5

This chapter explores the design process. It illustrates the principles followed in order to implement the theory, and highlights issues which shaped the design.

DESIGN PROCESS

1   INTRODUCTION

The design aims for the practical interpretation of theory on healthy environments. In order to create holistically healthy environments, two scales have to be considered – an urban scale and an architectural scale. This chapter illustrates how the theory was interpreted and implemented on these scales.

HEALTHY ENVIRONMENTS

URBAN SCALE

The physical shape of the city influences the metaphysical realm thereof, and thus influences the quality of people's lives. The *Discover Pretoria* framework (see Appendix A) proposes to make Pretoria CBD a tourist destination by following these principles:

        _ enhancement of the CBD's unique identity
        _ orientaion of the user
        _ enhancement of movement on a pedestrian scale
        _ creation of gateways to the inner city
        _ definition of the CBD precinct & its unique character
        _ definition of main routes and creation of new pause spaces
        _ enhancement of visual clarity

In addition to this, the author proposes the following in order to improve the health of the city:

        _ residential areas closer to work/amenities - this means less commuting, more time for family
          and relaxation
        _ more public transport, which results in less pollution
        _ pedestrian-friendly streets which also facilitate exercise
        _ more safe public spaces
        _ more lungs for the city, from pocket parks sizes to big urban parks

The implementation of these principles will positively impact on the health of the Pretoria CBD.

ARCHITECTURAL SCALE

On architectural scale, the design influences the user directly.

        _ no more artificial environments
        _ contact with nature, by bringing in the elements of nature - nature is not confined to the
          countryside, but envelops us
        _ the use of materials from sustainable sources
        _ designing to human scale
        _ human comfort
        _ allowing users control over thermal comfort of spaces – not centrally controlled.

TRANSLATING THEORY INTO ARCHITECTURE

An architecture which does not detract from health not only has physical properties, but also relates to the metaphysical realm. Nature may be invited into a building in subtle ways.

Architecture has qualitative value, which evokes the senses and has an effect on the emotions. A subtle change in light, material or enclosure, affects the human spirit. For architecture to be soothing, it should have an austere quality, and should not contain an overload of information.

The habitation of the architecture may be revealed by the progression of space, emphasized by the changing of the quality of light and of the materials used. This creates subtle thresholds. Framed, unlimited or no views emphasize these changes, and facilitate a direct contact with nature. The senses may be evoked by the use of materials with different tactile qualities, smells and associative values.

The design should implement six principles to create a healthy, tranquil environment:
  _ natural ventilation
  _ natural light
  _ tranquil exterior spaces, with views onto them
  _ the use of materials with tactile and aural qualities
  _ utilising the elements of nature, eg. the quality of light
  _ engaging the users, and allowing them to control their own environments.

DESIGN MANIFESTO

Architecture is the threshold between man and the city, and should reconnect man with nature.
This is a subtle art. Architecture exists between light and shadow; in texture and in smell.
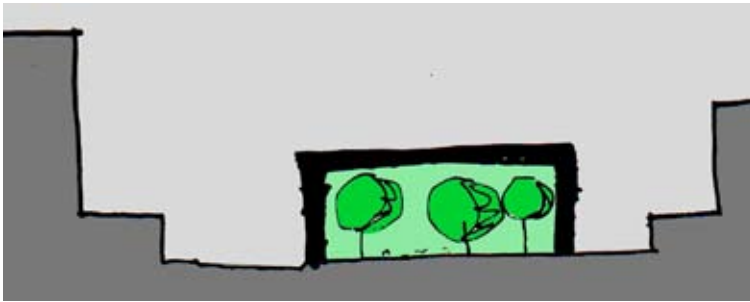It engages or ignores its users, and does not dominate or manipulate, but allows them freedom to control their own environments.
Architecture which excludes the elements of nature causes a disconnection from the natural world.

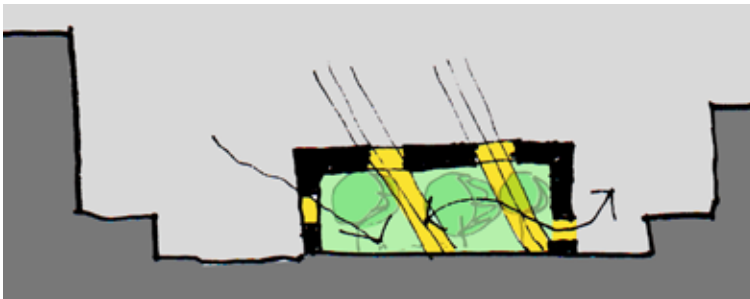Fig. 5.0   REFLECTING NATURE (left); PEDESTRIAN-FRIENDLY CITY - LONDON (right)

2   CONCEPT

THE BUILDING AS A WALL

To keep out the chaos of the city.
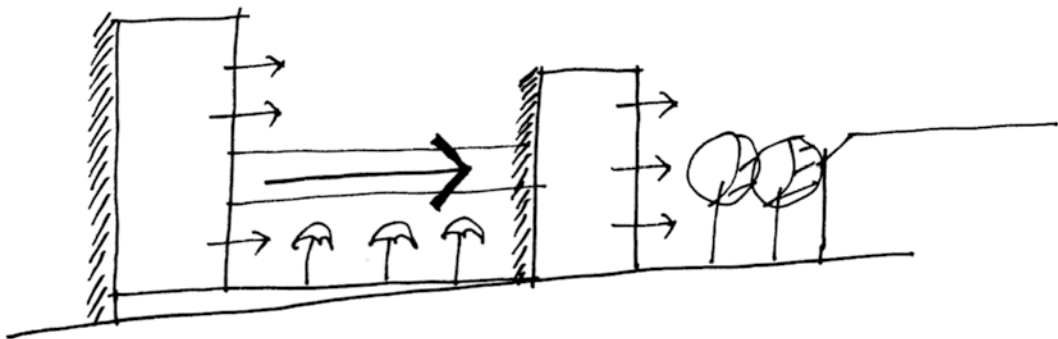

PERFORATED

To invite in the elements of nature.

