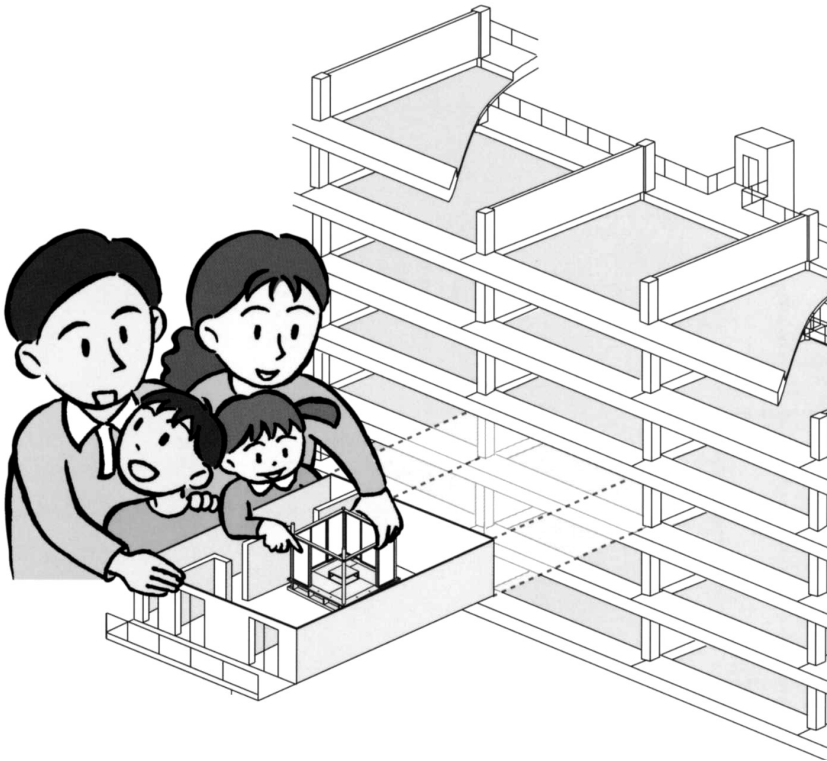


Open Building Exercises

an introduction

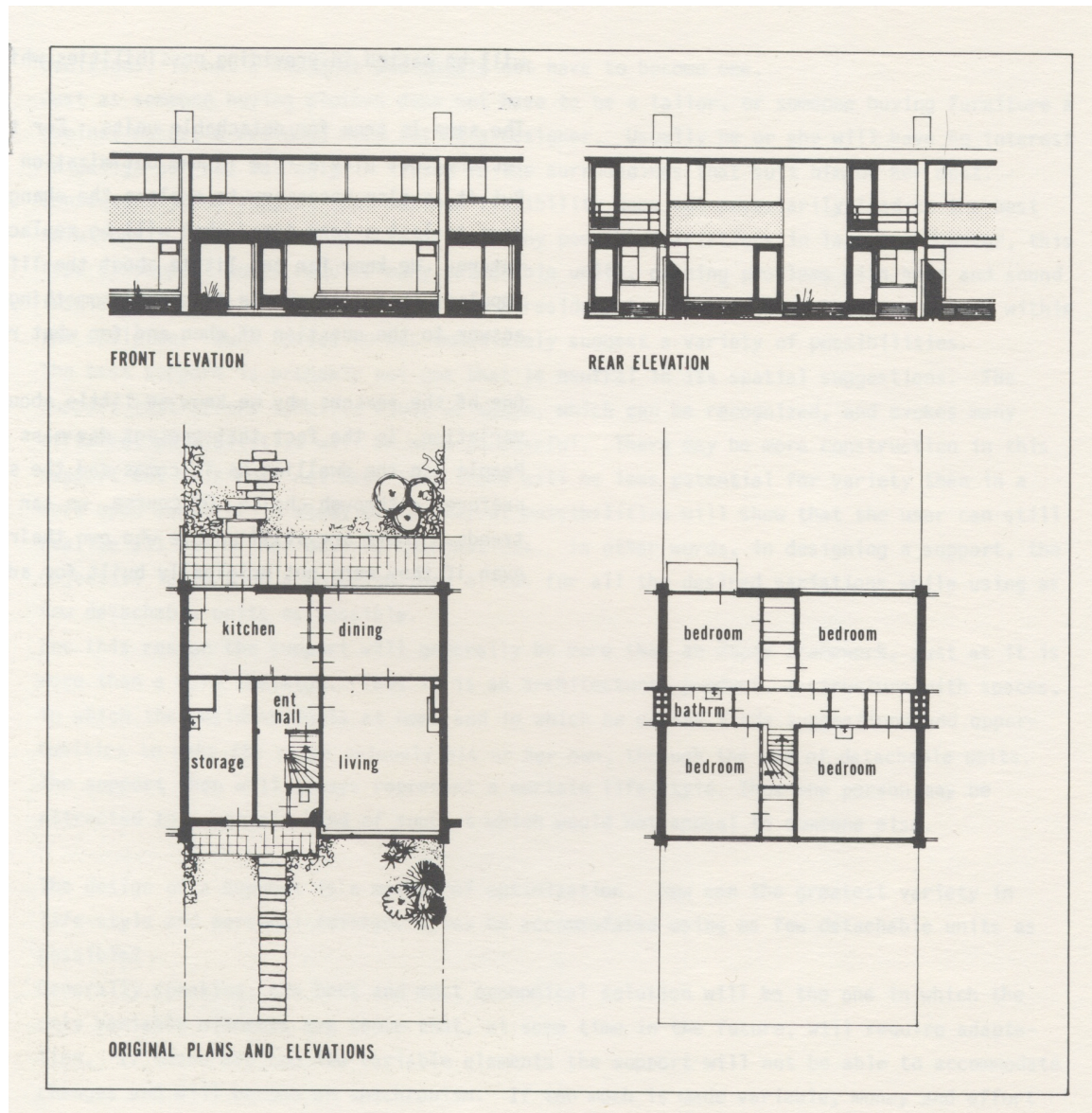
People cannot be separated from the built environment, if it is to be healthy

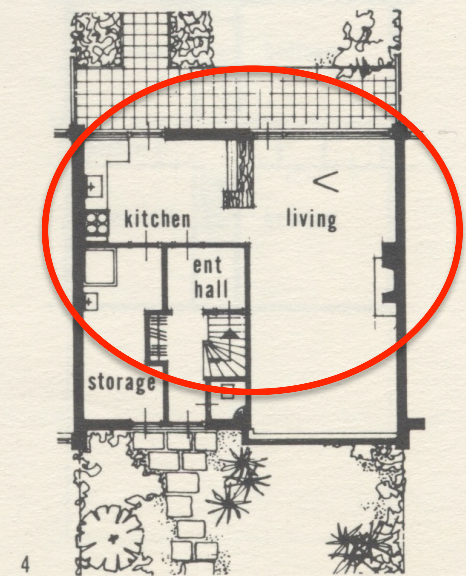
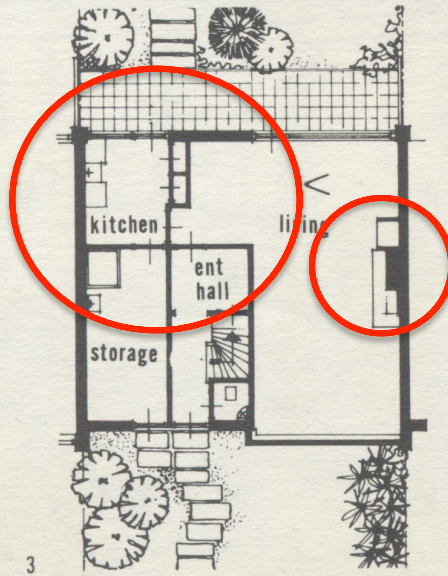
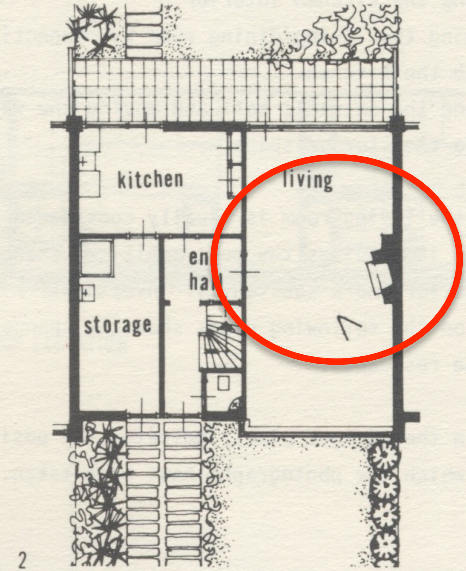
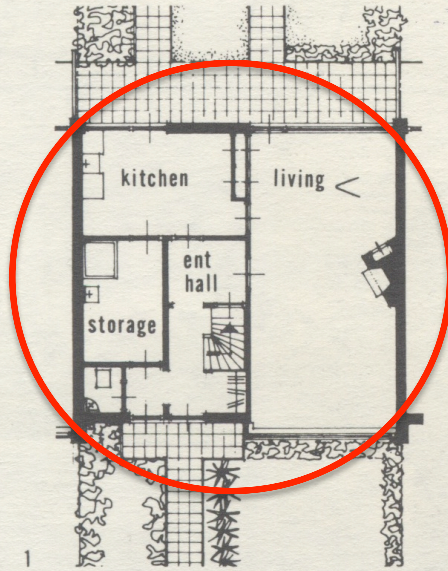
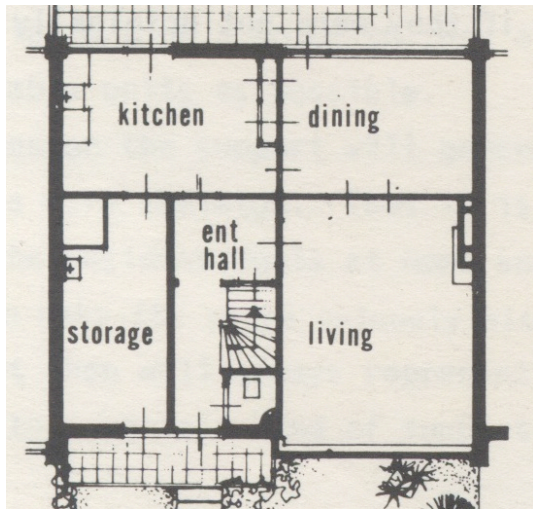
Therefore, power in the hands of the people is a **CONDITION** for a healthy environment.

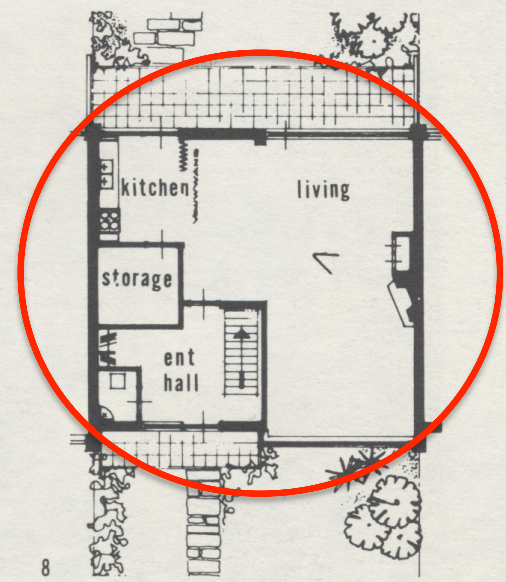
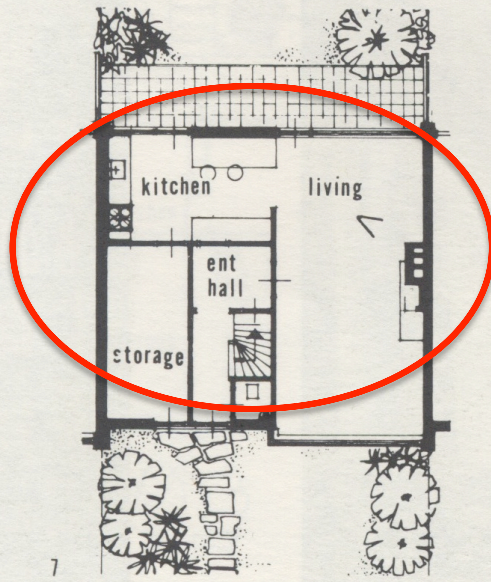
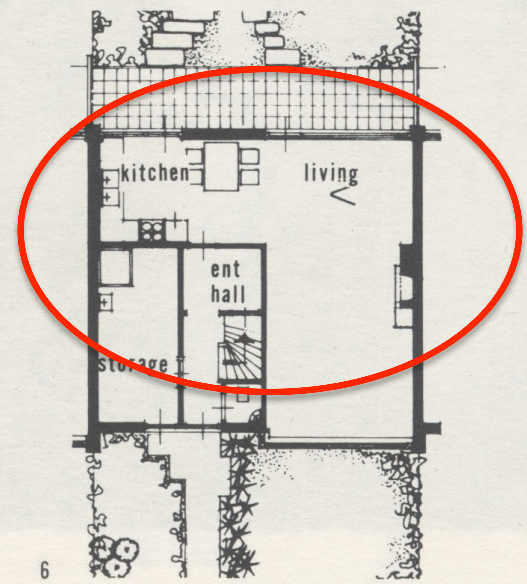
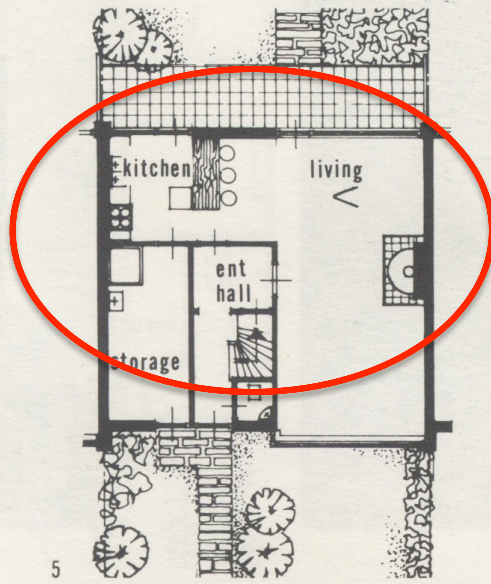
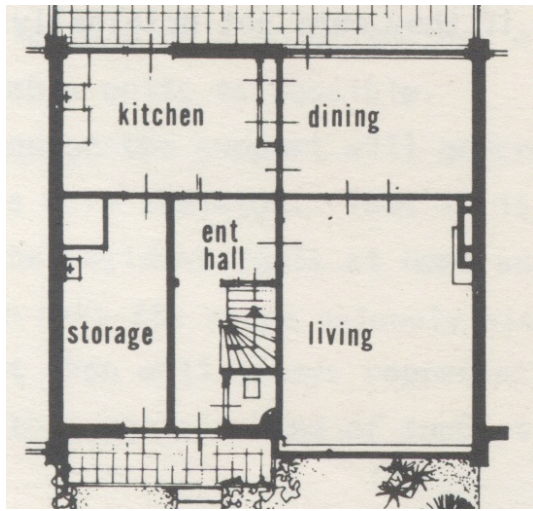


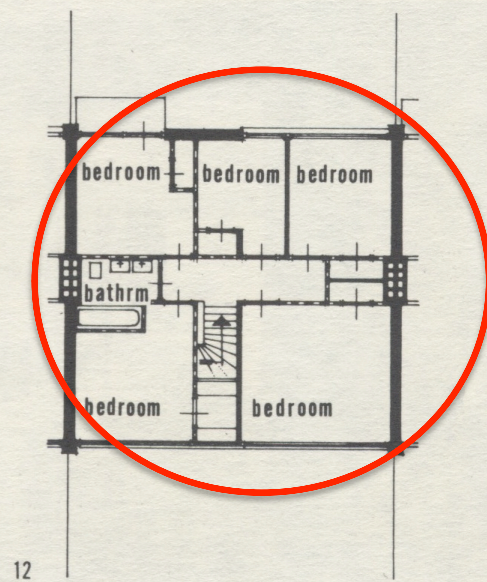
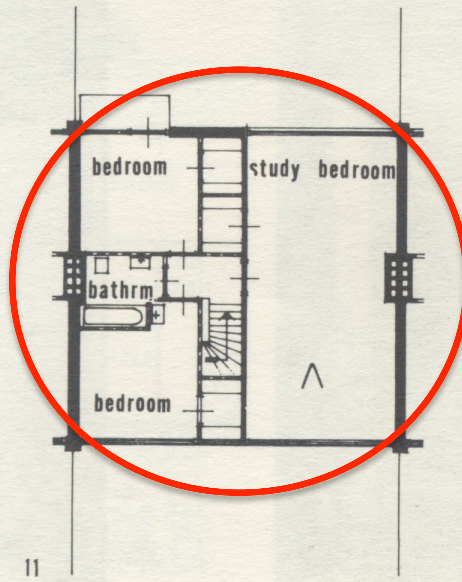
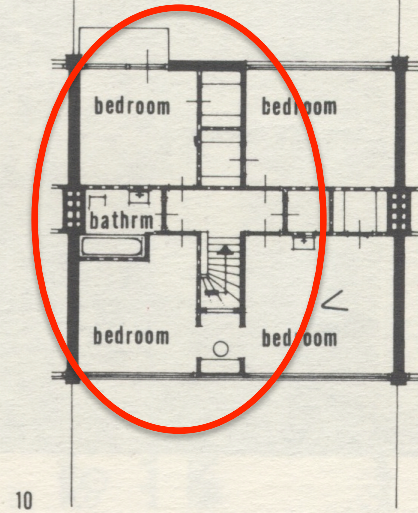
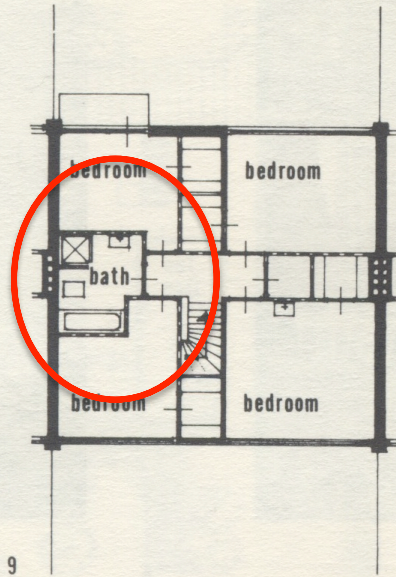
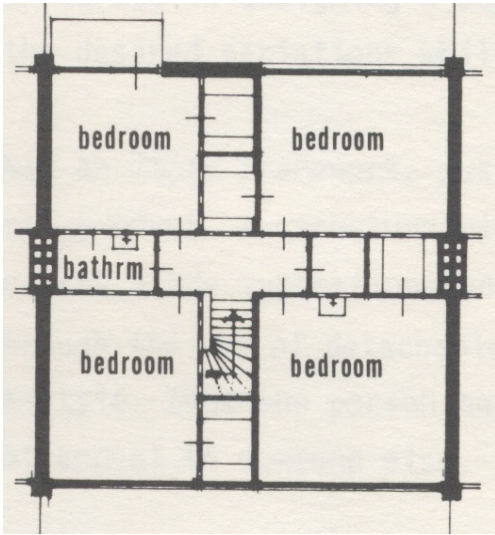
Ordinary residential buildings change

