

Topic: RE-THINKING THE POSSIBILITY OF THE URBAN
ROOF SPACE

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Thanks to my father, mother and my wife.

Thanks to my supervisor Tarna Klitzner for her patience and guidance.

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Abstract

Within an urban context, if multiple level thinking associated with landscape architectural design principles are applied to roof spaces, these can be activated for specific purposes. The space on top of roofs has the potential to be converted into areas for production, recreation, socializing and even for healing.

Today, in the urban context it is difficult to find spare spaces that can be actively used by people; most public squares focus on improving the micro-economy, leaving almost no space for recreation. Also, within the urban context many buildings are designed in an “unfriendly manner” creating dark and damp spaces on ground level where people are not willing to stay. These kinds of dark, damp and “un-friendly” environments are not beneficial to people. Because people are looking for recreational spaces in an urban environment, the recreational, multi-purpose use of roof spaces is becoming necessary.


There are many examples within the urban context of people trying to use roof space for the growing of vegetables, or creating gardens for biodiversity purposes. Currently many green roofs only focus on increasing the ecological value of the space, a seemingly simple function, causing many people to lose interest in the concept.

Landscape architects should not only work on ground level but on multiple levels within the urban environment. James Corner who designed the “High Line Project” worked on an abandoned

bridge, activating the dead space and thus allowing the space to be used for human activity and at the same time improving the urban ecology.

Urban hospitals require a comfortable environment for their patients, who can benefit from the right kind of healing environment. Roof spaces have the potential to be used for this purpose. When designing a roof space, landscape architects should not only focus on the ecological and cultural aspects, but also focus on space making for a specific group of people (patients).

Creative ways of re thinking the healing landscape environment and bringing healing landscape principles and ideas while applying them to a completely artificial environment is the challenge.



Hypothesis: It is possible to incorporate all the characteristics of a healing landscape into a roof space for patients and their families. “Can a healing landscape be accomplished in an artificial garden on a roof space, while at the same time marrying Western and Eastern healing principle and ideas?”

1.0 Introduction

This document will focus on innovative ways of rethinking green roofs. Currently the focus of most green roof spaces is to increase ecology, while providing interesting space or spaces for energy harvesting. Many roof spaces are designed without incorporating the function of the buildings in the surrounding environment. Through landscape thinking, innovative ways of incorporating a new function for roof spaces can be developed. This would create a better place for people and their associated activities, and a place that can help to improve not only the local ecological value but will be beneficial to all relevant aspects of urban ecology as well as social and cultural aspects. (Nigel,2010)

An overview of urban space and its context will reveal all the possible activities that can enrich the urban life. The design interventions will aim to explore and enhance potential possibilities to re connect urban communities with their heritage and culture, and currently available green technologies. Open space in the urban context is limited; to find outdoor spaces for people's different activities has become more and more challenging. People need outdoor space for their recreational purposes, and cities need to provide space, not only for people's activities but also for people to have a space of their own within the urban concrete jungle. (Wall,2009)

Roof spaces have the potential to contribute all the requirements of space, and place, while combating urban sprawl. Other outcomes could include urban roof spaces becoming green spaces that could help to reduce the urban heating island effect, therefore making cities more ecologically sustainable. (Blanc,2008)

Roof space is similar to a building's foot print; to change the function, systematic thinking is required. The function of the roof space needs to be considered in correspondence with the current functions of the building. If roof spaces are used in a certain way, the space itself can help to improve urban ecology, biodiversity and quality of public places, thus improving the social quality of the urban environment. There are many innovative ways of thinking about roof spaces, such as production roofs, energy production spaces, space for shops, cinemas, recreation purposes, museums and education centers to name a few.

An investigation into different roof typologies and their different functions will help to redefine the function of the roof space, not only of the individual roof but also within the bigger urban scale to understand the roof and the relationship of the natural / living environment with the built environment.

The intention is to expand the profession of landscape architecture into a new field or dimension, after reviewing and exploring urban roof spaces and new innovative ways of thinking about the urban environment.

The roof garden is not a new concept, with roof spaces being used for prayer purposes both in Western and Eastern societies. In old China, people used roof spaces for agricultural purposes and tried to use the roof space for various activities and functions. (Anon,2009) Ancient people used vertical space and roof spaces; hanging gardens are a representation of how the ancient people dealt with level spaces, and how they developed their technology in order to make the garden survive on the un-natural ground levels. In this day and age people are again starting to try and expand the roof's functions and activities, bringing more and more value to this space.

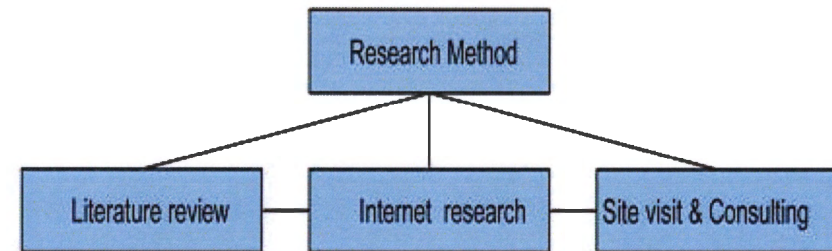
This thesis will attempt to marry Eastern garden design principles with Eastern and Western healing garden concepts while using innovative ways to accomplish this in the context of an urban roof space.

2.0 Methodology

The research process included: Literature review, internet research and site visits in consultation with people working with green roofs. (Fig 1.0)

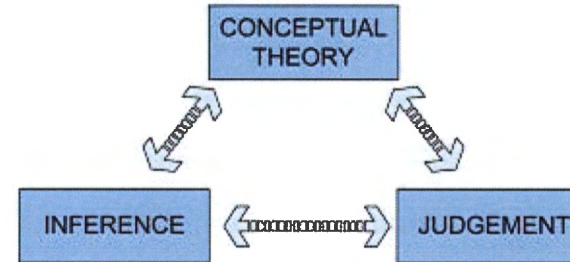
Design analysis is the search for the theory of practice. For this reason the theoretical approach should not only deal with designing, but should also, in part, coincide with it: analyzing by designing. – Lodewijk Baljon (1995)

The methodology of this thesis is the use of the cyclical programme. The cyclical programme contains conceptual theory, judgment and inference. (Fig 2.0) This thesis will also be based on analysis and investigation, using the analysis as an instrument to argue the theoretical components. The process is to draw a parallel between the objective (key research question) and the methodology into the entire programme.



Source: Author's own

Fig 1.0 Circle programme



Source: Author's own

Fig 2.0 Research process

Design process

The design process diagram is a system for producing work. Figure 3.0 illustrates the structure of the design programme. Design is about problem solving, an activity that requires specific definition of the problems at the outset. Design is how to form the decision, and the decision making process is about systematic analysis and value judgments. (Anon,2011) This process can help to form the whole project, and indicate “where we are.”

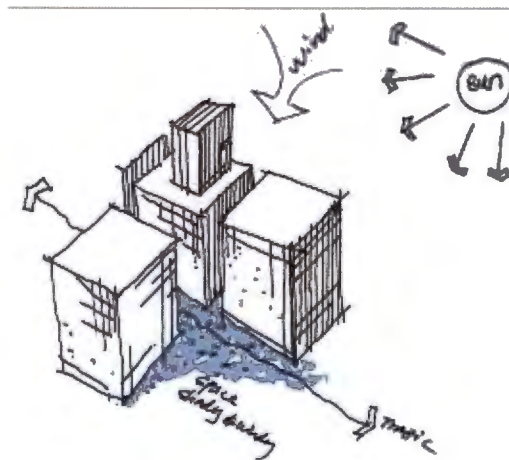
Process					
V ision Idea Hypothesis Problems statement Precedent Approach	T heory Medicine theory Spatial theory Landscape narrative	A nalysis Climatology Visual impact Sunlight Accessibility Activity Movement	S trategy Understanding space Understanding customer Identify problem Key research Precedent Definition Inspiration Design	C onceptual model Accessibility Movement Safety Activity Vegetation	I ntervention Concept Design Design development Technical investigation Design review Detail design
M otivation	C ontext				D esign

Source: Author's own
 Fig 3.0 process

3.0 Problem Statement

Why green roofs in the city of Cape Town?

The Cape Town central business district (CBD) consists of many old and new tall buildings. These tall buildings have negative effects on the immediate surrounding areas. Tall buildings create shadows and dark spaces, providing uncomfortable space for human use.



Source: Author's own

The built environment should have good interrelationships between the individual buildings. A well designed built

environment can provide a comfortable space for people who work or live there. The result of a good environment is that it can attract people; sequentially improving the micro-economy of the surrounding environment. People who live there can benefit from the space and improve their communities within the urban environment. (Coct,2011)



Images show the healthy urban environment. There are places for people to socialize, relax, and the space also has ecological benefits. Source: <http://www.dailytonic.com/>

However, many buildings are not very well integrated into the surrounding environment, creating narrow, cold, dark, windy

areas. People do not feel comfortable being there. Furthermore, this kind of environment does not attract people. As a result of high urban land cost, many developers are taking less into consideration to the building's relationship within the immediate environment, resulting in developers trying to obtain as big a building foot print as possible on the site in order to get good, short term financial returns. In reality, this situation will bring bad long term financial returns, while creating un-sustainable environments. These examples of building relationships also break the social structure; people cannot derive any benefit from this kind of harsh environment. (Coct,2011)

Cities need good quality outdoor space, especially in the city of Cape Town. Cape Town depends on tourism for job creation; these dysfunctional buildings cannot provide interactive environments, and it is my belief that the tourism industry is suffering from this. (Coct,2011)

To re-link a building to the outdoor environment is necessary in order to solve this particular issue. Cities have to be flexible and creative; an interactive relationship between the build and the natural environment is necessary. The vertical building structures and their associated roof spaces provide many possibilities to re-connect buildings to their surrounding environment. There are many successful cases that show how roof spaces are useful for people; socially, recreationally and even for energy production, etc. Roof spaces can definitely provide possible solutions to deal with the above-mentioned issues. (Wall,2009)



The picture shows the potential for roof space utilization in the Cape Town CBD area.

Source: Google Earth 2011

Site observation

Many tall buildings in Cape Town, particularly the Christiaan Barnard Memorial Hospital buildings, do not have good surrounding environments; patients, relatives and doctors all need outdoor spaces to relax, in order to help patients to recover quickly.

As the Christiaan Barnard Memorial Hospital building is located in the Cape Town CBD, there are no public parks surrounding this building, and patients do not have an option to go outside. The interior of the hospital buildings are, although sterile, actually an un-healthy environment; air conditioning, artificial lights, painted walls and narrow passages create an environment that makes people feel uncomfortable and patients become listless staying in this kind of sterile environment that is supposed to be a healing environment.

To summarize, patients and doctors need outdoor space, in order to relax and improve concentration. Roofs can provide a possible space that can allow people to get out and breathe fresh air, enjoy the sunshine and tranquility that the sky has to offer.



The picture shows the location of the hospital.

Source: Google Earth 2011



Vision

To demonstrate an innovation in healing space: the space should not only focus on visual aesthetics but also activate all the senses; hearing, smell, touch and the sense of temperature, wind etc. In order to let the user benefit from the space and to achieve relaxation either spiritually or physically, the space should contain many interesting spaces and these spaces should be rich in culture, nature, serenity and plant species.

Theory and precedent

Theory is very important in understanding the rationale behind philosophical and historical foundations, and it can help to find problems and concerns. Theory can provide a responsible structure, with attendant principle. (Corner,1999)

The profession of landscape architecture has a responsibility to deal with current and future living environments. Landscape architecture could find possible ways to heal or improve environmental and social qualities.

Theory is a generalization of social experience in any particular field, or in all fields. It is at one and the same time a generalization of the past, a vitalizer of the present, and a projection of the future. (Garrett,1950)

The use of landscape as an instrumental tool, an innovative way to integrate social and psychological spaces, can bridge people, ecology and possible urban space, demonstrating how environments with healing functions can be beneficial to people. Technological advances should be investigated for the harvesting of eco-friendly energy. The healing garden should serve as a model; (Larson,2004) this model can be applied at multiple levels of ground space, including the roof space, terraces and any non-natural ground surface in the urban environment. This innovation will give people a new kind of feeling, it will let people re-think the possibilities of their surrounding environments, re-using these spaces as functional space, therefore, using their spare space in a highly efficient

way. Using these spaces as functional space can also help to slow down urban sprawl. (Black,2008)

The use of precedent studies is a learning process; people can determine theory from precedent and learn how to apply theory into practical projects. People use precedents to aid in avoiding unnecessary problems and improve current projects.

4.0 Precedents

- The hanging gardens of Babylon
- MFO Park
- JOIE DE VIE(W)
- Classical gardens of Suzhou
- Healing garden (Eastern and Western)
- UWC garden local project
- Illness and biopsychosocial model
- Summary

The hanging gardens of Babylon

The hanging gardens of Babylon are one of world's most famous gardens. This garden is not really "hanging" by cables, as the name suggests, but from an inexact translation of the Greek word Kremastos, meaning not only "hanging" but also "overhanging". The exact meaning is a terrace or terraces. It consisted of vaulted terraces raised one above another, and resting upon cube-shaped pillars. The Greek geographer Strabo said in the 1st century BC that if this site still existed, it would represent a great idea about multi-level ground design concepts. Therefore the concept of the green roof or multi-level ground garden is not a new concept. (Claudia, 2005)

We can use technology as a slave, not a master. (Ian,1998)

The hanging gardens of Babylon also indicate the ancient people's wisdom in dealing with water and irrigation. Naturally, water only flows from highest area to the lowest area. To bring water to the terraces was a challenge. Ancient people designed a system of pipes leading up to the highest level and machinery for raising water drawn from Tigris River. This was an invisible system, showing how ancient people not only thought about how to use technology but also took aesthetics into consideration. Another aspect that the ancient Greeks developed was a water proofing detail: a double layer of baked bricks set in gypsum in order to prevent water seeping from the plant medium. (Lee,1998)

During this ancient age, the design thinking coincided with the thinking of designers today. Design is about response to a problem, not only creating new things / places.



The picture depicts an artist's impression of the Hanging gardens.
Source: personalgardencoach.files.wordpress.com

MFO Park (The three dimensional park) in Zurich, Switzerland

This park is located between a formal industrial area, a commercial area and a residential area. Therefore the potential user will come from any of these three areas. This three dimensional park really can provide space for all of the different users to enjoy. The MFO Park is an unusual park design concept where space is used differently. A three dimensional concept was used in designing this urban park. When people enter this park, they will get a different experience when they stand on the different levels of decking. (Mcleod,2008)

The multi-level structure is covered with selected plants, providing a landscape of interest for this otherwise industrial looking area. The deciduous plantings with seasonal colour change further provide a changeable scene. Technically, the rain harvest system can provide enough water for all irrigation purposes. (Busquets,2010)

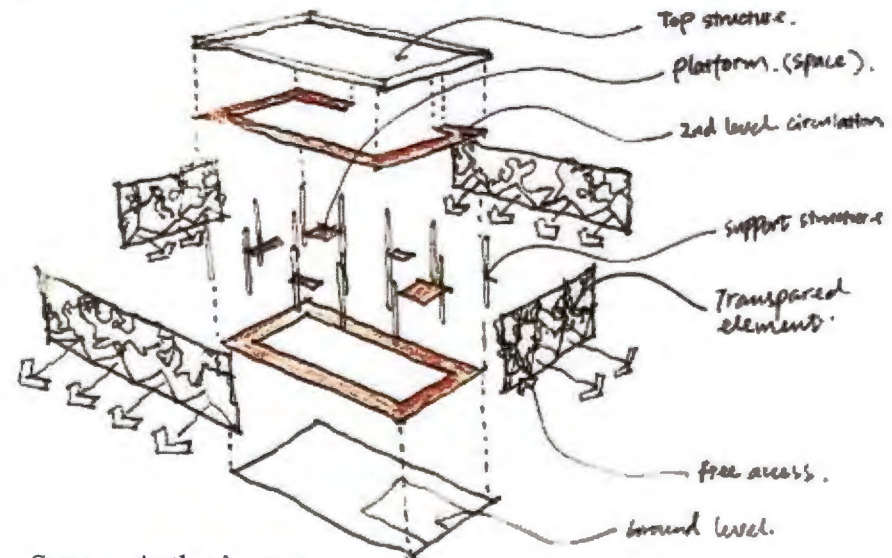
The MFO Park accommodates many activities such as a place for meeting and play, but also for concerts, film and theatre. All these functional aspects attract people.

The MFO Park demonstrates an innovative way of bringing the landscape design concept into the internal space. Some of the design concepts come from the Baroque theatre. There are many small garden rooms located on the different levels, with views into a triple volume space. These small garden rooms are very much like opera boxes. Therefore, people have some

familiar experiences, feelings, but actually each room provides for different experiences.

On the other hand, this park can help to improve the local ecological value of the area. The climbers provide opportunities for birds nesting space and roosting, while providing food for them. It is almost creating a system whereby birds can be relocated back to urban living environments. (Nigel,2010)

To summarize, the innovation required for this urban park was much greater than for a normal park; it uses natural elements plus massive metal structures to commemorate the memory of the industrial area, at the same time providing a creative spatial experience for people who stay in the surrounding areas.



Source: Author's own

JOIE DE VIE(W) Montreal, Quebec, Canada

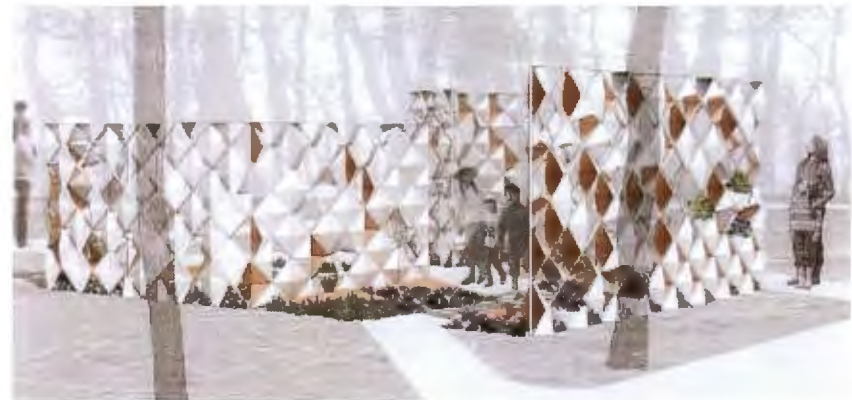
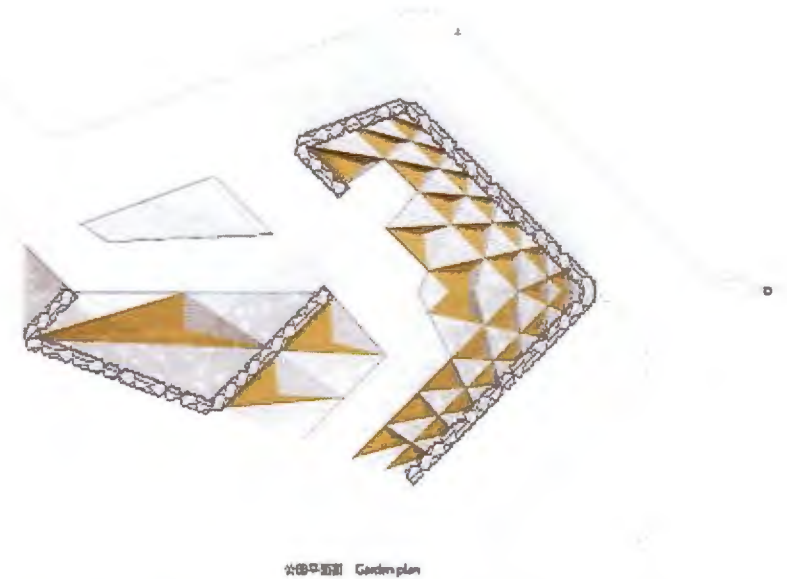
This garden design challenges traditional garden design in the sense that the garden uses a creative way to explore and extend the essential elements of landscape design.

The garden explores and shows the connection between exterior and interior space. The unfolding of space is through the selected angles of view. The design concept echoes traditional Chinese garden design concept. This garden uses contemporary thinking and new technology to create a garden with both organic and inorganic components, while maintaining the tranquility and vibrancy of a traditional garden.

The wall is composed of three dimensional design elements to create a changeable landscape; when people walk on the steps the view that follows will change. Landscape architects designed this park by playing with geometry, shape and views of angles in order to create changeable interesting views.

The selected plants set on to the walls blossom during different seasons, and the colour on the wall and the combination of the plants provides for more variety within this park.

The whole design talks about "enclosure." Visitors are walking in between actual or implied boundaries, and will feel a combined experience of garden and culture. (DUT,2010)

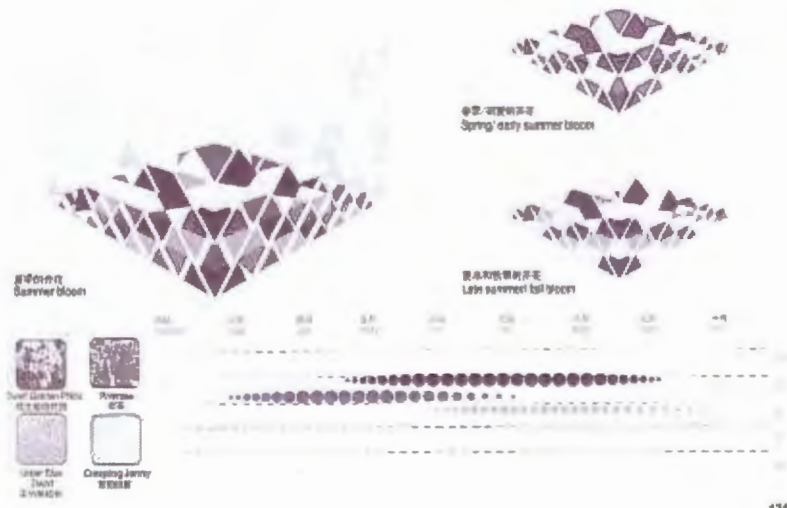


Source: Elizabeth Rothwell



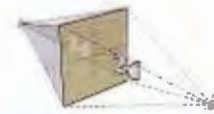
平頂淨地的透視
Flat-topped bloom perspective

● 圖案研究圖 Patterned Bloom Diagram



Source: Elizabeth Rothwell

● 透視透視圖 Protection Diagram

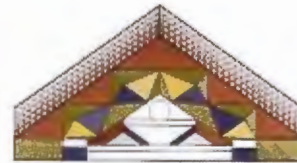


透視的三維抑制透視
Precedent: 2-d suppresses 3-d



透視的三維增強透視
Proposed: 2-d enhances 3-d

● 歷史先例：1925年 Gabriel Guébron
Garden of Water and Light (1925, Gabriel Guébron)



● 透視圖 Tri-Axial



Source: Elizabeth Rothwell

Classical gardens of Suzhou

Master of Nets Garden

This small garden contains much meaning and sense of place. The garden contains 12 different interesting places and also reflects the deeper metaphysical significance of natural beauty in traditional Chinese culture.

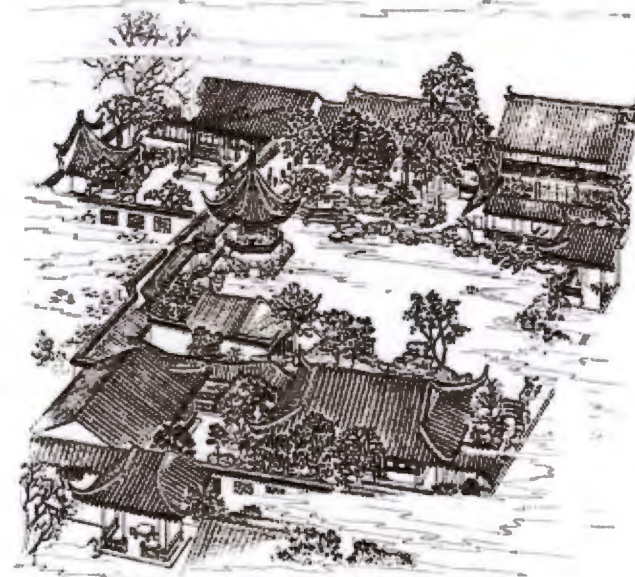
The garden integrates nature, art and many design principles. All design ideas represented embody beauty and harmony.

There are very few design elements in this garden and people use these few elements to create rich environments such as pavilion-like wood pagodas, rocks, water, plant and passages with pergolas. Different shaped windows are incorporated in the walls in order to shape and guide the landscapes views to various points of interest.

This garden also contains buildings for residential purposes, taking into consideration the relationships between internal space and the external environment as well as the difference in weather conditions. For example, the plant called the Japanese Banana (*Musa basjoo*) is always planted around buildings; when people look outside there are big leaves, always creating better views containing a piece of green. Also, the sound of bamboo during the rainy season is relaxing.

The Chinese garden engages with people's senses and feelings, from sound, sight, smell, touch and the imagination. The small size of the garden contains rich feelings and meaning. (Xuehan,2004)

Bird's eye view of the Garden of the Master of Nets, Suzhou



SOURCE: *Lin Dunzhen, Suzhou gudian yuantlin* (Nanjing: Zhongguo jianshu gongye chubanshe, 1979).



Source: <http://depts.washington.edu/chinaciv/home/twangshy.htm>

Healing garden (Eastern and Western)

The Eastern garden philosophy differs from Western garden philosophy. Western healing gardens in general give people a strong sense of feeling, such as hope, life, and safety. This kind of information will give people a more positive outlook. Material, organic form, and living forms are the foundation of the western garden, compared with the irregular form and attitude of recognition of the natural environment by the Eastern garden philosophy, where people usually feel a very strong connection between man and nature in their minds.

Any garden can be a healing garden if it can help relax the user's mind. In general, gardens can help people to release stress and become comfortable within their mind or within a garden's physical location: "a garden in a healing setting designed to make people feel better" (Eckerling, 1996). Therefore, the healing garden's main functions should be to make people be able to relax and experience less stress in the mental aspect, help people to revive their body in the physical aspect, and provide an environment where people can feel happy.

Eastern traditional gardens used to help people to release their spirituality. The Chinese Monastic garden, royal gardens in China and the Japanese Zen garden all used a similar philosophy. Asian people believed that all elements have a relationship; similarly the mind, body and spirit have a relationship with the natural environment. When people become ill there must be some sort of disconnection between

the elements. Therefore, the garden can provide as many elements as possible in order to revive some of the connections rather than purely alleviating symptoms.

Today research shows evidence about relationships between human health and natural environment. The Texas A&M University found that viewing natural landscapes can help to de-stress and recover by promoting positive mind-sets and at the same time reducing / blocking negative thoughts. Different results can be observed between people viewing vegetation and people viewing a built up urban environment (Figure 4.0). To view vegetation is more relaxing than viewing built up urban environments. Furthermore, the study has shown that postoperative patients viewing natural landscapes required less pain medication. In Western cultures many people still maintain a doubtful attitude; there needs to be more research into these relationships.

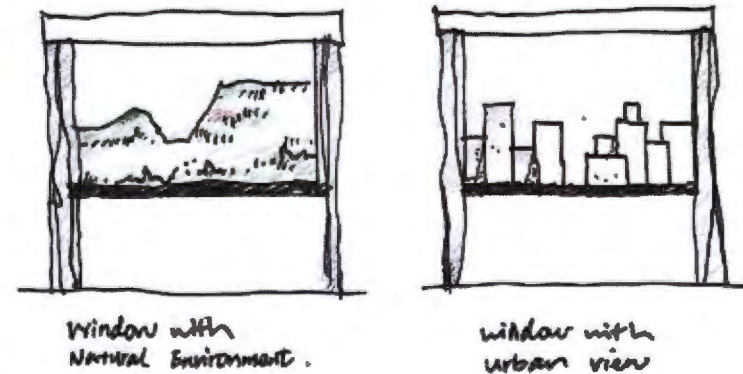


Fig 4.0

Source: Author's own

The healing gardens principles lack proven evidence. Western people are confident with the biopsychosocial model of health. According to this theory, illness should have approvable evidence. In other words the illness has to have a cause and to heal the illness there needs to be a focus on the cause.

From a medical point of view in comparing Eastern and Western cultures there is a definite difference in approach; in Eastern cultures many people believe that the reason people are getting sick is due to an imbalance of *Yin* and *Yang* (In general the concept of *Yin* talks about cold, woman and shadow; the concept of *Yan* talk about warm, man and sunshine). To heal the illness one has to find a way to balance the *Yin* and *Yang*. For example, if people always work in cold and moist environments, this will affect the body's *Yin*. In order to let the body balance the *Yin*, Eastern medicine will tell them to have more sunshine, exercise and eat some gingers to warm up the body in order to make *Yang* stronger, therefore to balance the *Yin*.

The Western method of allopathic medicine differs from the Eastern approach. Western medicine is consistent with formal scientific processes. Western medicine encloses all types of un-adventurous medical treatment, such as surgery, chemotherapy, physical therapy etc. Both Western and Eastern cultures have long histories, reaching the same goals by different means.

Today both Western and Eastern cultures / societies believe in strong social, biological and psychological relationships. For

example, that people living in a healthy environment will have a smaller chance of getting ill compared with people living in a high pressure, busy, modern environment. The environment has a relationship with people's health. To improve the quality of the surrounding environment will have an effect on the surrounding people.

From a theoretical aspect and a landscape architectural point of view, it is important to show that humans can benefit from the garden and that humans need different environments to shift their mind in order to feel better spiritually and mentally. (Cooper,2007)

UWC garden local project

The Life Sciences Department of the UWC (University of the Western Cape)

Generally, people think that green roofs are a way to deal with climate change because they can increase ecological value, but green roofs also have potential as space for people's activity, especially in the landless urban environment.

Different projects should take different aspects into consideration, according to the building's immediate surrounding environment. The environment on the urban edge is different from other urban areas.

In terms of activity and site constraints and opportunities, the systematic analysis of the final result of this project reflects ecology and the site's main constraints. Therefore, this project's approach is to improve ecology and increase the biodiversity value of the surrounding environment.

Designers took into consideration the climatic conditions. In this area climatic constraints include the dry climate during summer and very wet and windy climatic conditions during the winter. Only specific types of plants can survive in this kind of environmental conditions, deeming the selection of indigenous plants necessary. Another aspect is that plants can also help absorb some of the noise and air pollution from the road. (Eicker,2010)



Source: OvP Associates Landscape Architects South Africa



Source: OvP Associates Landscape Architects South Africa

Illness and biopsychosocial model

The biopsychosocial model is a health care concept that has relevance to the current pain theory. The pain theory model states that poor health and disease are a result of the interrelation of biological, psychological and social aspects.

There are three interconnected factors contained in biopsychosocial model - the psychological, biological and social. In this model we can partially find the reason why people get ill and it is an indication of the relationship between their biological, physical and social environments.

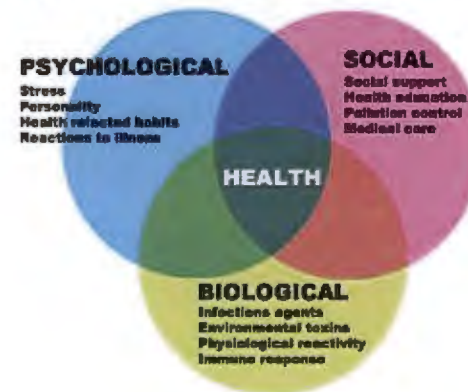
In a hospital, doctors can only give patients medical treatment for specific symptoms or illness. If psychological and sociological aspects can be improved, this should have an effect on the biological aspects of a person.

The surrounding environment has an effect on the psychological and social aspects, and suitable living environments could help people to relax, be calm and feel refreshed. (Labonte,2005)

Landscape architecture as an instrumental tool can improve the quality of the environment, therefore improving the other two aspects. Designing a “happy” environment for patients will help patients to feel calm, have less stress and thus recover more speedily. The “happy” environment concept must take into consideration the social aspects and psychological aspects. Spaces need to be designed that can transfer as much positive

information as possible to patients, helping them to re-built confidence and improve relaxation. The “happy” environment should consist of various different spaces, including social space for patients to communicate with other patients that have similar conditions. Compared with patients with no social contact, patients with social contact have a speedier chance of recovery. (James,2003)

Thus spirit, mind and body are fundamental biopsychosocial elements. The biopsychosocial model distinguishes between pathophysiological processes that cause disease and the patient's perception of their health and its effect on illness.



How do you feel after spending time in the garden?

- More relaxed, calmer79%
- Refreshed, stronger25%
- Able to think/cope22%
- Feel better, more positive19%
- Religious or spiritual connection....6%
- No change of mood5%

What is it about the garden that helps you feel better?

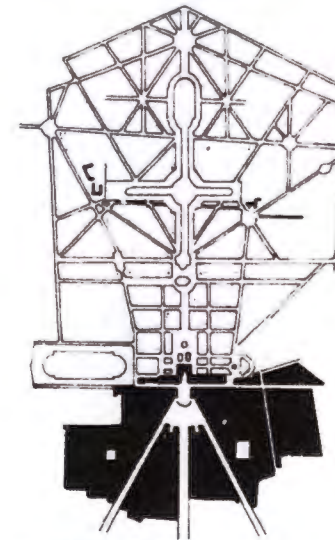
- Trees, plants, nature58%
- Smells, sounds, fresh air58%
- Place to be alone or with friend...50%
- Views, sub areas, textures26%
- Practical features, benches, etc. .17%
- Don't know8%

Responses from 143 garden users at four San Francisco Bay Area hospitals (Cooper Marcus, C. and M. Barnes, 1995).

Summary

From ancient times to today, from the traditional gardens to the three dimensional garden, and from an ecologically purposed roof park to a healing landscape, all of the gardens mention space creation and the space relationship between man and the environment. Other aspects include the importance of garden design in the experience and interactive information systems and how people receive information from gardens, especially when landscape architects design the garden while taking into consideration the user's feelings for the exterior environment, using positively conveyed information while giving preference to users' safety.

However, we do not need to follow the traditional way of thinking about garden design. Traditional Western landscape architects designed healing gardens often in a too straightforward manner and were too concerned about the visual impact. (Figure 5.0) (James, 2003) Gardens are not just about visual aspects, but should also incorporate a sense of touch, smell, hearing, taste and feeling, for example when a person stands under the sunshine, he/she is warmed by sun and at the same time experiences the wind, carrying the scent of flowers. The different elements in the system are interlinked, each element supports the other. (James,2003)



Western garden
Source: J YuKong

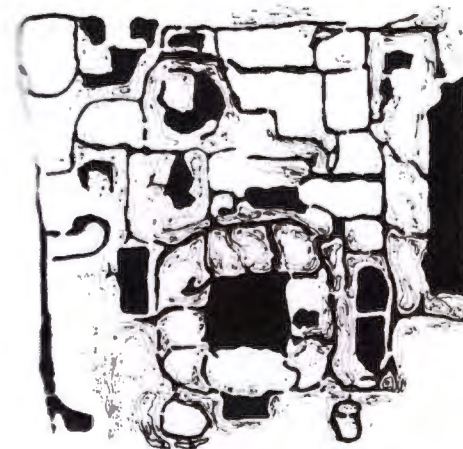


Fig 5.0 Pictures demonstrate how
Eastern garden Eastern landscape design is
Source :J YuKong more organic than Western.

From a place making point view, many opportunities are lost creating two dimensional parks in comparison to three dimensional parks. People should get the full set of spatial experiences. Time is another spatial element; if we take time into consideration alongside three dimensional space, it will in actual fact be a four dimensional space. In this case garden users will not just look at the garden, they can get the full experience, not only spatially but also incorporating the full spectrum of all of the senses. (S,Bradford, 2008)

Taking into consideration the function of the garden, such as healing gardens, Western and Eastern cultures are using different methods but they all are looking for same goal: to heal the patient.

However, Western and Eastern cultures all believe that the environment is important to people's health. The environment talking in a broad sense, not only affects the psychological aspects, but also the social aspects of people/communities.

Gardens are media to provide comfortable environments, allowing for people to socialize, relax, exercise and de-stress. To take into consideration the biopsychosocial model in landscape design, will definitely be beneficial to people's health. (Anon,2006)

5.0 Theoretical Framework for Healing Gardens

Understanding Healing Landscape Concepts and Principle (Both Eastern and Western)

Many hospitals do not consider that the use of the “natural environment” can form part of the healing process. The value of the natural environment is that it can be used to de-stress and relax the patient’s mind. Many of the interiors of hospitals have lost the connection with the exterior environment. The interior spaces are small, which could have a negative psychological effect on patients, leaving them feeling ‘I am sick’. From a psychological point of view this kind of environment is not good for patients. Some hospitals even completely lock the windows in order to avoid patients committing suicide. The interiors of hospitals have become an isolated world. These kinds of environments are not beneficial or of any value to the healing process. Mentally, people gain more stress from these environments, which does not aid the recovery process. Therefore, the careful design and consideration of hospital environments has become necessary. (Thwaites,2005)

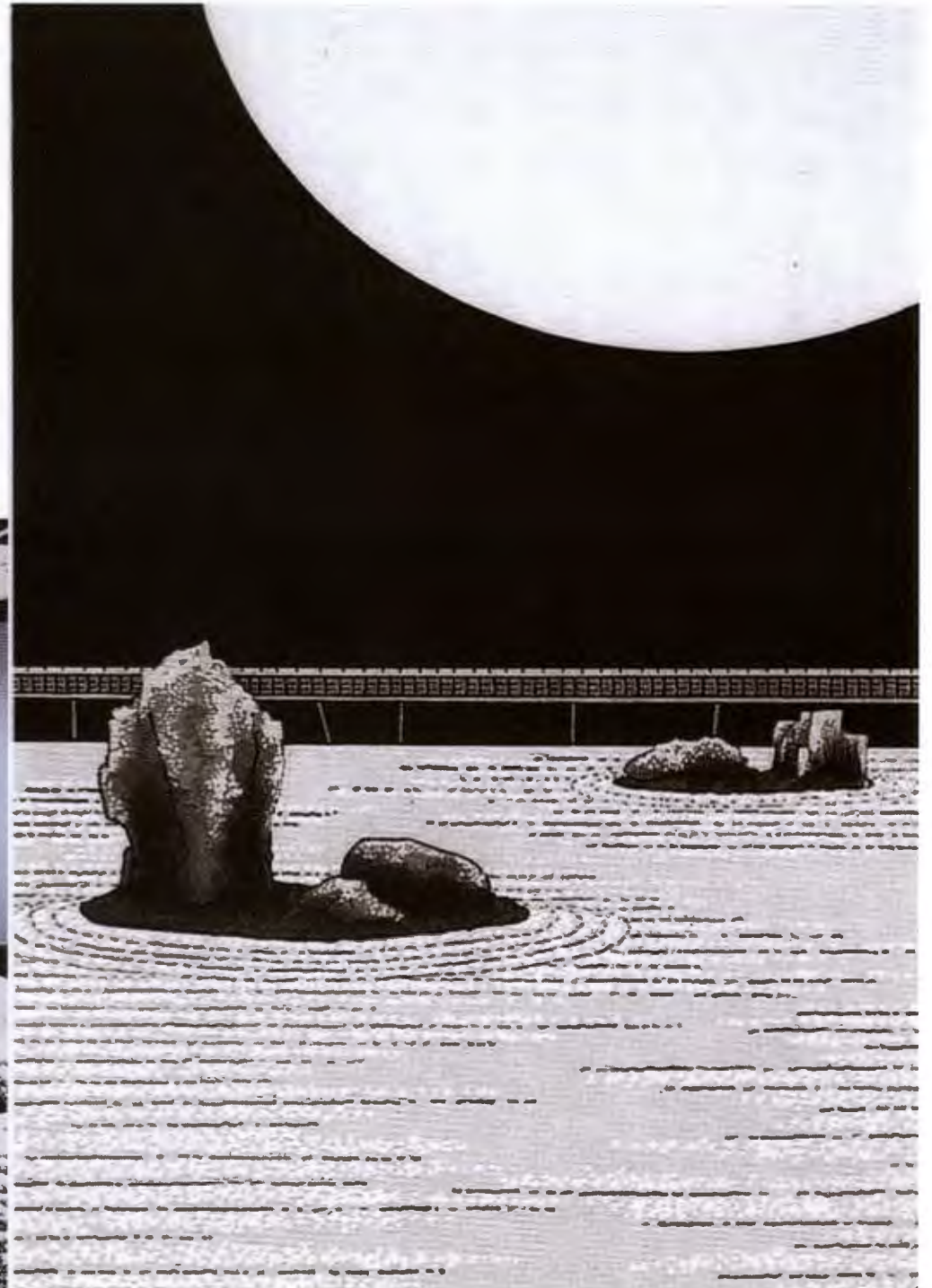
The hospital environment should connect the environments from the internal space to the external landscape. The connection of exterior natural landscape to the interior space is one of the ways to support people’s health and improve the healing process. Seasons and life cycles can be brought into the internal space in order to support the healing process; nature’s cycle can highlight to patients that seasonal cycles and change are natural life processes. The implication of this is that people will more likely accept change and be aware that all seasons present a different beauty; this can assist people to relieve their stress and encourage them to find joy in their day. (Anon,1999)



The picture illustrates the health environment surrounding the hospital.

