

Open Building Principles I

First of Three Lectures

Open Building Principles I:

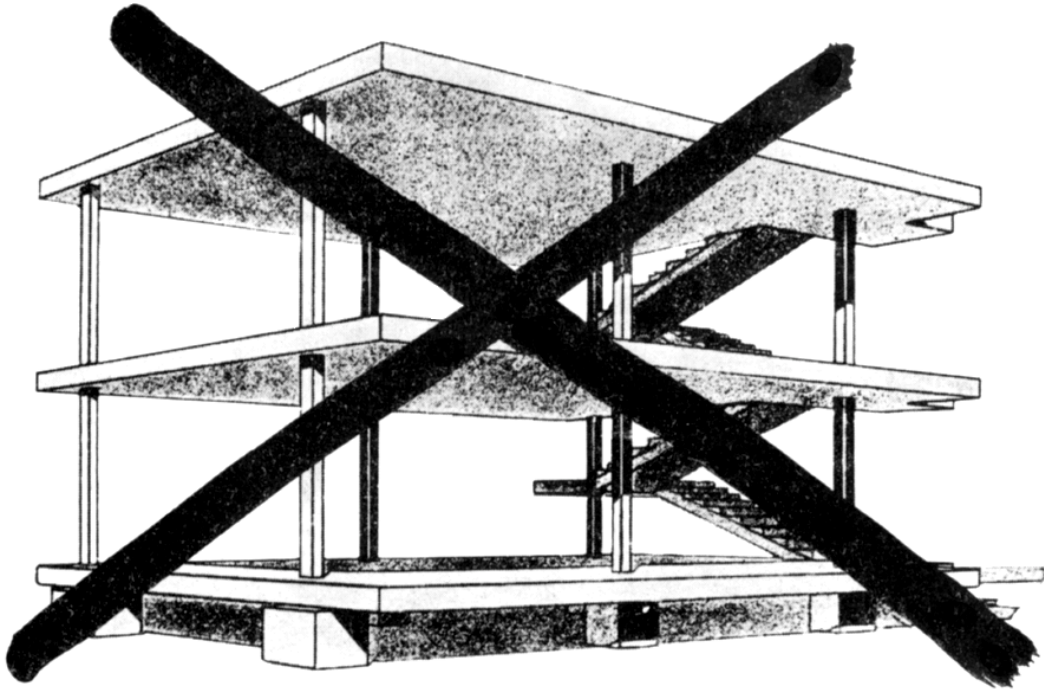
Getting started: Capacity Analysis and Mechanical Systems

Open Building Principles II:

Putting Principles to work: How to Design a Base Building

Open Building Principles III:

The face of buildings: How to Design Open Building Facades



In an open building way of thinking, a shell or base building **is not a skeleton...**

Open Building is first of all ARCHITECTURE

We should never forget this!!

Residential Open Building (designed for long life and shared responsibility)



Copeland/Weinstein
Architects - Seattle



Kahri Architects - Helsinki



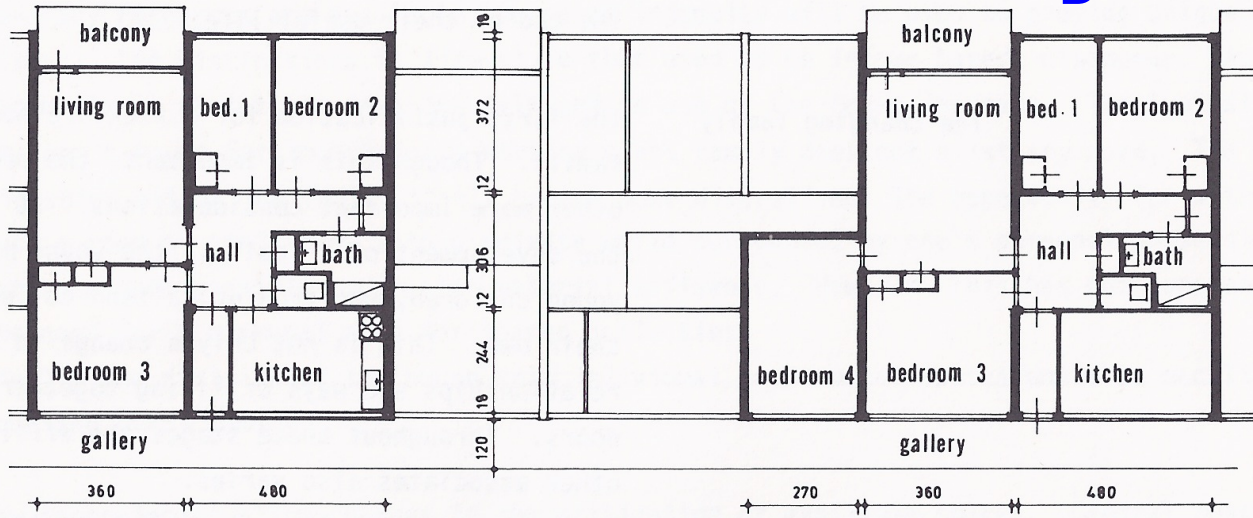
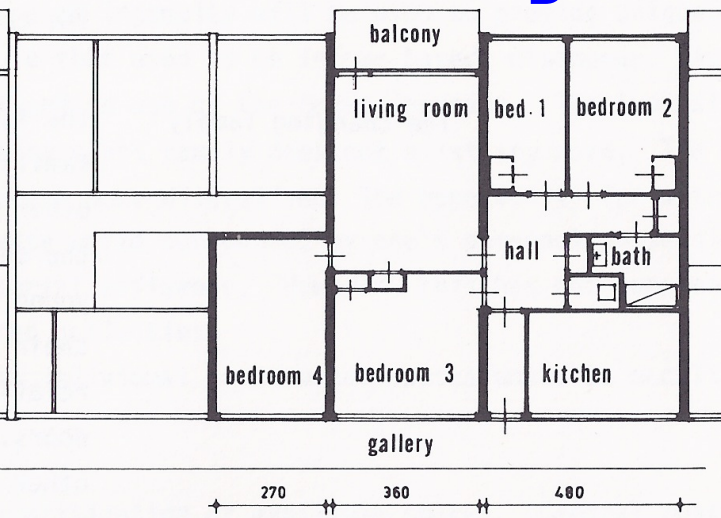
Marco Polo Tower
Behnisch Architects
Hamburg



Sweeny Sterling Finlayson & Co Architects Inc - Toronto.

Why do people change their houses?

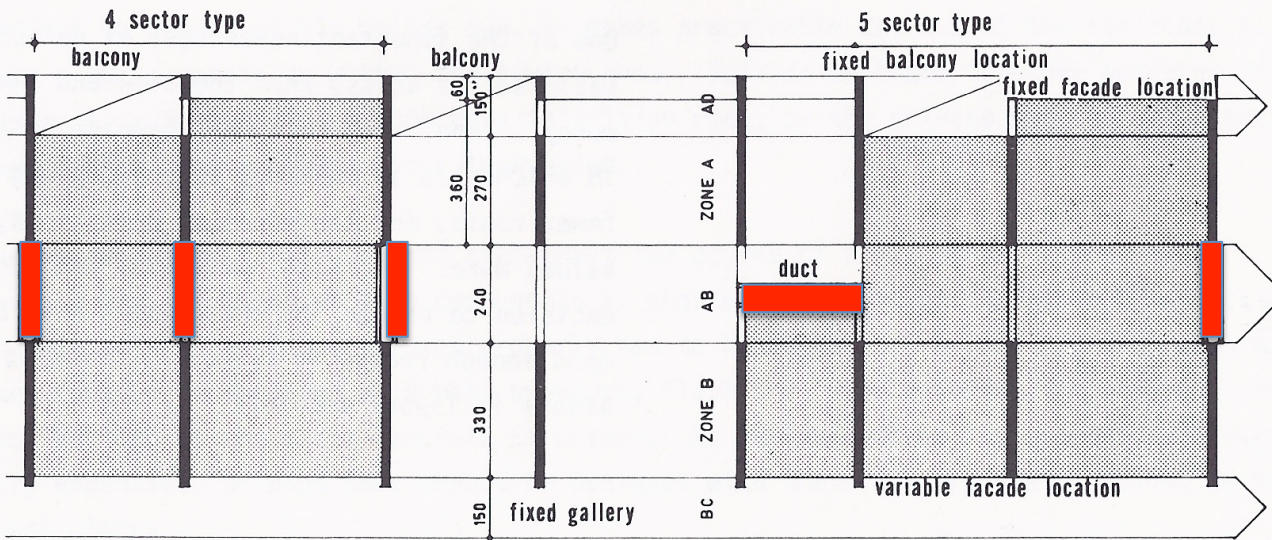
- 1. The need for identification** (people want to recognize themselves and to be recognized...improvements in a person's house can often be explained by their need for identification; to determine one's place in society is a very basic need that has been neglected in our "functional" age)
- 2. Changes in life-style** (changing life-styles result from contact with other cultures, new ideas about society and new technology. Individual and communal space concepts evolve, across all income levels)
- 3. New technological possibilities** (new technologies allow changes in the use of available space. New models of equipment make old models obsolete before they are worn out. The number of fragile parts in a house are increasing...they will not last as long as the life-span of the building)
- 4. The changing family** (a family can start with a basic set of infill parts. When means and demands increase, additions may be made, a process that can be very different for each household...this is reason enough for the designer to think about architectural solutions that make variations of layout of houses possible)

A**B**

Two existing apartment types

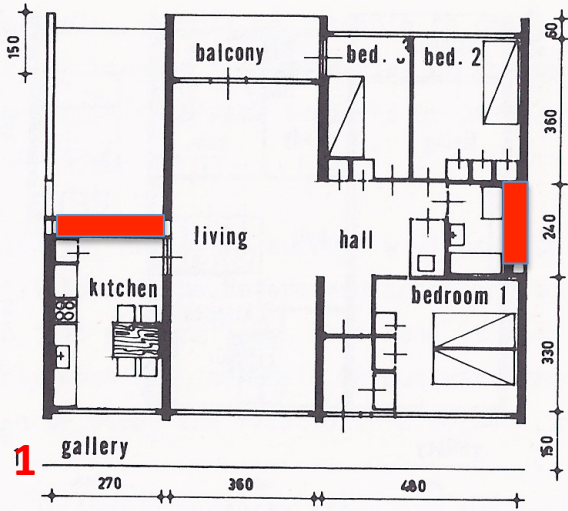
An exercise in transforming a “RIGID” residential building into an OPEN BUILDING.

The two dwellings (A&B) are the only two kinds available. In the building studied, only 2 of the 8 families were of the type for which the building was designed...the others were “mis-fits.”

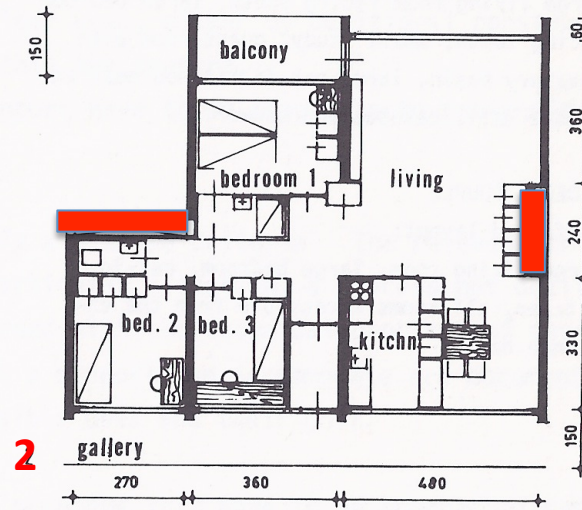


The new BASE BUILDING based on the original building

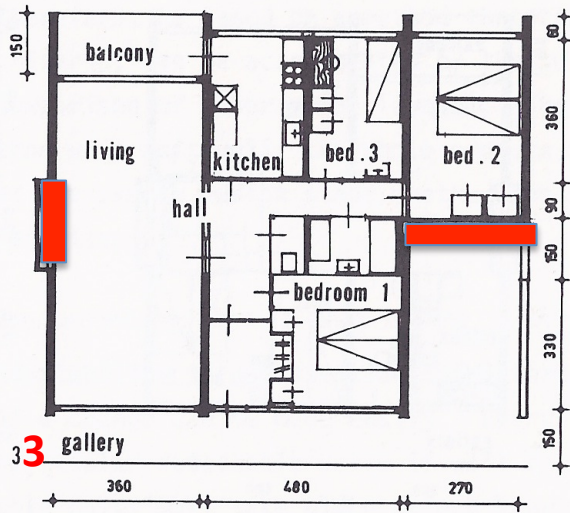
The drawing at the bottom is the SUPPORT or BASE BUILDING, based on the existing building but differing only in detail + the vertical pipe shaft located in the central area.



