

insolplan

roskilde (denemarken)

2de prijs

2001-2002

ontwerpen van 400 woningen met zonneënergie als centraal thema.

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*general statements*

The durable development of the environment as a prime quality of actual life and a potential living standard for the future generations.

Architecture will be developed in mutual consent with the forest belts, supporting the scale of the natural feature. A reduced architectural footprint enlarges the abstract and surrealistic approach of contrasting landscape icons. The concept intends to enlarge the development of the public and semi-public space, the private territory being locked up within the architectural walls. The equilibrium between both voids and solids is a priority on every site area proposal.

integration of social functions

The integration of social functions in the area is forest belt related. Within the limits of the Trekroner development zone the forest belts will be strong landmarks along the Nordens Parkvej, with a small architectural folly as attachment. The implantation of shops, public

services and other functions in connection with the university campus, on sequence of the forest belts, finds his logic in the easy access of this public points in permanent visual contact while driving in the Parkvej with the car or the bicycle.

landscape

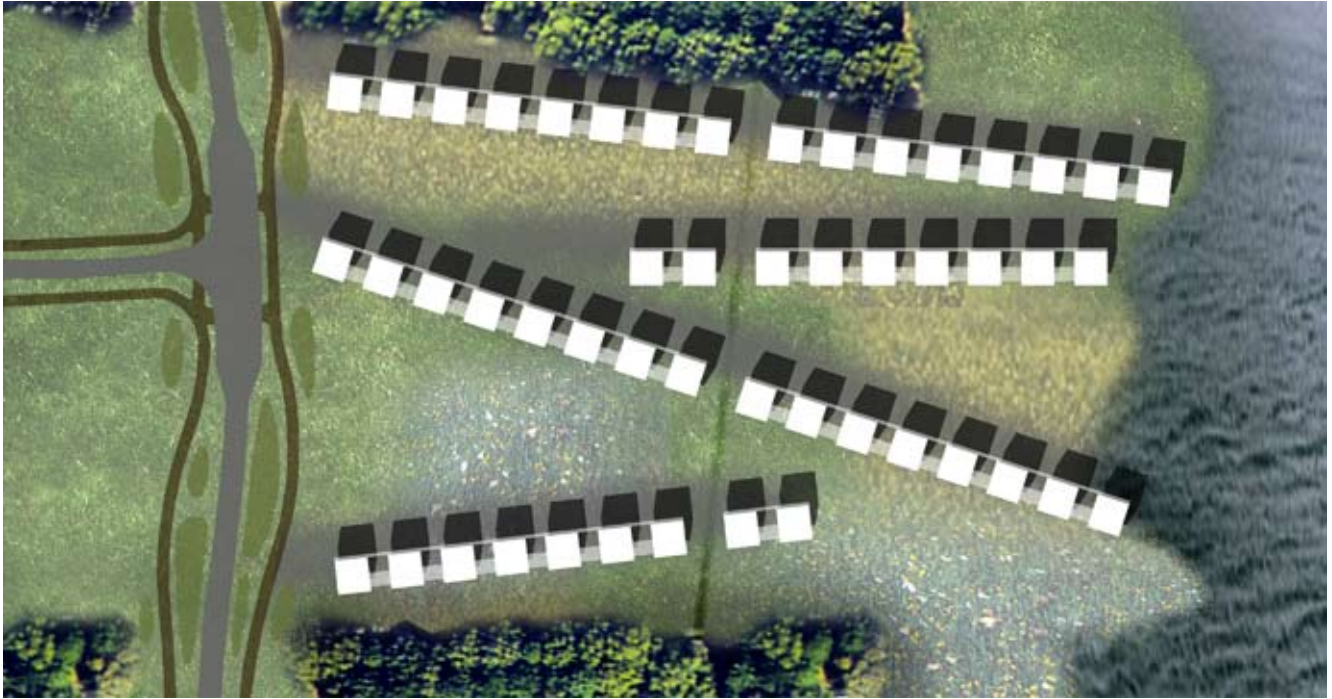
The landscape around the building-units is constructed as follows. Seems there will be the presence of the forest belts referring to a big scale endemic natural feature, a scale which is able to compete with the building-units, the decision is made to leave the space around the buildings as empty, and as open as possible. This strong juxtaposition of contrasting landscape-icons, stresses the intrinsic specificity of each individual icon.