Source: [www. Panoramio.com](http://www.Panoramio.com)

Landscape symbolism is another way to bring positive meaning into patient's minds. Symbolism can connect many invisible things without the use of language. For this reason symbolism is an important concept in healing garden design.



Naturally people are looking for beauty; a beautiful environment can inspire patients to positively deal with medicinal treatment. Innovative elements and art can play an important role in creating a healing landscape. Incorporating art piece(s) in an innovative way can have a positive impact on the healing process. (Anon,1999)

The landscape has a potential impact on human health, especially in environmental psychology. The ancient Western societies used landscape as part of the recovery process: in ancient Greek and Roman times, people arranged a “sick room” close to the courtyard of the house in order to allow the room to get fresh air and sunshine. They believed that there was a link between the natural environment and the healing process. Roger Ulrich did a study in 1984, where he showed that surgery patients with view of “nature” recovered much quicker than patients only taking drugs. (Ulrich,2002)

An example of a sculpture using simple geometry and vivid colour in a contemporary style, which can be used to develop positive feelings.



Source: www.sculptures.org.nz

The more we are engaged with the environment through all our senses, the lower are our rates of anxiety and the less we are aware of pain.

--Clare Cooper Marcus (1999)

Thus the healing landscape should provide for an environment rich in vegetation, material, texture, sight, fragrances and colour in order to give people a multi-sensory experience. The exterior space should also be able to attract people visiting patients. Research shows that patients who receive better social care from family and their friends recover quicker and better than patients without social support. A healing landscape can provide areas for patients' social purposes (private, semi-private spaces). The basic function of a healing landscape is to help patients to deal with stress - the relief of stress can help to reinforce the immune system and awake the body's self-recovery proclivity. Scientific evidence shows that there are four aspects which, when supported by landscape design, can help relieve stress. The four aspects are green nature, exercise, social support, and a sense of control. (Ulrich,2002)

Much research has been done by Western people on the effects of gardens on health; this research indicates that there is a relationship between the two. In Eastern philosophy, many concepts and principles are similar to Western philosophy but are represented differently. (Thwaites,2005)

From an ideology point of view, traditional Chinese garden designs follow descriptions in poems and indigenous religious stories. The concepts captured in these poems and stories try to bring together and build a connection between a good health environment and a longer life for people.

Chinese people believe in a strong connection between the environment and human health. This kind of ideology influence can be found in most South East Asian countries.

Source: ShuQing, S 2003

Activity, plant, soil, rock, water material, space - all these are indicated in Wu Xing and Tian Di Ren concept. The relationship between people and environment is also shown.



From a Chinese philosophical point of view, Chinese people believe in the concept of “Tian di ren”. “Tian” means heaven, “di” means ground, and “ren” means humankind; therefore, “man in between heaven and nature”, a concept that relates to the relationship between man and his environment. (Hui,2002)

Source: ShuQing, S 2003

This image depicts Chinese life attitude and life philosophy. Different levels / locations are associated with different activities. The temple is located on the top of the mountain with the people's settlement near the bottom. The distance is the focal point and helps to identify location. The picture records a harmonious and healthy environment (man and nature).



In other countries people also use similar concepts to design gardens - they design buildings and the environment as a system, as the outside environment can be beneficial to the inside of a building. An example is these gardens in Persia, where the concept of “borrowing the landscape” to the interior is similar to Chinese philosophy. The aim is to create a harmony between buildings and the environment. From a design point of view, the relationship between the internal space and the exterior should be considered in order to engage the relationship between man and nature. (Jerry,2003)



Source: H Jerry 2003



Source: H Jerry 2003



Another Chinese concept is “San Cai”. This concept divides space into 3 realms: the middle realm is occupied by humanity and its emphasis is the importance of the relationship between humans and nature. Above is the gods’ realm and below is the ground. In ancient China the majority of temples were constructed on the highest point of a mountain. The Chinese believe that the highest point is closer to heaven, thus making it easier to receive information from the gods. They also believe that man should stay in man’s realm which is on the ground level. Only when man wants to worship, is it appropriate for him to go to the temple in order to get closer to heaven. This is why China does not have a history of tall buildings. This concept applies to all building environments, both internal and external space. (Hui,2002)



Source: J Kongyu 1998



Source: Anon 2005

The Chinese believe that gardens are important media and contain philosophy, culture and art. Garden art is the most meaningful art as it connects man and nature.

The Chinese also believe that the whole natural environment is an example of the best garden and that man can only learn from the natural environment. (Hui,2002)

Source: Anon 2005

This image illustrates the location of the building's site, vegetation and space making and the relationship between man and nature.



Space (interior, exterior) has an effect on the human psyche. In the past, theologians have used this concept to spread their religion. For example, when people stand outside a church, people will feel less of a connection with god, but when they stand inside the church with its higher ceiling volume, people will feel that they are small - the space hints to people that the only thing that they should rely on is god. (Hui,2002)



The picture demonstrates the scale of internal church space.
Source: www.newyorkwallpapers.net

The same concept applies in Chinese Buddhism; monks normally construct Buddhas up to 40 times human size. When people stand in front of the Buddha they will feel small. This kind of design hints to people to believe that Buddha has more power than they do, and therefore Buddha can save or answer prayer. (Hui,2002)



The picture shows the scale of Buddha in relation to humans.
Source: www.ahsffq.com

Today people use this kind of methodology to design political environments in order to get a similar effect. For example Tian An Men square is a large open space, the design reflecting the extent of political power.



The picture shows the scale of Tian An Men Square in relation to humans.
Source: www.treasuretroveblog.com

Similarly, these concepts can be applied to a therapeutic environment. From a psychological point of view, peaceful surroundings will help people to feel better and “treat” their minds. (Anon,2006)



Source: S Edward 1962

Some elements that are used regularly in Chinese garden design are: water, stone, rock, pergolas, pine trees, bamboo and the Japanese banana (Musaceae) These elements are referred to in traditional Chinese poetry and are therefore preferred elements in Chinese garden design. (T Chu, Class note,2001)



The picture illustrates the traditional Chinese garden elements: Banana tree, rock, pergola, and occasional seats.

Source: www.flickrriver.com

Chinese painting and implications

Chinese landscape paintings depict harmony between the environment, man and nature from a large to a small scale.

Small scale garden paintings depict only a few pieces of rock and plants and reference to man's imagination and the environment.

Larger scale landscape painting usually depicts man, water and mountains. This is because artists depict the concept of "Tian Di Ren". The Chinese believe that people should have a wide range of connections to the natural environment and that man is a part of nature. The relationship between man and nature is beauty and this beauty creates harmony. Research shows that a pleasant natural environment can arouse human wisdom and calm the mind. A pleasant environment can relax both the mind and physical body. (Meng,Class note,2000)



Source: www.artxun.com

The “Wu Xing” Concept

The “Wu Xing” concept in garden design in Chinese culture deals with 5 important elements: metal, wood, water, fire and soil. The Chinese believe that only when “Wu Xing” is balanced can there be a good environment / future to their lives. (Fig 6.0) The “Wu Xing” concept is widely applied in Chinese culture to medicine, architecture and landscaping. The “Wu Xing” philosophy states that the elements of metal, wood, water, fire and soil arranged in clockwise order will bring a comfortable, good, healthy life. If these elements are in an anticlockwise order, this will bring disaster, bad luck, illness or death.

The principle of “Wu Xing” reflects a conflict between the different elements. For example: fire is bad for wood as it can burn it but as a result of this the ashes will be absorbed by soil and its quality will improve so fire is good for soil. Oppositely soil can be used to extinguish fire. Therefore when designing or when responding to a problem one needs to think about the elements’ positions within the “Wu Xing” system. Another example would be if there is a problem with water, one should respond with either wood or metal, in order to balance the “Wu Xing”. (Lillian,2005)

“Wu Xing” is a philosophy; it can apply to everything. The metal in “Wu Xing” does not necessarily only mean metal in the literal sense, it also can mean everything that is hard in condition. Wood means roots and water means flow, Fire means energy, soil means ground. Therefore when people are conducting site analysis, if they find a problem they should convert this problem into the corresponding element and then select the suitable response according to “Wu Xing” principle. (Lillian,2005)



Fig 6.0

Source: www.paipaitxt.com

The “Wu Xing” Concept in Chinese Medicine

The “Wu Xing” concept is integrated into traditional Chinese medicine. The different elements are reflected in different parts / organs of the body. For example, the liver corresponds with the element of wood, the heart corresponds with the element of fire, the spleen corresponds with the element of soil, the lungs correspond with the element of metal and the kidney corresponds with the element of water. This is based on the characteristics of each organ, for example the kidney is essential in the urinary system and is therefore represented by water. The heart is represented by fire as energy is generated by the heart. The belief in Chinese medicine is that the human body is a system and therefore the different organs effect one another and people get sick as a result in the imbalance of “Wu Xing”. In order to heal an illness one has to look at which organ has a problem, find its interrelation to other organs and treat these in order to bring balance to the system. (Hui,2002)

In traditional Chinese medicine the concepts of “Wu Xing” and “Yin Yang” are applied to illness.

The “Yin Yang” Concept

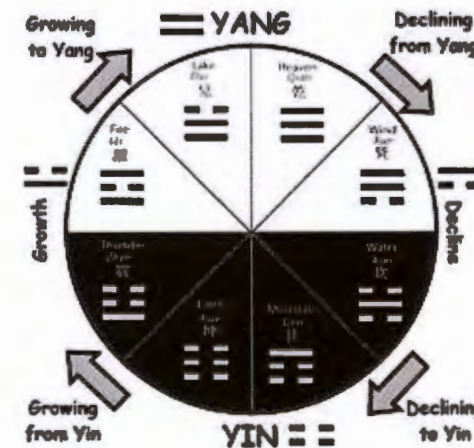
The concept of “Yin Yang” basically reflects balance; a healthy body should have a balance of “Yin” and “Yang”. If an organ is imbalanced one has to adjust either “Yin” or “Yang”. In order to adjust “Yin” and “Yang” one has to find the corresponding medicinal treatment (medicinal herb or physical treatment).

Herbs also have corresponding elements within the “Wu Xing” concept, depending on the herb’s character. (Fig 7.0) For example plants with a yellow flower belong to the soil element, plants with a red flower belong to the element of fire and plants with a silver flower belong to the element of metal. Certain herbs are selected that correspond with the “imbalanced” organ, in order to help and improve balance to the system and heal the illness.

Western research shows the human body as a circular system, each organ is linked and has an effect on the others. For example the relationship between the lungs and heart; in order to add fresh oxygen to the body the lungs and heart needed to work together, neither organ can complete the process in

isolation. (Mark,2010) The inverse effect is that when there is a problem with the lungs this will affect the heart.

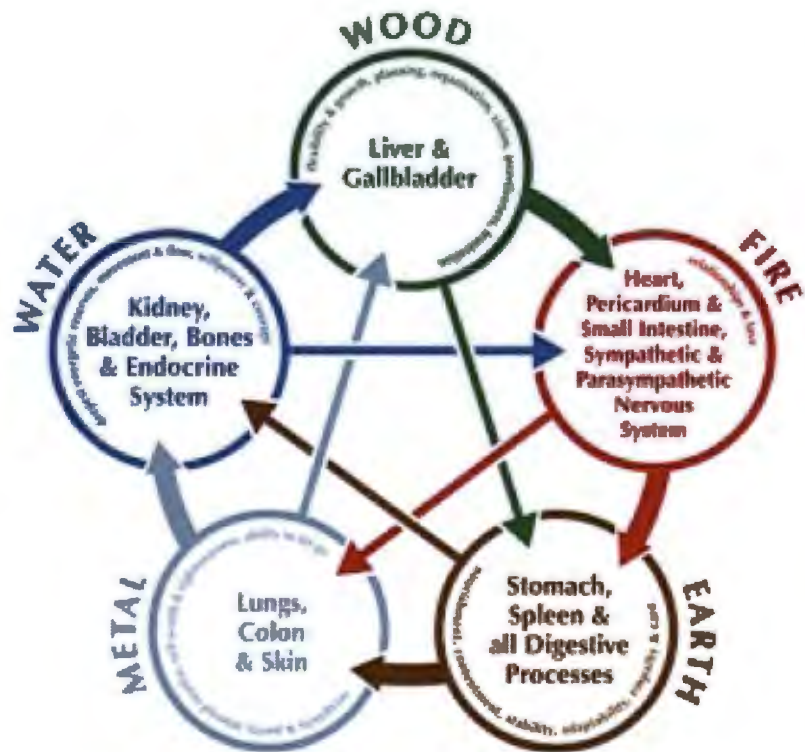
The “Wu Xing” and “Yin Yang” concepts are essentially about balance and use the five elements to show the different relationships between the different organs. (Lillian,2005)



Source: <http://www.spaweekblog.com>

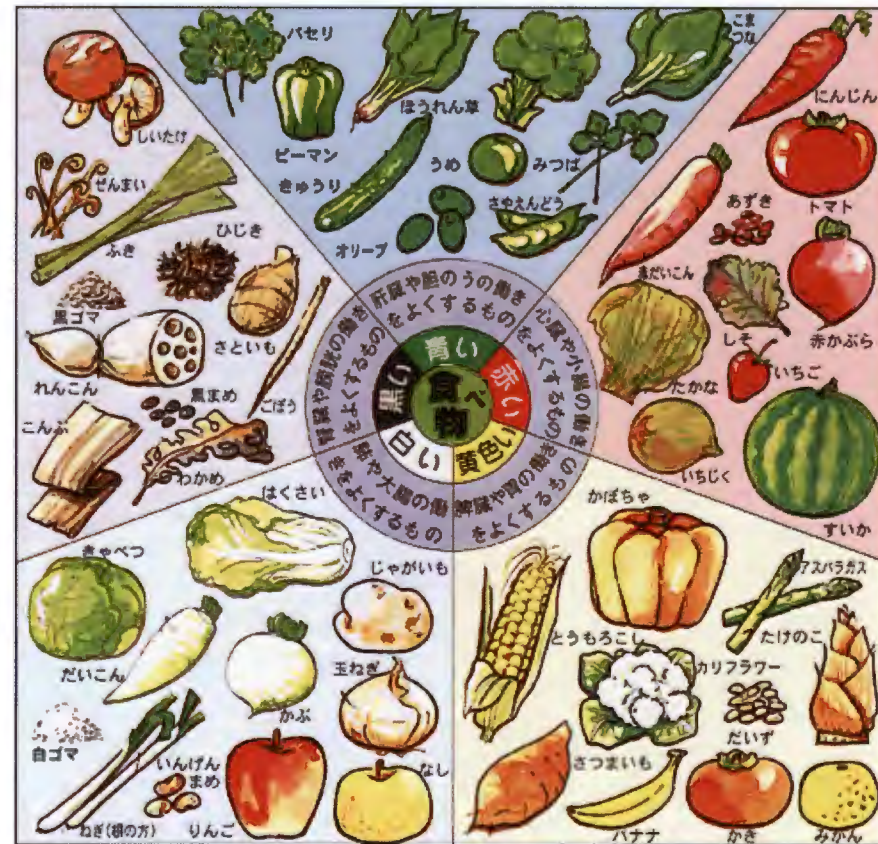


Source: www.txzyy.com



Source: www.rootacupuncture.com/five-elements/

This diagram illustrates the different human organs and the corresponding “Wu Xing” - the concept model on which traditional Chinese medicine is based.

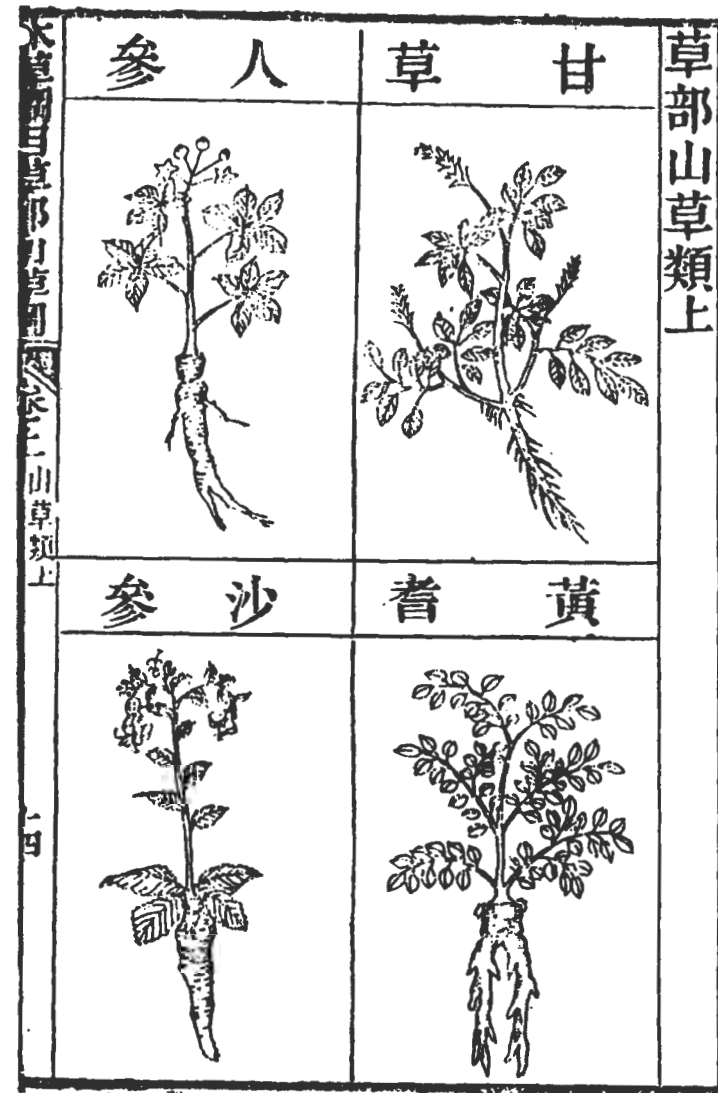


Source: q.sohu.com/forum/61/topic/786898

This diagram illustrates different vegetable types and their correspondence with the “Wu Xing” concept.

In practice, traditional Chinese medicine has a history of over 5000 years. Chinese medicine refers to a broad range of medicinal practices which includes herbal medicine, massage therapy and acupuncture therapy. All these medicinal practices have a relationship with “Wu Xing”. An example is foot massage therapy whereby different areas of the foot correspond with different organs and resultant “Wu Xing”. To massage a certain area can help improve the resultant organ. (Fig 8.0) These medicinal principles / methods have spread throughout Southeast Asian. In practice Chinese medicine is feasible and has a strong relationship with plants and the “Wu Xing” concept.

In the ancient Chinese medicine book “Ben Cao Gang Mu” (A book with over 400 years of history) are recorded more than 1200 types of medicinal plants and more than 11 000 treatment methods. All these medicine treatment methods rely on plants and “Wu Xing” principles. In order to understand all the plants’ medicinal effects, the Chinese doctor Li Shi Zhen



The picture shows one page of the BenCaoGangMu.

Source: www.txzyy.com

tested many of the plants on himself in order to directly experience their effects and claimed that many types of plant had a healing effect.



Fig.7.0

Source: userweb.port.ac.uk

This diagram illustrates the Five Element (“Wu Xing”) and their corresponding herbs.

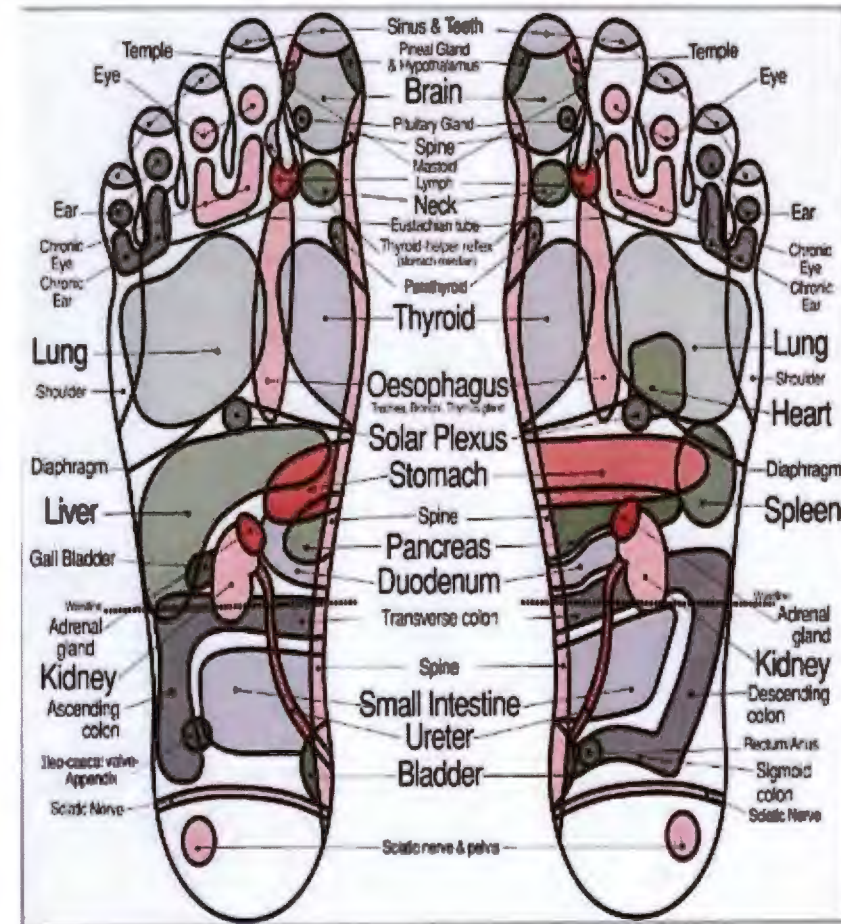


Fig 8.0

Source: www.bibliotecapleyades.net

This image illustrates the foot massage therapy diagram.

5 Element Chart

	Wood	Fire	Earth	Metal	Water
Season	Spring	Summer	Long Summer	Fall	Winter
Direction	East	South	Center	West	North
Color	Green	Red	Yellow	White	Black
Taste	Sour	Bitter	Sweet	Pungent	Salty
Ying Organ	Liver	Heart	Spleen	Lung	Kidney
Yang Organ	Gallbladder	Small Intestine	Stomach	Large Intestine	Urinary Bladder
Sense Organ	Eyes	Tongue	Mouth	Nose	Ears
Tissue	Sinews	Vessels	Muscles	Skin	Bones
Emotion	Anger	Joy	Pensiveness	Sadness	Fear
Sound	Shouting	Laughing	Singing	Crying	Groaning

Source: www.rootacupuncture.com/five-elements/

Chinese Concepts and Landscape Design

Based on these concepts many landscape designers have selected certain types of medicinal plants, integrating the “Wu Xing”, “Yin Yang” and “Tian Di Ren” concepts into garden design. A garden incorporating the above provides an environment that can help to improve people’s health.

Patients are able to select certain areas based on the “Wu Xing” concept in order improve their health. From a design point view the “Wu Xing” concept can be broadly applied to all aspects of a healing landscape. It can be applied to form, space making , choice of material and plant selection.



Source: www.panoramio.com



Source: www.karensyardadventures.com

Top right: This image illustrates a garden design based on the “Yin Yang” concept.

Bottom left: This image illustrates a medicine garden, with design based on “Yin Yang” and “Wu Xing” principles.

Both of the designs are not confining well and the conversion of the concept is pedestrian, losing a sense of interest.

Garden design should contain as much meaning as possible. It should not be necessary to incorporate multiple elements in order to enrich the design. Elements should bring elements and these elements contain multiple meanings.

It is possible to integrate Chinese principles into the Western concept of landscape design. More and more Western people have begun to accept Eastern principles and apply these concepts to the hospital environment. (Ulrich,2002) Many of the Chinese principles are related to the biopsychosocial model. For example, the Eastern concept “Tian Di Ren” shows the relationship between man and nature, and explores the environmental effect on man’s health. (W,Joyce,2011) Similarly, in the biopsychosocial model the surrounding environment has an effect on the psychological and social aspects, with suitable living environments helping people to feel relaxed, calm and refreshed. Therefore both Western and Eastern philosophies believe that environment has an effect on aspects of human health.

This design provides four different types of paths for patients to choose from; patients can also choose to stay in different spaces; public, private, semi-public and a transition space. The finish material varies from hard to soft. And the plant selection differentiates the different areas and also it provides options that patients can choose between areas that are shaded or exposed to sunshine.



Source: www.metrocourtyardsm.com

Healing Garden Concept

“Healing gardens” is a term frequently applied to gardens designed to promote recovery from illness. “Healing,” within the context of healthcare, is a broad term, not necessarily referring to the cure from a given illness. Rather, healing is seen as an improvement in overall well-being that incorporates the spiritual as well as the physical.

The healing garden in a hospital environment should be easily accessible and visible. When people are in an internal space (hall, pause area, sickroom or cafe) they should be able to visually connect with the exterior space. The healing garden should be a sensitive mixture of recuperative elements (medicinal plants, rock, wood or equipment). A healing landscape needs to be carefully design by a specialist such as a landscape architect or designer. (Ulrich,2002)

Historically, medical models cared for a person’s body, mind, and spirit utilizing a holistic approach, leading to an integration of nature with the healing process. Modern medicine focuses on the illness in isolation rather than the “whole” person. In these sterile settings there seems to be a need for an

alternative place where one can go to calm and regroup. (Joyce,2011)

In practice, in-patients have to follow the hospital’s set of rules, such as what clothing can be worn, choice of food, sharing of rooms with others and even visiting hours. When in hospital, patients lose the right to decision making and have to obey the hospital’s rules. Combined with the physical and mental pressure of being ill, this does not aid recovery. (Barnes,1994)

Therefore, in providing a space that allows patients to exercise a sense of control, it is logical that patients will release some of their tension and stress. Consequently, when designing a hospital garden one should consider means of allowing the user to develop a sense of control, providing opportunities that can allow patients to make choices, for instance providing different type of spaces could allow patients to choose which space they feel most comfortable in. Different types of furniture can be used and different types of views can be provided for the patients to enjoy.

Western healing concept

In Western healing gardens, Marcus and Barnes(1995) identify three aspects of the healing process to clarify how a garden may provide benefit:

- Relief from physical symptoms or awareness of those symptoms
- Stress reduction
- Improvement in overall sense of well-being

The healing garden is a term frequently applied to gardens designed to promote improvement in overall well-being that incorporates the spiritual within the healing process. In the book *The Sanctuary Garden* by C. Forrest McDowell and Tricia Clark-McDowell (1998), the authors state, "...the key to a (healing garden) is to honour and celebrate our broader human relationship with nature and spirit, not just plants."

The McDowells propose seven design elements as a guideline for design and as a means of identifying the intention of the space. That is, a marriage between the garden keeper and the spirit of nature.

The seven design elements are:

- 1 A special entrance that invites and embraces the visitor into the garden
- 2 The element of water for its psychological, spiritual, and physical effects
- 3 A creative use of colour and lighting (be they plant or human-designed light sources) to elicit emotion, comfort, and/or awe in the visitor
- 4 The emphasis of natural features as grounding points- such as the use of rocks, wood, natural fences, screens, trellises, wind, ground etc.
- 5 The integration of art to enhance the overall mood/spirit of the garden
- 6 Garden features that attract wildlife and provide habitat to a diversity of wildlife
- 7 Overall, the healing garden design should comfort the soul and renew the spirit, no matter if it consists of a

bench next to a tree or an intricately designed landscape.

To elaborate, there are three major overlapping design principles or schema for the design of healing gardens:

- Natural mapping (Norman, 1986)
- Latent image elements (Lynch, 1960)
- Housing zones (Zeisel, 1998)

Naturally-mapped environments and objects are those in which all the information needed for their use is designed into the object or environment itself. No instruction book, map or memory is needed to negotiate the environment or figure out how to make the object work. A naturally-mapped environment is one with a few clearly recognisable pathways that can be seen from anywhere in the setting, with an entrance and exit that everyone can see and understand with destinations that users of the environment can see easily. One that is not naturally mapped would have many pathways leading to destinations that are hidden around curves and bushes that would leave users in places with no clear way out and might

even have paths that lead back on themselves without an indication of a way out.

Latent image elements, defined by Kevin Lynch in his landmark study and book "Image of the City" addressing how taxi cab drivers organize information about cities in which they work include:

- Paths: The channels along which people move; the predominant element in their image of their environment as they move through it.
- Edges: Boundaries between two areas; either penetrable barriers or seams that join parts of an area together. Edges like the fence around a garden define and hold together general areas.
- Districts: Sections of an area that someone can enter into; recognizable as having a unique identifying character.
- Nodes: Spots in an area to and from which people travel. Nodes can be junctions, the crossing of paths or places of activity.

- Landmarks: Reference points singled out from a host of possibilities in a setting: towers, domes, signs, trees, doorways; “increasingly relied upon as a journey becomes more and more familiar” (Lynch,1960).

These five elements appear to be central to the way the brain processes environmental place information. Research has shown that landmarks play a central role in how people organize mental information for direction in order to develop their cognitive maps. (Tyson,1998)

Outdoor environments can be fully described using these descriptive elements. Zeisel, in “Housing for Families”(1981), defined the following housing “zones” as natural organizing principles for residential settings. Residential housing in most traditional societies can be diagrammed into the following zones:

- “Outsider public” - for example a park where everyone is welcome.
- “Insider public” - for example a residential street where everyone is free to walk, but those who live there keep a close eye on strangers.
- “Front personal areas” - front gardens and lawns that belong to someone but are physically accessible by the public.
- “Building edges (fronts)” - include porches and front stoops that are out of bounds for strangers, but are accessible.
- “Building walls” - include the windows and doors that separate inside from outside.
- “Front stage areas” - the formal welcoming areas of a house.
- “Back stage areas” - include kitchens and bedrooms that residents use more informally.
- “Building (back) edges” - include patios and back porches that are clearly off limits for outsiders.
- “Back personal areas” - represented by back yards where children play and people gather.

- “Insider (back) public” areas - include back alleys and other areas shared only by those who live there.
(Clark, 1998)

Thus when these three organizing principles are overlapped and merged into a single healing garden plan, they will represent the major design principles for the design of a successful healing garden. The reason for this is the combination of theoretical and practical knowledge from environmental, psychological and planning backgrounds, applied to a holistic healthcare practice.

Eastern Healing Concepts

Eastern healing concepts could be integrated into the concept of a Western healing garden. Eastern concepts, such as “Yin Yang” and “Wu Xing” concepts and philosophies could be combined with South Eastern garden space making ideas. To design an Eastern orientation healing landscape the following concepts should be considered:

The concept of “Wu Xing”

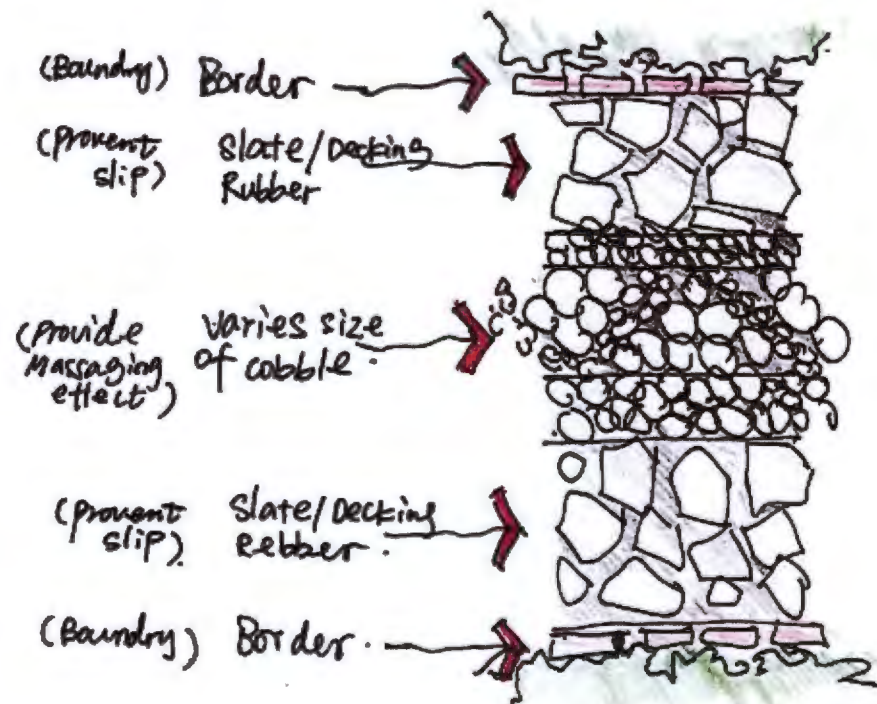
The concept of “Yin Yang”

The concept of “Tian di Ren”

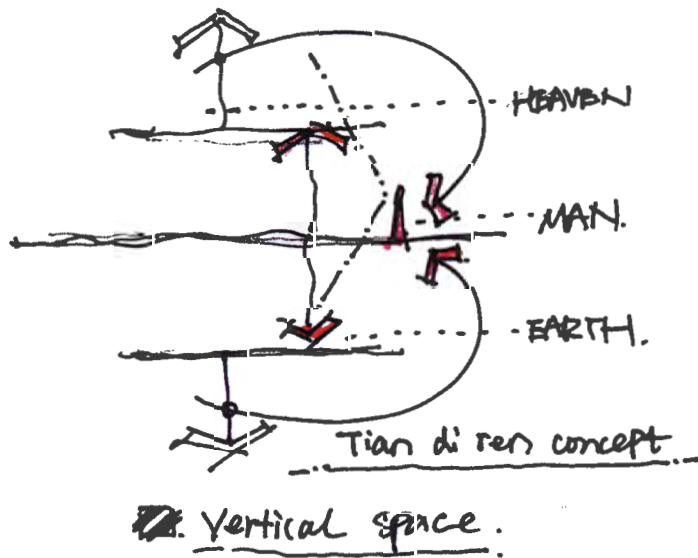
Traditional Chinese medicine principles

The integration of these concepts into Western healing gardens could improve the healing effect and bring an improved quality of environment to hospitals. There are six Eastern medicine therapy design concepts:

Path: Varied sizes of stone surfaces are used; when people walk on these surface it can have massaging effect. Visually this can also be used to positively inform the user.



Form: The “Tian di Ren” concept can be used to represent the relationship between man and the environment.



Plant: The “Wu Xing” concept and medicinal function plants.



