

WOODEN ARCHITECTURE

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- Research:
Climate-conscious
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WOODEN TOWN TRADITION

- Traditional wooden towns in Finland were dense.
- It was the functionalist style that broke urban structures, and caused the urban sprawl.



LINNANMAA, OULU

- First modern wooden town in Finland.
- Multi-storey wooden buildings.
- Planning, and fire and sound isolation systems development carried out by the University of Oulu Wood-studio.



LOW-DENSE PLANNING

Low-dense building is an alternative both for detached houses and multi storey housing.

- Cost effective.
- Different building types in wood.
- Social milieu.
- Eco-efficiency:
 - solar architecture,
 - good micro-climate,
 - use of rainwater,
 - nature area preserved.

ROVANIEMI (KUISMANEN)



CO2-NEUTRAL TRONDHEIM

Demanding target in Brøset:

- To build CO₂-neutral area (CO₂ today 11 tn/inh/a in Norway, target 3 tn/inh/a)
- Efficient town planning.
- Top architecture.
- New traffic concepts.
- Ecological energy production and energy saving.
- Green urban environment.
- Balanced safe social milieu.
- Reuse of wastes, recirculation.
- New sustainable life-style.

(KUISMANEN AND COWI AS 2011)



BRØSET. TRONDHEIM



Dense, livable, multi-functioning wooden town:

- Everyday life within walking or biking distance.
- Free time facilities.
- Green network.
- Ecological wooden buildings.
- New building types.
- Local economy.

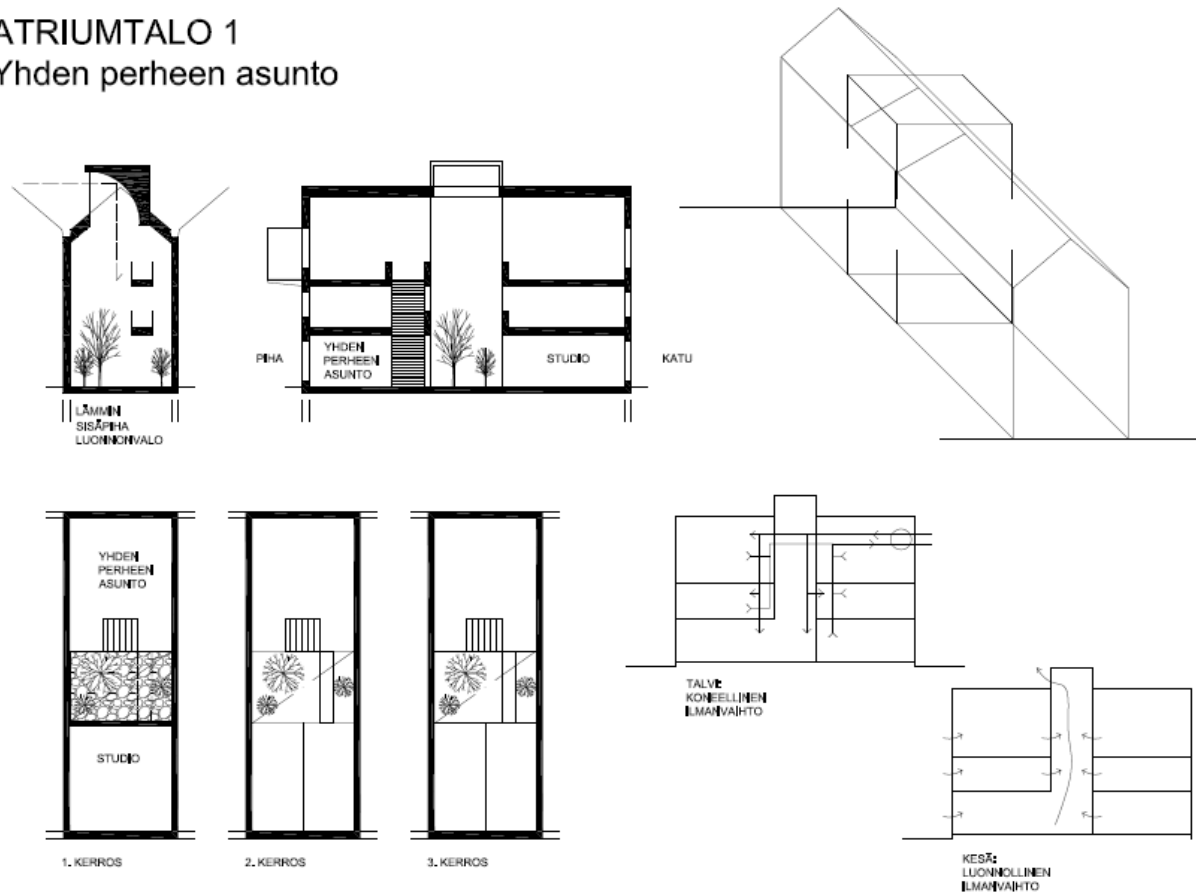
Planning process:

