



Fig 6-1

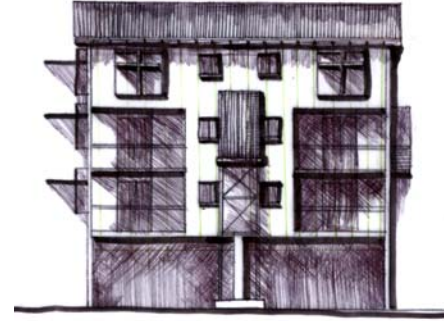




Fig 6-2 Sketch of Daspoort Ridge



Fig 6-3 Small Play nodes - like a basketball hoop and an adjacent bench - are located to serve small clusters of residents. (Newman,1999,p27)

6 DESIGNS: PRINCIPLES AND IMPLEMENTATION

6.1 URBAN DESIGN PRINCIPLES

The question of affordable housing in a highly segregated city is a problem with many dimensions. Moreover, the question of housing in the context of the South African city is a design and typological issue which must be considered on an architectural level, but most importantly, also on an urban planning level.

The book "Making urban places, Principles and guidelines for layout planning." concerns itself with the quality of urban environments to produce layout plans with the ability to initiate urban environments of quality. It promotes the prioritizing of concerns, the recognition of functional and special relationships; making trade-offs, and understanding the social, financial, environmental and end-user implications of layout decisions. "It is neither possible nor desirable, at any one point in time to 'design' an urban settlement. Enriching urban environments are the result of successive collective and individual actions, and reactions over time.

The purpose of a layout plan is therefore understood to provide a spatial framework within which numerous collective and individual investments can be accommodated over time, in a mutually reinforcing and developmental manner."(Behrens & Watson; 1996)

6.1.1 ROGERS URBAN TASK FORCE

A source of design guidelines by the Rogers Urban Task Force, led by architect Richard Rogers, drew up a set of basic principles for good urban design: (Lewis.S.2005 p 80) It promotes context specific layout planning responses to the particular cultural and natural features of a site. Context specific responses are central to the creation of a sense of uniqueness, or place, in urban developments.

They suggest the following:

- Respecting the site and setting.
- Respecting context and character
- Priority to the public realm
- Ensuring linkage and ‘fine grain’
- Using land efficiently.
- Mixing activities
- Mixing tenures
- Building durably
- Building to high quality
- Respect the environmental stock.

In summary, these design guidelines for urban housing includes the following issues for consideration:

Making Connections	Choice, permeability, activity, safety
Providing green areas and corridors	Legibility, variety, activity
Treating the streets as a place	Safety activity
Layout of the built form	Legibility, activity, neighborliness, safety
Absorbing diversity	Flexibility, variety
Defining public and private space	Choice safety, activity, privacy
Creating a relationship between buildings and spaces	Safety, activity, legibility
Arranging the building mass	Safety, legibility, energy efficiency
Optimizing solar potential and good aspect	Choice, energy efficiency, privacy
Managing and integrating parking	Safety, legibility, flexibility
Providing frequent and convenient access	Activity, privacy, flexibility
Mixing uses/ building in flexibility	Variety activity, adaptability, energy efficiency
Providing spaces around the home	Choice safety privacy
Meeting the ground-thresholds and interfaces	Safety, privacy, activity

(Lewis.S.2005)



Fig 6-4 Site: from the west.



Fig 6-5 Meeting the ground-thresholds and interfaces



Fig 6-6 Connectivity:
Connecting places in the building to the park.
Creating places for social inter action





Fig 6-7 Greenhouse and gardens in the openspaces between buildings.

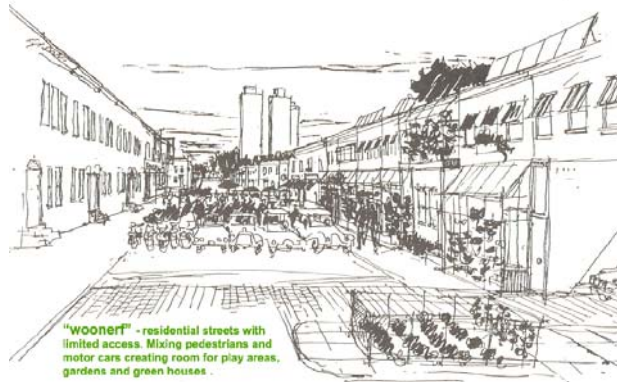


Fig 6-8



Fig 6-9

6.2 URBAN DESIGN IMPLEMANETATION:

6.2.1 RESPECTING THE SITE –Building layout and orientation.

“Each act of settlement relies on articulated form to stimulate further interpretation. Given the increasing fluidity and variety of contemporary life, the functionalist approach may prove to be a short lived phenomenon. Inhabitation remains fundamentally territorial, and architecture may return to the articulation of space that is open to acts of inhabitation.” (Habraken.1998p135)

To allow “the articulation of space that is open to acts of inhabitation’: the main concern with regard to the placement of the buildings was to consider the park and the quality of the environment. The rectangular site is divided by the spruit and after consideration of the floodplains, the northwest corner and south east corner was deemed the most suitable position for development. The aim with the proposed buildings was firstly to allow the appropriation of the green space and to provide safe and secure living environments.

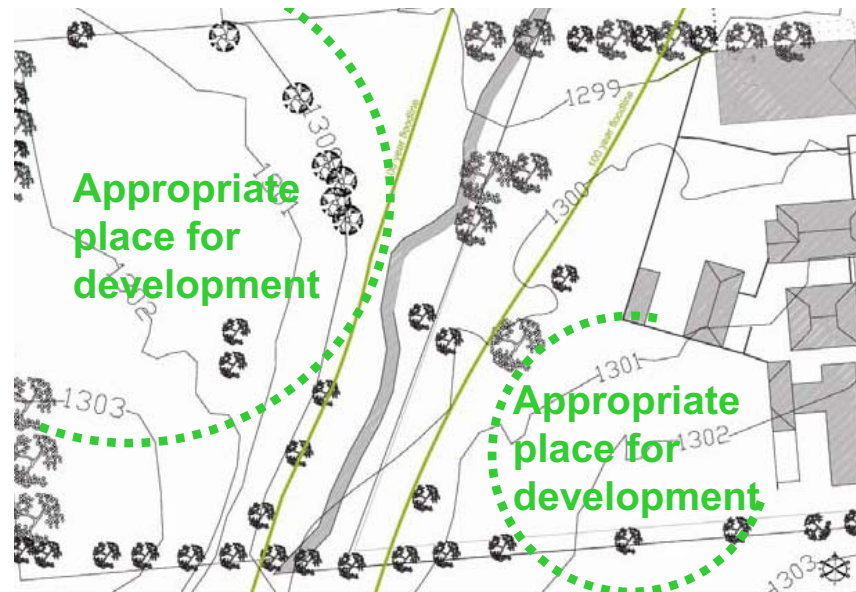


Fig 6-10

6.2.2 THE PERIMETER BLOCK

“The essence of urban architecture is how it negotiates the narrow margin available between territorial boundary and building façade”
(Habraken.1998p167)

The three sided perimeter block defines the street edges. However, the design had to be cautious of turning its back on the agricultural park, where resident surveillance is important, and hamstringing the views over the green area.

In “Sustainable communities: A new design synthesis for cities, suburbs and towns”, Calthorp and Van der Ryn offers examples of real and proposed environmental planning that promotes self-reliant cities. A prominent feature in the case studies is the courtyard and “woonerf” model.

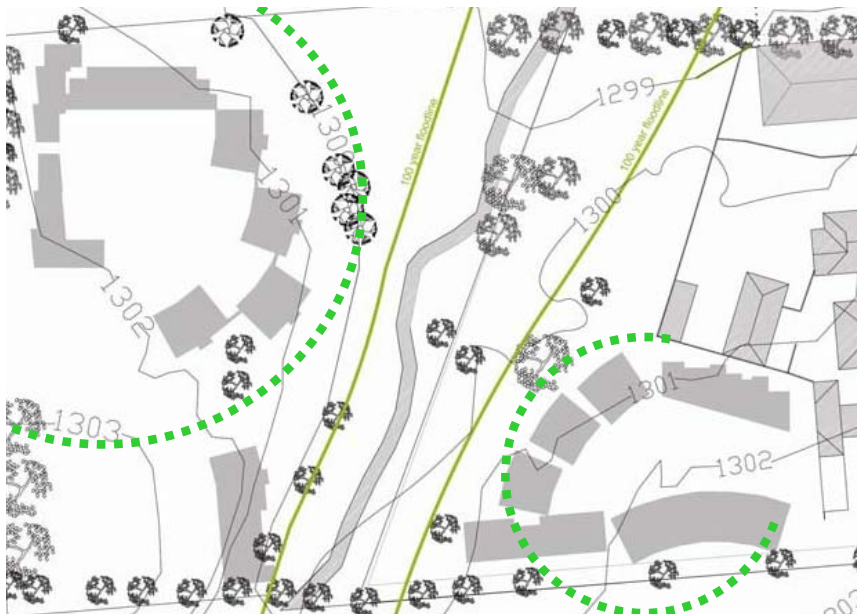


Fig 6-11 Placement of buildings on site.