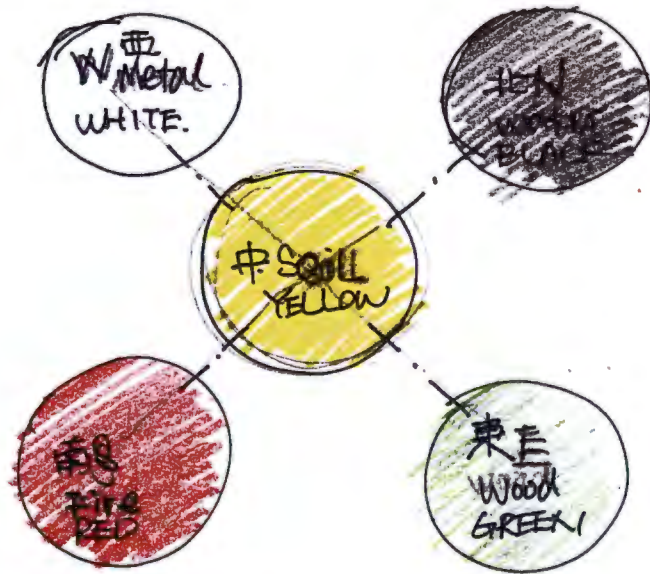
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www.neverlight.com / www.nzplantpics.com/

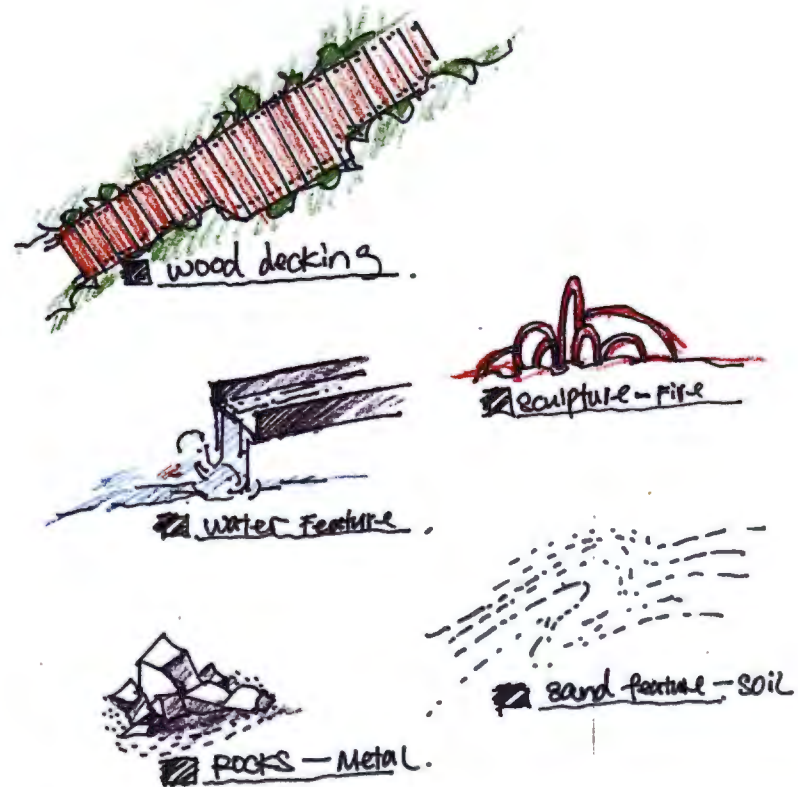
www.imagesphotospictures.com / www.gardenexpress.com.au

www.inwardbound.com

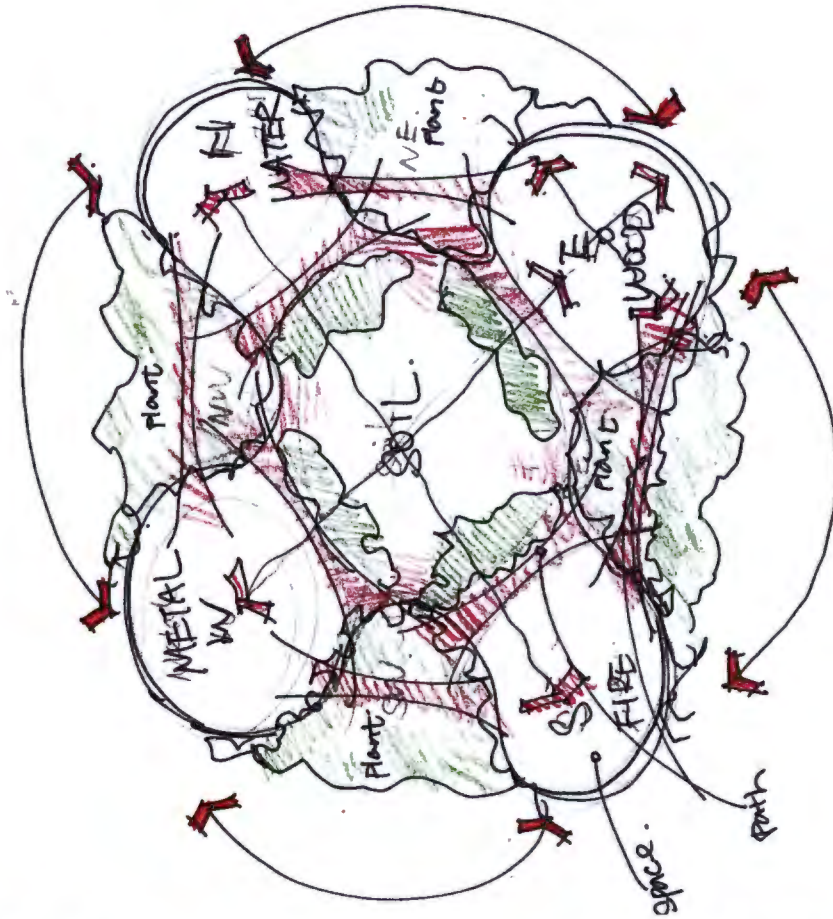
Colour: The "Wu Xing" concept should be taken into consideration; when providing a peaceful environment one should avoid "unstable" colour, vivid colour should be used to attract people.



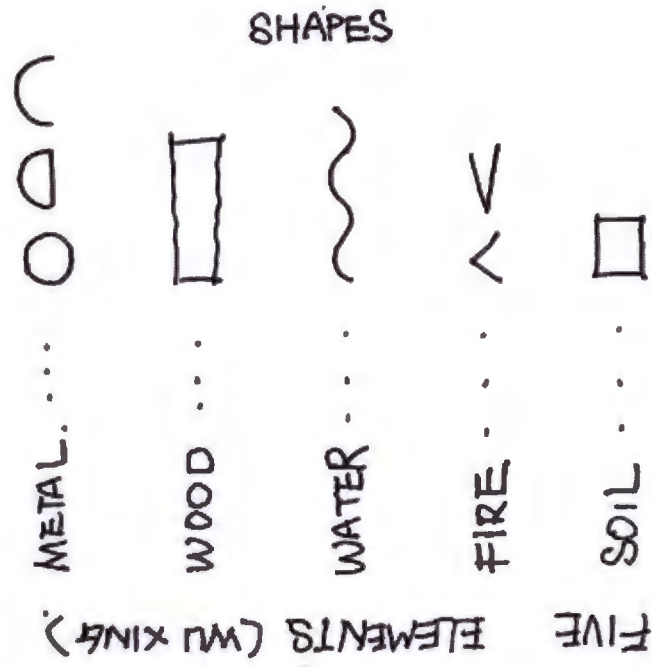
Material: Should be a response to the "Wu Xing" concept.



Space making: Should be a response to the "Wu Xing" concept.



Feature elements: Should be a response to the "Wu Xing" concept.



The integration of the above mentioned concept can not only have a healing function but also improve people's physiological state

Summary

The healing landscape can be a complex environment. The interaction between the patient and the environment needs to be taken into consideration. According to the biospsychosocial model, the healing landscape through Eastern and Western philosophy can be used to improve social and psychological aspects of patients, therefore aiding in recovery. Evidence reflects that the natural environment can have a positive effect on patients.

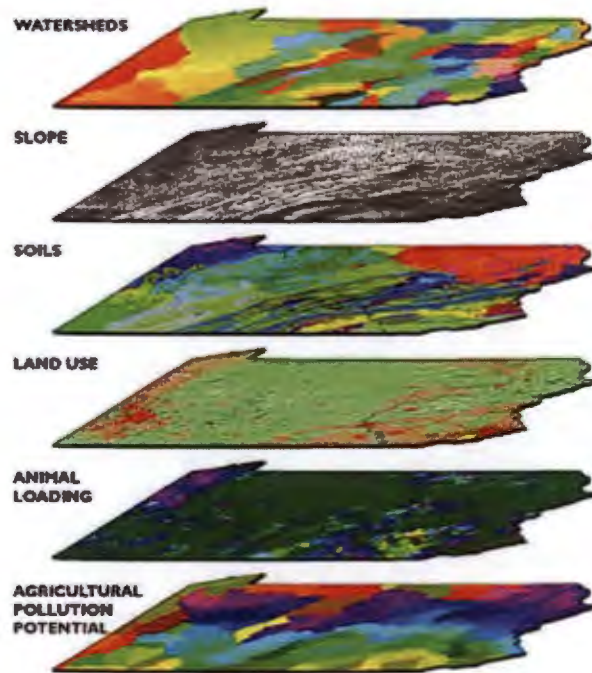
The healing landscape can be used to provide spaces for patients to reconnect with nature. Thus patients can find space to relax their minds in order to cope better with stress and recover their dignity. Patients can exercise their own decision making in the healing landscape, finding a place where they feel comfortable, helping them to feel more at home and feel less stress in the hospital environment.

In terms of ideology, the Eastern philosophy of "Tian Di Ren" can be generally applied. The healing landscape environment can give patients psychological suggestions, therefore it can help patient find a confidence to deal with illness. The use of Chinese massage can be used to provide simple treatment to patients in order to improve their illness. Patients can experience massage from equipment while being unaware of this.

In short, providing opportunities for patients to connect with the healing environment can potentially improve a patient's experience, comfort (psychological and physical) and help them better deal with illness while providing spaces that allow patients to communicate with themselves, family members or share experiences with other patients. Overall, the healing landscape can help the patient experience a sense of control and reduced stress.

6.0 Site Analysis

Ian Mcharg's layer cake is the main method used in this thesis. (Mcharg,1969) The difference is that this system is usually applied on to the ground; it starts from the natural aspects of a site. This thesis project is different, due to the fact that the ground is a concrete roof and not natural ground. However, the layer cake method can help to find out the roof's problems and help to generate solutions.



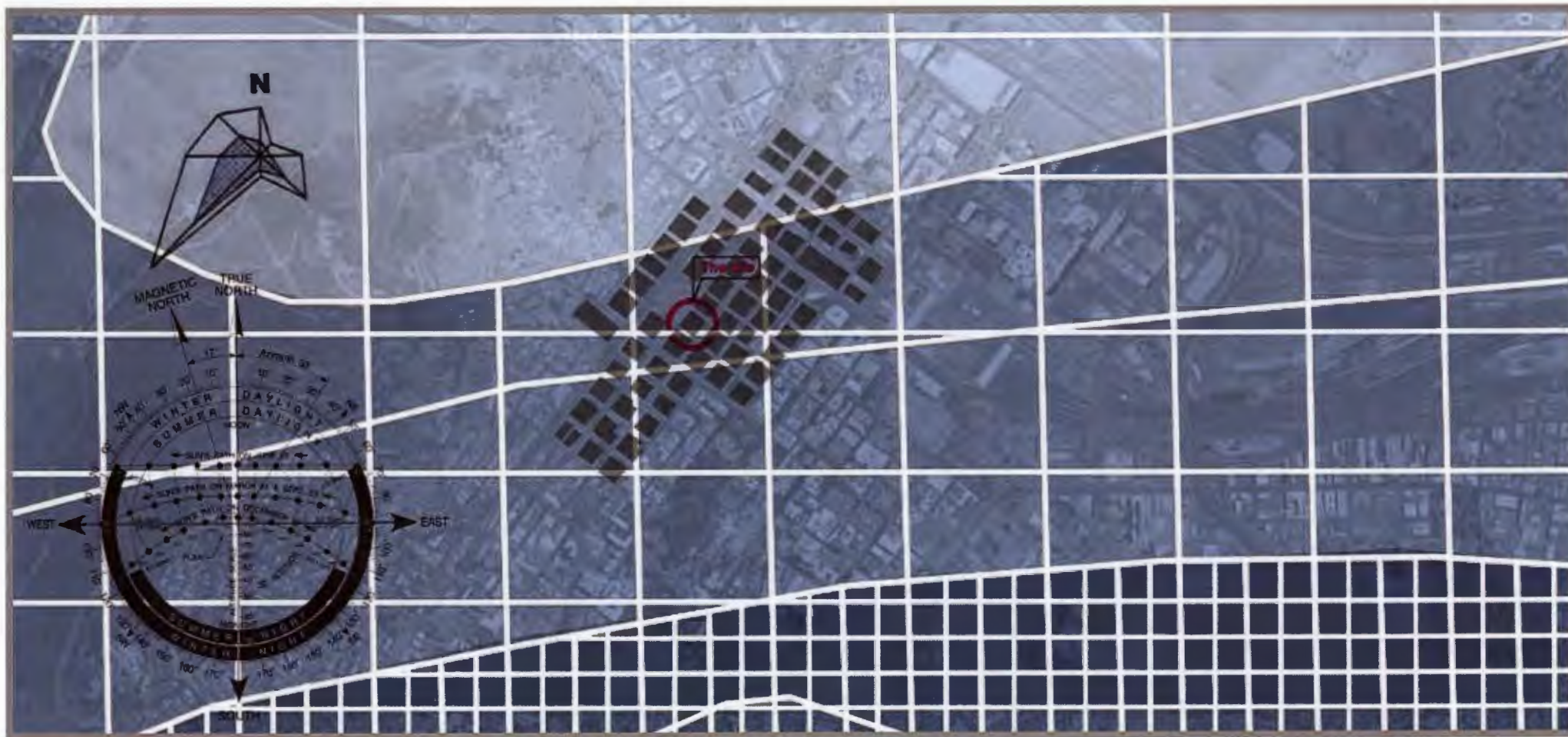
Source: www.e-education.psu.edu

This Chirstiaan Barnard Memorial hospital building is located in between Bree Street and Loop Street, with the South-West side in Church Street and the North-East side in Longmarket Street.

In terms of the climate, the Cape Peninsula has a subtropical Mediterranean climate type: dry in summer and wet in winter. The prevailing wind direction is Southeasterly, but some of the wind blows from the North East. However, in winter, most of the wind blows from the North West.

The rainfall in this area is moderate (500 – 700mm).

The maximum temperatures range between 16.5°C –41°C.

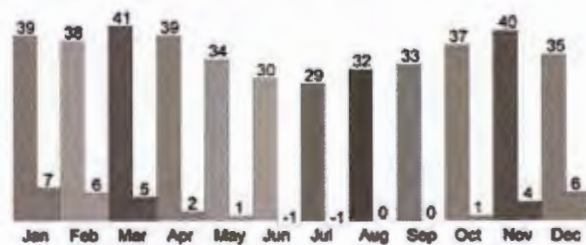


Wind Rose



■ Summer winds

□ Winter winds



Climate data: www.weathersa.co.za/climate

CLIMATOLOGY PLAN

Source: 1:10 000 Scale series Topographic Map
 Chief Directorate, Surveys and Mapping 1984
 1:250 000 Scale series Climatology rainfall Map
 Trigonometrical survey office Pretoria 1964



LEGEND



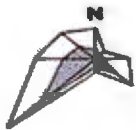
Light rainfall



Moderate rainfall



Heavy rainfall



Wind rosa

The prevailing wind direction is from Southwest, some wind blows from the Northeast

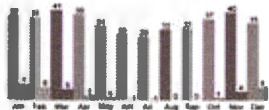
The northeast side get less wind



Solar chart

Summer sunlight of up to 14.hours and 25mins per day
Winter sunlight of up to 9.hours and 53mins per day

Summer daylight longer than winter daylight.



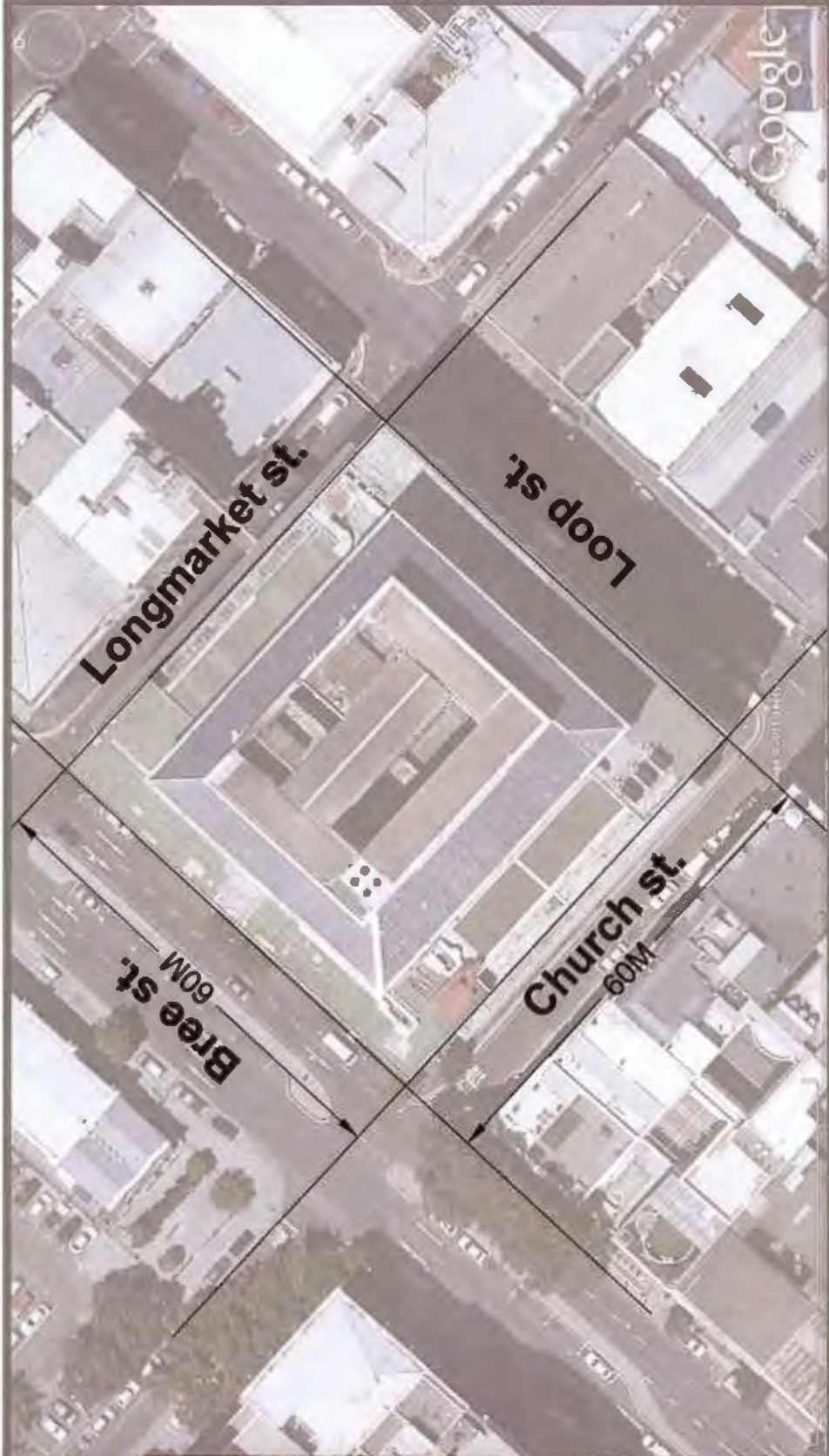
Temperature chart

Highest month temperature is 41C°
the average temperature is 18.5C°
Lowest temperature is -1C°
Source: weathersa.co.za

This area have a typical Mediterranean climate

CLIMATOLOGY

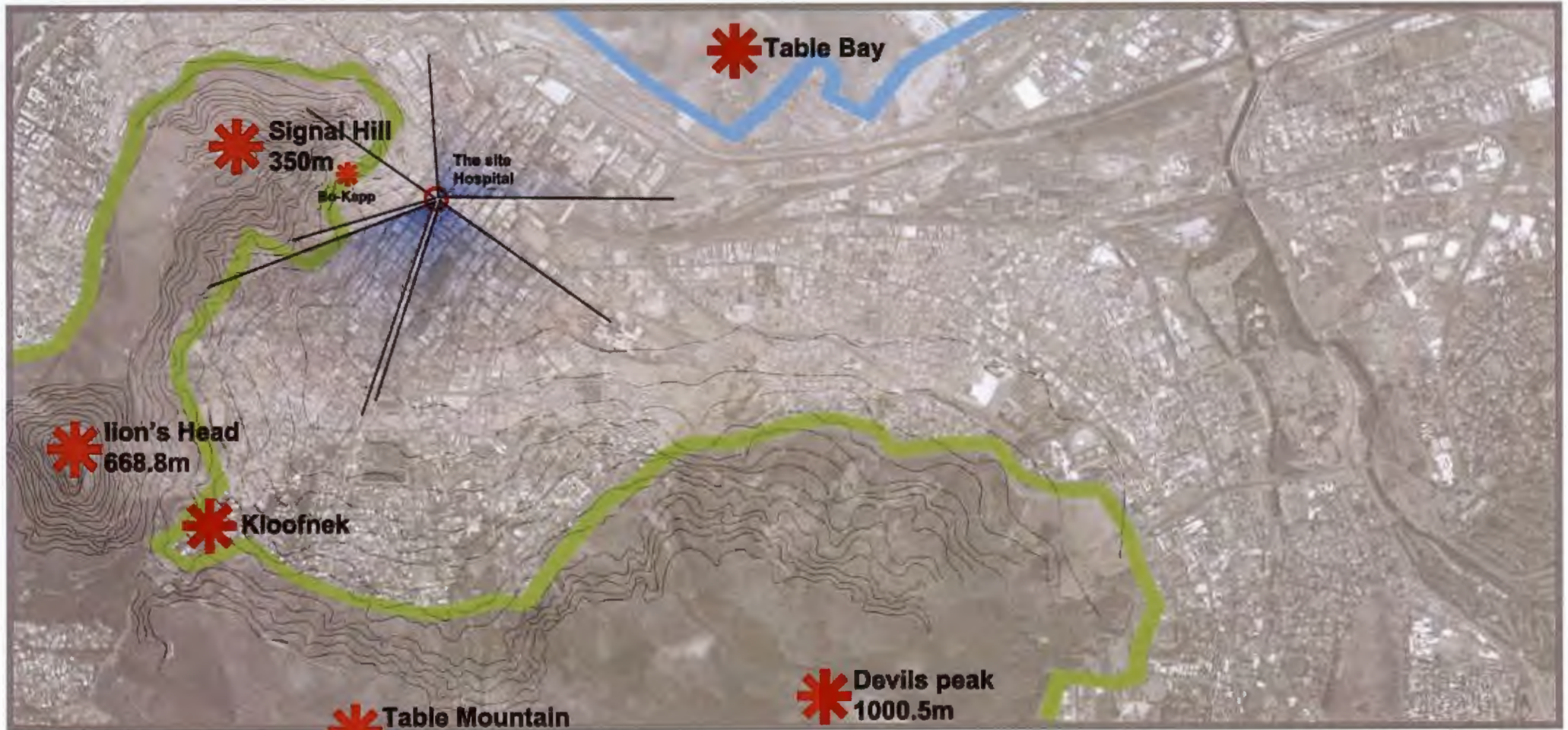




Source: Google earth 2011

LOCATION MAP





Implication:

Significant Mountain view, sea view all the way around the site. Area with protection status, such as Table mountain national park, heritage Bo-kapp, seascape and urban landscape.

Bo-kapp
 Current urban edge (Table mountain national park)

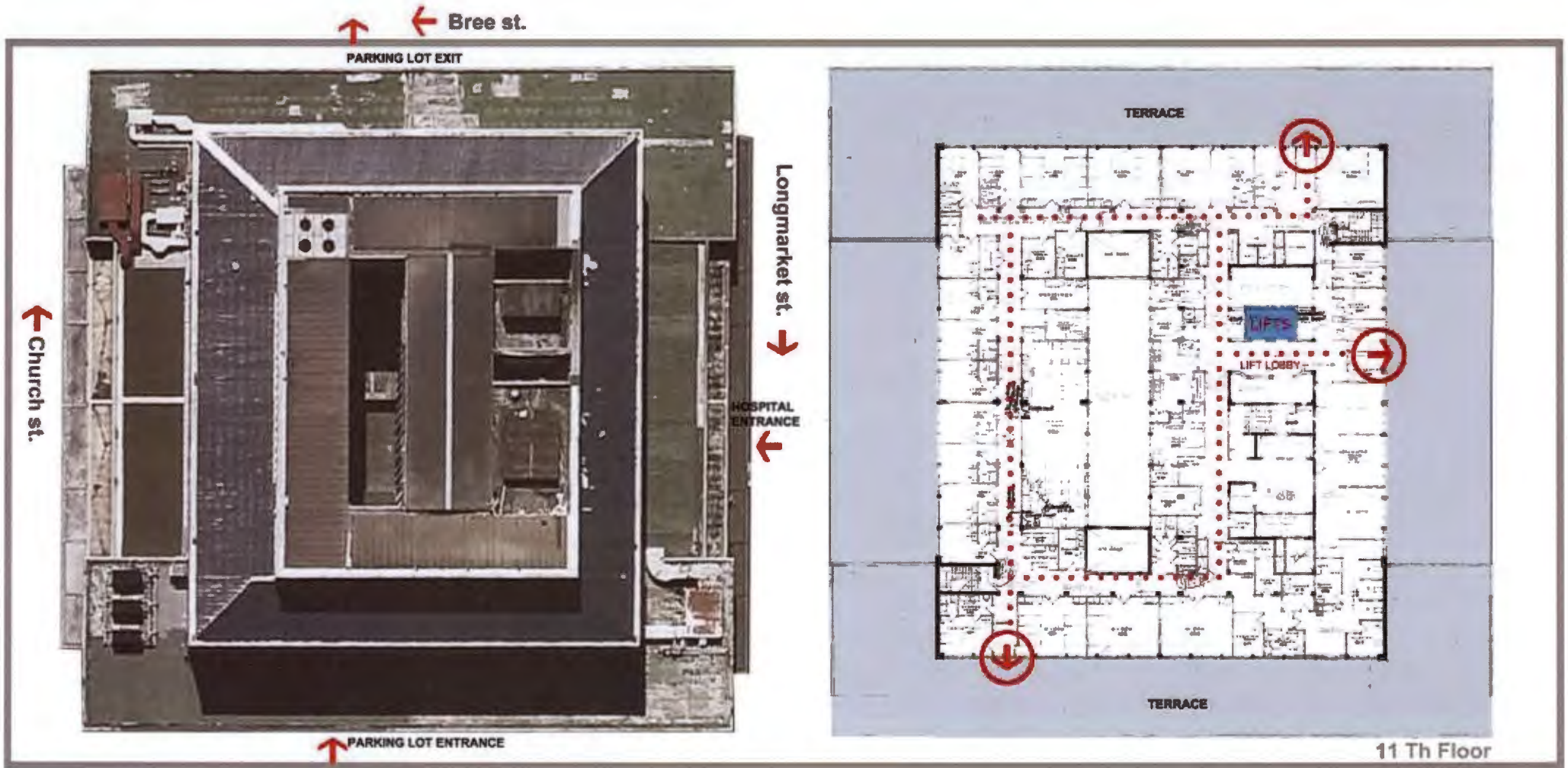
Current urban edge (Table Bay)

Source : google earth 2011

VISUAL LINKAGE



Source: 1:10 000 Scale series Topographic Map Chief Directorate, Surveys and Mapping 1984



Implication:

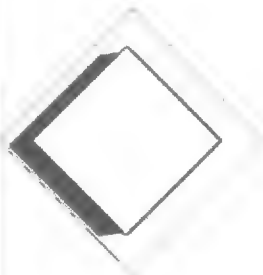
There are two ways can access into the building. (by car or walk)
 On the 11th floor , there are 2 fire door can access to outside terrace, on the right hand side lift lobby is another potential access to terrace.

ACCESSIBILITY

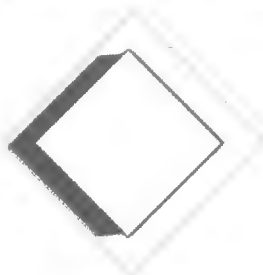


SUMMER DEC - FEB

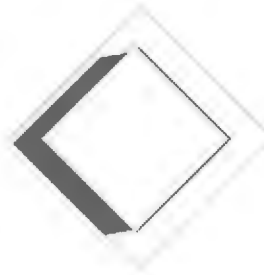
AUTUMN MAR - MAY



**10:00AM
DECEMBER**



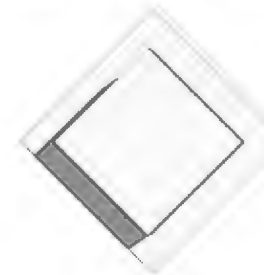
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JANUARY**



**10:00AM
FEBRUARY**



**10:00AM
MARCH**



**10:00AM
APRIL**



**10:00AM
MAY**



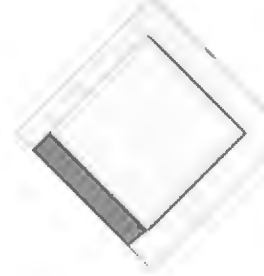
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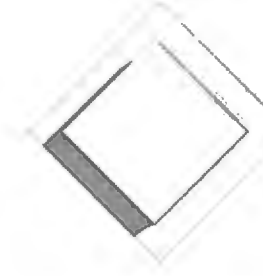
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JULY**



**10:00AM
AUGUST**



**10:00AM
SEPTEMBER**



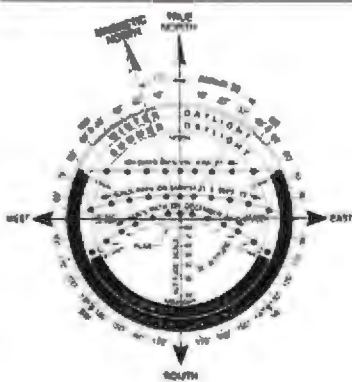
**10:00AM
OCTOBER**



**10:00AM
NOVEMBER**

WINTER JUN - AUG

SPRING SEP - NOV



Implication:
 From November to March , during the morning
 The Southeast side in the shade.
 From April to October , during the morning
 The Southeast & Northwest side in the shade.
 During Winter and Spring people are prefer
 sunshine than shade area and vice versa.

SUNLIGHT STUDY



SUMMER DEC - FEB

AUTUMN MAR - MAY



**4:00PM
DECEMBER**



**4:00PM
JANUARY**



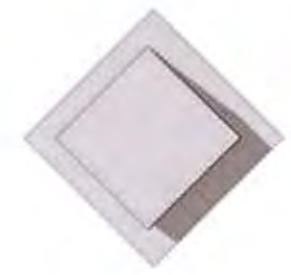
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MARCH**



**4:00PM
APRIL**



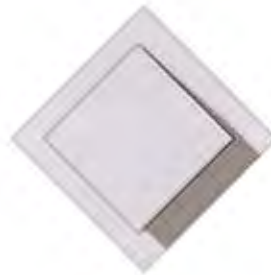
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JULY**



**4:00PM
AUGUST**



**4:00PM
SEPTEMBER**



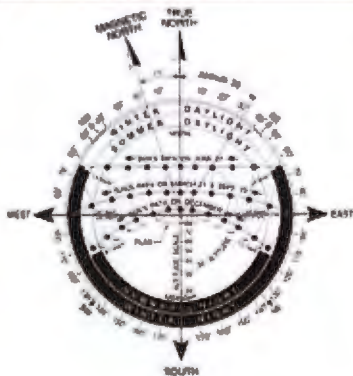
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OCTOBER**



**4:00PM
NOVEMBER**

WINTER JUN - AUG

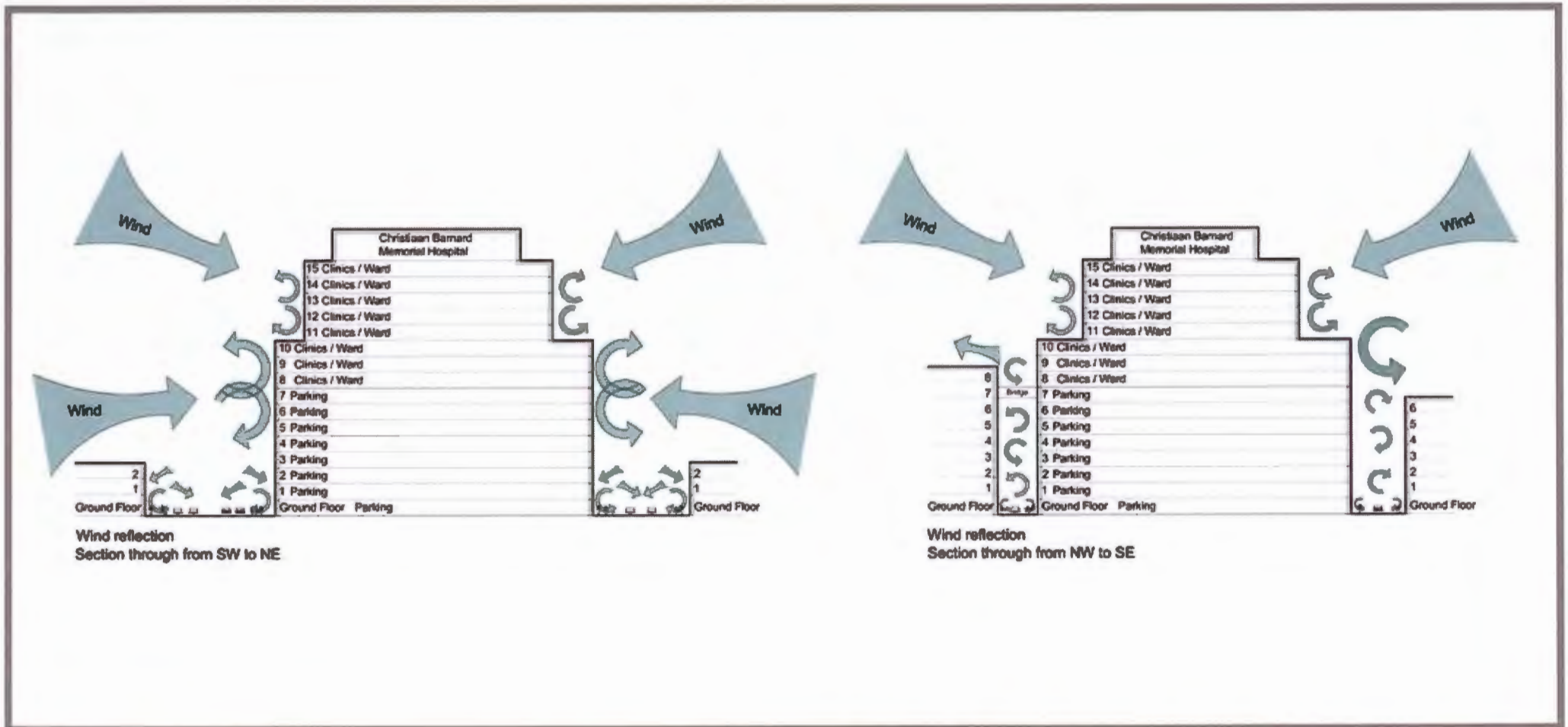
SPRING SEP - NOV



Implication:
 Winter, during the afternoon
 The Southeast side in the shade.
 Spring, Autumn and Summer, during the afternoon
 The Southeast & Northwest side in the shade.
 Southeast and Northeast will become popular
 during the summer and autumn.
 Morning sun are comfortable than afternoon sun,
 especially during summer and autumn.

SUNLIGHT STUDY





Implication:

Do to building's that blocks/reflects the wind flow into different directions, prevailing wind conditions are constantly changing within the urban context. This kind of micro-climatic condition is not suitable growing conditions for most plants and it creates uncomfortable environments for people.

WIND REFLECTION



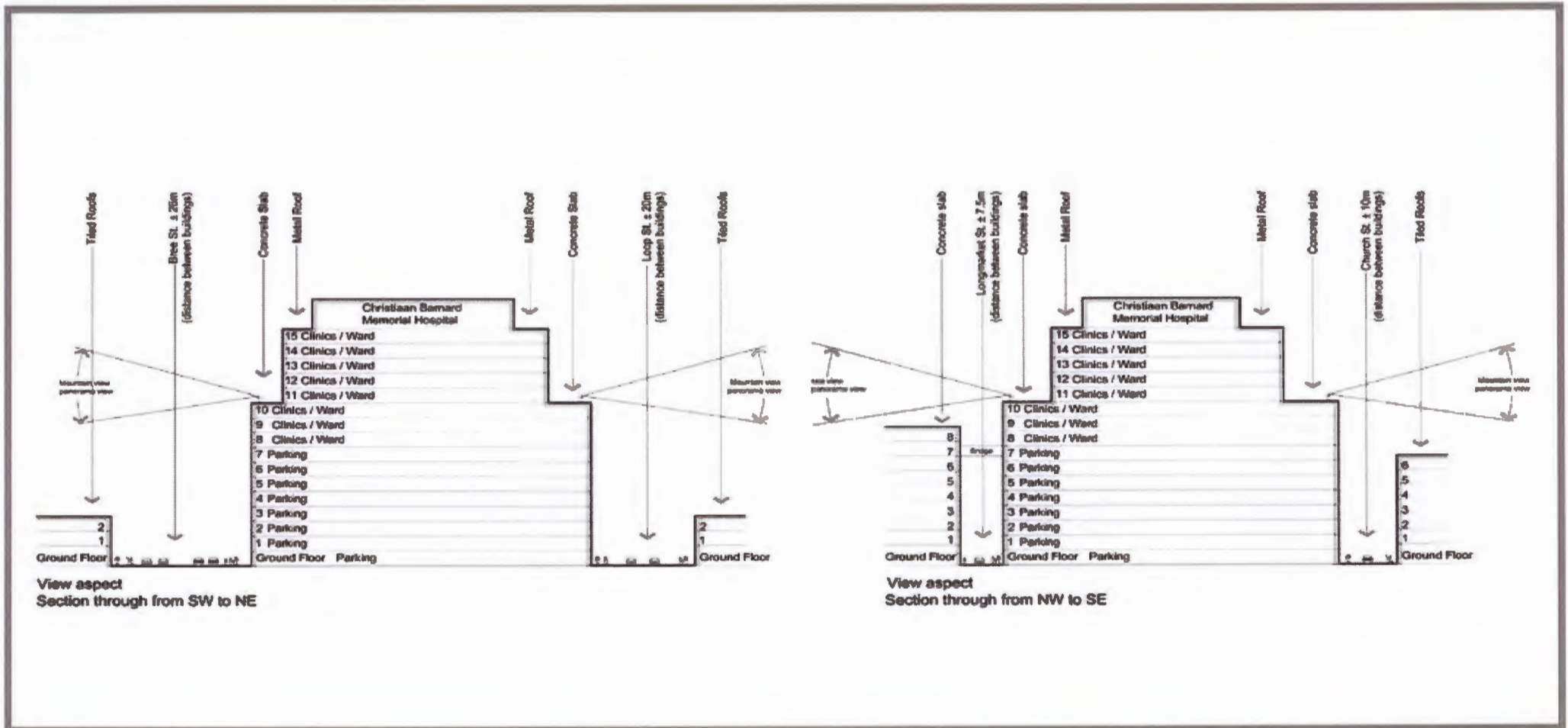
The Christiaan Barnard Memorial Hospital building does not engage with its surrounding environment. This causes reluctance in people using the building to spend time outside or inside the building. This kind of hospital environment limits the healing opportunity for patients.



Source: Author's own
Photos show the Christiaan Barnard Memorial Hospital surrounding environment: dark, small, windy and shady with no areas for activity.



