CHAPTER 05
THEORY

To understand cities, we have to deal outright with combinations or mixtures of uses, not separate uses, as the essential phenomena...City diversity itself permits and stimulates more diversity...A lively city scene is lively largely by virtue of its enormous collection of small elements
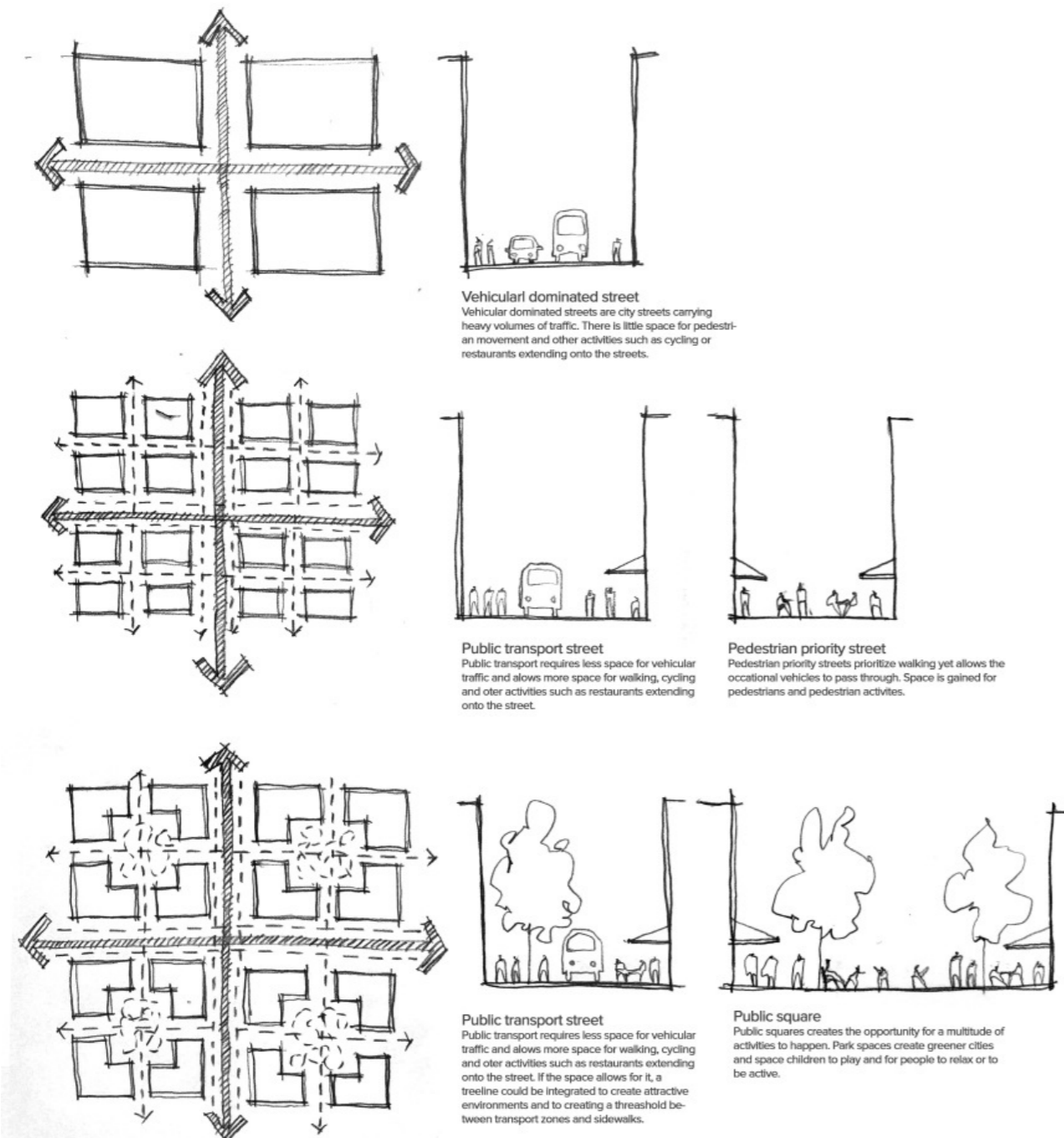
- Jane Jacobs (1961:155-160)-

Vehicularl dominated street
Vehicular dominated streets are city streets carrying heavy volumes of traffic. There is little space for pedestrian movement and other activities such as cycling or restaurants extending onto the streets.