The purpose is to make a multifunctional open and gentle landscape with a futuristic looking expression, but made with unsophisticated self-evident materials, which refers to the place, to the Genius Loci.

The space is divided by oscillating planes of alternating mown grass and lesser mown grass in which a part of the endemic flora can develop. This results in a fascinating but more or less ecological graphic pattern, which still remains flexible and open, as far as functional requirements is concerned.

In this open landscape, which refers to the surrounding landscape, a few specific elements are provided.

The modular recreation spots, being open hardened spaces of more or less equal surface, which, on the side of the main wind, are sheltered by a waving hedge, which is cut in a way that expresses its formal autonomy towards the building morphology. Those waving hedges should consist of one endemic species, or at least one, which refers to Danish Landscape typology. The waving shape is also an iconographic expression of shelter in the large open field. Those recreational spots can contain a children-playground, a basketball field etc.



area 2B

Visual guidelines are implemented by the direction of the shrubs and by the building parallel. The double connected stilt building is flanked by the six stages of the subsidised dwellings, marking the beginning and the end of the traffic lane. The contradicting requirement of this orientation area has been resolved by the use of complete south oriented flats with private terrace, above the east – west oriented units. Due to the high density, the landscape principle chosen here is one of autonomous oscillating shrub-walls which function as windscreens, but which also give a counterbalance to density of the building morphology.

area 4 (above)

The area implementation is based on wide open perspective from the Parkvej in direction of the lake. The subsidised dwellings can be

integrated in this configuration. One architectural strip is calculated on energy, costs, urban density, construction. The elaborated part leans against the forest belt as natural protection to northern wind. The units are wide opened to the south, with wide perspective over the area. The Parkvej connected traffic lane and grass paved border gives access and parking facility to all 50 flats and 5 houses, all along the building stilts.

area 9

Four clustered horizontal platforms express the feeling of territory. Houses have individual gardens and an intermediate space as extension of the private space.

The clustered family houses are wide opened to the south offering wide landscape perspective on both sides, northerly over the park like scenery in direction of Kallemosegard, southerly over the Nordens Parkvej in direction

of the university centre. The cluster envelope and the solar thermal systems are cluster concerns.

The use of the intermediate space is restricted to the individual family. The landscape principle used here is that of an 18th century dissimulative scenery where the landscape is open with just a few clumps of trees and a big open grass space.

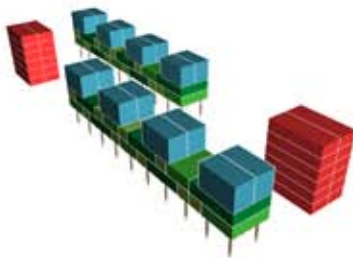
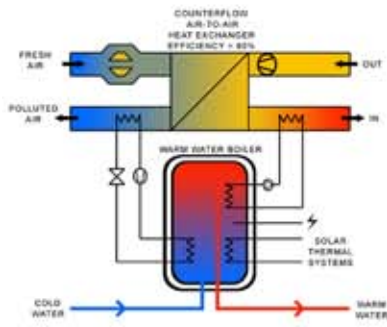
The recreation modules are half-hidden in the soil which causes invisibility and openness, seen from the units. These recreationspaces are on top of this hidden between non-mown areas, which makes an allusion to the surrounding landscape.

sustainability as result of flexibility

The lifetime of a building depends largely on its flexibility, its capacity to adapt to changing needs and taste. The designed units are flexible in function, circulation and envelope.