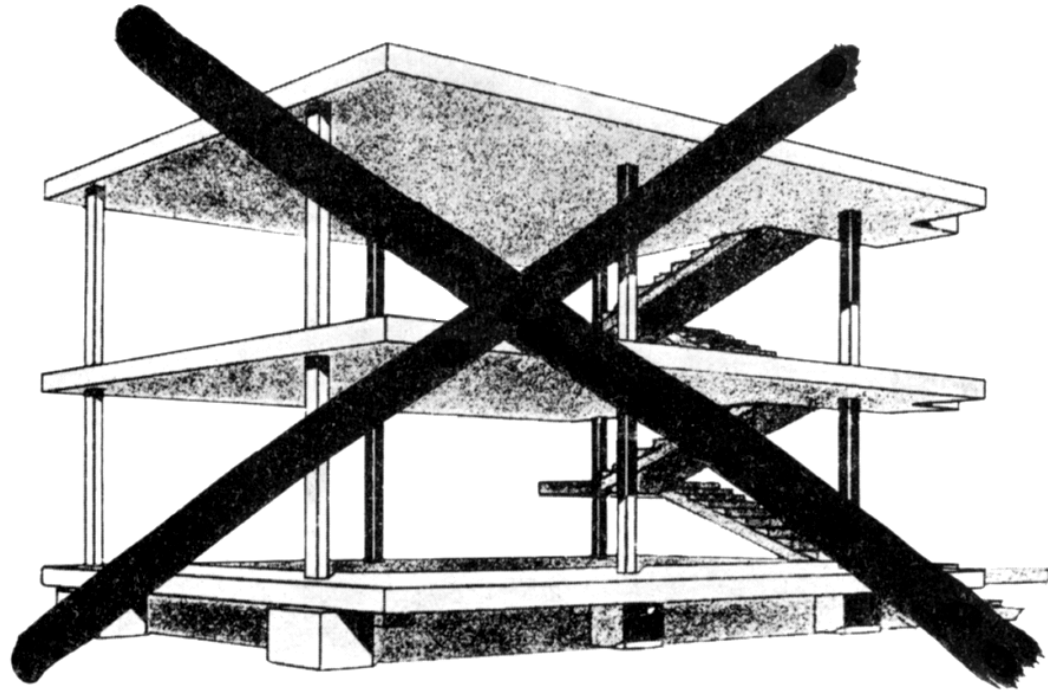
Here are some examples (from Variations: The Systematic Design of Supports, MIT Press)











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

A good base building is good architecture!

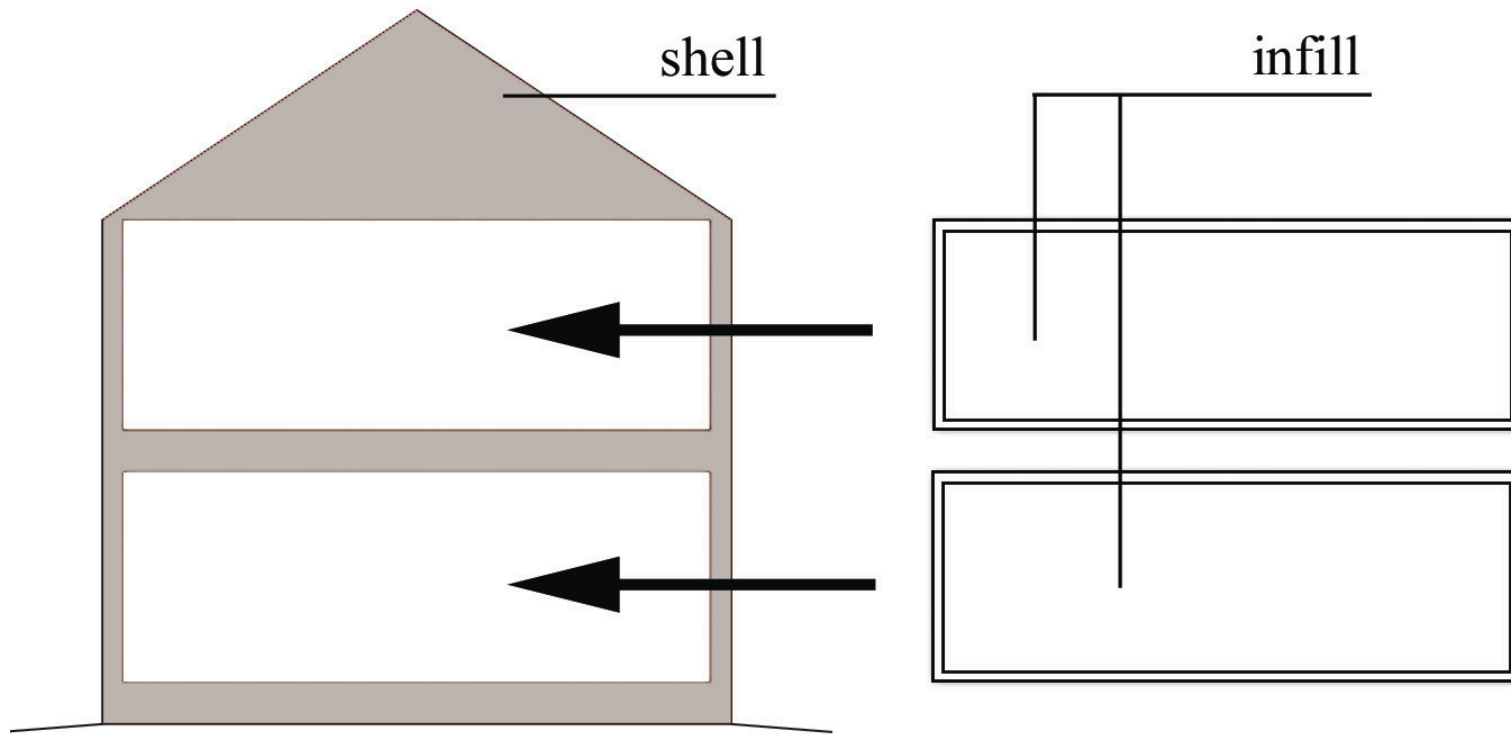


Xacalli, Mexico City



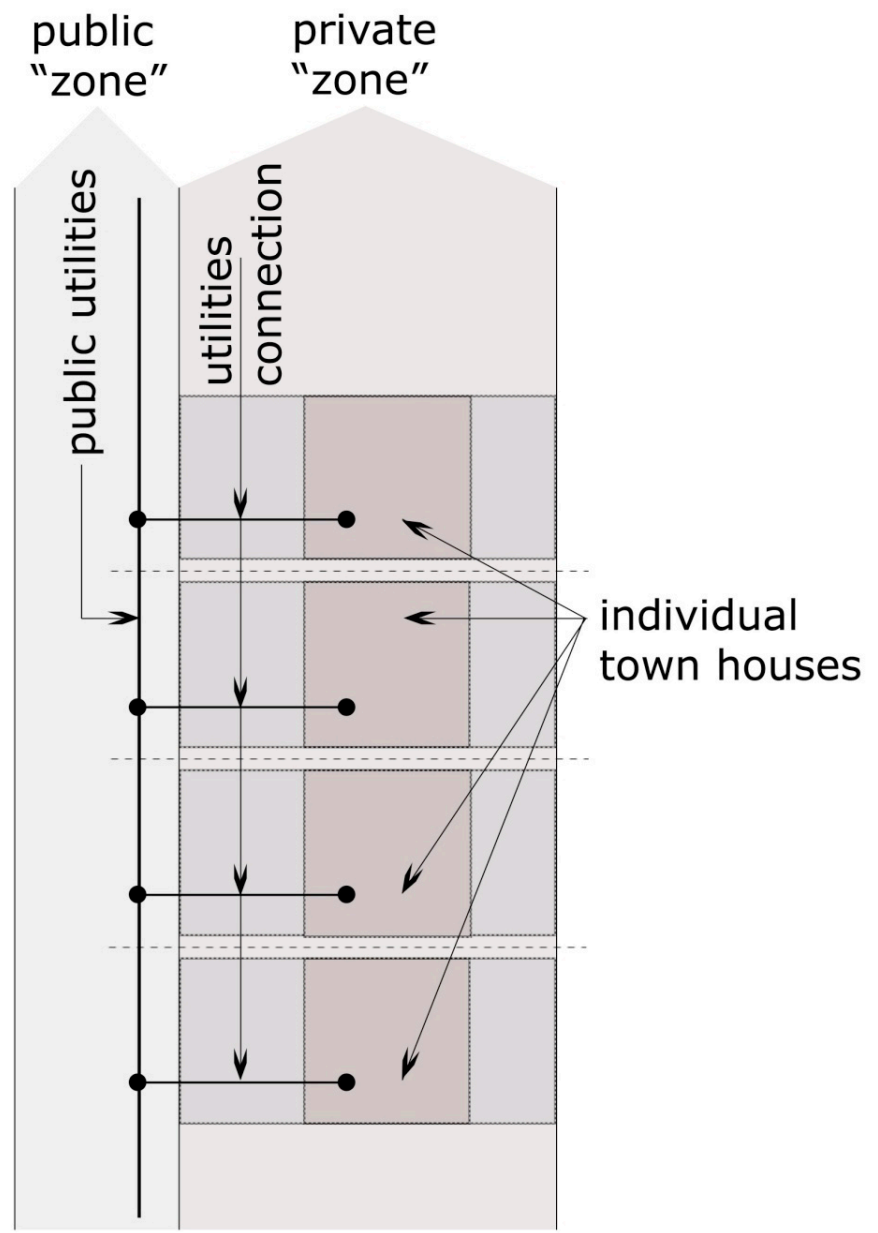
Pelgromhof, the Netherlands

Basic technical principles of a Shell/Infill approach



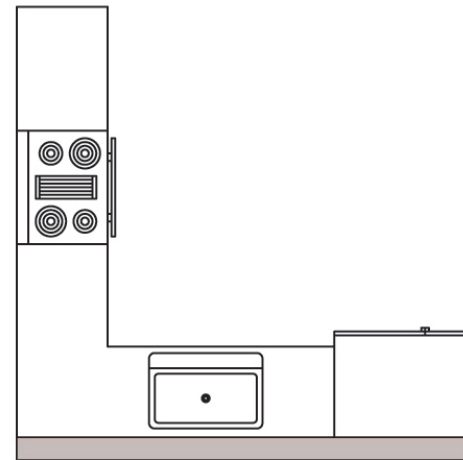
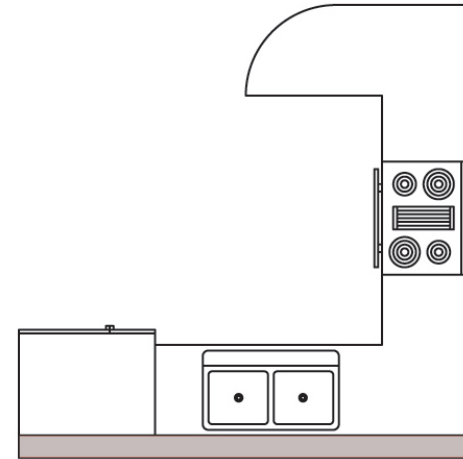
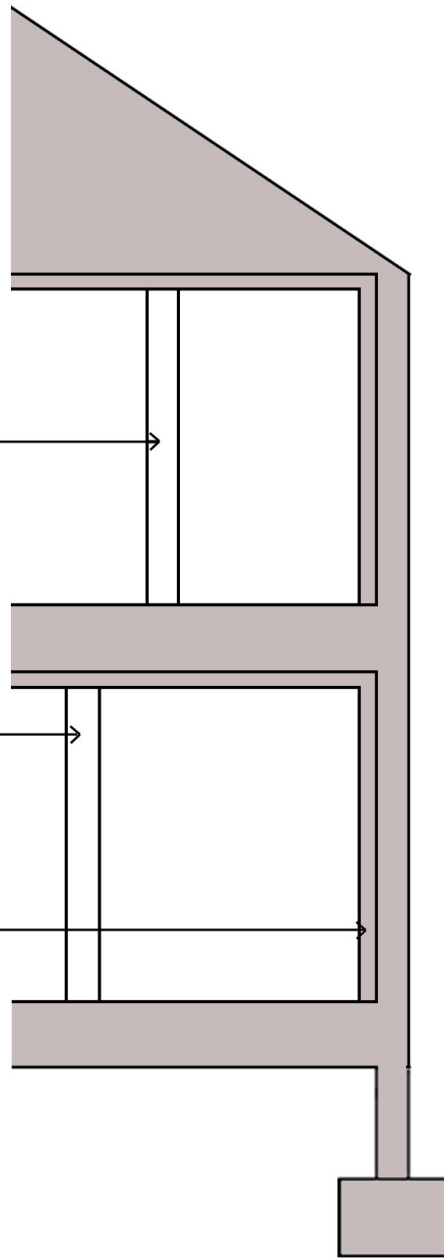
A Shell or Base Building is ready for inhabitation by means of infill or fit-out, decided per dwelling unit.

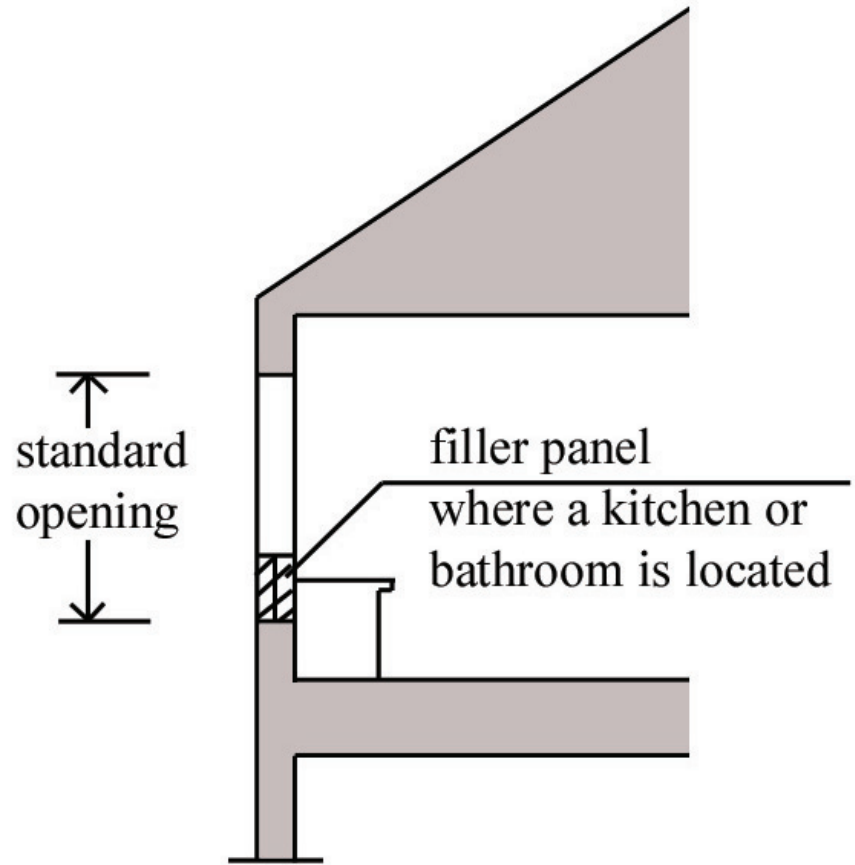
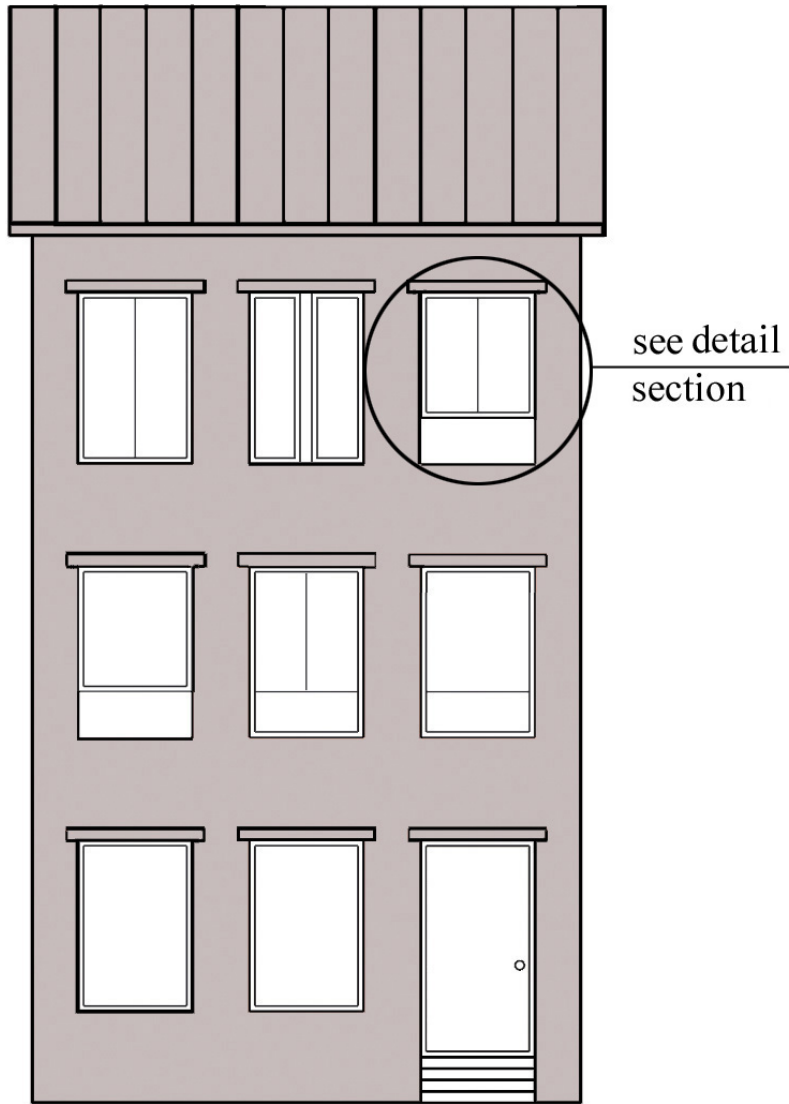
In laying out public utilities (piping and cabling), the most effective distribution of these systems is as shown - each individual dwelling unit has its own individual connection directly to the utilities in the “public zone”.

