
Handover	End of 2010
Construction costs, VAT / grants excl.	1,693 €/m²
Exemplary building grant	100 €/m²



The description of this building is provisional as its construction has not yet been completed.

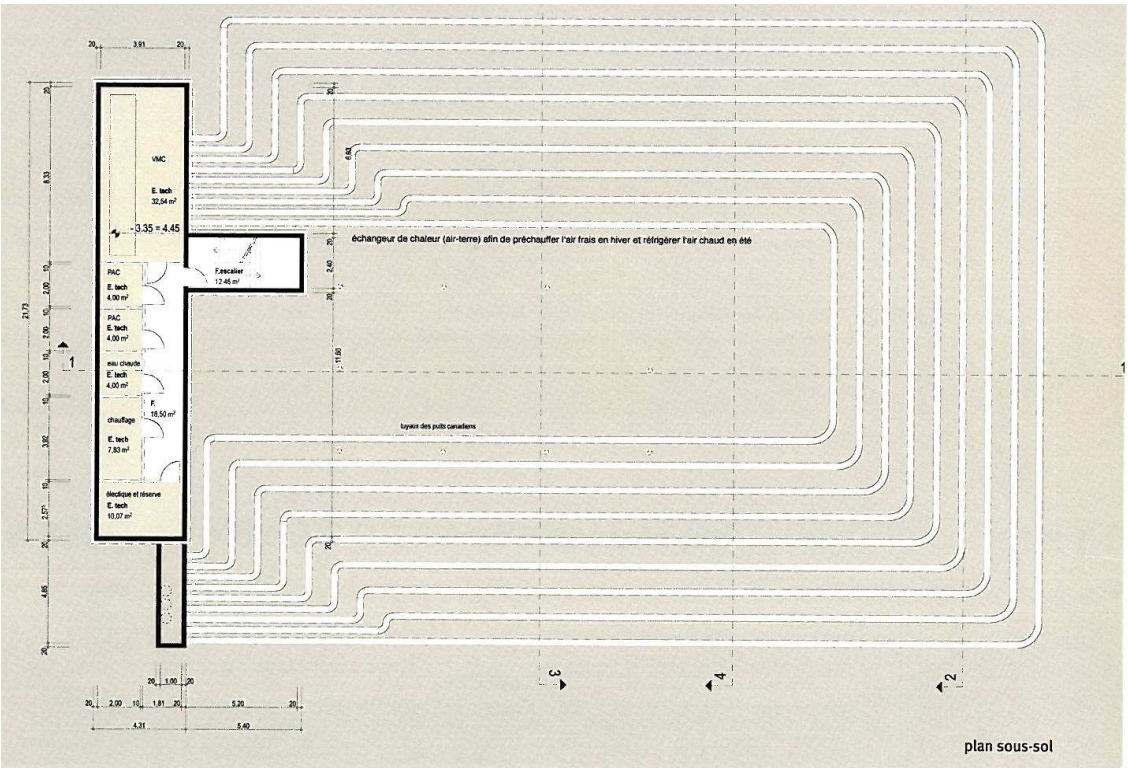
PASSIVE : A TOP-QUALITY BUILDING ENVELOPE

Passive constructions must have a well-designed building envelope to be able to minimize energy losses. That's why a high level of insulation was planned for this building. Walls are made from perfectly insulated prefabricated solid wood partitions. Windows are triple-glazed and a green roof has also been planned. Considerable attention has also been paid to the building's air-tightness (n_{50}=0.6 renewal per hour), orientation and measures taken for avoiding overheating and cold. An external sunshade has been installed, fixed or mobile depending on the inside premises.

THERMAL COMFORT PROVIDED BY A HEAT PUMP

In the past, there was a building with a basement floor on the site of the new building. Following demolition, the existing foundation was reused for installing a horizontal collector for a heat pump. The heat pump (48kW) should supply the heat demand in winter, seconded by a gas-fired condensing boiler. Heat will mainly be distributed from heater batteries in the ventilation system (low-temperature size). Domestic hot water for the school will be produced by solar collectors (10m²) backed up by a gas-fired condensing boiler.

The caretaker's accommodation is not connected to the heat pump, but only to a gas-fired condensing boiler (33kW). In winter, air can be preheated by means of a heat exchanger positioned on the air extraction circuit.



ADDED EXTRA

Lighting is a major source of electricity use in schools. Consumption is reduced by making the best-possible use of naturaldaylight via high wide windows which channel daylight more deeply into classrooms. The electrical lighting system in the classrooms is equipped with regulators and interior sensors so that lights only switch on when required.

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