Fig. 5.1   CONCEPT

An oasis in the urban environment.   A life-enhancing environment which caters to relaxation, social interaction and stress relief.
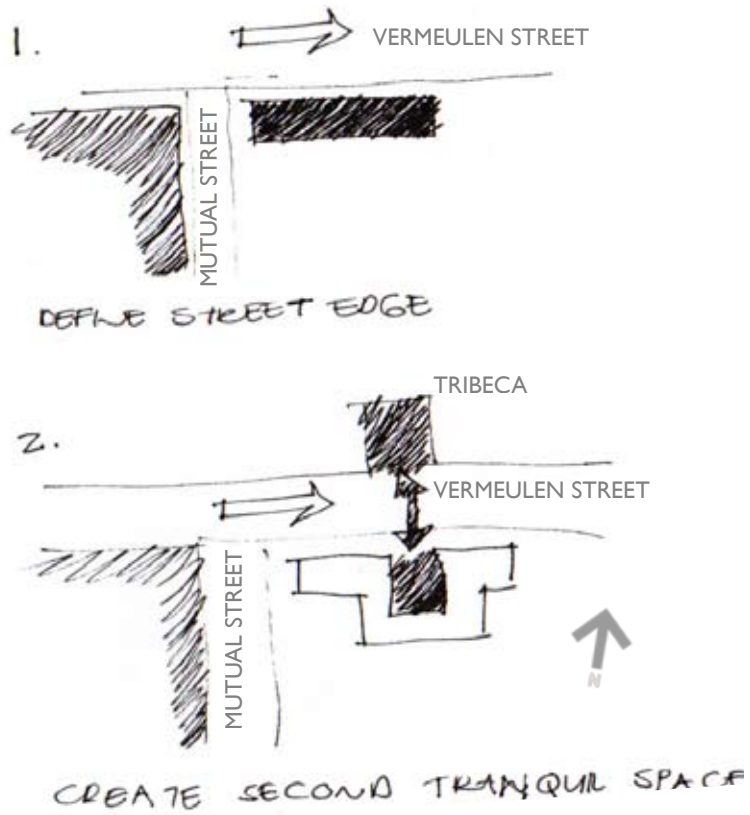
PARTI DIAGRAM

Fig. 5.2   PARTI DIAGRAM

STREET EDGE

Fig. 5.3   STREET EDGES

HIERARCHY
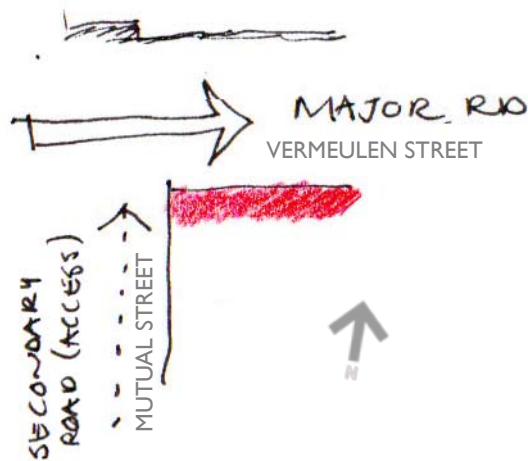
Fig. 5.4   HIERARCHY
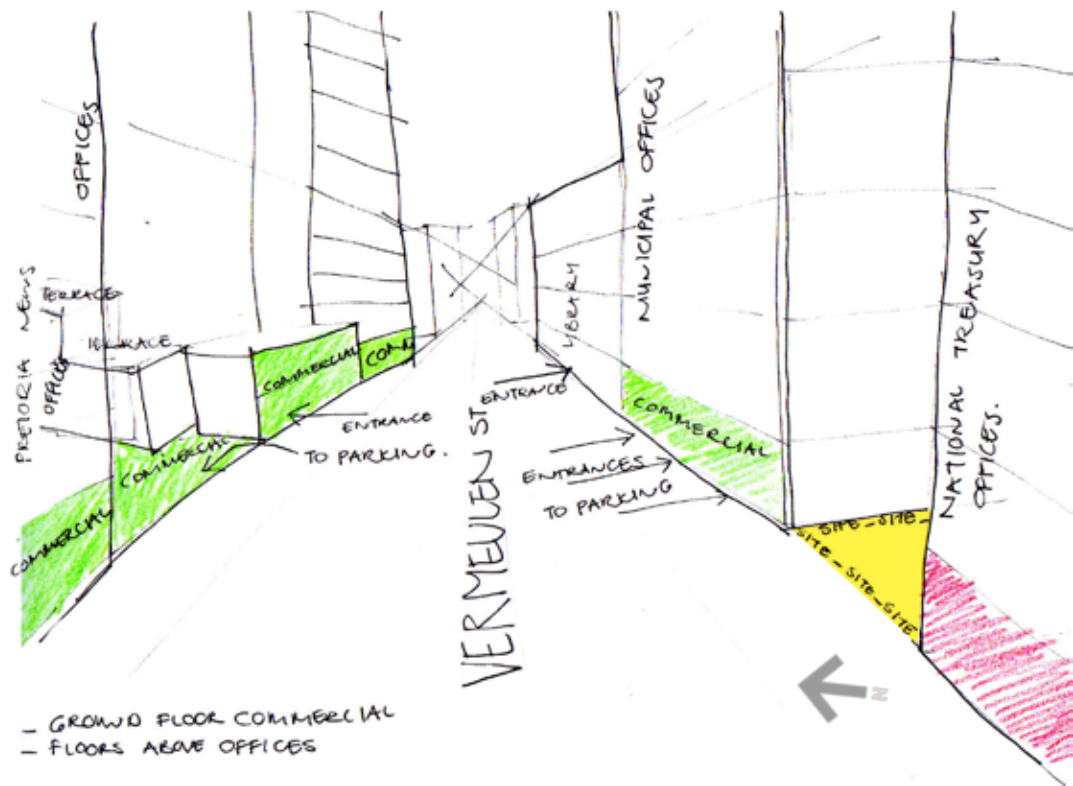
Fig. 5.5   VERMEULEN STREET