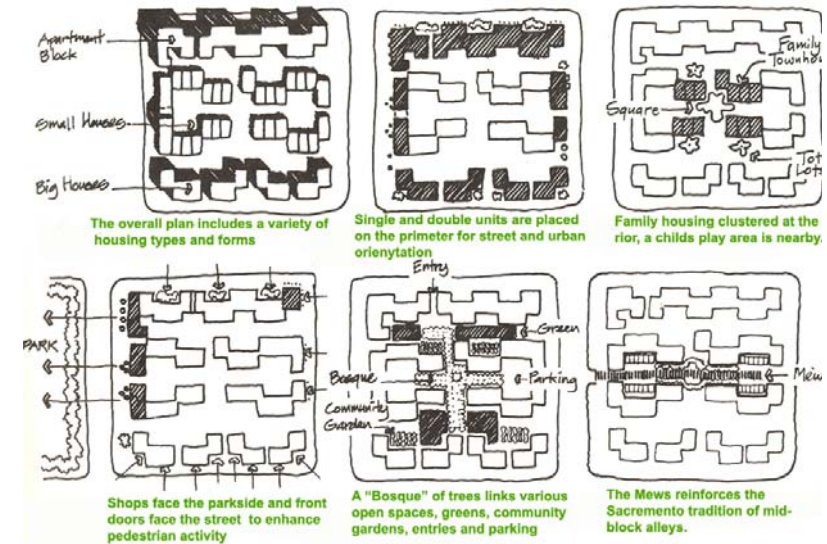


Fig 6-12

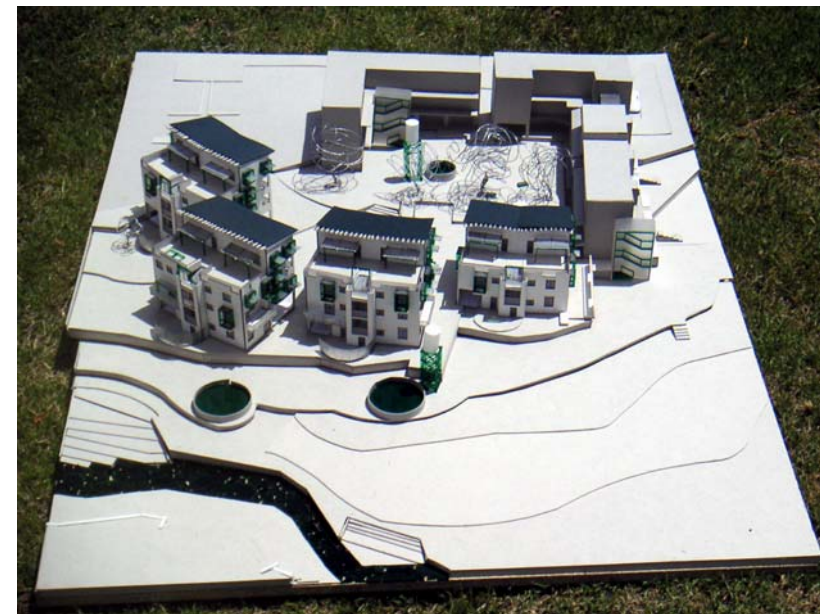


Fig 6-13 Model

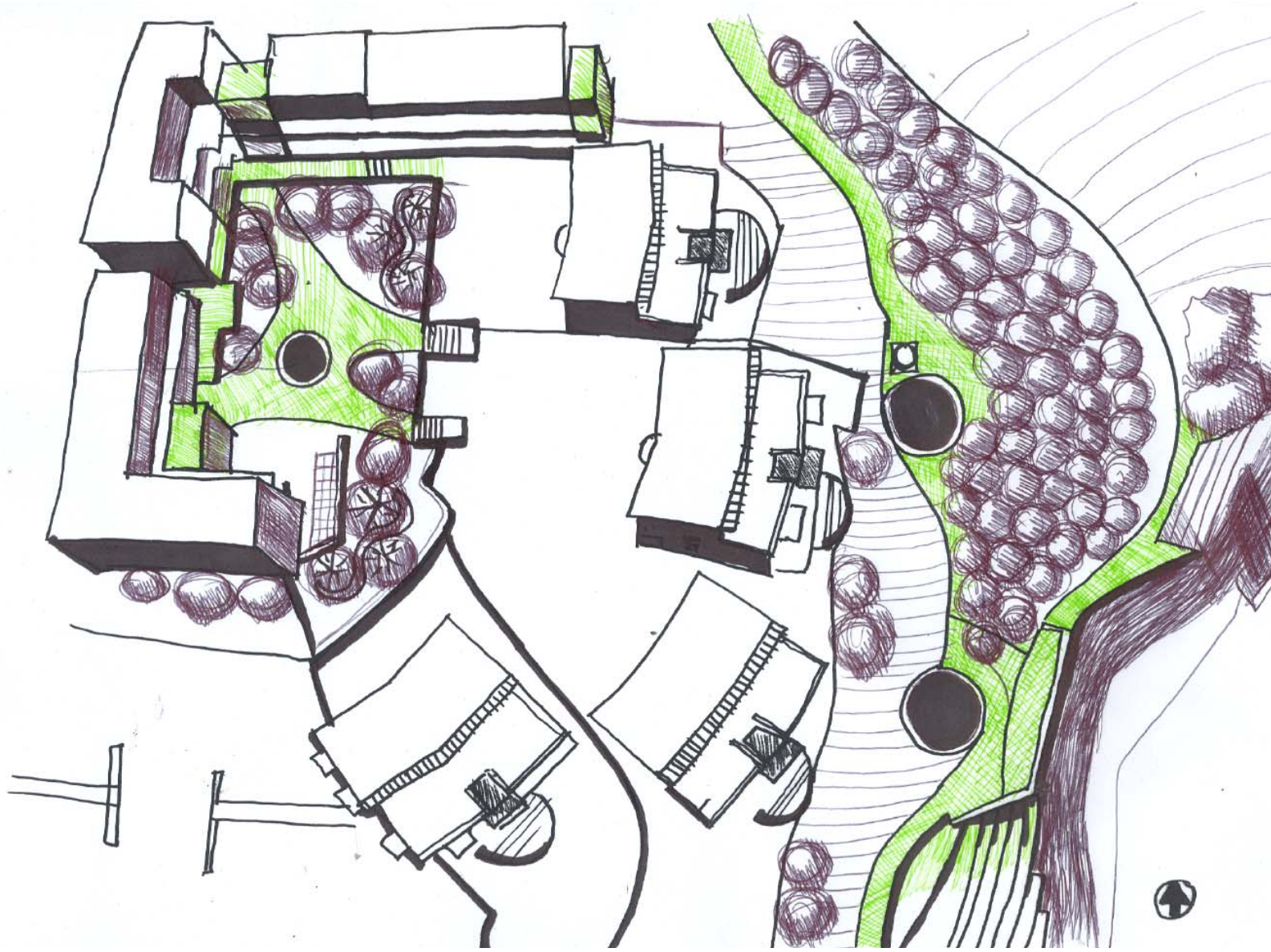


Fig 6-14 Sketch of site indicating defensible courtyard space

6.2.3 DEFENSIBLE SPACES

Oscar Newman is an architect and city planner known internationally for his work in community planning, assisted housing, crime prevention, and racial integration. His 'defensible space' concept has helped communities to redesign neighbourhoods for greater safety. Newman's theory of defensible space informed the decision and method of creating buildings with edges which contain various spaces. This also allows the creation of controlled entrances and exit points into the housing facility. The intention was to make the internal environments safe and secure for occupants – especially children. The ways in which the buildings are placed contribute to the surveillance and security of the facility.

The Defensible Space programs restructure the physical layout of communities to allow residents to control the areas around their homes. This includes the streets and grounds outside their buildings and the lobbies and corridors within them. The program helps people preserve those areas in which they can realize their commonly held values and lifestyles. "Defensible Space depends on resident involvement to reduce crime and remove the presence of criminals. It has the ability to bring people of different incomes and race together in a mutually beneficial union. For low-income people, Defensible Space can provide an introduction to the benefits of main-stream life and an opportunity to see how their own actions can better the world around them and lead to upward mobility." (Newman, 1996.p9)

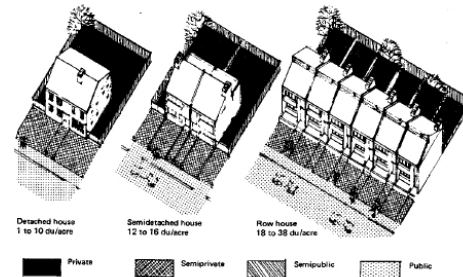


Fig 6-15 Three types of single-family houses and the nature of spaces in and around them. (Newman, 1999, p27)

- all interior spaces are within the private domain of the family.
- all grounds around the private unit for the private use of the family.
- there is a direct abutment between private grounds and the sidewalk.
- the domain of the house encompasses the street.

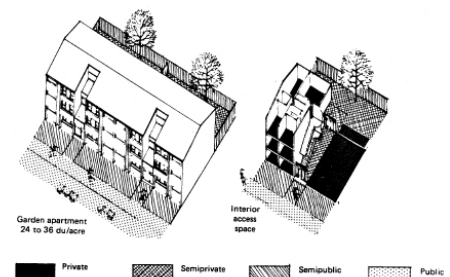


Fig 6-16 Walkup buildings and the nature of spaces in and around them. (Newman, 1999, p 27)

- private spaces is within the apartment unit only.
- The interior lobby, stairs and corridor are semi private.
- Grounds can be designated for open family but are usually shared by all the families in the building.
- Only a small number of families (three to six) share the interior circulation areas and grounds.
- The street is within the sphere of influence of dwellings.