Public transport street
Public transport requires less space for vehicular traffic and allows more space for walking, cycling and oter activities such as restaurants extending onto the street.

Pedestrian priority street
Pedestrian priority streets prioritize walking yet allows the occasional vehicles to pass through. Space is gained for pedestrians and pedestrian activites.

Public transport street
Public transport requires less space for vehicular traffic and alows more space for walking, cycling and oter activities such as restaurants extending onto the street. If the space allows for it, a treeline could be integrated to create attractive environments and to creating a threshold between transport zones and sidewalks.

Public square
Public squares creates the opportunity for a multitude of activities to happen. Park spaces create greener cities and space children to play and for people to relax or to be active.

Figure 5.1 *Pedestrian typology (Gehl, 1987, edited by Author).*

SUCCESSFUL CITY SPACE

Existing housing and residential areas in the City of Tshwane are more than often merely housing estates and not neighbourhoods (City of Tshwane 2012:61). Areas targeted for densification should be treated as whole environments, with investment in infrastructure, landscaping, open spaces and social facilities ideally preceding higher-density developments (City of Tshwane 2012:13)

The theoretical investigation of the project is aimed at the necessity of reintroducing the residential component of Marabastad and how this could enrich its existing activities. It also introduces the theory of *Open Building* and why it is applicable to a housing scheme in Marabastad.

From our site visits and understanding of Marabastad, one of the main issues that we identified as an urban group was the diurnal state of the area. As discussed in Chapter 3, the primary reason for the high activity during the day is because of economic and transport activities feeding off the daily commute of people coming into the city. In her book The death and life of great American cities, Jacobs (1961) discusses the attributes of fertile environments. When an area becomes predominantly devoted to work, there will be few people after working hours, and when an area becomes residentially focused, people are in the streets at the same time. Combining the two creates an environment that *support*s people on the streets at different times of the day (Jacobs 1961:173—181).

The sidewalk and streetscape serves as a public space and these are the city's most vital organs and main public spaces (Jacobs 1961:41). It is clear that the street of Marabastad serves as the public space with high levels of activity. It is worth recognising that, because the

street belongs to the people, they unconsciously form a network of voluntary controls and standards (Jacobs 1961:41-47). Gehl (2010) builds on Jacobs's theory and stresses the importance of active shop frontages and mixed use in buildings to encourage people to be in the streets. He points out that around-the-clock activities bring safety and protection to the people on the streets and the residents of the area (Gehl 2010:99). He also points out that successful and lively active public spaces need both moving and stationary activities (Gehl 1987:99). This effect is clearly noticeable in Marabastad. The streets where people move are populated by the static activities of informal and formal shops, but where there is little to no activity towards the inner part of the city block, there is little pedestrian movement. Due to the lack of passive surveillance in these areas, it becomes unsafe and unfriendly. Gehl (2010) states that people will perceive a place to be safe when they are enticed to walk and live in the area when moving through it.

The success of Marabastad's lively streets lies in the fact that it submits to what Gehl and Jacobs described as the basics of ensuring activities on the streets. When considering an intervention in this already successful context, one has to integrate the existing with the new, whether is the activities are formal or informal, tangible or intangible. Although Marabastad is a vibrant place with successful street activity levels, the areas towards the inner part of the city block hold opportunities for improvement and upgrading to create a safer and livelier urban environment.

The project proposal aims at changing the areas of the inner block to safe, usable public spaces. These public spaces will be programmed according to what they will be used for by the adjacent buildings. Public spaces without public place to *support* them, seem unwelcome to most people because they are open to everyone, yet no-one has a reason for being there (Jacobs 1961:74). The proposed public spaces will be open to the public, as everyone has the right to be there. However, according to the studies of Newman (1973), these spaces will have a symbolic definition of space through surveillance and prevent the ambiguous use of the spaces (Newman 1973:64). As Newman discusses, symbolic

restricting spaces can be divided without actually prohibiting entry (Newman 1973:64).

The proposal strives to create a sequence of territorially defined areas to create a sense of security moving from the public realm to semi-public grounds and to more intimate and private individual places. Moving to the inner part of the block, semi-public spaces are defined by the mixed-use buildings of shop houses on the ground floor and housing units on the upper floors.

