Apartment buildings Backa Röd in Göteborg SE

PROJECT SUMMARY
In Backa outside Göteborg, the public housing company Poseidon has been renovating their apartments, built in the 70s. Now the renovation process will continue but with very energy efficient solutions, first in a demonstration project.

SPECIAL FEATURES
Great duplication potential with many similar buildings in the area.

ARCHITECT
Pyramiden Arkitekter AB

OWNER
Bostads AB Poseidon

SHC
SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

IEA – SHC Task 37
Advanced Housing Renovation with Solar & Conservation

Before

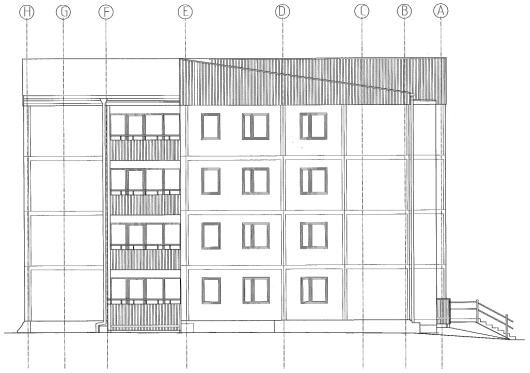
Planned design after renovation
(Photo: Pyramiden arkitekter)

BACKGROUND

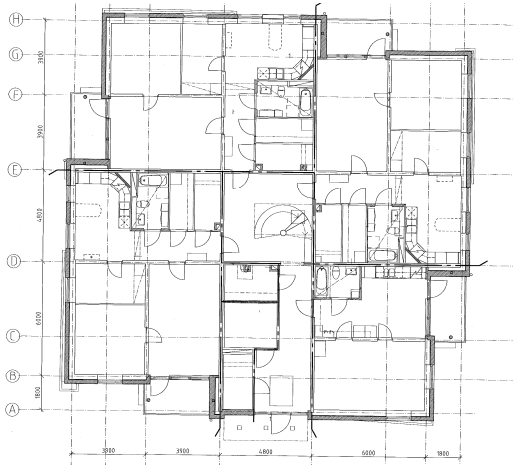
The public housing company Bostads AB Poseidon has been renovating its building stock continuously during the last years. The company aims to build and renovate buildings to be very energy efficient and climate neutral. Accordingly, their upcoming renovation project has energy issues as a major focus. The building presented here, built in 1971, needs major renovation. Experiences within the company from earlier renovation projects is being applied here. Also, a group of experts with low energy building experience supported the planning process.

RENOVATION MEASURES

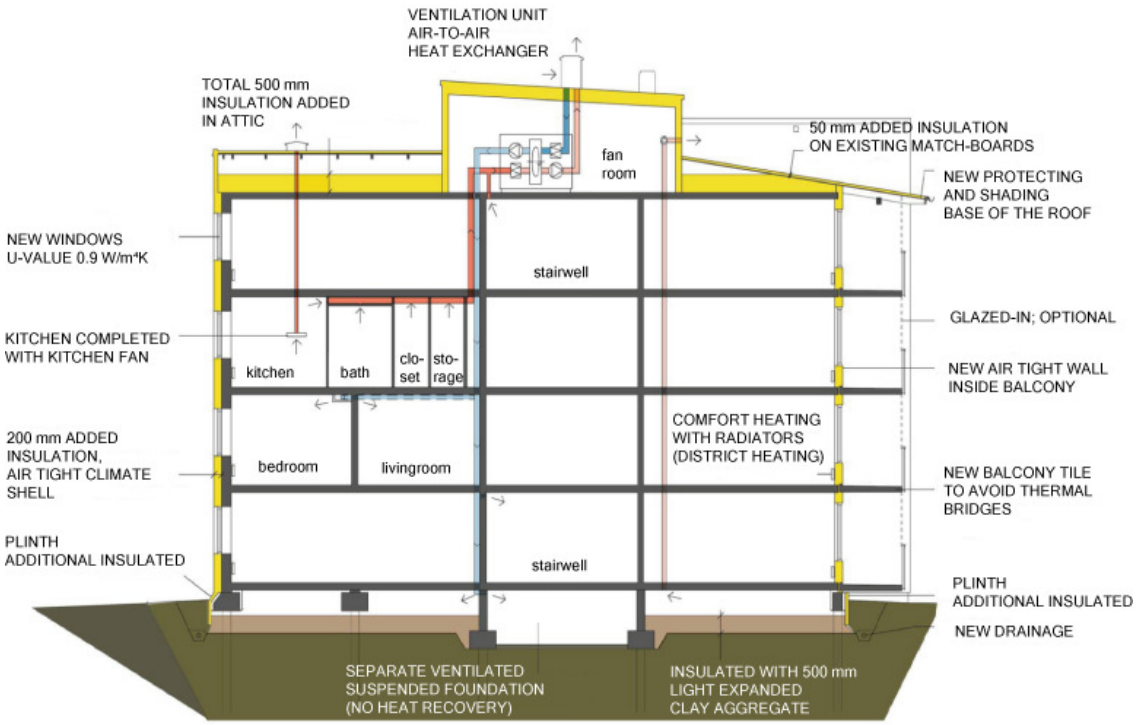
- Insulation: ground floor, exterior walls and roof
- New facade exterior
- New windows
- Increased air-tightness of the building envelope
- New balconies relocated to outside the facade
- New build entrance vestibules
- New ventilation system with heat exchanger
- New energy-efficient household appliances