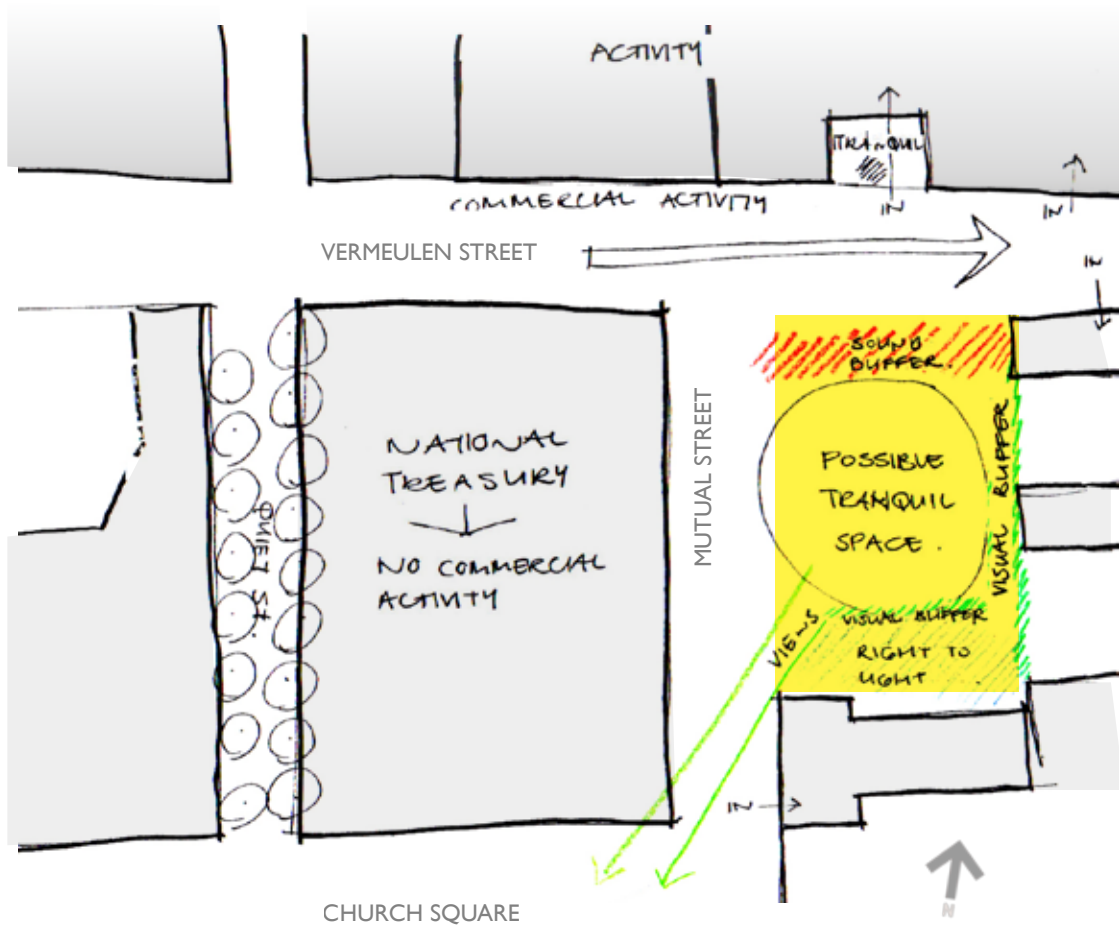Fig. 5.6   STREET SECTION - PROPOSED MASSING
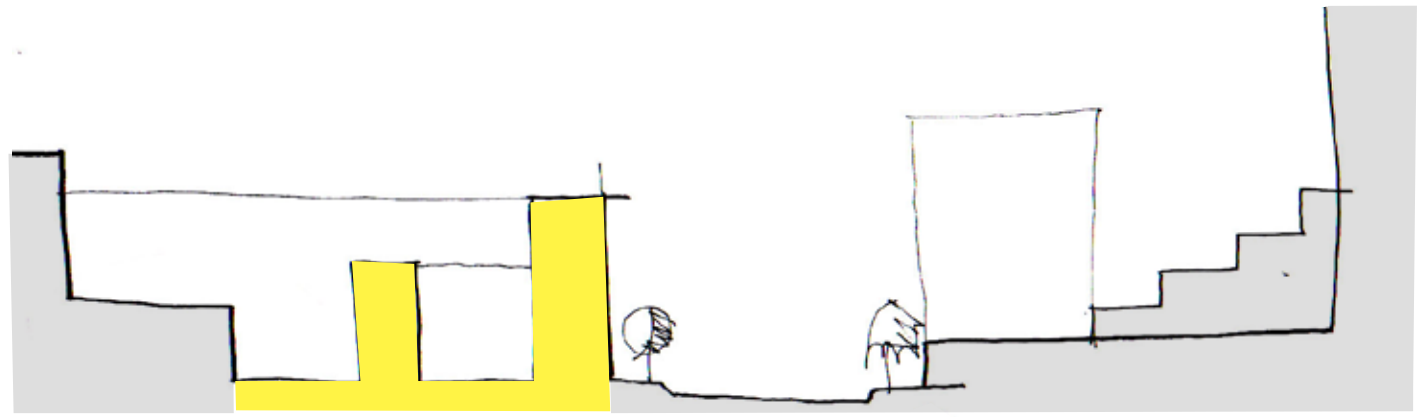
Fig. 5.7   SITE PLANNING

There is no need to emphasize the corner, as a hierarchy already exists between the two streets. Vermeulen Street is an artery road, allowing for fast-moving traffic, while Mutual Street is a secondary exit from Church Square; has low traffic volumes and has a calm atmosphere.

Building uses in Vermeulen Street are mostly commercial functions (semi-public) on ground floor and offices (private) above. The proposed building will continue this pattern.

Massing of the proposed building should relate to the urban context, but also to human scale. It should define the street edge and allow for an open space. The Ons Eerste Volksbank has windows on its northern facade, which borders on the site. The proposed building thus cannot be directly adjacent to this building, but has to allow light to reach this facade of the building.
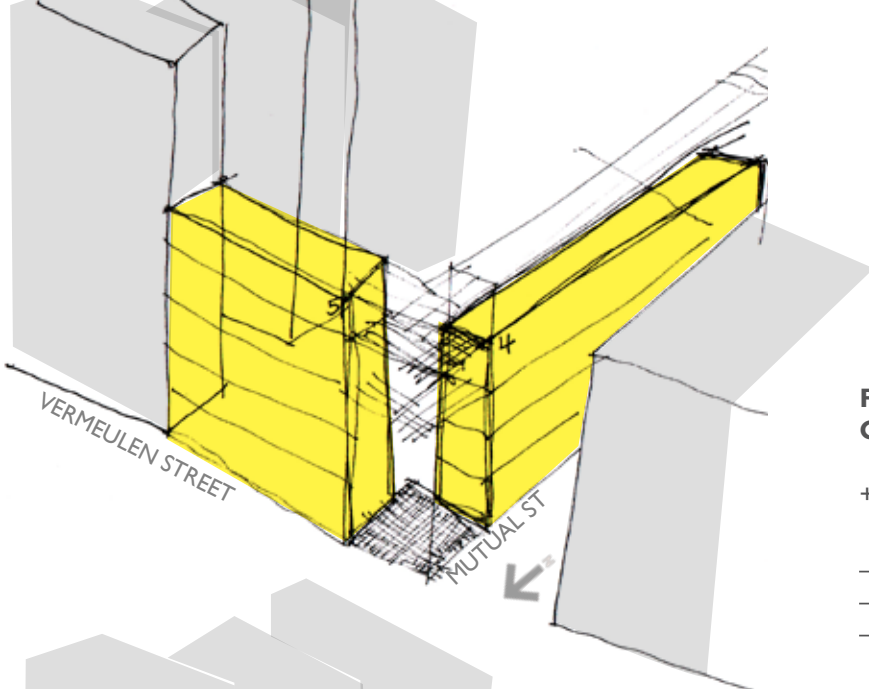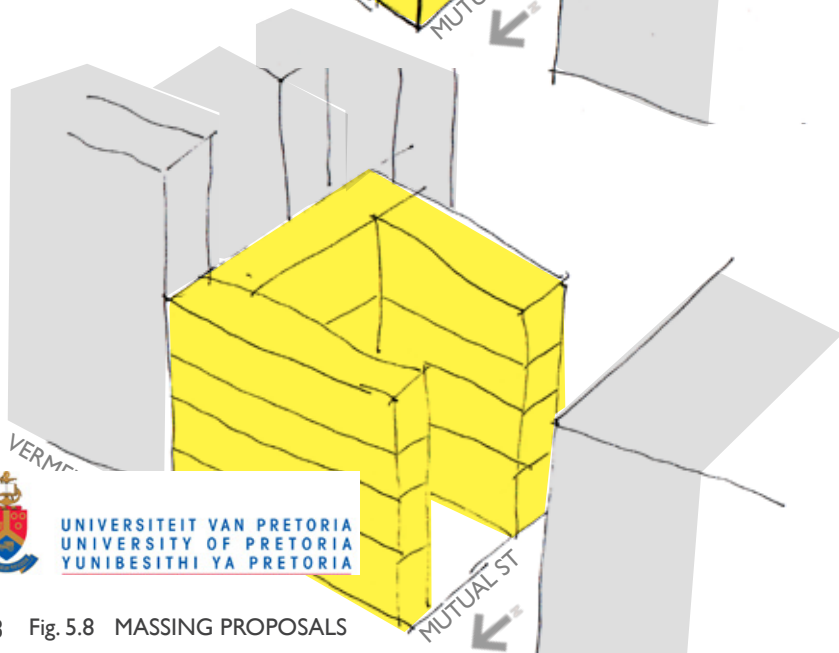
PROPOSAL 1
CORNER SQUARE