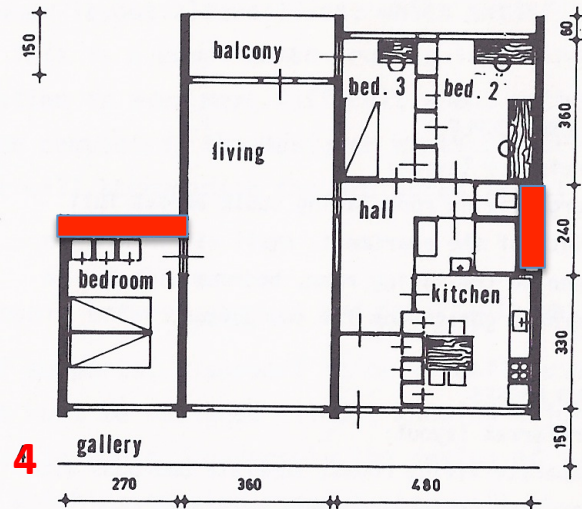
1. Family with two children



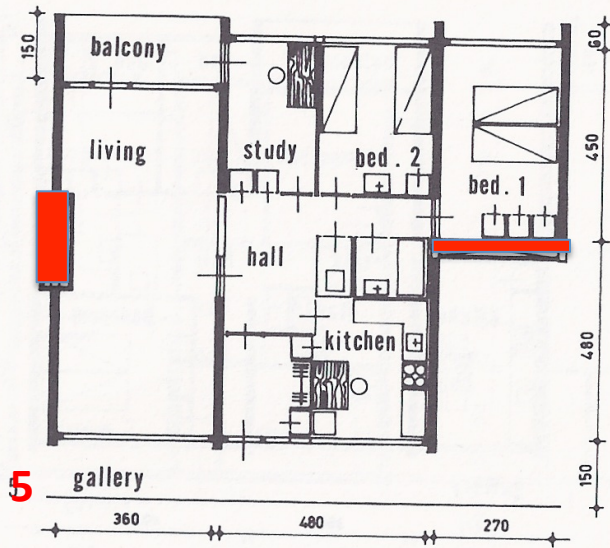
2. Family with two children



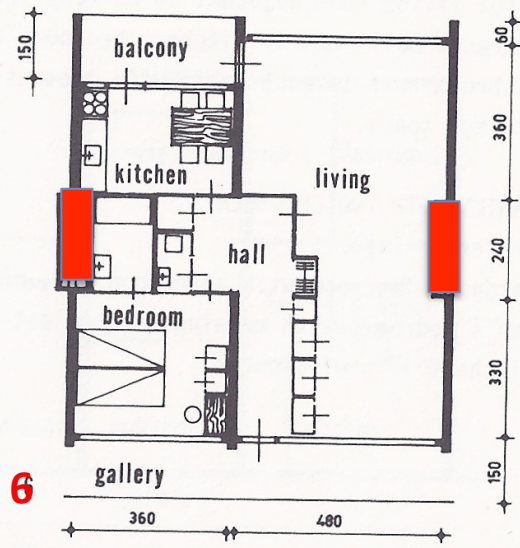
3. Couple with one son in college



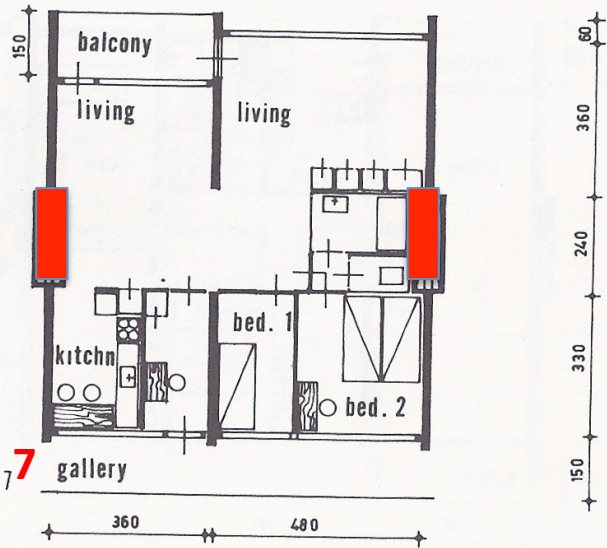
4. Couple



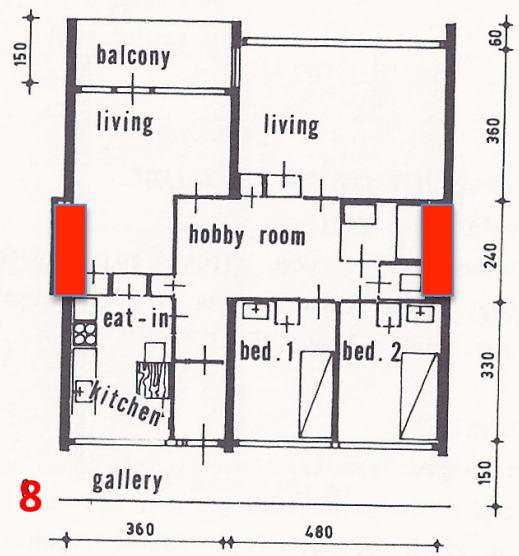
5. Couple



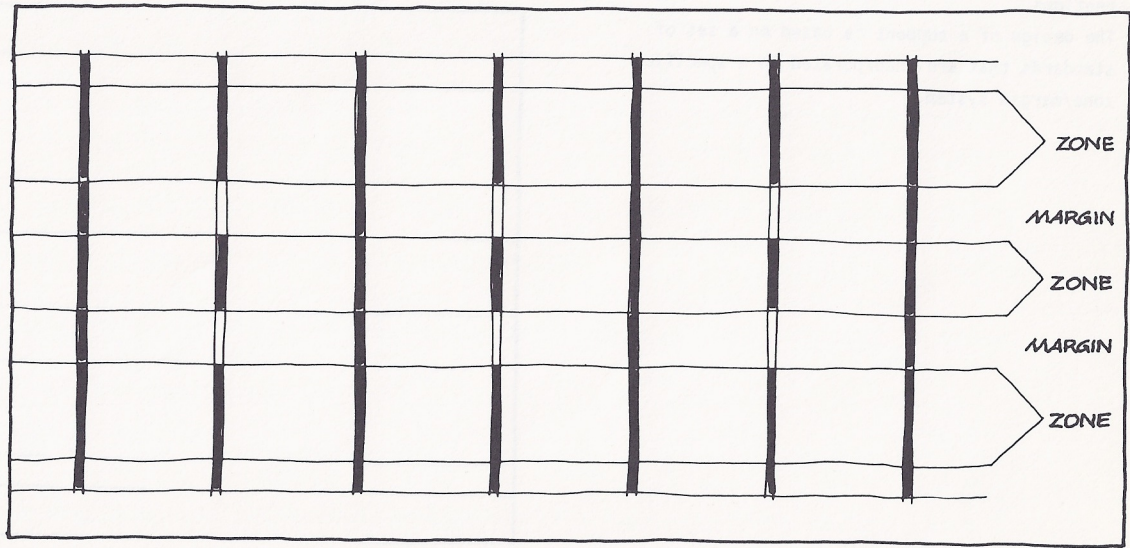
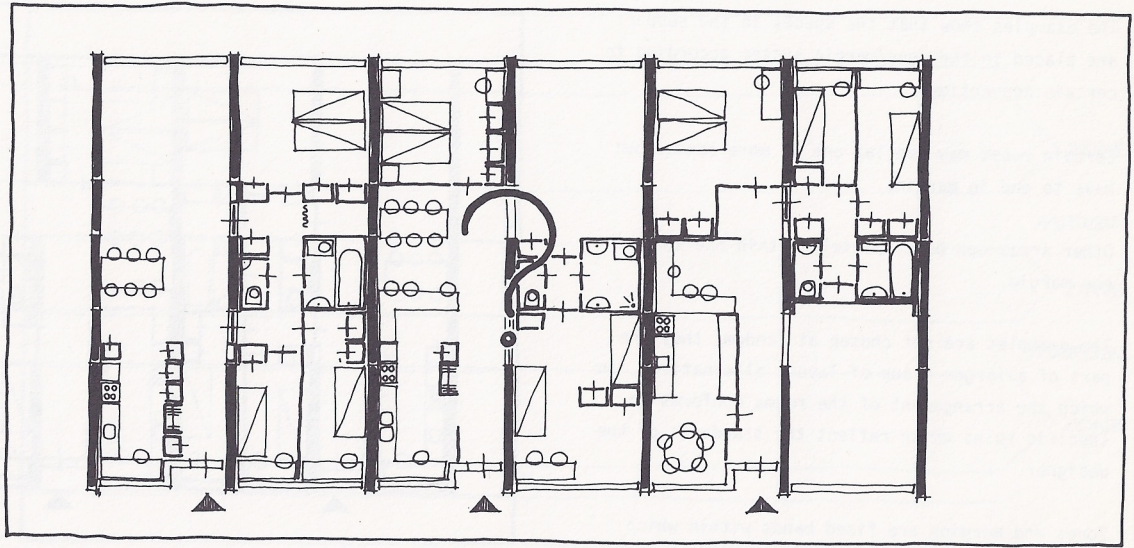
6. Elderly couple