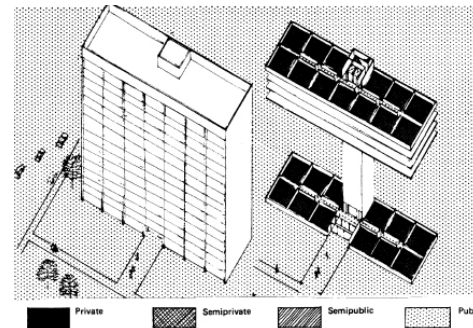


Fig 6-17 This elevator highrise and the nature of space in and around it. (Newman, 1999, p 27)

- Private space exist only within the apartment units.
- The interior circulation areas and the grounds are public.
- There is no association between building and street

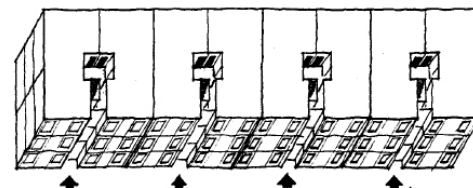
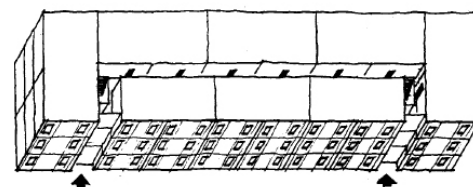


Fig 6-18 Comparison of two ways to subdivide the same building envelope to serve the same number of families, but in radically different ways. (Newman, 1999, p 27)

Case Study: CLASON POINT , New York.

Photographs of an area of Clason Point a neighborhood in the Bronx, new York City. The original layout provided no grounds in the front of units for individual residents. In the site redesign, the central green area, which was largely neglected, was removed and residents were given their own front yards and a childrens play node was also added. (Newman,1999,p76)



Fig 6-19

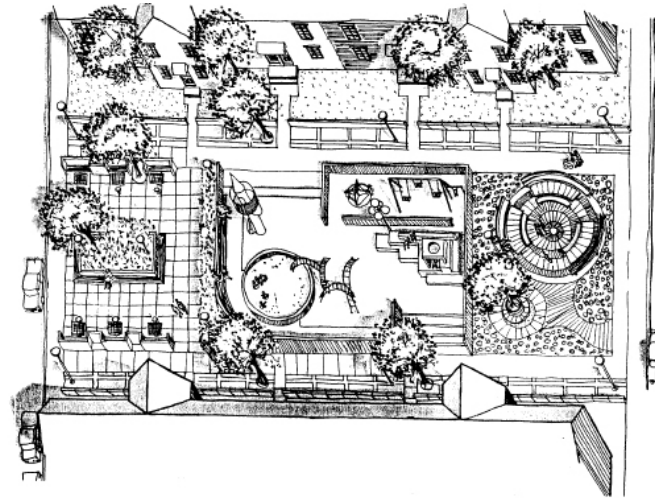


Fig 6-21
Plan for the conversion of the central area into a facility serving, from left to right the elderly, young children and teens (Newman,1999,p27)



Fig 6-20



Fig 6-22
The central area as modified. Note that the extended front yards of neighboring homes now border the central area, bringing a bigger area under the residents control (Newman,1999,p27)



Fig 6-23 Layout of the built form:
 Safety - perimeter block
 - eyes on the street
 Courtyard - play area for children
 Opportunities for neighbors to interact



Fig 6-24 Defining public, semi private and private space

- Low walls
- Line of paving edge
- Level changes
- Screens and gates

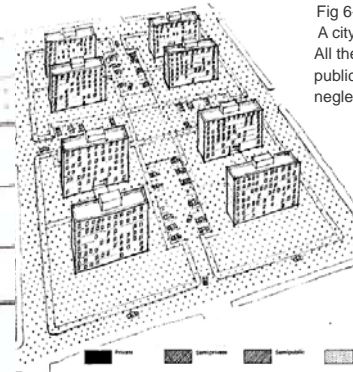


Fig 6-25 A city-block highrise development. All the streets and grounds are public. Public space tend to become neglected and dangerous

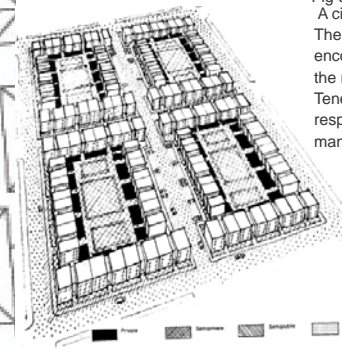


Fig 6-26 A city-block highrise development. The streets and grounds are encompassed within the domain of the multifamily dwellings. Tenents tend to take responsibility for the safety and mantenance of the public spaces

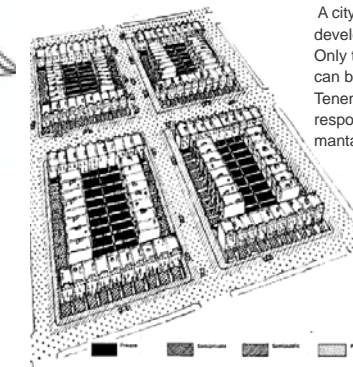


Fig 6-27 A city-block-row-house development. Only the central portion of the road can be considered truly public. Tenents can easily take responsibility for the safety and mantenance of the public spaces

6.2.4 ACCESS CONTROL – Inhabitation and territory

Rather than focusing on how different parts of the site environment is demarcated and governed by territorial rules, we seek to determine how territorial boundaries can be demarcated and deduces by other means. In short, the interest lies in the overlapping relationship between physical form and territorial control. “On the one hand humans express territory explicitly – building walls, making gates, and placing marker stones. On the other hand, we draw implicitly understood territorial boundaries as custom and inhabitation dictates, within the artificial landscape of the built environment. Often as the shopkeeper’s claim of sidewalk space is marked by the placement of wares, territorial boundaries are drawn by setting lower level objects in relation to architectural form. Territory interprets architecture, but by no means in strict obeisance to it.” (Habraken 1998 p 132)

Private and Public space: The neighbourhood, as one territory, exhibits two kinds of space: space occupied by houses (private space) and other space (public space) Territory refers to a unit of special control. Private and public refers to space, but not to territory. There is a clear designation of space as private and the degree of privacy it affords. Territorial depth is measured by the number of boundary crossings needed to move from the outer space to the inner most territory.

The Design of low boundary walls that separates the patio form the park provides a threshold between semi private and public space.

Parting walls and territorial boundaries: Walls between neighbours are another aspect worthy of comparison. Different approaches to building parting walls reflect profound differences in conceiving the environment.

The western European model separates acts of settlement, utilizing a geometric structure that includes house lots. It creates a predetermined framework of relatively shallow territorial depth. The Middle Eastern model, devoid of predetermined geometry, recognizes only the act of settlement and produces over time a relatively deep territorial structure. Externally, one is a form containing settlement; the other is settlement generating form. (Habraken 1998 p 150)





Fig 6-29 Diagram to explain placing of buildings on site



Fig 6-30 Working around existing trees

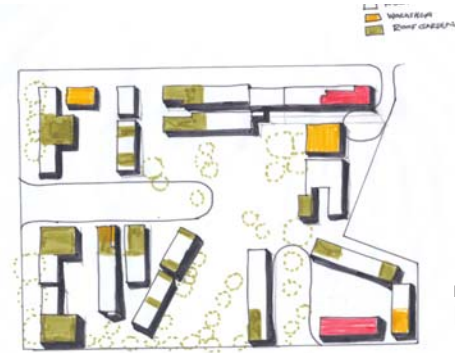


Fig 6-33 Different tenures

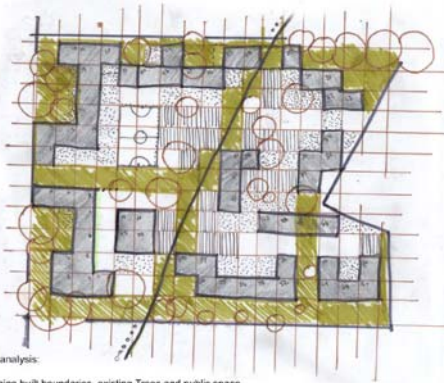


Fig 6-31 Defining the street.



Fig 6-34 Allowing for communal open green spaces



Fig 6-32 2 access points

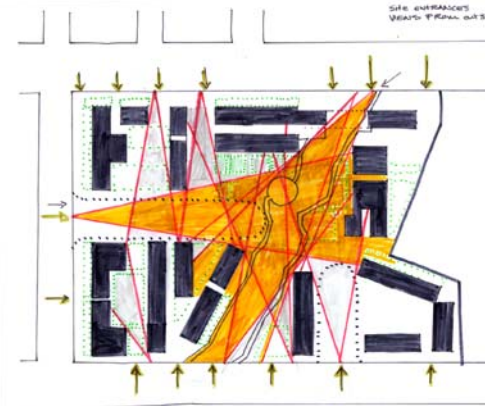


Fig 6-35 Views towards die middle of the site

Conceptual investigation: creating perimeter blocks and internal spaces .



