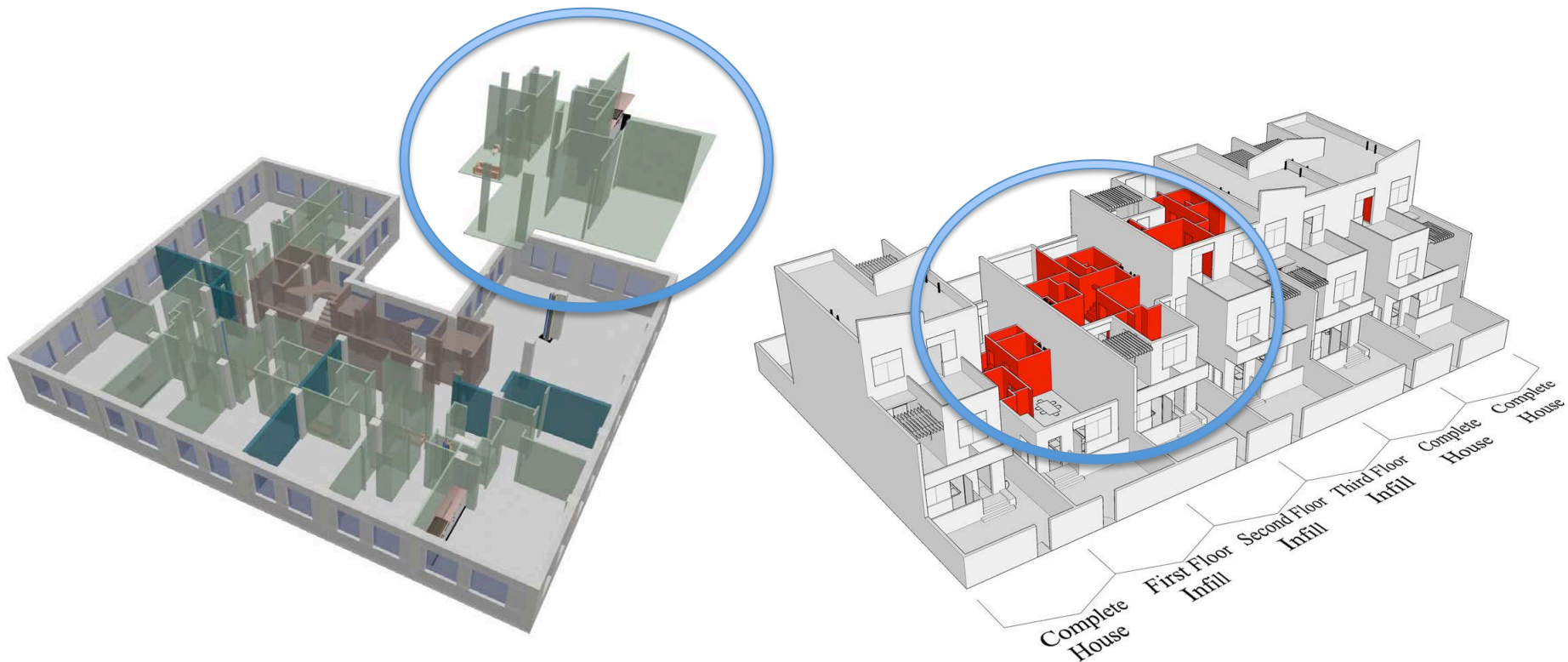


MATRIX TILE SYSTEM Principles

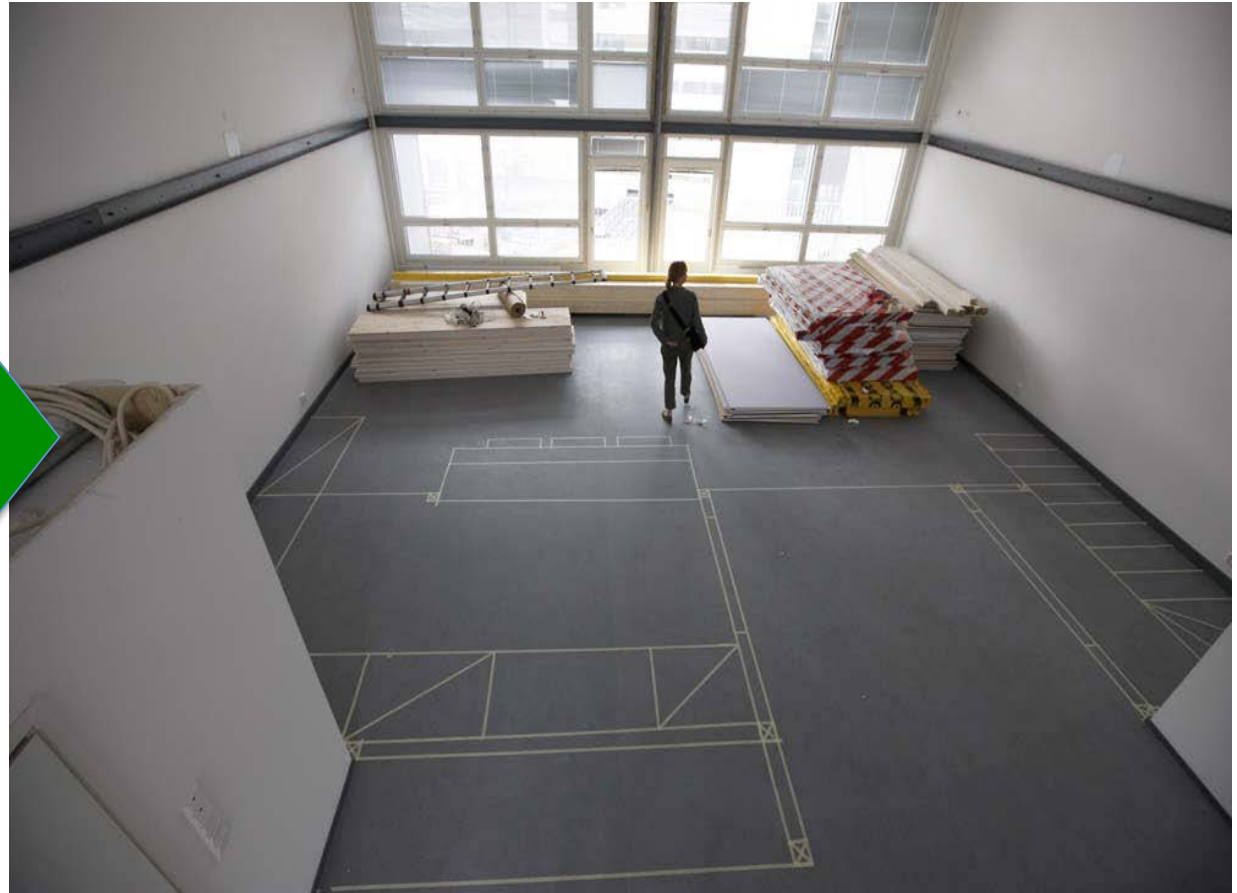
Infill Systems US LLC
Philadelphia, PA, 19119
www.infillsystemsus.com
sk@infillsystemsus.com

