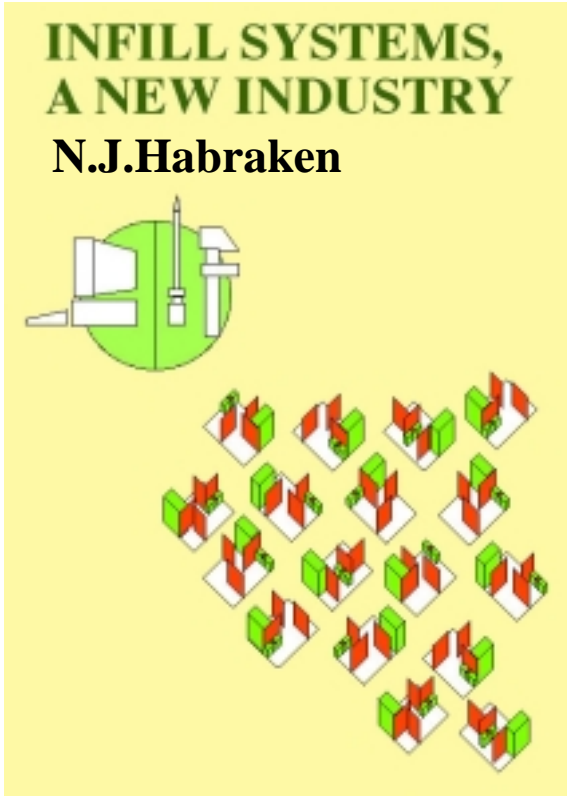


infill/fit-out systems

case studies of RESIDENTIAL OPEN BUILDING



INTRODUCTION:

At an international conference held in Taiwan in 1994 (hosted by Professor Ming-hung Wang), Professor John Habraken presented a series of nineteen images without words. In his accompanying remarks, he commented briefly on each image. That presentation recalled his earlier work written in 1964 – Three R's For Housing (and first published in Forum, vol. xx, nr. 1, December, 1966) – in which, using a series of diagrams with minimal words, he laid out the basic principles for an open residential architecture, principles that shed new light on the dilemmas faced by so many regarding the question of the architect's

role in "housing", "industrialization", and the recognition of the "two spheres" in which the process of housing is carried out.

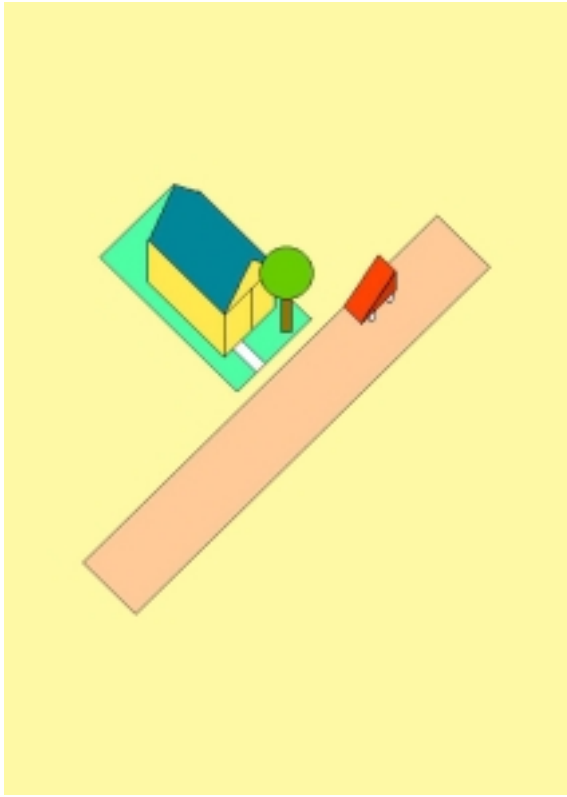
In a remarkable way, the images presented here – as in the essay Three R's For Housing – tell the story of an open architecture as clearly as any lengthy and detailed essay. In these nineteen images, the physical reality of residential buildings is placed inseparably in view with the social and organizational reality of living residential environments. In short, the uses of Levels – probably the basic notion of an open, agile architecture – is made palpable, including both people and built form in active interplay.