The shop houses provide surveillance of the street during the day and the housing units, depending on the type of family structure, provide surveillance when they are present during various hours of the day, but especially in the evenings. A family's claim to a territory diminishes proportionally as the number of families who share that claim increases (Newman 1996:17). Semi-private stoep areas are provided in the proposed housing scheme. These areas are shared by a smaller number of families, as opposed to the courtyard that is shared by all the families. The housing units are arranged in such a manner that they define semi-public spaces that are still accessible to the public. The semi-private spaces that look onto the public and semi-public spaces create surveillance and a sense of safety (Newman 1973:65).
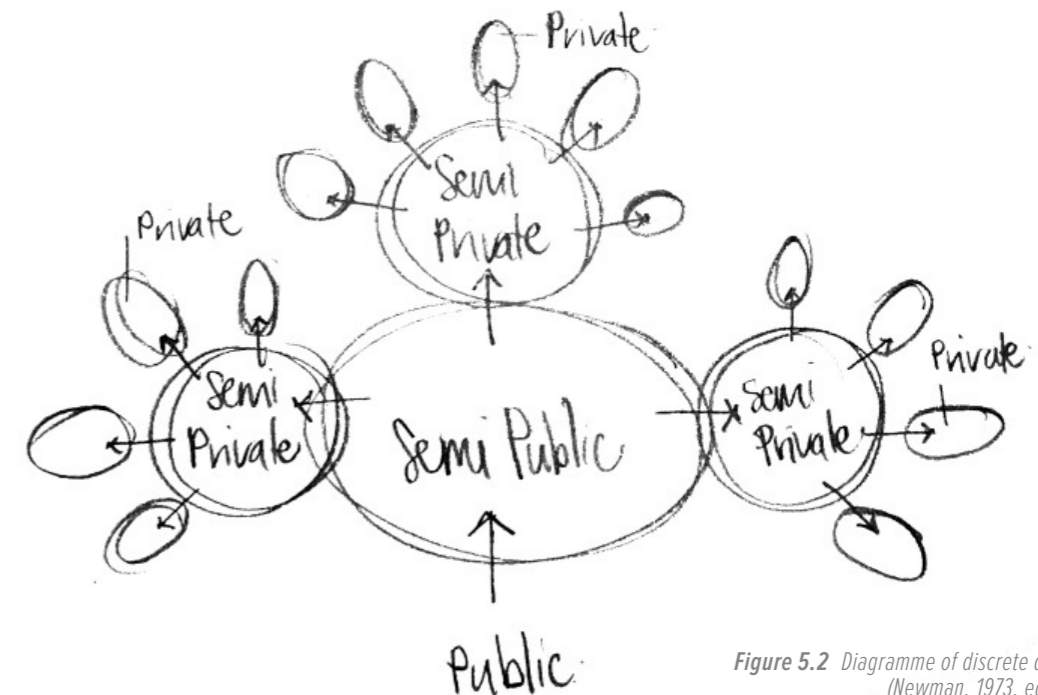

Figure 5.2 *Diagramme of discrete defensible spece (Newman, 1973, edited by Author).*

THEORY OF *OPEN BUILDING*

In 1972, Habraken published *Supports: an alternative to mass housing* (Habraken 1972). From his observations of post-World War II housing buildings, he expressed concern for the removal of the individual's ability to alter his or her dwelling and therefore eliminating the inhabitant's participation in the housing process. He recognised that the traditional process of habitation allowed for uniqueness and a variety of houses on the street. Habraken was not interested in reinventing housing types, but rather focused on reinstating the natural relationship or process of the inhabitant and the units of housing provided. Three main issues of 21st century housing are addressed by the concept of *Open Building*. Firstly, housing must be diverse. Secondly, it must be adaptable and accept change. Thirdly, the user must be part of the decision-making process (Setien 2012:4).

Habraken's approach to providing a flexible plan was to construct *supports*; **a fixed structure that implements an architecture that recognises the architectural character of the context and** *infill*; **a detachable unit to adapt to consumers' needs and meet the differentiated demands of individual households** (Kendall & Teicher 2000:9-11).

Habraken (1972) realised the importance of recognising the different parts of the building with different life cycles and the relation between fast-changing and slow-changing building elements. In his Shearing Layers diagram, Brand (1994) explains the hierarchical system of a building's layers. Each layer has a different life cycle and changes at different rates. The site long outlasts generations of buildings, the structure that consists of all the load-bearing elements has a life span of 30 to 300 years, the exterior skin changes every 20 years, services have to be changed every seven to 15 years, the space plan or interior layout can change every three years and the furnishings, including chairs, desks and appliances, can change regularly (Brand 1994:12-13). This diagram suggests that the layers should act independently from one another to allow the layers with a shorter life cycle to transform without compromising the integrity of the more durable layers.