Section *(Picture: Pyramiden arkitekter)*



Ground floor *(Drawings: Pyramiden arkitekter)*



Cross section *(source: Bostads AB Poseidon)*

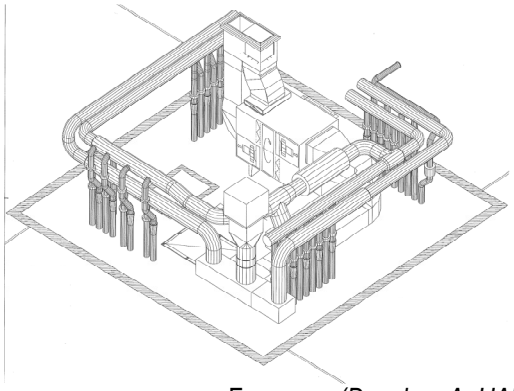
CONSTRUCTION

Ground construction	*U-value: 0.1 W/(m²·K)*
Light expanded clay aggregate	500 mm
Concrete (existing)	180 mm
Total	680 mm

Wall construction	*U-value: 0.17 W/(m²·K)*
(interior to exterior)	
Concrete (existing)	75 mm
Insulation (existing)	120 mm
Concrete (existing)	80 mm
Eps-insulation	200 mm
Plaster	10 mm
Total	485 mm

Roof construction	*U-value: 0.1 W/(m²·K)*
(top down)	
Millboard	
Insulation	50 mm
Match-board (existing)	23 mm
Air gap	20 mm
Loose wool insulation	500 mm
Concrete (existing)	180 mm
Total	773 mm

Photo *(Ulla Janson)*



Fan room *(Drawing: AoHAB)*

Summary of U-values W/(m²·K)

	Before	After
Attic floor	0.14	0.1
Walls	0.31	0.12
Basement ceiling	0.4	0.1
Windows	2.4	0.9

BUILDING SERVICES

There is one central ventilation unit with 85% heat recovery efficiency located in the attic. Additional heat is supplied to the apartments by heating radiators. Heat for space heating and domestic hot water is supplied by district heating. Other measures taken are hot water circulation to each apartment, installation of needle flushed toilets and energy efficient water taps. Also new energy efficient white goods are installed.

RENEWABLE ENERGY USE

The district heating in Göteborg is mainly based on waste heat from industrial processes, garbage combustion and heat pumps. In this project there will be no solar thermal system installed, since it is impossible to justify this financially or ecologically for the above reasons.

ENERGY PERFORMANCE

Space heating, water heating (incl. distribution losses) and electricity use in the common area:

Before: 178 kWh/m²a
After: 60 kWh/m²a
Reduction: 66%

INFORMATION SOURCES

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www.poseidon.goteborg.se

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