+ Emphasizes corner

_ Ambiguous levels of privacy
_ Adjacent to busy street - not calm space
_ May become part of movement route
  rather than pause space (pedestrians
  cutting the corner)
_ Long western facade
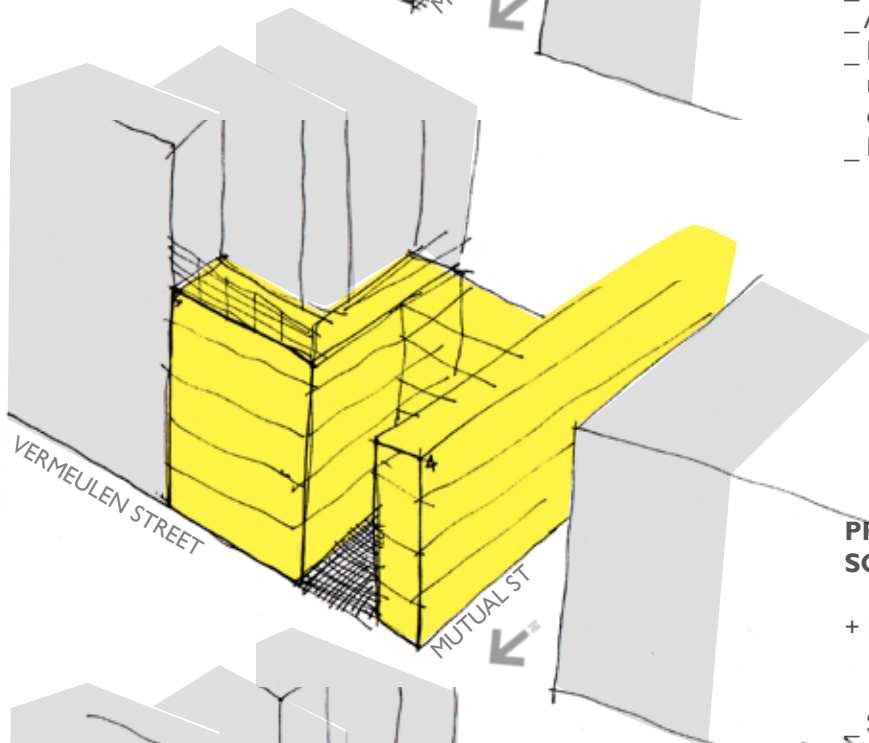
PROPOSAL 2
SQUARE ON VERMEULEN STREET

+ Relates to Tribeca square (across
  Vermeulen street)

_ Severed from Church Square
_ Faces onto busy Vermeulen Street
_ Two parts of building with western aspect

PROPOSAL 3
SQUARE ON MUTUAL STREET

_ Western facade

+ Square faces onto calmer street
+ Visual relation to Church Square

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63   Fig. 5.8   MASSING PROPOSALS

VERMEULEN STREET

NORTHERN SUN

MUTUAL STREET

CONTINUITY OF STREET EDGE

MAIN SPACE

SECONDARY SPACE

VISUAL ACCESS to GREEN 'LUNG'

VERMEULEN STREET

MUTUAL STREET

ACTIVE

BRIDGE
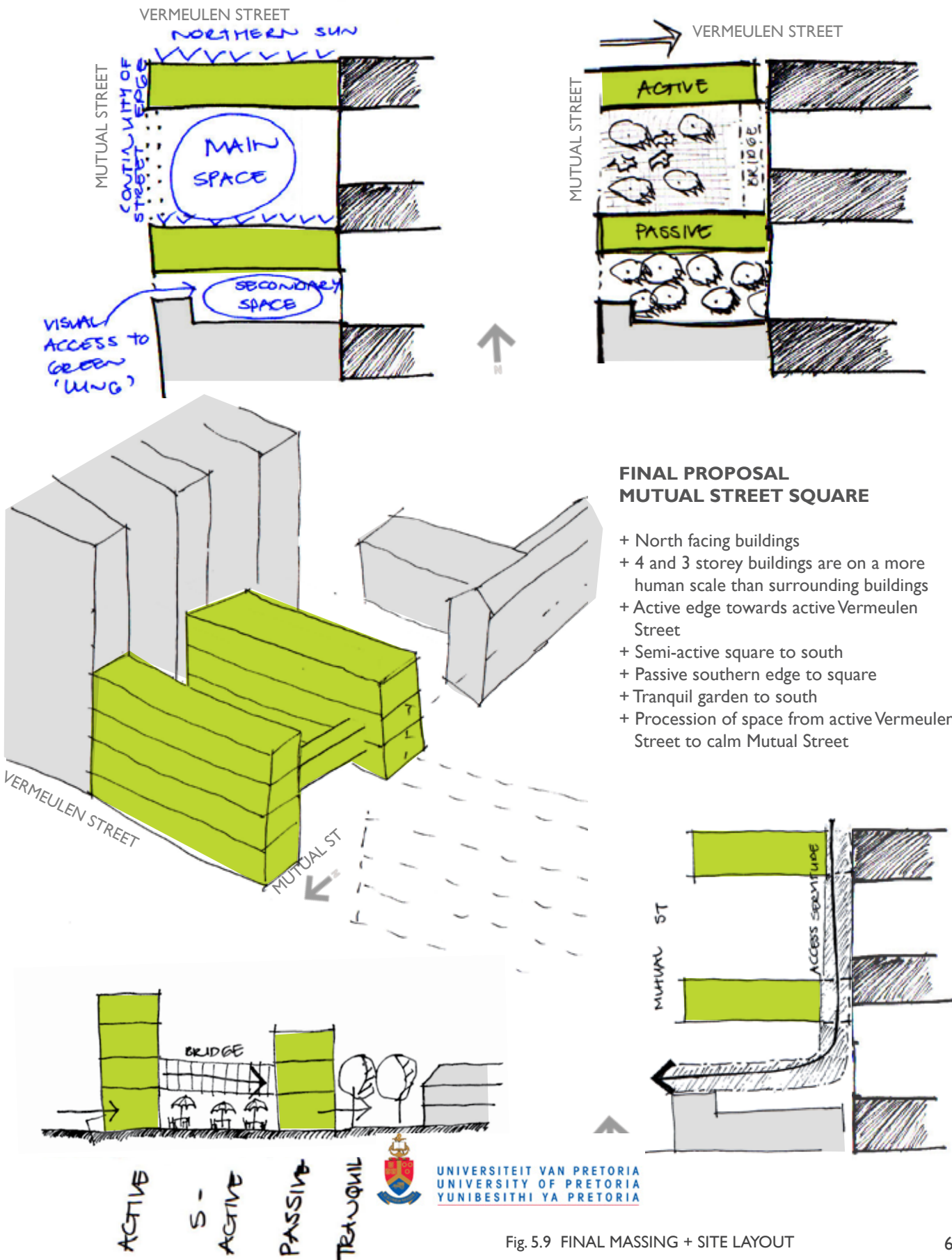
PASSIVE

FINAL PROPOSAL
MUTUAL STREET SQUARE

+ North facing buildings
+ 4 and 3 storey buildings are on a more human scale than surrounding buildings
+ Active edge towards active Vermeulen Street
+ Semi-active square to south
+ Passive southern edge to square
+ Tranquil garden to south
+ Procession of space from active Vermeulen Street to calm Mutual Street