Habraken (1972) identifies two levels of control in the collective housing building and defines them as the act of building and the act of dwelling. He pointed out that to create long-term residential architecture, the different levels of control have to be clear (Kendall & Teicher 2000:31).

Habraken (1972) compares the **support** and **infill** concept to a highway with lanes intended to be occupied by many kinds and sizes of vehicles. The **support** (highway) is the finished building without pre-determined *infill* (vehicles) layouts (Setien 2012:18). The *infill* can be altered by the individual occupancies to fulfil their needs and the **support**, which is intended to long outlast *infill* changes, will largely persist independently from the individual occupants' choices to accommodate changing life circumstances.

Individual units can thus change their initial configuration regularly as incomes, household composition and space needs change (Kendall & Teicher 2000:32-33). *Support*, as defined by Habraken (1972), is more than a column-and-slab construction, it is what enables the architecture of the project (Habraken 1972:61). *Support* should be seen as the physical setting that offers flexible internal space. *Support* is that which is provided by the professional and has some considerations concerning the placement of buildings, size restriction and regulated use. *Support* is dominated by architectural styles, climate, building codes and land-use rules (Kendall & Teicher 2000:32-33).

Kendall and Teicher (2000) state that when the *support* is finalised, it has to appear as a complete building, but it requires *infill* before it can be occupied. The *infill* is defined by social criteria. It can be any type of construction, as long as the residents have control over their position, and it can be changed without affecting or impacting on neighbouring units or the *support* (Kendall & Teicher 2000:35).

From the research done on the concept of *Open Building* and its application over the years, it has become clear that there are different interpretations and approaches with different characteristics and possibilities when it comes to *Open Building* (Setien 2012:29). Leupen (2006) used Habraken's definitions of the terms *support* and *infill* to analyse flexibility in housing. He concluded that the term *support* is not defined as the physical load-bearing structure, but is considered to be the communal property of the building. In some cases, the envelope and services form part of the *support*, and sometimes they form part of the *infill*. The relationship and combination of *support* and *infill* are dictated by the intended level of control (Nikolic 2011:6).

In his book, *Frame and generic space*, Leupen (2006) went on to develop a kit of analytical tools to study *Open Building* projects in six different components. It was based Brand's proposal of Shearing Layers (1994). In his publication *Open Building in the collective housing of the 21st century in 2012*, Setien (2012) uses the analysis tool developed by Leupen to research the different scales of intensity of the relationship between permanent and changeable (Setien 2012:29). Setien uses the term infrastructure to describe the collective components of the building, i.e. *support*. Setien's four degrees of *Open Building* and the relation between architecture and participation (Setien 2012:30-80) are on the next page.
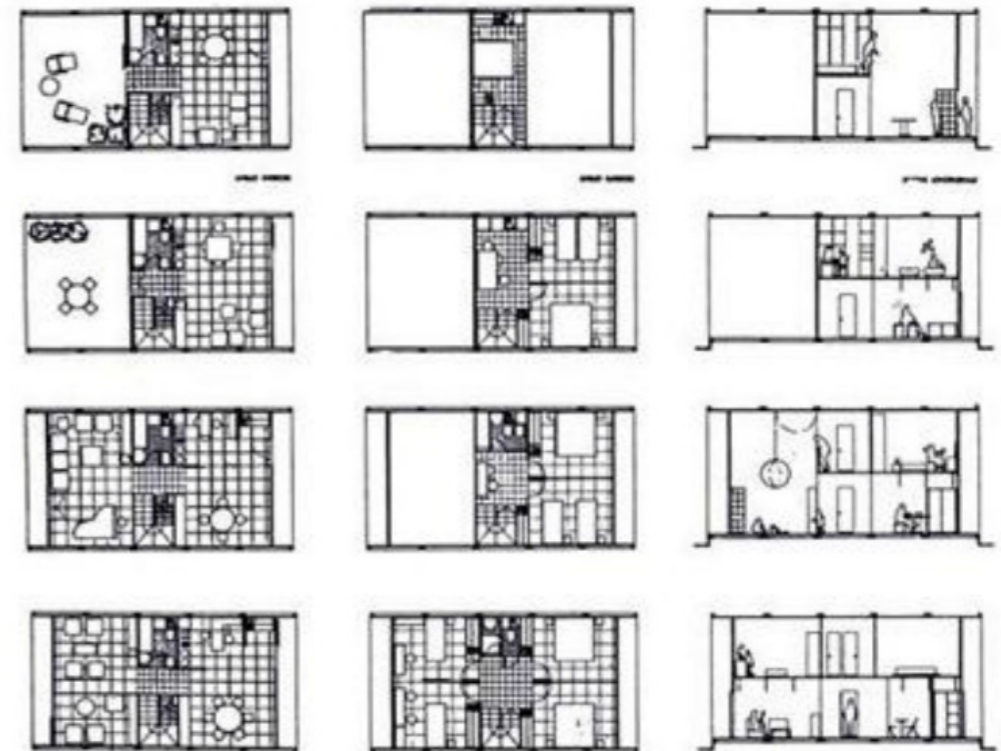