- Analyses.
- CO₂ calculations.
- Planning guidelines.

BRØSET, ATRIUM HOUSE

- Dense wooden detached houses that need very small building site.
- A milieu that resembles small town will be created.

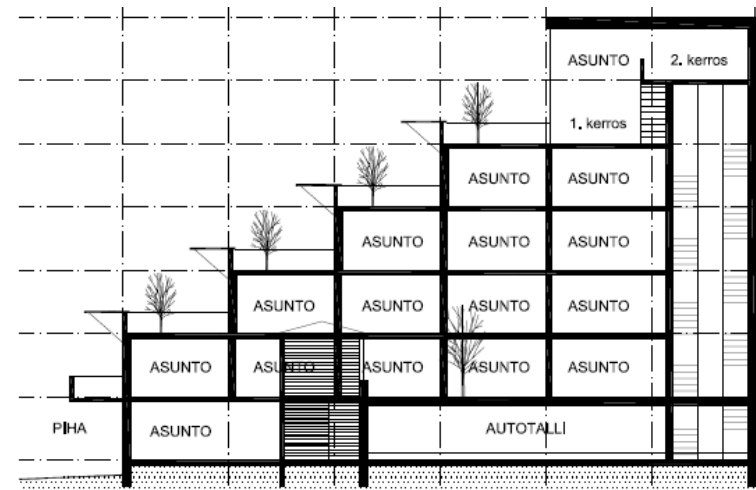
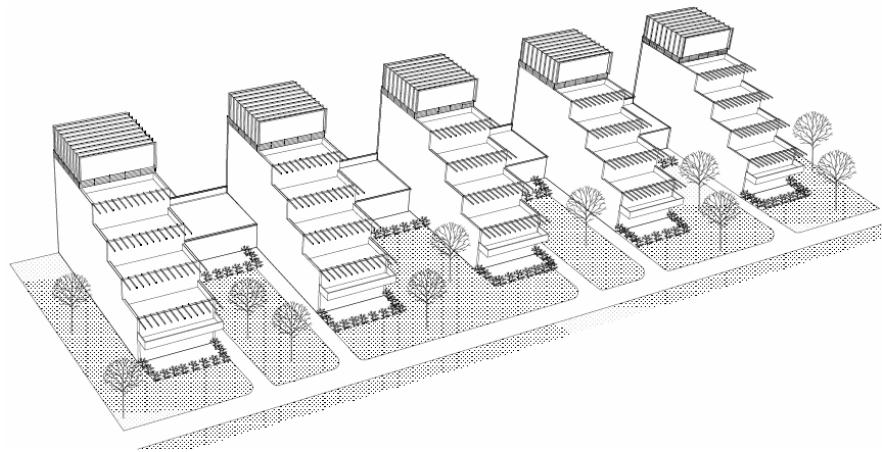
ATRIUMTALO 1
Yhden perheen asunto



BRØSET, MULTI-STOREY BUILDING

- Wooden multi-storey buildings are planned.