VERMEULEN STREET

MUTUAL ST

MUTUAL ST

ACCESS SERVITUDE

BRIDGE

ACTIVE S-ACTIVE PASSIVE TRANQUIL

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Fig. 5.9 FINAL MASSING + SITE LAYOUT

64

BREAK IN BUILDING TO LET IN LIGHT TO ENTRANCE.

BRIDGE TO ROOF.

GREEN ROOF AS EXTENTION OF GYM

TRANQUIL GREEN SPACE

BRIDGE @ 1st FLOOR FROM MAIN ENTRANCE TO ENTRANCE TO 'SPA' AT 1st FLOOR

SPA LOOKS OUT ONTO PERFORATED NORTHERN FACADE SCREEN TO ONLY FILTER WESTERN LIGHT → PATTERN/ SHADOW RESEMBLES LIGHT THROUGH LEAVES.

GYM

WATER HEATERS

LIGHT SHUTTER

TO SQUARE

VERMEULEN ST

EXPOSE RUNNING TRACK

SERVICE ENTRANCE

MAIN ENTRANCE

CAFE

MUTUAL ST

VERTICAL GARDEN FILTER LIGHT + SOUND TO HEAVERS' ROOMS.

GREEN SQUARE (RESTAURANT SPILLS OVER)

1

Fig. 5.10   13 May

LIGHTWEIGHT ('FLOATING') CANOPY

WALKWAY EXTENDS - COVERS PART OF ROOF GARDEN

GREEN ROOF CLASSES

VERMEULEN ST

PERFORATED COPPER/CORTEN SCREEN - SOLAR FILTER;

URBAN JUXTAPOSITION - NATURAL

MUTUAL ST

VERTICAL GARDEN; SOLAR FILTER. INACTIVE STREET EDGE - REACTS TO NAT. TREASURY.

INTERACTIVE STREET EDGE + STAIRS BECOME SEATING

2

Fig. 5.11   1 June

VERMEULEN ST

MUTUAL ST

26·06·09 #19

PROPORTIONS + DETAILING
THE SAME → MULLIONS, etc.

PROPORTIONS + DETAILING
CONTINUITY → SCREENS.

TEXTURE to
RESEMBLE
CREEPER.

Fig. 5.12   26 June

3

VERMEULEN ST

MUTUAL ST

GAP IN BUILDING -
SWIMMING POOL -
TO ALLOW MORE
SUNLIGHT INTO THE
SQUARE.

4

Fig. 5.13   1 July

Fig. 5.14   15 July

Fig. 5.15   26 July

CURVED ROOFS
MIMIC THE
MAGALIESBERG;
FORMALISTIC
APPROACH.

7

Fig. 5.16   6 August

-16.08.09

'FLOATING'
ROOF.

HORISONTAL
EMPHASIS.

DOOR-SIZE OPEN
SIGN PANELS
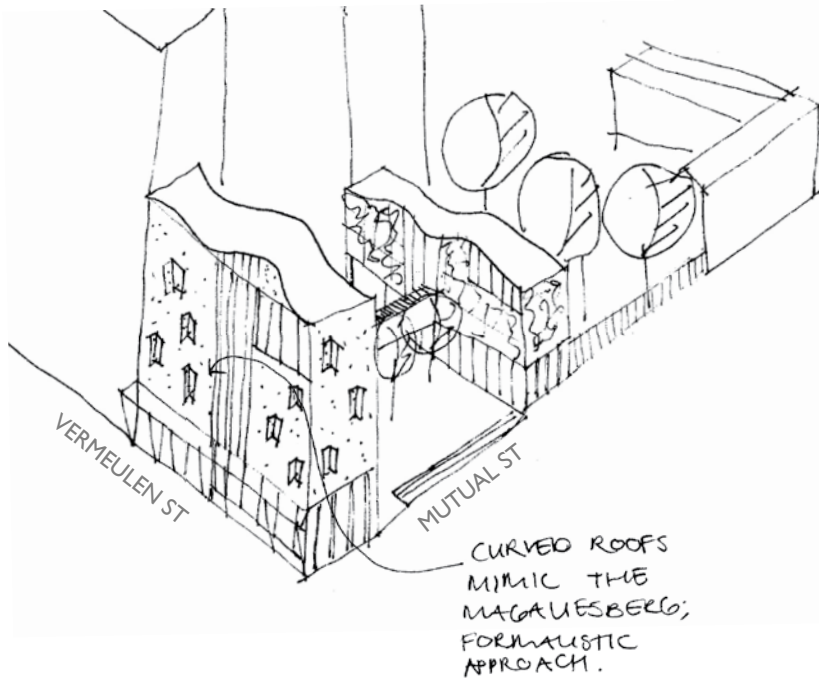
VERTICAL EMPHASIS-
MOVEMENT - STRONG
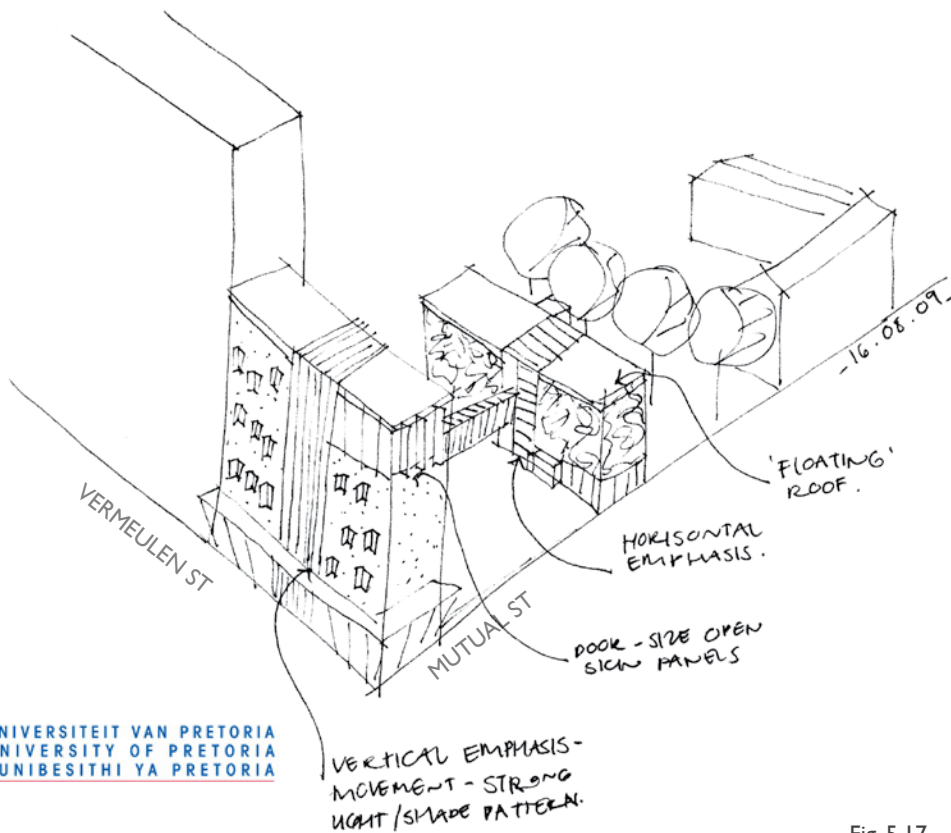LIGHT/SHADE PATTERN.