Source: Author's own

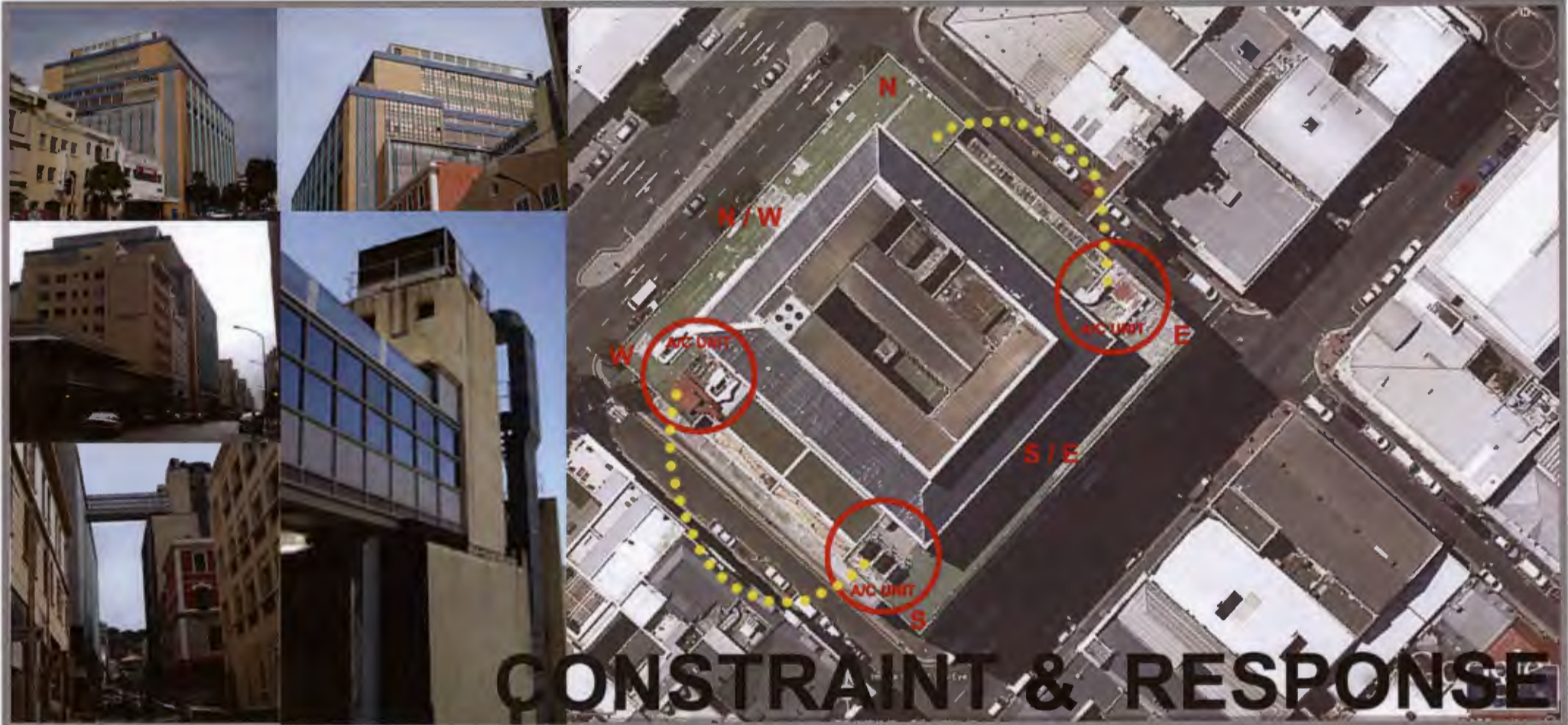


Implication:

Views and light are often blocked by buildings. In the urban environment many buildings don't have an open view resulting in people losing their connection with surrounding natural environments such as rivers, mountains, trees and the sea. White or silver painted roofs reflects sunlight more than darker colours, often causing uncomfortable sunlight glare onto and into other surrounding buildings. There are no positive contributions to a comfortable environment resulting from the visual aspects that buildings impose on the environment.

VIEW ASPECT





CONSTRAINTS:

- + 3 A/C units are located on the 3 corners of the roof, all these A/C unit have got noise.
- + A/C unit needs to regularly maintain and repair.
- + A/C unit emit a waster air to the open air and intake fresh air into the ducting system.
- + Northwest side roof and Southeast side roof are not connected.

RESPONSE & OPPORTUNITY:

- + Replace existing A/C unit to new version low noise A/C unit.
 - + Create a landscape water feature in order to soften the noise from A/C unit.
 - + The design of an access hatch / door to the A/C units is necessary.
 - + Water feature and vertical green landscape element can provide better quality air for A/C unit intake.
 - + To connect N/W side and S/E side roof becomes necessary in order to create circular type circulation.
- Opportunity: North side are quite area due to without A/C unit. North side corner has got high value, space engage significant Mountain View, Bo-Kaap view and sea view and this corner all year around has good sunshine.



Reflection

Designing multi-purpose space is becoming necessary, especially in a hospital-surrounding environment.

The healing garden should include some real natural context, such as green vegetation, flowers, rocks and water. The security is an important aspect that needs to be taken into consideration. The healing garden should provide various types of space in order to shift people's minds to suit their mental or physical needs. Enough plants and landscape features need to be provided in order to draw people's attention. Suitable plant species need to be selected in order to balance the aesthetic, ecological and health concerns such as suitable micro-climates and healthy ecology, enough sunshine over time. To choose plants that are not necessarily indigenous only, but also to consider the use of plants with high medicinal value or aesthetic value. From a maintenance point of view, water features will need more attention than the other features.

An important aspect to consider is views; significant open views can make people feel comfortable. To bring a view of nature close to a window can improve the psychological condition of patients (stress attenuation, restoration). To reconnect views from an internal space to the exterior space can mitigate a feeling of being in a tedious internal closed

space. This could apply especially to those patients that are unable to leave their hospital room or bed. Enhancing visual connections to the healing gardens and views from nearby spaces can provide interesting windows of viewing from outside the designed space. Also it can provide visual buffers in order to avoid unnecessary access of privacy.

Currently this hospital lacks green space, facilities and healthy internal spaces. Patients need green space, activity and sense of place. The reconnection of the relationship between environment and man are important.

A healing garden is about perception as well as activity. Designers should take into consideration the group of people for which the garden is intended, and be aware of their levels of mental power. A healing garden must be about communicating with the visitor in a supportive and positive way. Depending on the visitor's stress levels, the garden should consist of different rooms with different characters; serene, wild, rich in species, sense of space, common interest, and pleasurable, festive and cultural.

Another aspect is that the garden should be easily accessible for patients. The access should not only focus on general access, but should also be accessible for paraplegic and/or other physically disabled people, and take in to account that

patients may not be as mobile as the general public. In terms of ergonomics, patients' needs should be taken more into consideration, and this concept should be integrated into the design.

A state of complete physical, social and mental well being should be experienced within a healing garden and not merely the absence of disease or infirmity. This could have a positive impact on hospitals' healthcare outcomes and patients' experiences, leading to improved perceptions of hospital care.

A healing garden should be a resource for everyday life, and should be incorporated wherever possible into healthcare environments. It is a positive concept emphasizing social and personal resources as well as physical capabilities.

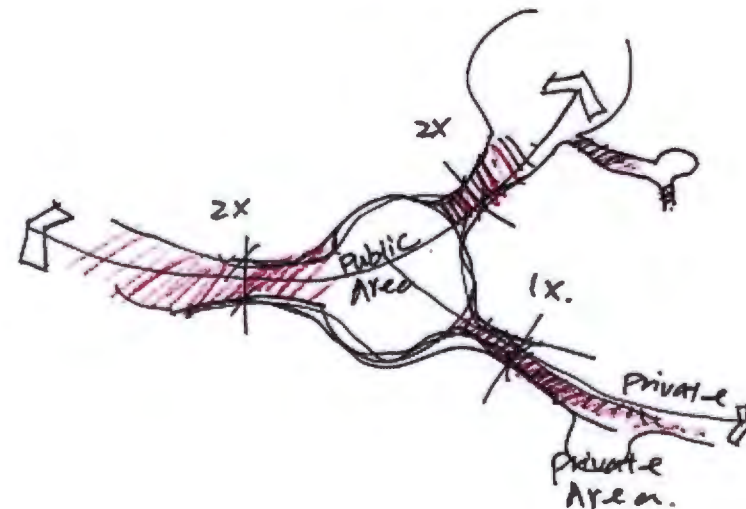
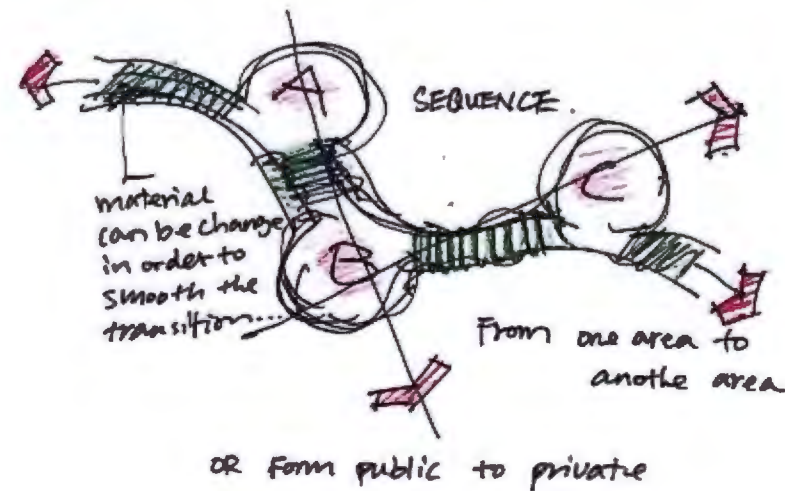
7.0 Documentation of Design

Place making and Design

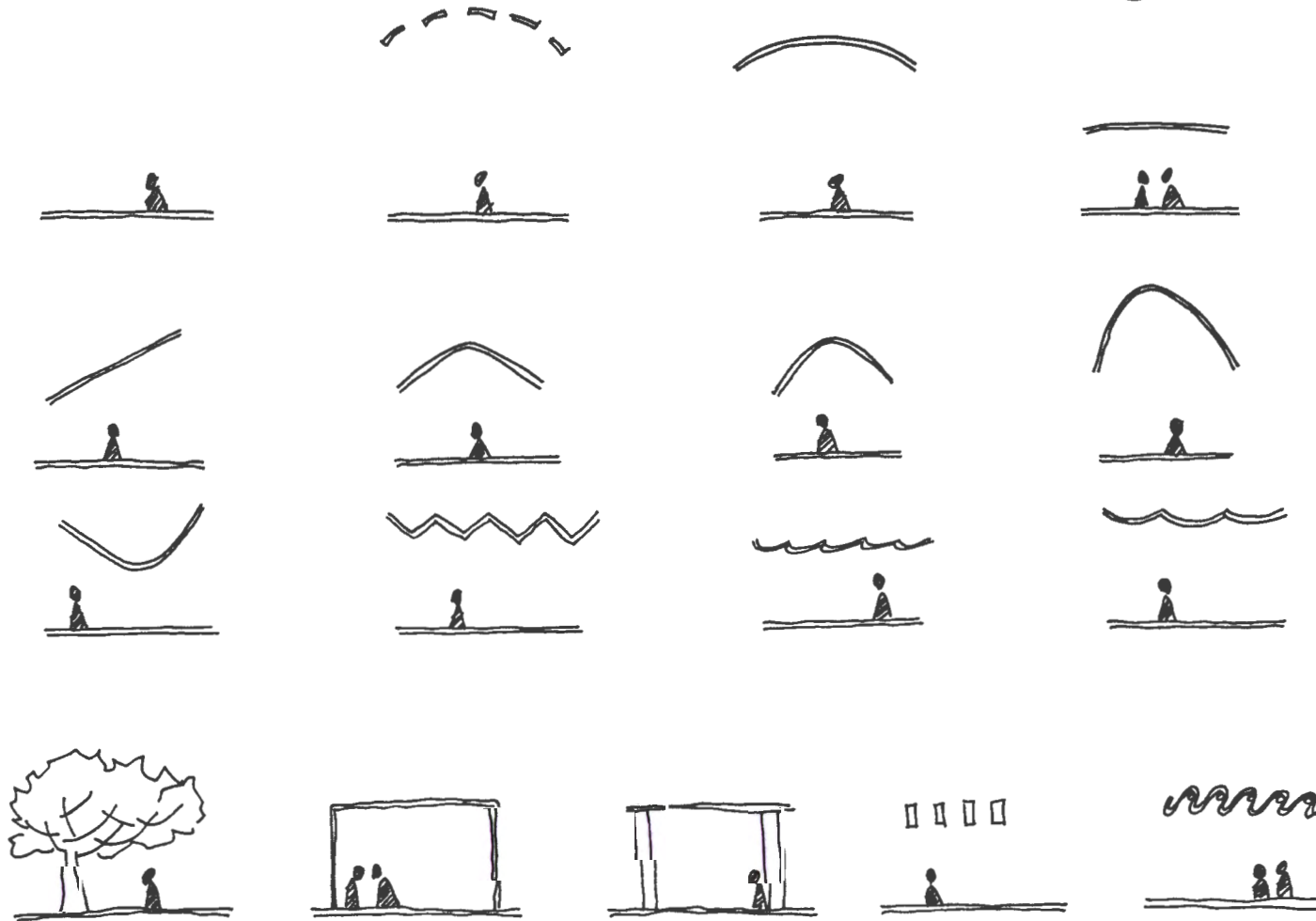


Space relationship diagram

Provide different kinds of space and organize different spaces into different positions in order to make the whole place become a sequence of a quality spaces. In terms of the healing landscape, each individual space should have a certain function. The relationship between different spaces needs to be taken into consideration, while thinking about the relationship between patients and the space, and the experience patients will get from the place. (Catherine, 2001)



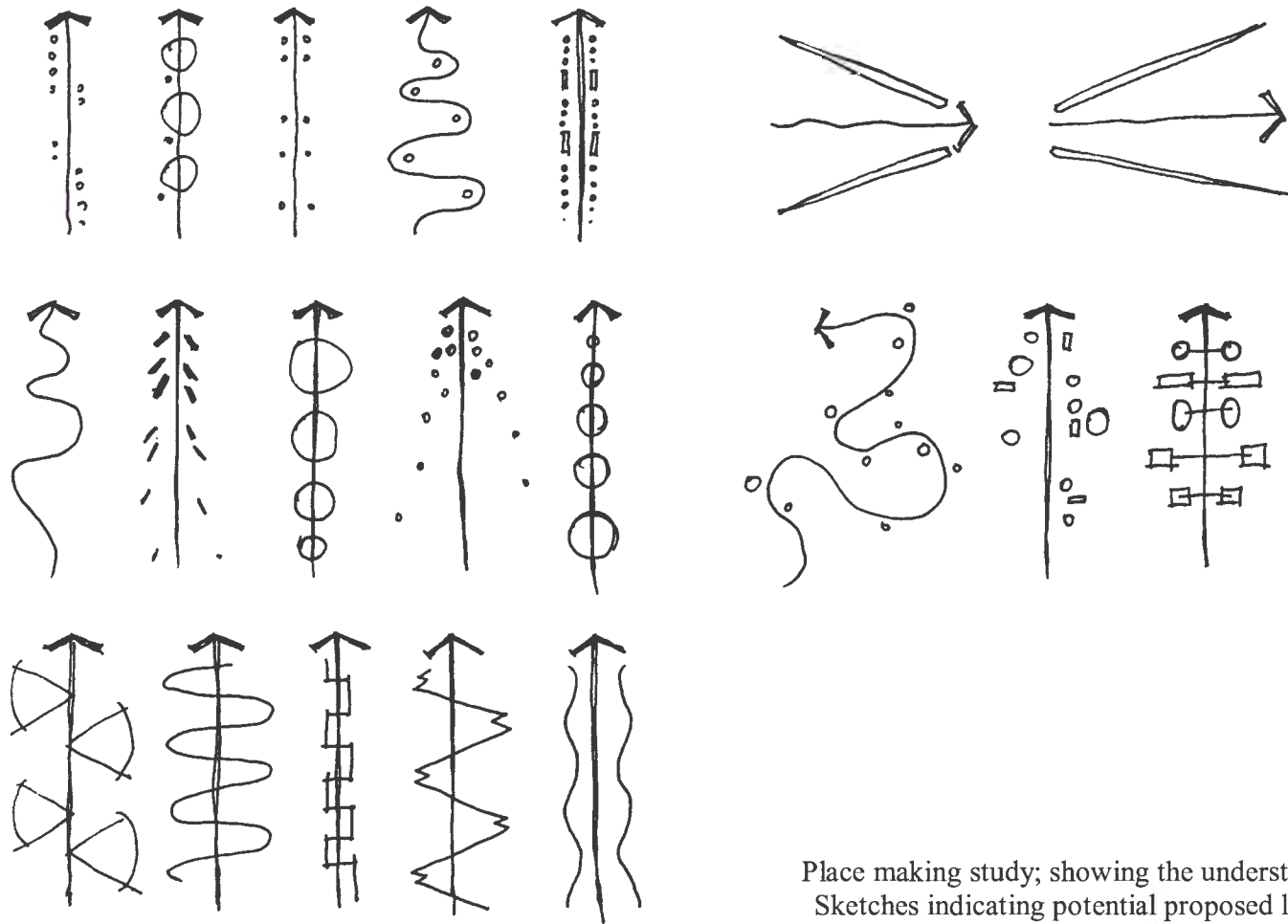
Place making and Design



Place making study; showing the understanding of space.
 Sketches indicating potential proposed landscape design interventions.

Source: S,Ormsbee John;2000;Landscape architecture a manual of site planning and design – 3rd Ed; The McGraw-Hill companies; U.S.A

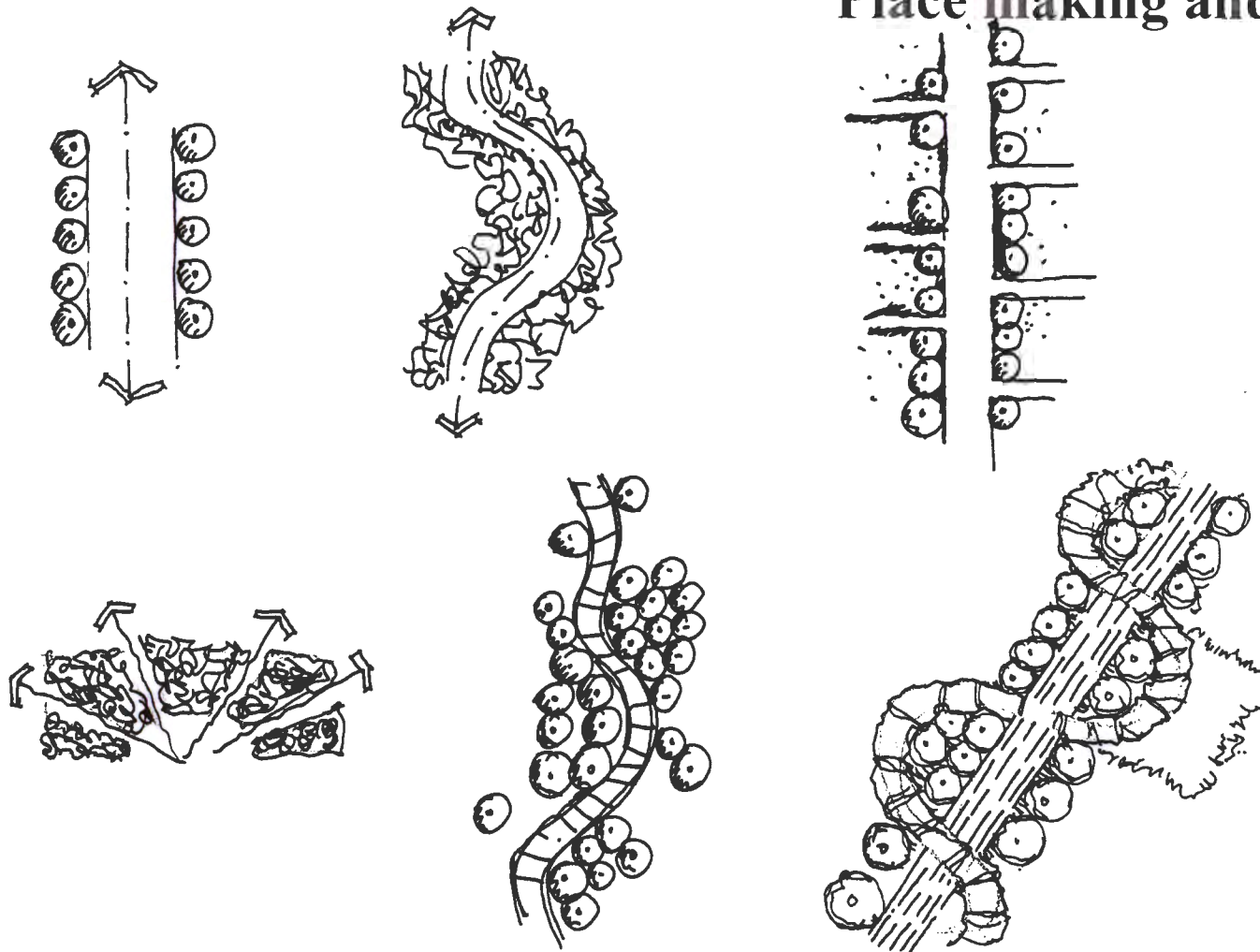
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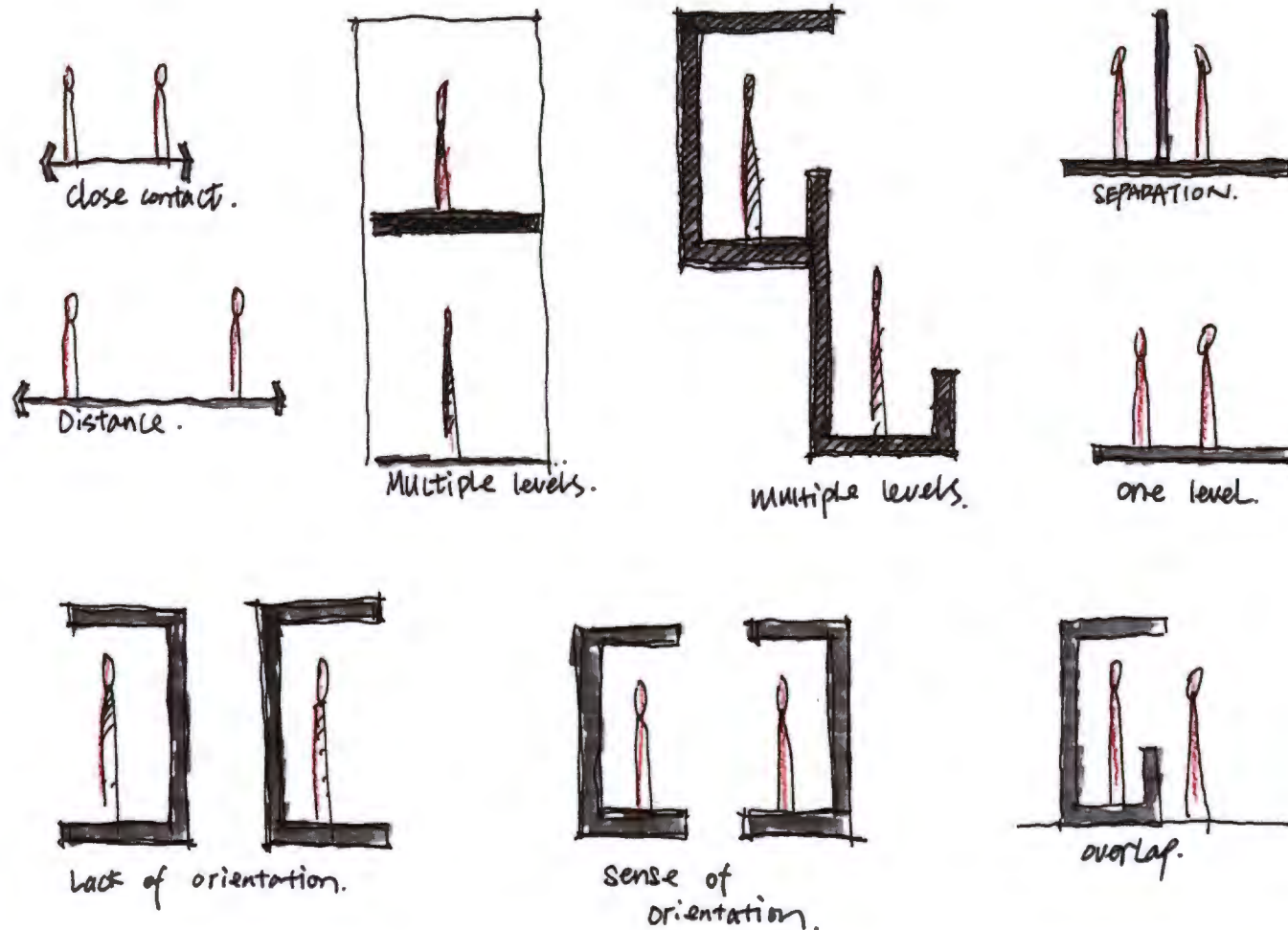
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Source: O, Catherine; 2001; Form and Fabric in Landscape
Architecture; Spon Press; U.K

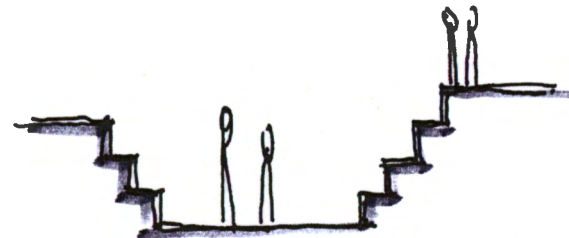
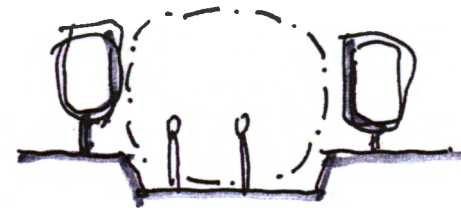
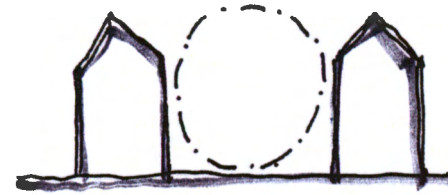
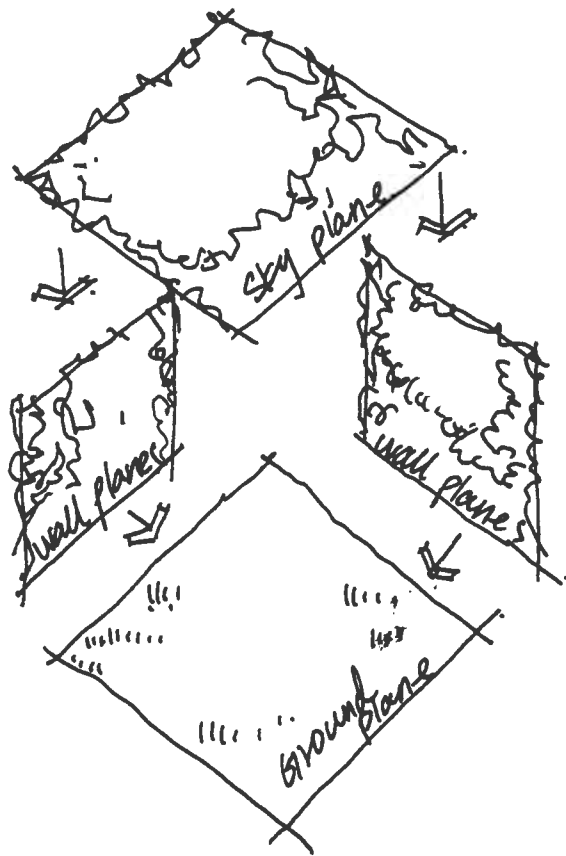
Place making and Design



Place making study; showing the understanding of space.
Sketches indicating potential proposed landscape design interventions.

Source: W.Ed; 2010; Urban Design; Ava publish SA; Switzerland

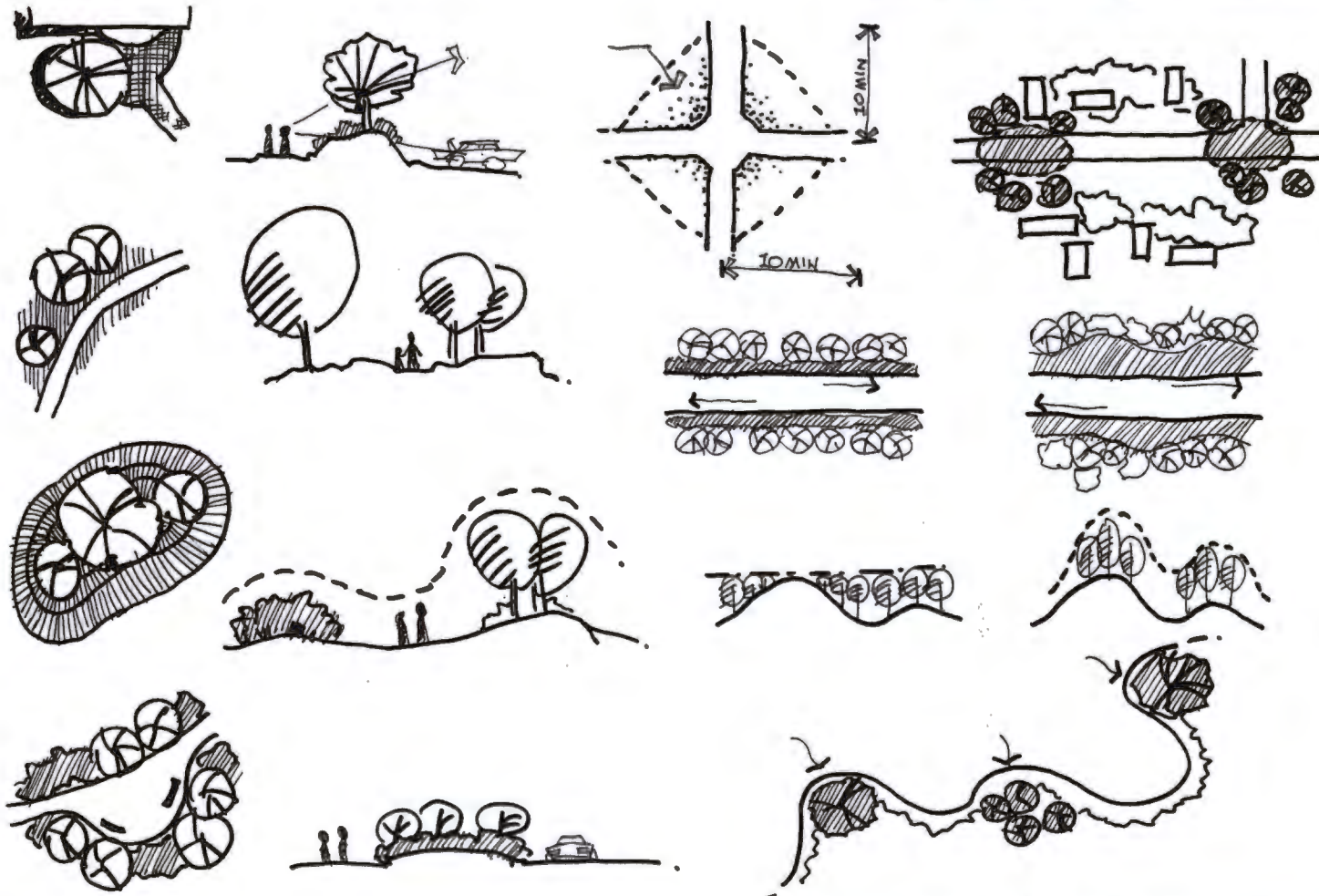
Place making and Design



Place making study; showing the understanding of space.
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Source : O,Catherine;2001;Form and Fabric in Landscape
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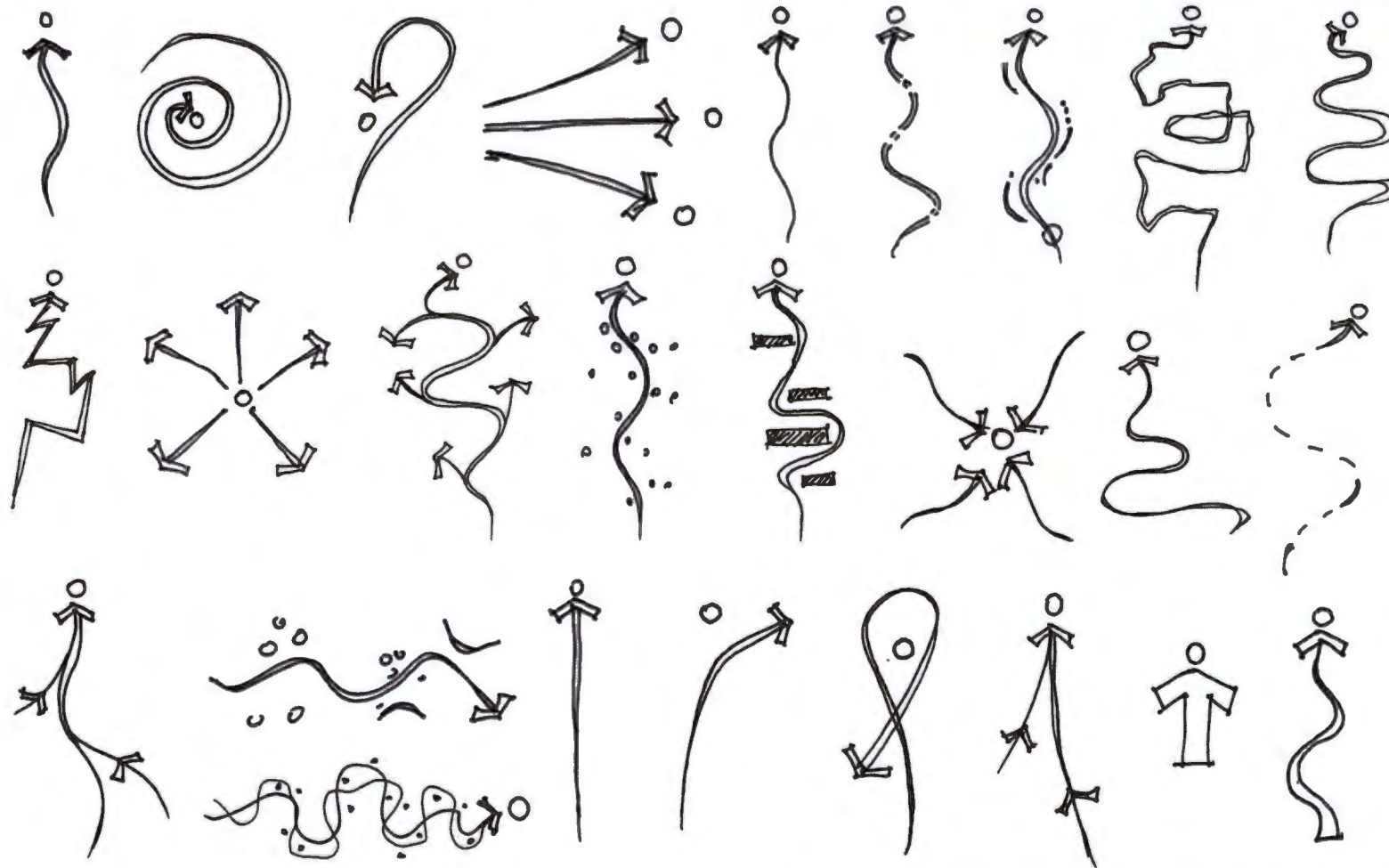
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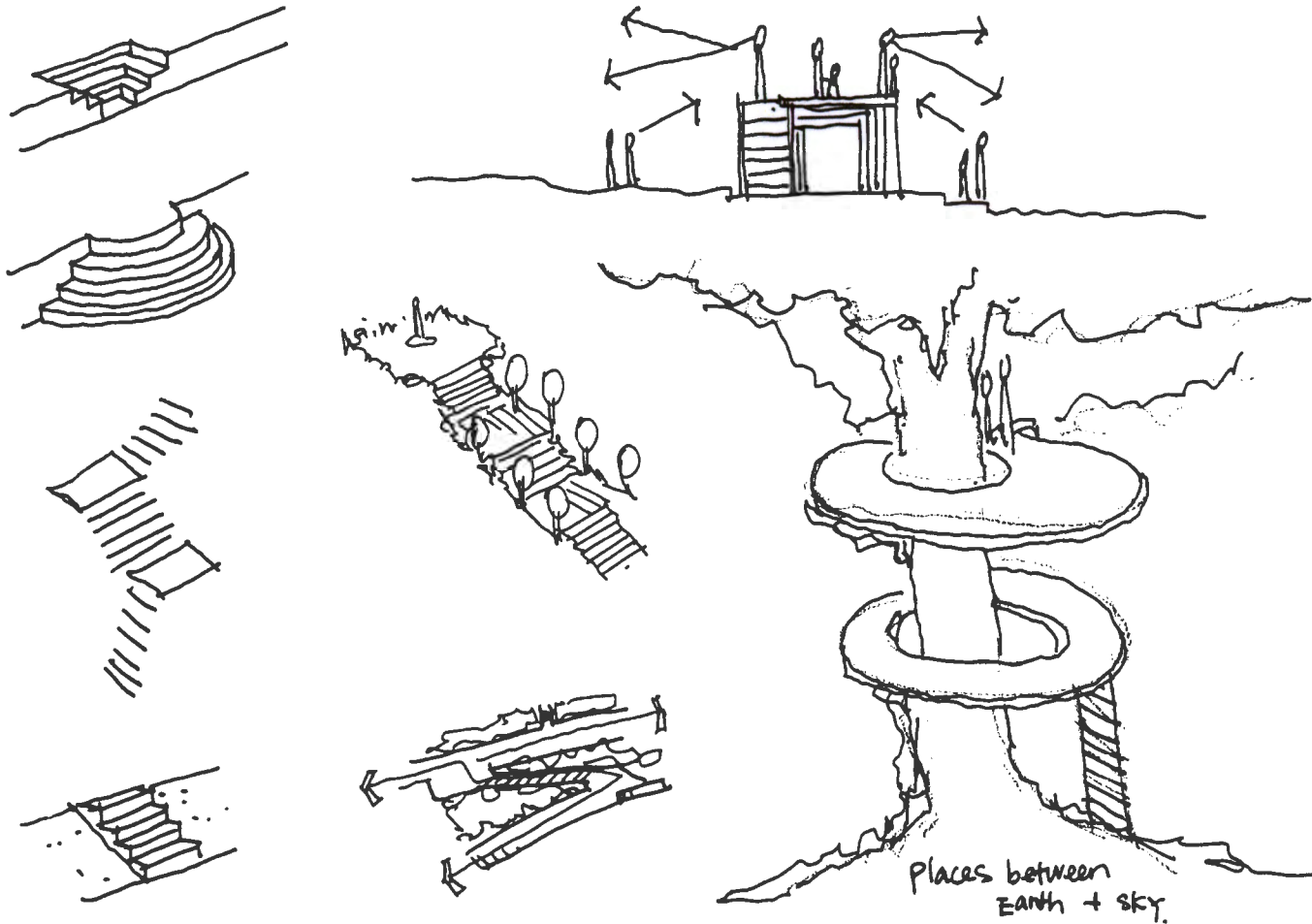
Place making and Design



