

Row Kroeven in Roosendaal NL

PROJECT SUMMARY

First large-scale Passive House renovation project in Holland. Innovative building technology and process.

SPECIAL FEATURES

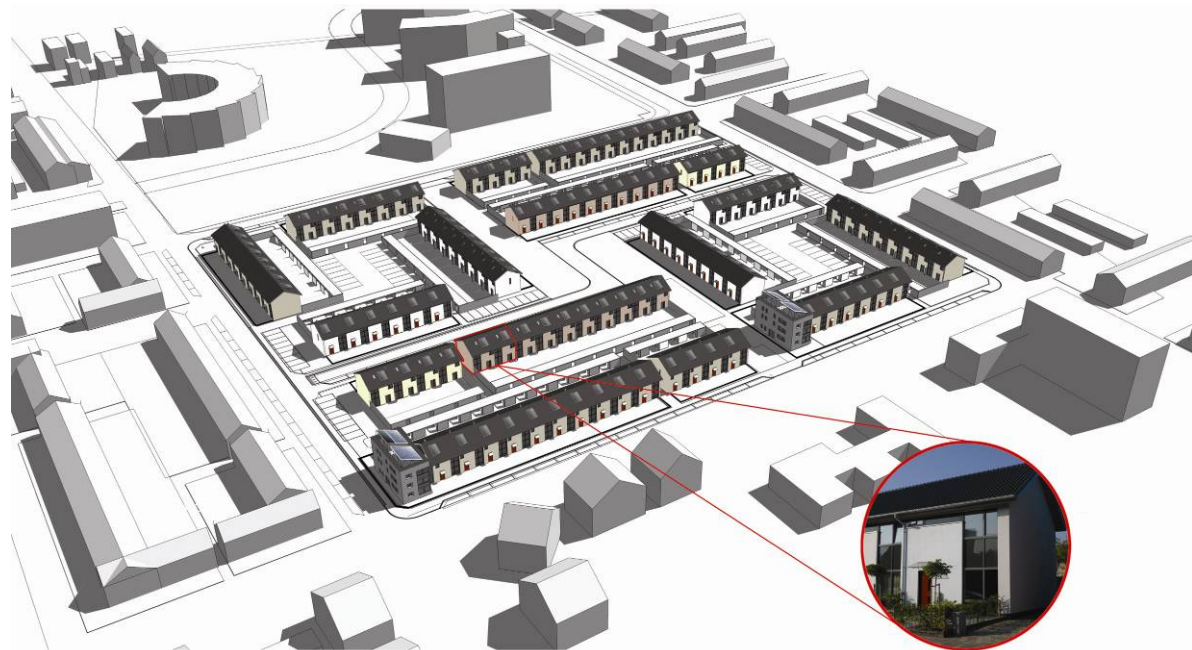
Tenants occupying houses during renovation.

ARCHITECT

Franke Architecten
www.frankearchitekten.nl

OWNER

Housing Corporation Aramis
AlleeWonen, www.alleewonen.nl



IEA – SHC Task 37

Advanced Housing Renovation with Solar & Conservation

Before



After

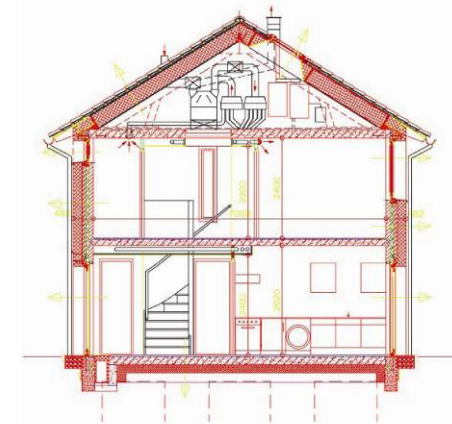


BACKGROUND

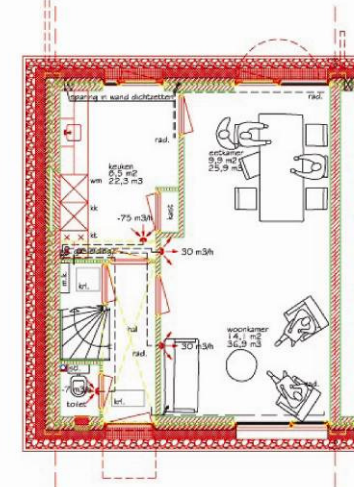
De Kroeven district is a typical Dutch social housing project in the city of Roosendaal, built in 1967. Because of rising energy prices the goal was to keep social housing affordable by reducing energy costs. Earlier renovations in the district were done by Aramis AlleeWonen to improve insulation, but never this radical. Three test houses with Passive House quality have already now been renovated. Lessons learned from these 3 houses should ensure a smooth ride for all those involved when in April 2010 the renovation of the other 246 houses will start.