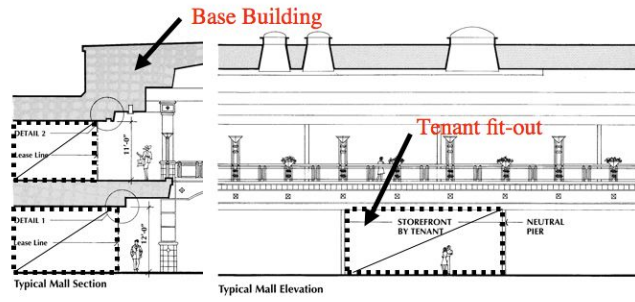
LOOKING TO THE FUTURE

to help us address sustainability and add value

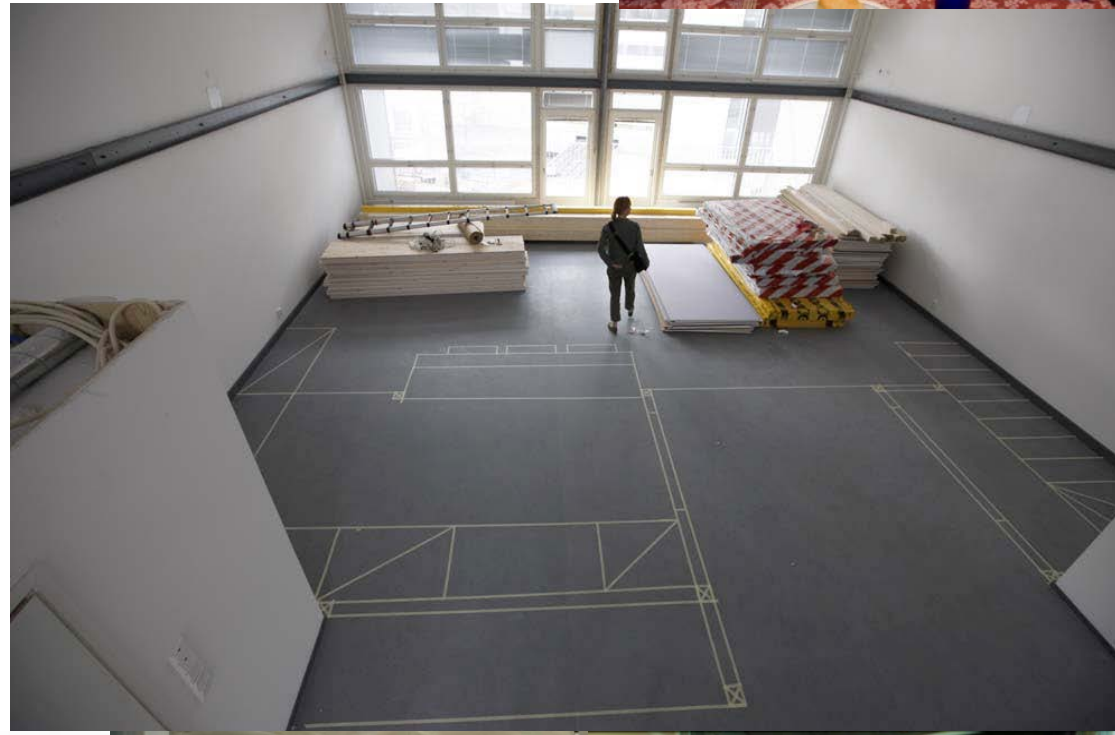
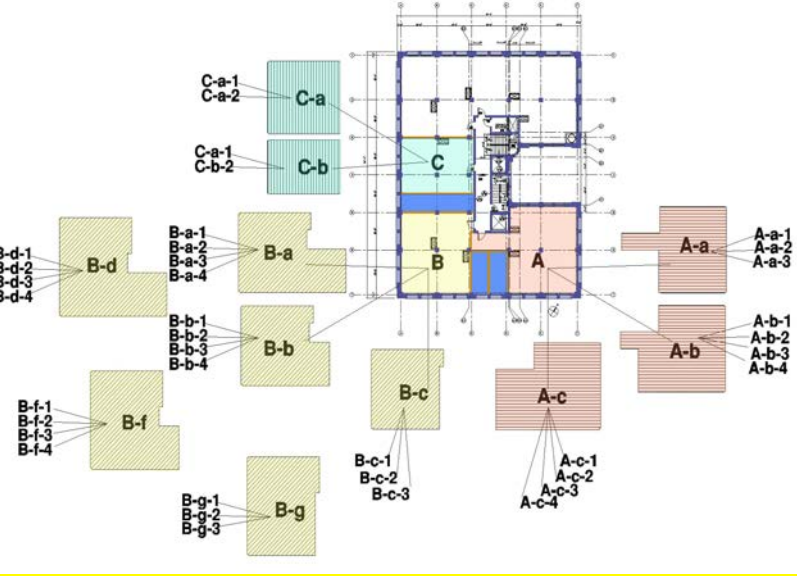