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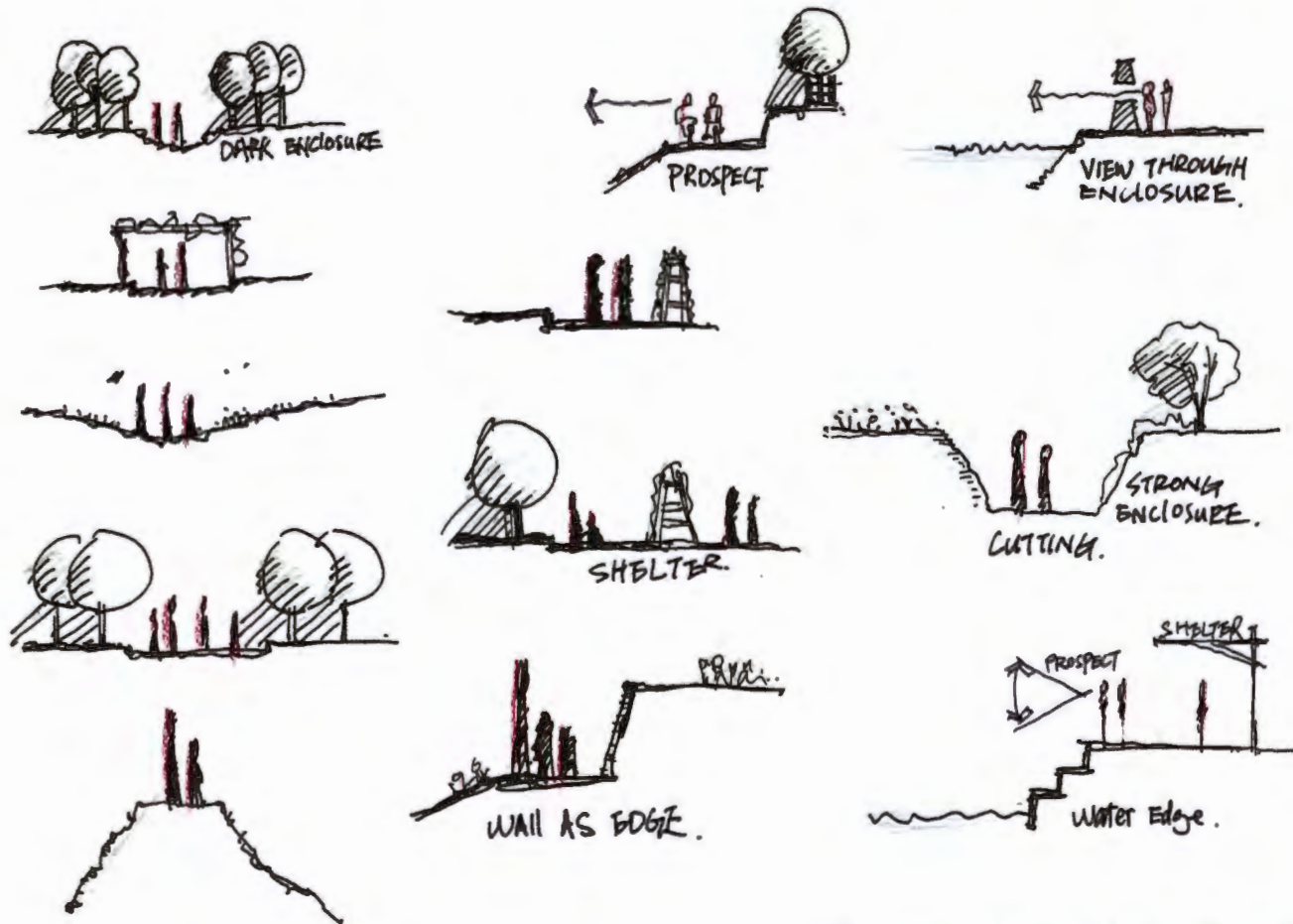
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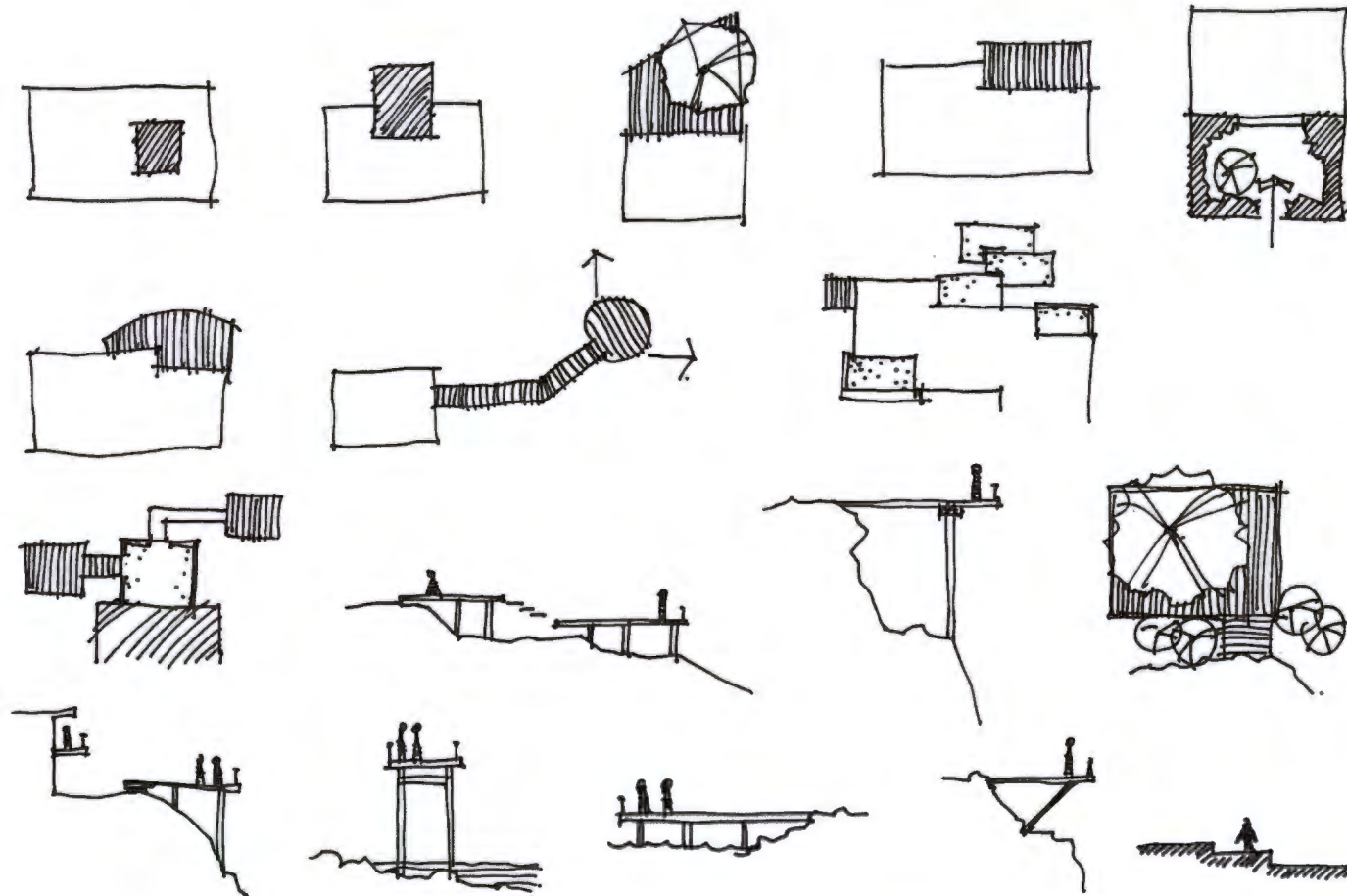
Place making and Design



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Place making and Design

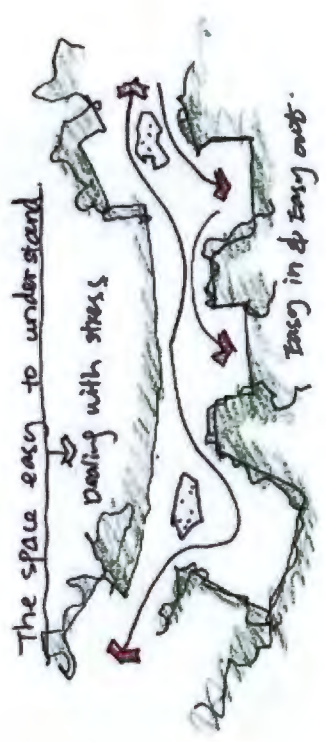
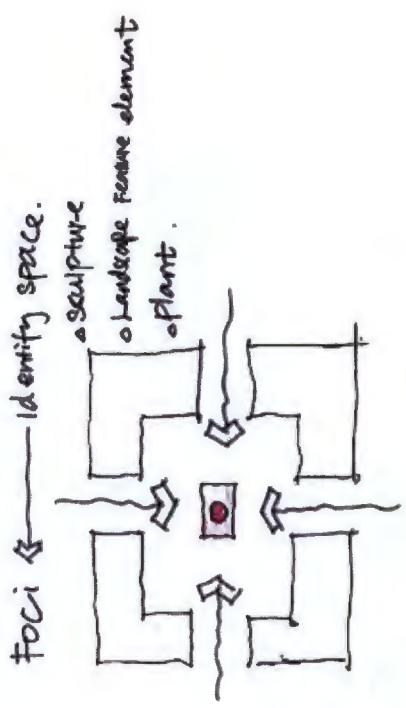
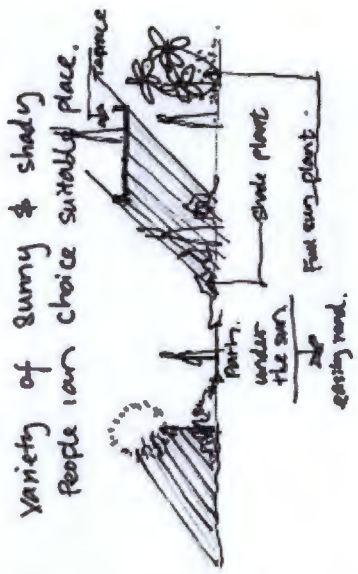
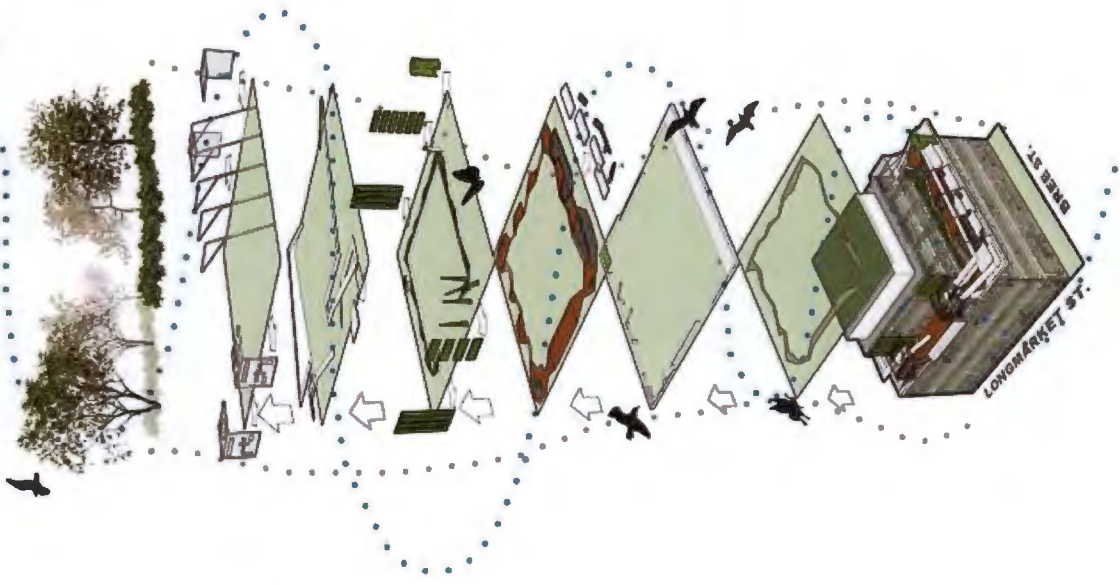


Place making study; showing the understanding of space.
Sketches indicating potential proposed landscape design
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Conceptual Design

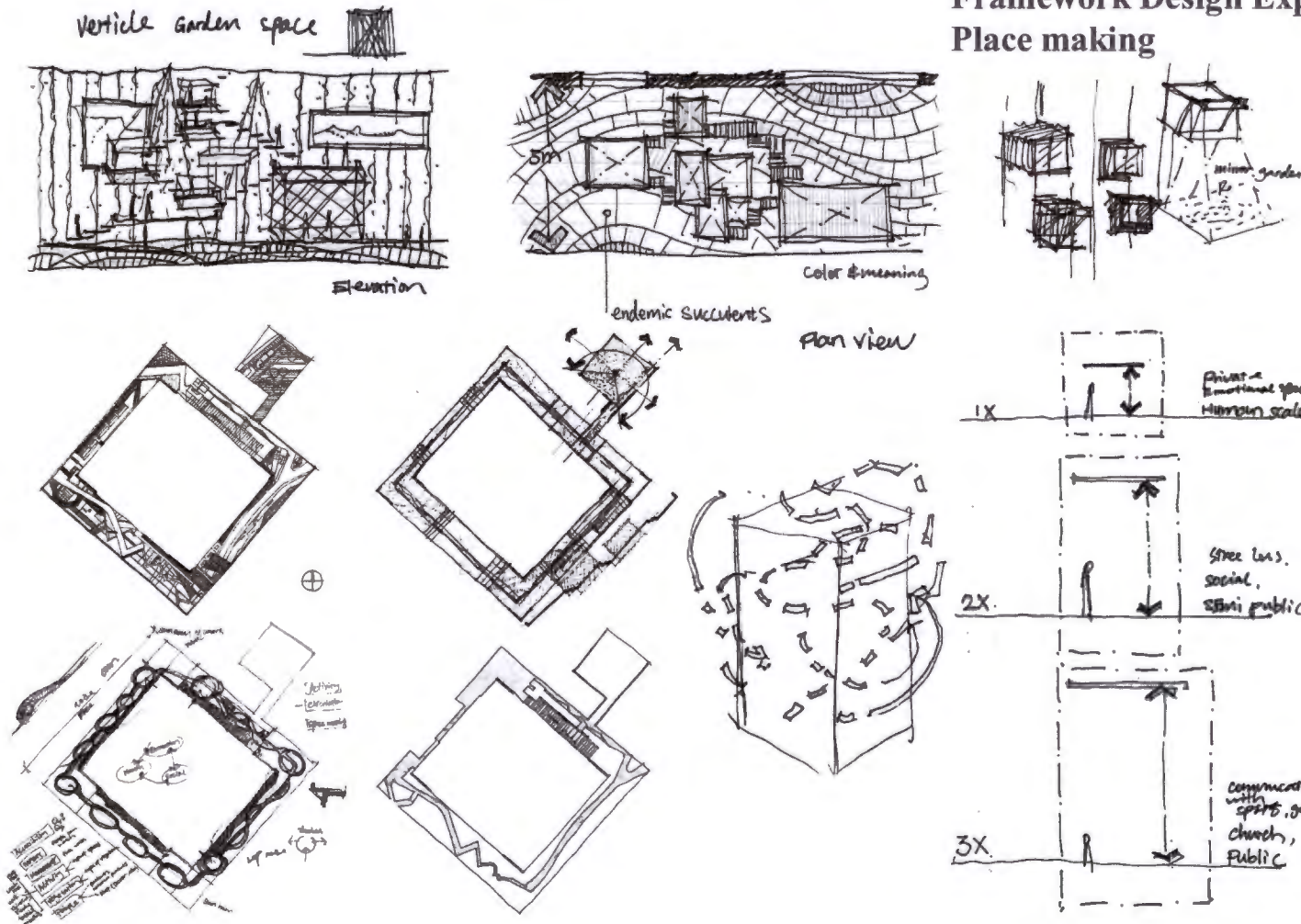
Framework Design Exploration



Conceptual Design

Framework Design Exploration

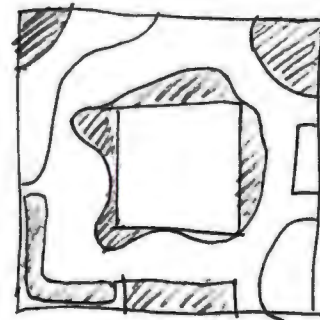
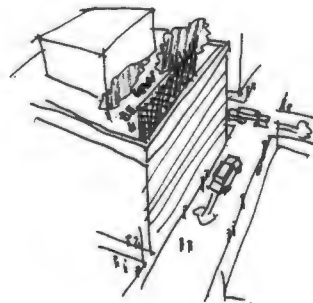
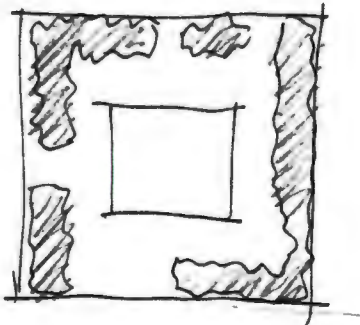
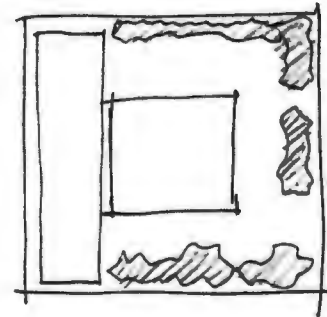
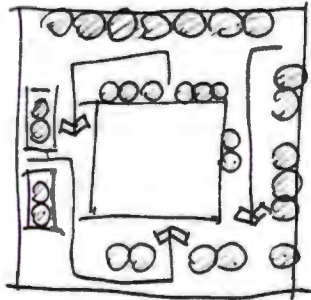
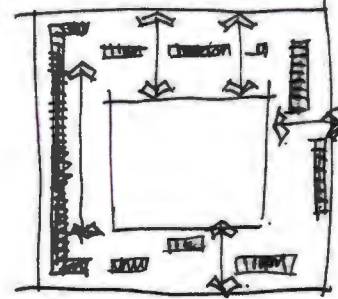
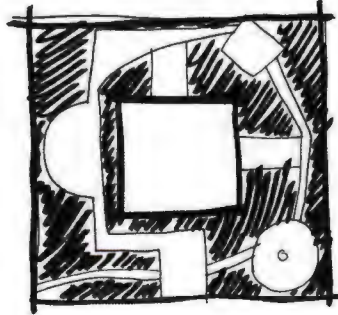
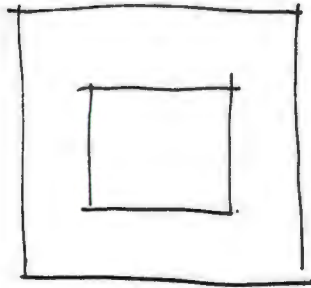
Place making



These images indicate the conceptual design integrating ideas and critically examining them; taking into considerate space making, circulation, structure, function, nature and culture.

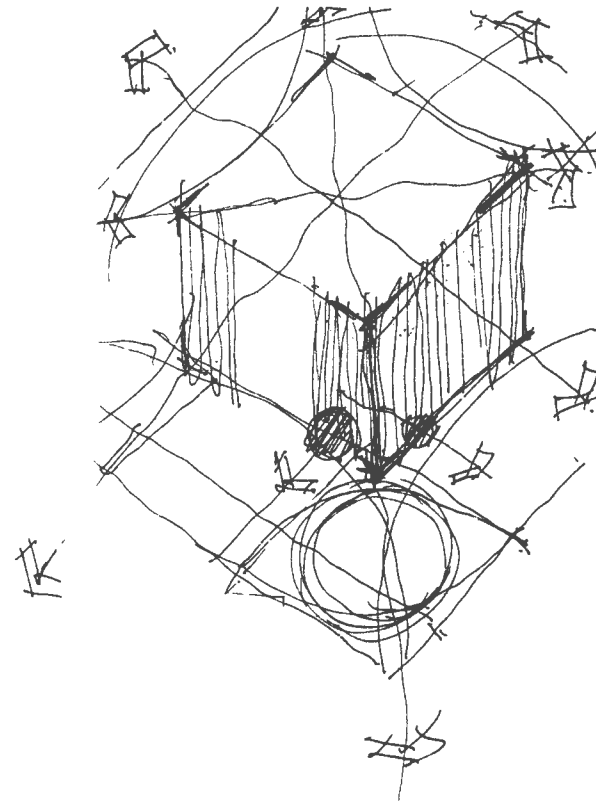
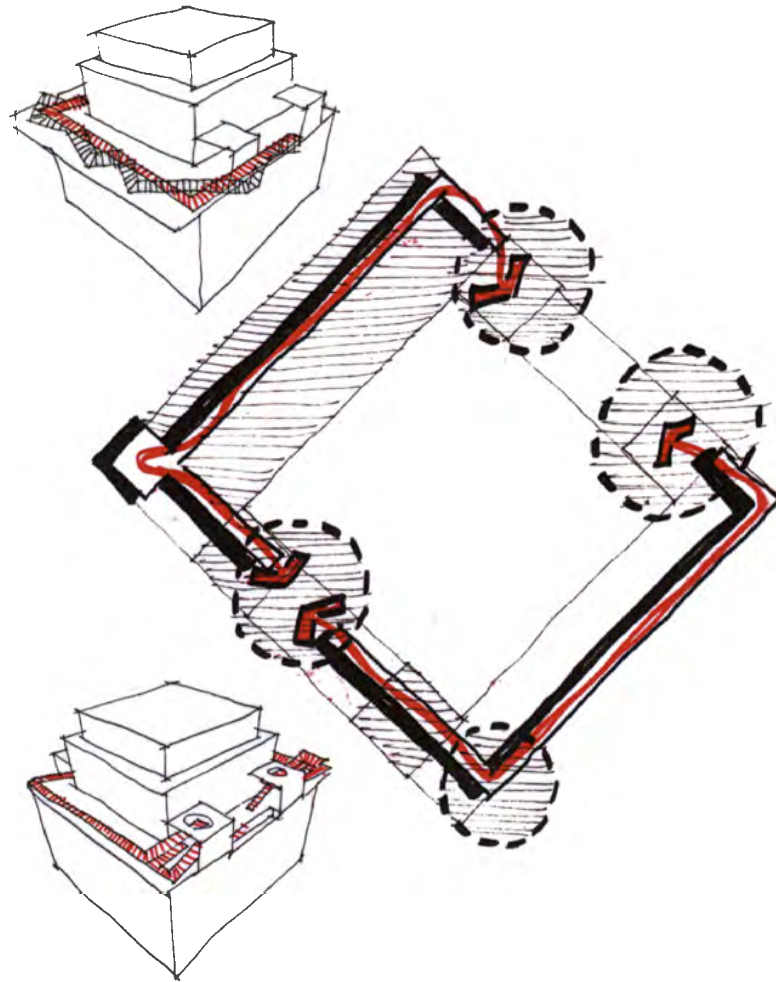
Conceptual Design

Framework Design Exploration
Place making



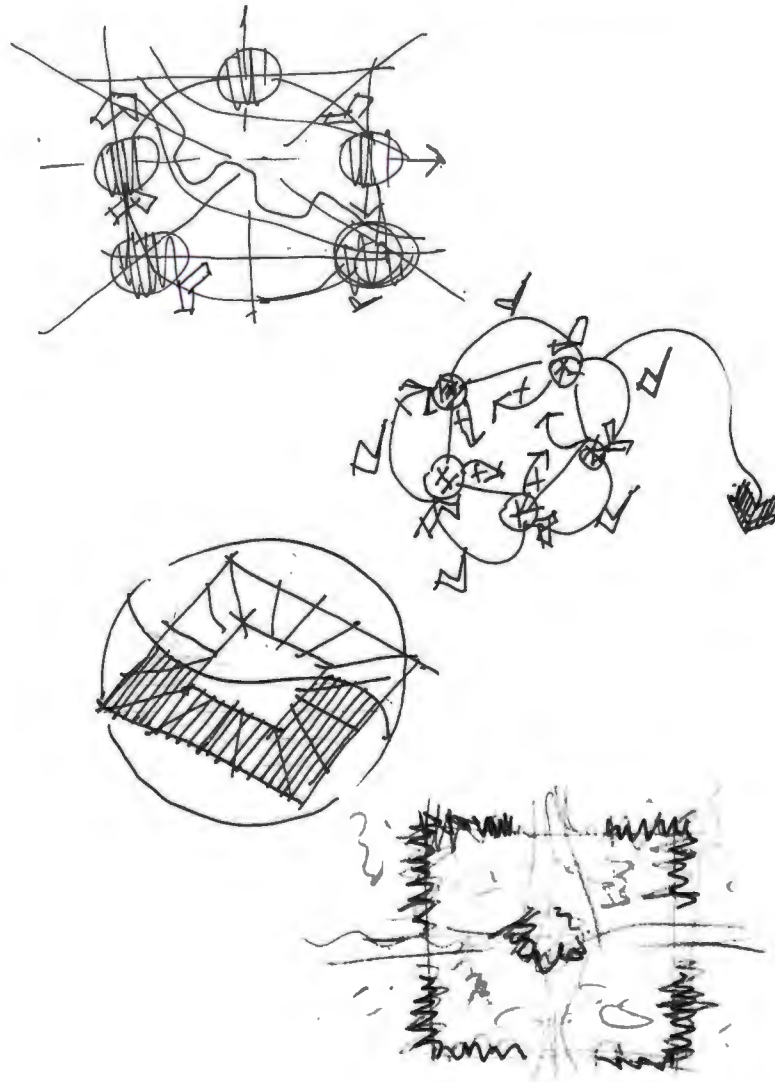
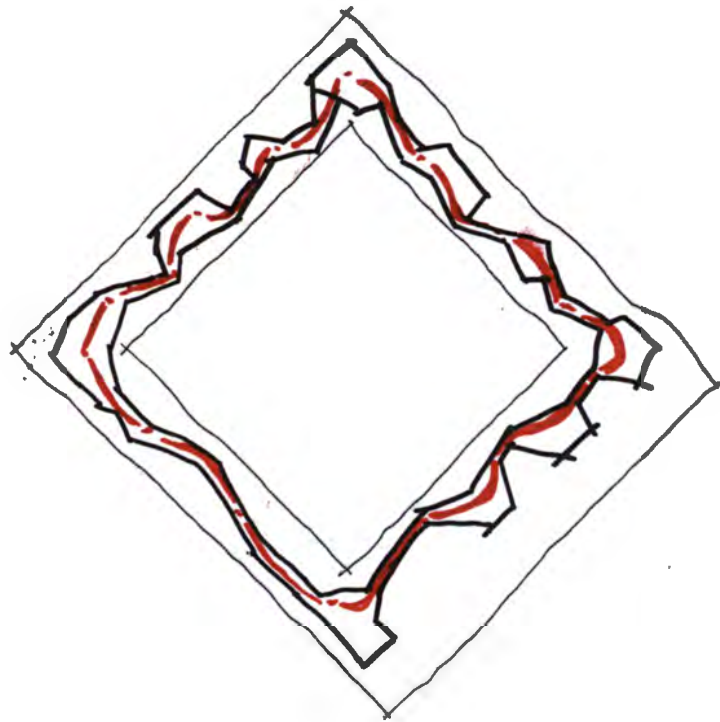
Conceptual Design

Framework Design Exploration
Place making



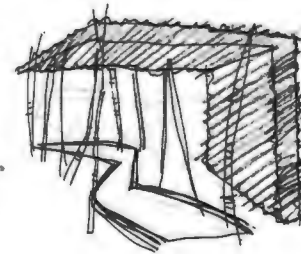
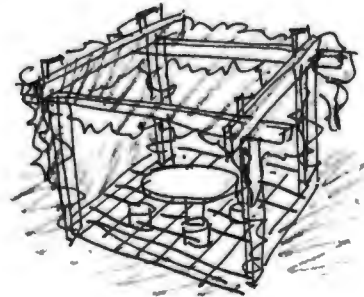
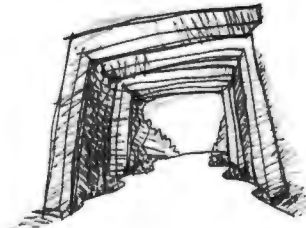
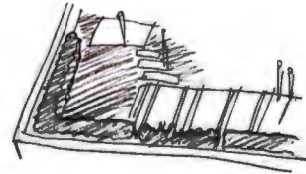
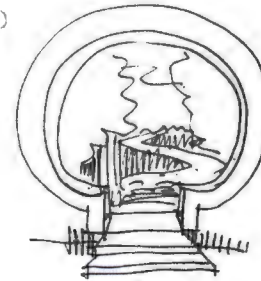
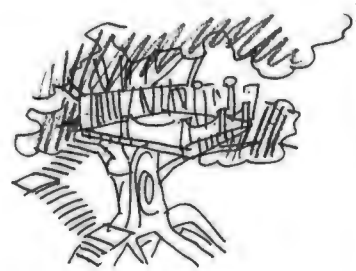
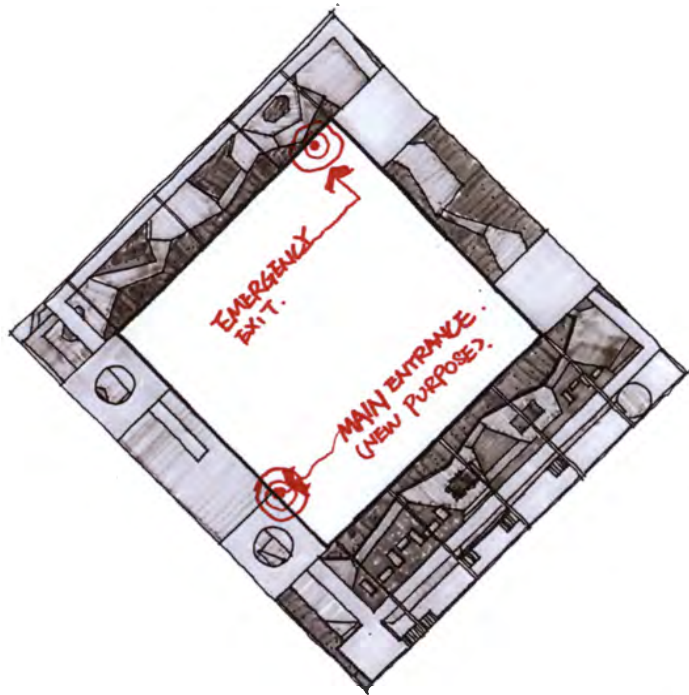
Conceptual Design

Framework Design Exploration
Place making



Conceptual Design

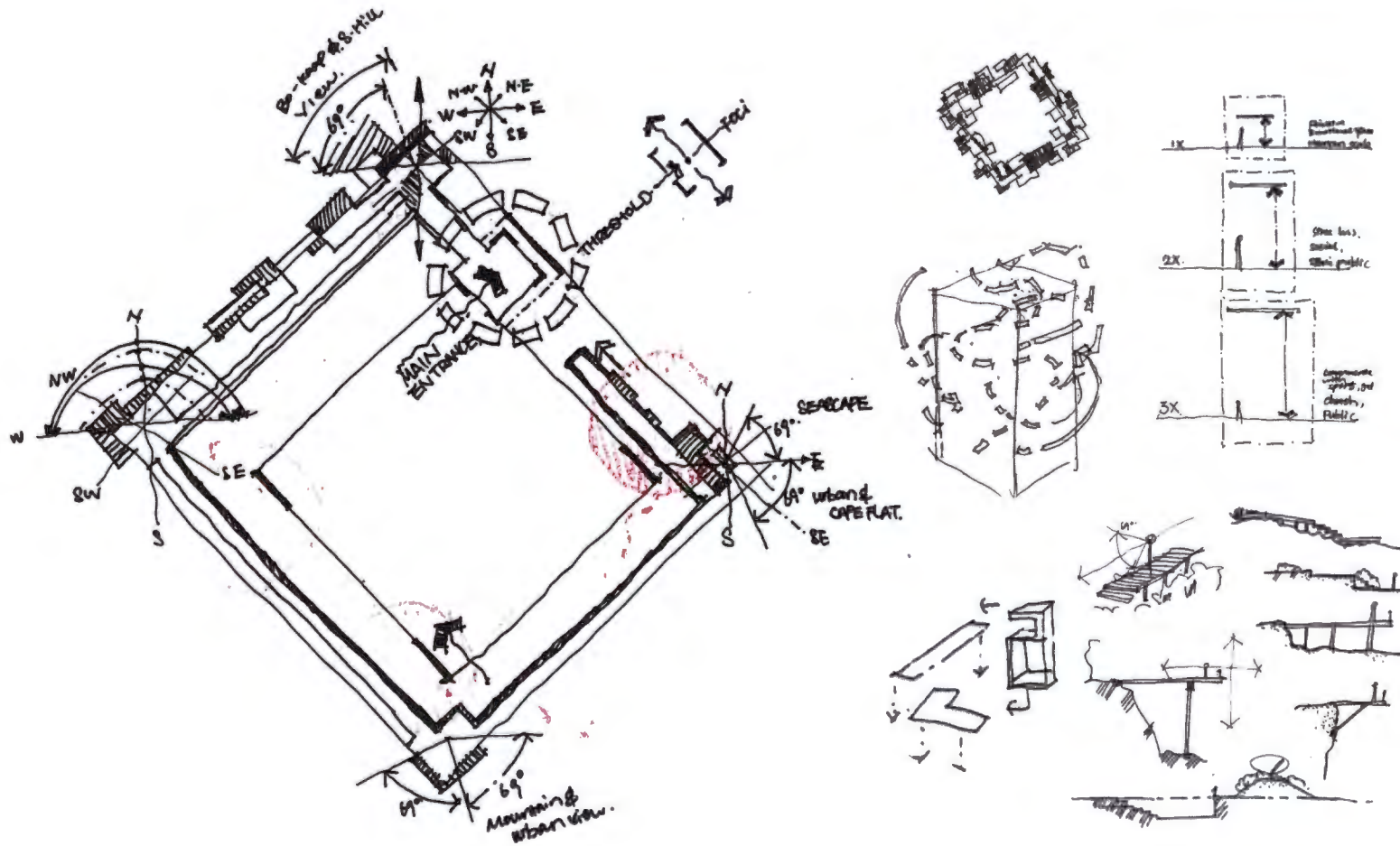
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Place making

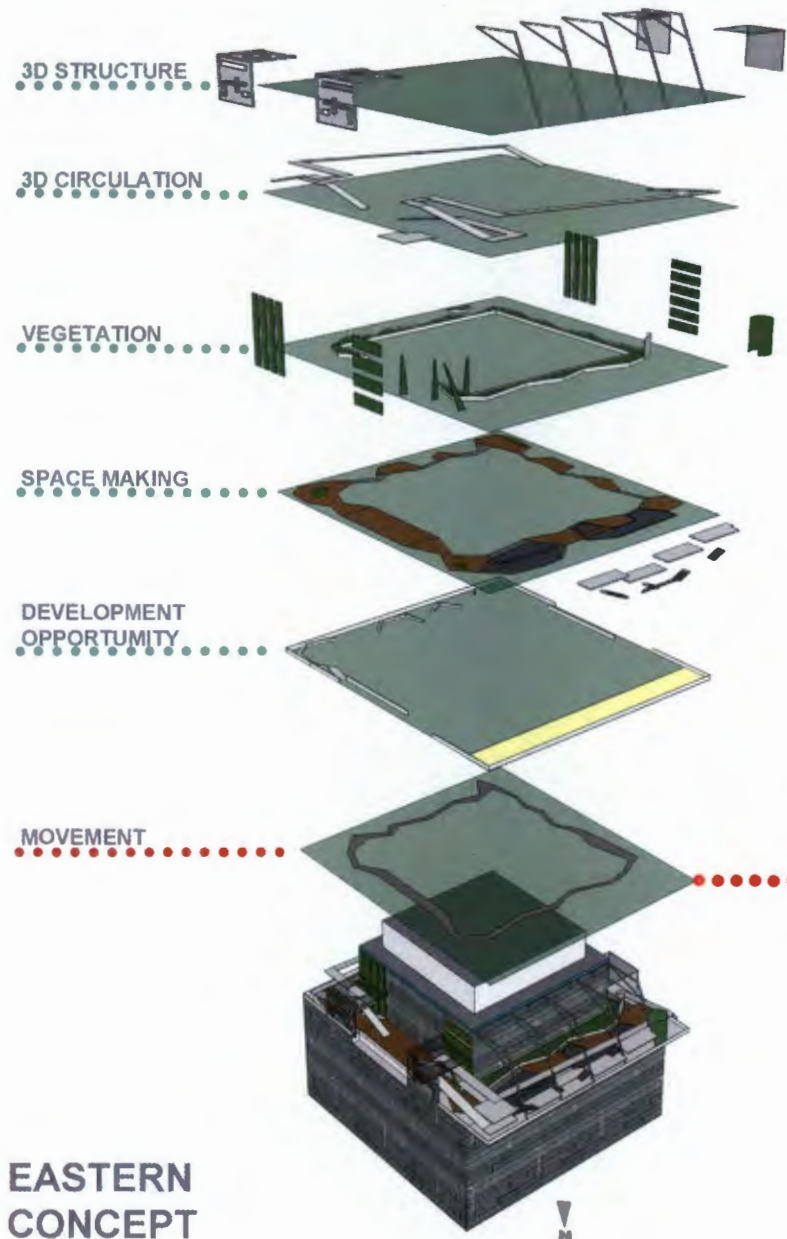


Conceptual Design

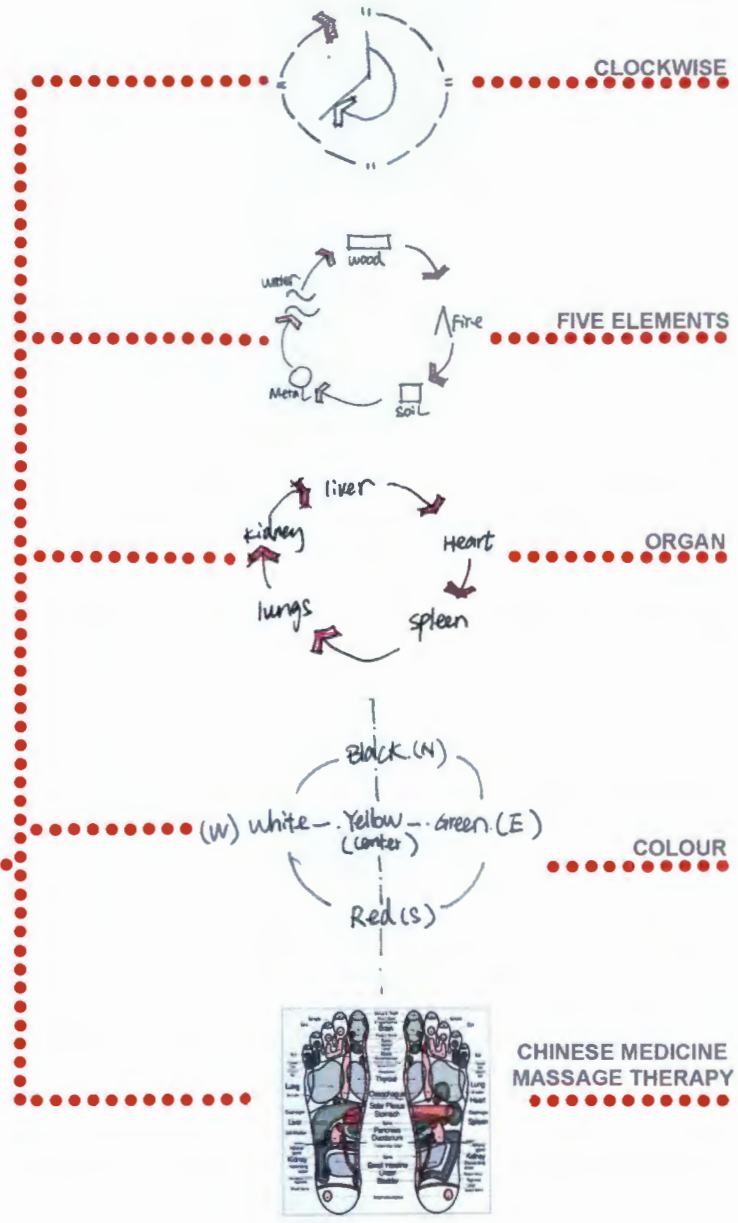
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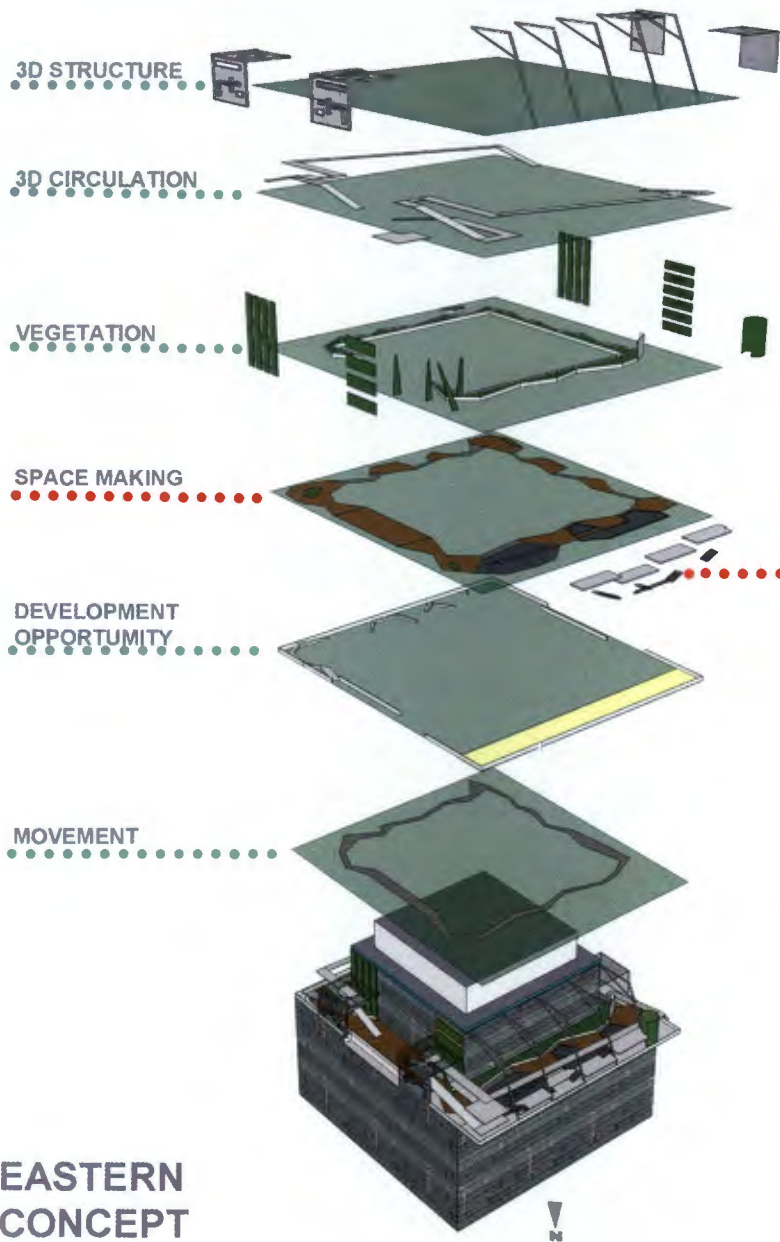
Scale & place making