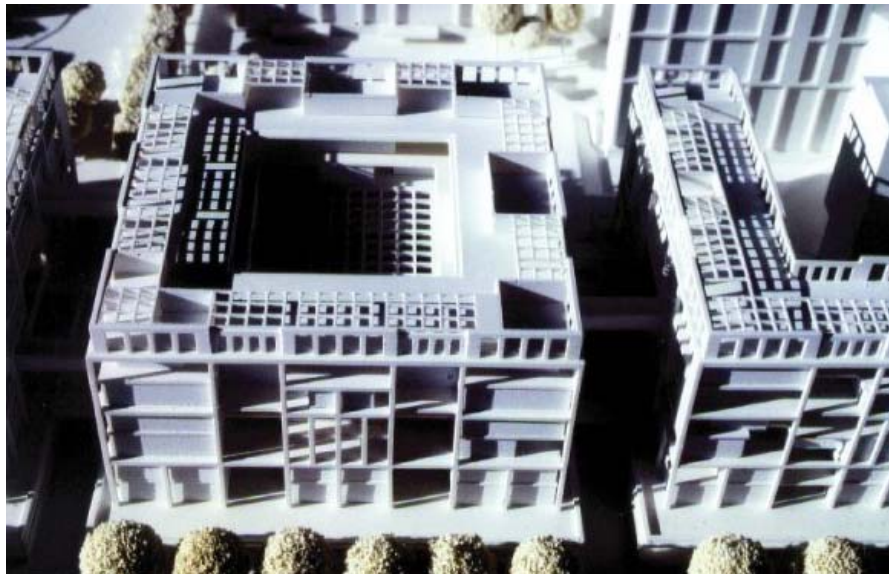
(KUISMANEN, 2011)



HYBRID CONSTRUCTION

In many cases central areas can be of concrete, while the most part of the residential blocks are of wood.