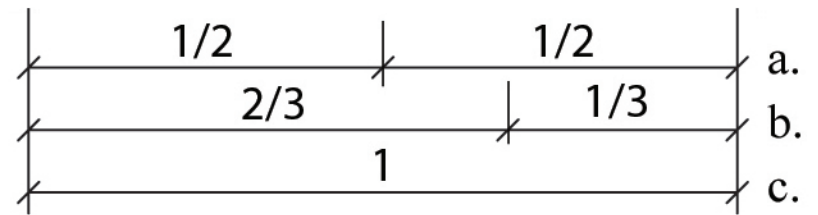
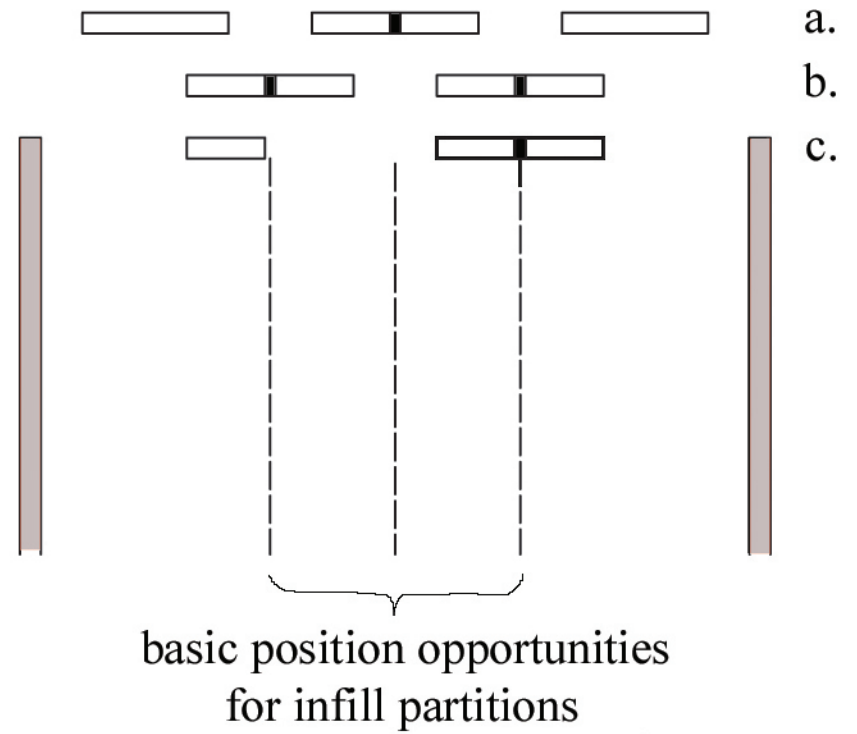
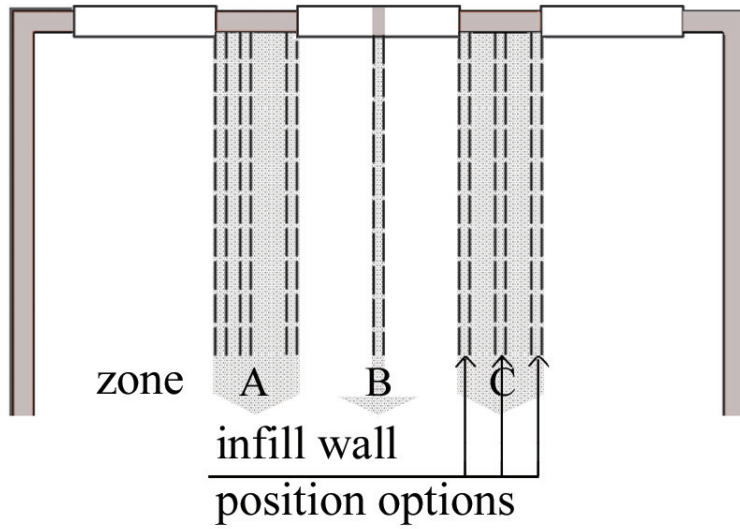


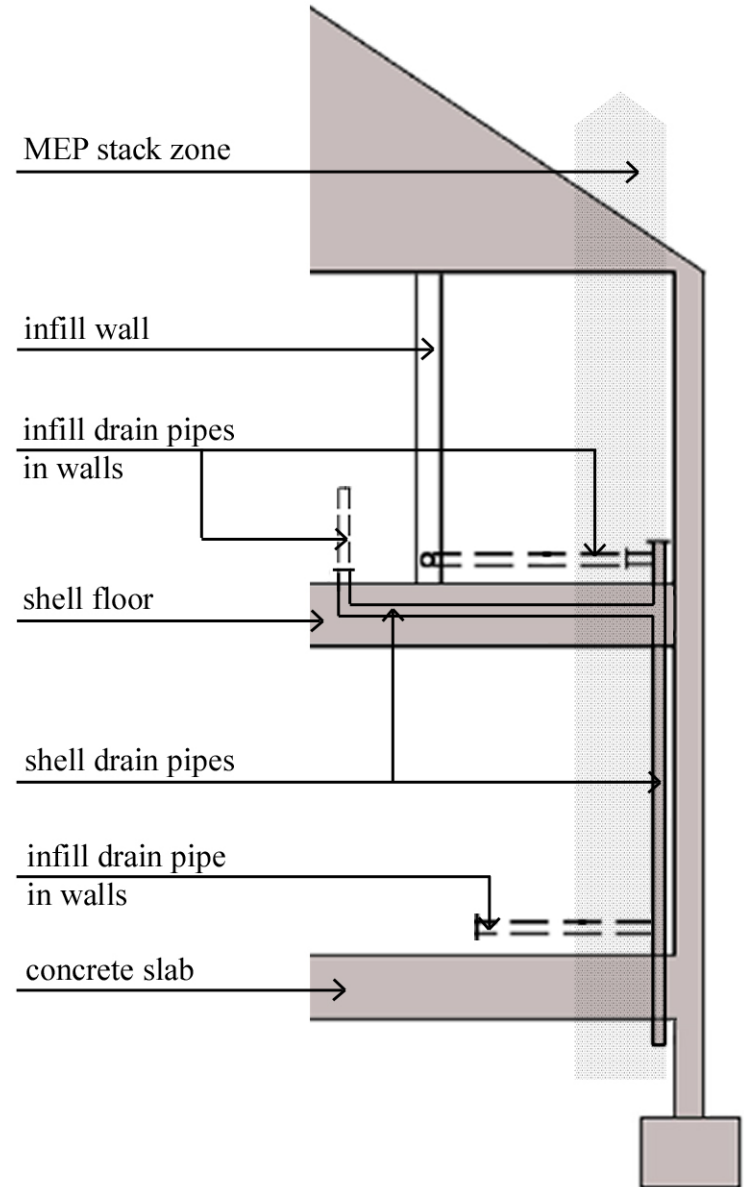
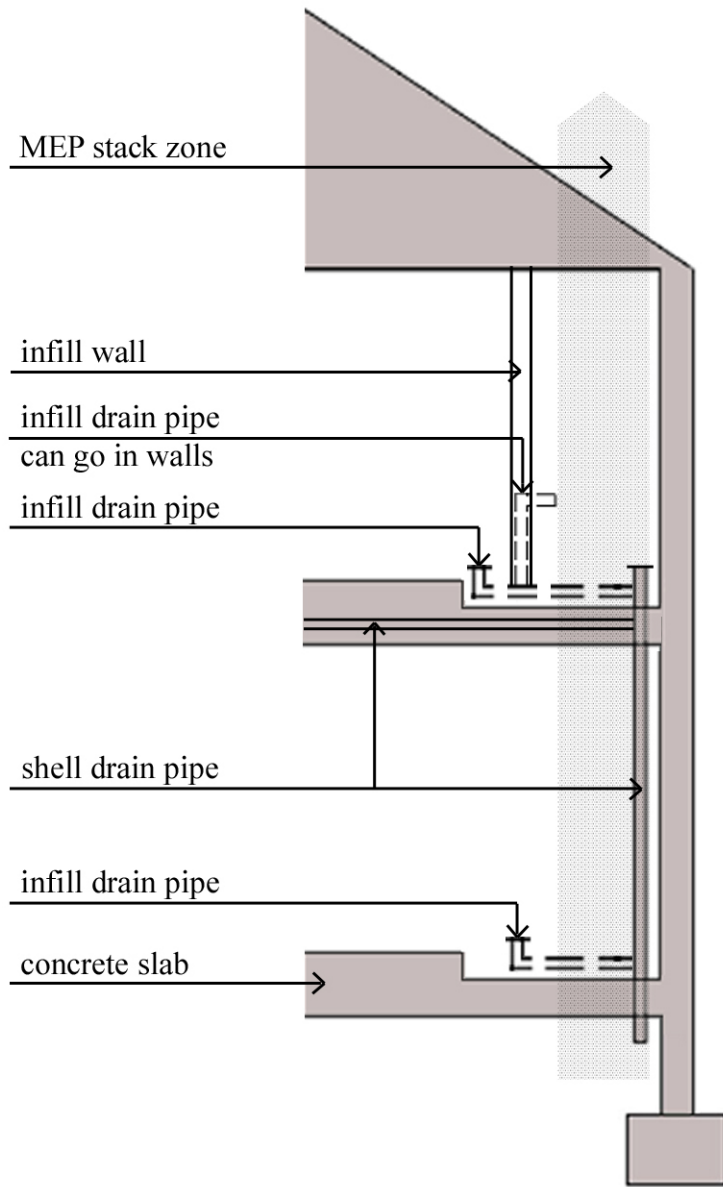
Infill partitions have drywall as part of the infill package. Infill partitions attach either to shell studs or joists or to shell drywall using molly bolts or equivalent fasteners.

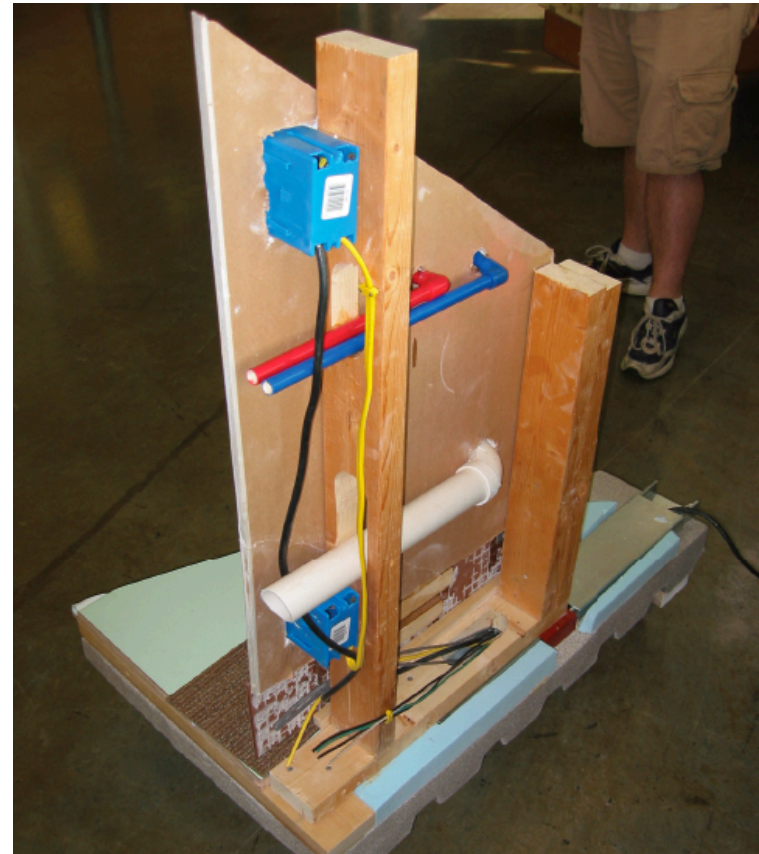
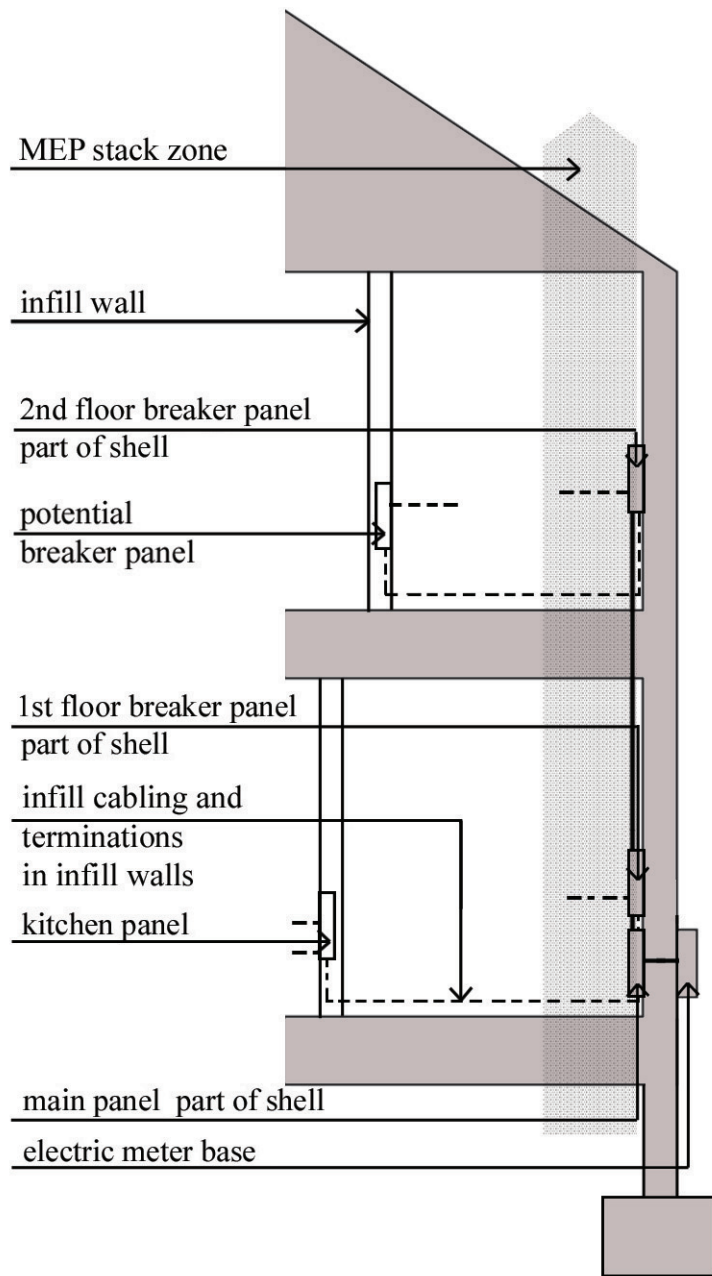
All interior surfaces of the shell have drywall installed in the shell contract.