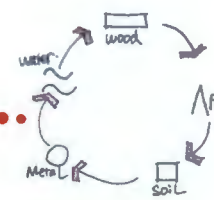


EASTERN CONCEPT

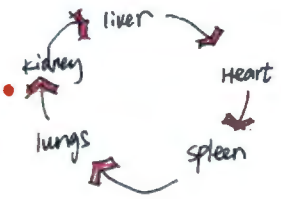




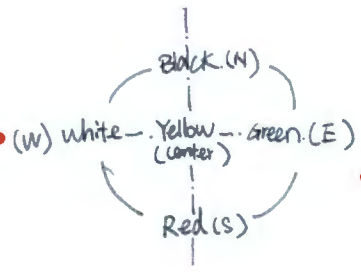
YIN YANG



FIVE ELEMENTS



ORGAN



COLOUR

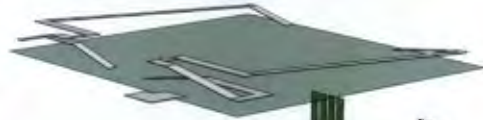


SEASON

3D STRUCTURE



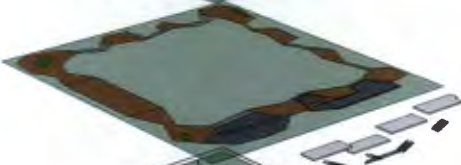
3D CIRCULATION



VEGETATION



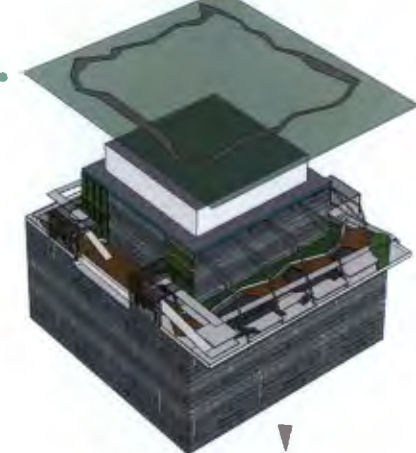
SPACE MAKING



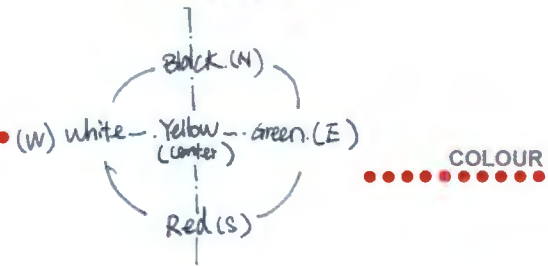
DEVELOPMENT OPPORTUNITY



MOVEMENT



EASTERN CONCEPT



COLOUR



SEASON

3D STRUCTURE



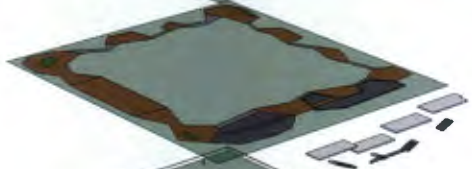
3D CIRCULATION



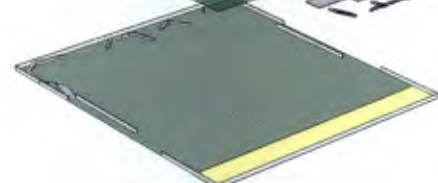
VEGETATION



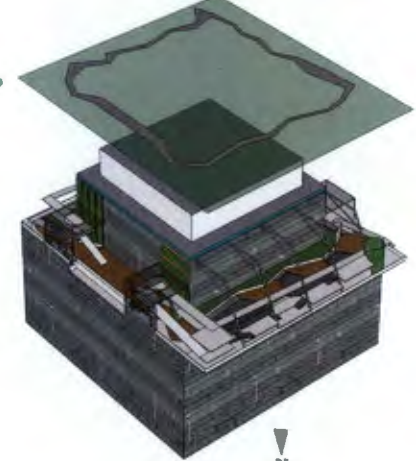
SPACE MAKING



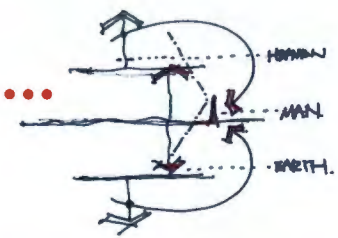
DEVELOPMENT OPPORTUNITY



MOVEMENT



EASTERN CONCEPT



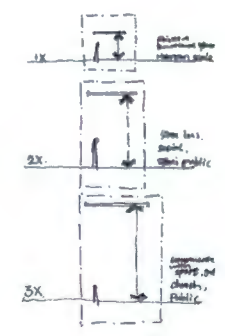
TIAN DI REN CONCEPT



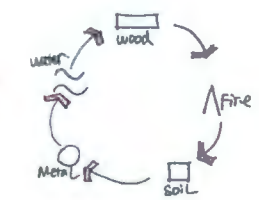
CHINESE MEDICINE MASSAGE THERAPY



YIN YANG

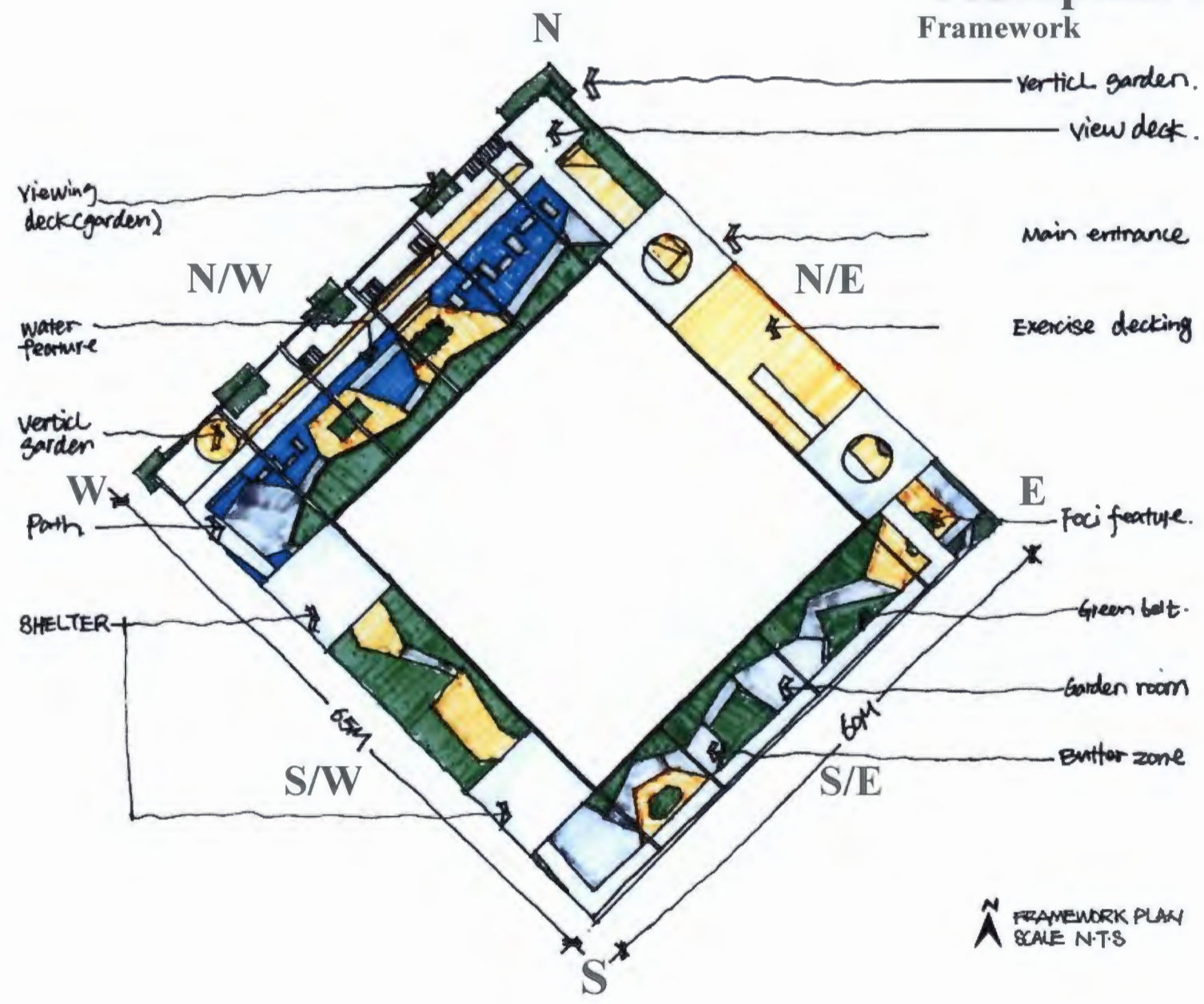


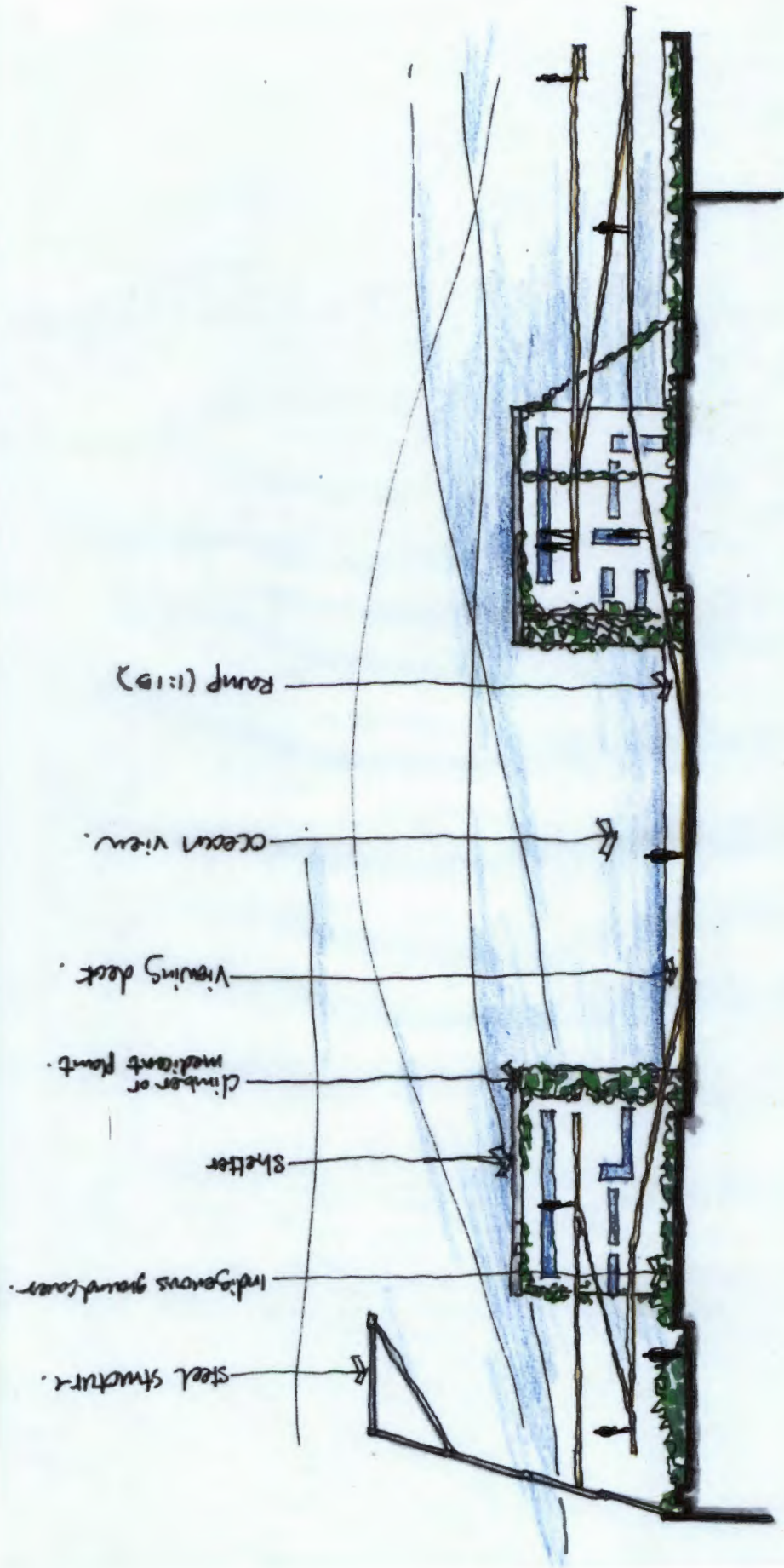
SENSE OF SCALE



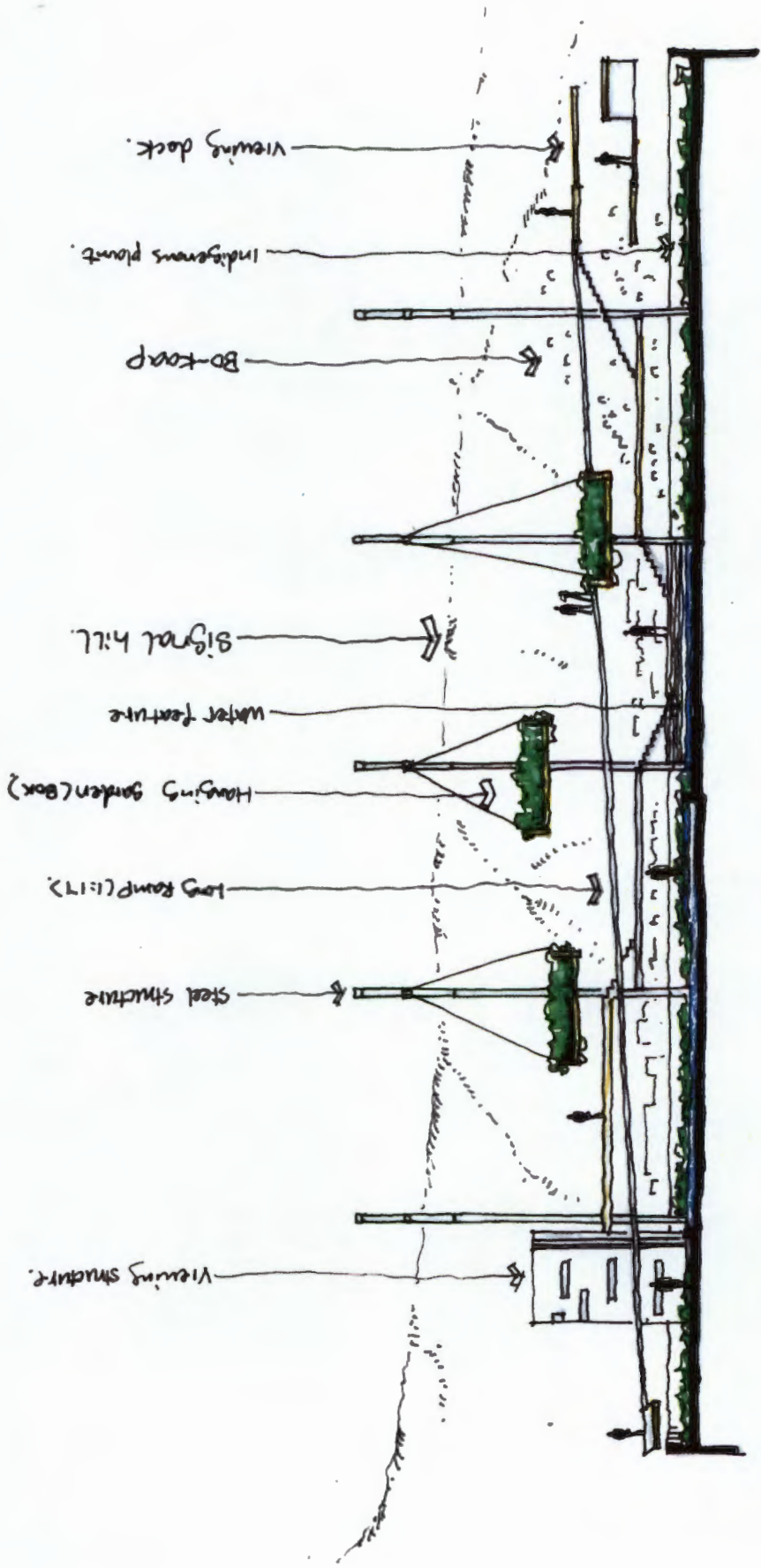
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Conceptual Design Framework