The images here are instructive of the power of graphic images in the service of conveying information and complex concepts. Edward Tufte's books, including Envisioning Information, The Visual Display of Quantitative Thinking, among others, come to mind as parallel explorations of the potency of visual images. Habraken's essays, as yet unpublished, on form language (studies of the thematic properties of Amsterdam's canal houses, the use of computers to support thematic designing, among others) and his diagrams in The Structure of the Ordinary – Form and Control in the Built Environment – constitute a patient search for retracing the fundamentals of his seminal work. The images in this essay are

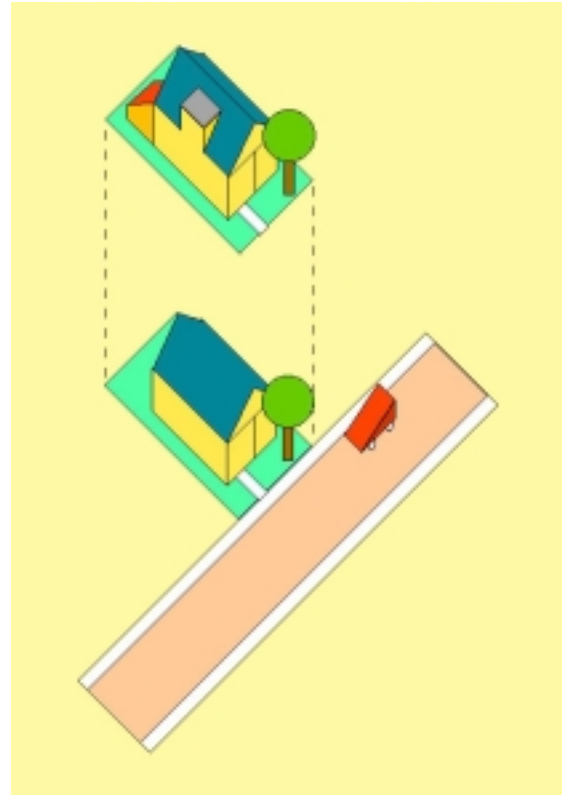
part of his search to retrace the fundamentals of the work.

The possibility of the development of infill systems and an infill industry – in local and regional markets and even at an international level – is the theme of this special issue of Open House International. It is fitting that the first essay be this one, since it lays out the basic principles on the basis of which an infill industry will eventually emerge.

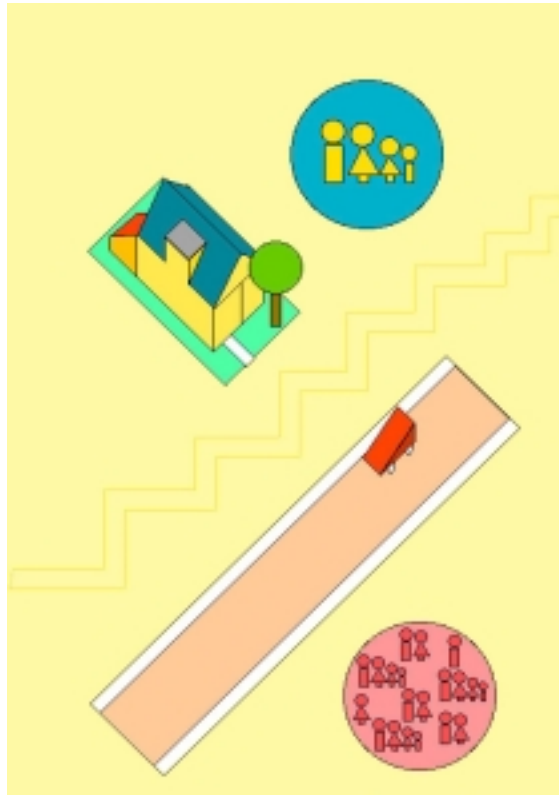
Infill systems represent a new industry, different from the traditional building construction industry. To understand Infill systems it is necessary to explain that they operate on a different level. The following slides explain the concept of Levels.