Fig 6-36 Concept sketch - April 2006
Investigating the Courtyard

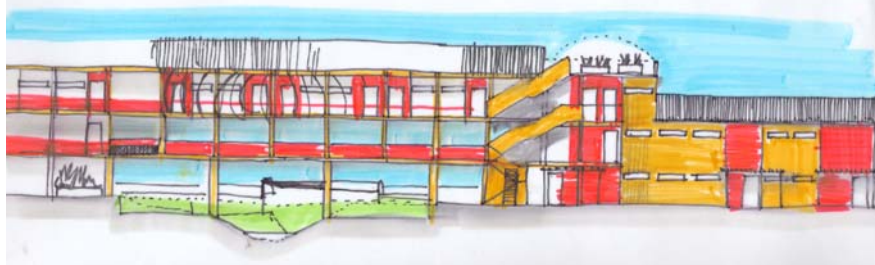


Fig 6-37 Concept sketch - April 2006
Experimenting with the idea of bridging the spruit.
Very high density

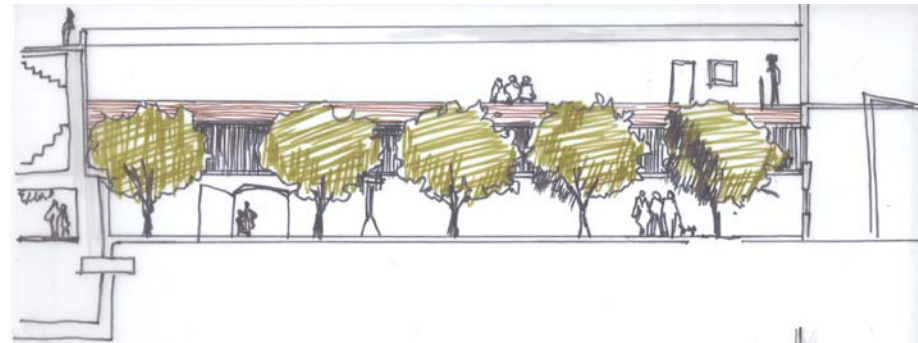


Fig 6-38 Concept sketch - April 2006 Relationship between the trees and the building

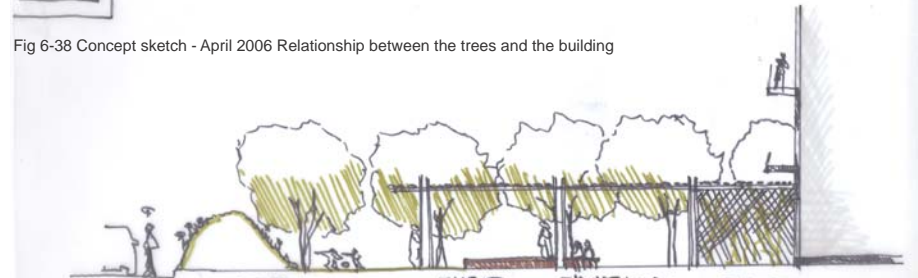


Fig 6-39 Concept sketch - April 2006
Green transition zones - Using landscaping to protect the building from the road.

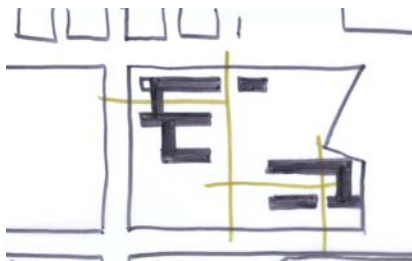


Fig 6-40 Concept sketch - April 2006
Determining access points and building edges

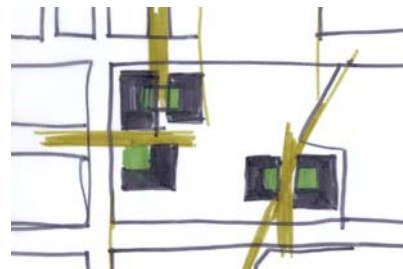


Fig 6-41 Concept sketch - April 2006
Permiability of the Perimeter block and balancing the relationship between building and open space

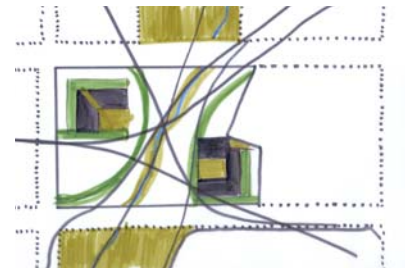


Fig 6-42 Concept sketch - July 2006
The importance of openspace. Connecting the internal green areas with the green link along the spruit

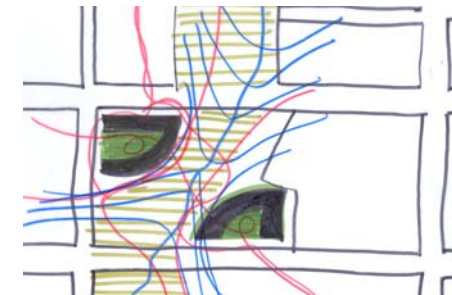


Fig 6-43 Concept sketch - June 2006
establishing the green corridor as a north south axis along the spruit

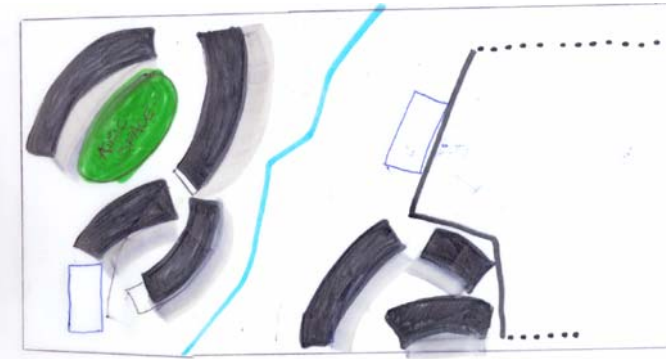


Fig 6-44 Concept sketch - June



Fig 6-45 Concept sketch - July

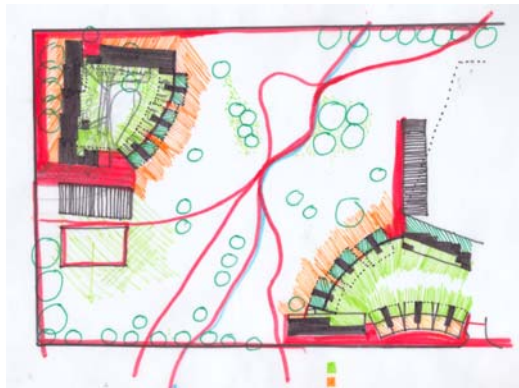


Fig 6-46 Concept sketch - July. Public - Private

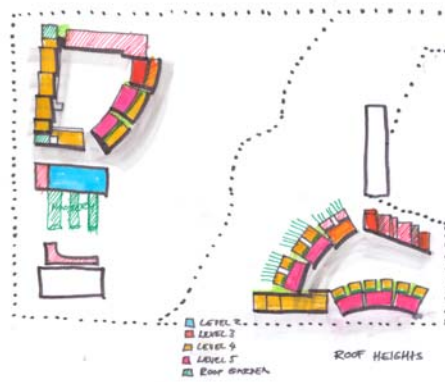


Fig 6-47 Concept sketch - July Building heights



Fig 6-48 Concept sketch - August Working to create a connection with the landscape

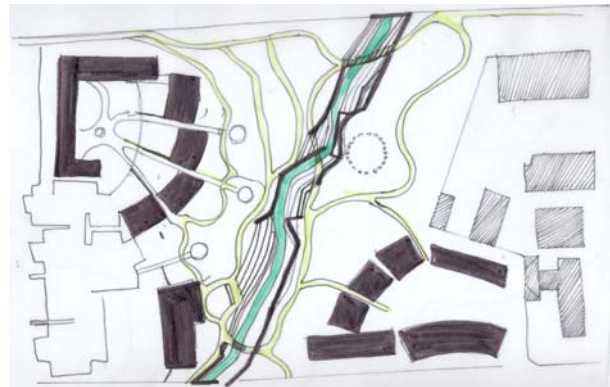


Fig 6-49 Concept sketch - September Walkways connecting different parts of the development