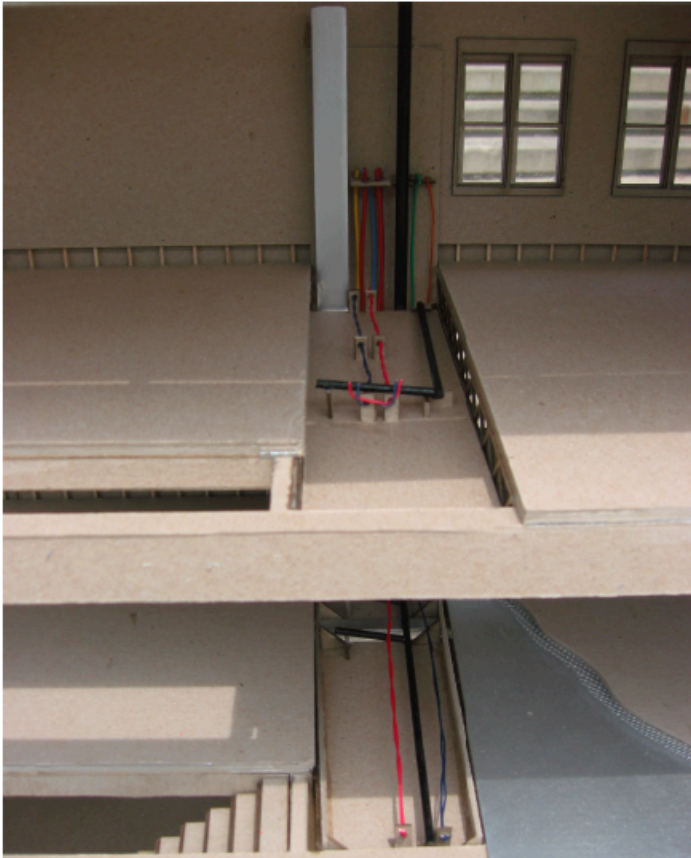




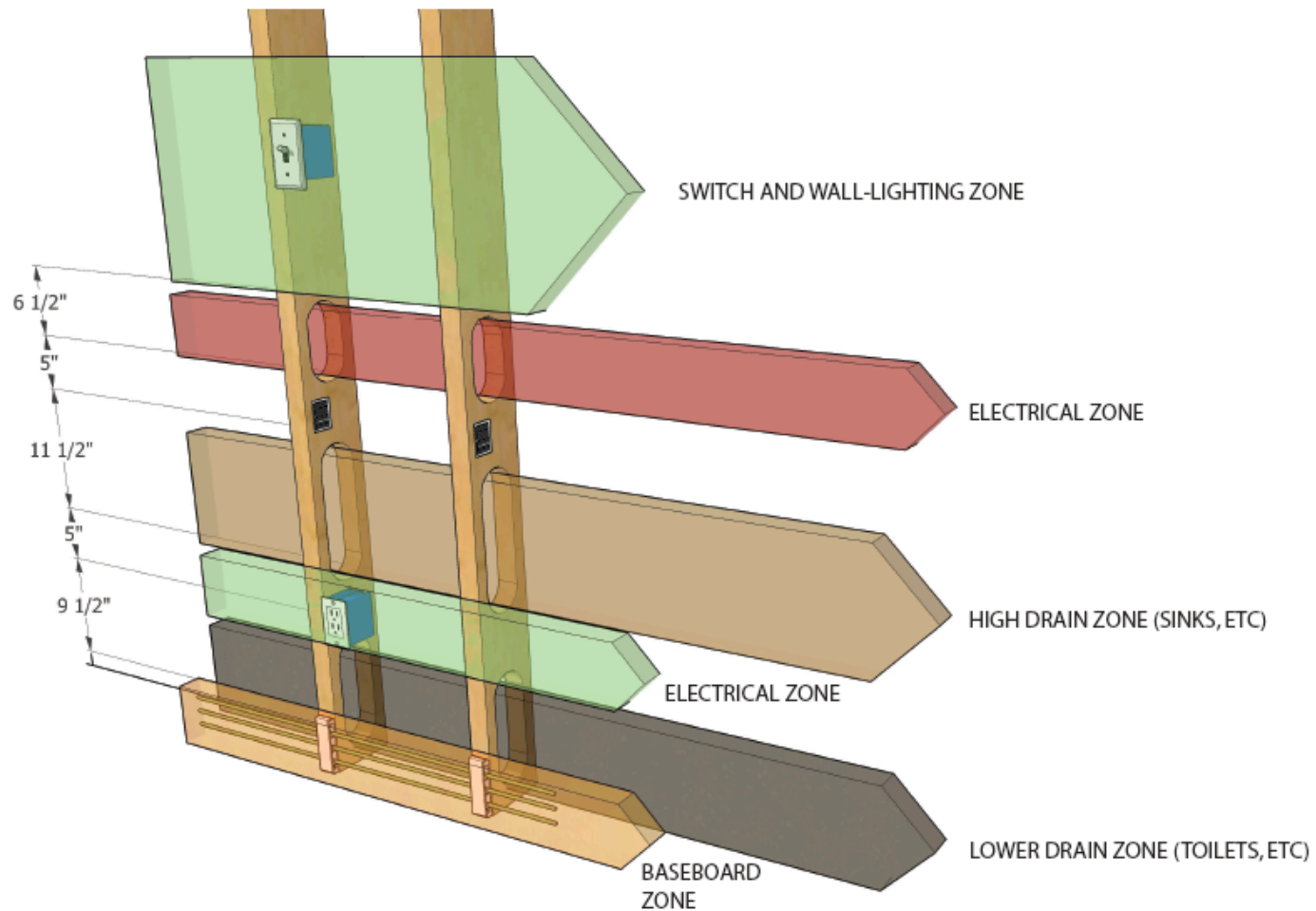




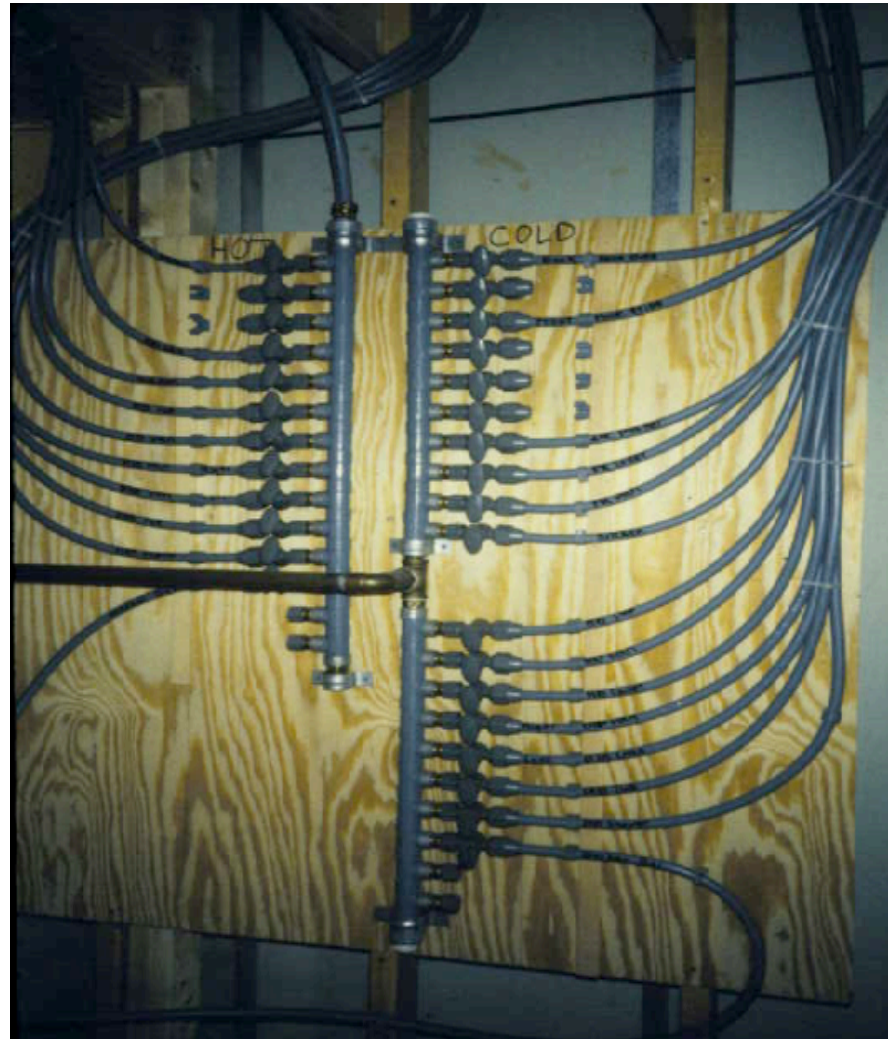
These are examples of a Shell Trench



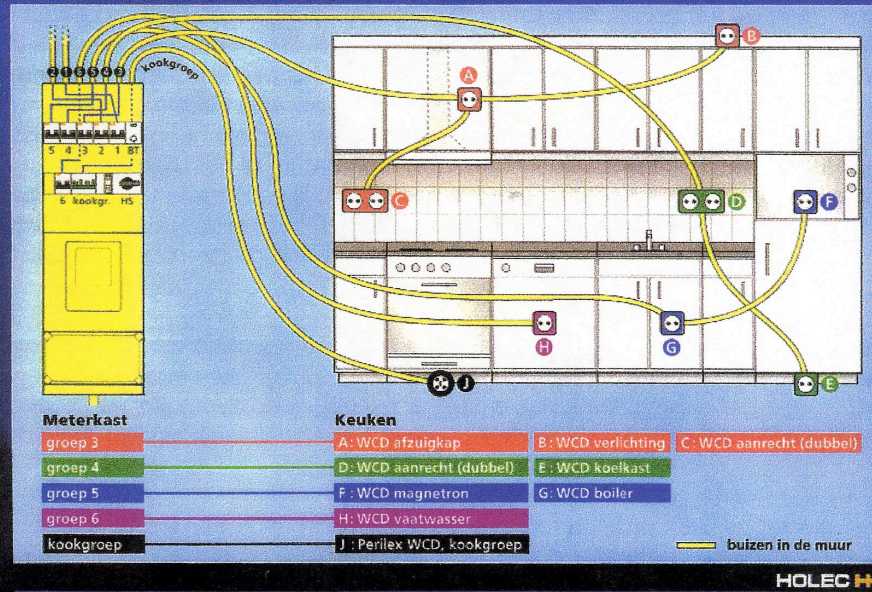
This is a variation on the idea of routing installations in INFILL walls



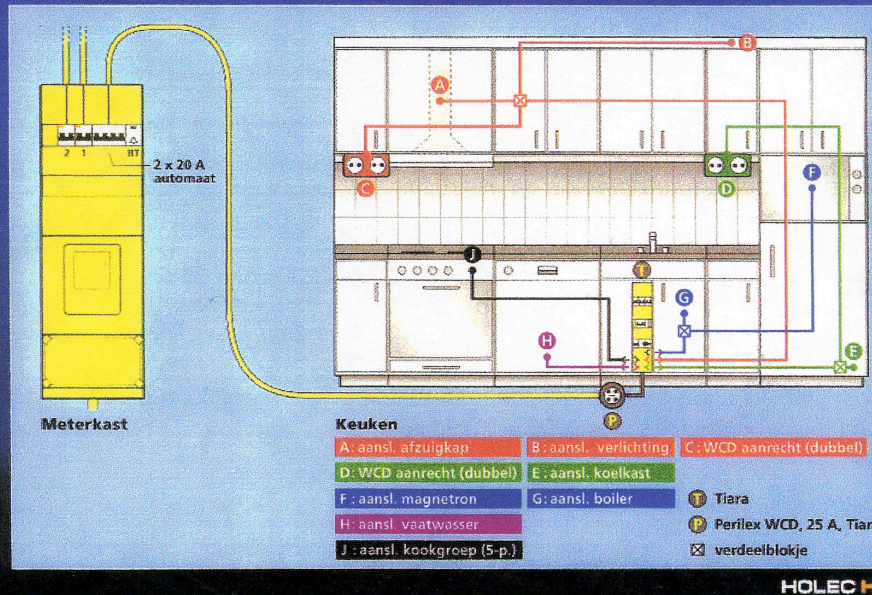
The cold water “manifold” is attached to a supply line, reducing the number and diameter of supply pipes in any given Infill wall location. From each manifold, “home-run” smaller diameter pipes reach each fixture or appliance, each with a shut-off valve at the manifold.



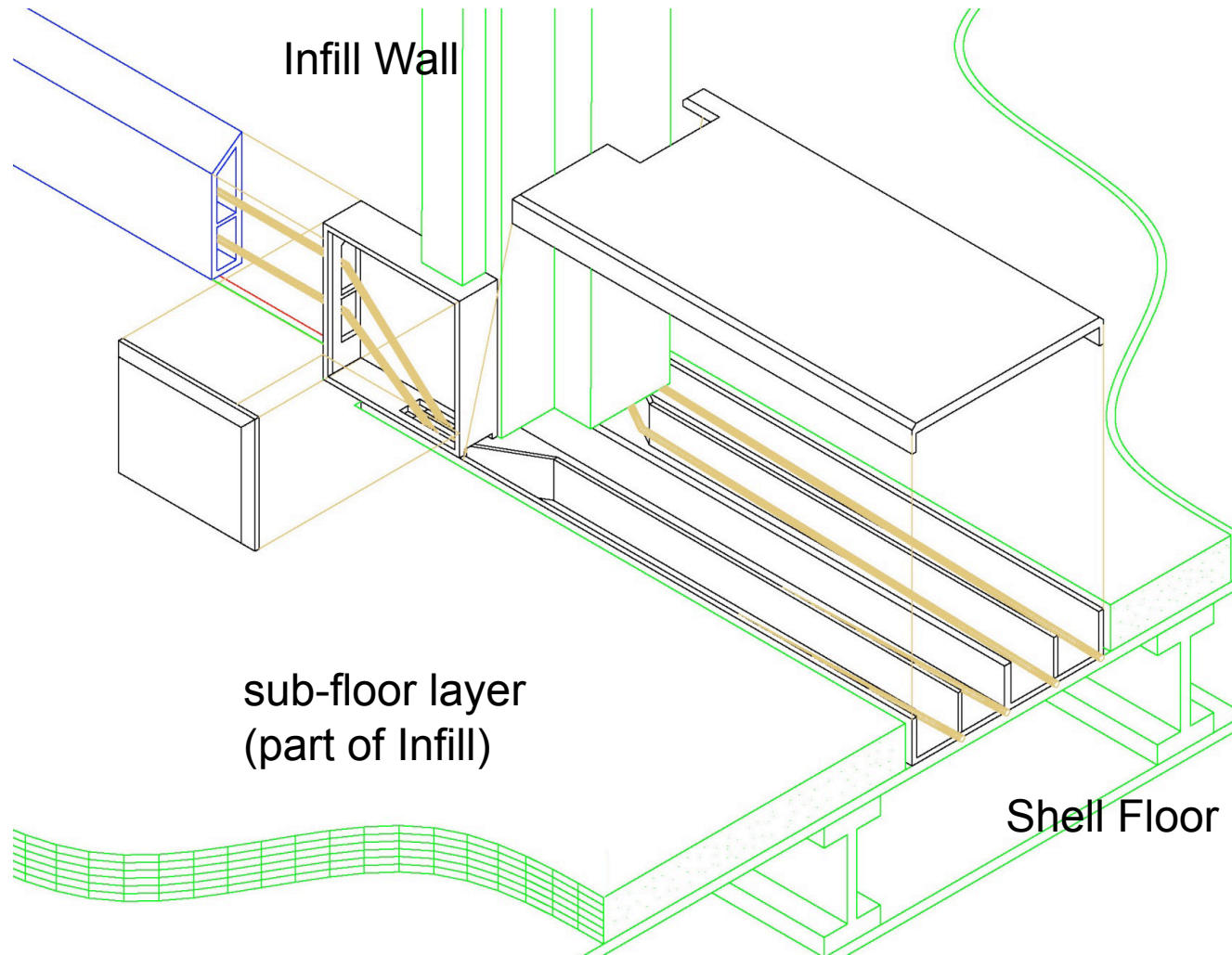
1. Traditioneel



1. Tiara A4F1



A way has to be found to route cables for power and data under the doorway, such as this...



This is what a townhouse would look like with a separation of shell and infill



The **INFILL** is the part of the whole building related to the individual dwelling unit, thus matching the basic social unit of society.



Getting started with the exercises

- One way to get started is to design new buildings using OB principles...
- Another way to get started is to practice on existing buildings...transforming them to make them “open”...
- **We will do the latter**
- If you are interested, you can practice more and then try to design a new building this way!

Here are some examples from students
at the National Taiwan University of
Science and Technology

INFILL A TOWNHOUSE

This exercise is designed to continue your study of capacity analysis. Capacity analysis is a method to evaluate what INFILL is possible in a BASE BUILDING.

We will use a townhouse SHELL designed before as an example and assume it is being build in Taipei and try to follow Taiwanese conventions and regulations as much as possible.

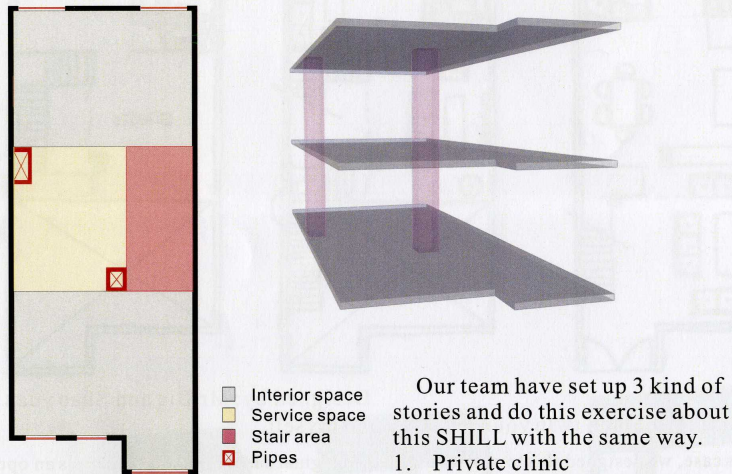
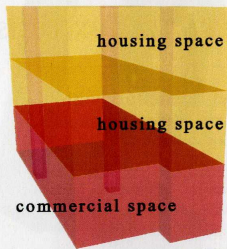


Fig.1 SHELL

Our team have set up 3 kind of stories and do this exercise about this SHILL with the same way.

1. Private clinic
2. Parents, 2 children and a car
3. Parents and 2 children



In this practice, we have three plan spaces to be possible to use, therefore we coordinate make 1F are the commercial space, and others are two housing spaces, we attempt design the different plan to the plan and the pipe shaft which decides the position.

In this exercise we try to do different functions in this site. We set a dispensary in the first floor to make a family clinic, and set the restaurant in back of the house. There is a conversion of public and private from the family clinic, this scheme is interesting in the conversion. The first floor set for the public to use, there are larger space over the second floor. Let the function of those spaces to be open relatively, such as the living room. Some spaces have windows, and then put the bedroom in these space (Fig 2).