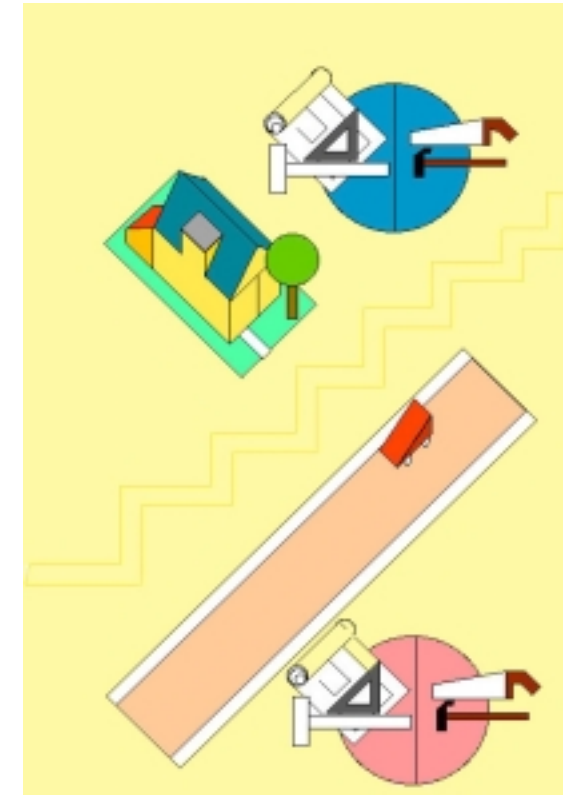
1) The familiar model of the urban environment gives us a street with houses. There are two levels of action. One is the street and the other is the house-lot with the house.



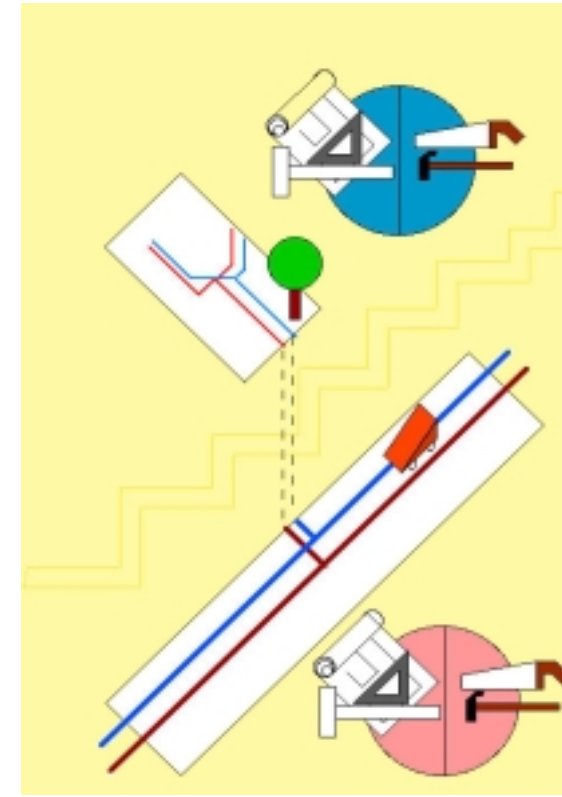
2) The house can change independently from the street. Over time all houses will change, but the street is more permanent.



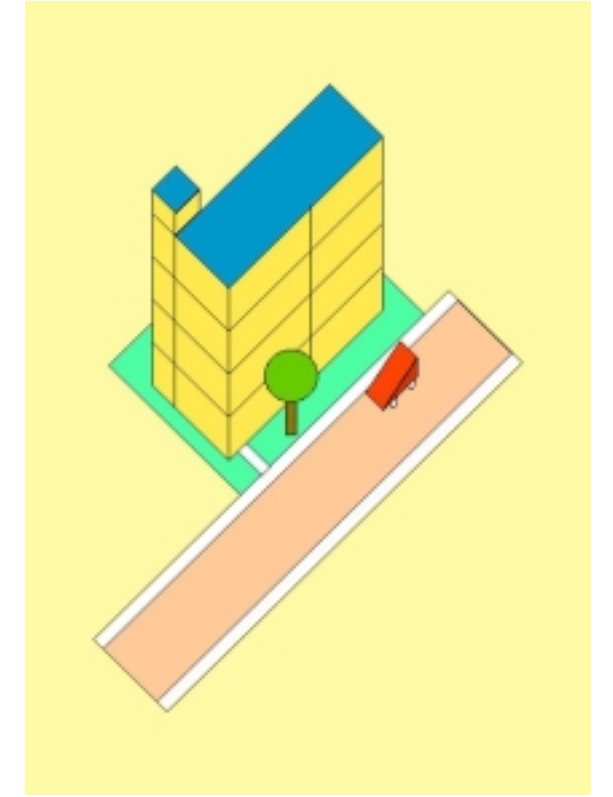
3) The house is related to the occupants: the household. The changes to the house are in response to their needs. The street is related to the community. A single household cannot make the street change. A higher authority, representing the community, must change the street.