8

Fig. 5.17   16 August

5 PRINCIPLES

SKIN

A skin wraps around the northern and western façades of both buildings. Both these act as solar screens, and also filter light into the building. The skin of the northern building visually distances the interior environment of the building from the chaos of the city street; and is a metaphor for the city, as the weathered steel ages with time; and in juxtaposition to this city image, light patterns from perforations in the skin cast leaf-like shadows on the interior. The vertical garden skin of the southern building provides a soft edge to the square; perceptually distances the building from the activity in the square; and signifies nature, which renews itself each year.

PERFORATED WEATHERED STEEL SKIN WITH OPERABLE PANELS

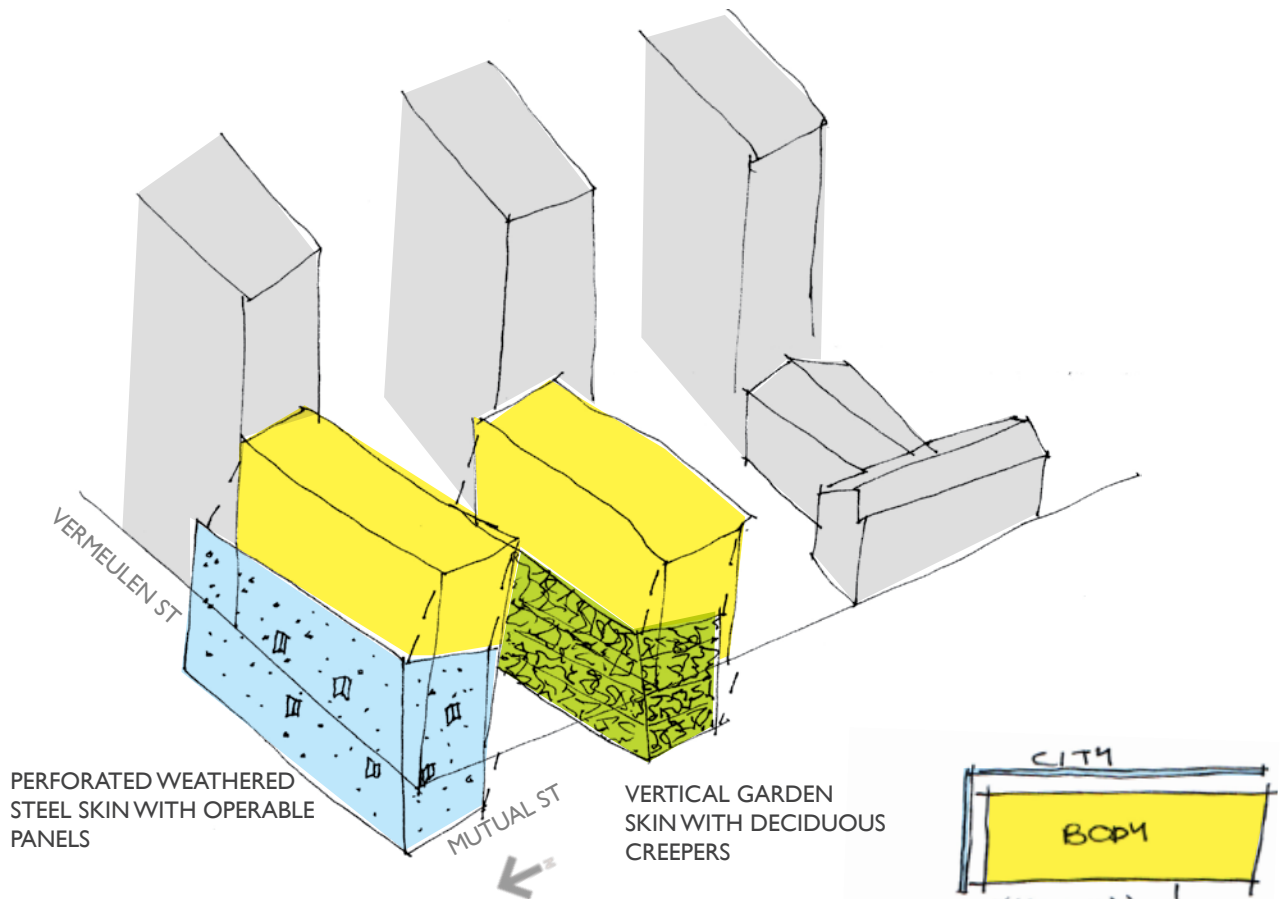VERTICAL GARDEN SKIN WITH DECIDUOUS CREEPERS

Fig 5.18   SKINS

The northern building hosts programmes relating to the body, while the programmes in the southern building relate to the mind and spirit.

69   Fig 5.19   (right) SKINS CONCEPT

FAÇADE STUDIES

SURROUNDING BUILDINGS

Several historic buildings surround the proposed building. The homogenous skin that wraps around the proposed building not only perceptually distances it from the city, but also places it in juxtaposition to these historical buildings.