INFILL or FIT-OUT 内装(填充体)

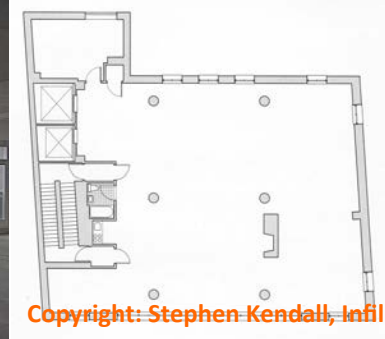




Kendall / Introduction to Open Building

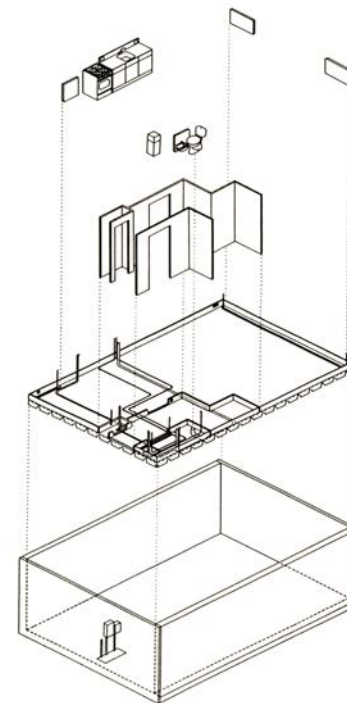
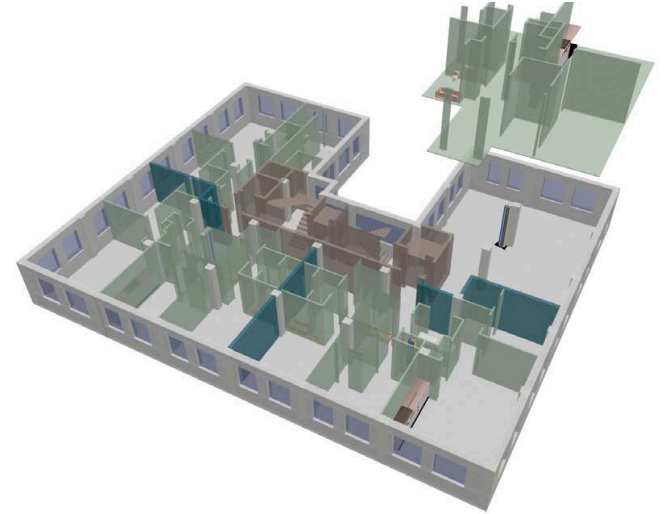