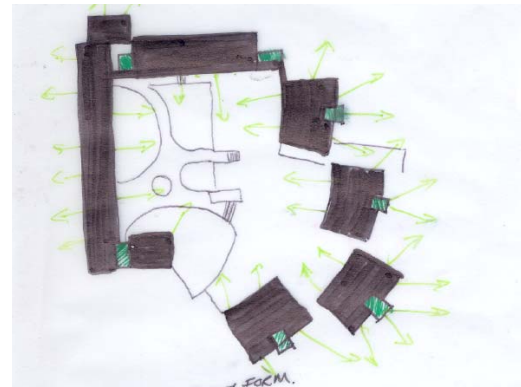


Fig 6-50 Concept sketch - September Sitelines and views from the housing blocks

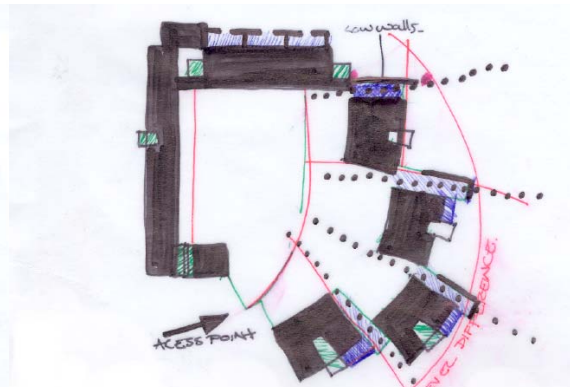


Fig 6-51 Concept sketch - September Level changes and access points

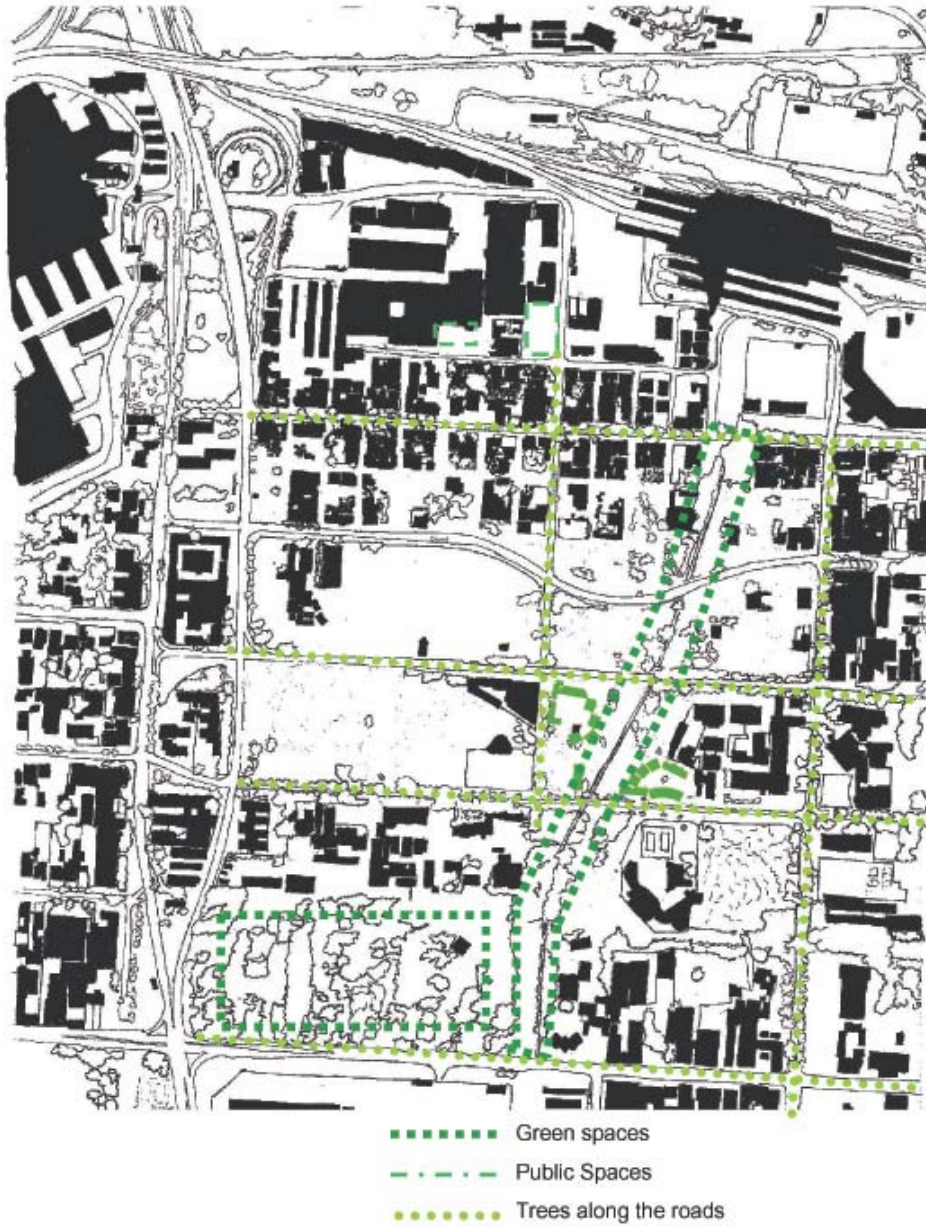


Fig 6-52 Figure ground study with highlighted green spaces

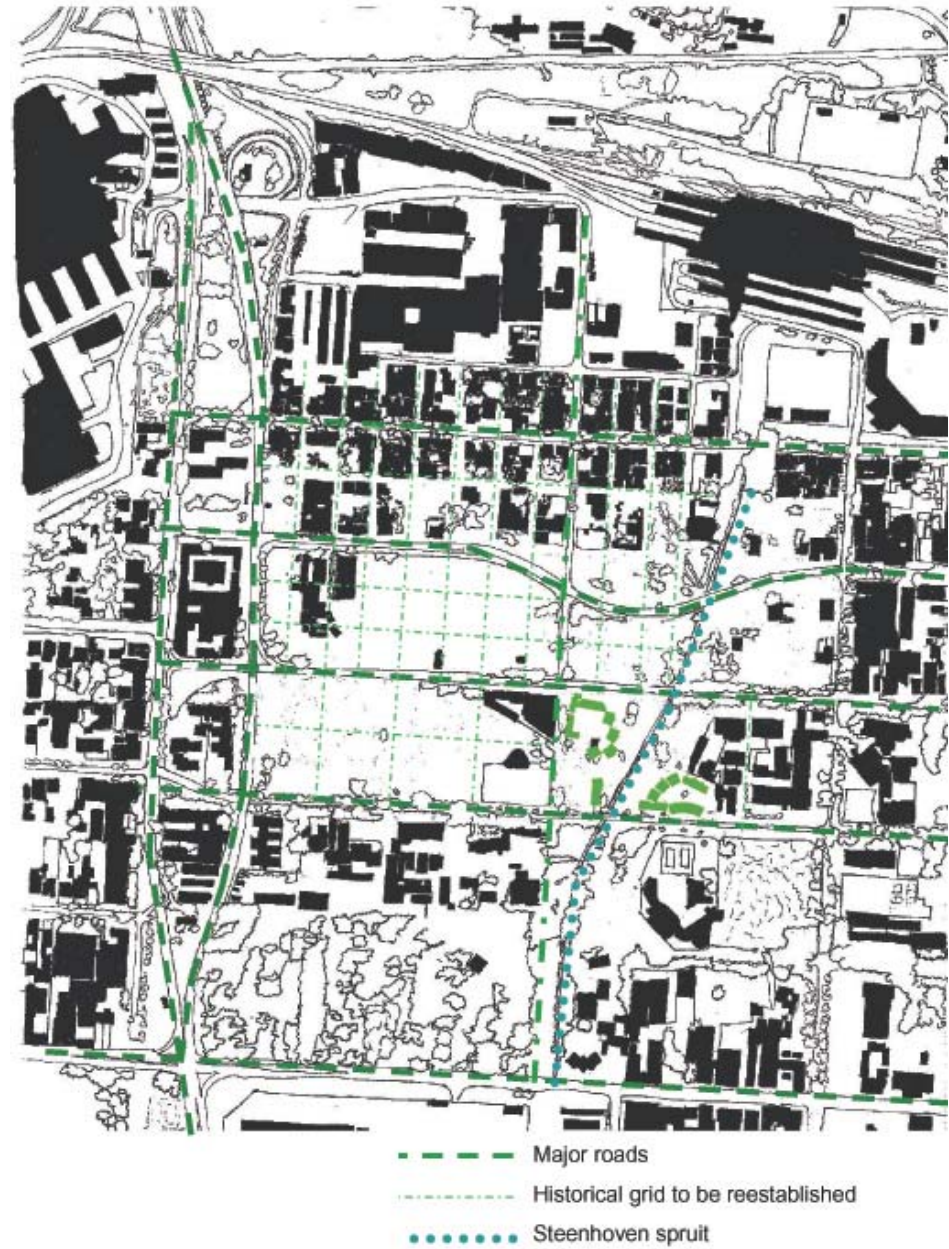


Fig 6-53 Figure ground study with road grid

6.2.5 INTEGRATION AND ACCESS TO THE PARK

Public Space is commonly defined as space used by those who do not individually control it. Entering the public realm from private space is a fundamental right; the door to public space is always open, and there must always be public space we can move out to. Public space is commonly shared among those from similarly included territories. Once one enters public space, by right or by admittances, one is free to walk in public parks, sit on public benches, and use, for a fee, public telephones. In addition to using space we also use things. Control of things is an immediate hands-on affair. To use and, manipulate things we move downward into the territory of the person in direct control: a person who is actually there. The unhappy fate of uncontrolled telephone booths and public toilets offers proof that this territorial reality cannot easily be denied. (Habraken 1998 p 158)

The human body implies territorial presence and people claim territory through the use of space. Therefore, being in a public space means partaking in a game of instant territorial reconfiguration, shifting as people use things: sitting on benches, waiting for buses, parking cars, entering telephone booths or standing on the side walk.

The building is divided into blocks separated by approximately 2 meter wide pathways. This is to allow the park to be viewed and accessed from the inner courtyard with the intention that it would assist people in claiming territory through the use of the courtyard space. Each block has a central staircase that leads up from the communal ground floor to the roof gardens and overlooks the park. The ground slopes away from the buildings. This level difference and terraces creates a physical boundary between the park and the building, without interfering with the visual connection.



Fig 6-54 South Facade



Fig 6-55 Claiming territory



Fig 6-57 Central staircase.



