

Apartment Building Erlenweg, Volketswil, CH

PROJECT SUMMARY

Renovation to Swiss "Minergie"
Added insulation
New ventilation system

SPECIAL FEATURES

Sustainable living in the suburbs
of the 60's

ARCHITECT

kämpfen für architektur,
www.kaempfen.com

OWNER

Eigentümergeinschaft
Leuenberger / Gehri, Volketswil



IEA – SHC Task 37

Advanced Housing Renovation with Solar & Conservation



Before



After

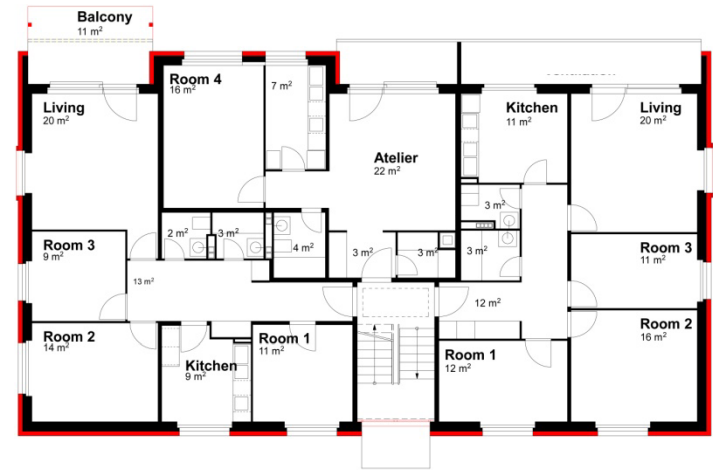


BACKGROUND: LIVING IN THE SUBURBIA

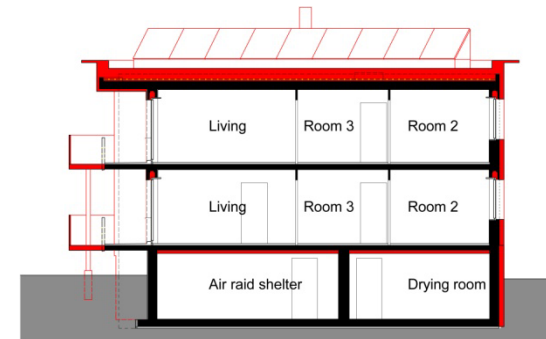
Volketswil is a suburb outside of Zürich near the Greifen Lake. The house is in a quiet area surrounded by similar buildings from the 1960's. This building is owned by two families, living in the house and renting three of the flats. The renovation work was carried out while the apartments were occupied.

BEFORE RENOVATION

The goal of higher energy efficiency was achieved by: adding insulation to the façades, solar collectors on the roof, and a ventilation system. This work had to keep within the financial limitations of the owners. In 1999 they installed new windows with plastic frames and insulated glass ($U = 1.3 \text{ W/m}^2\text{K}$). The central gas heating was rebuilt and the cellar ceiling insulated with 12cm of Polystyrol.



Upper floor



Section



CONSTRUCTION

Wall construction

U-value: 0.20 W/(m²·K)

(interior to exterior)	
Interior plaster	10 mm
Existing brick wall	320 mm
Existing exterior plaster	20 mm
Thermal insulation	140mm
Exterior plaster	10 mm
Total	500 mm

Basement ceiling

U-value: 0.29 W/(m²·K)

(top down)	
Wooden flooring	10 mm
Anhydrite Subfloor	30 mm
Cork insulation	20 mm
Concrete ceiling	160 mm
Mineral wool (Flumroc Top Akustik)	100 mm
Total	320 mm

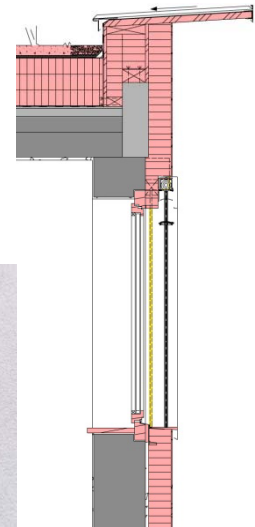
Roof construction

U-value: 0.12 W/(m²·K)

(interior to exterior)	
Concrete ceiling	180 mm
Screed laid to slope	100 mm
Mineral wool insulation	300 mm
Roof cladding	
Rubber granulate mat	20 mm
Extensive green area	60 mm
Total	660 mm

SUMMARY OF THE RENOVATION

- Façade, roof, and basement ceilings thermally insulated; heating and hot water pipes partially insulated.
- Balconies enlarged on the east side.
- New sun blinds installed on south façade and shutter boxes insulated on all sides.
- New glazed entrance with adjacent bike shelter.
- New roof with solar vacuum collectors.



Window detail



Summary of U-values $W/(m^2 \cdot K)$

	Before	After
Wall construction	0.93	0.20
Basement ceiling	1.04	0.29
Roof construction	0.35	0.12
Windows*	1.7	1.7

BUILDING SERVICES AND RENEWABLE ENERGY USE

New central ventilation system installed on top of the roof; supply air ducts run through façade joints; exhaust-air ducts runs through existing bathroom shafts. The ventilation system efficiency: 90%.

Central gas heating supplemented by solar-vacuum collectors with a of 3'000 liters storage tank. 70% of warm water and 6% of space heating covered by solar.

ENERGY PERFORMANCE

Space + water heating (primary energy)*

Before: 180 kWh/m²

After: 79 kWh/m² (Minergie Standard)

Reduction: 62%

INFORMATION SOURCES

Brochure authors

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