The proposed building reacts to the composition of adjacent buildings by employing their façade ordering principles, which comprises of three parts – plinth, body and roof; and by picking up some of the lintel heights as new floor heights.
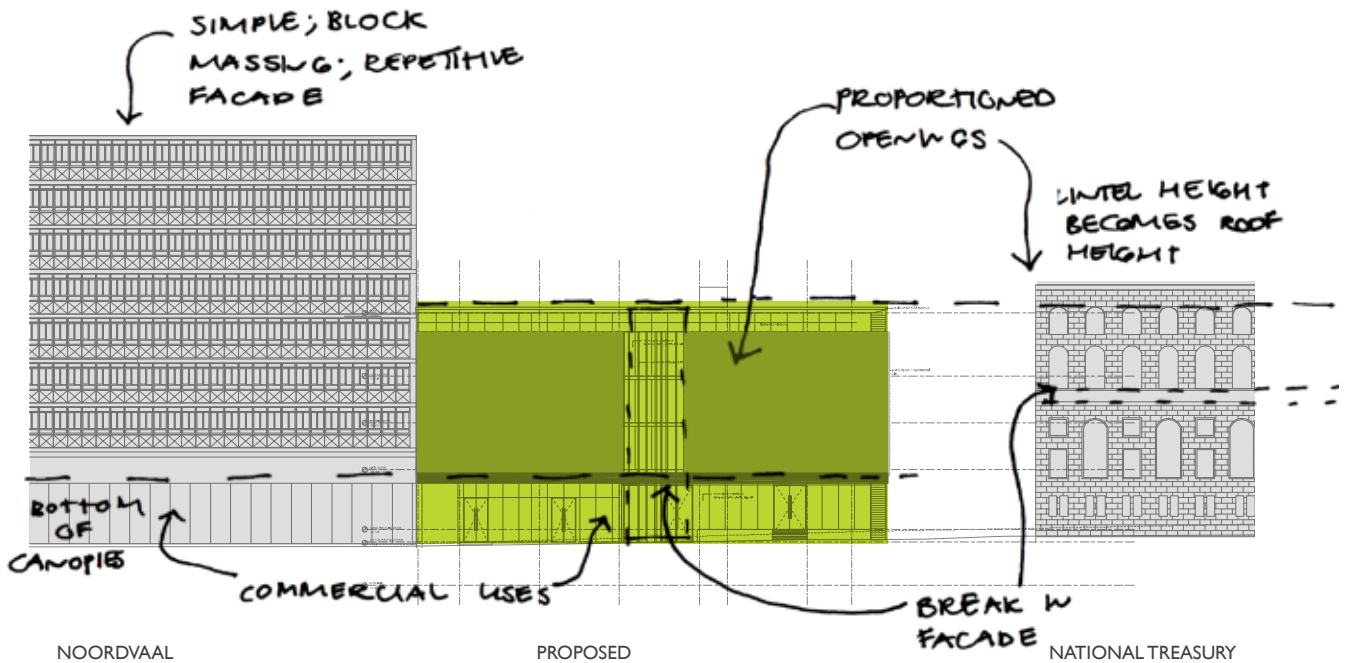

SIMPLE; BLOCK MASSING; REPETITIVE FACADE

PROPORTIONED OPENINGS

LINTEL HEIGHT BECOMES ROOF HEIGHT

BOTTOM OF CANOPIES

COMMERCIAL USES

BREAK IN FACADE

NOORDVAAL   PROPOSED   NATIONAL TREASURY

Fig 5.20   VERMEULEN STREET (NORTH) FACADE REACTION n.t.s.

REPETITIVE, PROPORTIONED

ROOF

REPETITIVE, PROPORTIONED.

ROOF

LINTEL HEIGHT BECOMES 2ND FLOOR
CEILING HEIGHT BECOMES 2ND FLOOR
LINTEL HEIGHT BECOMES 1ST FLOOR

PLINTH.

ONS EERSTE VOLKSBANK   PUBLIC PROSECUTIONS

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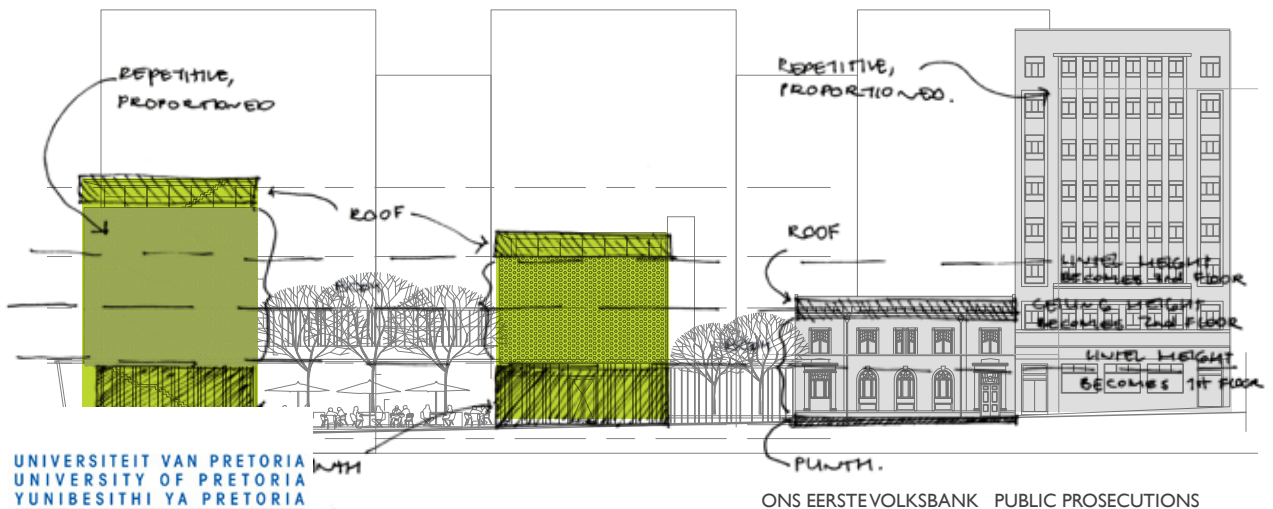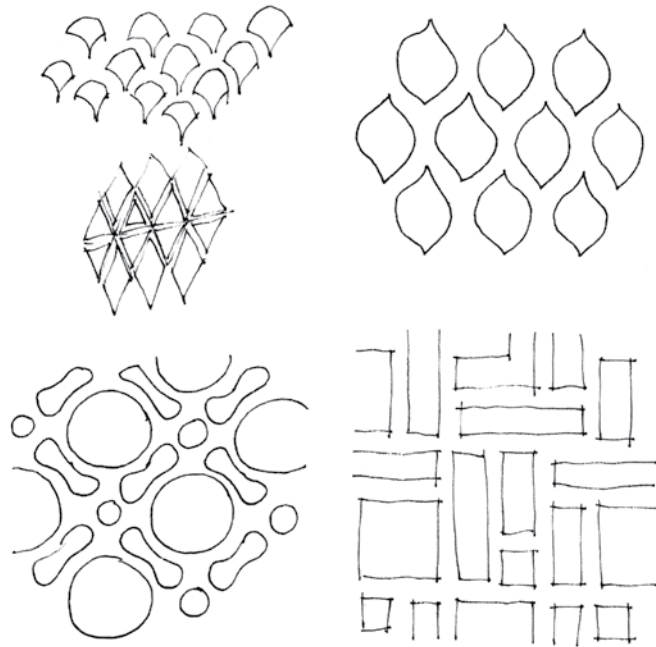YUNIBESITHI YA PRETORIA

Fig 5.21   MUTUAL STREET (WEST) FACADE REACTION n.t.s.   70

BUILDING SKINS IN PRETORIA

A study was done on historic building skins in the study area and surrounds - Pretoria CBD, Arcadia and Sunnyside.