Spaces For Life





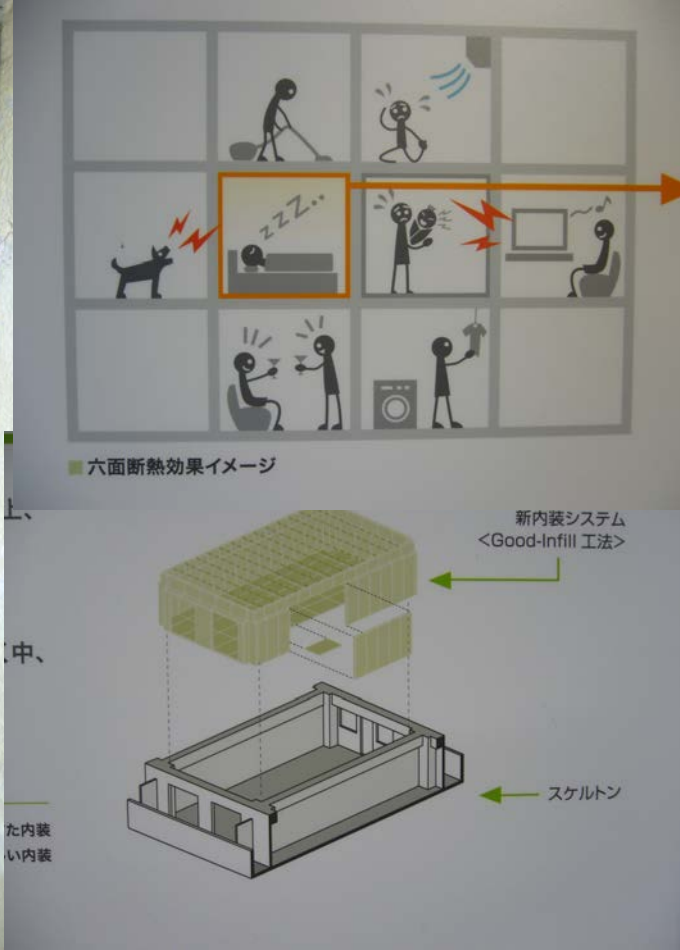
Infill Solutions



New construction needs INFILL

新建築內填需求





INFILL is also needed to upgrade the existing building stock 升級建築存量

**The INFILL is the part
of the whole building
relating to the
individual unit of
occupancy**

中填實是部分
關於各居住單元的整個建築

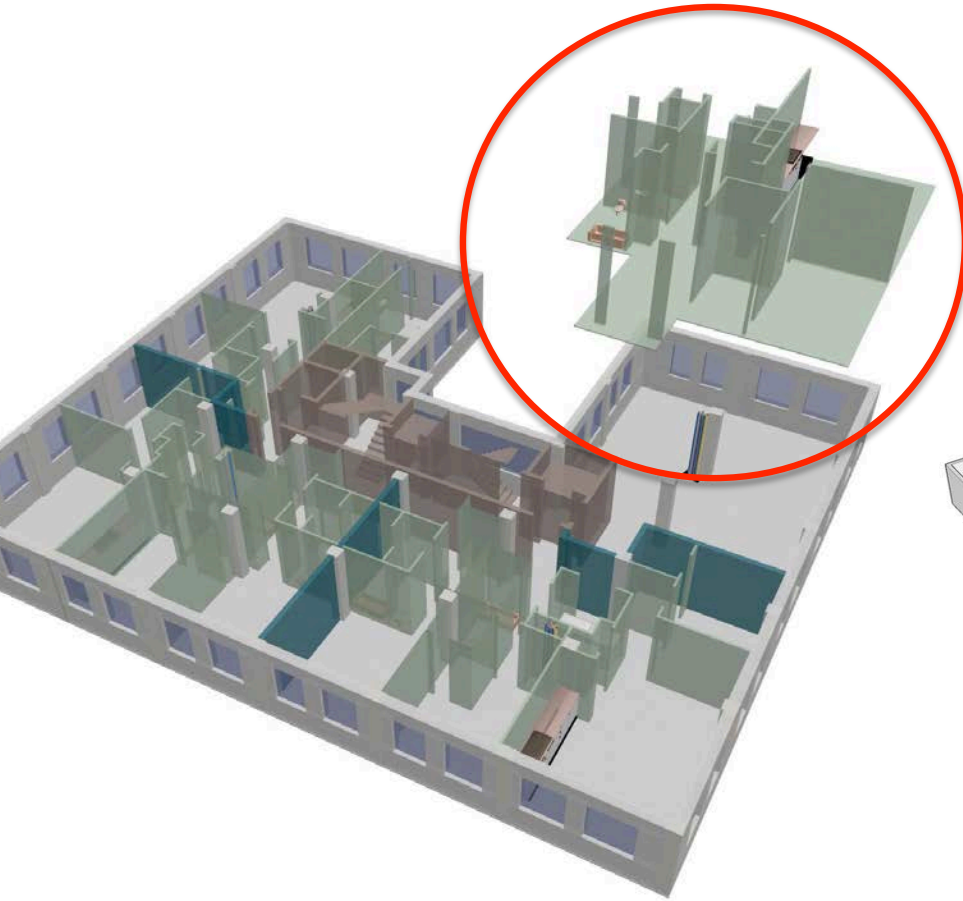
**It matches the basic
social units of society,
in all their variety**

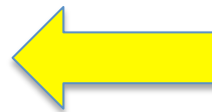
這社會的基本社會單位相匹配，
在其所有品種



INFILL or FIT-OUT

或內填 FIT-OUT





HOW AN INFILL COMPANY WOULD WORK

如何填充處理公司會工作

Three requirements of an infill industry

一個填充行業的三項要求

FIRST:

Separated Regulations 分離條例

- **SUPPORT REGULATIONS** 法規支持
- **INFILL REGULATIONS** 條例內填

SECOND:

Separated Financing 分居融資

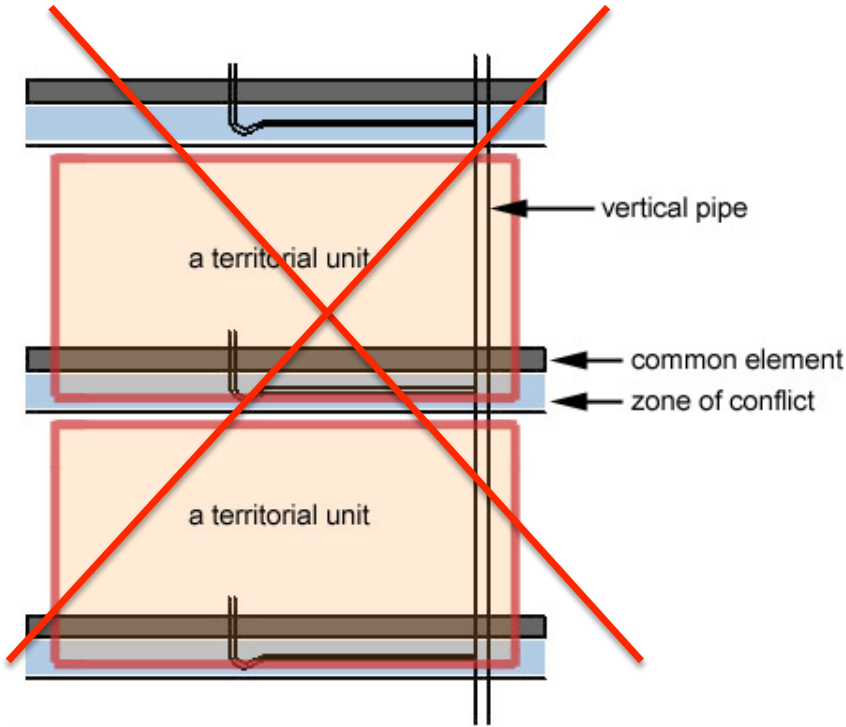
- **SUPPORT FINANCING** 支持融資
- **INFILL FINANCING** 融資內填

THIRD:

