Rådhuslunden_City hall grove

by Asta Justesen / 2023-03-15 14:27:10 / International / 13 / EN

Primary energy need :

76 kWhpe/m².year

(Calculation method : Primary energy needs)

ENERGY CONSUMPTION

Economical building *Building*

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

Building Type : Terraced Individual housing
Construction Year :
Delivery year : 2017
Address 1 - street : Smørum Smørum RåDHUS, Denmark
Climate zone : [Dfb] Humid Continental Mild Summer, Wet All Year

Net Floor Area : 7 950 m² Other
Construction/refurbishment cost : 12 000 000 €
Cost/m2 : 1509.43 €/m²

Certifications :

General information

Flexible public housing

How do you convert an older town hall into public sustainable housing?
Both above, inside and next to Smørum's former Town Hall, there is 86 visionary and responsible public housing. BJERG's total consultancy thus included both new construction and a thorough renovation.

The former Smørum Town Hall has been converted into 24 apartments with their own gardens and courtyards. The climate shield is optimized, based on passive house principles, corresponding to ultra-low energy. Upstairs and next to the town hall, 23 and 39 apartments with their own roof terraces, balconies or gardens have been built, respectively, in light wooden modules.

The concept for Rådhuslunden is flexible and dynamic housing. Therefore, a home must be able to create the framework for a single person one day and be

home to a family with two children the next. The ambition was also healthy and inspiring homes that should be cheap to build and cheap to run.

The building has a dynamic expression with the varying protrusions between the homes. With horizontal wooden panels, variation in facade elements and tight lines, an exciting and modern expression emerges. At the old town hall, the load-bearing structure with the classic red bricks and the distinctive concrete element has been preserved.

The entire area is laid out with smaller meandering paths and rainwater beds, which tie the various smaller local environments of the buildings together, and at the same time link it with the surrounding city.

Modular construction

Rådhuslunden is being built as a modular building, which is made up of "bricks" of the same basic size, but each in its own material, which precisely emphasizes the modular nature of the construction. The "bricks" can be put together in different ways, thus creating different home sizes. The apartments are varied in five different sizes from 38.5 m² to 110.5 m².

The facade elements have a flexible mounting system, so they can also be easily replaced if necessary. Modular construction not only facilitates construction, but also ensures an advantageous overall economy through an optimized and industrial approach to the construction process, transport and assembly.

The building's sustainable mechanism

The mechanism for the settlement is intended as a "self-sufficient" system, where you utilize nature's free resources such as the sun's rays and rainwater. The homes' need for added heat is reduced to a minimum due to a compact design, thermal bridge-free constructions and a well-insulated climate screen.

Photo credit

Jonas Krebs

Stakeholders

Contractor

Name : Domea
https://www.domea.dk/

Construction Manager

Name : Bjerg Arkitektur A/S
https://bjerg.nu/

Energy

Energy consumption

Primary energy need : 76,00 kWhpe/m^2.year

Calculation method : Primary energy needs

Breakdown for energy consumption :

PE demand (non-renewable Primary Energy 76 kWh /(m²a) on heating installation, domestic hot water, household electricity and auxiliary electricity calculated according to PHPP:

- Air tightness: n50 = 0.6/h
- Annual heating demand: 15 kWh/(m²a)
- Heating load: 19 W/m²
- Cooling load: 0 W/m²

Envelope performance

Users' control system opinion :

- External Wall
Wooden profile 15 mm
Air 22 mm
Wind barrier 8 mm
Wood with insulation 245 mm Plywood 12 mm
Wood with insulation 95 mm
Gypsum 30 mm
U-value: 0.11 W/m²K

- Roof
Plywood 12 mm
Lath and air 45 mm
Wood with insulation 440 mm
Air 22 mm
Gypsum 25 mm
U-value: 0.086 W/m²K

- Floor
Polystyren 300 mm
Air 10 mm
Powerboard 8 mm
Insulation 245 mm
Plywood 18 mm
Parquet 15 mm
U-value: 0.066 W/m²K

Renewables & systems

Systems

Heating system :
- Heat pump

Hot water system :
- Heat pump

Cooling system :
- No cooling system

Ventilation system :
- Double flow heat exchanger

Renewable systems :
- Solar photovoltaic

Other information on HVAC :
The Mechanical systems is one compact unit that provides ventilation, heating & domestic hot water.

