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
Eigentümergemeinschaft
Leuenberger / Gehri, Volketswil

IEA – SHC Task 37
Advanced Housing Renovation with Solar & Conservation
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 Wm²K). The central gas heating was rebuilt and the cellar ceiling insulated with 12cm of Polystyrol.
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  140 mm  
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.
**Summary of U-values W/(m²·K)**

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
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<tbody>
<tr>
<td>Wall construction</td>
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<tr>
<td>Basement ceiling</td>
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<tr>
<td>Roof construction</td>
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<td>0.12</td>
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<tr>
<td>Windows*</td>
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<td>1.7</td>
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**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 run 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
  - Nadja Grischott
  - Nadia Mastacchi