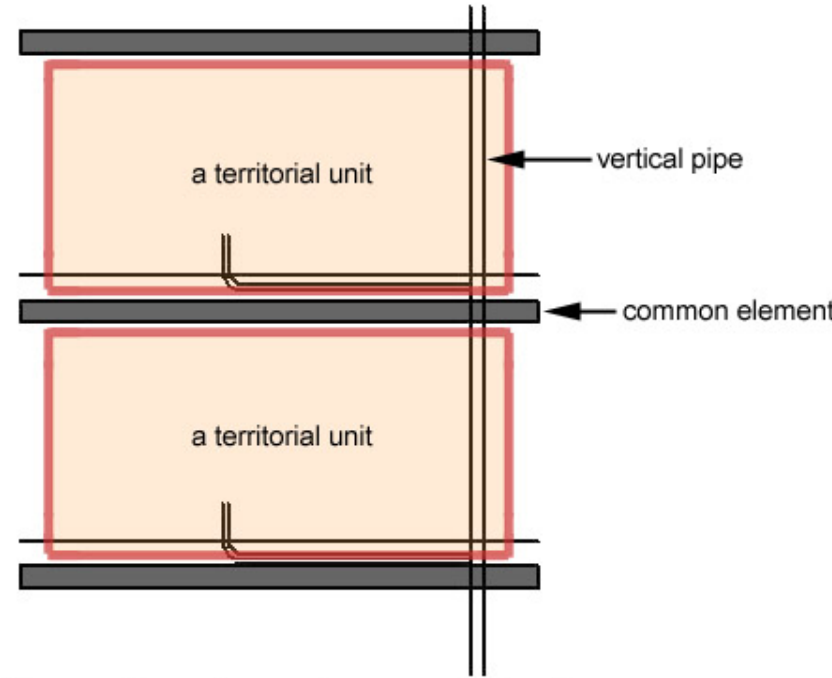
Separate Service Companies 單獨的服務公司

- **SUPPORT COMPANIES** 支持的公司
- **INFILL COMPANIES** COMPANIES內填

Utility Systems Principle

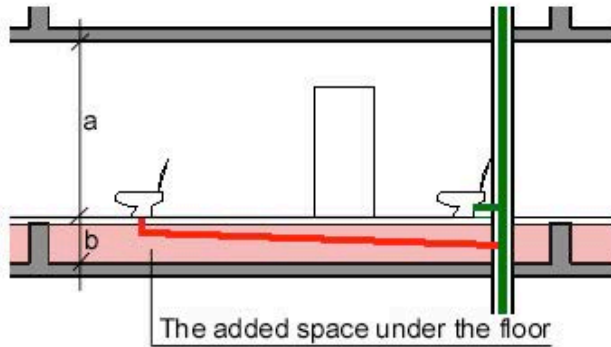


Chinese conventional way has problem of conflicts
Diagram courtesy Dr. Qiong Huang, Tianjin University



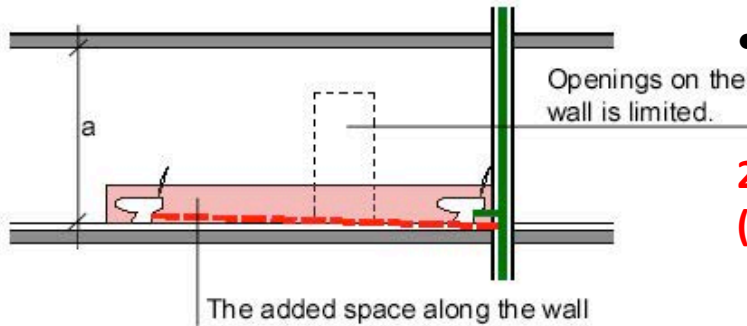
OB way offers clean autonomy of dwelling unit decisions that avoids conflict