Fig 2. Three floor plan and pipes

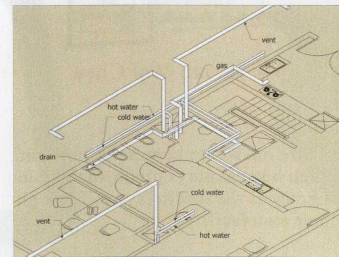


Fig 3. Pipe in the three-D diagram

We try to show the arrangement of every pipe in the three-D diagram (Fig 3) . The diameter of the water pipe set 8 centimeters, drain pipe diameter sets 12 centimeters, and vent pipe diameter sets 6 centimeters. There is a trench between the pipe shell and another. It is easy to set each pipe. When set the pipe, no more than five turns as the principle, and limit the length in 10 meters.

Lin, Meng-Shen

This homework is mainly to practice planning the INFILL in the SHILL which support Open Building construction methods, include the relation that advances among the principles through one that is with pipeline, must observe the rationality of people to move.

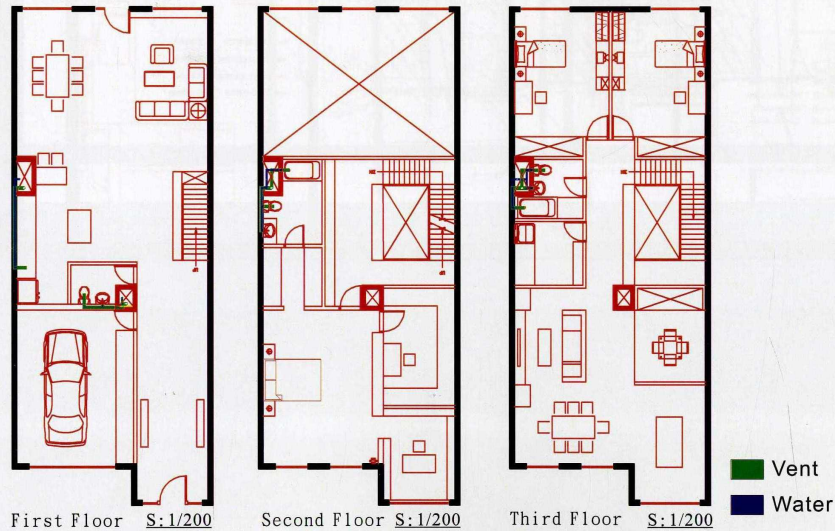


Fig 4. Three floor plan and pipes

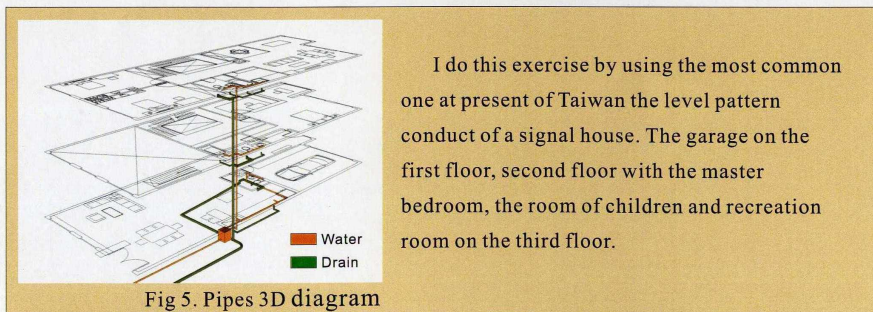


Fig 5. Pipes 3D diagram

Chen, Tsung-Yu

In slender townhouse plan, I cut the base three sections, then we dispose for the serves space and the skylight stair hall in among that section of base, 1f plan mainly for is near the street in a business area clothes shop and the working room, 2f plane for the parents room and the dining room and the living room, 3f plane are two child room, a guest room and the playroom.



Fig 6. Three floor plan and pipes

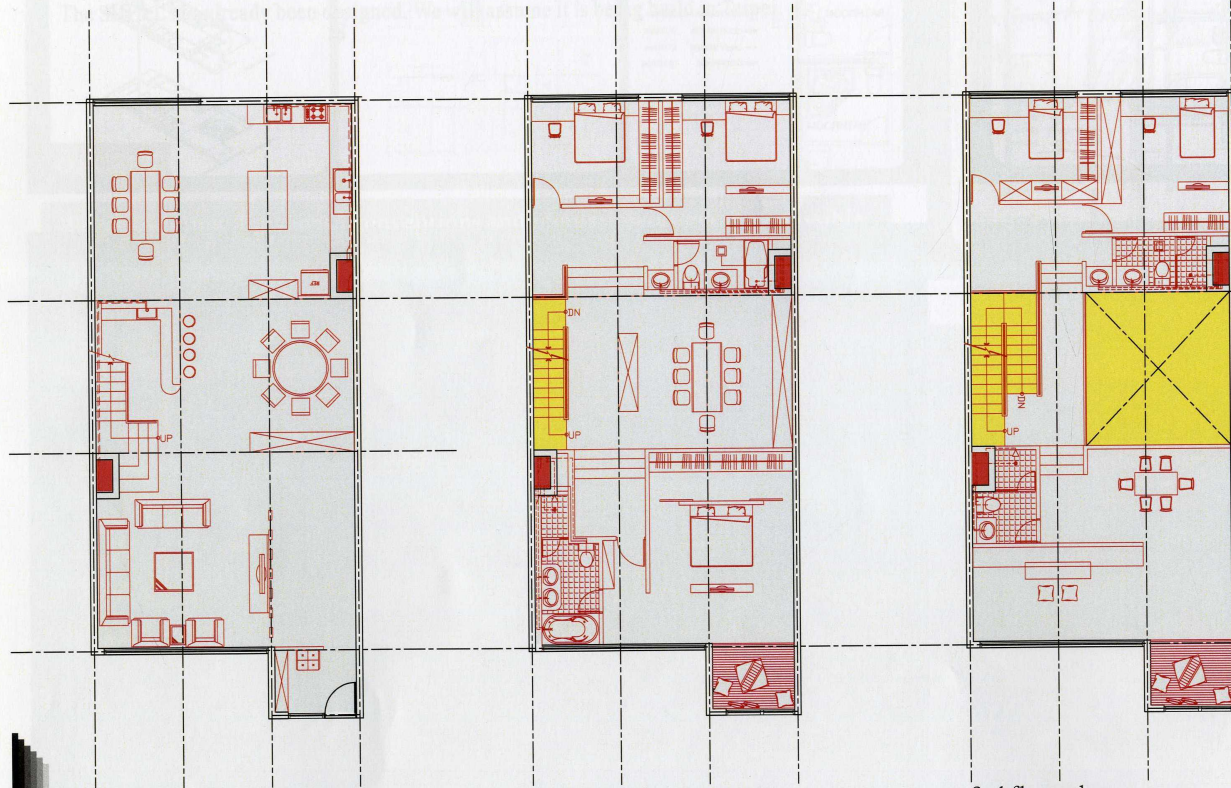


Fig 7. Space analysis

Ho, Wen-Chun

INFILL A TOWNHOUSE

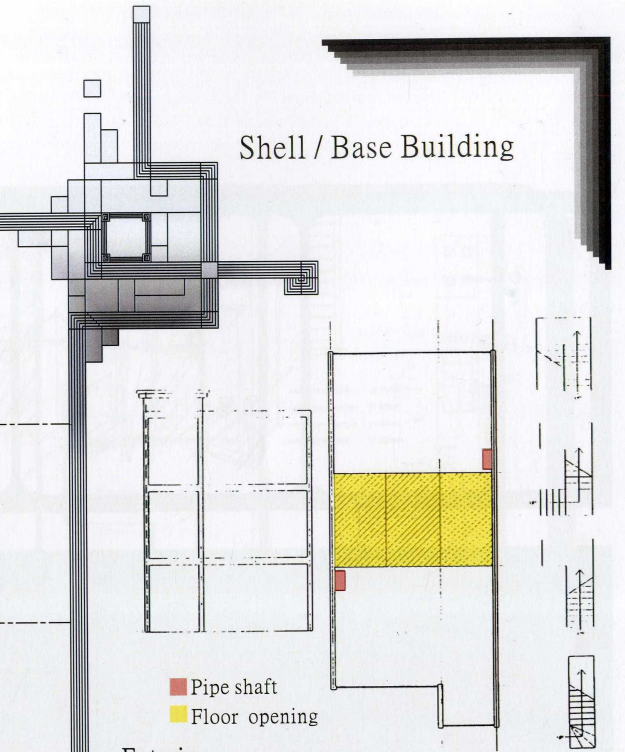
Design A



1st floor plan
Scale= 1:150

2nd floor plan
Scale= 1:150

3rd floor plan
Scale= 1:150



Shell / Base Building

■ Pipe shaft
■ Floor opening

Exterior

The exterior of the shell is a simple layout with six bays in which the panels are placed. Eleven foot floor to floor height provide plenty of room for deep floor cavities in which to place HVAC and other utilities.

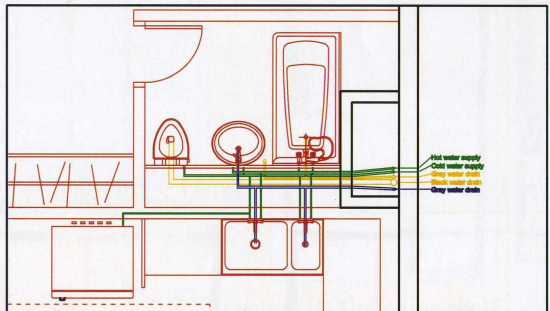
Floor Plan

The floor plate is divided into 3 bays both horizontally and vertically and has two mechanical chases in which all the HVAC, electrical, and data are run from floor to floor.

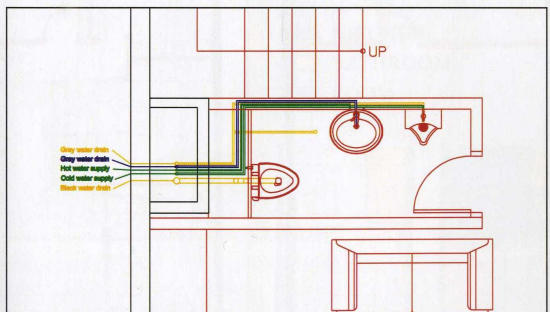
Vertical Circulation

With a consistent size opening for the stairs there are a variety of options. Each of the four options can be placed in any of the three places.

- Upper piping zone
- Waterline zone
- Lower piping zone

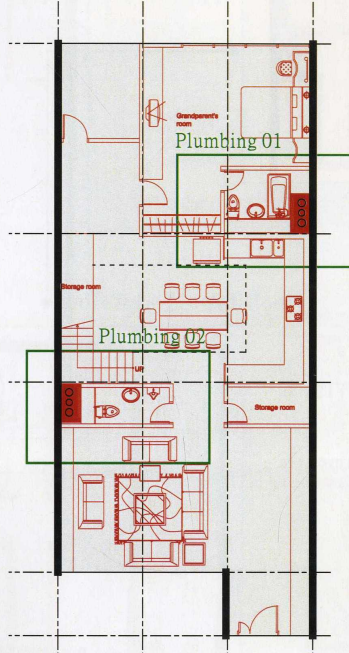


Plumbing A Detail
Scale= 1:50

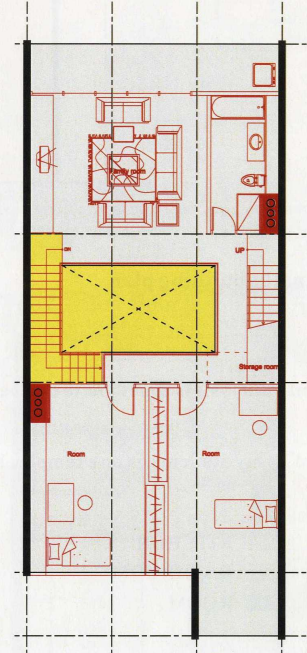


Plumbing B Detail
Scale= 1:50

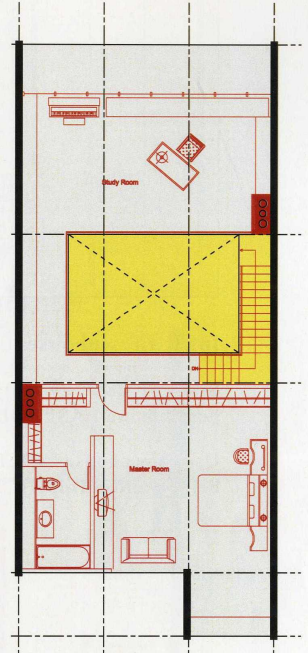
Design B



1st floor plan
Scale= 1:150



2nd floor plan
Scale= 1:150



3rd floor plan
Scale= 1:150

Plumbing

We categorize piping into 3 zones by height: upper piping zone, waterline zone, and lower piping zone. The drain with higher height, such as drains of sinks in bathroom and kitchen, are located in upper piping zone. In the contrast, the drain with lower height are put in the lower piping zone, such as drains of bathtub, toilet, and urinal. The water supply includes hot and cold water pipes which are located in the waterline zone which with middle height. The drain in both upper and lower zones could be divided into black and gray water drains, if there is a water recycle system implement in the building that could reuse the gray water.

EXPLORING CONSTRAINTS OF A FLOOR AREA IN A CONVERSION PROJECT

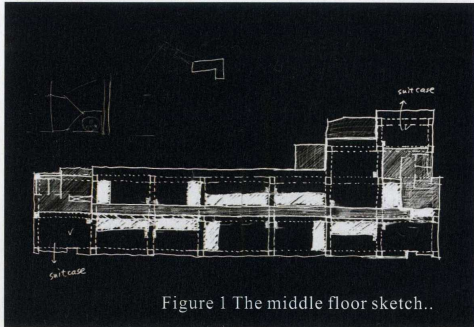


Figure 1 The middle floor sketch..

For renovating a new building, we should think differently. As an architect, we should think more to offer the owners special space experience, such as expanding threshold. Our team was assigned to transform a building above MRT station into multifunction usage. Actually, this building originally was designed for offices, now we should design for housing. Reclassifying the space would be a good way. It not only can enlarge the space, but also can easily be changed to respond to the customers requirement. Under the situation, we developed three composition answers. They would be picked up by the developer. So finishing reclassifying the floors section, we rearranged the pipe shafts and stair openings. As usual, we will show two possible solutions at the end.

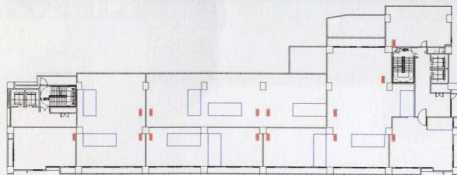


Figure 2 Pipe shafts and stair openings location.

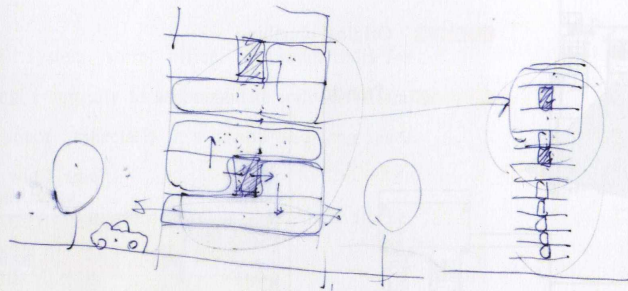


Figure 3 The sketch of building section drawn by Prof. Kendall.

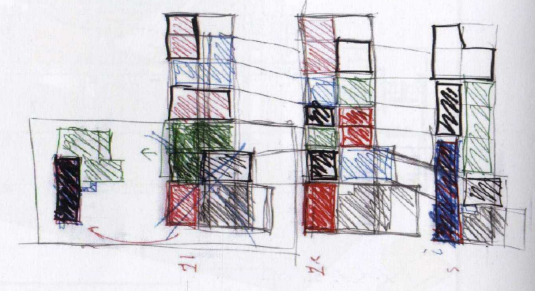
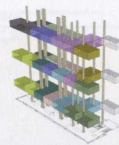
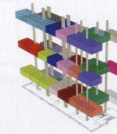


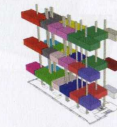
Figure 4 The sketch is describing the composition thinking.



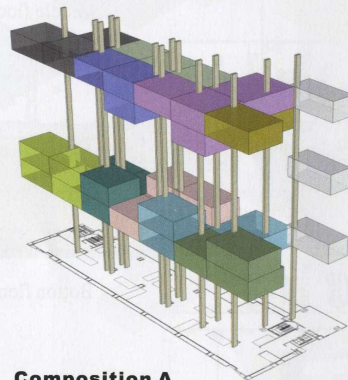
We regarded three floors as one pile. People can upstairs or downstairs from the middle floor.



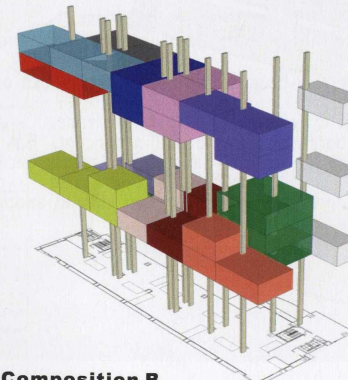
Following OB principals, we struggled to avoid putting pipe shafts and stair openings under ALL beams.



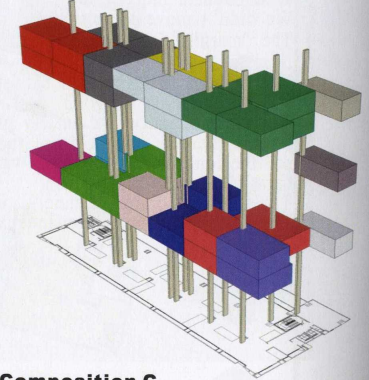
The apartment which is in GRAY is A type. We used this protopenigs to deliberate our intention.



Composition A



Composition B



Composition C

Figure 5 The three different composition way distributed by Ko Yang Lin and GenHan Lee.