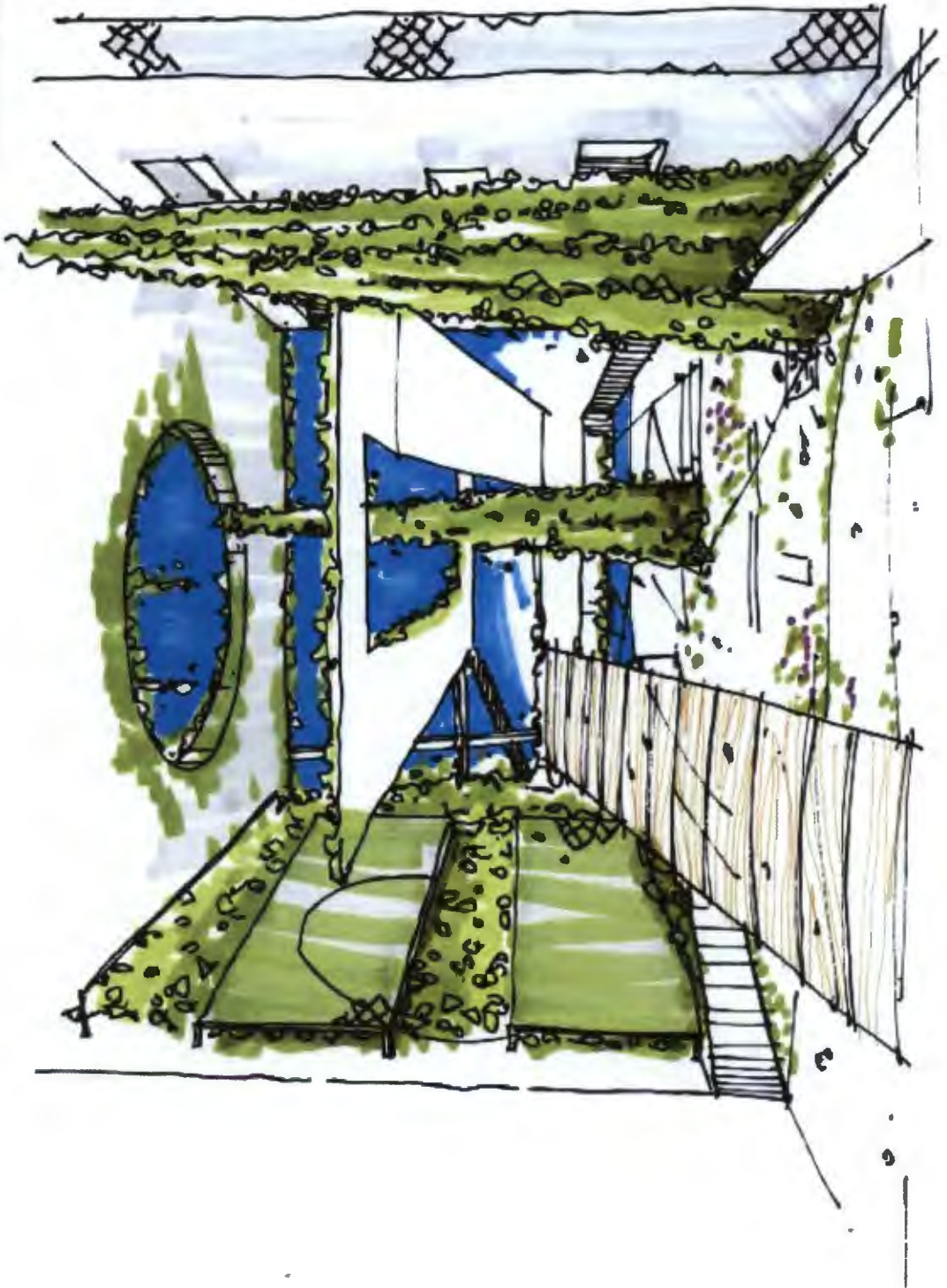
N/E SIDE SECTION



N/W SIDE SECTION

Conceptual Design

Entrance sketch



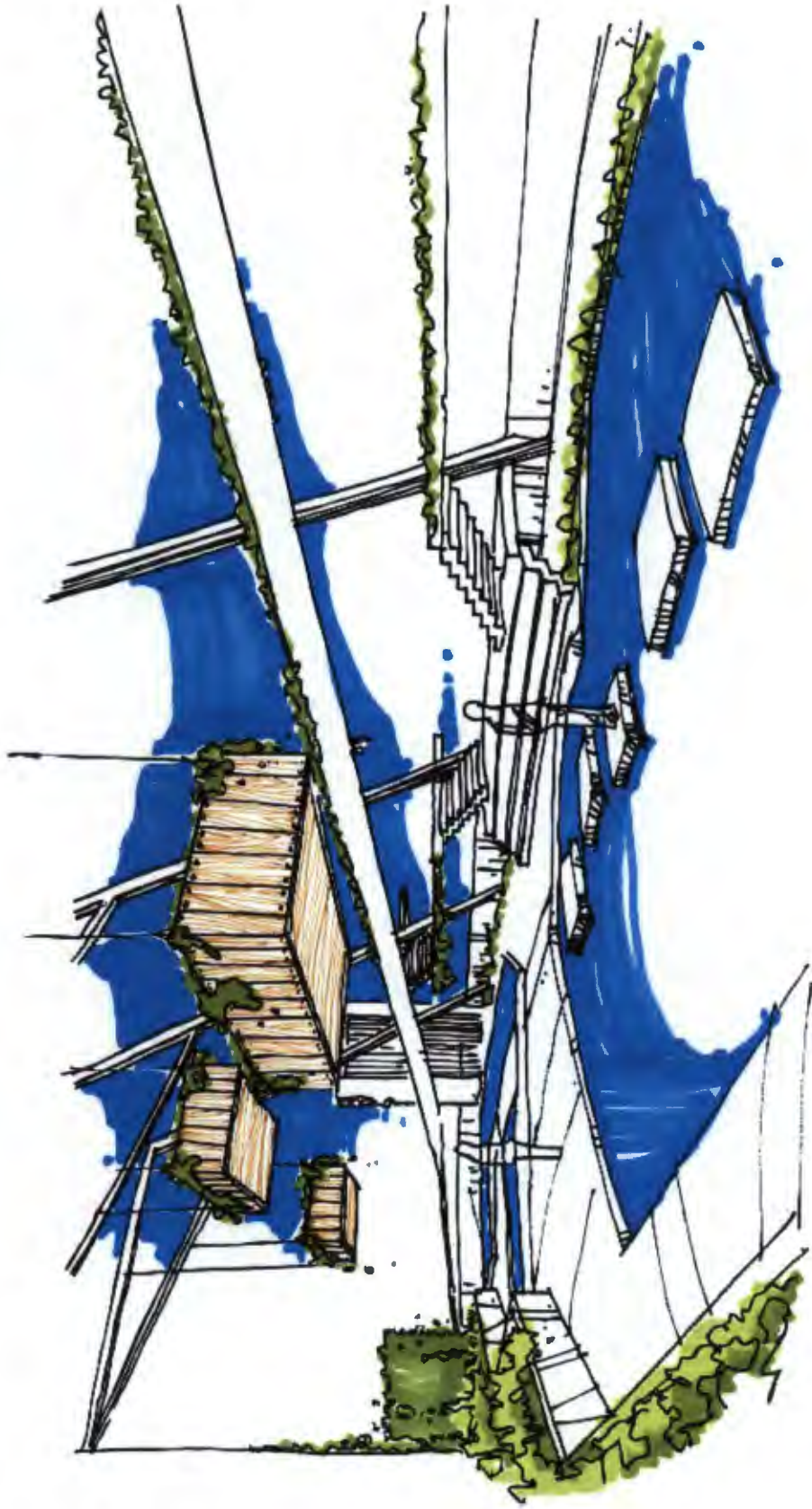
Conceptual Design

North Corner Sketch



Conceptual Design

N/W Side Sketch

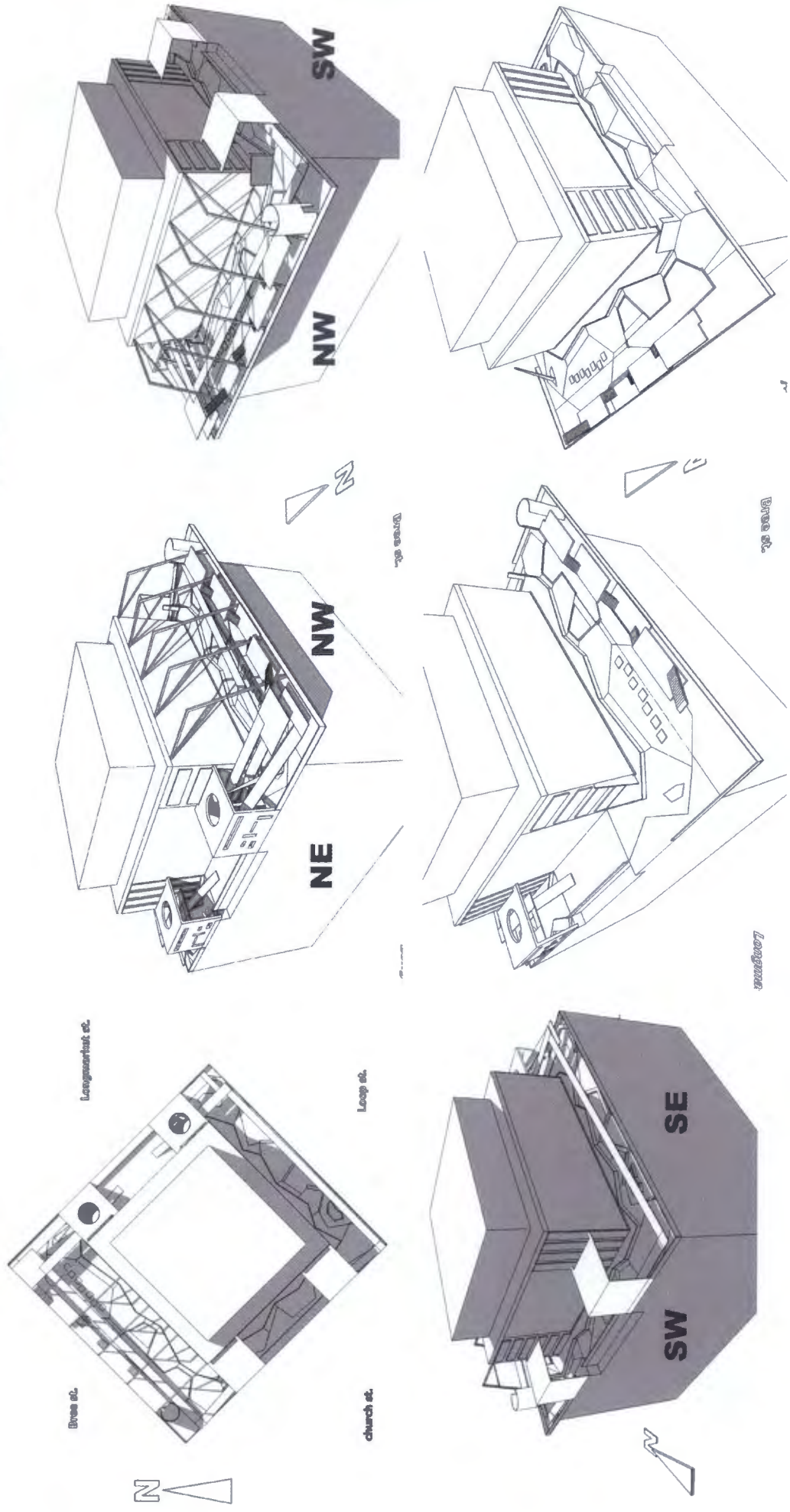


Conceptual Design

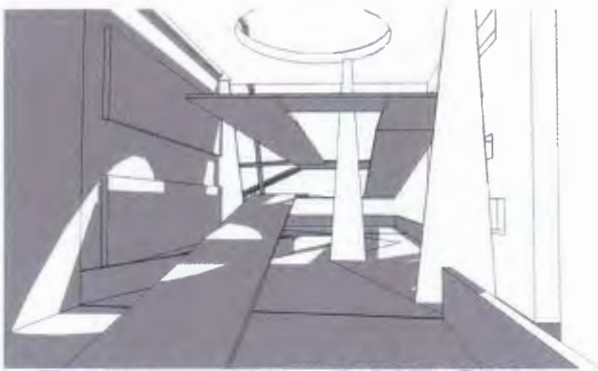
S/E Side Sketch



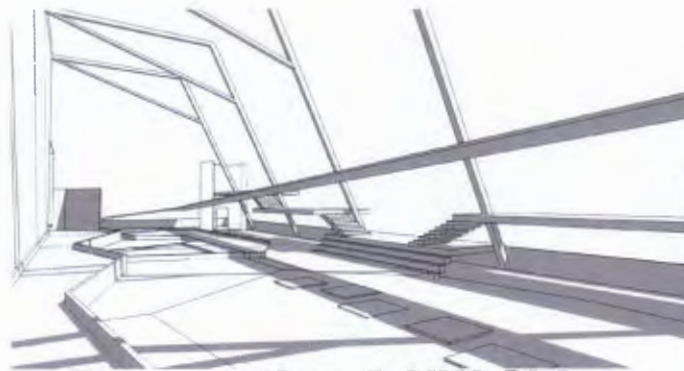
Conceptual Design Framework



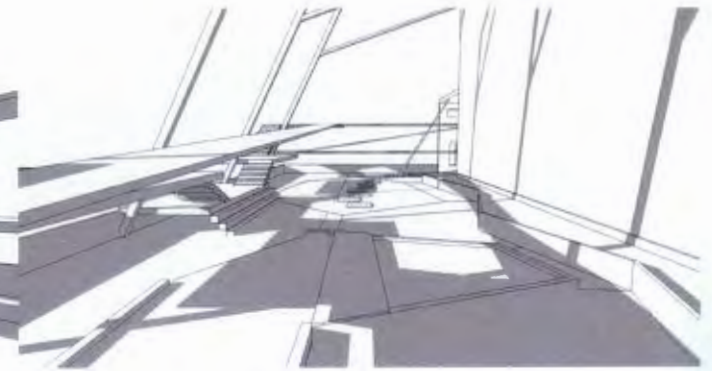
Conceptual Design Framework



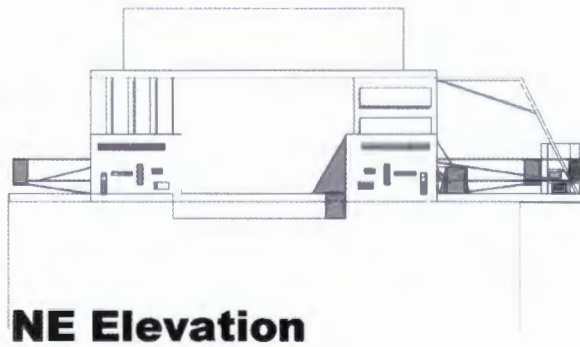
Perspective @ NE Side



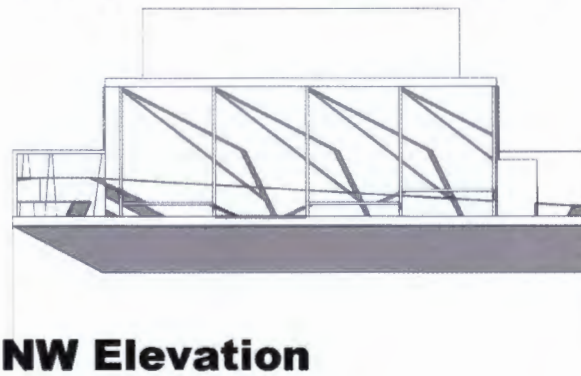
Perspective @ NW Side



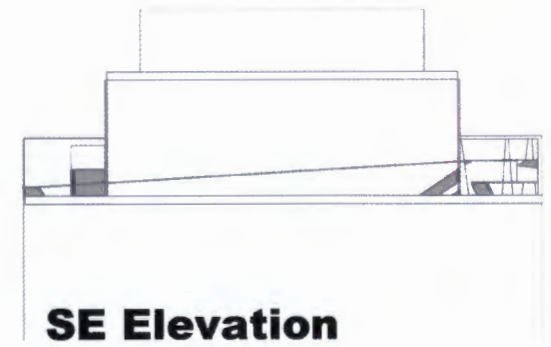
SE Elevation



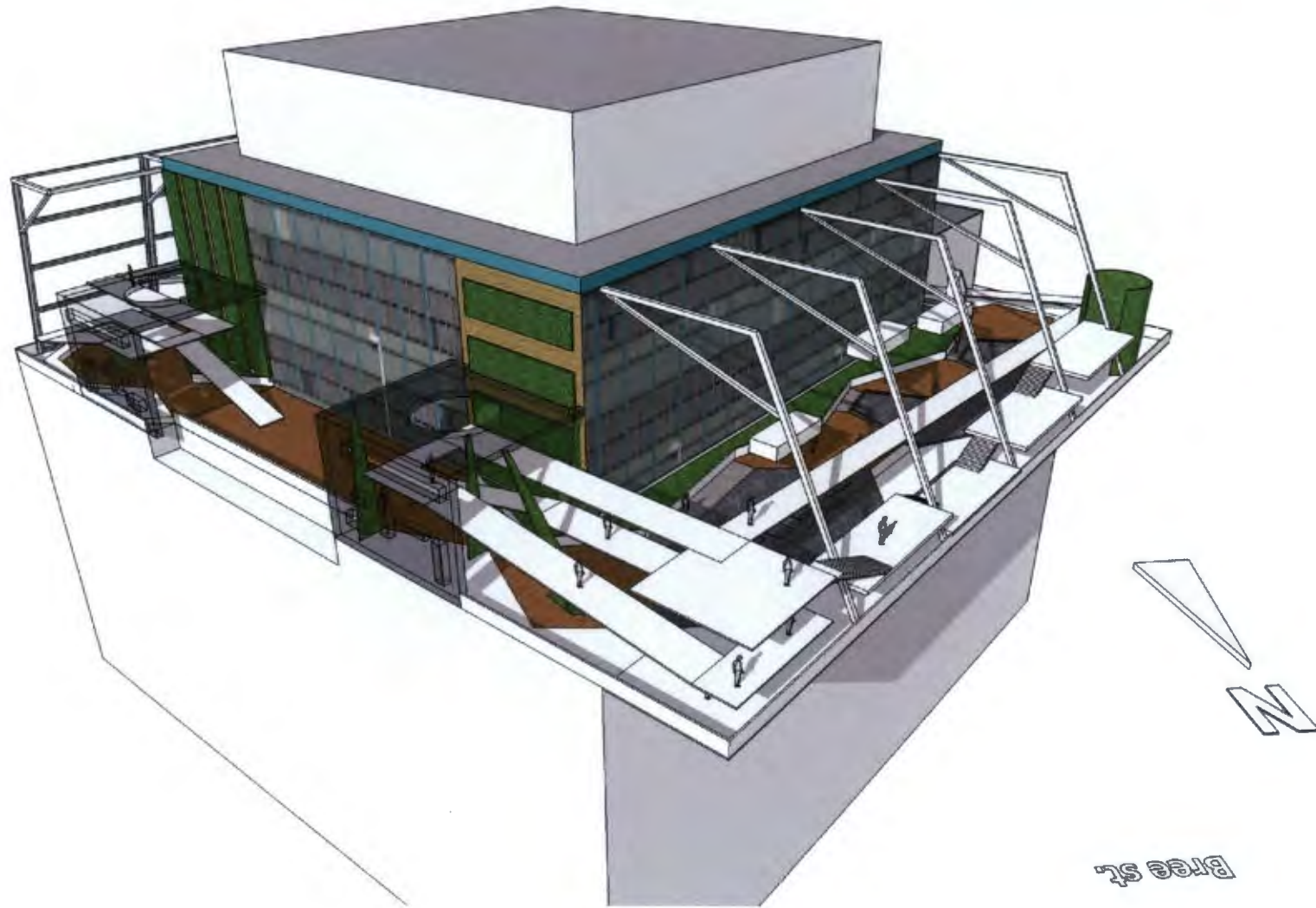
NE Elevation



NW Elevation

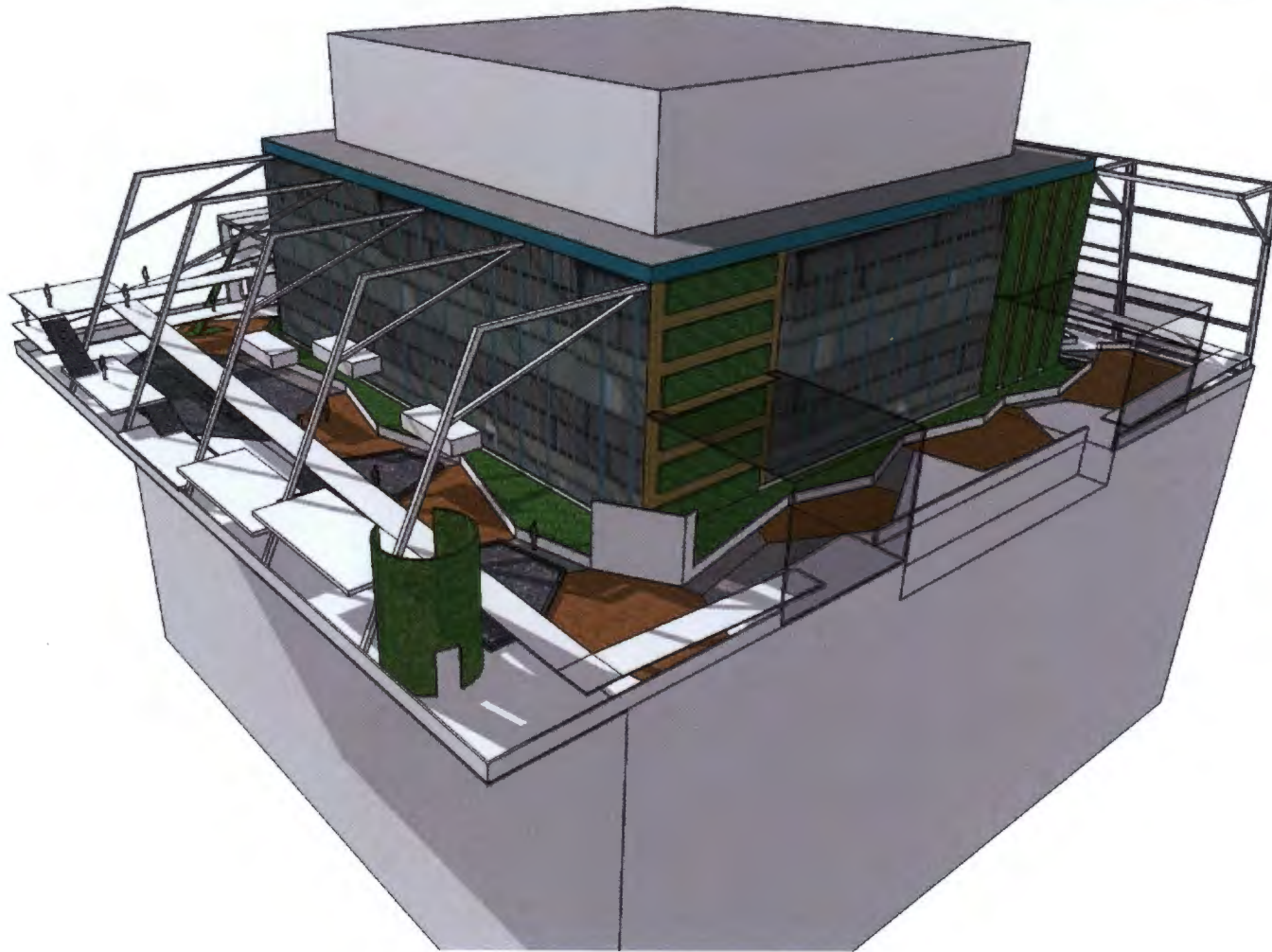


Conceptual Design Framework



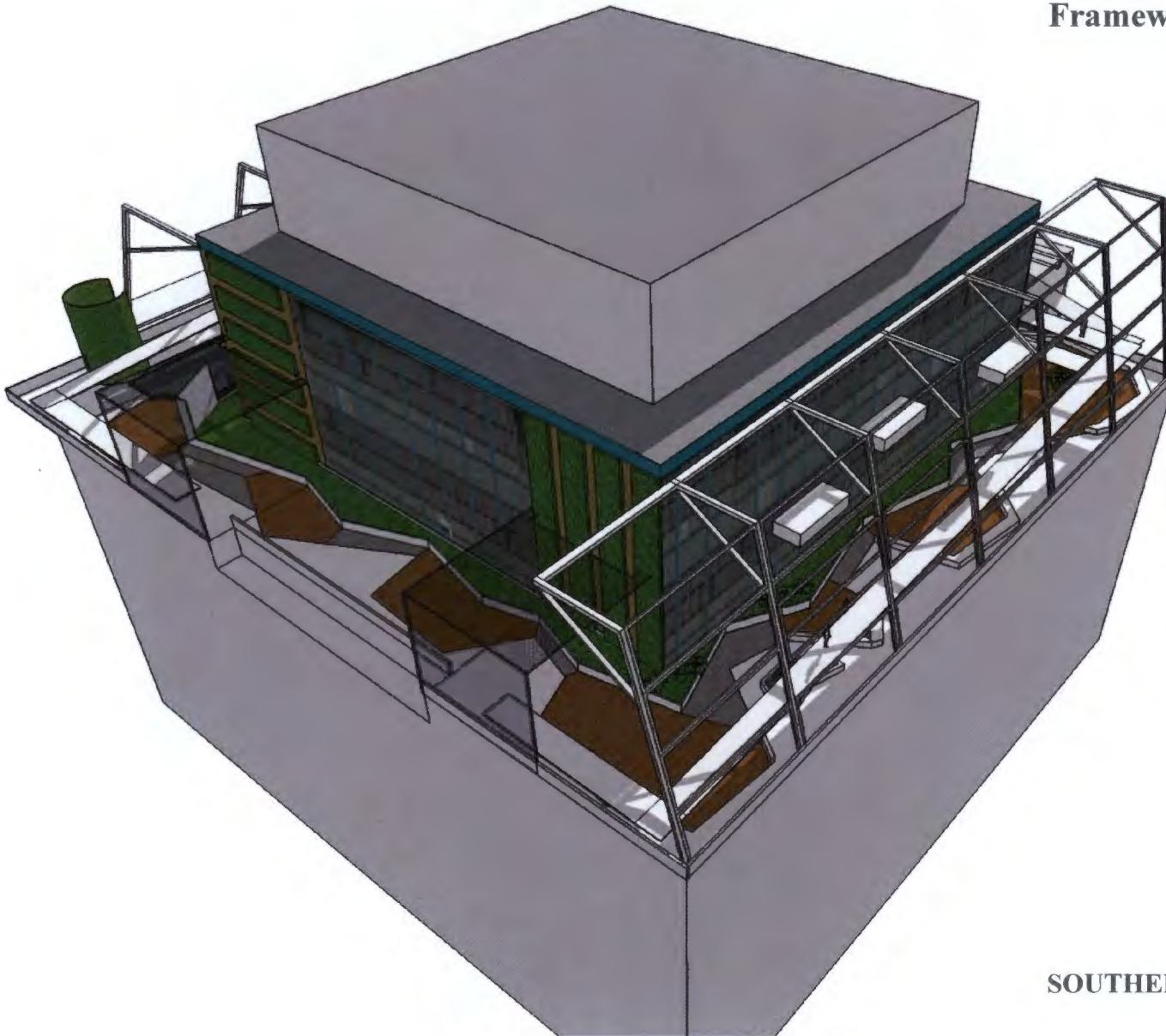
NORTHERN SIDE PERSPECTIVE

Conceptual Design Framework



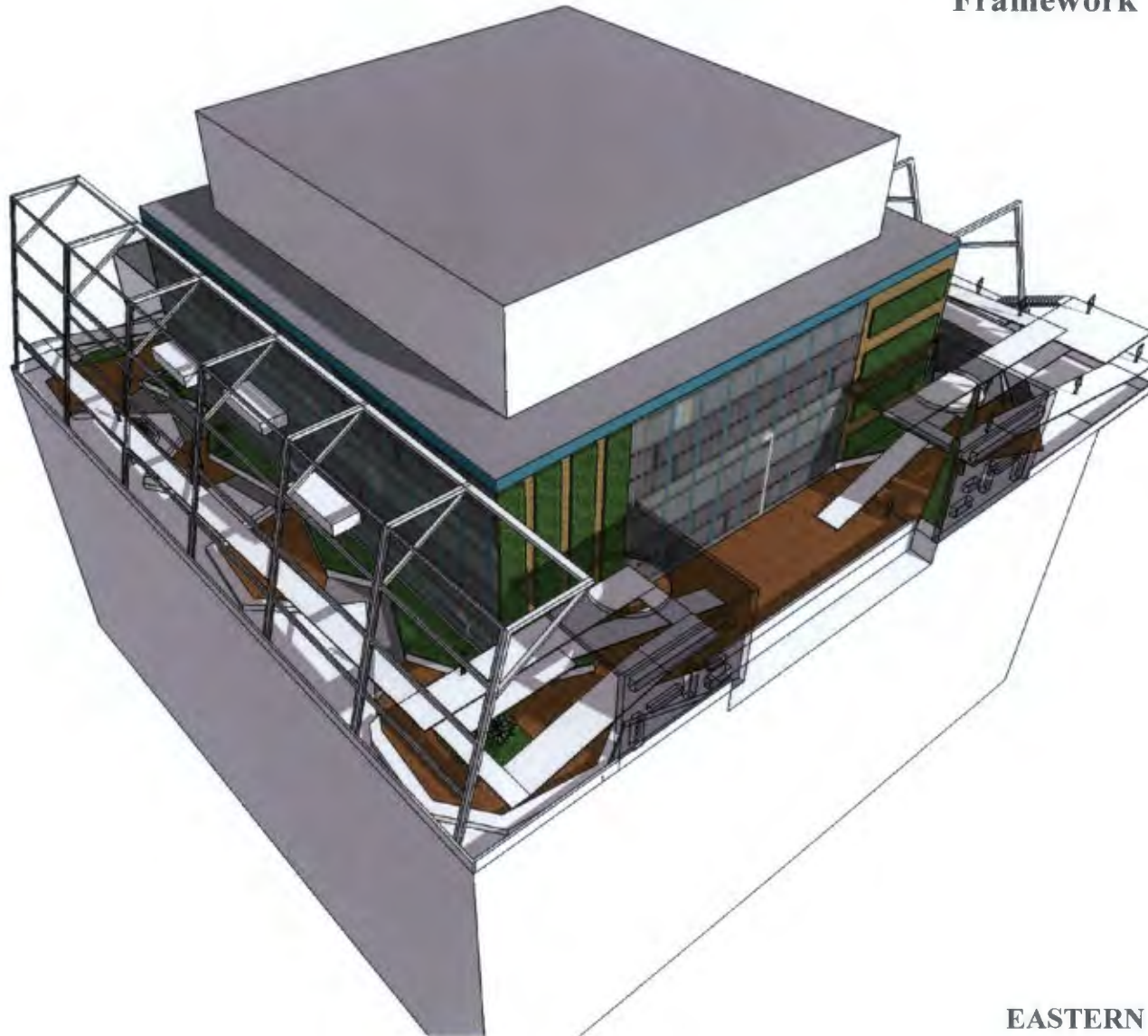
WESTERN SIDE PERSPECTIVE

Conceptual Design Framework



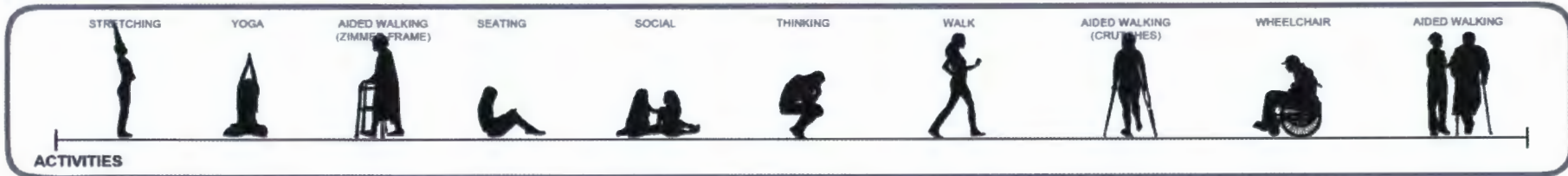
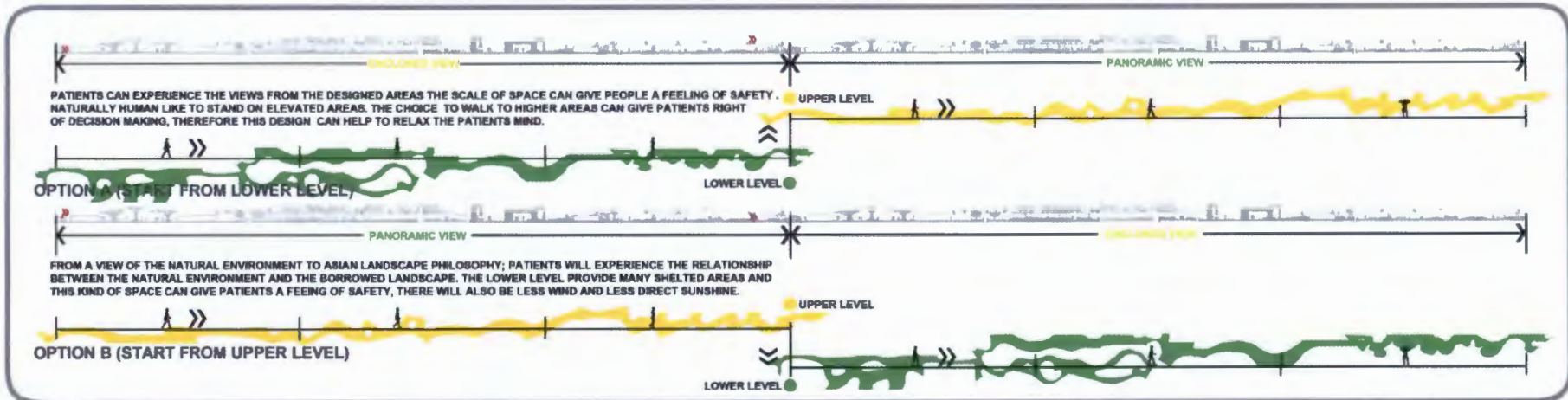
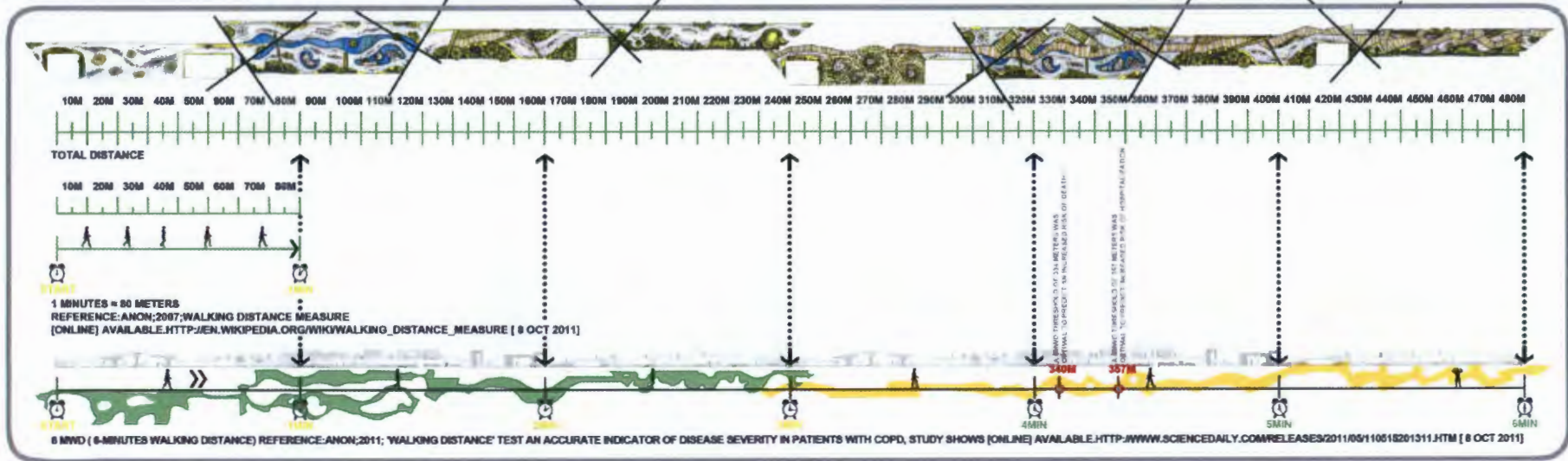
SOUTHERN SIDE PERSPECTIVE

Conceptual Design Framework



EASTERN SIDE PERSPECTIVE

Design Development





MANY HOSPITALS DO NOT CONSIDER THAT THE USE OF THE "NATURAL ENVIRONMENT" CAN FORM PART OF THE HEALING PROCESS. THE VALUE OF THE NATURAL ENVIRONMENT IS THAT IT CAN BE USED TO DE-STRESS AND RELAX THE PATIENT'S MIND.

THE SURROUNDING ENVIRONMENT HAS AN EFFECT ON THE PSYCHOLOGICAL AND SOCIAL ASPECTS, AND SUITABLE LIVING ENVIRONMENTS COULD HELP PEOPLE TO RELAX, BE CALM AND FEEL REFRESHED. (LABONTE, 2005)

IT IS IMPORTANT FOR HOSPITALS TO HAVE HAPPY ENVIRONMENTS. THE SPIRIT, MIND AND BODY ARE FUNDAMENTAL BIOPSYCHOSOCIAL ELEMENTS. THE BIOPSYCHOSOCIAL MODEL DISTINGUISHES BETWEEN PATHOPHYSIOLOGICAL PROCESSES THAT CAUSE DISEASE AND THE PATIENT'S PERCEPTION OF THEIR HEALTH AND ITS EFFECT ON ILLNESS.

LANDSCAPE ARCHITECTURE AS AN INSTRUMENTAL TOOL CAN IMPROVE THE QUALITY OF THE ENVIRONMENT, THEREFORE IMPROVING HEALTH. DESIGNING A "HAPPY" ENVIRONMENT FOR PATIENTS WILL HELP PATIENTS TO FEEL CALM, HAVE LESS STRESS AND THUS RECOVER MORE SPEEDILY. THE "HAPPY" ENVIRONMENT CONCEPT MUST BE TAKEN INTO CONSIDERATION WITH SOCIAL AND PSYCHOLOGICAL ASPECTS. SPACES NEED TO BE DESIGNED FOR PATIENTS THAT ASSIST THEM TO OBTAIN OR MAINTAIN A POSITIVE ATTITUDE.



RED FLOWER

	Hemerocallis aurea	AUTUMN
	Leucopernum cordifolium	SUMMER
	Cyanthus alatus	SUMMER
	Chamaejasme floribunda	SUMMER
	Astragalus cordifolius	SUMMER
	Aloe clavata	SUMMER
	Tecoma capensis	RED
	Hyphae cardinalis	SUMMER

WHITE FLOWER

	Asparagus pinnatifidus	SUMMER
	Asparagus speciosus	SUMMER
	Dietes grandiflora	SUMMER
	Zantedeschia albomaculata	SUMMER
	Jasminum multiflorum	SUMMER
	Tropaeolum majus	SUMMER
	Aporosa disticha	SPRING
	Metelasma auriculata	4 SEASONS

YELLOW FLOWER

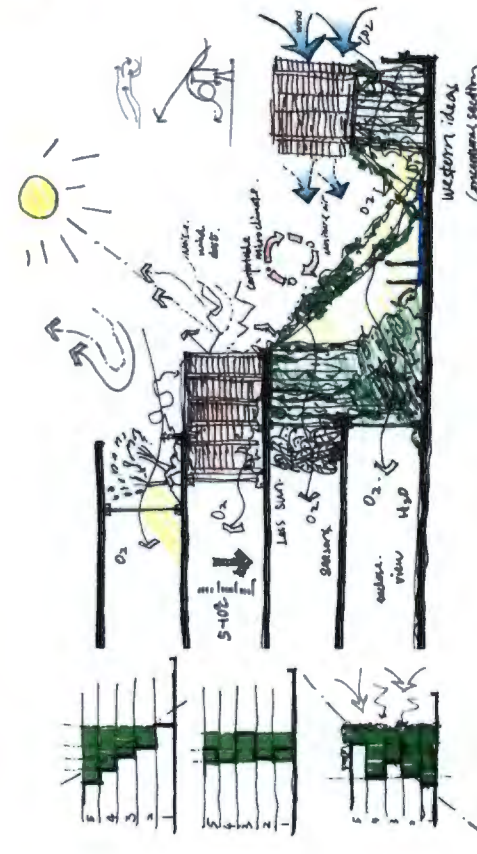
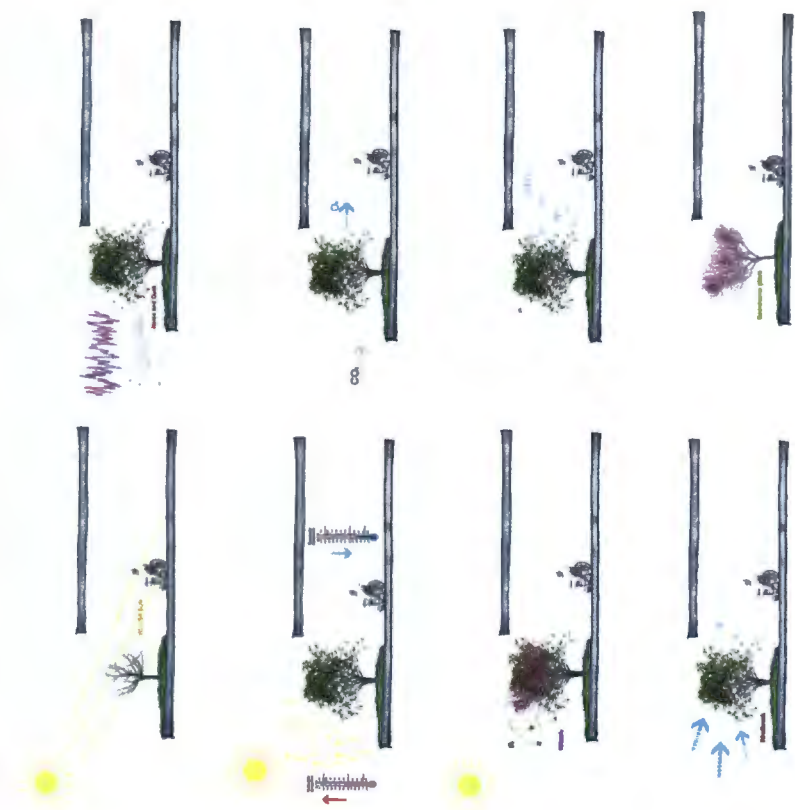
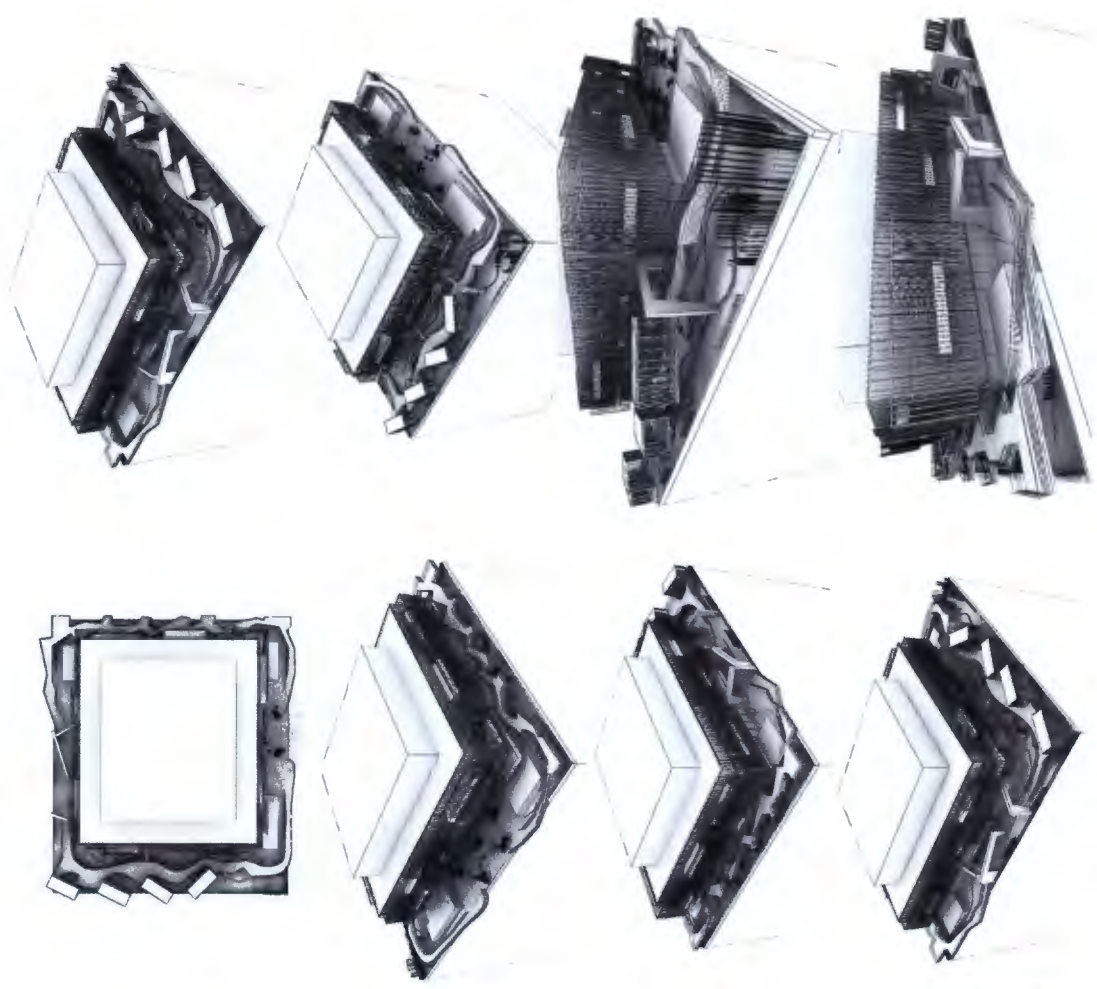
	Chamaejasme floribunda	SUMMER
	Dietes bicolor	SUMMER
	Sesuvio tamoides	SUMMER
	Ruellia strepera	SUMMER
	Leucopernum hypophylla	SPRING SUMMER
	Leucopernum streptolobum	SPRING SUMMER
	Leucopernum sessile	SPRING SUMMER
	Leschea cyrtoides	SUMMER

GREEN FLOWER

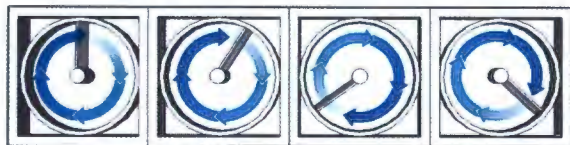
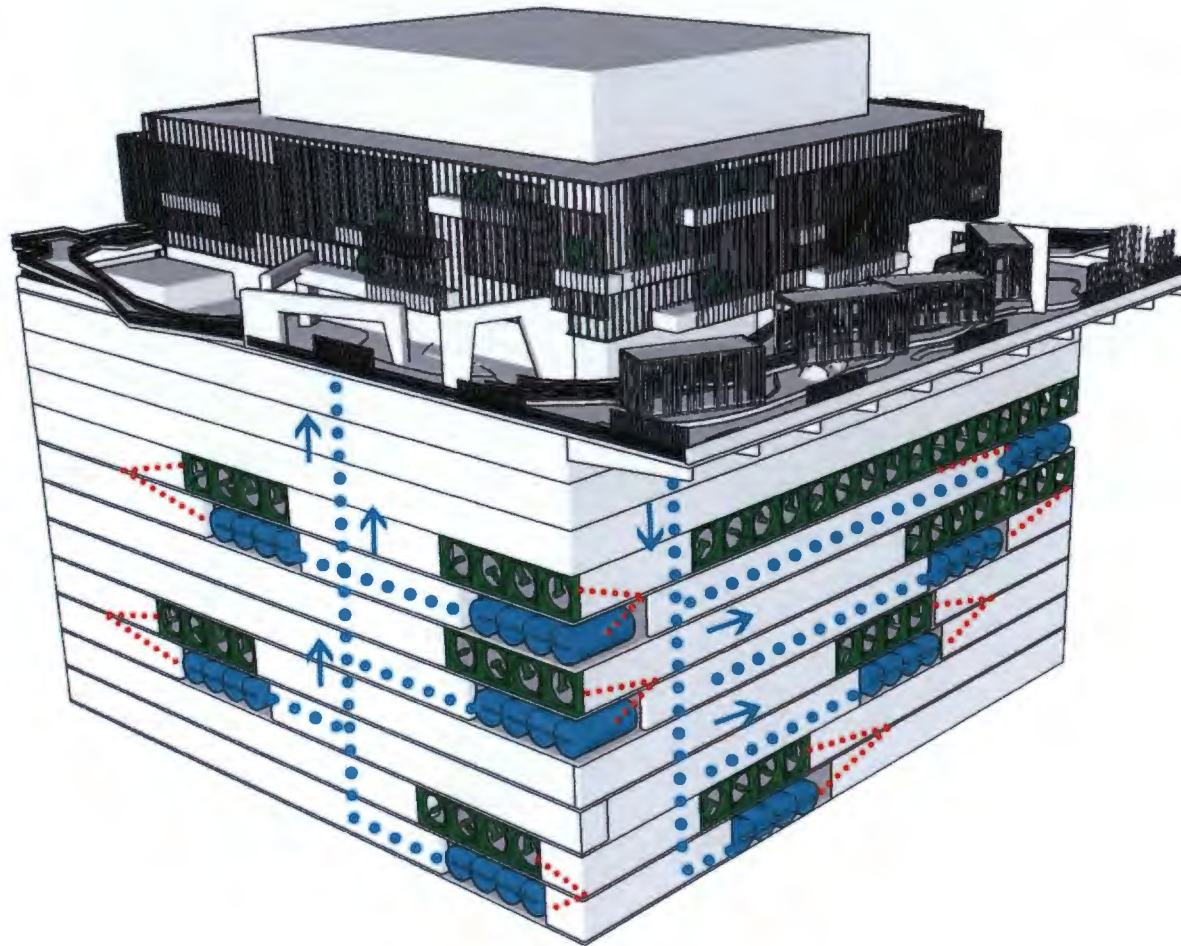
	Ruellia strepera	SUMMER
	Zantedeschia bicolor	SUMMER
	Sesuvio macrocarpum	SUMMER
	Ruellia strepera	SUMMER
	Ruellia strepera	SUMMER

BLACK FLOWER

	Asparagus pinnatifidus	SUMMER
	Eucodius autumnalis	SUMMER
	Zantedeschia black	SUMMER
	Tacca chantrieri	SUMMER
	Ruellia strepera	SUMMER



Western ideas
Conceptual section



TO USE SOME OF THE EXISTING PARKING AREA TO INSTALL WATER TANKS IN ORDER TO STORE RAIN WATER GATHERED FROM THE ROOF TERRACE AND OTHER ROOFS OF THE BUILDING. WIND POWER CAN BE USED TO PUMP WATER FROM THE STORAGE AREA BACK TO TERRACE LEVEL FOR USE DURING THE DRY SEASON FOR IRRIGATION AND GREY WATER PURPOSES SUCH AS WATER FOR FLUSHING TOILETS.

THE SEMI CLOSED SPACE PROVIDES PRIVACY FOR PATIENT TO BE CALM AND RELAX AND CAN ALSO BE USED FOR SOCIAL PURPOSES.

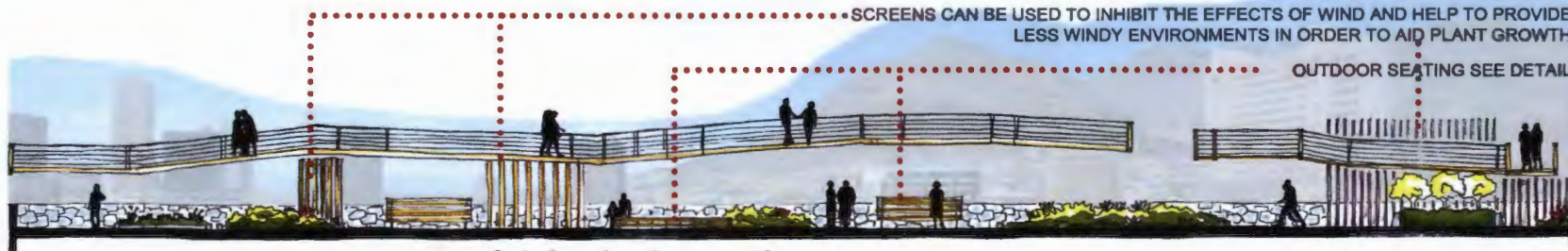
SCREENS CAN BE USED TO INHIBIT THE EFFECTS OF WIND AND HELP TO PROVIDE LESS WINDY ENVIRONMENTS IN ORDER TO AID PLANT GROWTH.



SECTION A_A 1:125@A0 0 2 4 6 10m

SCREENS CAN BE USED TO INHIBIT THE EFFECTS OF WIND AND HELP TO PROVIDE LESS WINDY ENVIRONMENTS IN ORDER TO AID PLANT GROWTH.

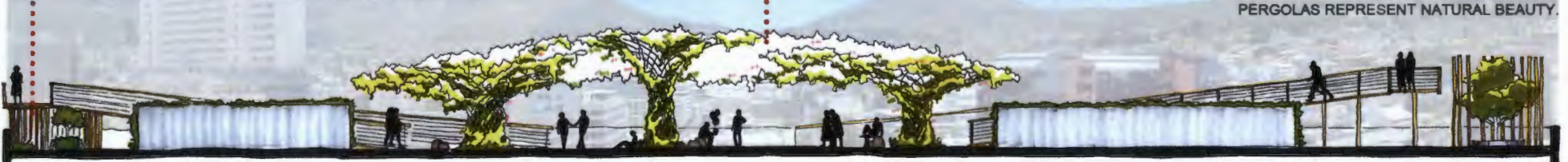
OUTDOOR SEATING SEE DETAIL.



SECTION B_B 1:125@A0 0 2 4 6 10m

SCREENS CAN BE USED TO INHIBIT THE EFFECTS OF WIND AND HELP TO PROVIDE LESS WINDY ENVIRONMENTS IN ORDER TO AID PLANT GROWTH.

THIS TREE SHAPED PERGOLAS HELP TO PROVIDE A SENSE OF SPACE. PATIENTS CAN FEEL THAT THEY STAY IN A NATURAL ENVIRONMENT. ROCKS IN BETWEEN THESE PERGOLAS REPRESENT NATURAL BEAUTY.

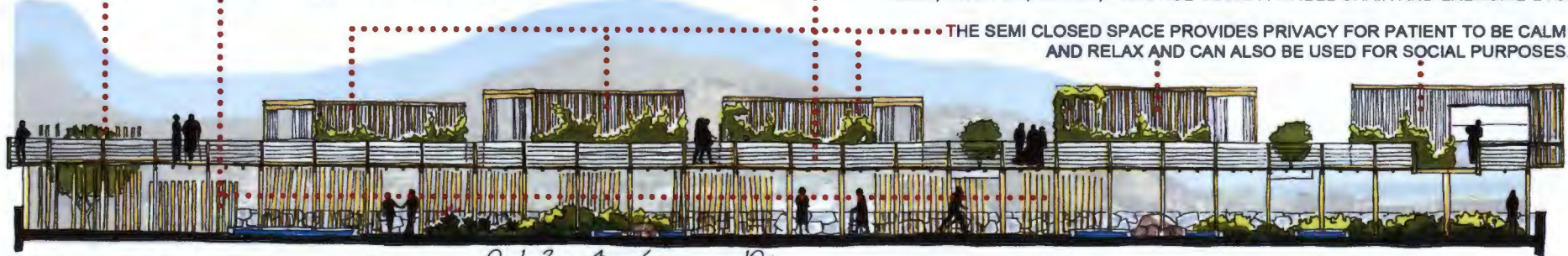


SECTION C_C 1:125@A0 0 2 4 6 10m

SCREENS CAN BE USED TO INHIBIT THE EFFECTS OF WIND AND HELP TO PROVIDE LESS WINDY ENVIRONMENTS IN ORDER TO AID PLANT GROWTH.

LONG BRIDGE WALKWAYS PROVIDE AN OPPORTUNITY FOR PATIENT TO WALK AND RELAX AND RELIEVE STRESS WHILE ALLOWING PATIENTS TO GET A BETTER VIEW OF THE NATURAL ENVIRONMENT SURROUNDING THEM. THESE BRIDGES PROVIDE SPACES THAT ALLOW PATIENT TO PREFORM A MULTITUDE OF ACTIVITIES SUCH AS WALK, STRETCH, WATCH, PRACTICE USING A WHEEL CHAIR AND EXERCISE ETC.

THE SEMI CLOSED SPACE PROVIDES PRIVACY FOR PATIENT TO BE CALM AND RELAX AND CAN ALSO BE USED FOR SOCIAL PURPOSES.

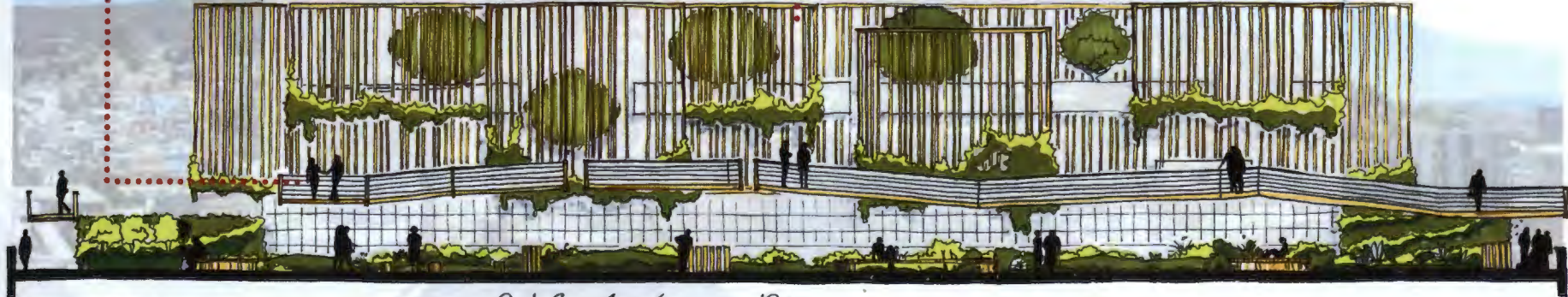


SECTION D_D 1:125@A0



LONG BRIDGE WALKWAYS PROVIDE AN OPPORTUNITY FOR PATIENT TO WALK AND RELAX AND RELIEVE STRESS WHILE ALLOWING PATIENTS TO GET A BETTER VIEW OF THE NATURAL ENVIRONMENT SURROUNDING THEM. THESE BRIDGES PROVIDE SPACES THAT ALLOW PATIENT TO PREFORM A MULTITUDE OF ACTIVITIES SUCH AS WALK, STRETCH, WATCH, PRACTICE USING A WHEEL CHAIR AND EXERCISE ETC.