Environment

Urban environment

- Part of a renewing of the city center and Urban blue and green concept. A site for the former town hall was used to build social housing with integrated green and blue outdoor spaces. The buildings in wood prefabrication, were placed on site and integrated on the old town hall construction. Blue spaces for rainwater biotop and climate robust solutions for future climate change.
- The entire area is laid out with smaller meandering paths and rainwater beds, which tie the various smaller local environments of the buildings together, and at the same time link it with the surrounding city.

Products

Product

Compact S Nilan

Nilan

https://www.nilan.dk/

Product category : Structural work / Passive system

Compact S is a ventilation unit that can ventilate the home as well as produce domestic hot water in an overall compact installation. The system is intended for standard single-family houses or apartments with a ventilation requirement of up to 340 m3/h.

A major advantage of the Compact S is, in addition to a large space saving in the technical room, that ventilation and domestic hot water work together in terms of

control, which allows for optimized energy consumption and thus an overall energy saving.

Costs

Construction and exploitation costs

Total cost of the building : 12 000 000 €

Health and comfort

Life Cycle Analysis

3,8 kg/m2 per year

Water management

Rain water is running to a rain biotope, grey water is filteret on site.

Indoor Air quality

- Cross ventilation can be used in al rooms.
- Indoor air quality in the summer: all rooms have windows to outside and opens to living area.

Comfort

Temperature level :

- Interior temperature winter 20°C
- Interior temperature summer 25°C

Quality of life and services

- The former Smørum Town Hall has been converted into 24 apartments with their own gardens and courtyards.
- Upstairs and next to the town hall, 23 and 39 apartments with their own roof terraces, balconies or gardens have been built.

Carbon

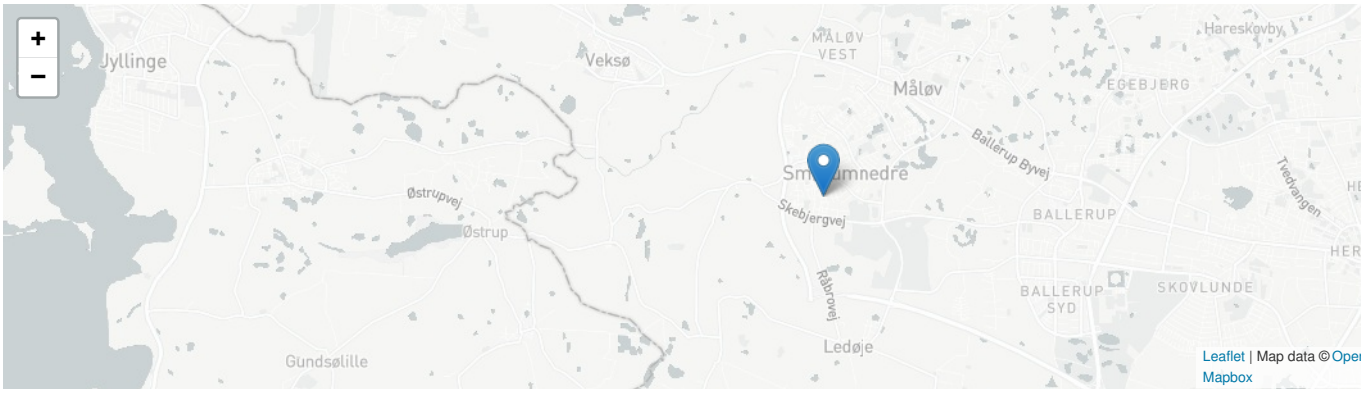
GHG emissions

GHG emissions (GHG in use can be found in the PER sheet in the PHPP): 0 according to PER and CO2/kWh final DK2035

Contest

Reasons for participating in the competition(s)

- The climate shield is optimized, based on passive house principles, corresponding to ultra-low energy;
- The ambition was to built healthy and inspiring homes that should be cheap to build and cheap to run;
- Rådhuslunden is being built as a modular building which facilitate not only construction but also ensures an advantageous overall economy through an optimized and industrial approach to the construction process, transport and assembly;
- The facade elements have a flexible mounting system, so they can also be easily replaced if necessary;
- The mechanism for the settlement is intended as a "self-sufficient" system;



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