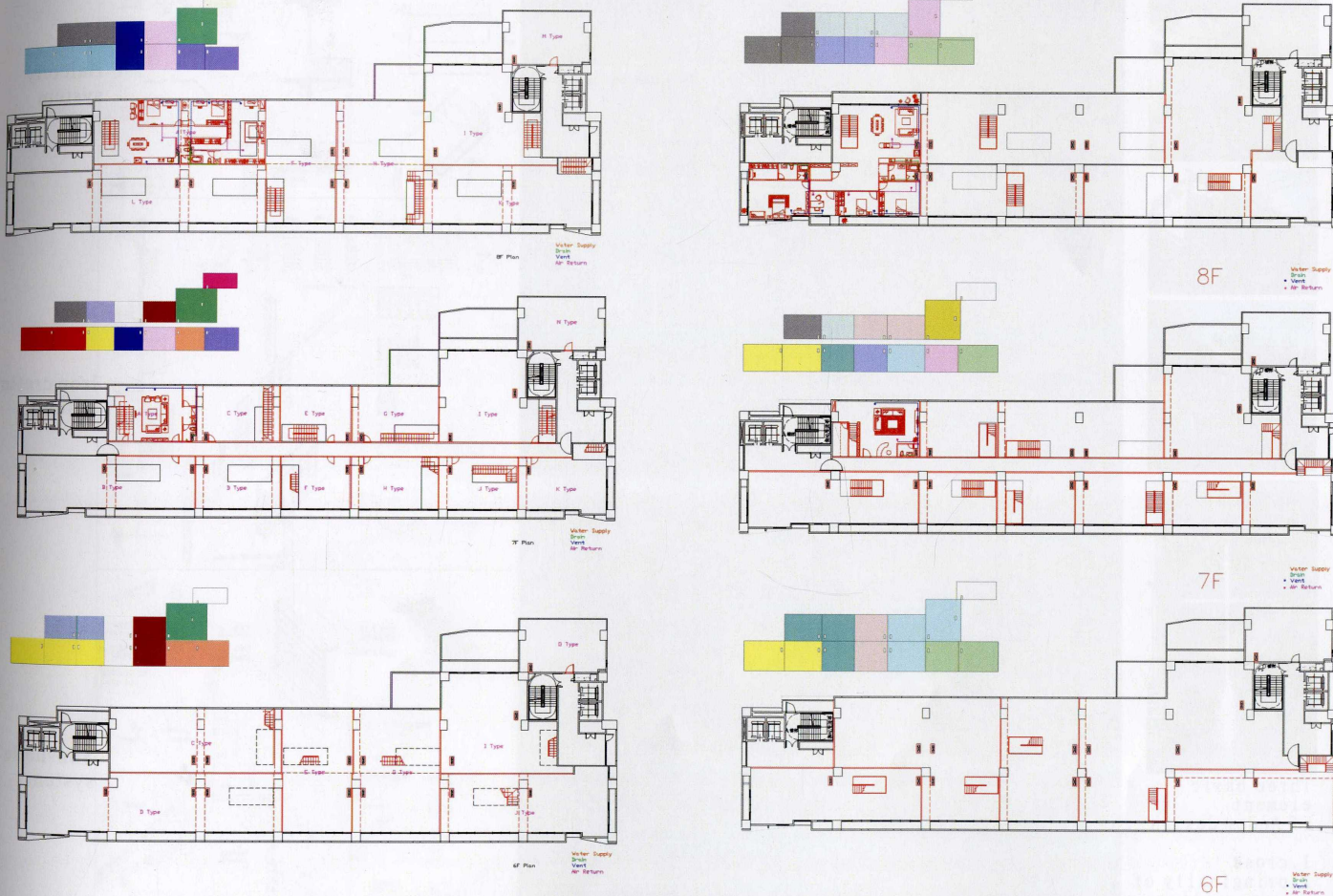


Figure 6 The left is composition #B designed by KoYang Lin, and the right is #A designed by GenHan Lee.

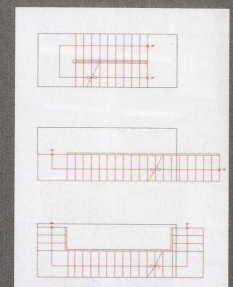


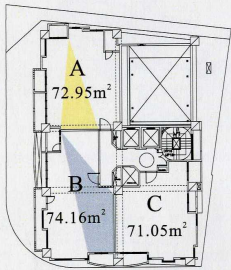
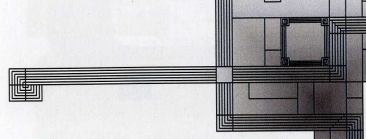
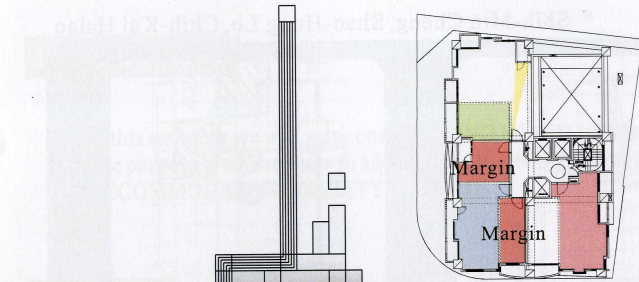
Figure 7 Three stair types.

After setting up the pipe shaft location, we started to explore unit and plan variants. Finally, we made two different plans. At the same apartment - Type A, we tried to develop two dissimilar interior ideas. Like the exercise two, we decided which kind of stair we want to use. From the above Figure 7, we designed three different stair types that allow the buyers to decide which one they prefer. As the result, we presented these two plans.

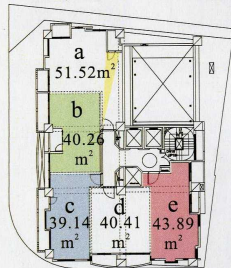
Transforming an existing base(rigid) building into A RESIDENTIAL OPEN BUILDING

Topic

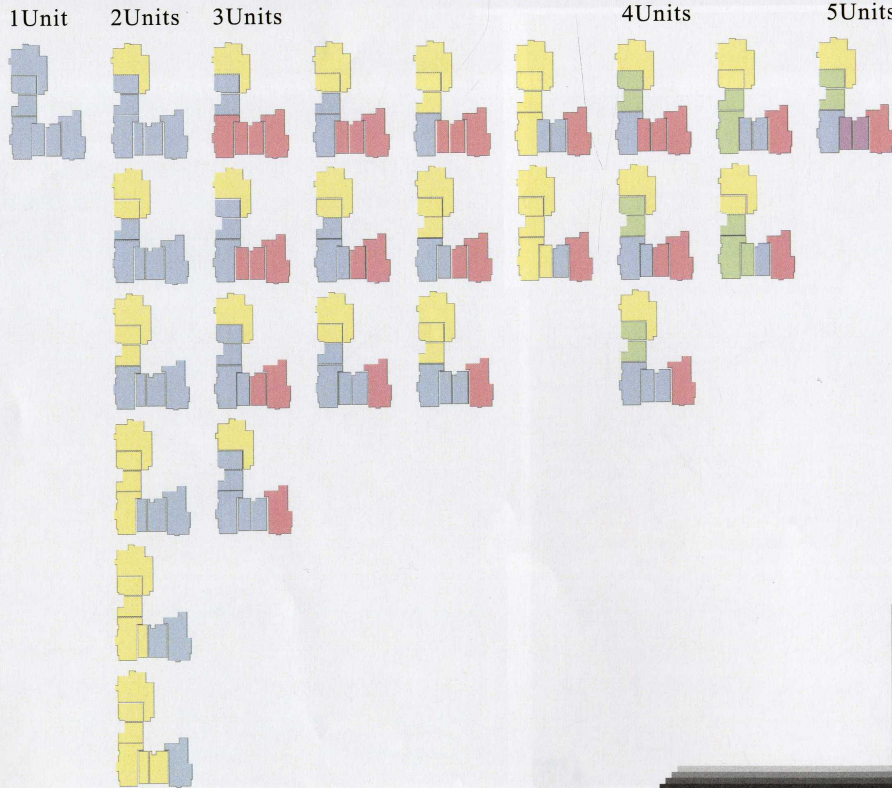
This exercise is designed to transform an existing mixed use base building into a Residential Open Building. Change as little as possible to increase this building's capacity to accommodate individual family preferences. The façade, structure, and fire escape system can not be changed.



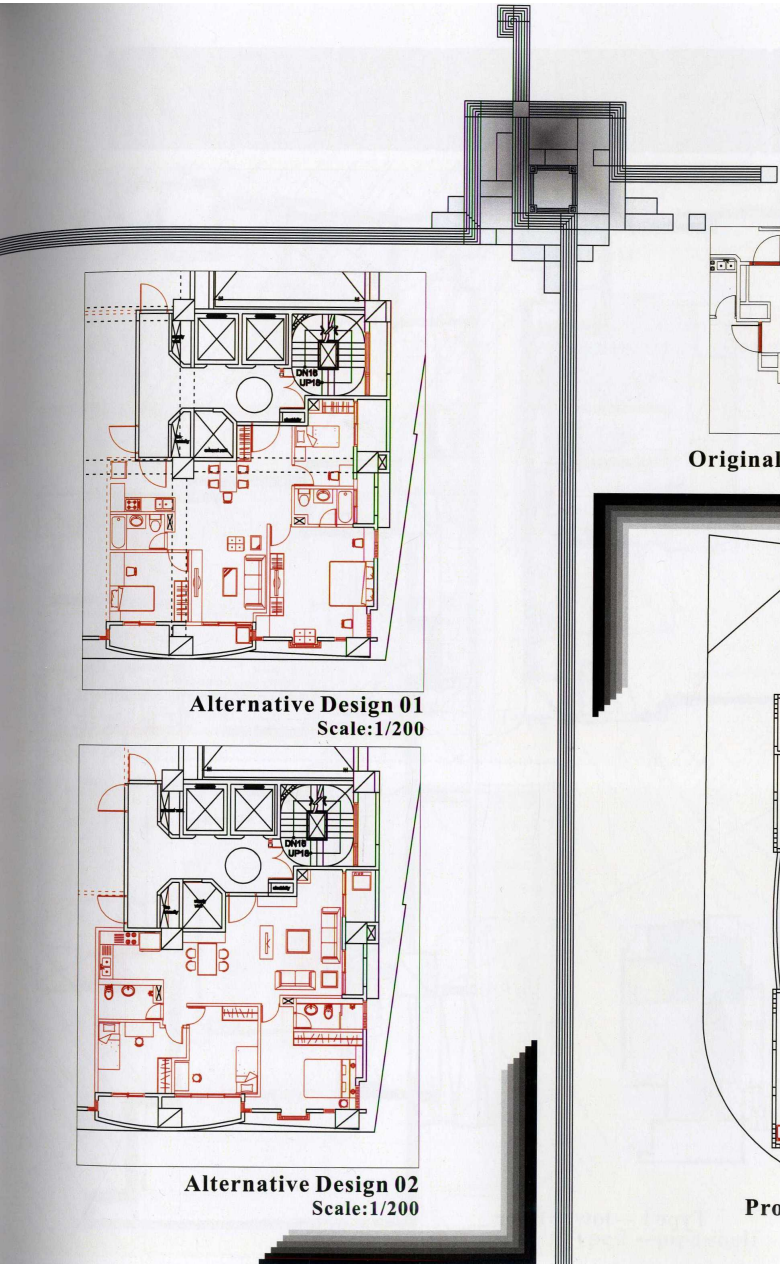
3Units Type



5Units Type

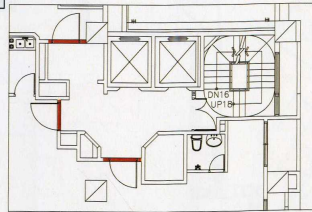


The floor is divided into 7 segments which with different measure of area can generate at least 25 different floor plans in accordance with different permutations. The area of each unit is flexible that there is a flexible margin between every two adjacent dwelling units, so up to 20 alternative units could be found. The square measure of single unit ranges from 39.14 m2 (1 bedroom) to 220.16m2 (whole floor). Because of its outstanding capacity of accommodating individual family preference, the arrangement of the whole floor is perfectly flexible. It demonstrates that if the designers (architects) can deliberate about the floor plan to enlarge its capacity, the difficulty of refurbishing or rearranging it will become much easier. Actually the problem base building caused is much minor than that of bad design in initial stage. The designer always plays a very important role in open building.



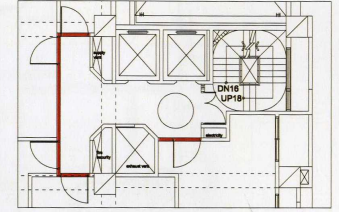
Alternative Design 01
Scale:1/200

Alternative Design 02
Scale:1/200

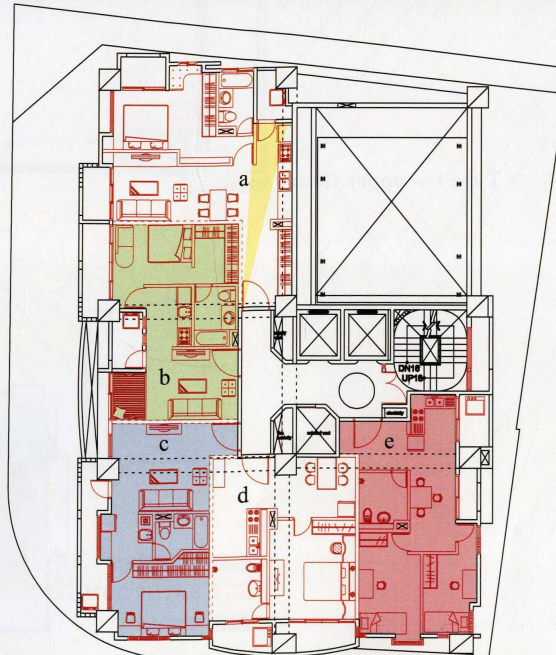


Original Core Plan - Scale:1/200

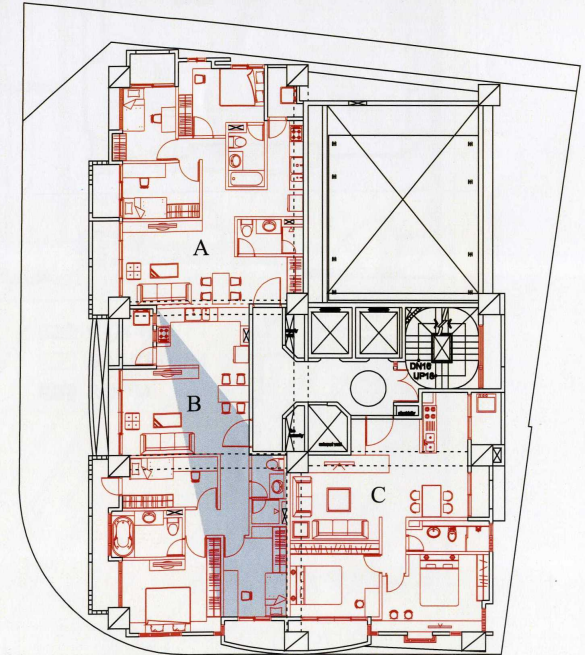
The redesigned of core creates more number and possibility of entrance location to each unit.