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

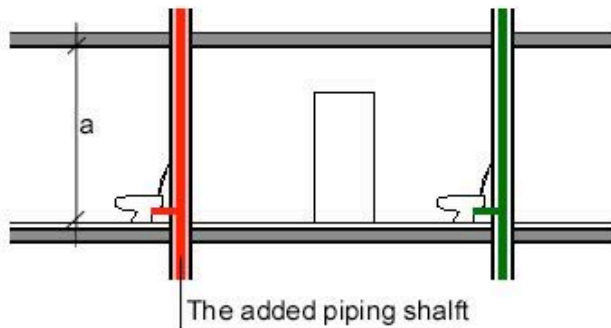


**1. Add thickness to the floor
(affects building height)**

- “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

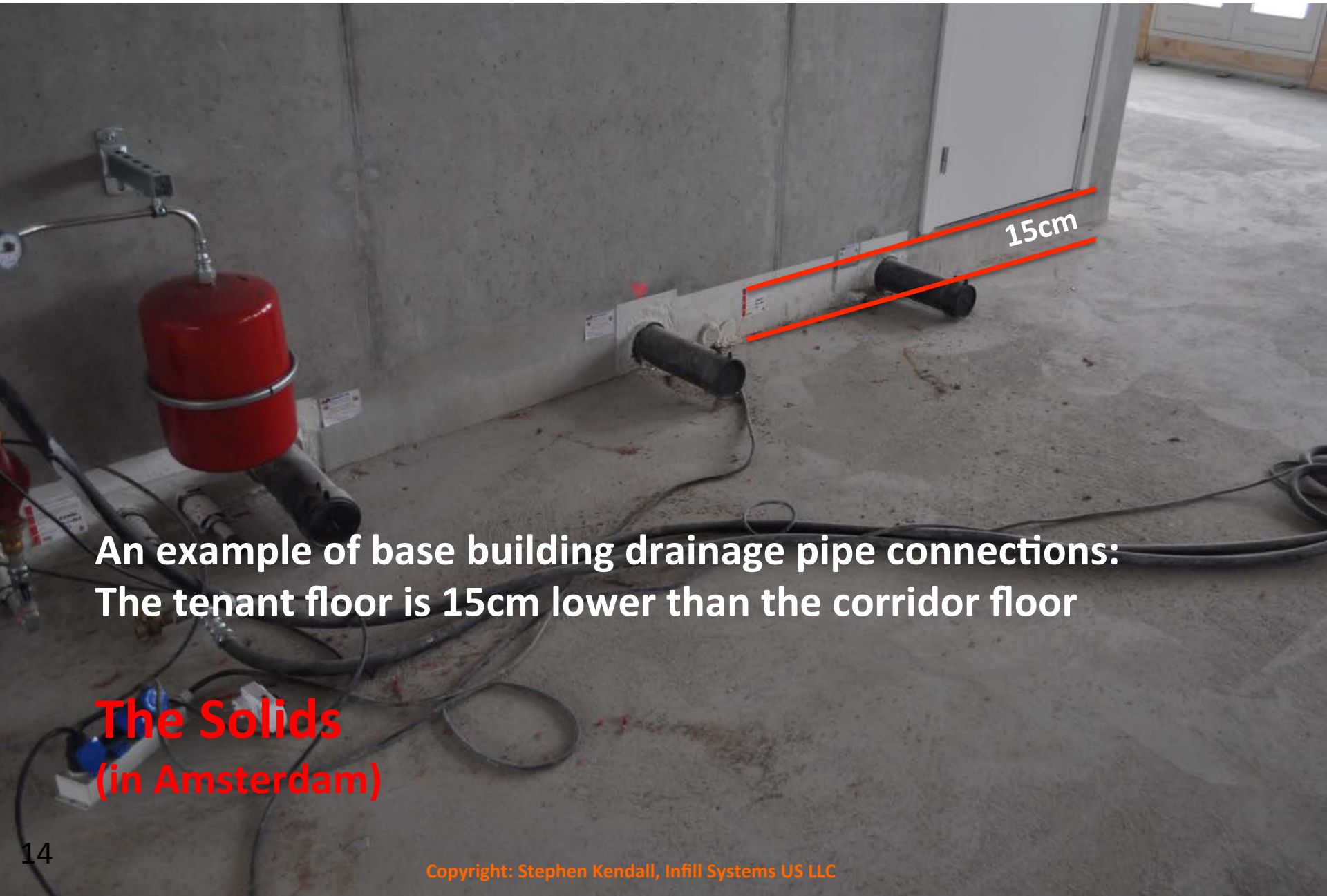


**2. Make Thicker walls
(affects floor area)**



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

**Three choices
for organizing
Infill piping**
三種選擇組織騰空管道



15cm

**An example of base building drainage pipe connections:
The tenant floor is 15cm lower than the corridor floor**

**The Solids
(in Amsterdam)**



MATRIX TILE SYSTEM

平鋪矩陣系統

Displayed at the 2012 International Housing EXPO, Beijing

在2012年國際住宅博覽會，顯示北京

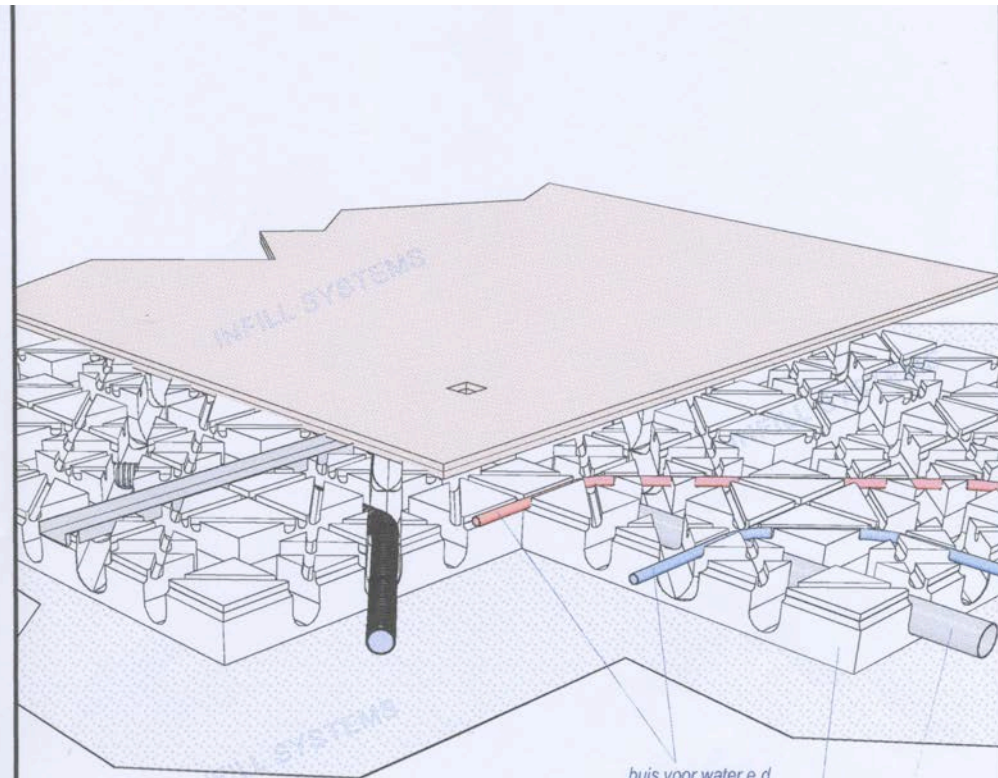
Matrix Tile System

平鋪矩陣系統



Matrix Tile System
Infill Systems BV / The Netherlands

Marketed in North America by Infill Systems US LLC



buis voor water e.d.
ø 16 mm

afvoerbuis ø 50 mm

in matrixtegel gesneden
gootprofiel voor doorvoer
kabels bij (deur)opening
in wand.
op deze plek geen kruisende
leidingen in matrixtegel

matrixtegel 2 600x600 mm en 85 mm dik
met zwevende vloerfunctie,
ligt op vlakke constructievloer

2 x 12,5mm vezelgewapende
vloerplaat



INFILL SYSTEMS B.V. oude delft 151 2611 ha delft, tel. 015 - 214 72 59

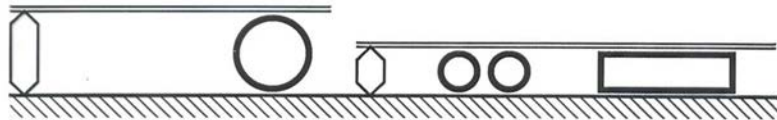
matrixtegel met leidingen en vloerplaat 2
alle rechten voorbehouden