Fig 6-56 Building and landscape



Fig 6-58 Integration with the park



Fig 6-59

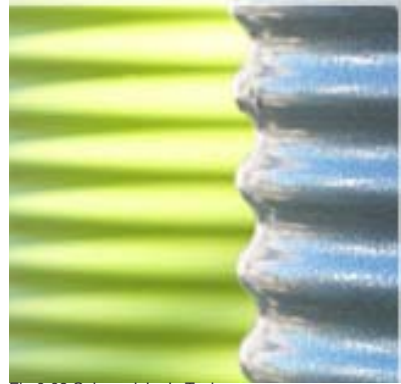


Fig 6-62 Coloured Jo-Jo Tanks



Fig 6-60



Fig 6-61 Irrigation system

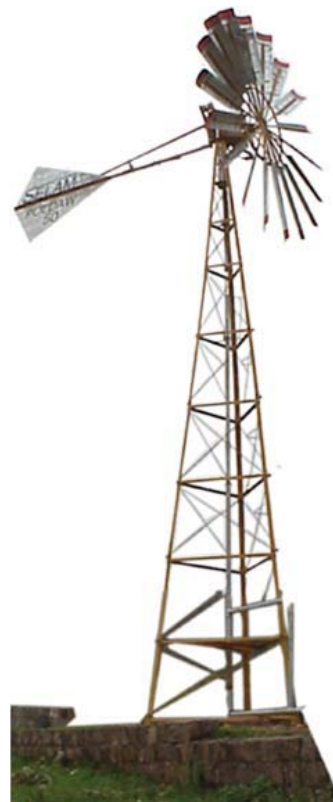


Fig 6-63 Wind mill

6.3 ECOLOGICAL PRINCIPLES:

Ecological buildings create room for living, and the object is to enable people to live in a healthy way without damaging the environment or spoiling the legacy they leave for future generations. A house that harmonizes human needs, technology and ecology should not only be a privilege for the affluent. This project intends to show that a green lifestyle can bring aesthetic enrichment. Today an eco-friendly home does not necessarily require more money, just more thought and planning. Ecology in building has less to do with expensive technology than with durability and quality.

6.3.1 RAIN WATER HARVESTING

Rainwater should be harvested, collected and stored for use in the gardens. Storm water on ground level need to be controlled and also used in the garden.



Fig 6-64 Water Tower

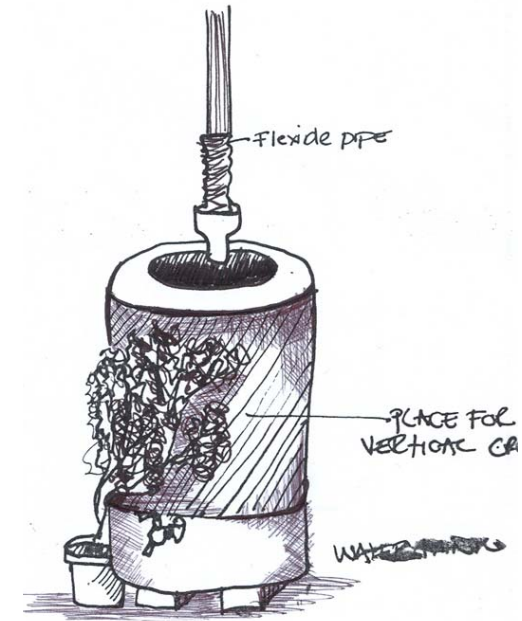


Fig 6-65 Storing rain water.

6.3.2. RUNOFF.

The site slopes towards the spruit. If the runoff is not properly controlled it can cause erosion. The best solution is to design to prevent excessive storm water runoff and to deal with runoff near its source. The further the runoff travel the faster it moves the greater is the erosive force.

Reaction in design: Control and minimizing hard landscaping by using pervious or absorbent surfaces and other paving solutions for the parking area and incorporating bioswales, linear, planted drainage channels into the design.

A typical bioswale moves storm water runoff as slowly as possible along a gentle incline, keeping the rain on the site as long as possible and allowing it to soak into the ground. At the lowest point of the swale there is usually a raised drain inlet that empties any overflow (during particularly heavy storms) into the nearest waterway. River rocks and small wooden check dams placed at 30-foot intervals, for water to pond and thus time to infiltrate the ground. Plants slow down the water flow and increase infiltration and biologically breaking down water pollutants. The water quality can be improved by filtering pollutants before entering the waterway. Bioswales functions particularly well in parking lots.

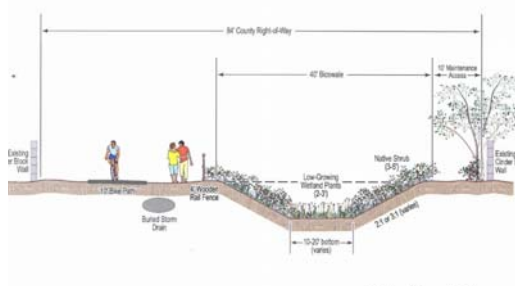


Fig 6-66 Bioswale Typical Cross Section.



Fig 6-67 Bioswale

6.3.3 WATER CONSUMPTION

Devices that can minimize water usage from the main water supply should be specified. Devices that can be used are:

- Dual flush toilet system, connected to the grey water supply.
- Aerating shower heads.

6.3.4 ENERGY CONSUMPTION

Appliances and fittings: Energy efficient fittings and devices should be specified. All light fittings in semi private and communal areas to be fluorescent or low energy consumption.

Solar technology is used for the light fittings in the landscape.

6.3.5 RECYCLING AND REUSE

Inorganic waste:

Residents are to be educated and encouraged to recycle. All recyclable waste should be sorted and stored in bins provided.

Organic waste:

A composting site will be established for suitable vegetation and kitchen waste.

6.3.6 MATERIALS AND EMBODIED ENERGY:

Low embodied energy materials include locally made and sourced timber, concrete, concrete blocks. Materials and component resources should be renewable. The building and construction process should be designed to minimally impact the environment.

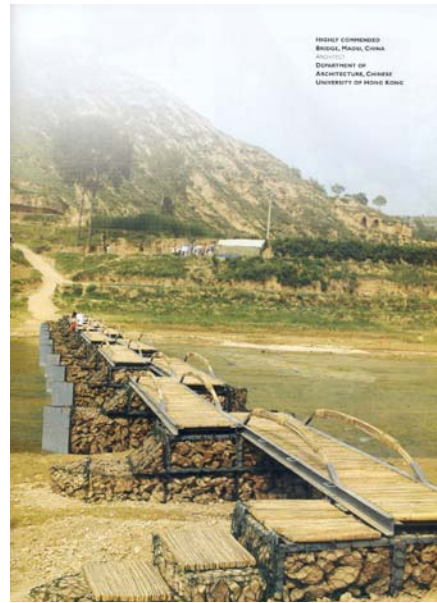
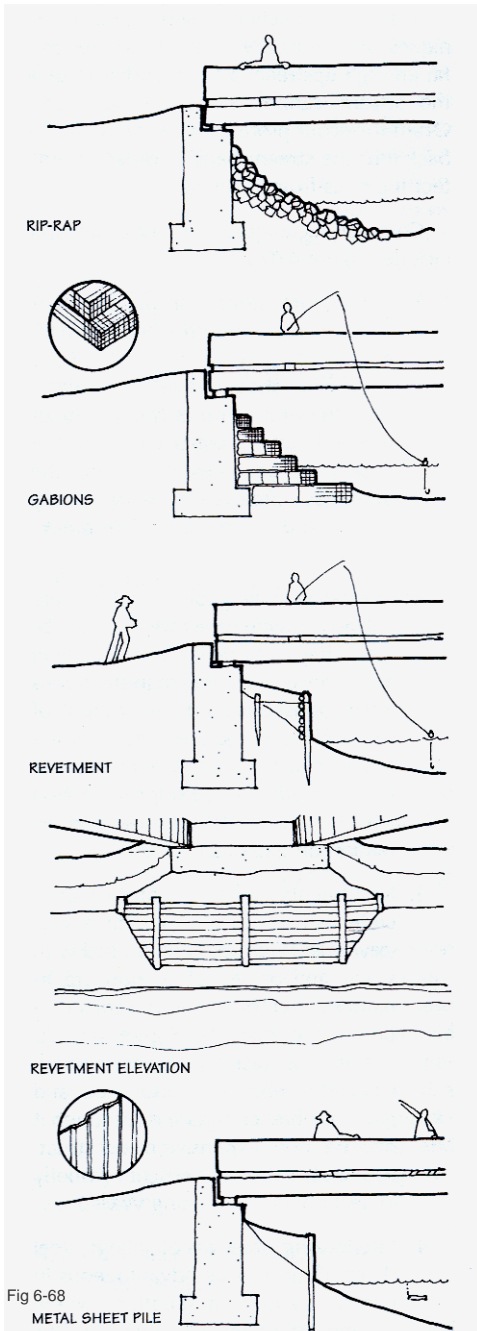


Fig 6-69 River crossing



Fig 6-70 River crossing



Fig 6-71 River crossing.