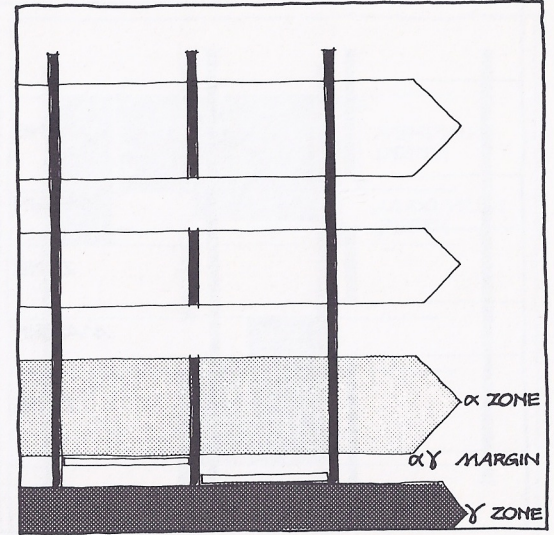
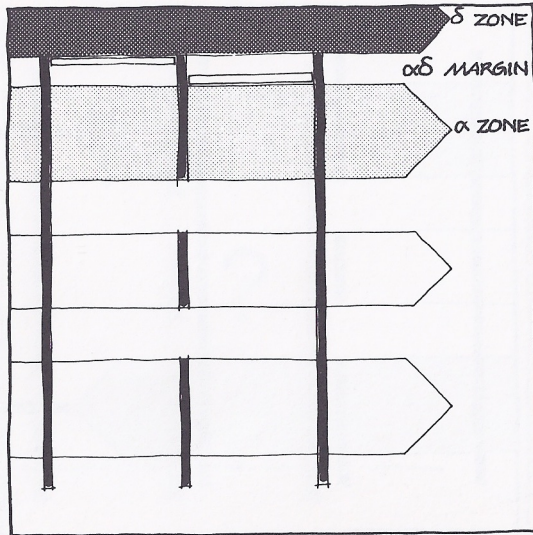
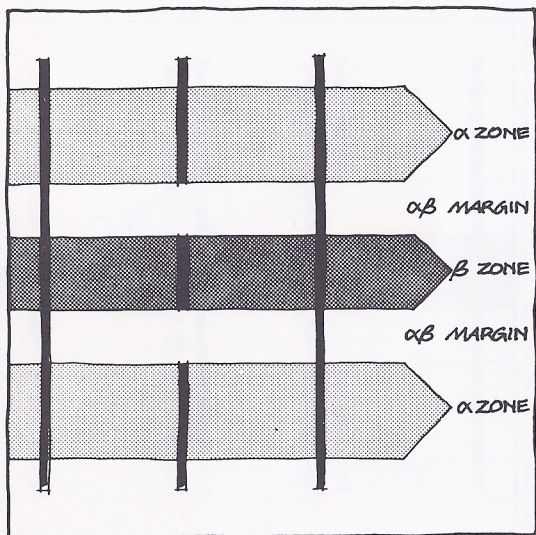
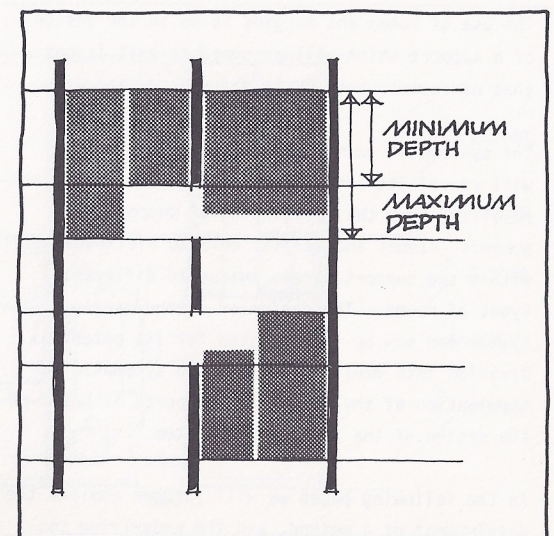
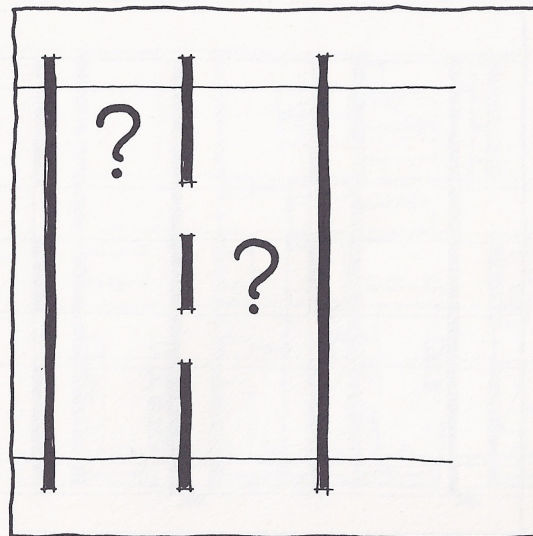
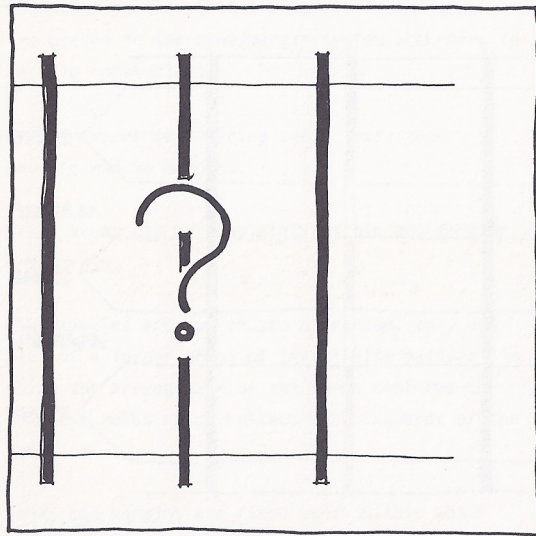


7. Young couple

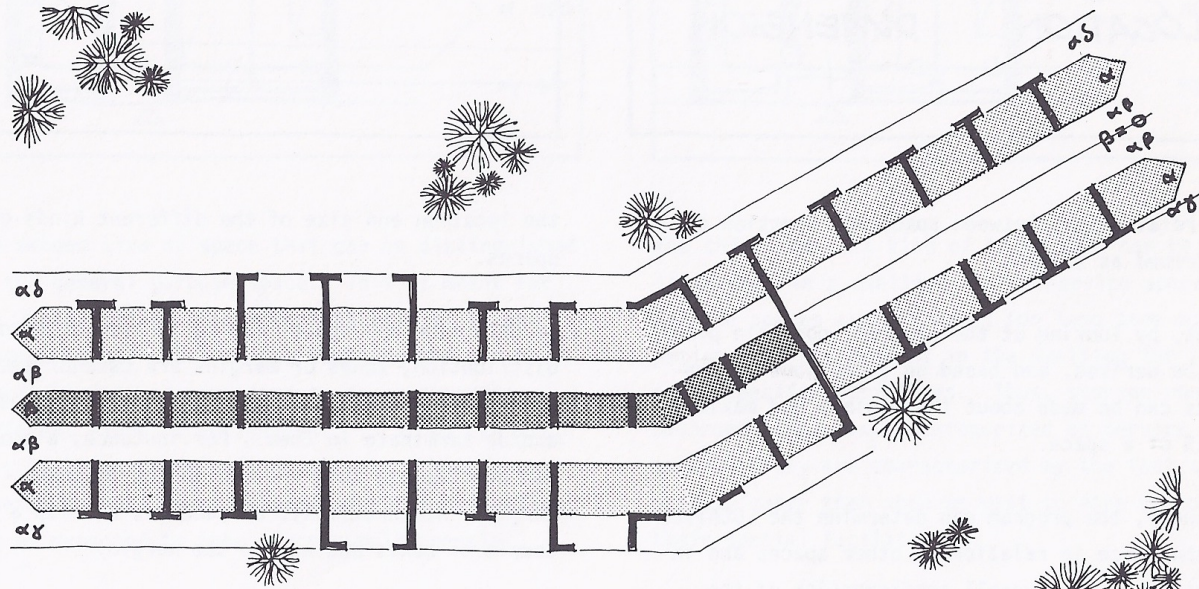


8. Two nurses





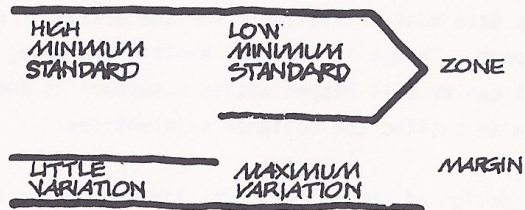
A zone does not have to be straight.
A zone does not necessarily have to be of uniform width.
A zone can have a width of zero.

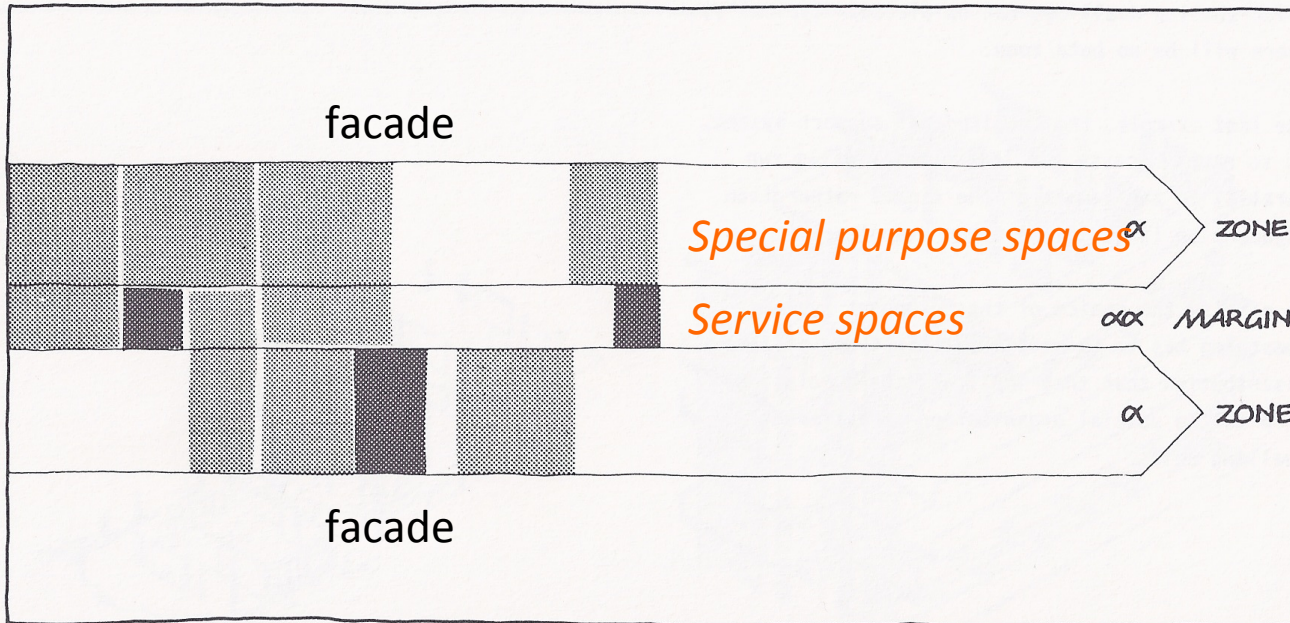


Within the total width of a zone and its adjoining margin, there is a choice between a wide zone and a narrow margin, or a narrow zone and a wide margin, which has repercussions on the sizes of spaces that are possible.

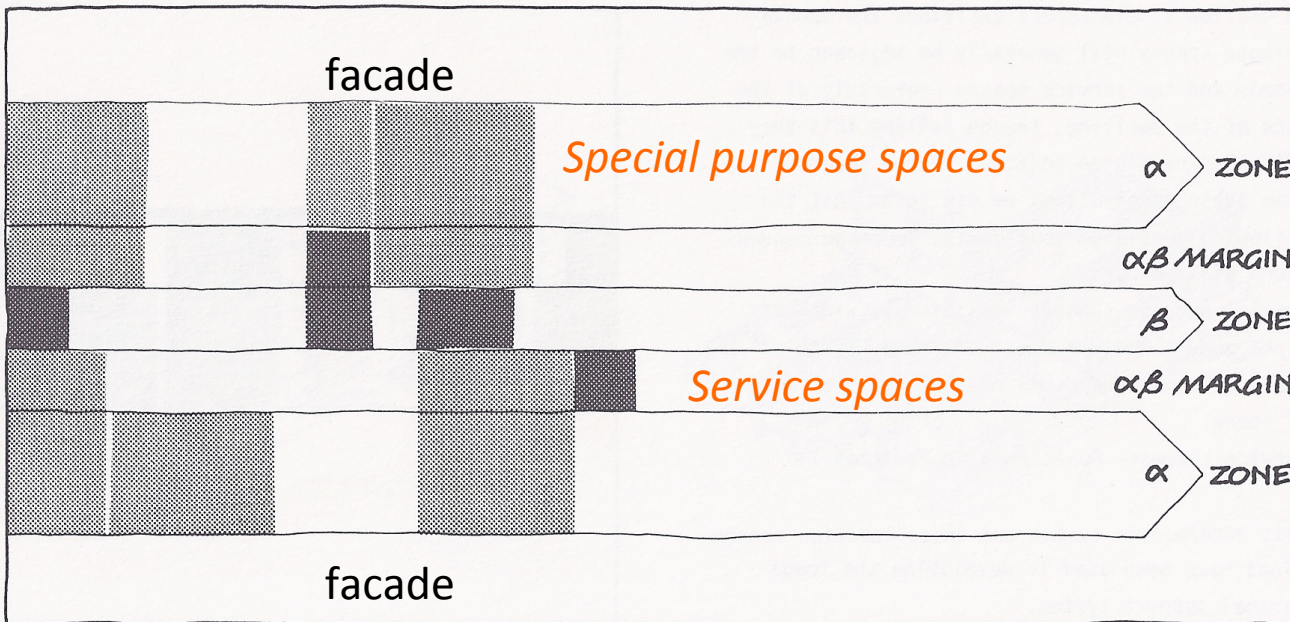
In the former case, there is little difference between the minimum and maximum depth which a space can have.

In the latter, when the zone is narrow, the minimum depth is less but there is greater room for variation.