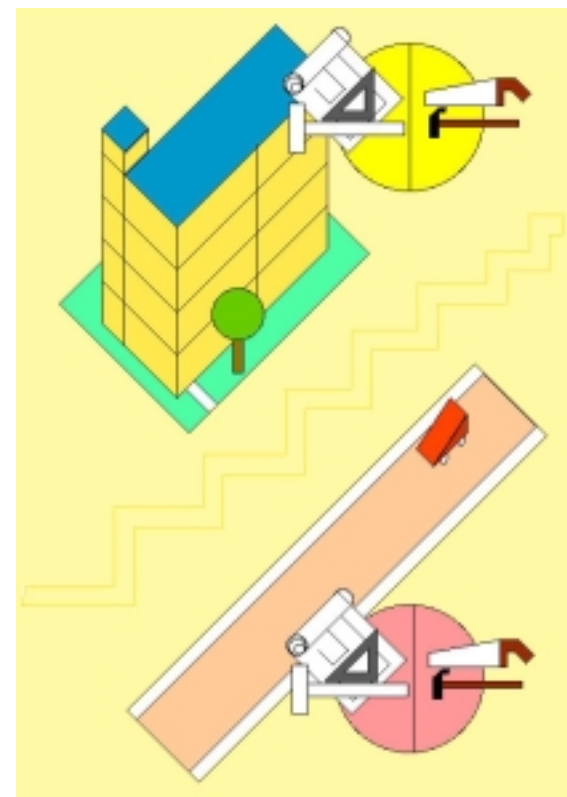
4) In the same way, the house and the street are produced by different professionals. The street is designed by urban designers and is built by contractors specializing in civil works. The house is built by a building contractor and designed by an architect. Thus different professionals operate on the different levels.



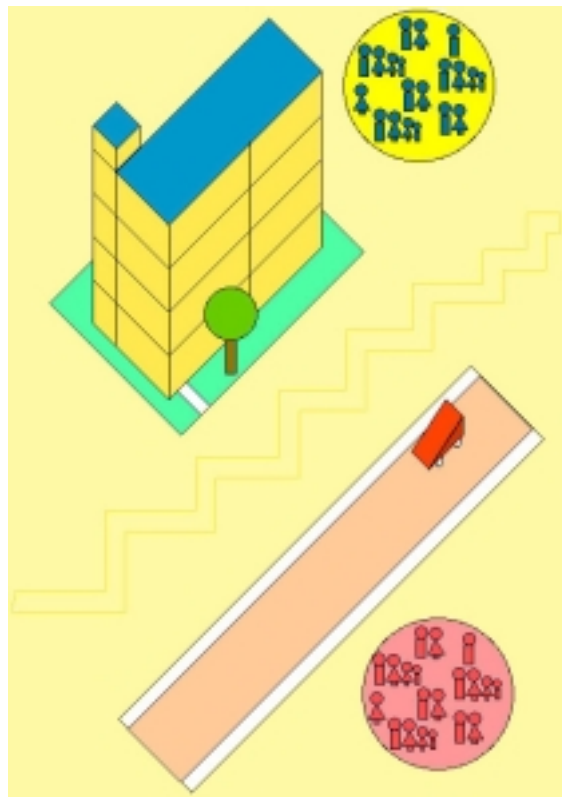
5) Pipes for utilities and sewage are particularly important. Their organization follows the same division of levels. There are pipes on the street level that serve the individual houses. The houses have their own distribution of pipes that is different for each house. The pipes in the house may change independently from those in the street. The contractors who install the pipes in the houses are not the same as those who install the pipes in the street.



