

Elderly home in Landeck AT

PROJECT SUMMARY

After renovating this home for the elderly, built in 1976, comfort was greatly improved. Balconies were closed in to increase the bedrooms. Handicapped accessibility was improved. The building complies with Austrian low energy requirements.

SPECIAL FEATURES

- prefabricated modules
- accessible for handicapped people

ARCHITECT

Gharakhanzadeh & Sandbichler
architekten zt gmbh

OWNER

Township Landeck
Public



IEA – SHC Task 37

Advanced Housing Renovation with Solar & Conservation

Before



After

BACKGROUND

The terrace structure, built in 1976, had become uneconomical due to sub-standard design. A three-stage renovation was planned and is in progress:

- 1999: the east front was renovated and existing heating system replaced by a modern central oil heating unit. Windows were replaced. Space heating demand was reduced to 59 kWh/(m²a).
- 2004: remodelling the building with 89 rooms instead of 109 (79 rooms for residents, 10 for employees). The building then complied with low Austrian low energy requirements. Space heating demand is now 38 kWh/(m²a).
- future: use of renewable energy

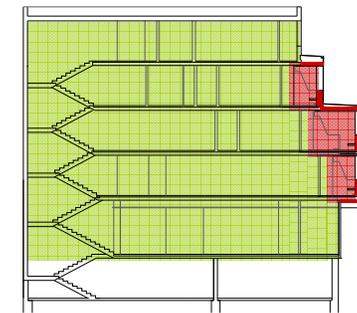
The renovation was subsidized by the state of Tyrol.

OBJECTIVES OF THE RENOVATION

- reduce operating and maintenance costs
- ecological renovation with renewable resources
- comply with Austrian low energy requirements
- renovation with least annoyance of residents
- high use of pre-fabrication modules

SUMMARY OF THE RENOVATION

- west, north and south facade, floors, roofs insulated
- new windows on the west façade
- enlargement of floor space by closing in balconies
- reduction of thermal bridges
- prefabricated room width and height modules
- addition of a conservatory



Section

Renovation
Lasting quality



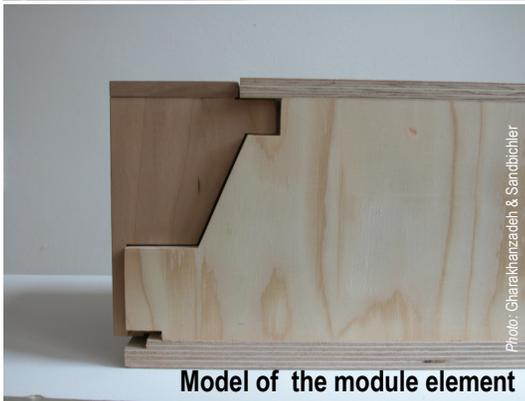


Prefabricated wood elements

Photo: Charakhanzadeh & Sandbichler



Photo: Charakhanzadeh & Sandbichler



Model of the module element

Photo: Charakhanzadeh & Sandbichler

CONSTRUCTION

Roof construction

U-value: 0.124 W/(m²·K)

(interior to exterior)

plaster (existing)	15 mm
reinforced concrete (existing)	230 mm
cellulose insulation	300 mm
wood boarding	24 mm
air space	20 mm
gravel, sealing layer	80 mm
Total	669 mm

Wall construction

U-value: 0.193 W/(m²·K)

(interior to exterior)

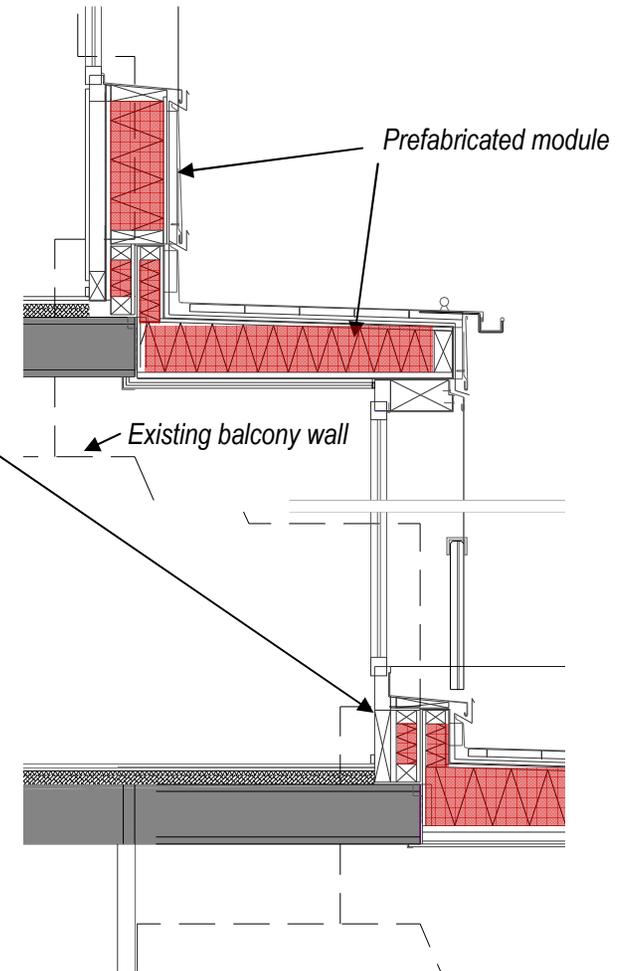
wood board	18 mm
lathing	70 mm
OSB airtight	25 mm
wood-fibre insulation	230 mm
hard board	15 mm
pre-oxidised copper sheet on corrugated aluminium and air space	56 mm
Total	414 mm

Basement ceiling

U-value: 0.146 W/(m²·K)

(top down)

floor konstruktion (existing)	120 mm
reinforced concrete ceiling (existing)	180 mm
mineral wool insulation	180 mm
Total	480 mm



Module window sections



Photo: Rupert Stamm



Photo: Rupert Stamm

West façade

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

	Before	After
Attic floor	0.1	0.12
Walls	1.3	0.19
Basement ceiling	0.5	0.15
Windows	ca. 2.6	1.20

BUILDING SERVICES

Space and domestic hot water heating are provided by the central oil heating installed in 1999. New heaters radiators were installed. The wooden construction's high insulation value and frameless glazing of the west façade minimize losses. Passive solar use is possible thanks to the thermal mass of the concrete structure. - Space heating demand was reduced by 65%.

RENEWABLE ENERGY USE

Solar collectors to heat domestic hot water and a heating system with renewable energy are planned for the third stage of renovation.

ENERGY PERFORMANCE

Space + water heating (primary energy)*

Before: 123 kWh/(m² a)

After: 93 kWh/(m² a)

Reduction: 25% (with existing oil heating)

Future reduction: 89% (new wood pellet heating)

*according to OIB Richtlinie 6

INFORMATION SOURCES

[Revitalising with S.A.M. - Synergy Activation Modules, bmvit and House of the future](#)

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