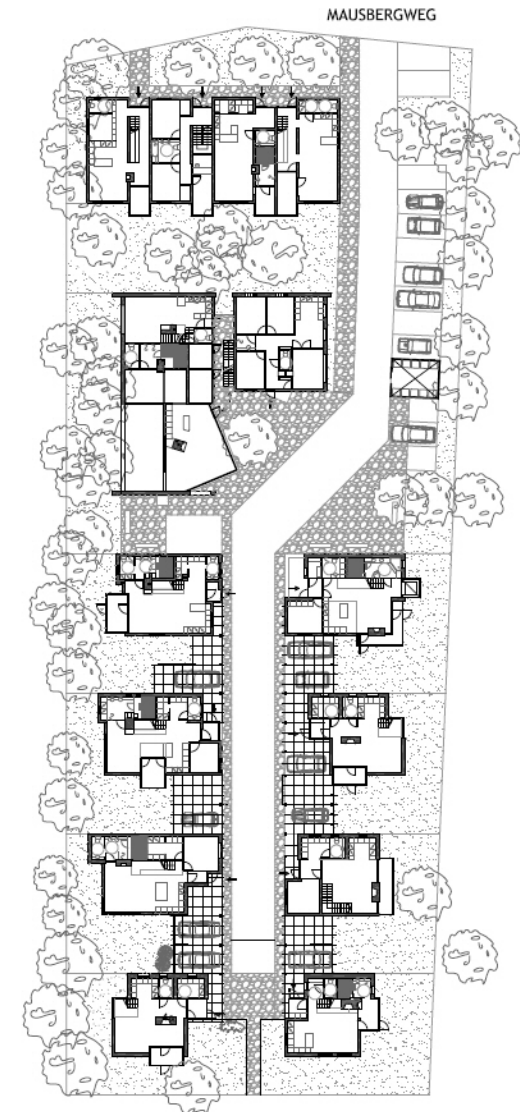
*NEW TOWN COMPETITION,
SHANGHAI, CHINA. 2ND PRICE.*



MIXED HOUSING BLOCK

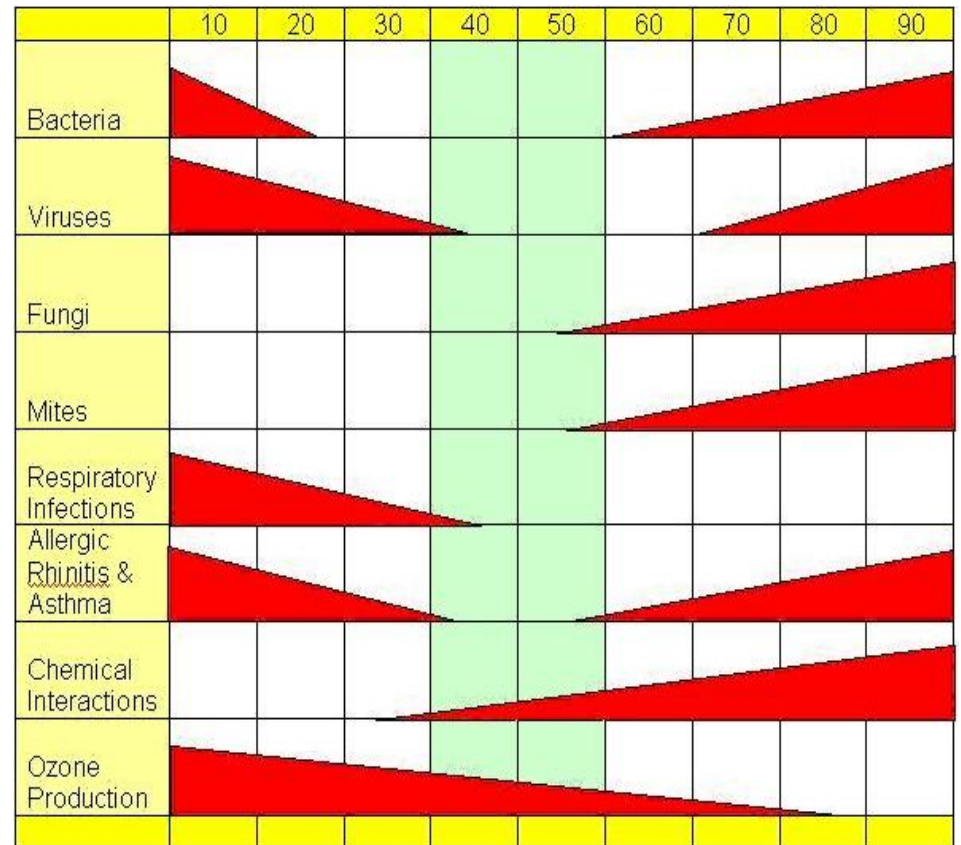
- Finland-Home buildings suite well different kinds of needs.
- All-generations housing blocks make the living of senior citizens easier.

*LOW-DENSE HOUSING, SPEYER, GERMANY.
(KUISMANEN 2010-)*



HEALTHINESS

- Wooden constructions help to keep the indoor air humidity inside the recommended area
- Wood, which is treated ecologically, doesn't give harmful emissions to the indoor air
- Many European doctors recommend living in a log house.



FIRE SAFETY

Modern wooden buildings are fire-safe. There are different methods to improve fire resistance:

- 1 Protective paints and treatments.
- 2 Massive wooden posts and beams.
- 3 Plasterboard cover.
- 4 Sprinkling.

Eight storey wooden buildings are permitted in Finland.



EARTHQUAKES

Wooden houses can be designed to stand earthquakes. Buildings have special steel parts to keep the parts together in the case of an earthquake.

Some of the standing buildings after the Kobe earth-quake in Japan were the Finnish Kerto-wood buildings.



LINNANMAA, OULU

Element system and natural treatment development.

- Different solutions for sound isolation have been developed and tested
- Many inhabitants say that the sound isolation and acoustics of wooden buildings are better than in concrete ones.

(KUISMANEN.1997 – 2002)