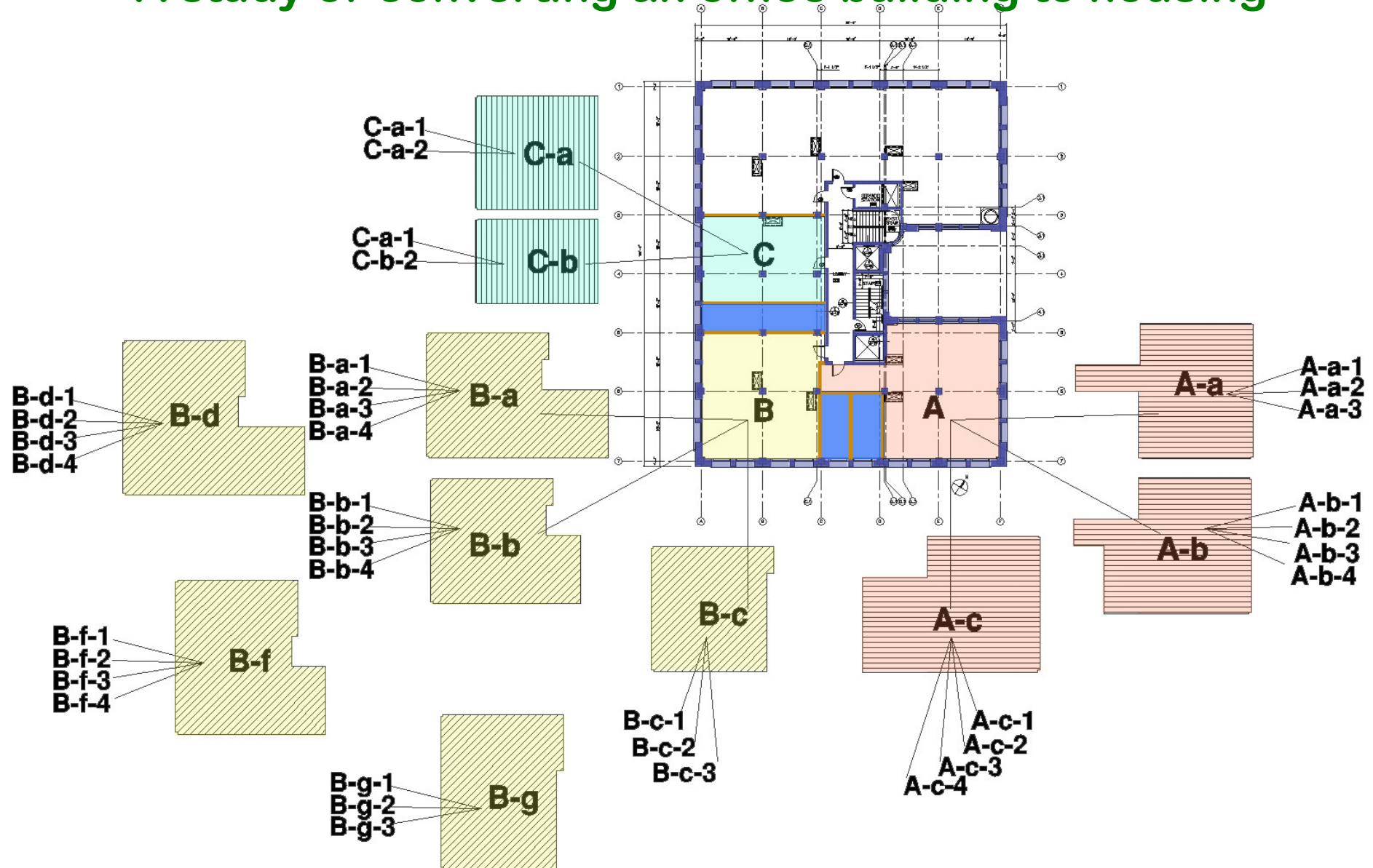


**Shallow dwellings
with facades on both
sides**

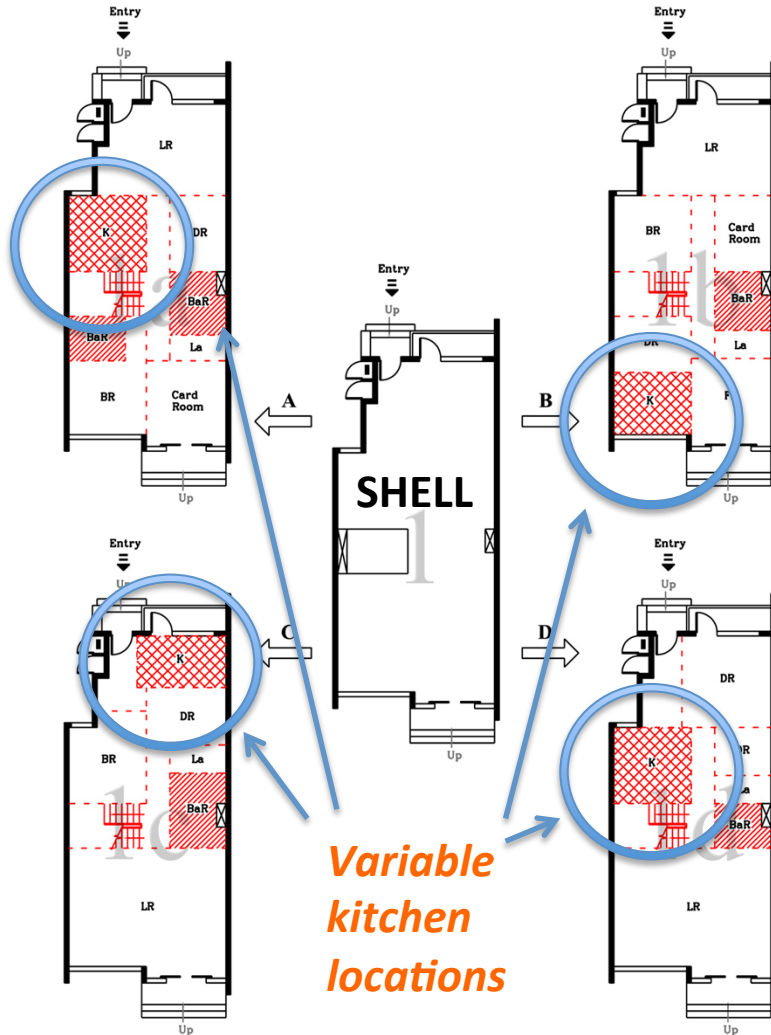


**Deeper dwellings
with facades on both
sides**

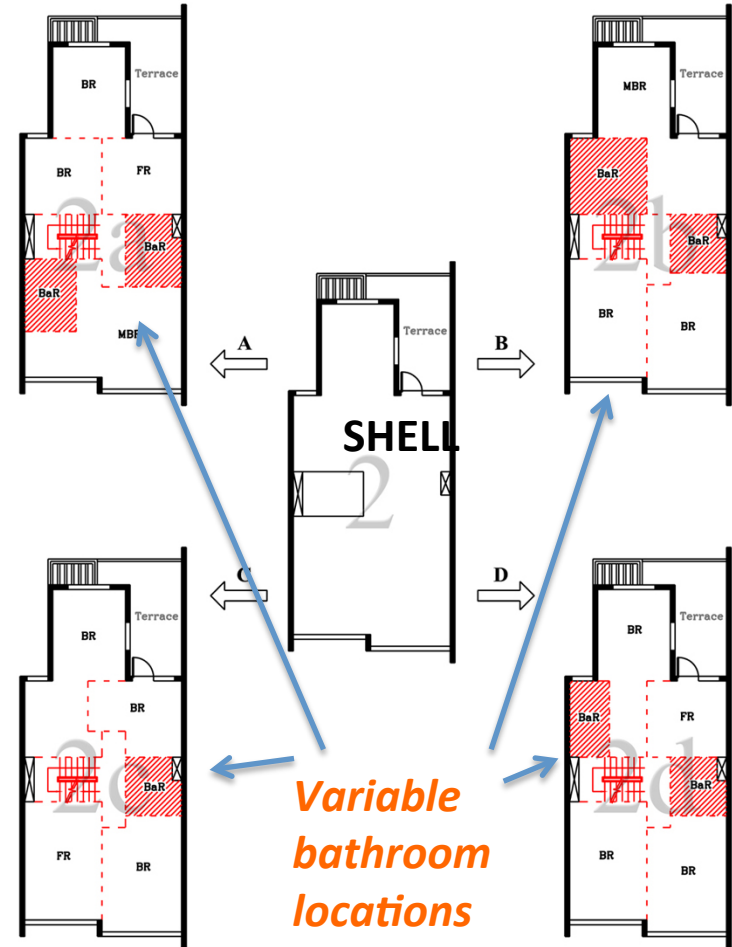
A study of converting an office building to housing



FIRST FLOOR PLAN



SECOND FLOOR PLAN



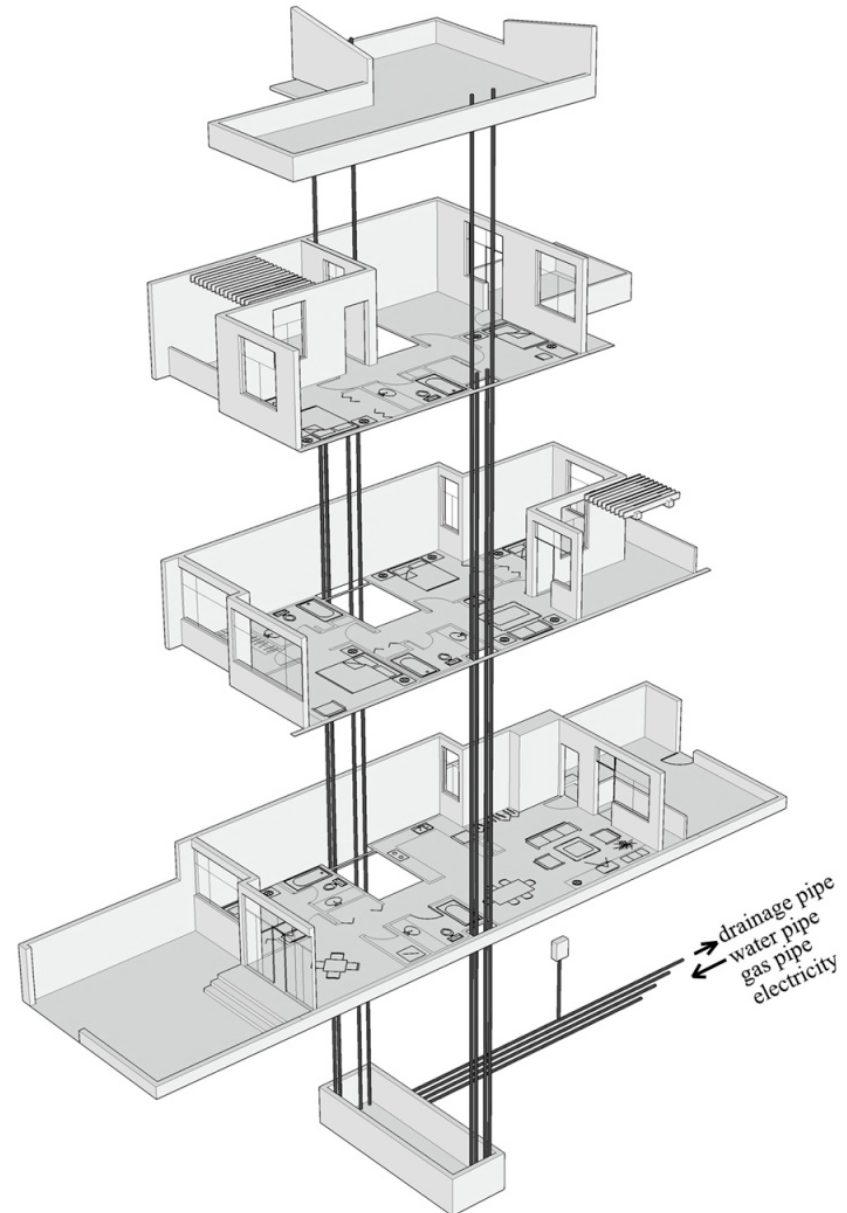
Capacity study of a new town-house design

This is a schematic drawing of a HOMEWORKS Shell or Base Building.