Matrix Tile System's Key Innovations

平鋪矩陣系統的關鍵創新

Space-requirement

New thinking



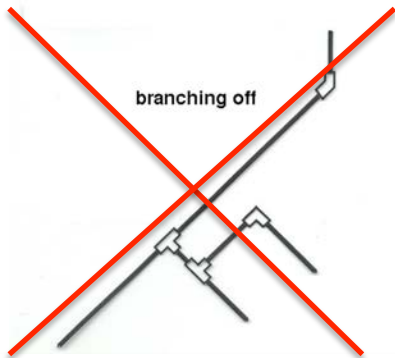
height of channel, raised floor or suspended ceiling

either

or

Flexible fitting

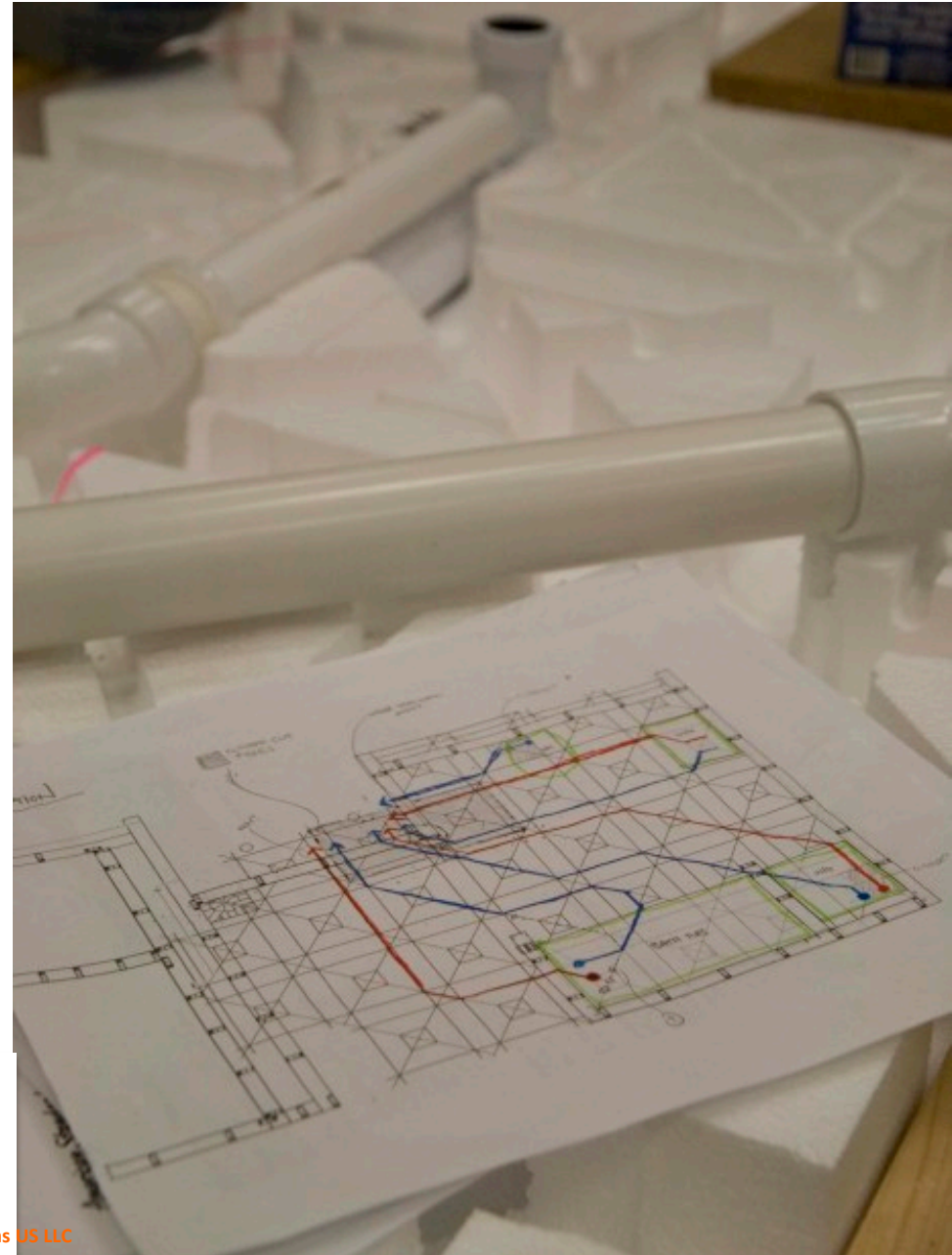
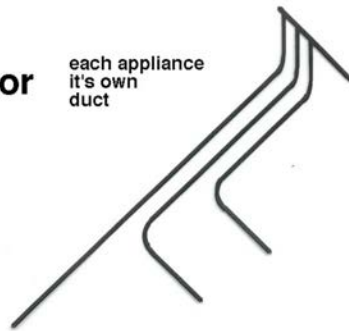
New thinking



branching off

or

each appliance
it's own
duct



Matrix Tile System

平鋪矩陣系統

Matrix tiles in place
到位矩陣瓷磚



Matrix tiles, “home-run” water pipes, 0-slope gray water drain lines (“sucking system” with no branching) and fire-proof floor covering in place