Redesigned Core Plan - Scale:1/200



Prototype Design for 5-Unit Scale:1/200



Prototype Design for 3-Unit Scale:1/200

84 CHAPTER THREE _ THIRD OB EXERCISE _ TEAM 7

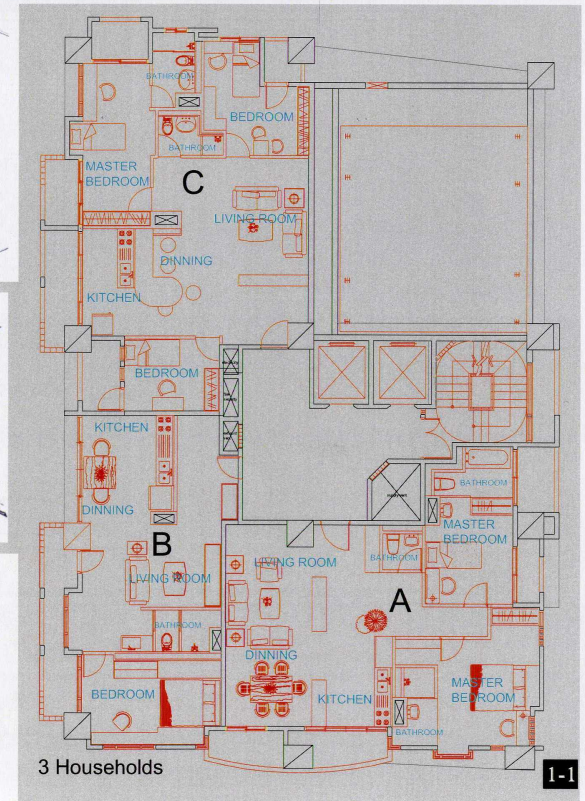
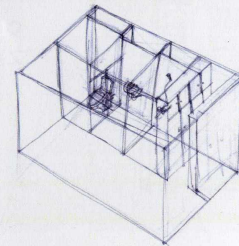
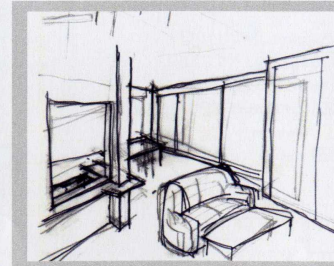
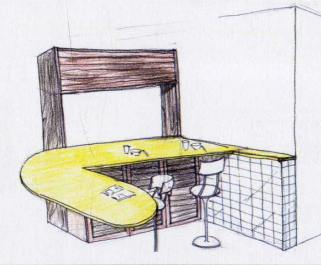
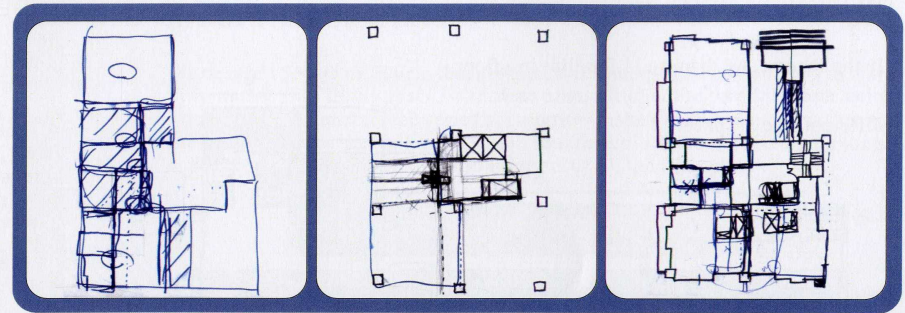
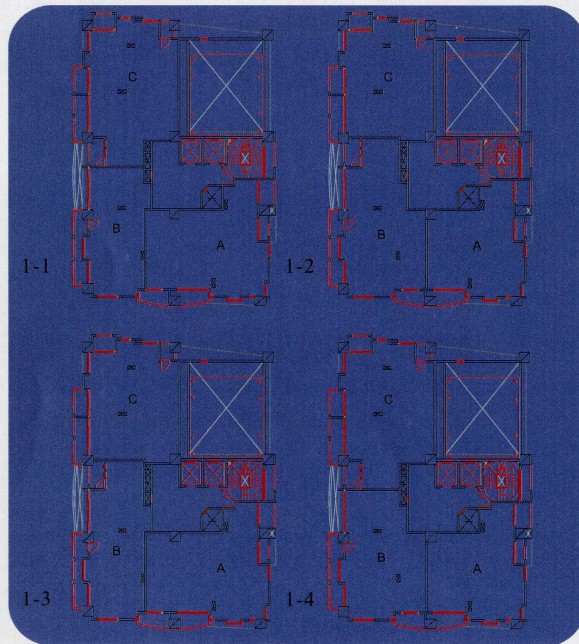
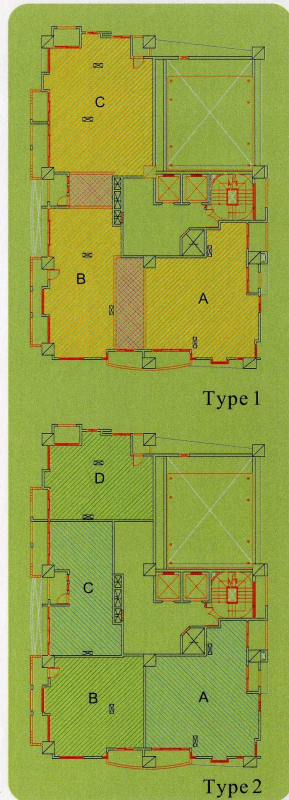
Transforming an existing base(rigid) building into A RESIDENTIAL OPEN BUILDING

INTRODUCTION

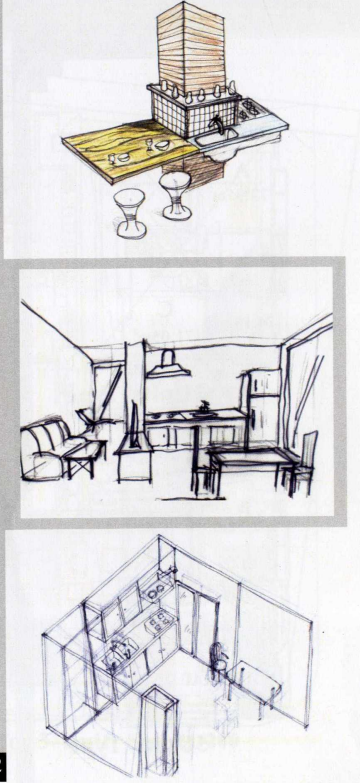
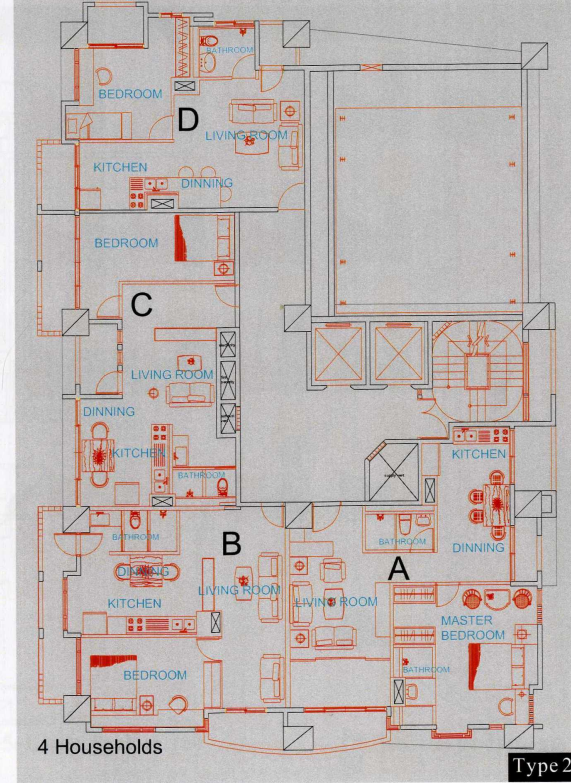
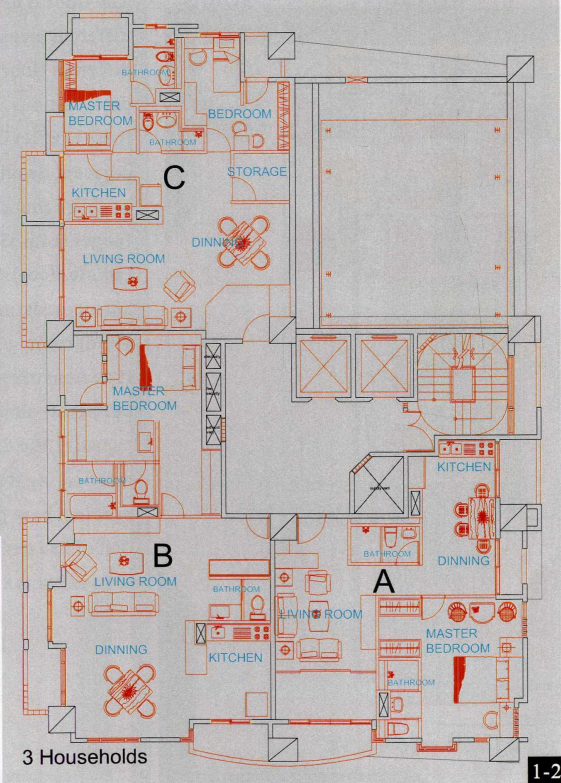
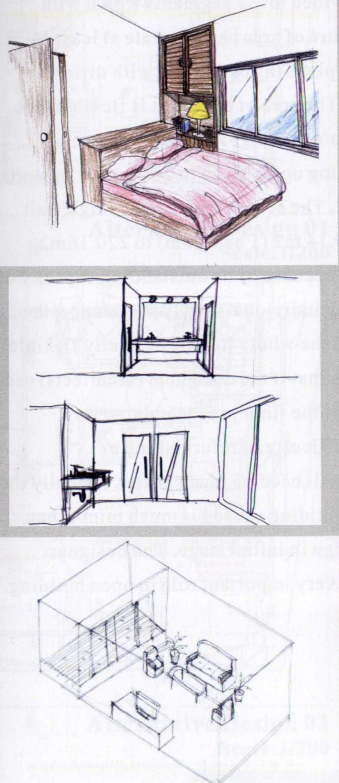
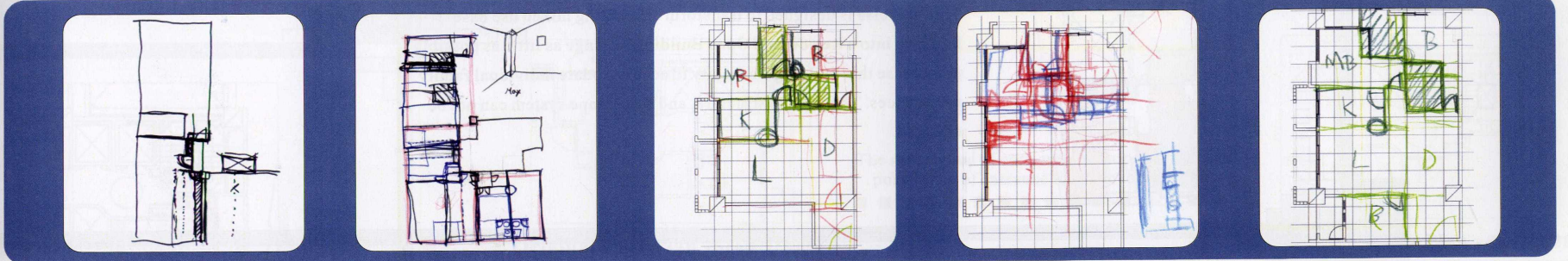
In this exercise, we will work one EXISTING MIXED USE BUILDING in Taipei. The purpose is to learn how to adjust them, to INCREASE THEIR CAPACITY FOR ACCOMMODATING VARIETY over TIME.

CONCEPT

- Step 1: Integrate service cores. Making a complete public space.
- Step 2: Deciding the number of space which we want to divide.
- Step 3: Deciding the position of partitions and margins. (according to the facade and structure.)
- Step 4: Making layouts.



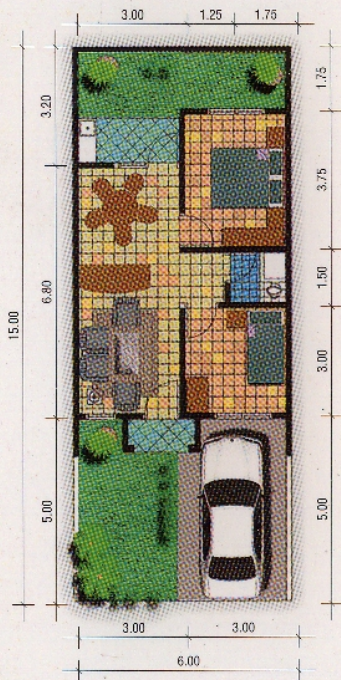
Shih-Min Cheng, Shao-Hung Lo, Chih-Kai Hsiao



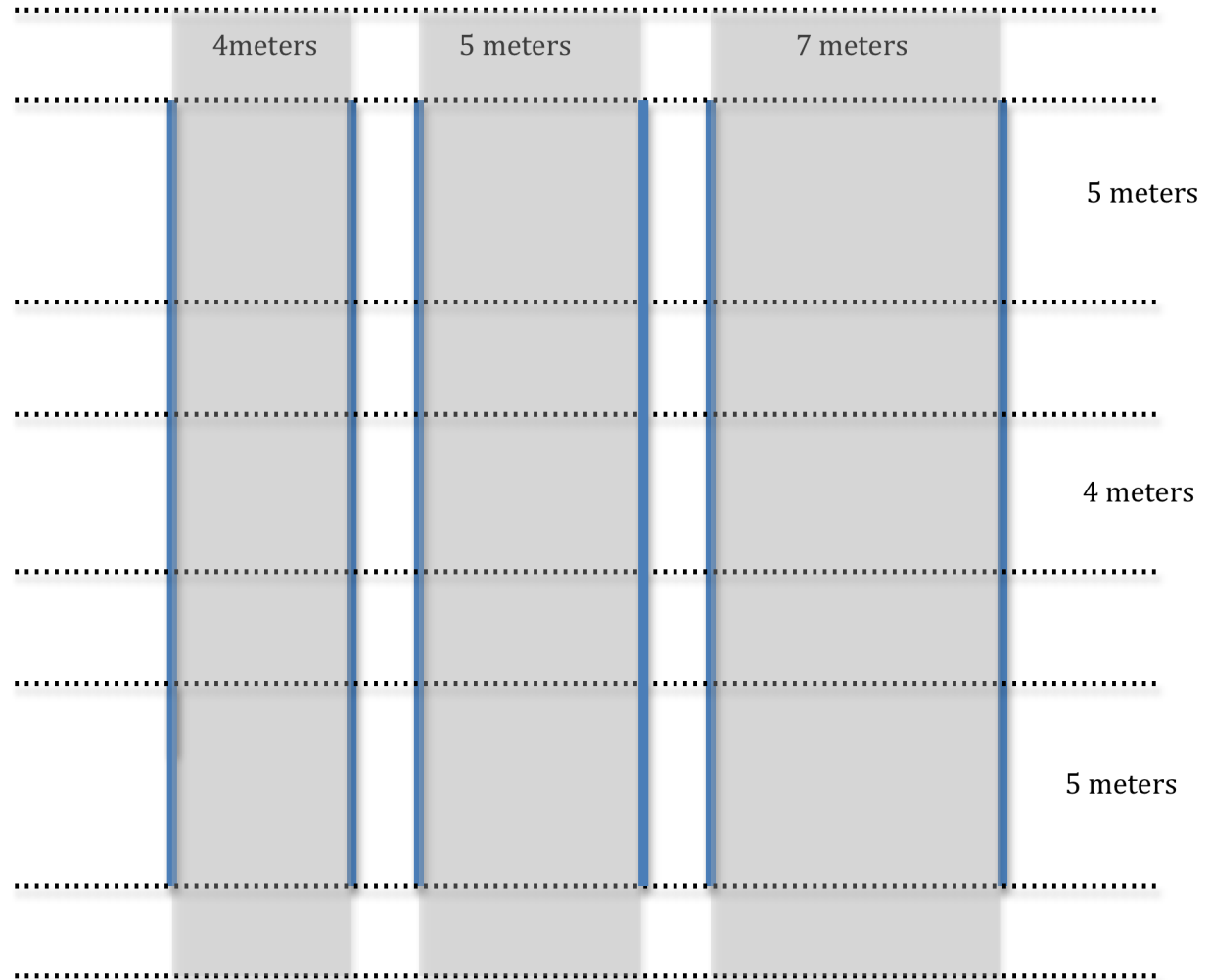
Our Exercises



Sapphire
Rumah Type 50/90



Exercise #1a

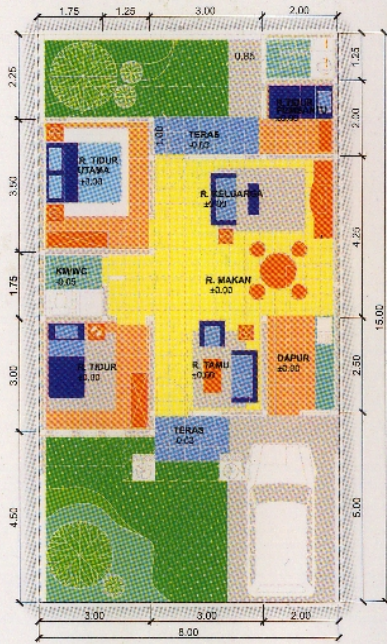


PLAY 1a (PLAY FOR ONE PERSON WORKING ALONE)

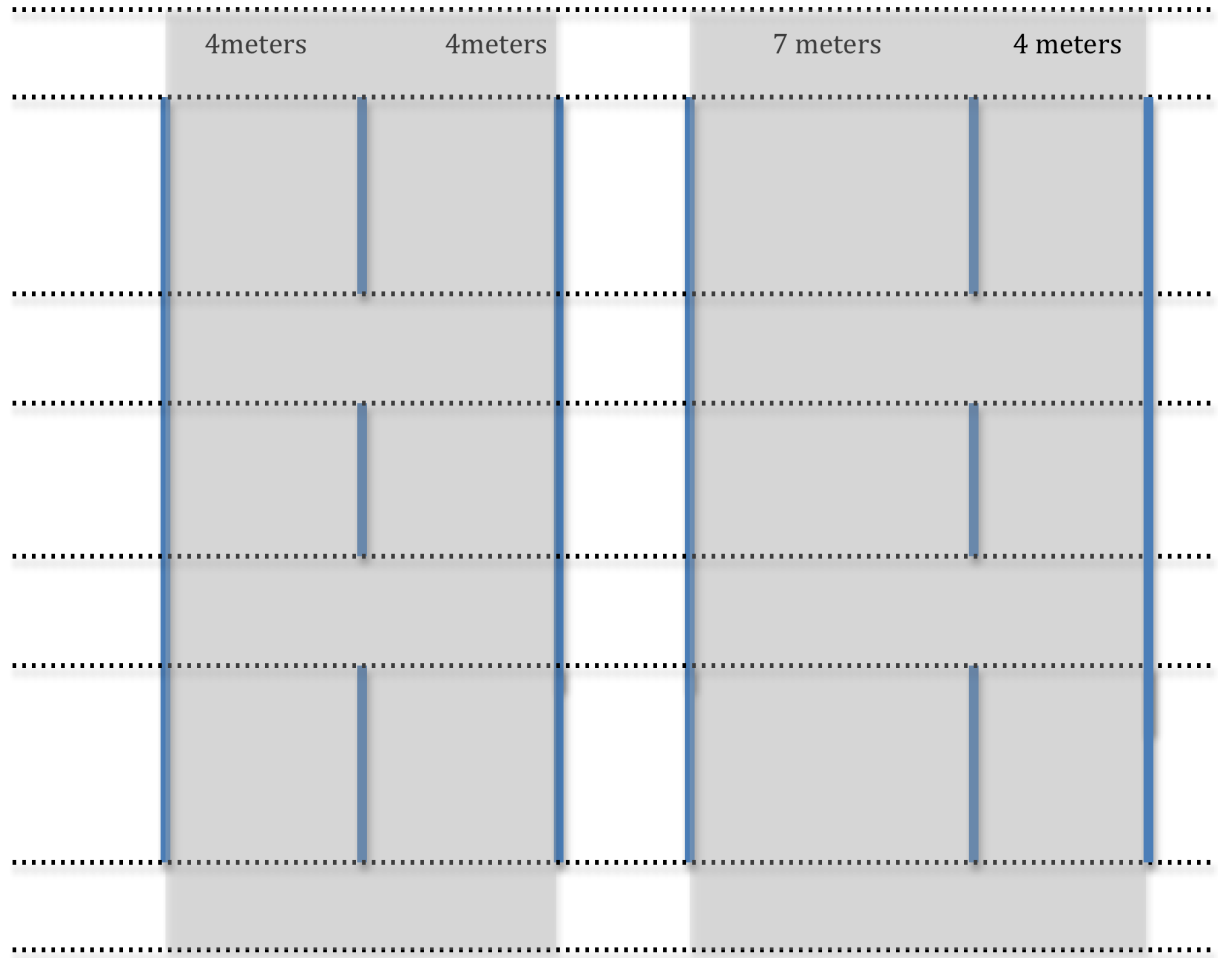


Jade

Rumah Type 70/120



Exercise #1b



PLAY 1b (PLAY FOR ONE PERSON WORKING ALONE)

Exercise #2a:

Filling in An OB example from the USA

(work in teams)

shell.

exterior

the exterior of the shell is a simple layout with six bays in which the panels are placed. eleven foot floor to floor heights provide plenty of room for deep floor cavities in which to place HVAC and other utilities.