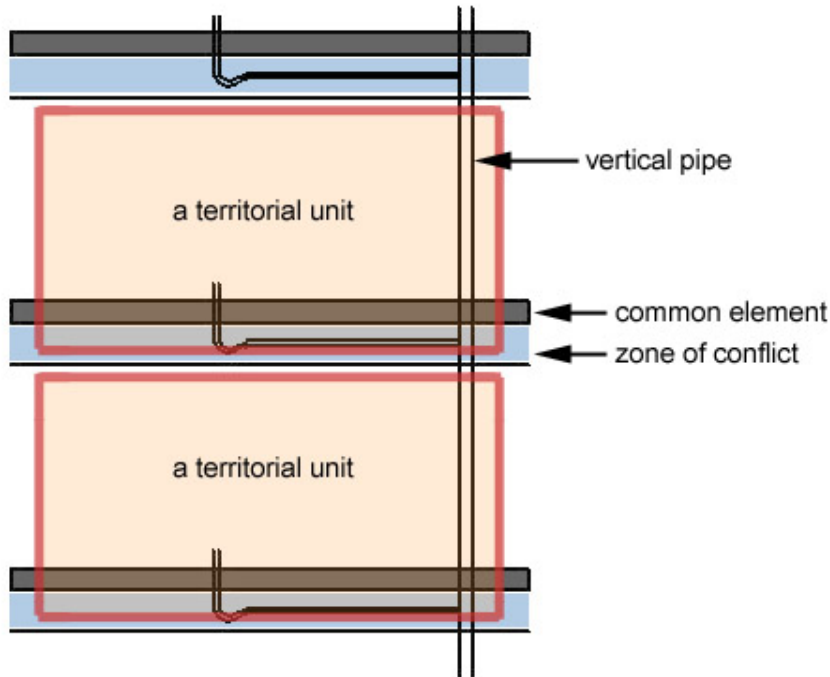
The vertical utility lines are connected to the public part of the utilities.

These include drainage, water and gas piping, and the electricity and communications cabling.

From the outside, the building appears to be a finished house, but it is empty inside.

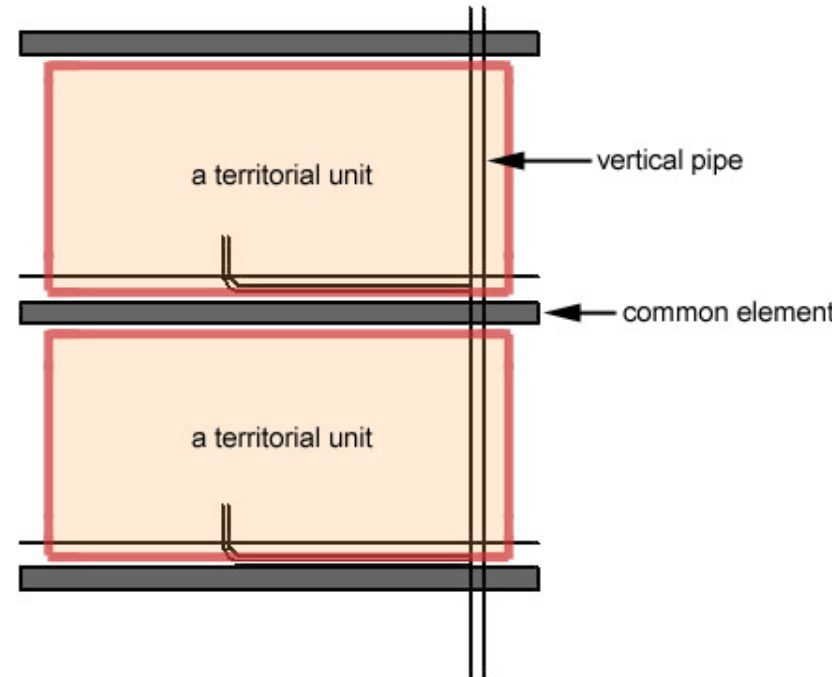


Utility Systems



Chinese conventional way has problem of conflicts

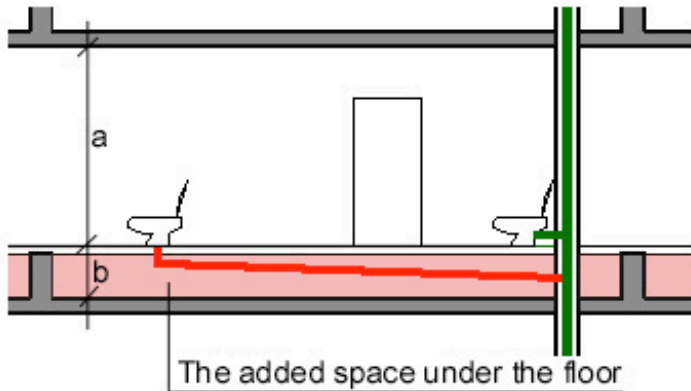
Diagram courtesy Dr. Qiong Huang, Tianjin University



OB way offers clean autonomy of dwelling unit decisions that avoids conflict

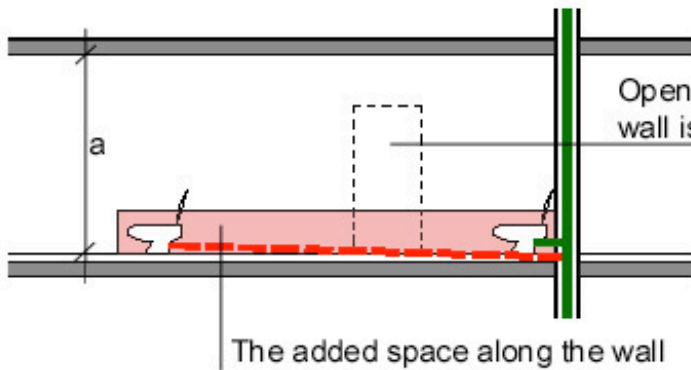


A basic principle of open building: drainage and other utility systems are accessible from the space they serve, not entering another owners' space

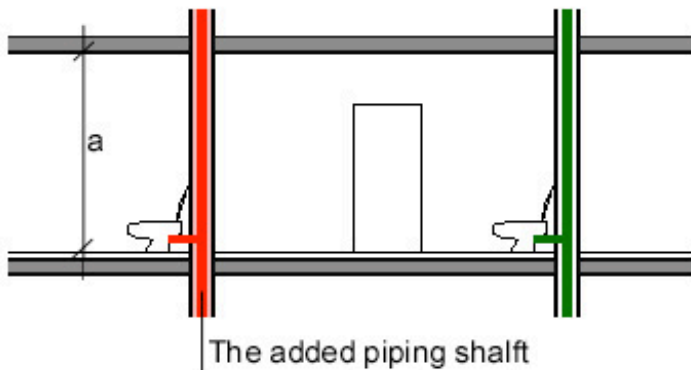


**Add thickness to the floor
(affects building height)**

- “floor layer”
(e.g. the Matrix Tile System)
- “raised floor”
(e.g. S/I housing)
- “floor trenches”
- “upside-down floor”
- Precast slab w/removable top



**Thicker walls
(affects floor area)**



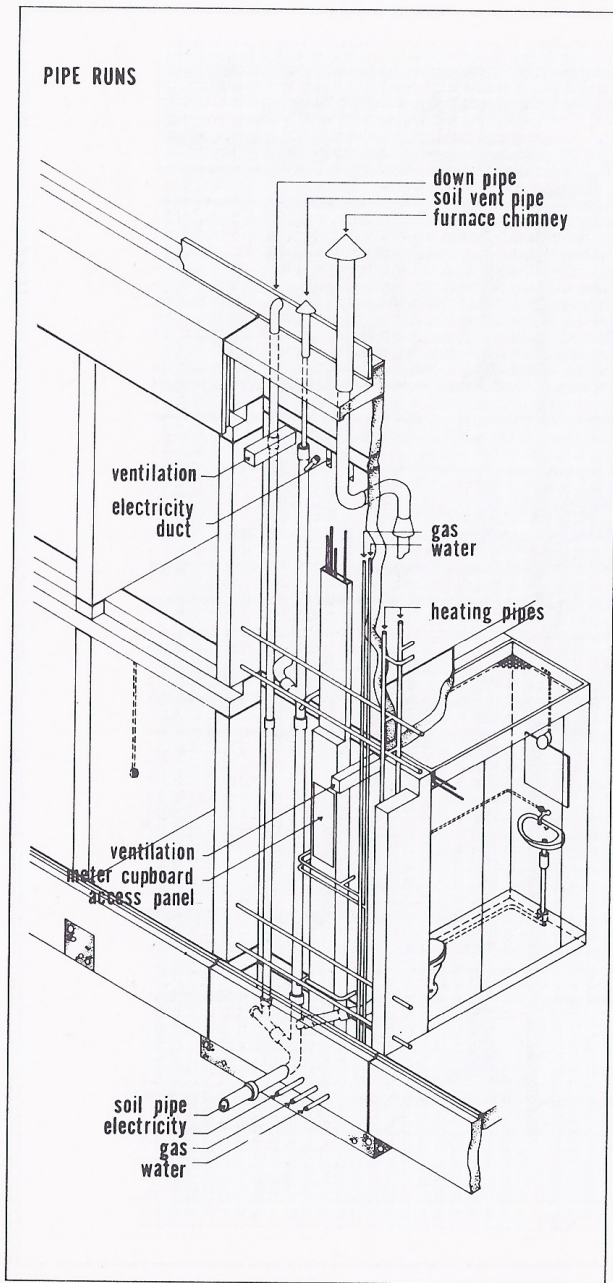
**More vertical pipe
shafts (affects floor
area)**

A Major Trade-off:

To let us decide floor plans later, we must choose between several ways to organize pipes:

- **vertical** (common parts)
- **horizontal** (belonging to each dwelling unit)

Courtesy Liu Peng, BIAD

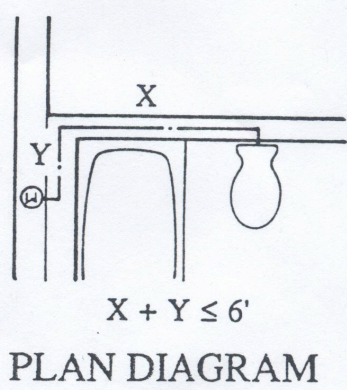
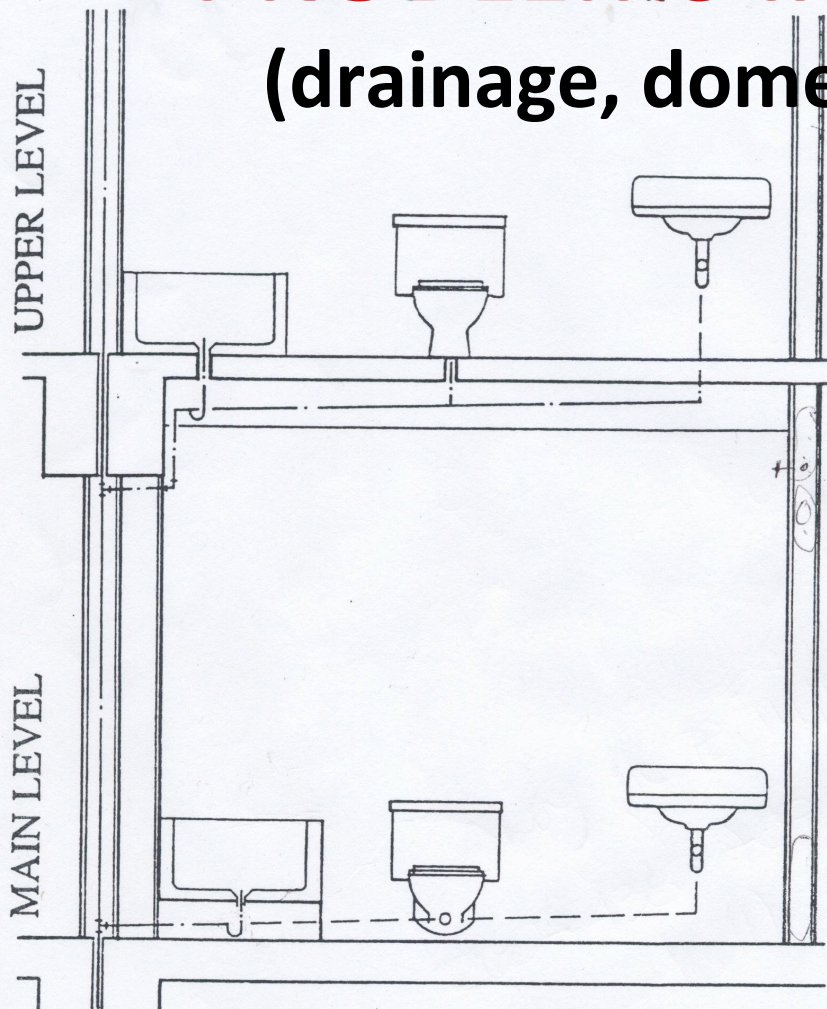


Examples of building utility cabinets

Tub/Shower: no special requirements for fixture type or location,
 Water Closet: special requirements for fixture type or location
 Sink/Lavatory: no special requirements for fixture type or location