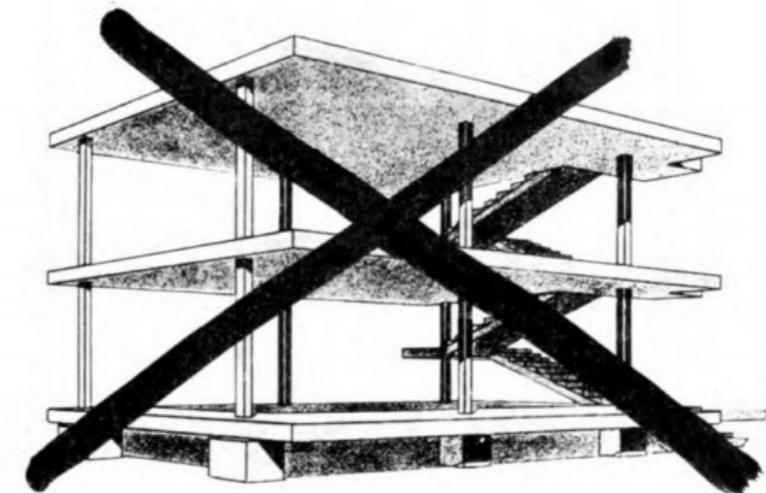**Figure 5.4** *Evolution of house as it extends over time, Renzo Piano(Setie, 2012)*

Figure 5.3 *A support is not a skeleton, by Habraken (Kendall & Teicher, 2000)*

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Infrastructure as skeleton

The infrastructure is formed by the load-bearing structure and circulation spaces and thus creates the skeleton structure where the houses can be inserted autonomously. These structures are therefore not dwellings or buildings and have no aesthetic consideration as the final *support* structure, it is only provided to hold the dwelling in place (Habraken 1972). The occupant therefore has complete control in the decision-making process when developing his or her unit.

Infrastructure as envelope

This type of infrastructure includes the skeleton structure and the external enclosure. This gives greater opportunity for architecture to become part of the building in representing it as a whole. The following four main aspects should be considered in developing this type of infrastructure: the perimeter and the envelope, the structural system, the depth of the floor plan and ceiling height, and the positioning of services including lifts, ducts and stairs. Therefore, as an architect, the focus is on the best optimisation of space with the diverse possibilities of subdivisions.
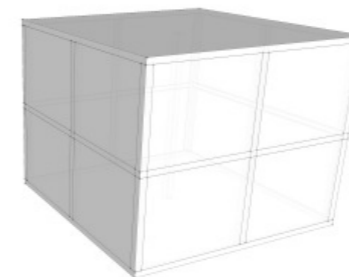
Infrastructure as service

In this scenario, services – including the kitchen and bathroom – are fixed in the floor plan and are not controlled by the user. The basic infrastructure that is provided here includes the structural system, the envelope and the services. This allows for better use of space by grouping services together and ensuring access for maintenance.

Infrastructure with open space

This type of infrastructure allows for the extension of the house. As an addition to a complete base building, an unfinished open space is provided that the occupant can put to use over time. This type of infrastructure allows the unfinished space to be external or internal. Although it is left unfinished by the architect, he or she has to think how this space can be used in different ways to ensure that the occupant can finish it.


Infrastructure as skeleton
This form of infrastructure(support) includes load bearing elements and access which includes galleries and cores.