Fig 6-72 Timber foot bridge



Fig 6-73



Fig 6-74 Baragon

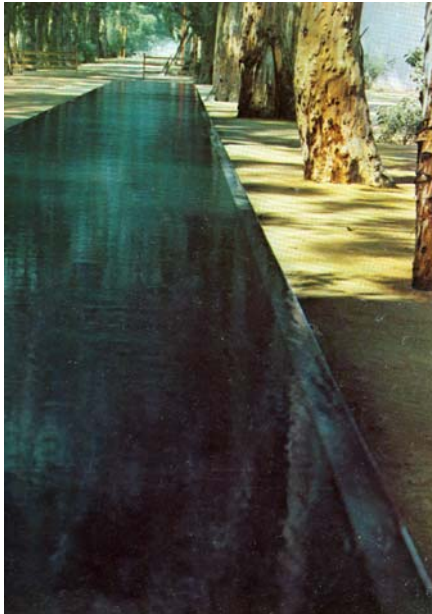


Fig 6-75 Baragon Landscape

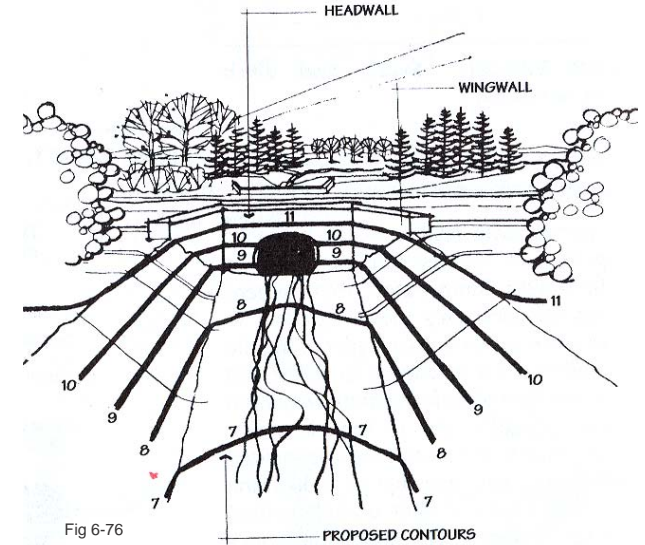


Fig 6-76

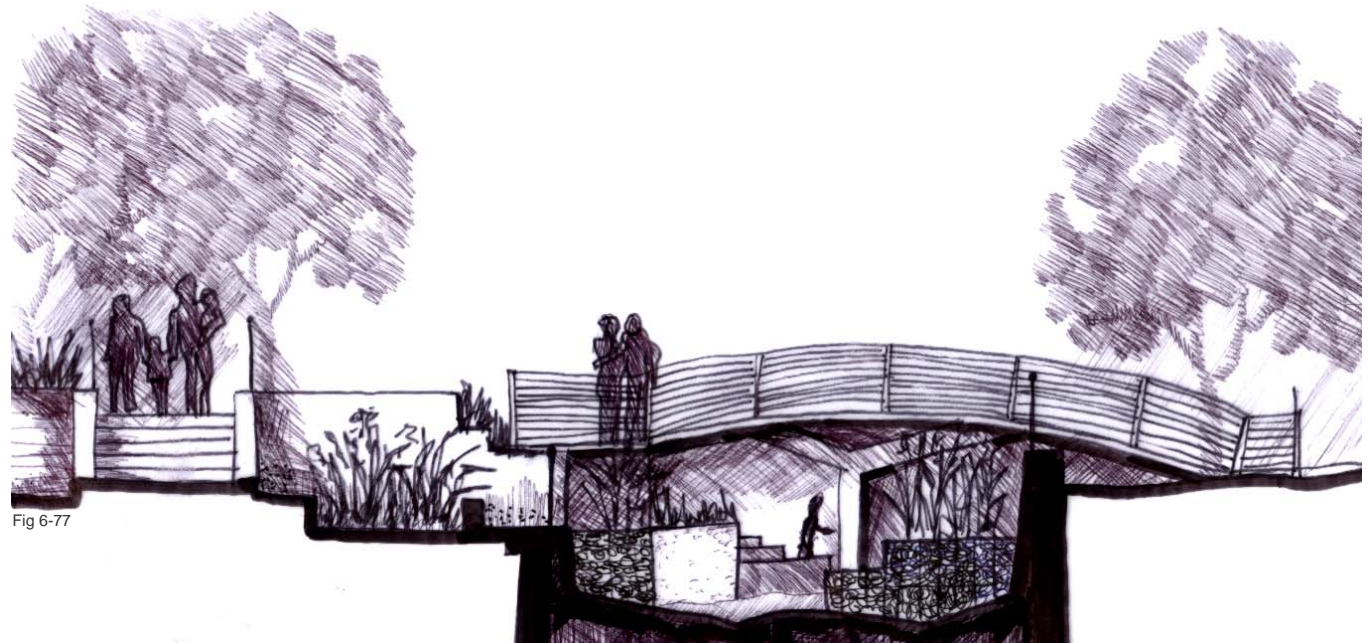


Fig 6-77

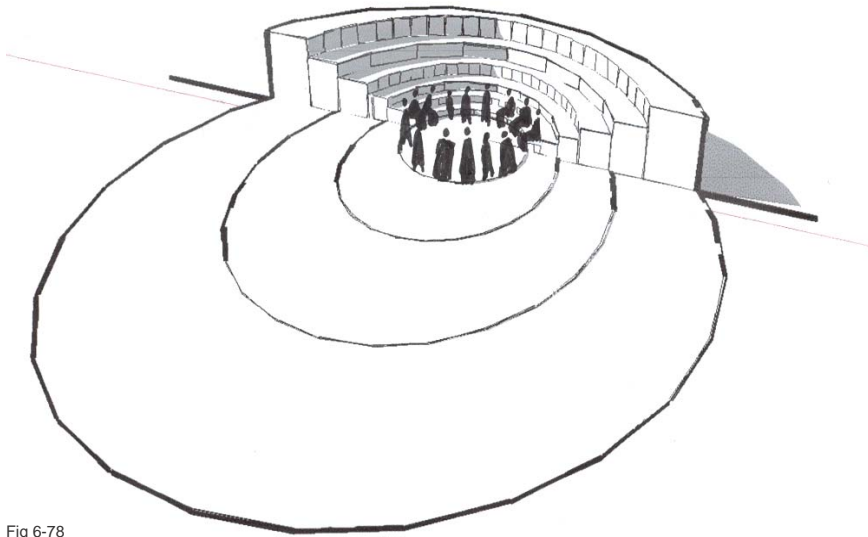


Fig 6-78

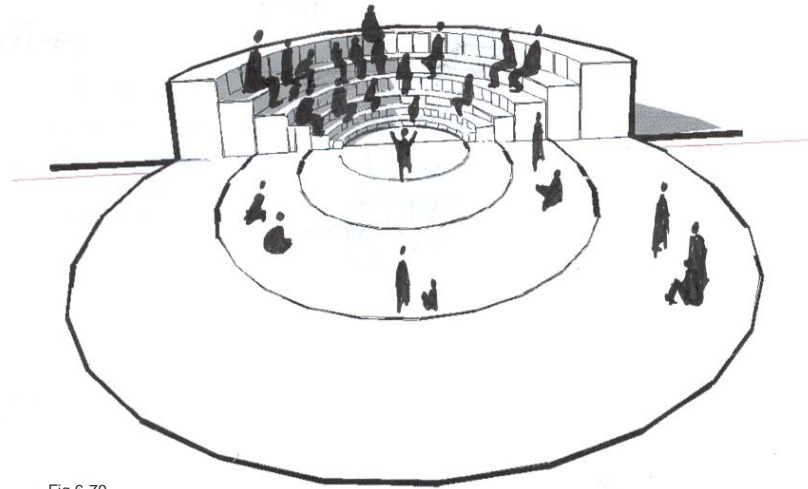


Fig 6-79



Fig 6-80



Fig 6-81



Fig 6-82



Fig 6-83



Fig 6-84 Spiritual circle on site plan.



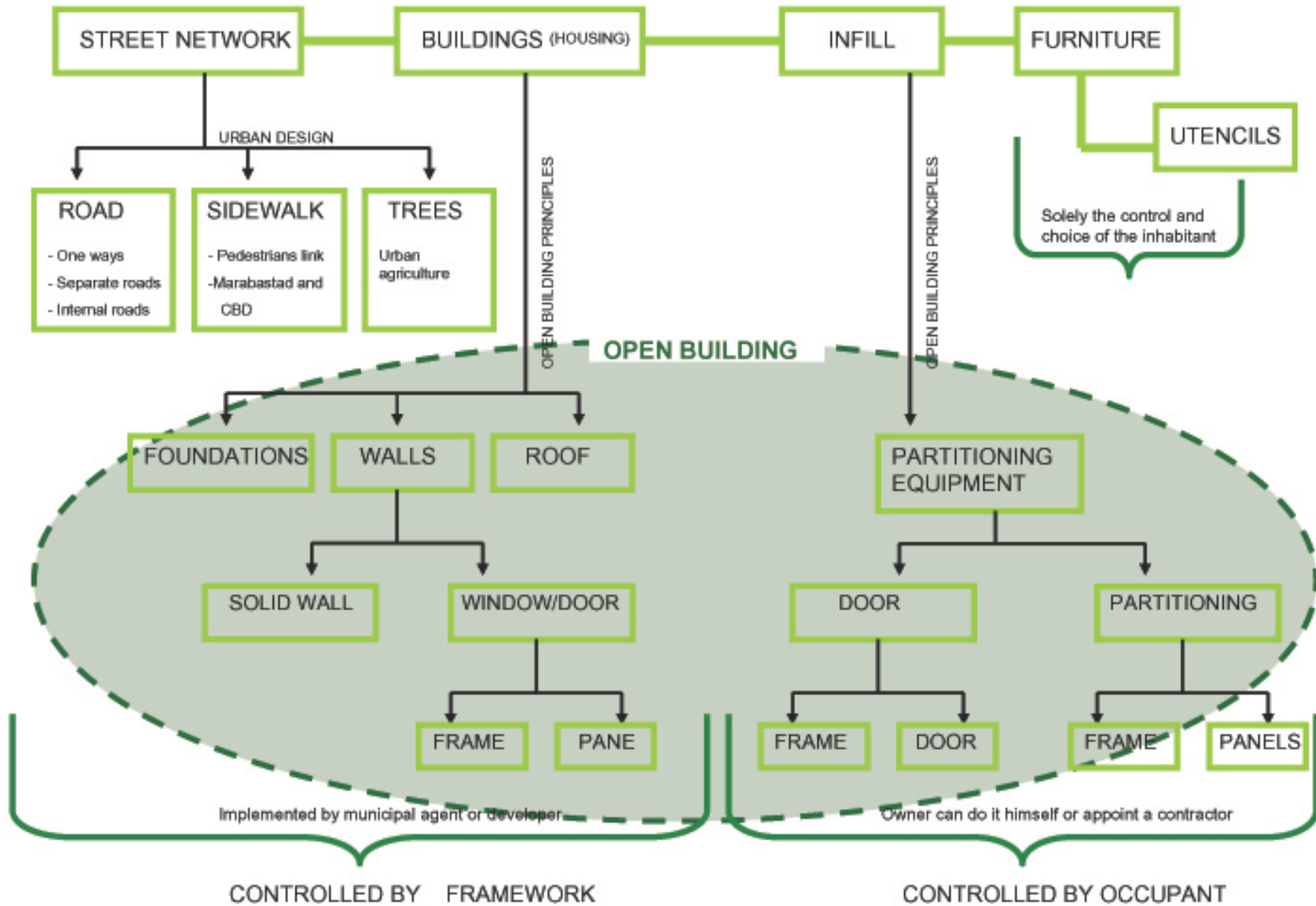


Fig 6-85 Diagram of levels defined for the initiation of the project.