PROBLEMS in HANDLING PIPES

(drainage, domestic water supply, gas)



Tub/Shower: raised platform required for clearance of drain trap and the slope of the drain line
 Water Closet: rear discharge/wall mounted fixture required, location limited in plan distance from waste line
 Sink/Lavatory: no special requirements for fixture type or location

PLUMBING FIXTURE DIAGRAM



Trench

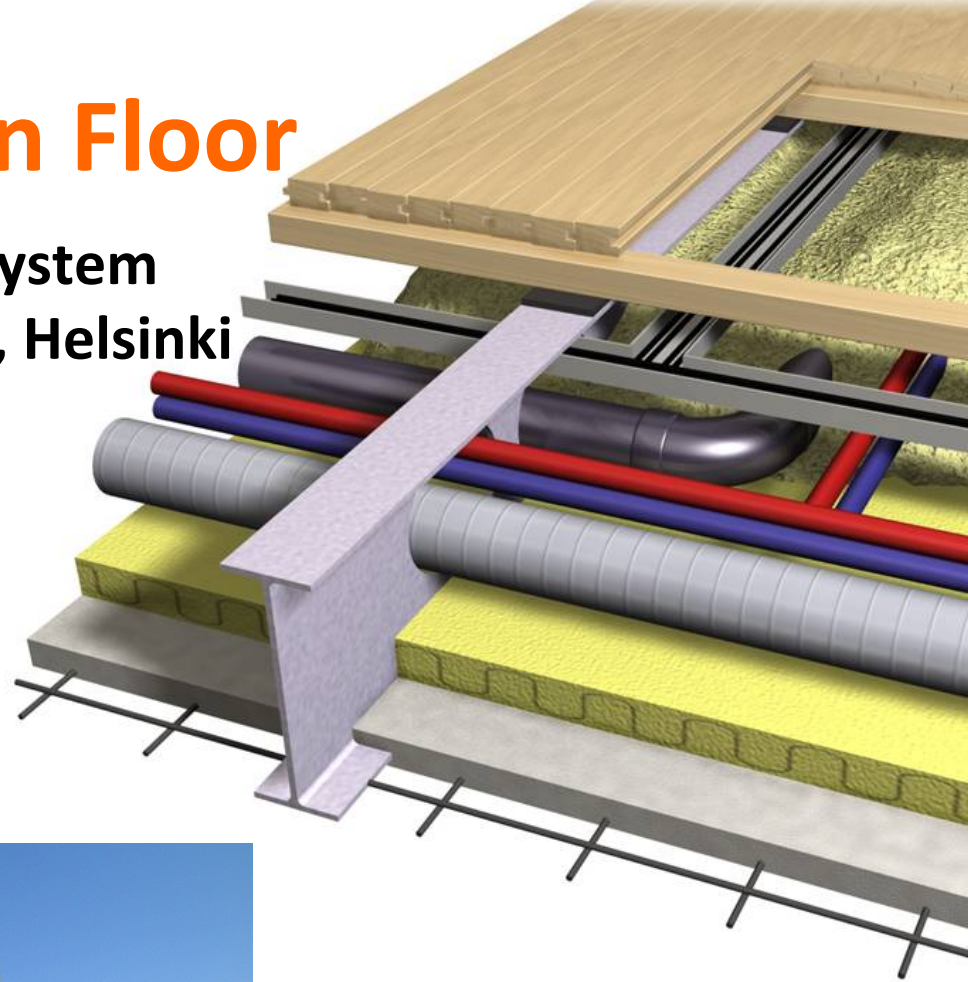


**A 'FLOOR
TRENCH' IN A
TYPICAL WOOD-
TRUSS FLOOR**

Upside Down Floor

Steel wall and floor system

Architect: Esko Kahri, Helsinki

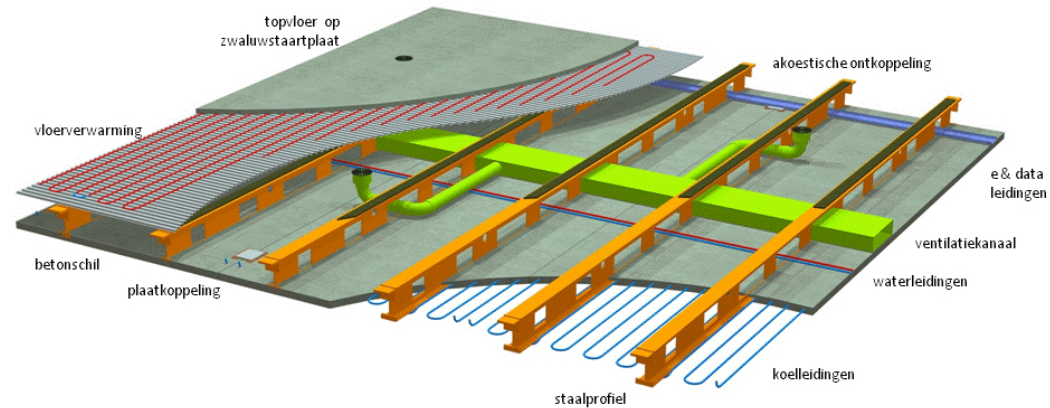


Prefabricated upside down floor

Slimline Floor System

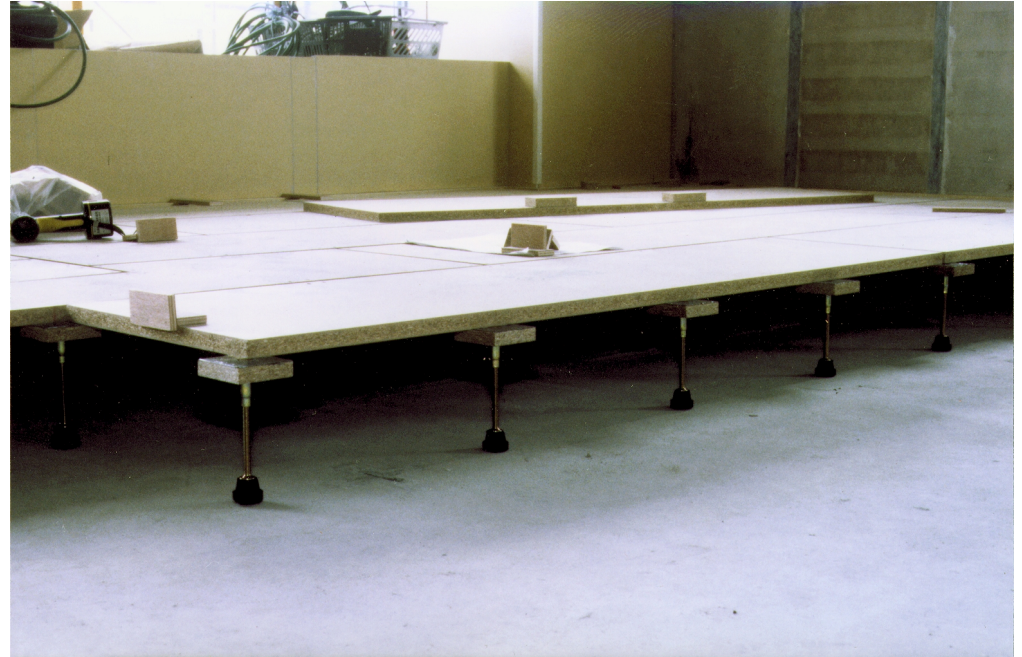
On the market in the Netherlands

S L I M L I N E
BUILDINGS

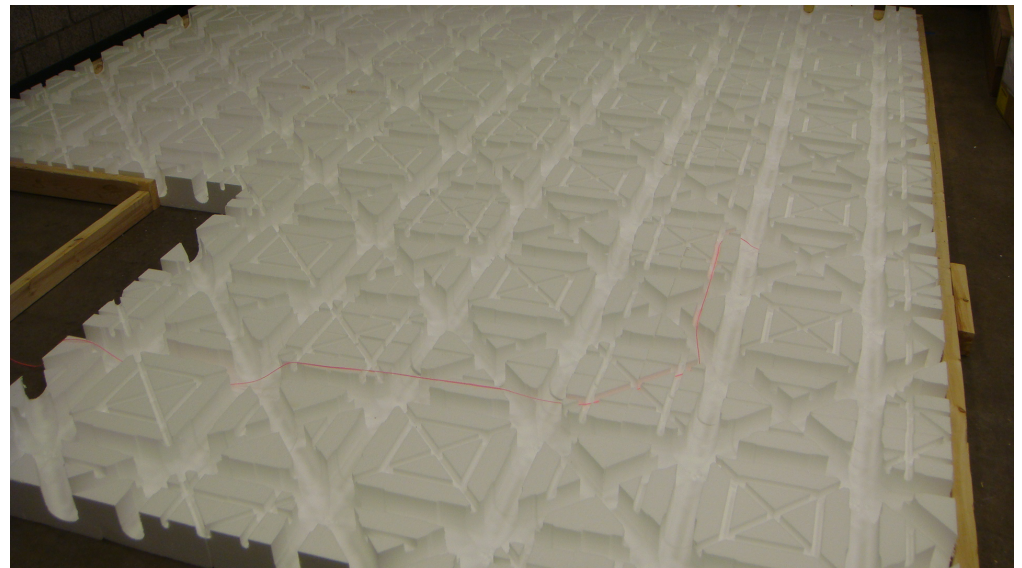


Organizing piping