Infrastructure as envelope
This level of open buidling includes the external enclosure in the infrastrure (support). This becomes a common element which generates a building as a whole
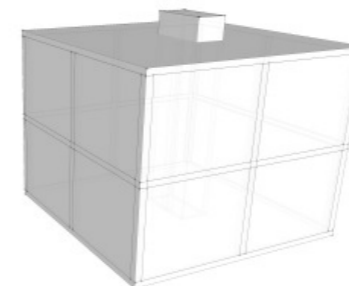
Infrastructure as service
Services are part of the infrastructural element, with careful consideration of the positioning and grouping enabling a more efficint use of installations and minimization of the number of ducts needed. These services include kitchens and bathrooms.
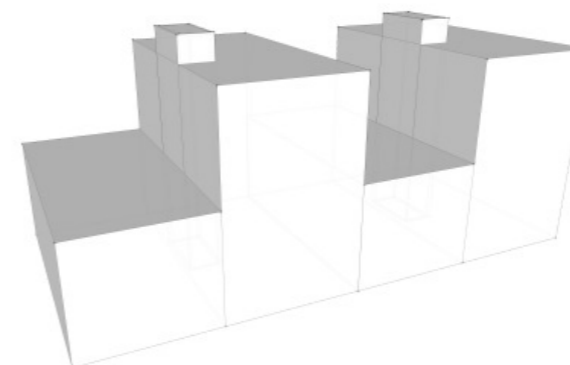
Infrastructure with open space
This level of open building has an open available space with the intention of the user to appropriate the space over time. This space is an unfinished space but to ensure proper functionality the architect has to design and think how the space can be used in different ways. This allows for more flexibility in use and growth of the unit over time.
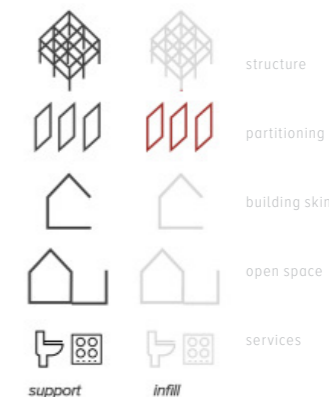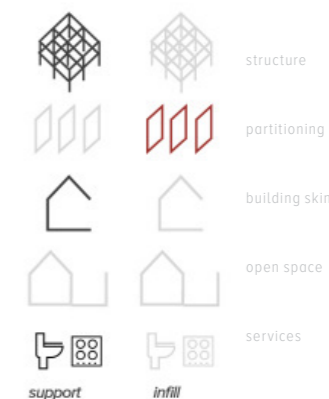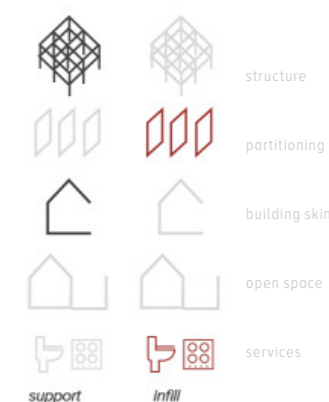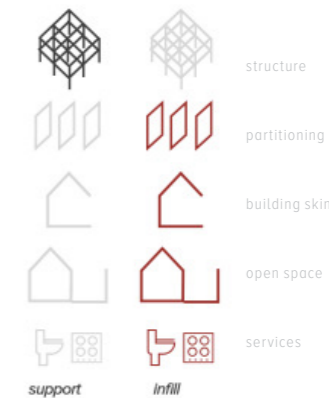
CONCLUSION

Upon analysing the possible types of *Open Building* practices in collective housing, one can conclude that each is appropriate in different conditions. In this project proposal, the different levels of *Open Building* will be applied to the different programmes and social groups identified in Chapter 4.

Some programmes require more flexibility than others, for instance, the size of a restaurant or shop can change over time as the owners' needs and income changes. *Open Building* thus provides the opportunity for a shop owner to start small and grow over time if and when he or she gains financial assets. A skeletal infrastructure will therefore be proposed for restaurants and shops.

Because the *Open Building* theory relies on the occupant completing the building, one has to consider if the occupant is indeed able to do so. Someone who has no economic income and who cannot afford to acquire *infill* will not be able to make the unit habitable. Therefore, the proposed programmes focused on the homeless will not include *Open Building* principles.

For the family housing part of the project, the principle of service infrastructure will be applied and an open space is also provided. The basic building provided will consist of two bedrooms, a separate bathroom with a toilet, shower and hand basin, and a kitchen (similar to the RDP prototype house discussed in Chapter 4). The bathroom and kitchen with wet services form part of the fixed infrastructure, but the occupant can alter the two bedrooms. The open space will be left unfinished, to be appropriated by the household, yet different scenarios will be explored to show what the space can become.