SUMMARY OF THE RENOVATION

- Insulation underneath the ground floor.
- Single pane glazing replaced by triple pane glazing in Passive House quality frames.
- Complete new roof installed in four sections.
- Walls insulated with 200 mm XPS.
- New ventilation system with heat recovery.
- Optional solar system (2.73 m² collectors + 110 litre storage tank).



Section



Ground floor

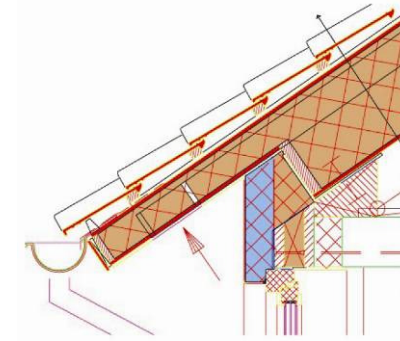


CONSTRUCTION

Roof construction (top tp bottom)

U-value: 0,111 W/(m²·K)

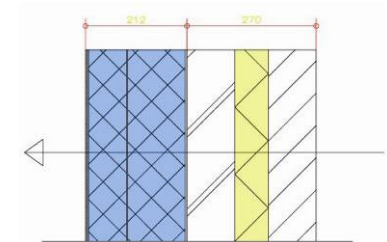
Roof tiles	65 mm
Battening	60 mm
Roof underlay	15 mm
Cellulose insulation	360 mm
OSB plate	15 mm
Total	485 mm



Wall construction (interior to exterior)

U-value: 0.116 W/(m²·K)

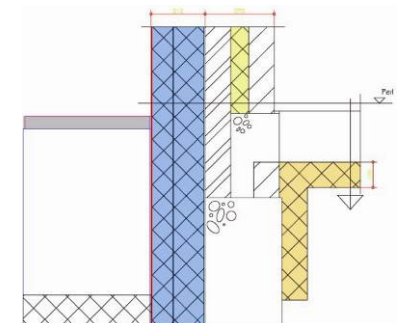
Sand-lime stone	100 mm
Insulation Rockwool	70 mm
Masonry	100 mm
XPS insulation	120 mm
XPS insulation	80 mm
Plasterwork	4 mm
Total	474 mm



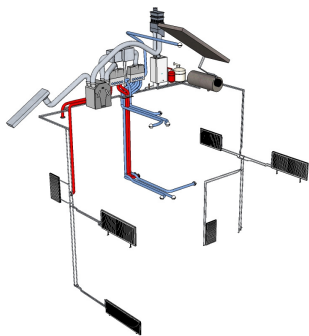
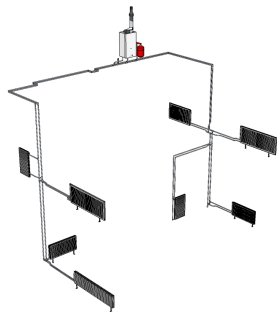
Ground floor (top down)

U-value: 0.249 W/(m²·K)

Top floor	30 mm
Reinforced concrete (existing)	200 mm
Foam underfloor	100 mm
Total	330 mm



Technical systems before



Technical systems after

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

	Before	After
Roof	0.42	0.111
Walls	0.587	0.116
Ground Floor	1.754	0.249
Windows	3.6	0.6

BUILDING SERVICES

Before the renovation a typical family in the district uses 1835 m³ of gas per year. After the renovation the average annual consumption will be reduced to 509 m³, a reduction of 1326 m³ per house per year. The total annual reduction for the complete project is 0.15 km³ of natural gas.

RENEWABLE ENERGY USE

Tenants can opt for a solar dhw system (2.73 m² collectors + 110 litre storage tank). This will save them roughly 112 m³ per year or about 6.50 Euro per month.

ENERGY PERFORMANCE

Space + water heating (primary energy)
Before: 219 kWh/m²
After: 21 kWh/m²
Reduction: 90 %

INFORMATION SOURCES

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