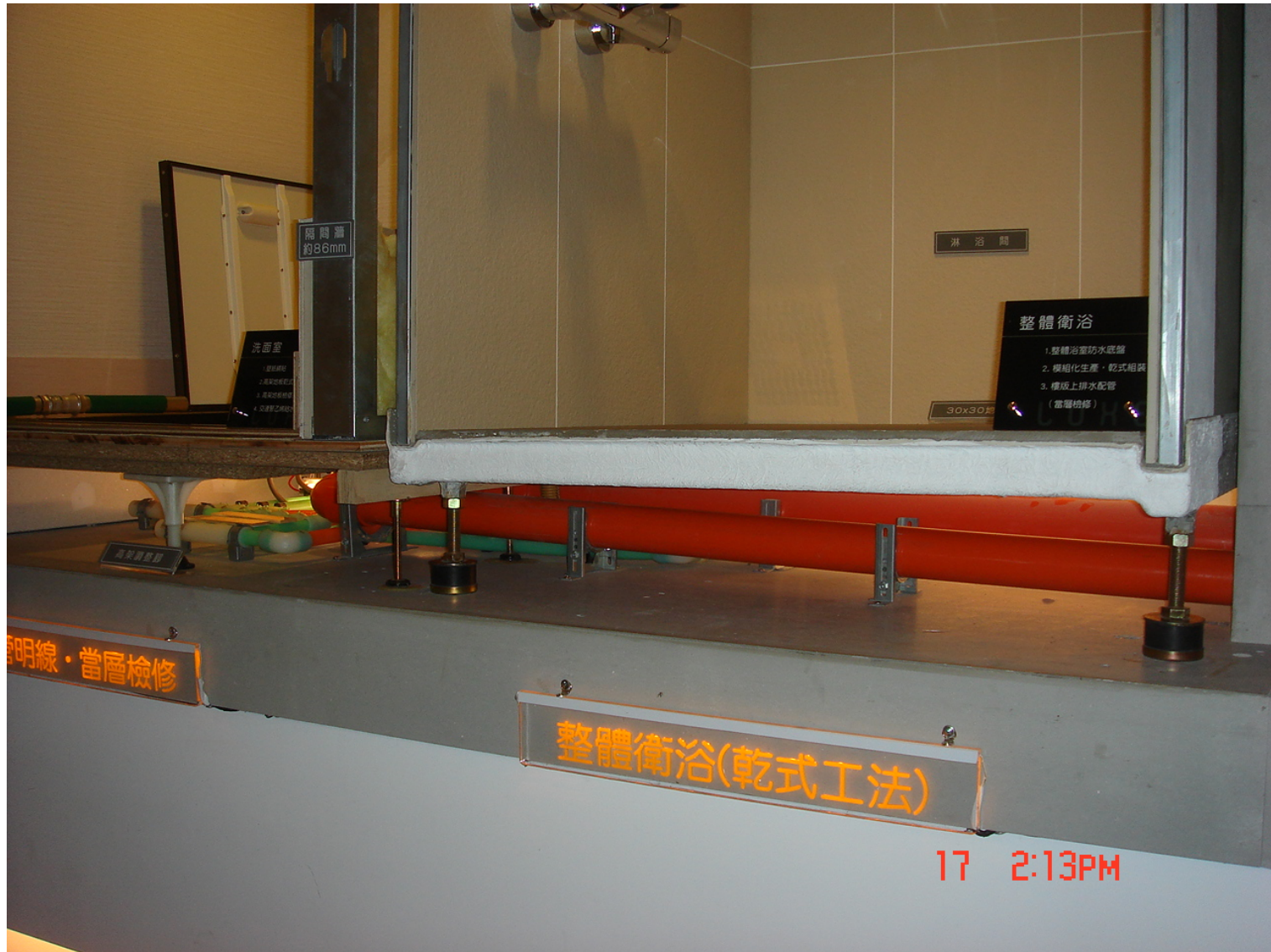
RAISED FLOOR



FLOOR LAYER / TILE



Raised Floor



Raised Floor

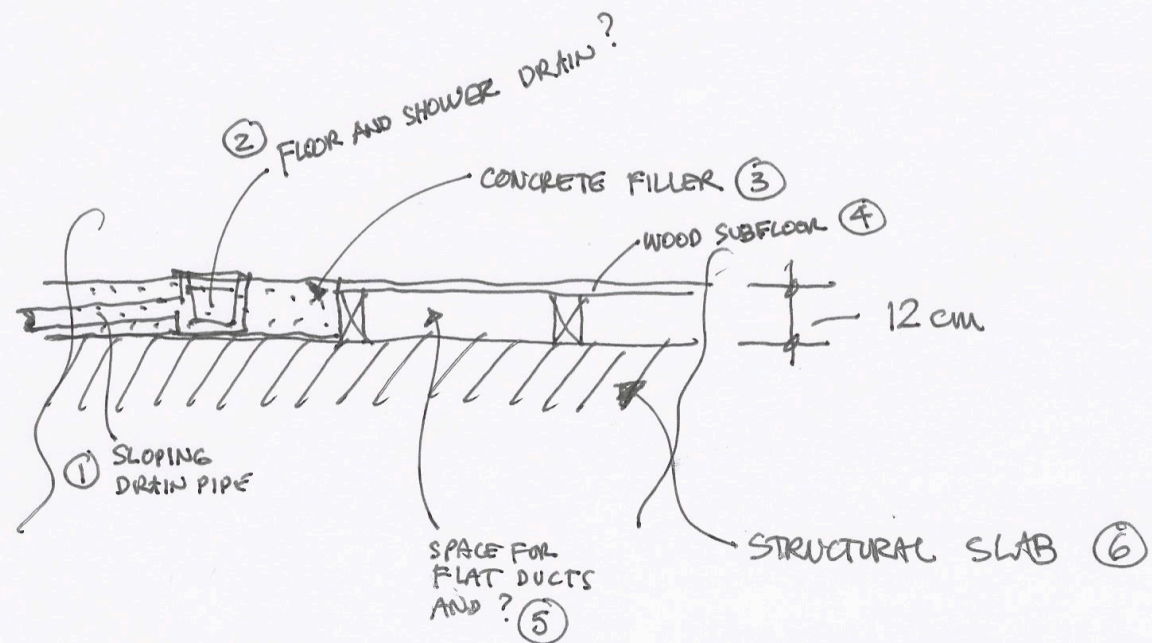


Thin Raised Floor

NEXT INFILL + Intellex / Tokyo



Landsea Company development in Nanjing



LANDSEA CO.
NANJING PROJECT



An example of base building drainage pipe connections:

The tenant floor is 15cm lower than the corridor floor

The Solids
(in Amsterdam)

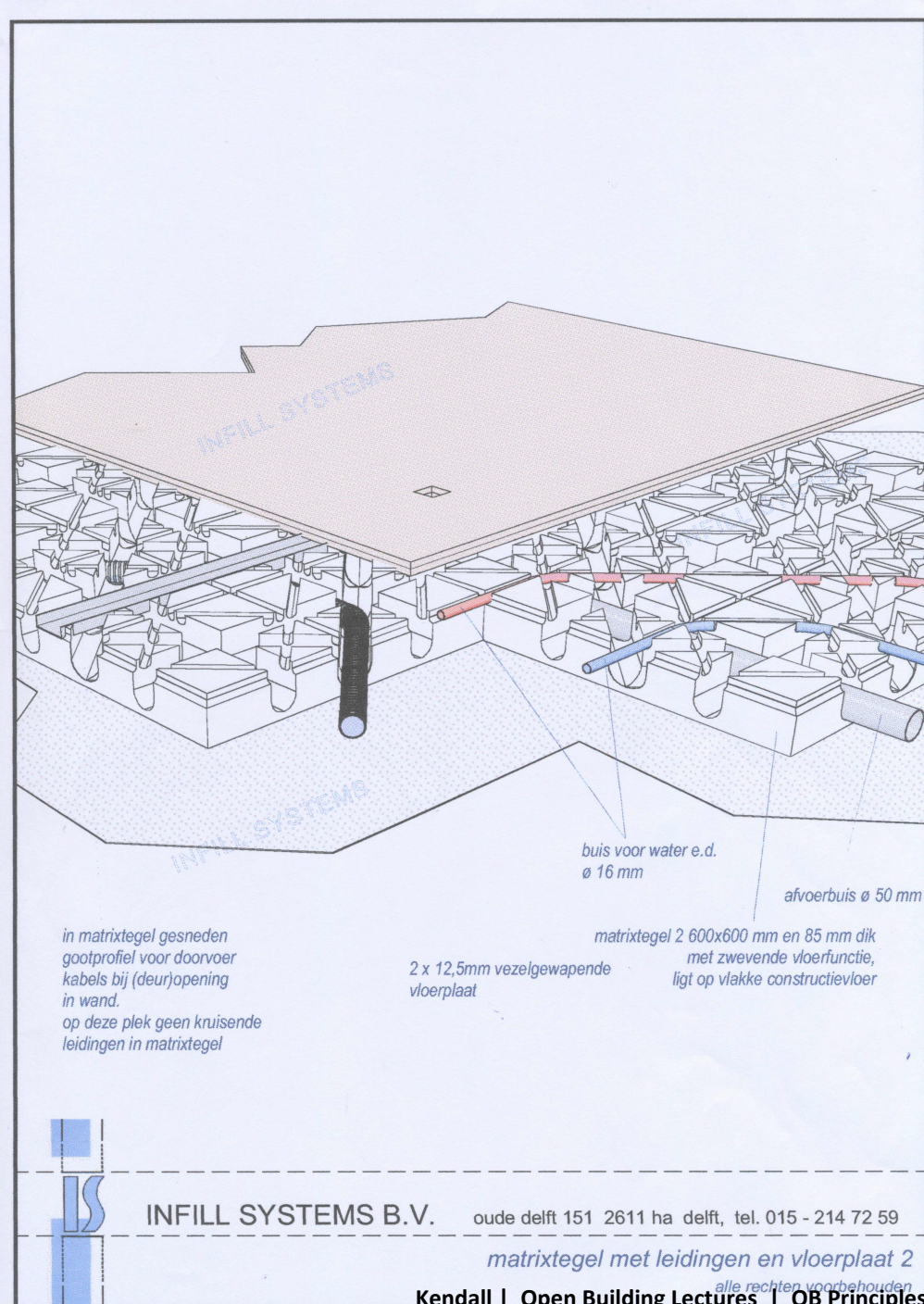
15cm

Matrix Tile System



Matrix Tile System Infill Systems BV / The Netherlands

Marketed in North America by Infill
Systems US LLC

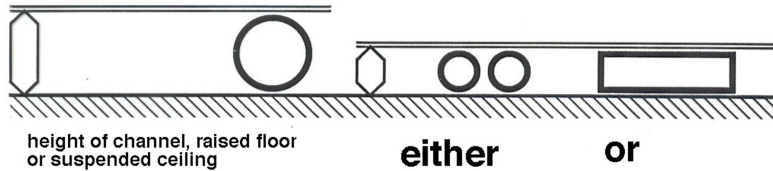


Matrix Tile System

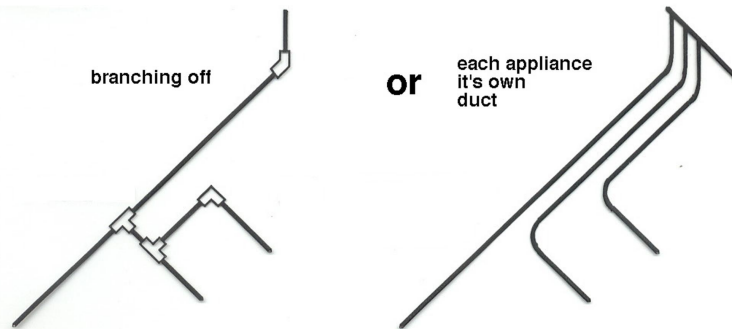


Matrix Tile System's Key Innovations

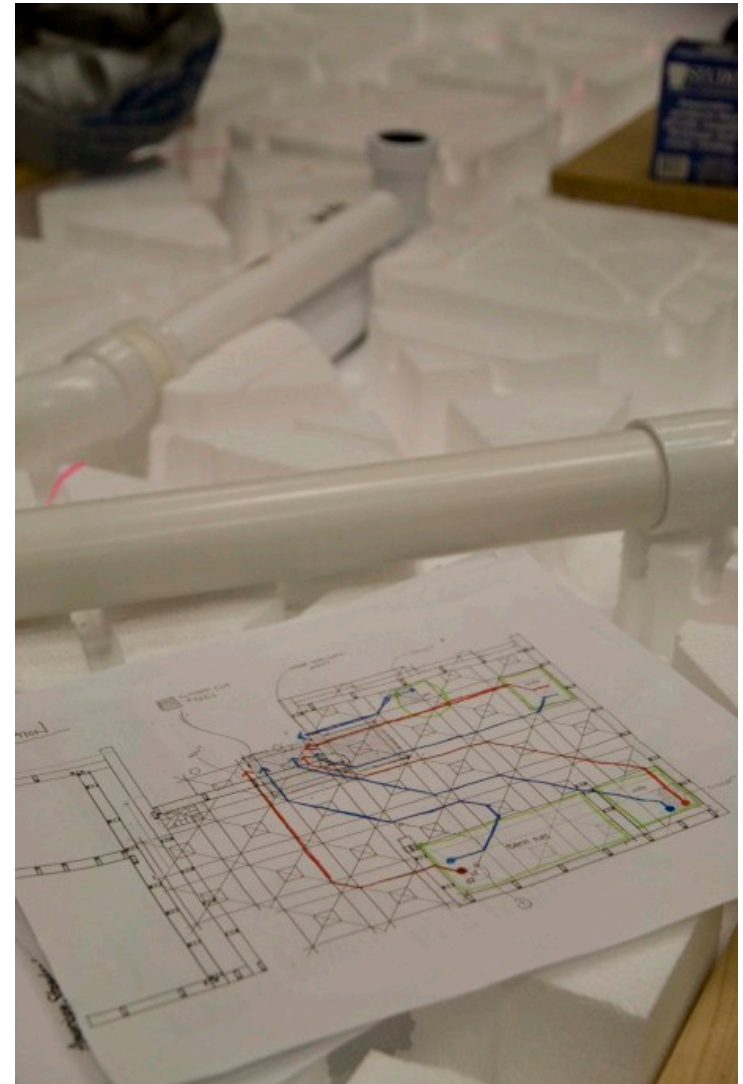
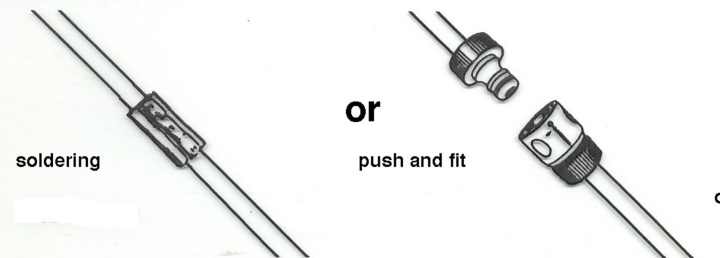
Space-requirement