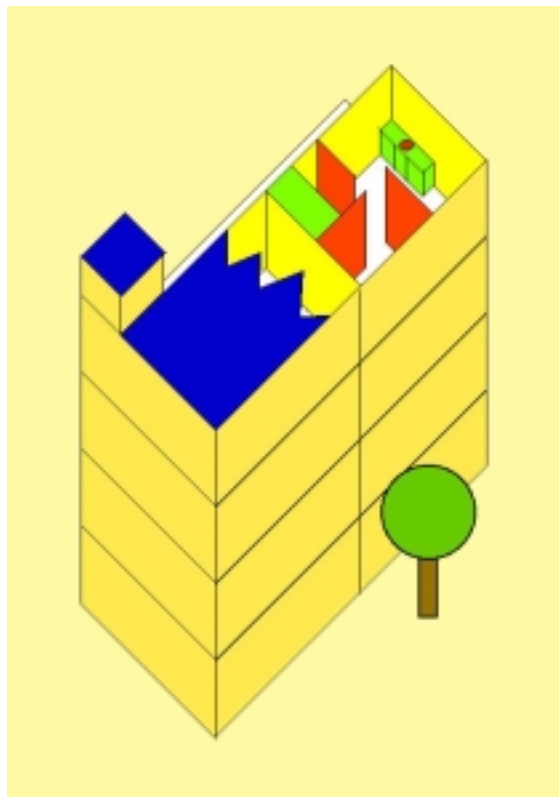
6) Instead of the house, consider the large apartment building built on the same street.



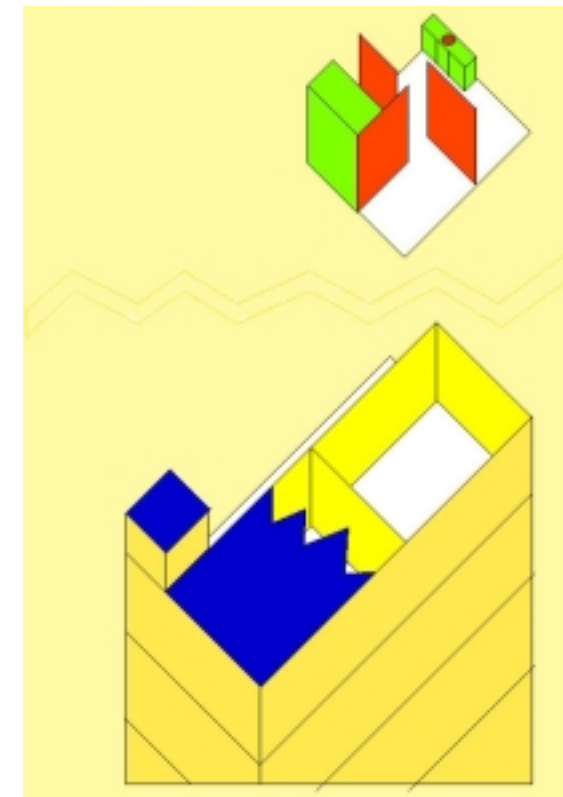
7) Here we have the same division of levels. The apartment building is designed and built by the professionals who do buildings. The streets are designed and built by professionals who do urban design and build infrastructures.



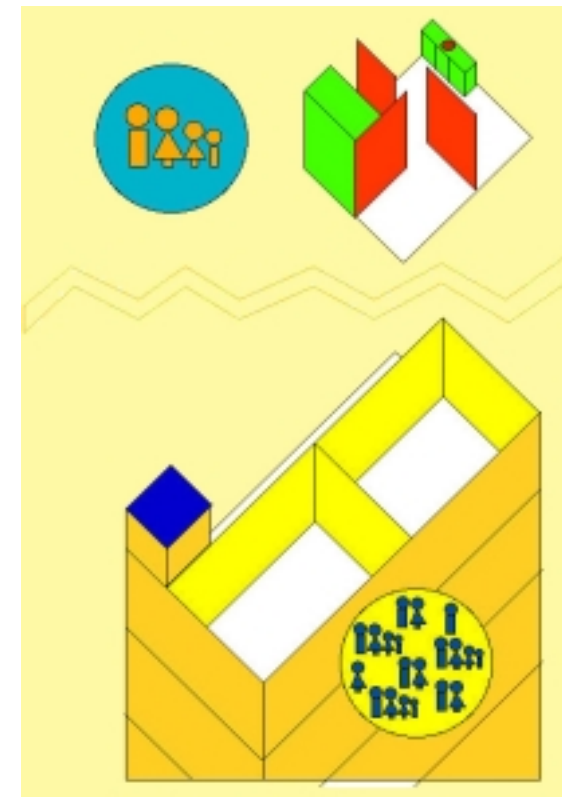
8) But if we look at the occupants the situation is different compared to the single house. The occupants of the apartment building are a community. The street is built for a community as well, albeit a different community. Where is the individual household?