6.6 OPEN BUILDING PRINCIPLES

6.6 OPEN BUILDING PRINCIPLES

- A distinction is made between 'base-building' and 'fit-out'. The base-building serves as a standard collective facility; and the fit-out is different for each unit.
- The base building includes parking and pedestrian circulation; both horizontally and vertically.
- The base building includes public gardens; on the ground level and on the roof.
- It is essential to set down clear rules for separation of base building and fit-out to enable the clear distribution of design responsibilities

6.6 IMPLEMENTATION OF OPEN BUILDING PRINCIPLES:

6.6.1 FORM

The form of the base building creates a connection to the landscape and generates inner courtyard space for communal activities. Breaking away from a square courtyard pulls the development closer to the park and the openings create the physical connection.

The curved form lets the building seem like a single complete and integrated entity. If the four blocks were to be aligned in a straight line, the pathways between the blocks would be much more evident, breaking the building into 4 obviously separate units.



Fig 6-86 Model

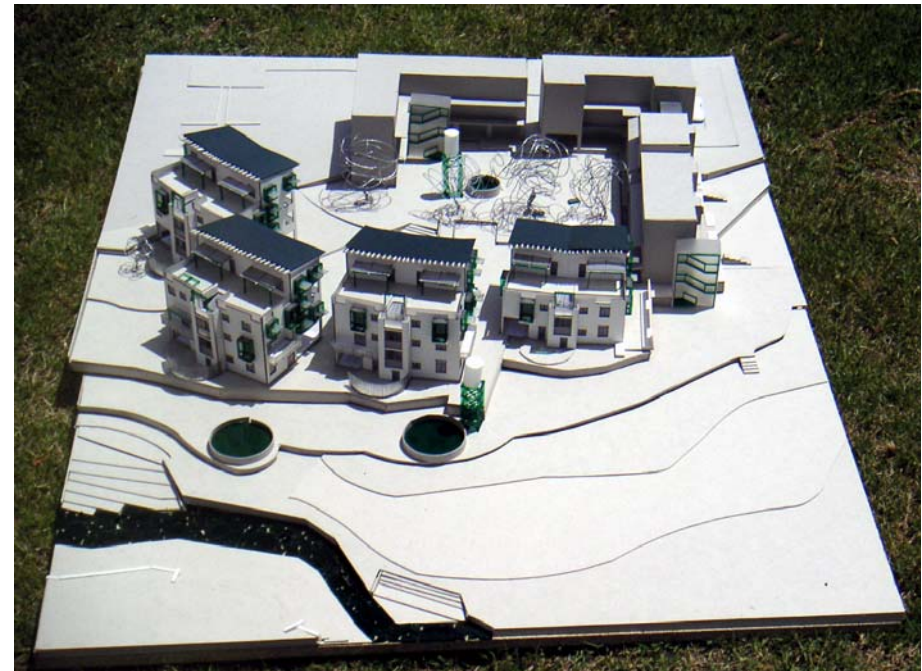


Fig 6-87 Model

6.5.4 CLIMATE CONTROL

The orientation of the building is a challenge. In order to keep a direct connection with the park the building faces predominantly East-West. Each block is slightly turned and the facades seldom face directly West, East, South or North respectively. The western façade remains problematic because of the excessive heat gain during summer. The handling of the facades becomes very important in order to make them responsive towards climatic changes. Each facade is designed individually according to the climatic needs. The north and western facades will be protected by roof overhangs, balconies or shading box devices. The façade design also keeps privacy and good neighbourly principles in mind.



Fig 6-88
Apartment Bloks
Izola, Slovenia
Architect: Ofis Arhitekt

Wooden shading boxes
and colourful blinds provide
shade and privacy

6.5.4 BUDGET AND AFFORDABILITY

Cost cannot be treated as an after thought. In order to keep the building feasible and accessible for lower income groups, a stringent budget must be adhered to.

The design tries to be viable for a variety of cost models. Important cost factors include the efficiency of the design of the unit, especially as far as circulation space is concerned.

Construction cost saving decisions include the use of standard door and window systems, pre-cast flooring system and alternative local and low-cost materials.

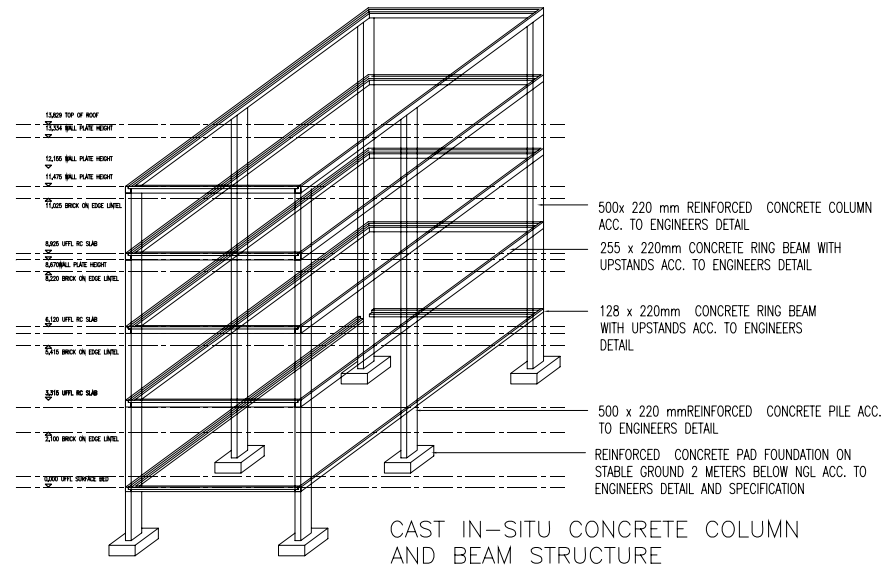
6.5.5 DESIGN FOR CHANGE AND ADAPTABILITY.

“Knowing that partitioning dominates furniture (and much else in the enclosure hierarchy) may be a matter of custom and convention”

(Habraken 1998 p.97)

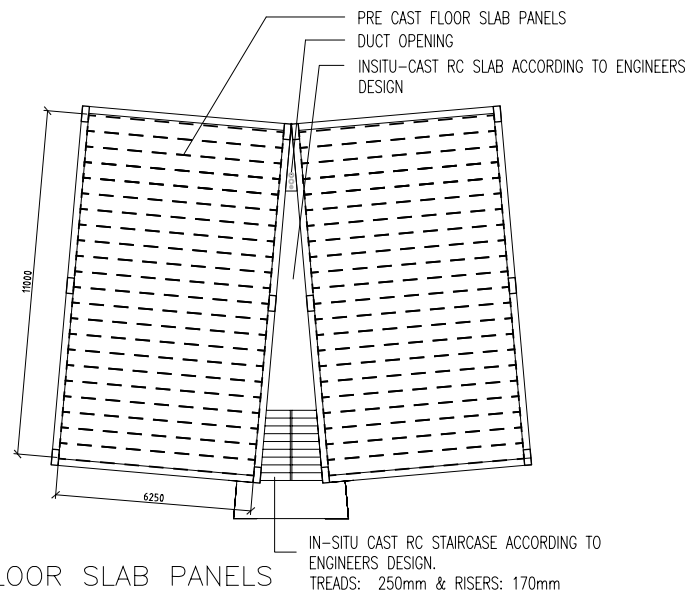
It is hard to determine where form imperatives end, and where habit and consensus begins; and even more difficult to break away from conventional practice, because it traditionally suits us best in living with complex form.

What is truly conventional is not noticed. Therefore we tend to perceive all such dominance as inherent in the form.



STRUCTURE

Fig 6-89



PRE-CAST FLOOR SLAB PANELS

Fig 6-90

6.5.2 STRUCTURE

The ordering effects of gravity are most easily recognized in the frame, which represents a function rather than any particular shape. (Habraken 1998 p. 109)

Frameworks are singular entities created solely to organize support and resisting gravity. They distribute lower level parts in three dimensional spaces, after which lower-level configurations connect and relate among themselves as required. The Framework is not a principle of form but arrangement of it. It is recognized more by its function of holding things in their proper place and relation, rather than by any particular configuration or shape.

6.5.3 FORM OF THE STRUCTURAL FRAME

Two rectangles are joined at the top. The dimensions of the rectangle are defined by the span of the floor panels and size of the living units. The two rectangles are turned away from each other at 5 degrees from the midpoint. This opens up the space for the central staircase.