矩陣的瓷磚，“本壘打”PEX管，0坡灰水排放管路（“吸系統”，沒有分支）和防火地板覆蓋到位

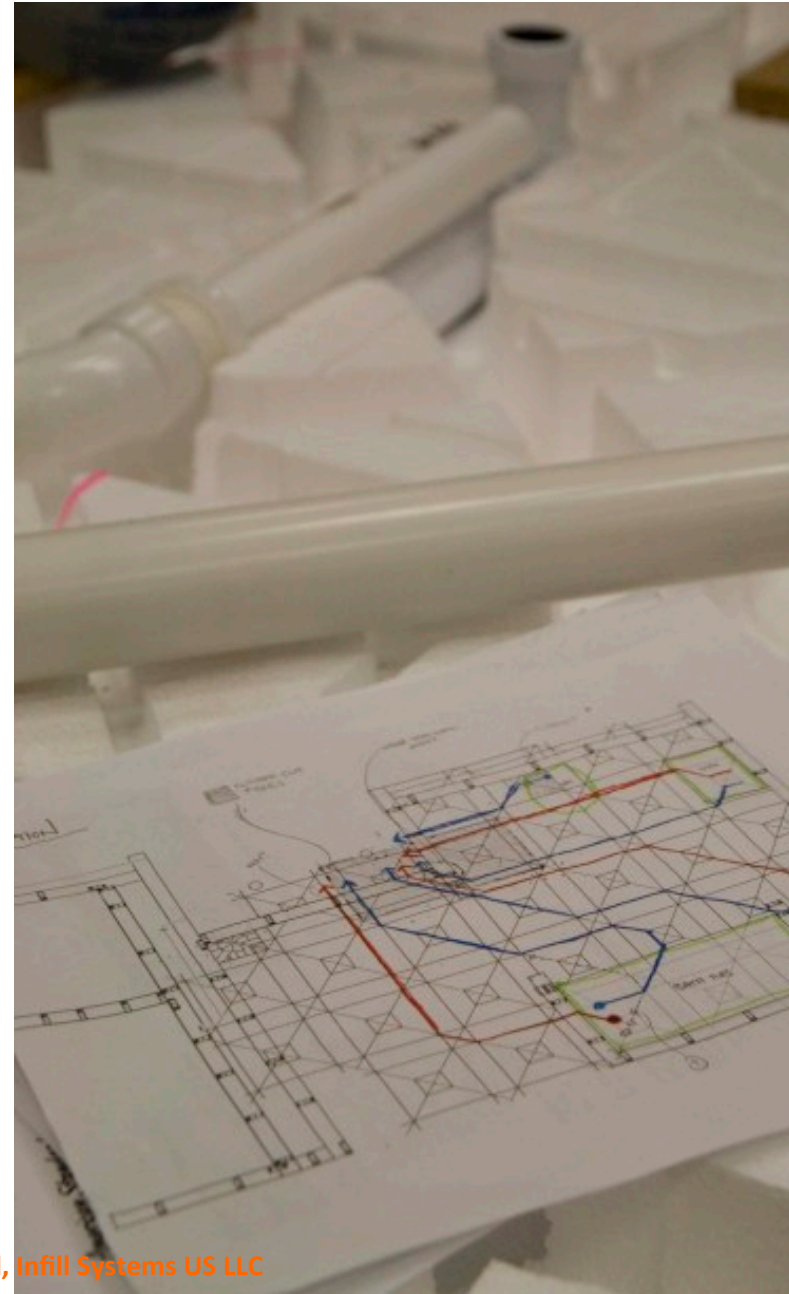
ADVANTAGES

• *for DEVELOPERS*

1. **Decision flexibility on floor plans and equipment**
2. **Reduced cost and time for customization**
3. **One-unit-at-a-time rehab**
4. **Improved sound isolation between floors**

• *for BUILDERS*

1. **Increased quality, coordination and cost control**
2. **Faster installation**
2. **No floor penetrations at fixtures**
3. **Easier maintenance (all plumbing is within a unit)**



HANDLING GRAY-WATER DRAINAGE

The Matrix Tile system is particularly important because it allows the gray-water drainage piping to be securely laid in the larger grooves of the Matrix Tile with no slope. Because each gray-water fixture is connected by its own drain line (no branching) to a manifold at the vertical gray-water pipe shaft, all drain lines are of the same diameter and can be up to 10 meters in length with 5 elbows.

HANDLING BLACK-WATER DRAINAGE

The usual solution to managing black-water fixtures is to use a "back-outlet" toilet, either wall-hung such as a GEBERIT in-wall tank product [Slide 26] or similar, or a floor-mounted rear-outlet toilet with the drain pipe running above the floor to the vertical sewer pipe. Such "rear-outlet" toilets can be up to 3 meters from the vertical drain stack, but the drain pipe has to go in or along a wall, with no door [Slide 22]. The key point is to use a rear or back-outlet toilet, not a toilet with an outlet that goes down thru the floor.

An increasingly popular alternative is to install a macerating grinder to pump the effluent (without regard to gravity) thru small-diameter drain pipes placed in the Matrix Tile grooves.

CODE ACCEPTANCE ISSUE

The MATRIX TILE SYSTEM + 0-slope gray water drain system has been tested and certified by official laboratories and certified by official bodies in both the Netherlands and Germany. This approval applies only in relation to the use of the MATRIX TILE.

In the United States, 0-slope drain lines for gray water are generally not accepted. In the US, plumbing codes and officials are very conservative. They must protect the public health and safety. They are slow to accept new solutions, even if they are scientifically tested. New solutions must meet requirements for installation, use and maintenance.

However, a nationally recognized code consultant has made the following statement:

“I would view the Matrix Tile + 0-slope gray water drain system as an “engineered design.” We managed to get all of the US and International plumbing codes to recognize “engineered design.” You can use the European test results; any certified laboratory test results can be accepted by the codes. An inspector cannot reject test results by simply claiming that a lab is European.”

Julius Ballanco, P.E.

PLUMBING CODE CONSULTANT

<http://www.jbengineer.com>

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.

開建築物的基本概念是，在至少兩個參與者獨立地並且順序地進行決策。首先，是築基誰提供了一個架構基礎設施的設計師。

Later, decisions will be made about the individual dwelling units. This assures that the architectural infrastructure is sustainable, and also allows dwelling units to adjust to changing user preferences, new technical systems, and changing demographics.

後來，決定將在關於個別住宅單位。這保證了建築的基礎設施是可持續的，並且還允許居住單元，以適應不斷變化的用戶喜好，新的技術系統，以及人口結構的變化。