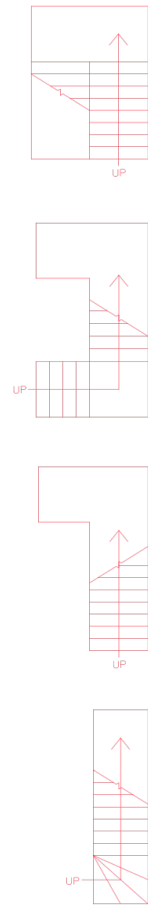
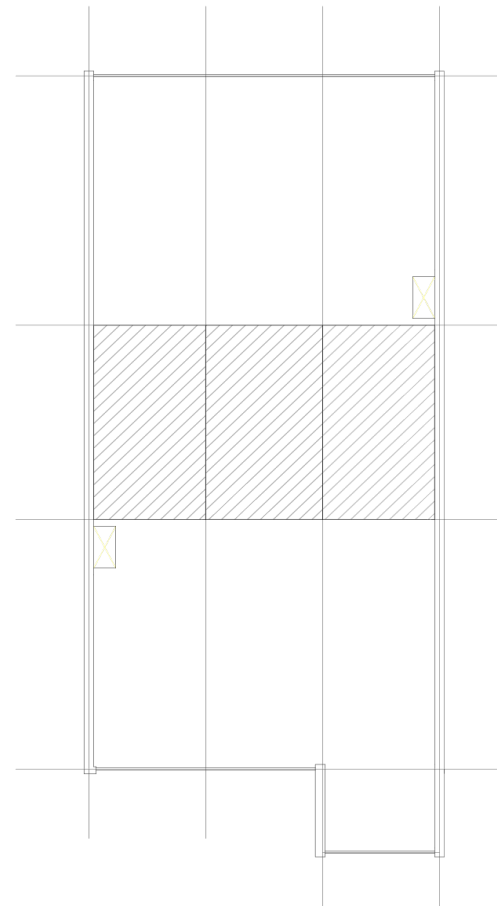
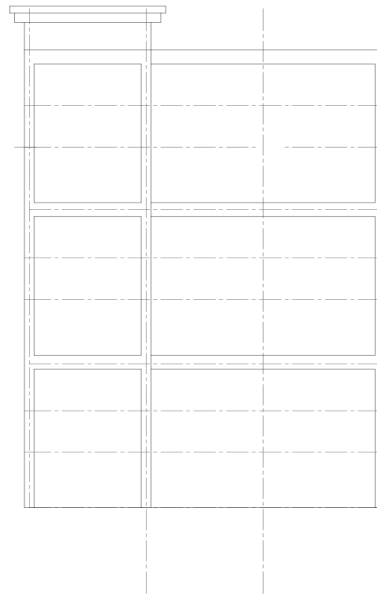
floor plan

the floor plate is divided into three bays both horizontally and vertically and has two mechanical chases in which all the HVAC, electrical, and data are run from floor to floor.

vertical circulation

with a constant size opening for the stairs there are a variety of options. each of the four options can be placed in any of the three places.

Base Building



Exercise #2b:

Filling in an OB example from the USA

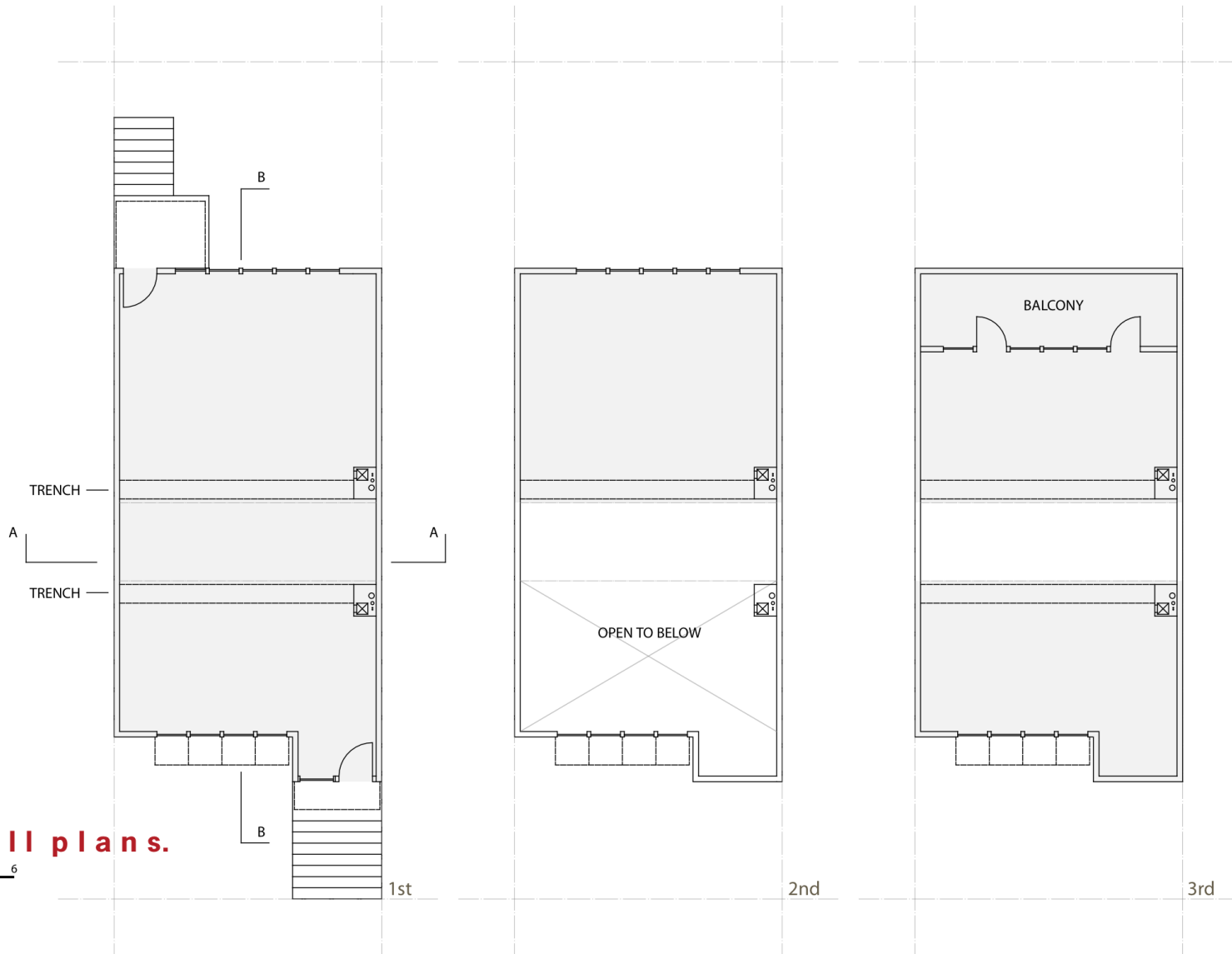
(work in teams)

HOMeworks
STUDIO KENDALL
February 16, 2007



shell plans.

0 2 6



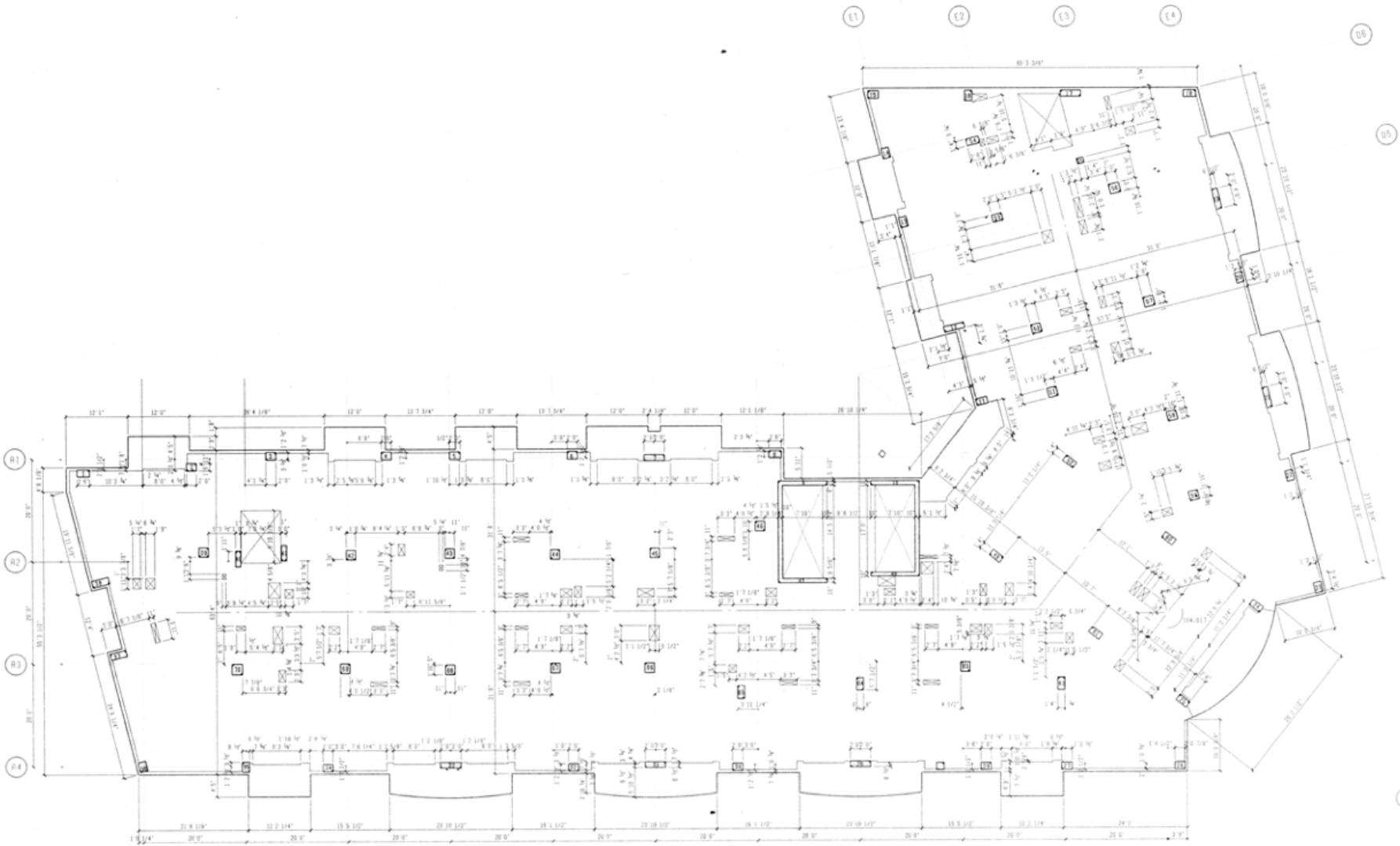
Exercise #3a:

Transforming an example of rigid housing from Indonesia
(work in teams)



Exercise #3c:

Transforming an example of rigid housing from the USA (work in teams)



ARCHITECTURE
PLANNING
LANDSCAPE ARCHITECTURE
INTERIOR DESIGN

1300 Spring Street
Suite 500
Silver Spring, MD
301-588-4800

OWNER/DEVELOPER
H.O.C.
301-929-2366

STRUCTURAL ENGINEER
Smidova/Kehring
301-881-1444

M/E/P ENGINEER
Shefferman &
301-587-4433

CIVIL ENGINEER
Luederman Ap
301-948-2755

LANDSCAPE ARCHITECT
Chynoweth &
202-546-7577

INTERIORS
Cm. Arch. & Pl.
301-588-4800

KEY PLAN

REVISION

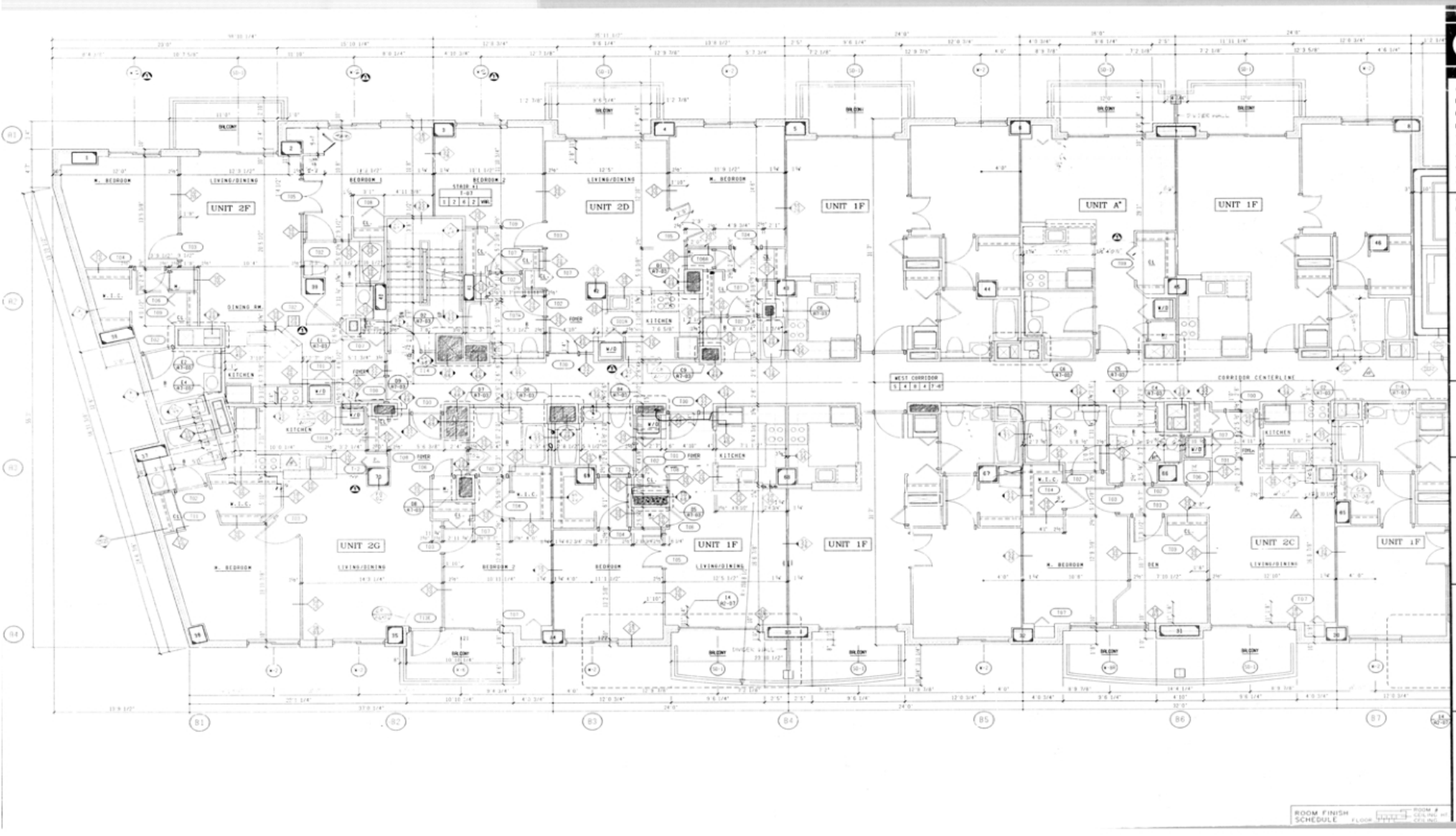
No.	Description

PROJECT NAME
ALEXA HOTEL
SILVER SPRING

DRAWING TITLE
TYP. FLOOR & SLAB

Exercise #3c:

Transforming an example of rigid housing from the USA



COWI/CS
ARCHITECT
PLANNING
LANDSCAPE
INTERIOR DESIGN

1300 Spring
Suite 500
Silver Spring,
MD 20910-4848
301-588-4848

COWI/CS
11.0 C
301-929-
STRUCTURE
Simpson
301-881-
M/E/P/EN
Shaffer
301-567-
CONS. ENGR
Lundberg
301-948-
LANDSCAPE
Carter
302-546-
INTERIORS
Lee Arch
301-588-

KEY PLAN

REVISION

PROJECT N

ALE
H

SILVER

ROOM FINISH SCHEDULE

Our Schedule

- **15/12/09 (Tuesday)**

09.00 – 12.00 / Introductory Lecture

13.00 – 16.30 / Introductory Exercises # 1 & 2

- **16/12/09 (Wednesday)**

Review Exercises #1 & 2

Workshop continued / Introduce Exercise #3

- **17/12/09 (Thursday)**

Review Exercise #3 Progress

Workshop continued / Exercise #3 continued

- **18/12/09 (Friday)** Public holiday

- **21/12/2009 (Monday)**

09.00 – 12.00 / Completion of Exercise #3

13:00 – 16:30 / Review Student work

Evening discussions about Open Building Research

Lets play!