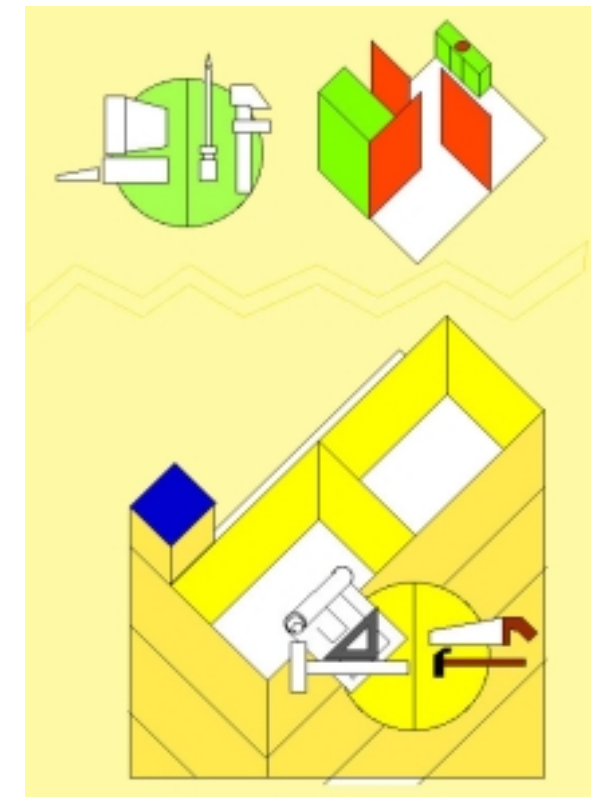
9) When we look inside the apartment building we see the individual households. They have their own space in the building. But what parts relate to them and what parts relate to the community of the apartment building?



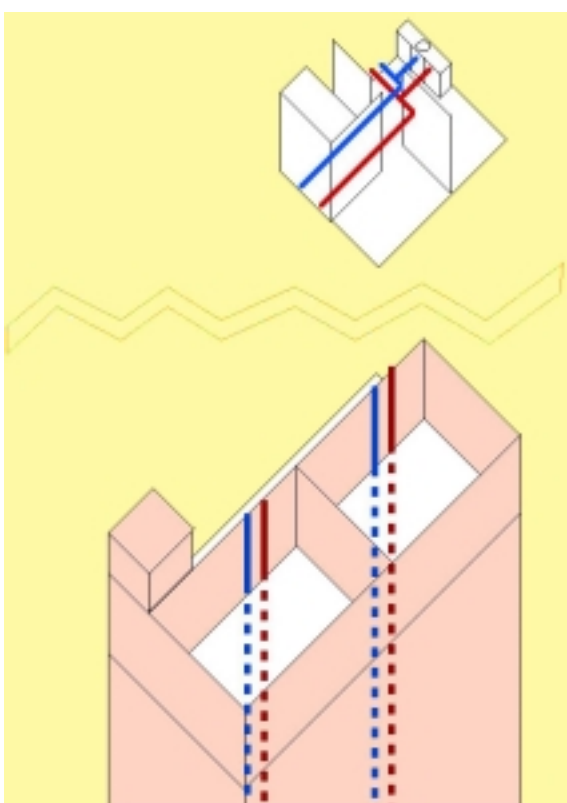
10) When we make that separation we can take out the partitioning and all the equipment for bathroom and kitchen as well as heating and ventilation. This is the infill package of the apartment building: it constitutes a level of its own. The elements that belong to the single apartment make an 'infill package' or just 'infill'. The remainder of the building is called the 'base building' or 'support'.