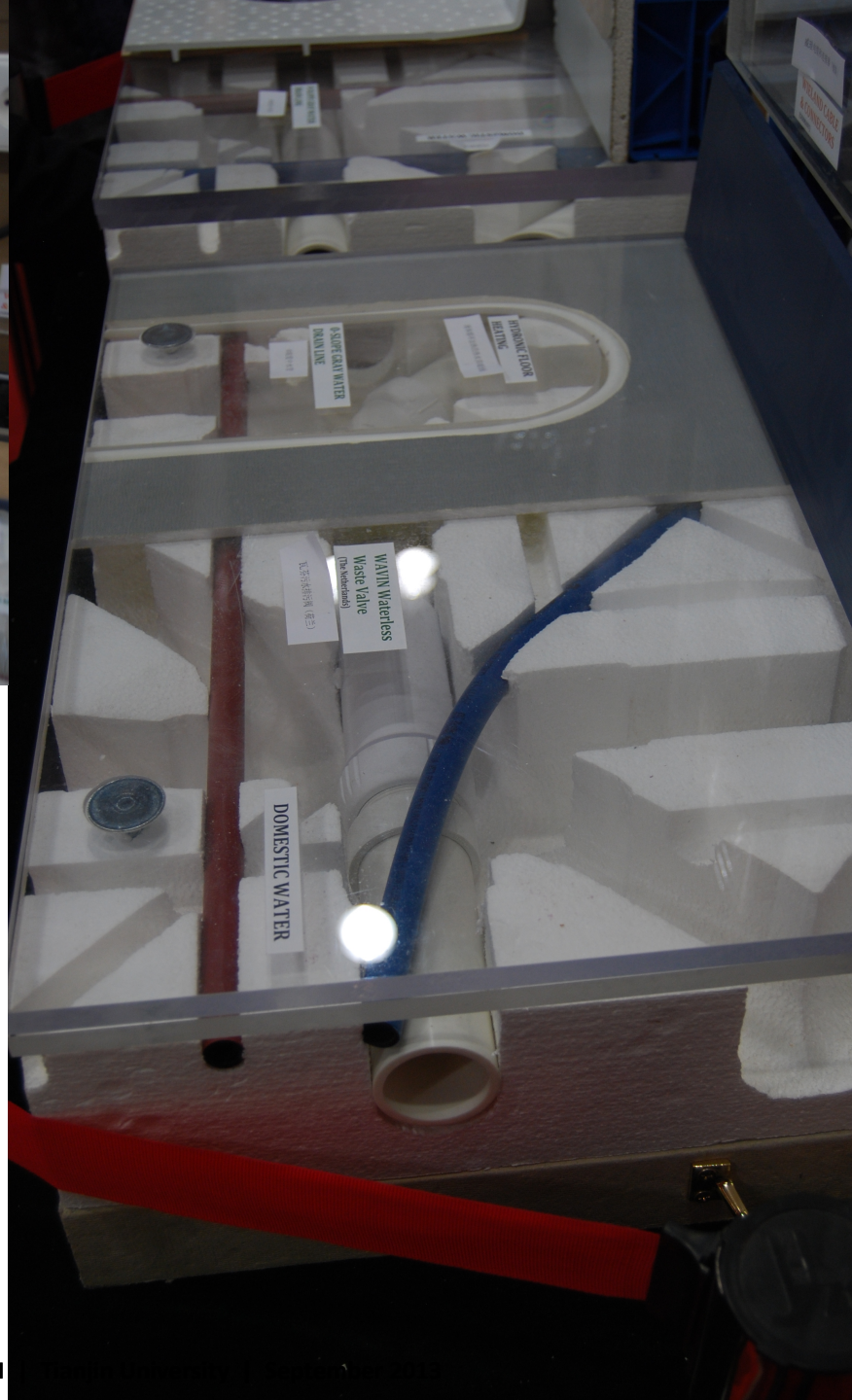
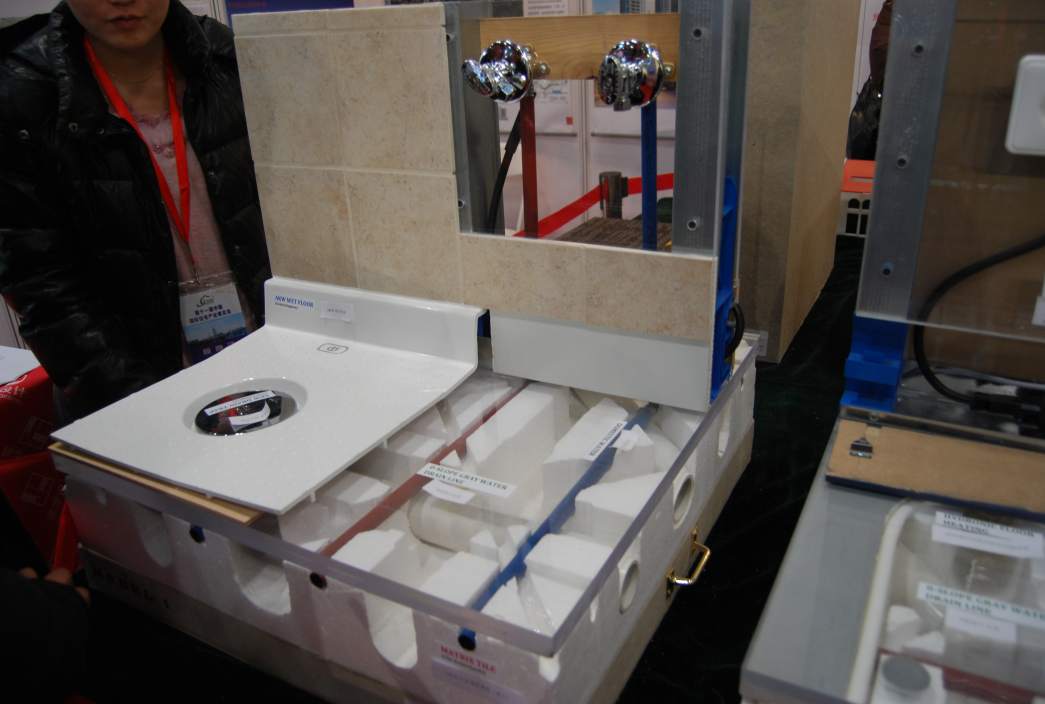


Flexible fitting



New fitting techniques





MATRIX TILE SYSTEM

(at the 2012 International Housing EXPO, Beijing)

PROBLEMS in HANDLING WIRING



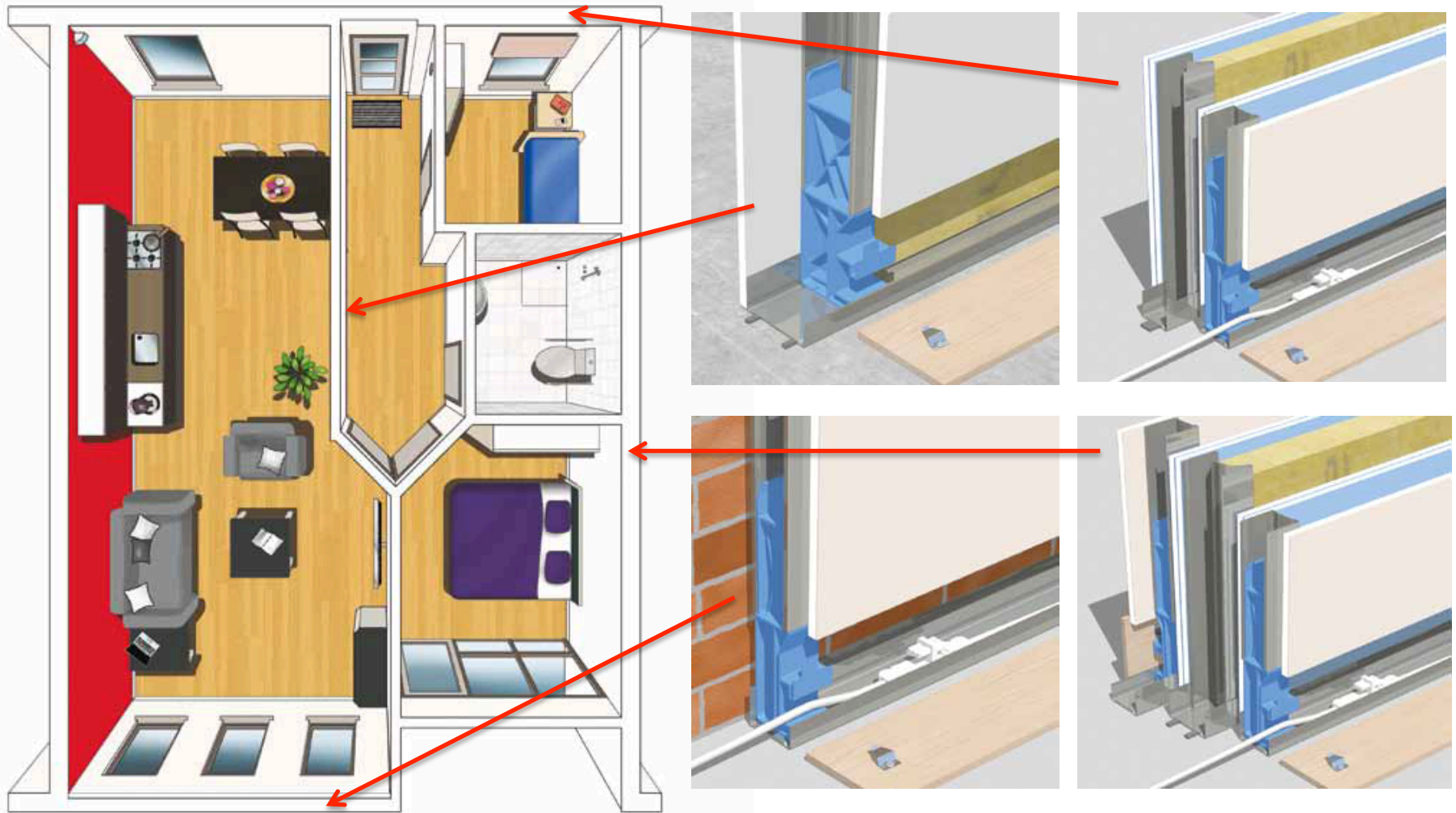
CableStud

The invisible, accessible solution to outlets anywhere, anytime

CableStud



Marketed in Europe by GYPROC and in North America by INFILL SYSTEMS US LLC



CABLESTUD wall types to meet all conditions



Delivery



CABLESTUD Installation





SUMMARY

The basic concept of open building is that at least two participants are making decisions independently and sequentially. First, there is the designer of the base building who provides an architectural infrastructure in which, at a later date, decisions will be made about the individual dwelling unit using an independent decision-making process. **WHAT OPTIONS DOES THE FIRST PARTICIPANT LEAVE FOR THE SECOND?**

Faced with complex problems, we tend to try to simplify them. This is a fruitful strategy when purely technical problems are involved, but if human, social and psychological needs are oversimplified, the result is a reduction of human life itself. This is what mass housing has taught us and is a lesson that must be learned again and again.

SUMMARY

Simplification of the housing problem leads to the elimination of the user in the decision making process. Open building seeks to reintroduce the user without oversimplifying the organizational and/or technological aspects of creating decent living environments.

When land is not a problem, building individual detached dwellings can be a solution to enabling users to decide. But when space is limited, the problem becomes more complex. Then, the individual dwelling must be clustered and a much more intricate interweaving of spaces and technology occurs. One way to solve the problems of complexity is to eliminate the individuality of the dwelling – this has produced mass housing (built by both governments and large companies).

SUMMARY

But this simplification also eliminates the user as an active participant. The balance of interests that throughout history has been vital for the process of creating an acceptable human habitat is broken.

Open building is intended to recognize that balance of interests, particularly in the typical urban situation where higher density building should not reduce but enhance the balance of public and private life.

Open building is not first of all a technical matter but a matter of decision-making power.

FINALLY

NECESSITIES we don't question...

- 1. Fire protection measures required by building codes**
- 2. Earthquake measures required by building codes**
- 3. “Functionality” – embodied in fixed space standards**
- 4. Energy performance (now a widely accepted necessity)**

A New Necessity:

- 5. A long lasting (sustainable) building stock that reestablishes the role of the individual user in the decision-making process of making human habitat**

SUMMARY

- 1. Open Building is architecture**
- 2. Open Building is designed for change and variety and for reestablishing the role of the user in the creation of human habitat**
- 3. Open building harnesses both older and new technologies and is a good platform for further innovation.**