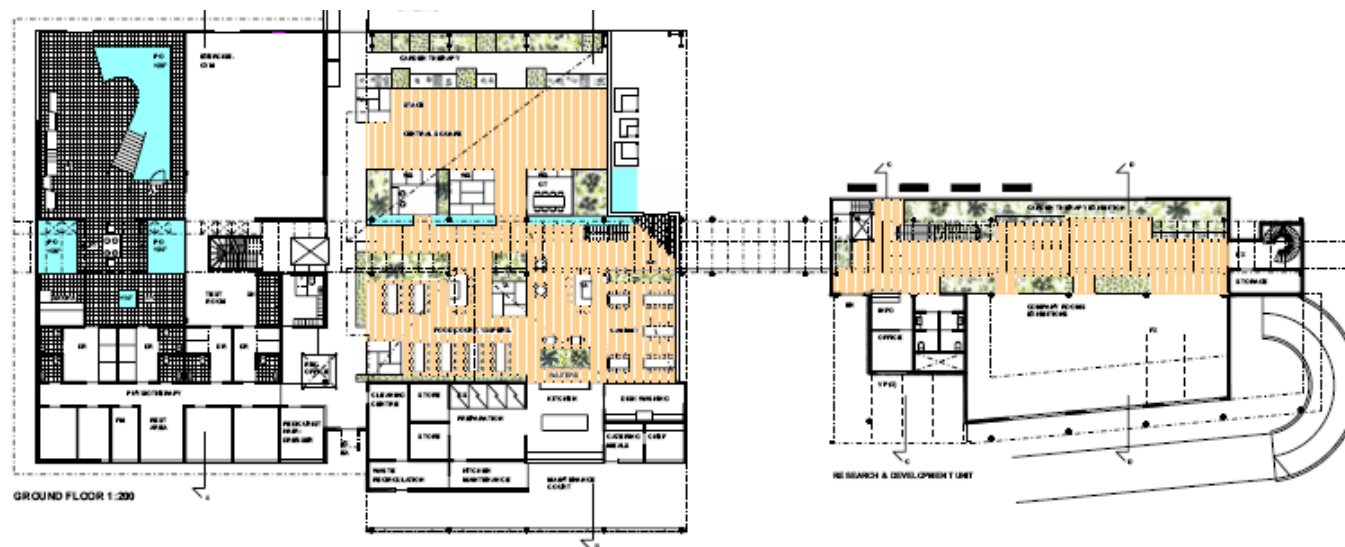
LINNANMAA



SENDAI, JAPAN

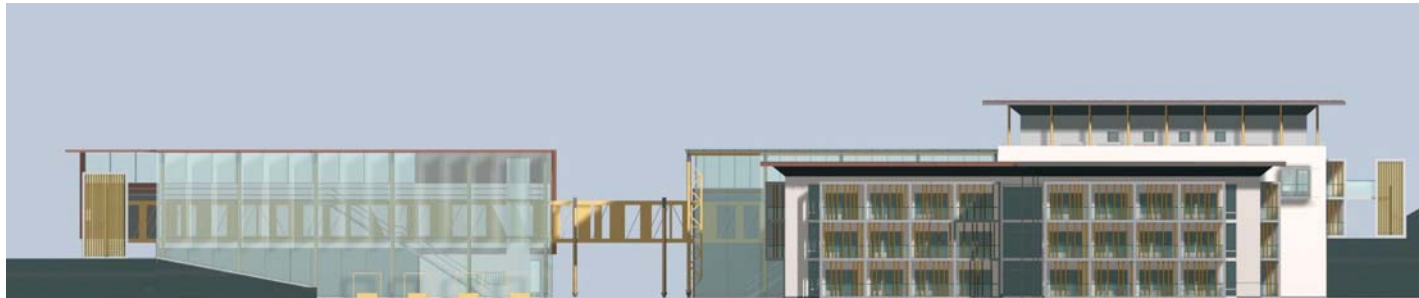
- Geriatric research centre, nursing home, services.
- Kerto-wood and bamboo structures, partly concrete.

*COMPETITION ENTRY 2005
(KUISMANEN)*



SENDAI

- Natural ventilation and cooling.
- Solar heating.



BUILDING SYSTEM, FINNFOREST

Kerto-wood system:

- Post-beam bearing structure.
- Kerto-riipa floor and roof elements.
- Short building time.
- Relatively free architecture.



OFFICES

Large office buildings can be made with Finnish wooden building systems.

(TASA ARCHITECTS)
(PIANO ARCHITECTS)



OFFICE PILKE, ROVANIEMI

- Post-beam structures.
- Glue lam beams.
- Wooden facade elements.

(SARK ARCHITECTS 2010)



LARGE ELEMENTS

Large framed elements:

- Cost effective.
- Suited for housing.



HIGH BUILDINGS

- Eight stories high buildings are allowed in Finland.
- First projects will be built in 2012.



ABOVE: POST-BEAM AND BEARING OUTER WALL CONSTRUCTION (KOSKINEN, REPONEN)