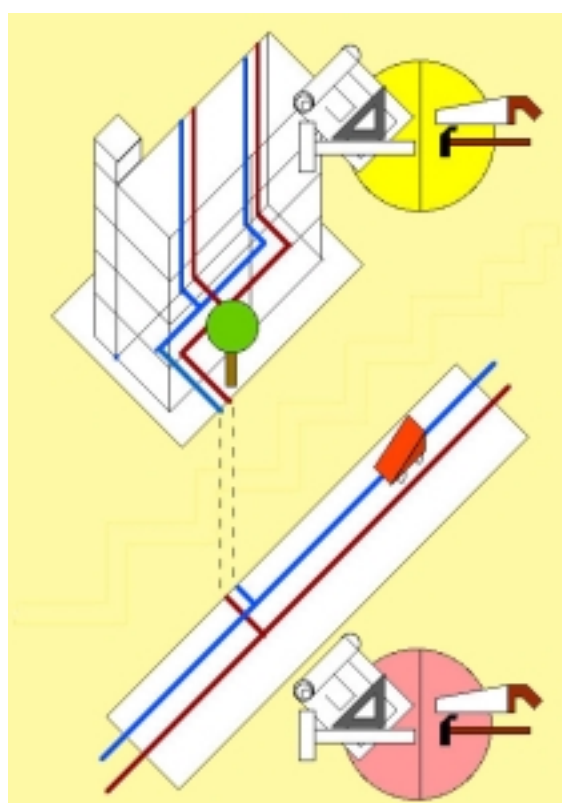
11) The infill package is related to the individual household. The 'support' or 'base building' is related to the community of households. The distinction that we see here is similar to the distinction between the street and the single house. But the physical elements are different.



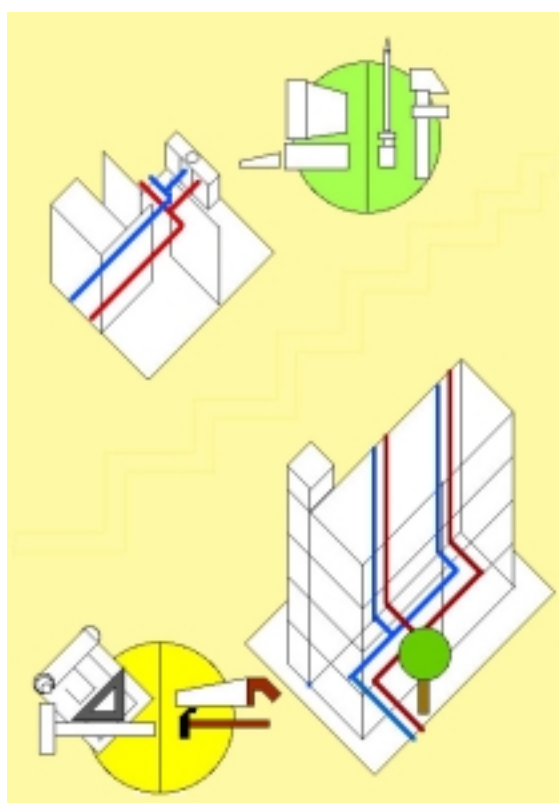
12) The level of the infill is the basis for the new industry that is the subject of these images. The base building or support is built by the same contractors who also build the individual house: they make buildings. The base building or support is also designed by the architect who works for the owner of the building. But the infill package becomes the product of a special industry that produces and installs infill packages. It is designed by interior designers or specialized architects who work for the owners of the infill.



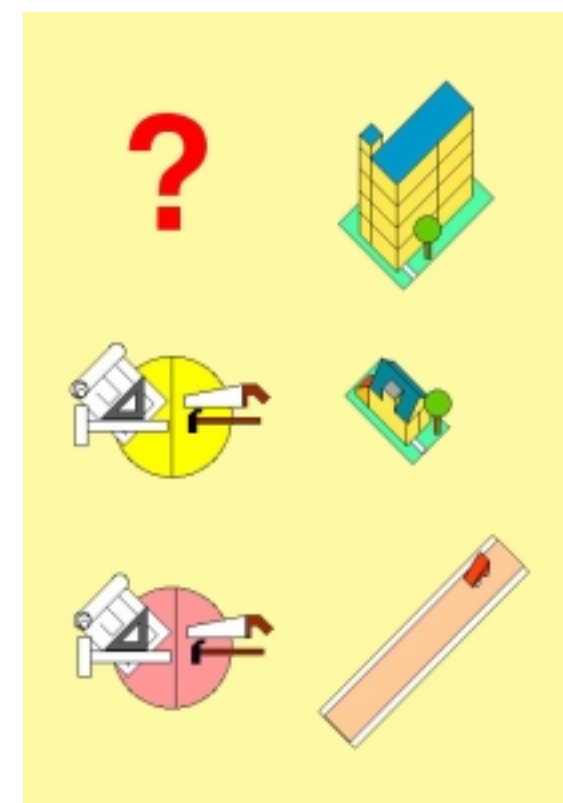
13) Here too we must give attention to the ducts, cables and pipes. They too are divided on the level of the support and the level of the infill. Each infill package has its own set of ducts, cables and pipes, distributed in its own way and installed as part of the total infill. The apartment building has the ducts, cables and pipes that serve the community in the building. They connect to the individual infill packages. The ducts in the base building are designed and installed by professionals who are not the same as those who install the ducts, cables and pipes in the infill system. The ducts and pipes in the infill system are different in nature and technology from those that go into buildings.