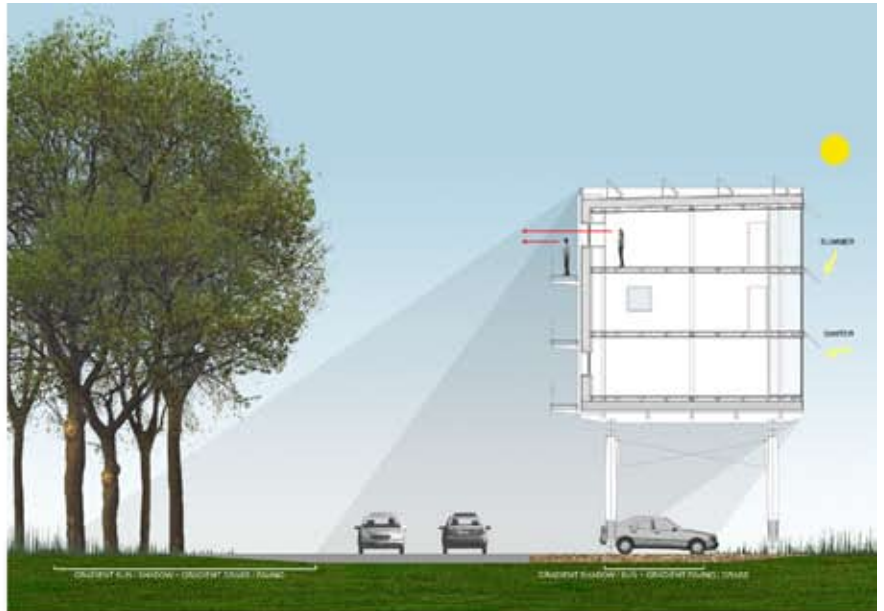
L'Eléphant Giraffe, Salvador Dali (1948)



The flexergy principle is used: urban design, architecture, and not the energy supply systems, is the essence of the design. Service-leasing strategy keeps energy supply and other systems up to date.

energy use and operation

The goal is to create passive houses. These are buildings with a comfortable indoor climate in winter and summer, without a conventional heating (and cooling) system. Therefore, the annual demand for space heating may not exceed 15 kWh/(m².a). The remaining heat demand will be supplied by heating the supply air in the ventilation system. A small heat pump extracts the energy from the exhaust air and delivers it to a boiler, from where the heat is delivered to a heat exchanger in the supply air (see figure below). The use of the heat pump will be reduced further by connecting the boiler to solar panels. The total energy demand (space heating, domestic hot water and household appliances) should be below 15 kWh/(m².a).



service-leasing fuel cell technology

Fuel cells are ideal for power generation, either connected to the electric grid to provide supplemental power and backup assurance for critical areas, or installed as a grid-independent generator for on-site service in areas that are inaccessible by power lines. Since fuel cells operate silently, they reduce noise pollution as well as air pollution and the waste heat from a fuel cell can be used to provide hot water or space heating.

There are three main components in a residential fuel cell system - the hydrogen fuel reformer, the fuel cell stack and the power conditioner. Many of the prototypes being tested and demonstrated extract hydrogen from propane or natural gas. The fuel cell stack converts the hydrogen and oxygen from the air into electricity, water vapour and heat. The power conditioner then converts the electric DC current from the stack into AC current that many household appliances operate on. The expected pay back period on a residential fuel cell for a typical homeowner is estimated to be four years. The initial price per unit in low volume production will be approximately 1,500 EUR per kW, with the ultimate goal of getting costs below 500 EUR per kW. Fuel cell developers are racing to reach these cost targets.

towards service-leasing strategies

The need for a fundamental change towards service-leasing business is highly felt in most engineering companies. The problem rises

from the fact that an engineering team is compensated for what it spends, not for what it saves. Higher profits will come from better solutions rather than from selling more consumption goods. For example, leasing better comfort at a lower cost instead of selling air-conditioners, leasing vertical transportation services instead of selling elevators. Leasing lets companies capture the savings from lower energy and maintenance costs. It can be remarked that service-leasing strategies might also provide for a partial answer considering whole buildings.

Similar to the developments for building materials and engineering, in some companies business strategies exist for a kind of service-leasing which could be called the 'provision of quality shelter'. The provision of constant quality of a product and closed loop production processes make it feasible for the producer to guarantee maintenance at no cost for the user or the owner.

For this project, we consider it plausible that continuous upgrading and maintenance can be provided while leasing fuel cell technology. This reduces initial cost for the builder and gives the manufacturer the chance that developments in better efficiency can be installed and tested, while recycling older equipment and revising production of new models towards waste prevention and closed-loop recycling. It is recommended that this approach shall function as a European example for comfort leasing.



West Pier, Brighton (UK)