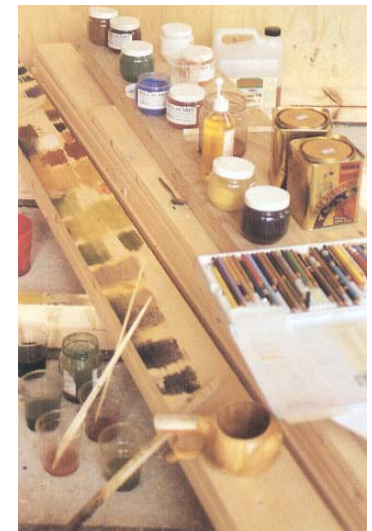
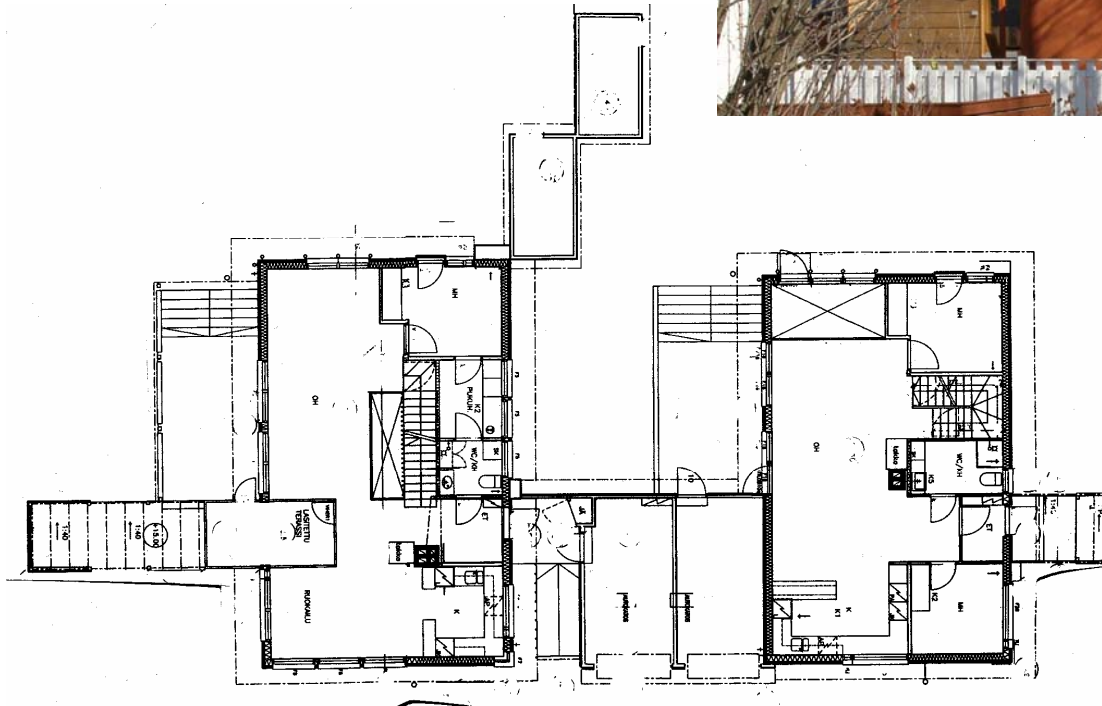
BELOW: LARGE ELEMENTS USING CLT-PLATES (STORA-ENSO)



WOODEN HOUSES

- Ecological wooden houses
- Industrial system development.

OULU. (KUISMANEN 2004)



WOODEN HOUSES



WOODEN HOUSES

- House A has natural ventilation.
- House B has mechanical ventilation with heat recovery.

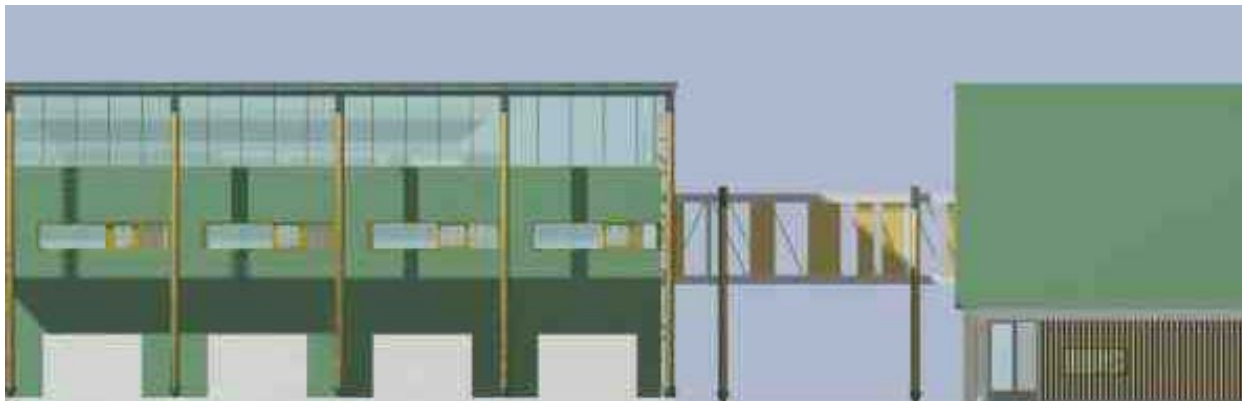


INTERIOR DESIGN



COASTAL BUILDING

- Because of the rising sea-level and tsunamis there is the need to develop new kind of coastal building.
- Wood is light and tolerates dynamic loads, which makes it suitable for new kind of safe quayside architecture.