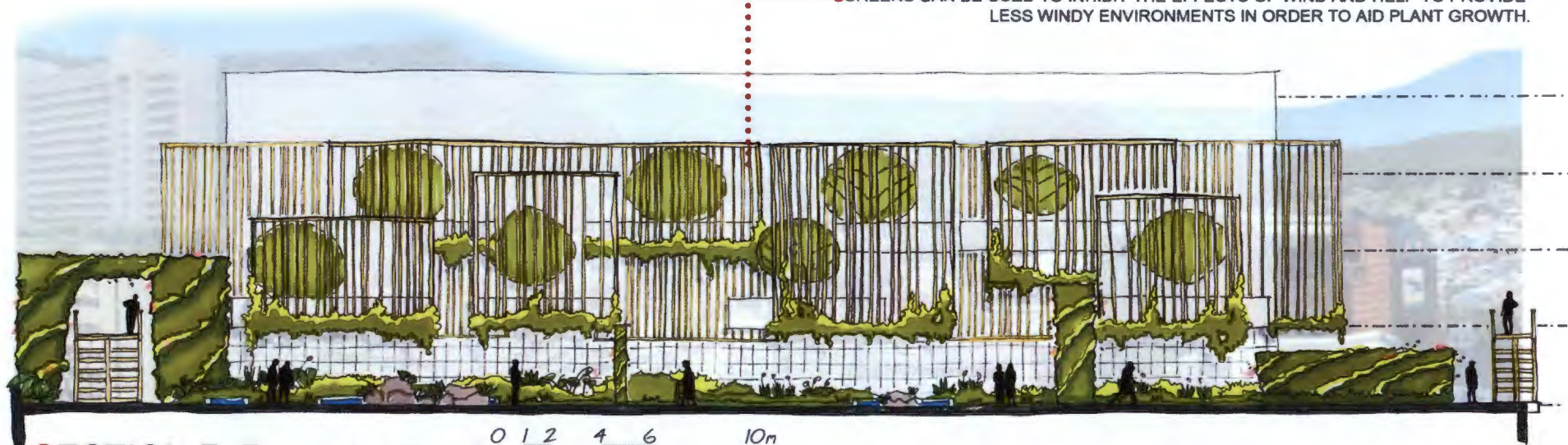
SCREENS CAN BE USED TO INHIBIT THE EFFECTS OF WIND AND HELP TO PROVIDE LESS WINDY ENVIRONMENTS IN ORDER TO AID PLANT GROWTH.



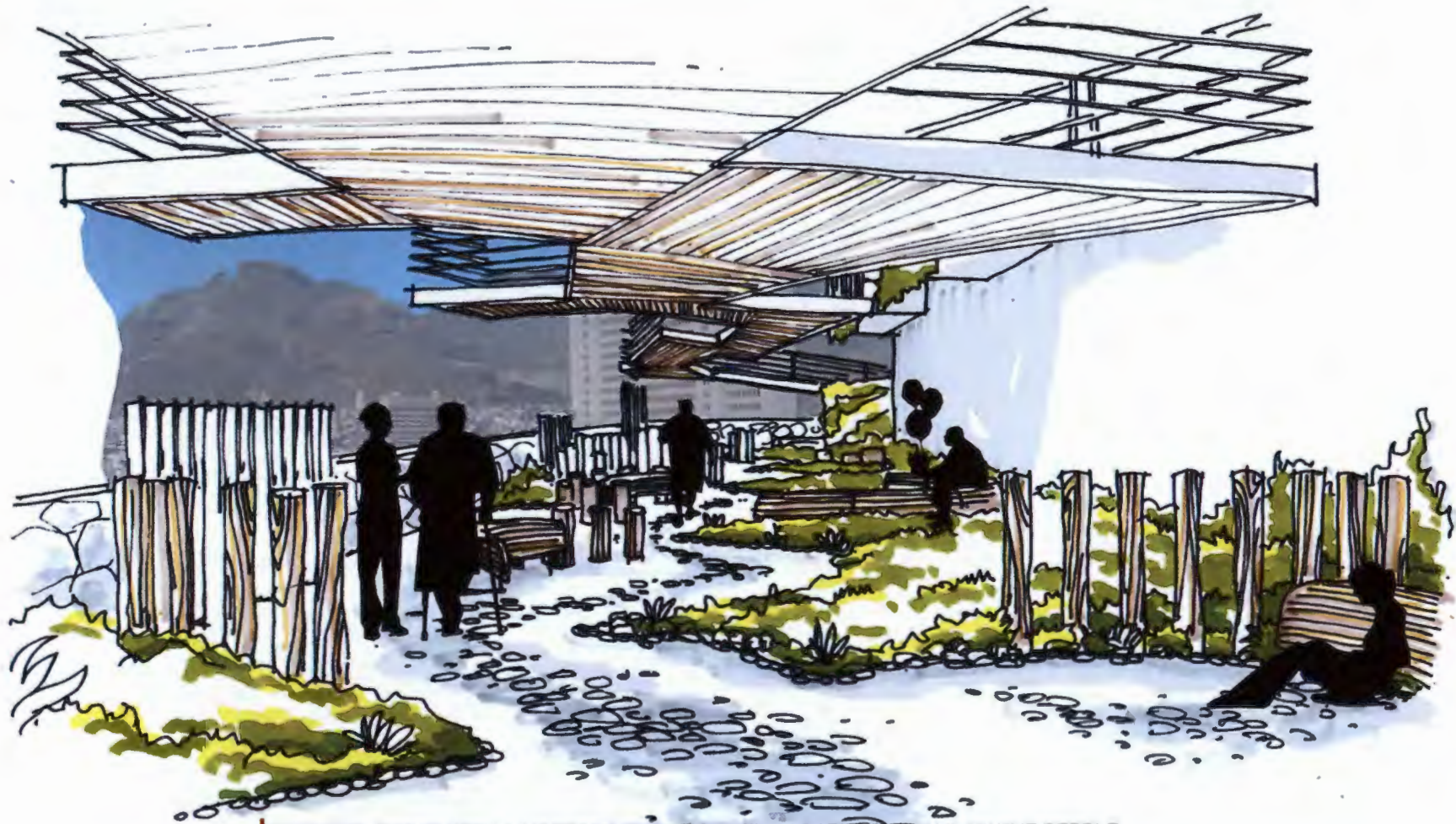
SECTION E_E 1:125@A0



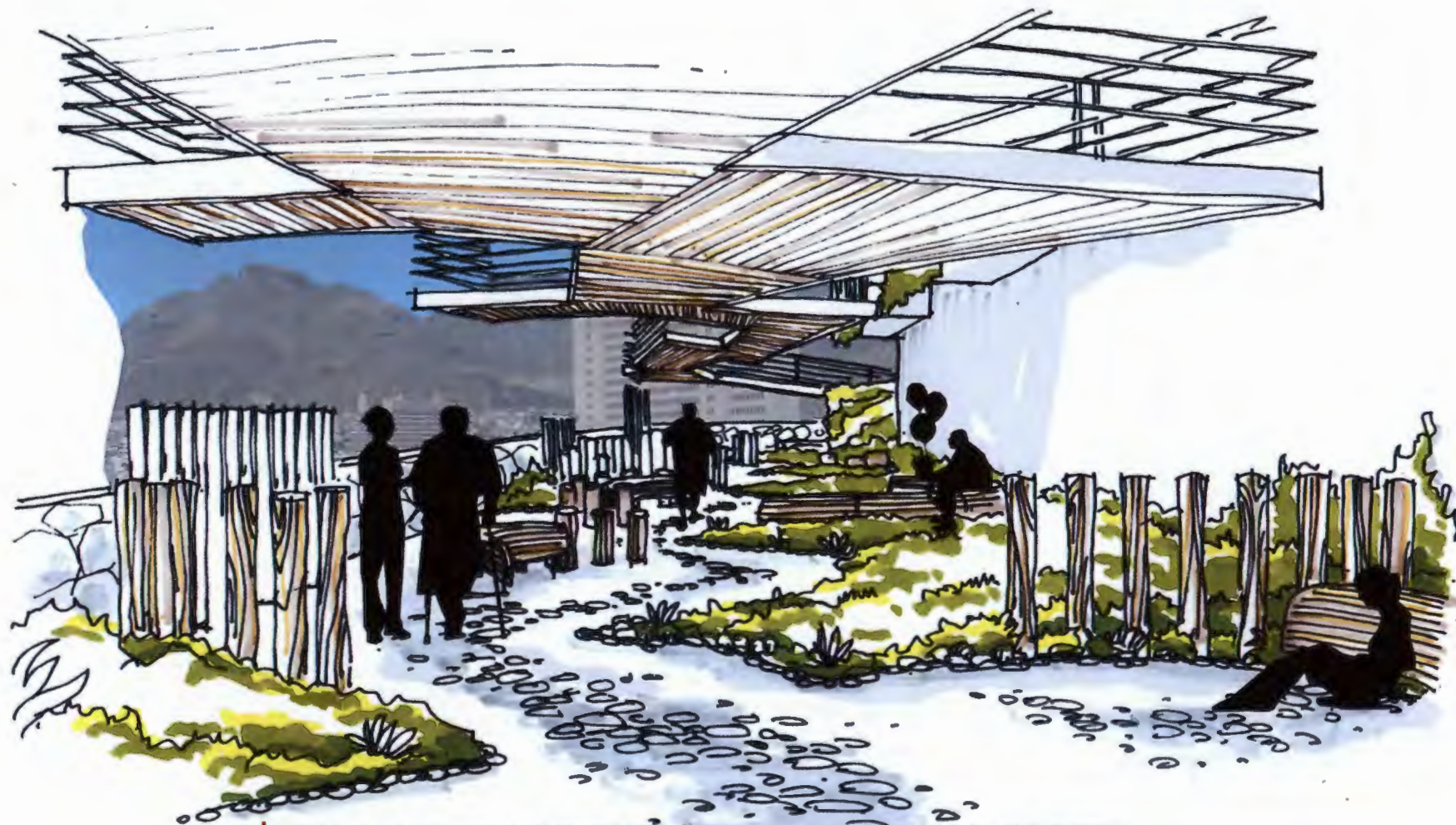
SCREENS CAN BE USED TO INHIBIT THE EFFECTS OF WIND AND HELP TO PROVIDE LESS WINDY ENVIRONMENTS IN ORDER TO AID PLANT GROWTH.



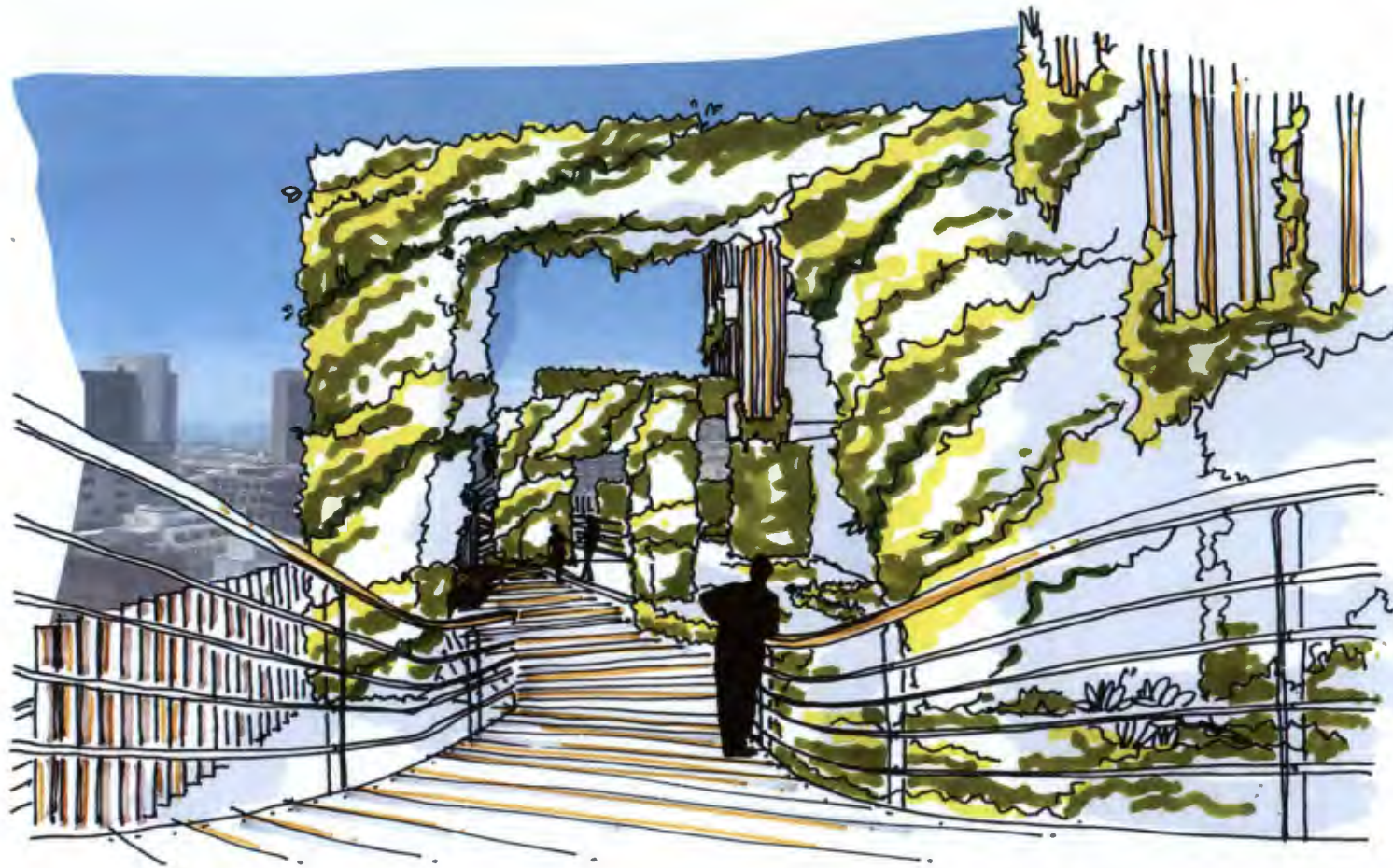
SECTION F_F 1:125 @ A0 0 2 4 6 10m



INDICATES PATHS WITH A MASSAGE FUNCTION. WHEN PATIENTS WALK ON THE PEBBLE PATH DIFFERENT AREAS OF THE FEET RECEIVE VARYING AMOUNTS OF PRESSURE FROM THE IRREGULAR SMOOTH PEBBLES OF THE PATH. THIS RELATES TO CHINESE MASSAGE PRINCIPLES WHEREBY MASSAGING DIFFERENT AREAS OF THE FEET CAN HELP TO IMPROVE AN ASSOCIATED ORGANS HEALTH. THIS PATH DESIGN ALSO PREVENTS PEOPLE FROM WALKING TOO FAST, ALLOWING PATIENTS TO VIEW THEIR SURROUNDING NATURAL ENVIRONMENT. THE DIFFERENT COLOURS OF THE PEBBLES WILL GIVE A NATURAL EFFECT.



INDICATES PATHS WITH A MASSAGE FUNCTION, WHEN PATIENTS WALK ON THE PEBBLE PATH DIFFERENT AREAS OF THE FEET RECEIVE VARYING AMOUNTS OF PRESSURE FROM THE IRREGULAR SMOOTH PEBBLES OF THE PATH. THIS RELATES TO CHINESE MASSAGE PRINCIPLES WHEREBY MASSAGING DIFFERENT AREAS OF THE FEET CAN HELP TO IMPROVE AN ASSOCIATED ORGANS HEALTH. THIS PATH DESIGN ALSO PREVENTS PEOPLE FROM WALKING TOO FAST, ALLOWING PATIENTS TO VIEW THEIR SURROUNDING NATURAL ENVIRONMENT. THE DIFFERENT COLOURS OF THE PEBBLES WILL GIVE A NATURAL EFFECT.

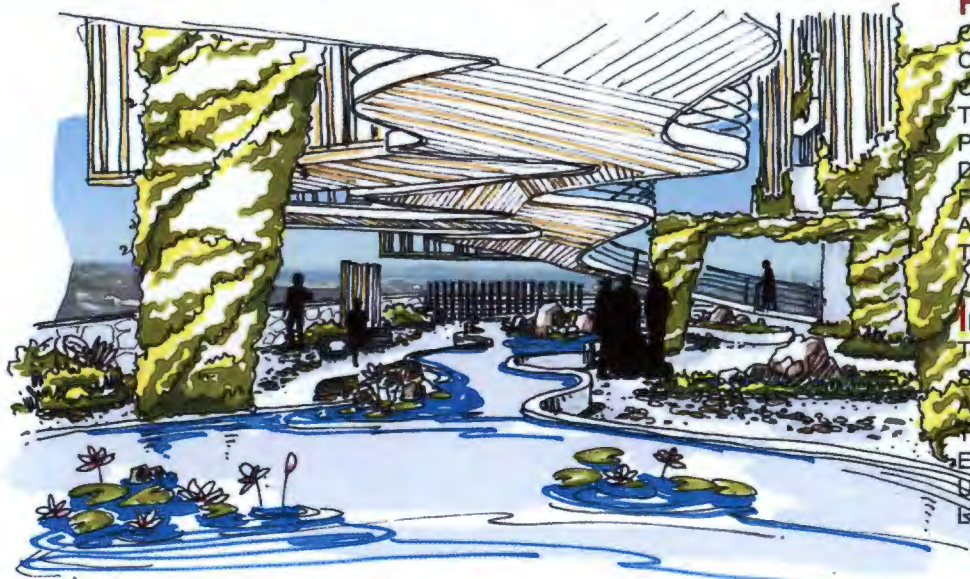


THIS LANDSCAPE FEATURE ELEMENT FORMS GATEWAYS; THE FUNCTION OF THIS ELEMENT IS TO FRAME VIEWS AND REDUCE THE EFFECT OF THE WIND. THE FLOOR FINISH OF THE TIMBER RAMPS IS BALAU DECKING WITH RUBBER PLACED BETWEEN THE DECKING PLANKS IN ORDER TO PREVENT SLIPPING. THE BALUSTRADE IS TO 1M ABOVE FINISHED FLOOR LEVEL IN ACCORDANCE WITH NATIONAL BUILDING REGULATIONS AND CONSTRUCTED FROM GALVANIZED MILD STEEL CANNELS AND RODS THAT ARE ROLLED TO THE CURVE OF THE WALKWAY WITH A TIMBER HANDRAIL.

THE ORIGIN OF THIS CONCEPT IS FROM LARGE TREES; DUE TO THE WEIGHT OF SOIL REQUIRED FOR LARGE SCALE PLANTING THE INCLUSION OF LARGE SCALE PLANTING IN AN EXISTING ROOF TERRACE ENVIRONMENT IS NOT ALWAYS POSSIBLE. THE IMAGE INDICATES THE USE OF A BAMBOO SUBSTRUCTURE THAT IMITATES THE FORM OF TREES AND IS CONNECTED CANOPY LIKE STRUCTURE. THE AIM OF THIS ELEMENT IS TO CELEBRATE NATURAL BEAUTY AND ATTRACT PEOPLE TO GO OUTSIDE. THE CANOPY ALSO FRAMES THE VIEWS; EVERY EDGE OF A VIEW HAS VEGETATION SURROUNDING IT, THIS EMPHASIZES THE RELATIONSHIP BETWEEN MAN AND NATURE.



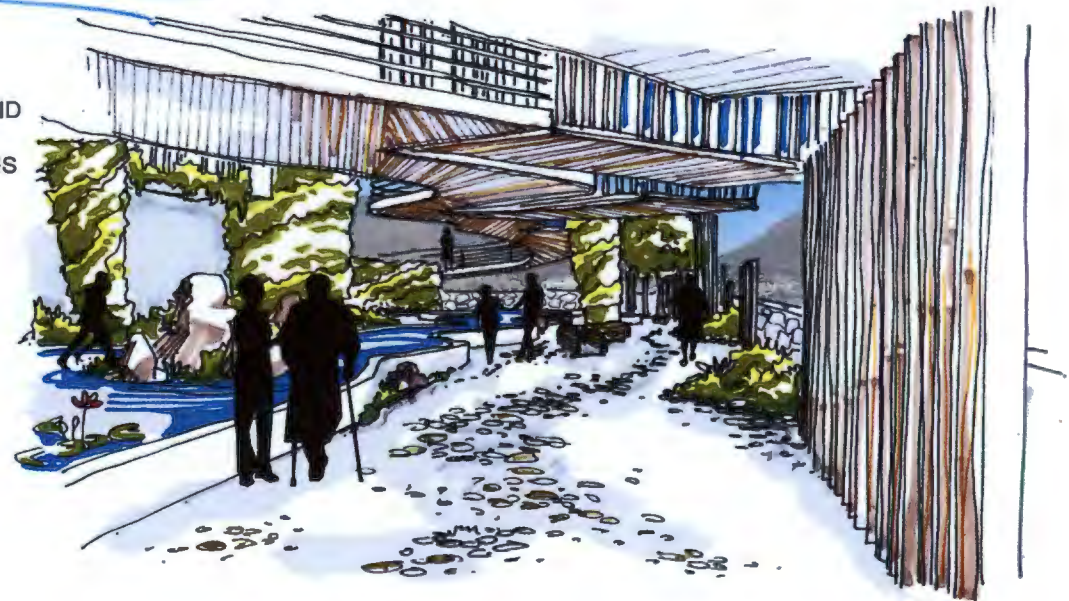
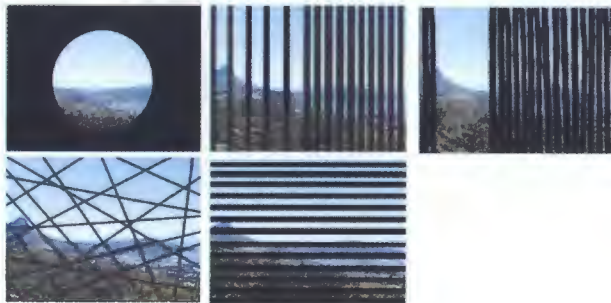
ON THE INSIDE OF THE LARGE TREE STRUCTURE ARE MINI ZEN GARDENS, WHICH PROVIDE ADDITIONAL DETAIL AND ALLOW PEOPLE TO REFLECT. THE AIM IS FOR PEOPLE TO OBSERVE THE DIFFERENT MINI ZEN GARDENS IN ORDER TO REMAIN ON THE PATH FOR A LONGER PERIOD OF TIME AND THUS RECEIVE MORE POSITIVE INFORMATION FROM THE DESIGNED LANDSCAPE ENVIRONMENT. THE ZEN GARDEN ALSO PROVIDES SOIL FOR THE CLIMBERS ON THE STRUCTURE ABOVE.

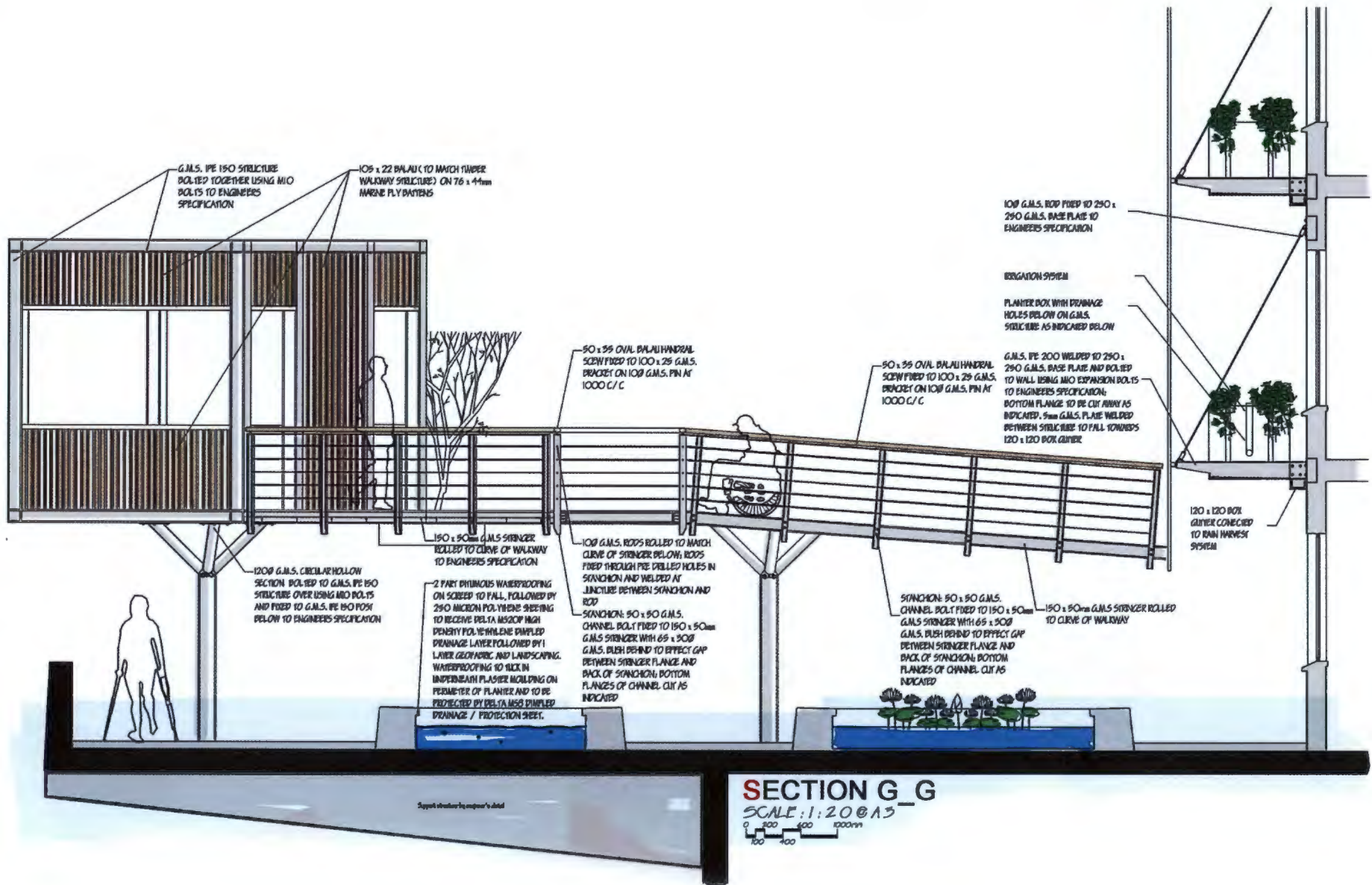


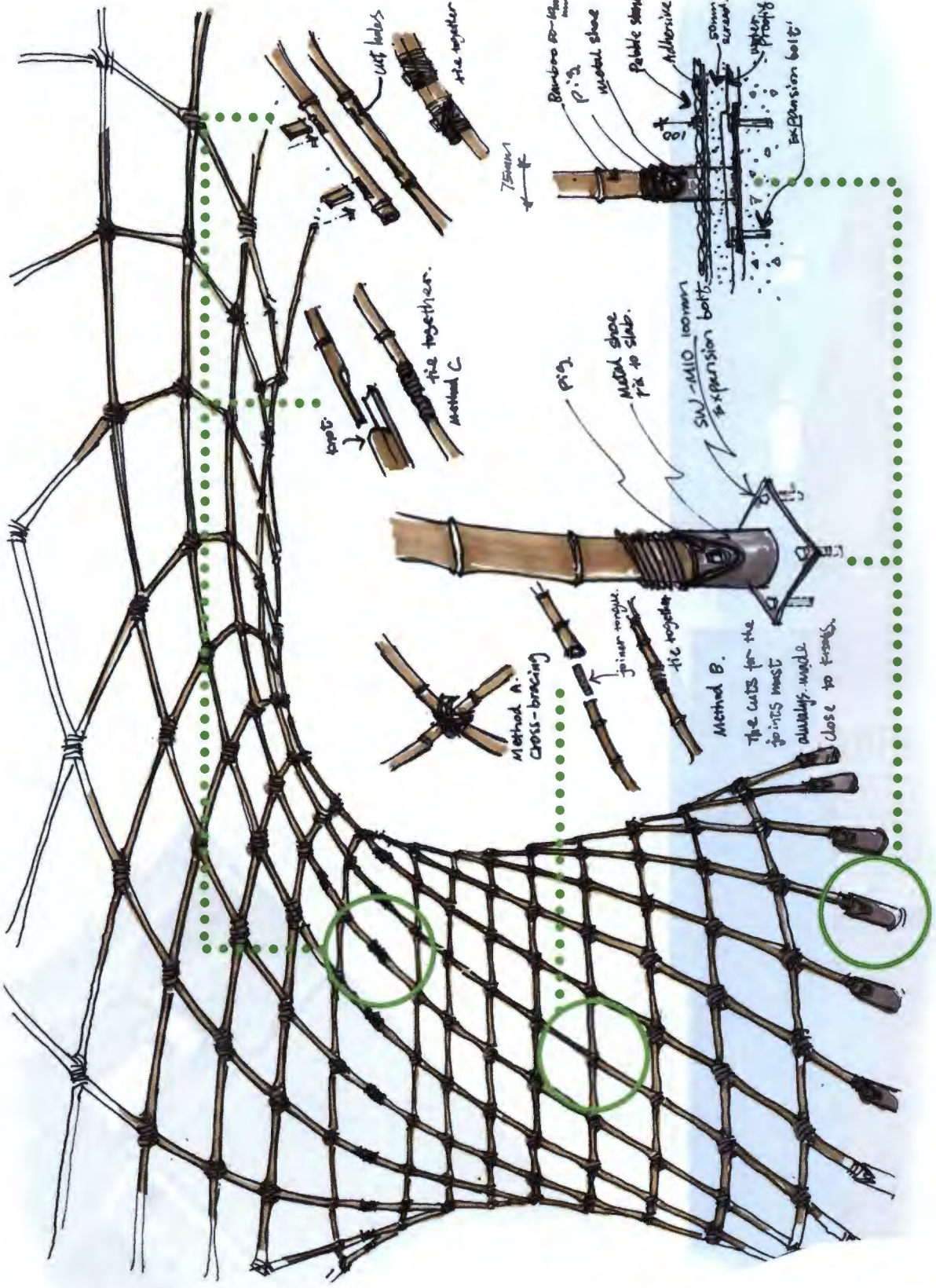
FEATURE LANDSCAPE ELEMENTS USE METAL WIRE WHICH IS CONSTRUCTED INTO AN ORGANIC CAGE FORM. SOME OF THE CAGES CONTAIN ROCKS WITHIN THEIR BASES. THE INSIDES OF THE CAGE ARE LINED WITH COCONUT FIBRE IN ORDER TO CONTAIN SOIL AND ALLOW PLANTING TO GROW. IRRIGATION PIPES ARE INCLUDED IN EACH CAGE IN ORDER TO HELP DEAL WITH THE DRY SEASON. THE INCLUSION OF WATER FEATURES COMES FROM THE INITIAL DESIGN CONCEPT AS THEY HELP TO PROVIDE MOISTURE INTO THE AIR OF THE SURROUNDING ENVIRONMENT.

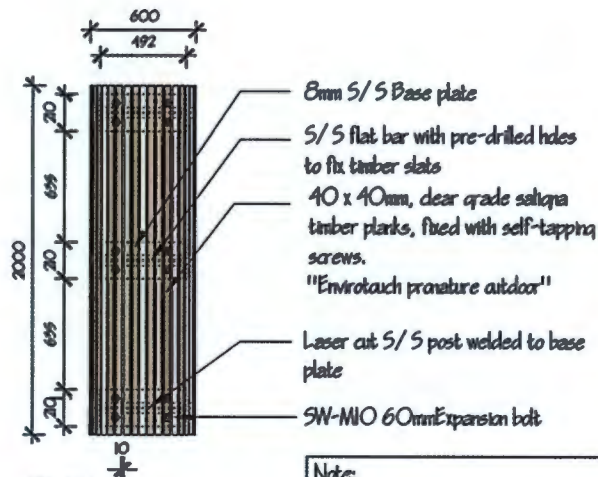
INDICATES MULTIPLE LEVEL THINK ABOUT THE SPACE; THE BRIDGES NOT ONLY ACT AS WALKWAYS, BUT ALSO PROVIDE SHELTER AND SHADE FOR THE ENVIRONMENT BELOW. AS THE BRIDGES SHADE THE WATER FEATURES THIS HELPS TO PREVENT WATER BEING LOST THROUGH THE PROCESS OF EVAPORATION. THE NORTH WEST PORTION OF THE SITE RECEIVES UNCOMFORTABLE AFTERNOON SUN WHICH EFFECT IS LESSENNED BY THE BRIDGES.

AS THERE ARE HIGH WIND CONDITIONS, SHELTER WILL HAVE TO BE USED TO REDUCE THE EFFECTS OF THE WIND AND THUS PROVIDE A LESS WINDY ENVIRONMENT FOR PATIENT'S ACTIVITIES. THE FORM OF THE SHELTER IS VERTICAL AS IT IS THE MOST FAVORABLE TO FRAME VIEWS OR POINTS OF INTEREST.



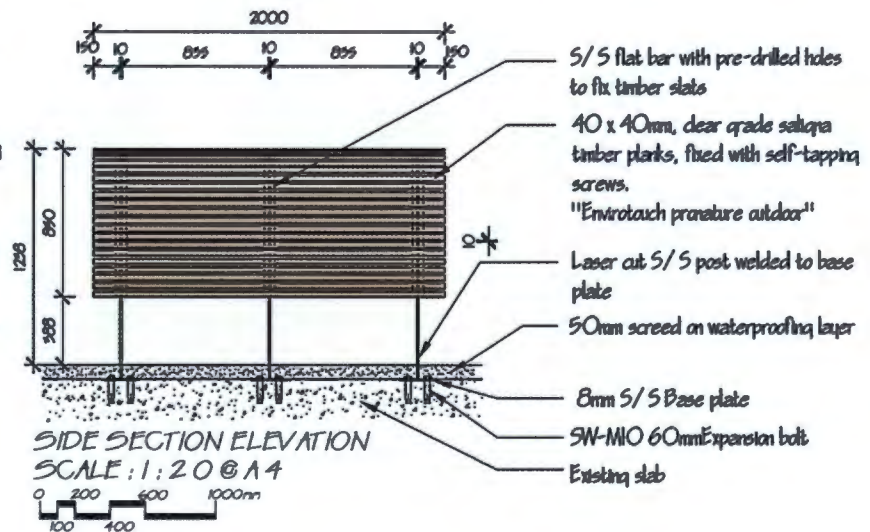
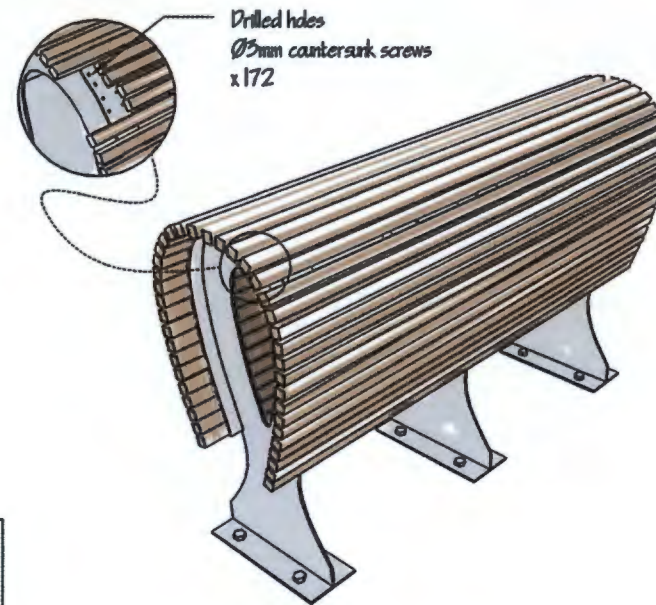
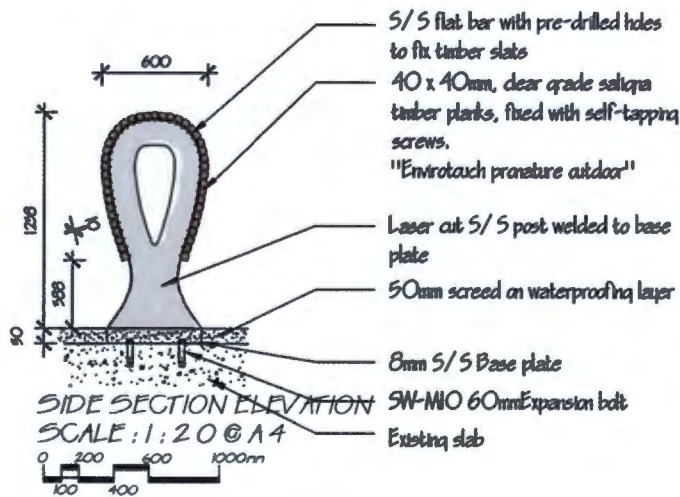






PLAN
SCALE: 1:20 @ A4

Note:
Support steel to be laser cut, as per AutoCad template



Conclusion

This design provides the function of a new healing landscape, it is a measureable healing landscape, and patients can measure the condition of their health.

It is possible to incorporate all the characteristics of a healing landscape into a roof space. This roof healing landscape combines Western and Eastern healing concepts and principles.

The design of the roof space incorporates the surrounding natural environment. An important aspect to consider is the surrounding views; to bring a view of nature close to a window can improve the psychological condition of patients (stress attenuation, restoration). The reconnection of views from an internal space to an exterior space can mitigate a feeling of being in a tedious, internal, closed environment.

The healing landscape should provide various types of area in order to help shift patients minds and to suit their varying mental and physical needs. A healing landscape is about perception as well as activity.

Landscape features such as water features and planting need to be provided in order to draw people's attention away from

some of the negative aspects of the site such as air-conditioning units.

Suitable plant species need to be selected in order to balance the aesthetic, ecological and health concerns. Plant colour also needs to be taken into consideration as this can also form part of the healing function.

The use of suitable planting to improve the environment of internal hospital wards can improve air quality and enrich the aesthetic of the ward environment.

A healing landscape should be a resource for everyday life and should be incorporated wherever possible into healthcare environments. It is a positive concept emphasizing social and personal resources as well as physical capabilities.

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