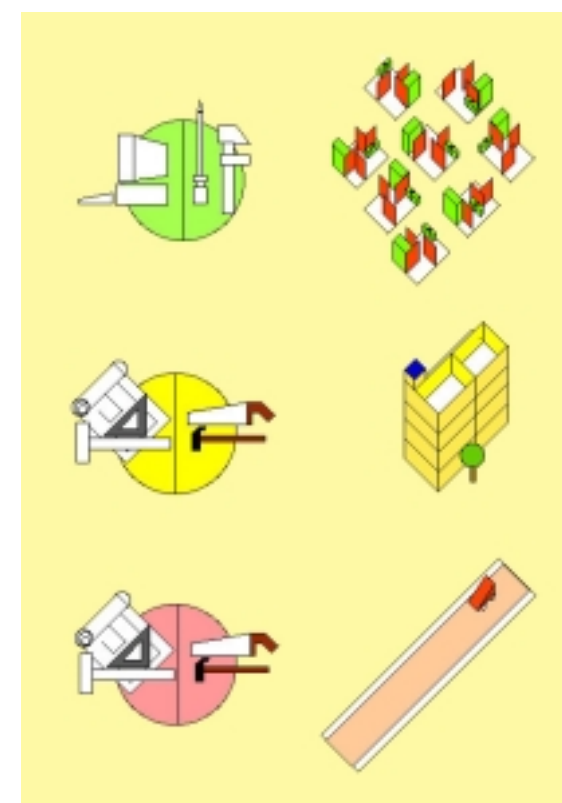
14) We now can see three levels: first the level of the street, supporting the level of the base building. Each has its own designers and installation companies.



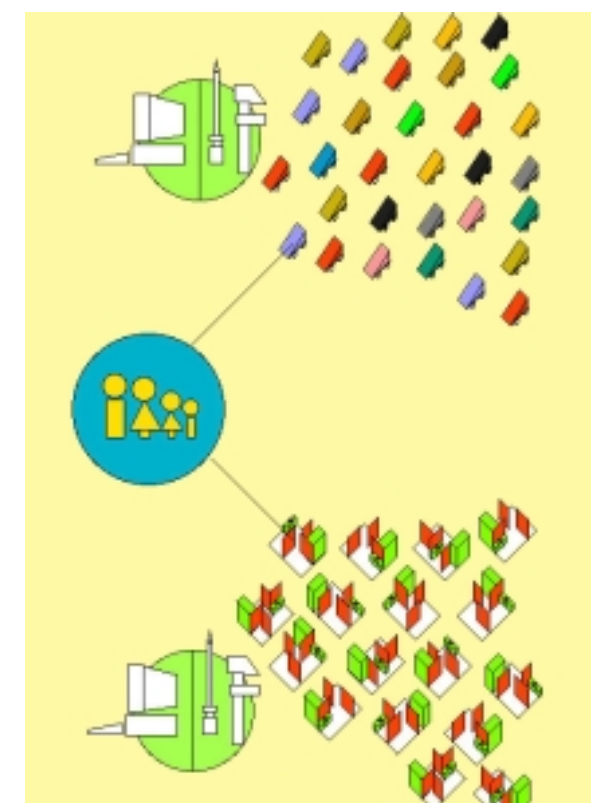
15) Next is the level of the building as distinct from the level of the infill just as the level of the street is distinct from the level of the building.



16) We now can understand the reason for the new infill industry. Traditionally we have two levels of industry: the level of the streets, and the level of the building. Today the large apartment building is built just as the single house. That creates a problem because the independent household no longer has a level of its own.



17) The infill industry corrects this situation. It recognizes the household as an independent agent in the built environment. An independent infill industry follows different principles of production and distribution compared to the traditional building industry. It has its own components, its own designers, and its own installers. It allows for new technology and new logistics.



18) The new infill industry relates to the building industry as the car relates to the street. The infill industry serves the individual user. The individual household now can choose an infill package like it can choose a car. The new infill industry will become as important as the car industry. The price of an infill package is similar to the price of a car.