SENIOR HOUSING

- Wood is safe and agreeable material for senior-housing
- Wood is warm to touch, and it evokes positive memories.
- New wooden constructions have a long life-cycle.

(KUISMANEN 2010)



SENIOR HOUSING

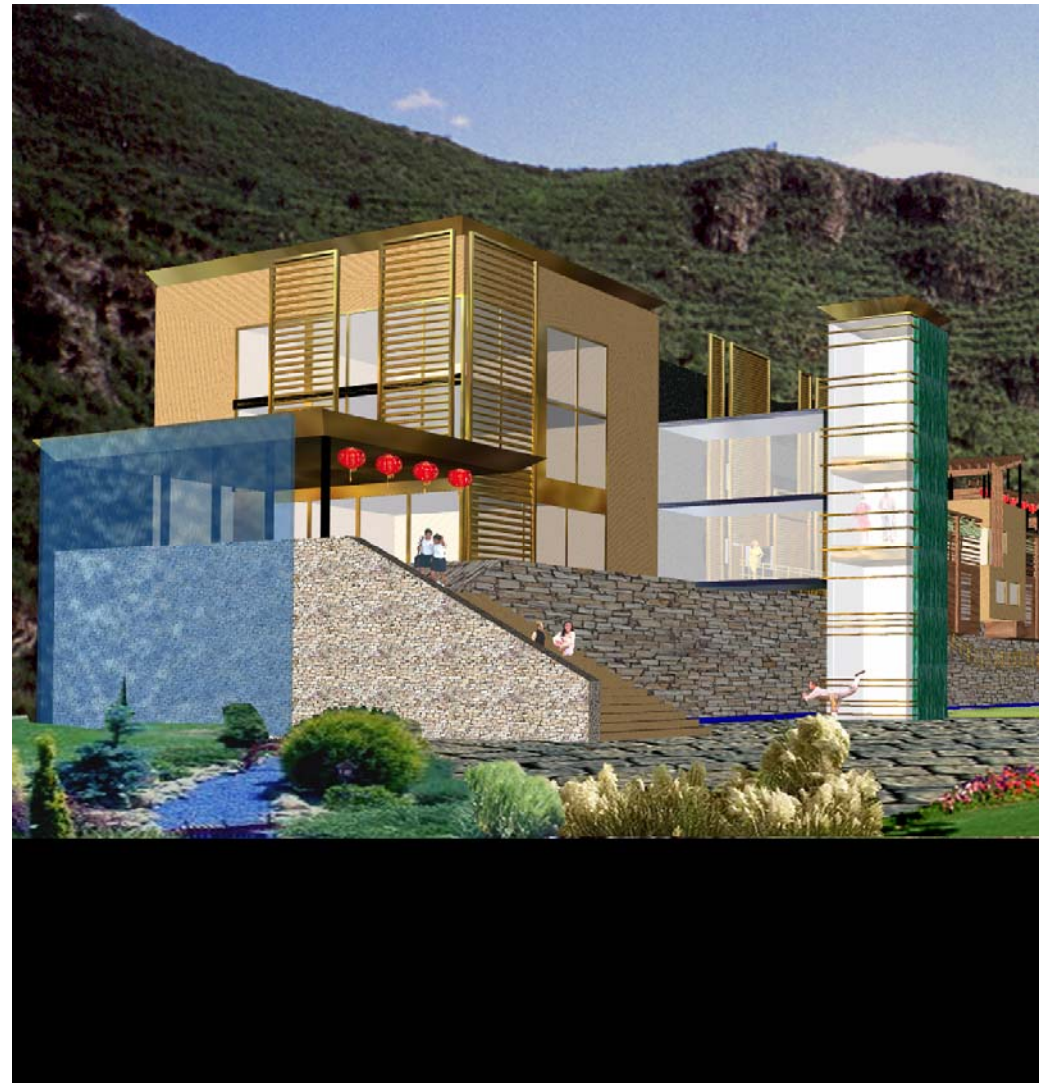
Senior-housing types:

1. Own homes with services.
2. Senior homes.
3. Nursing homes.

Natural house-techniques:

- Natural cold water cooling.
- Reed-bed cleaning of waste waters.
- During hot days massive wooden structures feel cooler.

(KUISMANEN 2010)



SCHOOL BUILDING

- Good results of Finnish schools in the international PISA-survey are result of new pedagogy and good school architecture.
- Wood makes a harmonious milieu for children.
- With post-beam system it is possible to build flexible schools and kindergarten rapidly.

(KUISMANEN 2008)

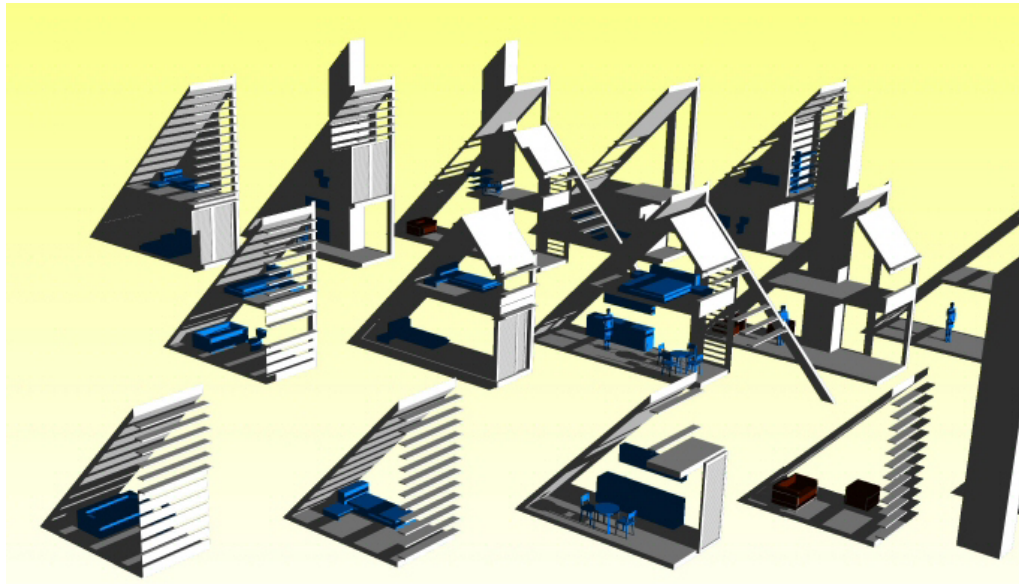


SCHOOL BUILDINGS

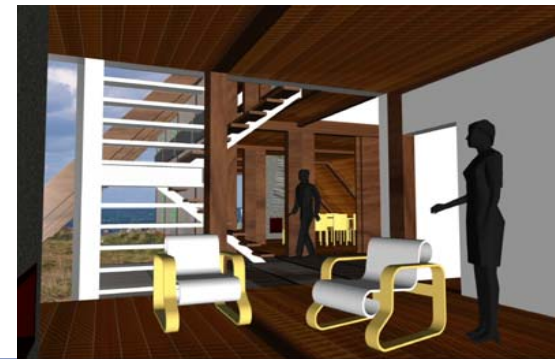
- Healthy buildings and in-door air are essential for children.
- Solar shading with wood-glass louvres.
- Mechanical or natural ventilation.



TOURIST ARCHITECTURE



*WOODEN CONSTRUCTION
SYSTEM, CHINA
(KUISMANEN 2009-)*



BUILDING IN WOOD

- Wooden town planning and wooden architecture guidelines are ready.
- Even CO₂-neutral planning and architecture are possible with our know-how.
- We can do high-tec and bioclimatic architecture in Japanese climate.
- Modern wood is economical and long lasting.
- Target is to construct wooden building areas and large buildings, like schools and senior housing, in Japan.



KEMIJÄRVI (KUISMANEN)

FINLAND-HOME CONCEPTS

Different building types can be made with the Finland-home partners:

- Wooden houses and multi-storey housing.
- Safe coastal construction.
- Senior housing and nursing homes with the Finnish safety- and wellness-technique.
- Wooden office buildings.
- Schools and kindergarten.

*(CULTURE CENTRE,
PYHÄ, LAPLAND.
KUISMANEN 2012)*



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