- PRIVACY SCREENS ⎱ @ STAIR CORES
- SAFETY SCREENS ⎰
- MODULAR UNITS, FIXED TOGETHER WITH MORTAR.
-     MASONRY / PRECAST CONCRETE.
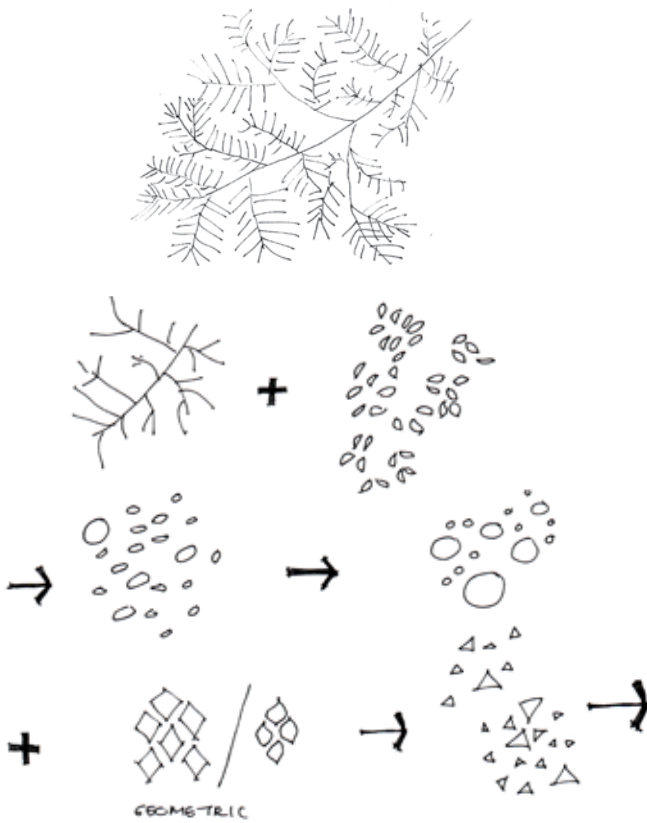- THIN PROFILE — 85m AND THINNER.
- GEOMETRIC PATTERNS.

Fig 5.22   ANALYSIS OF PRETORIA SKIN PATTERNS

SKIN PERFORATION PATTERN DEVELOPMENT

The perforations were designed to cast shadows that suggest the filtering of light through the leaves of a tree. The composition of a tree branch was used as base, and then abstracted and combined with the typical geometric from the historical analysis.

The panel size was based on brick modules; ergonomics and the buildings proportioning system (1:2:3, see Proportioning System). Opening sizes were also based on this proportioning system, as well as on the desired pattern of light and shadow; and on allowing light through without allowing views to the street. The random pattern of openings breaks the Pretoria tradition of ordered modules, and refers to the seemingly random nature of leaves on a tree.

Fig 5.23   (left) SKINS IN THE PRETORIA CBD, ARCADIA + SUNNYSIDE

Fig 5.24   (above, left) PATTERN DEVELOPMENT
Fig 5.25   (above, right) PERFORATED PANEL DESIGN

PROPORTIONING SYSTEM

The design makes use of a proportioning system, which is implemented from the structural grid, through to balustrades, scaled down all the way to the sizes of the weathered steel skin perforations. This creates a rhythm which emerges on all scales in the buildings. The system was derived from the structural system, and comprises the relationship 1:2:3.
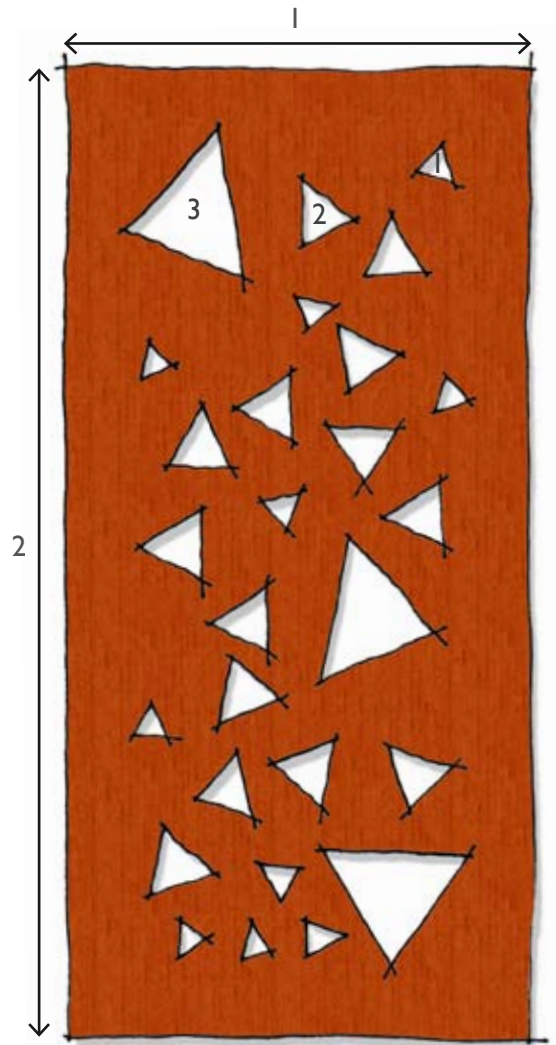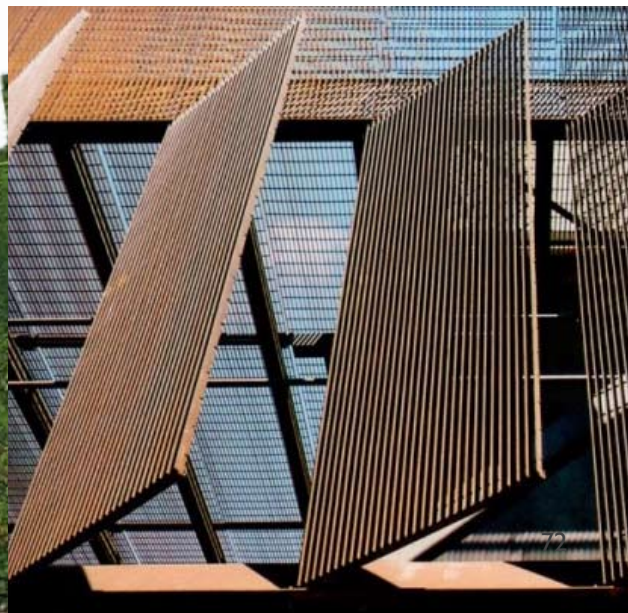
Fig 5.26   (below) CONTEMPORARY LIGHT WEIGHT BUILDING SKINS

NATURE IN THE CITY

RELATIONSHIP BETWEEN INSIDE + OUTSIDE

Nature is invited into the building in varying degrees. The building cores both face south towards the square or the garden, allowing unlimited views thereof. Different programmes have different levels of interaction with the surrounding environment. As an example, the yoga studio has low level windows towards the north (square), only allowing in the light filtered by the vertical garden, while on its southern façade folding stacking doors open up towards the garden. The four elements of nature regulate this relationship between inside and outside.
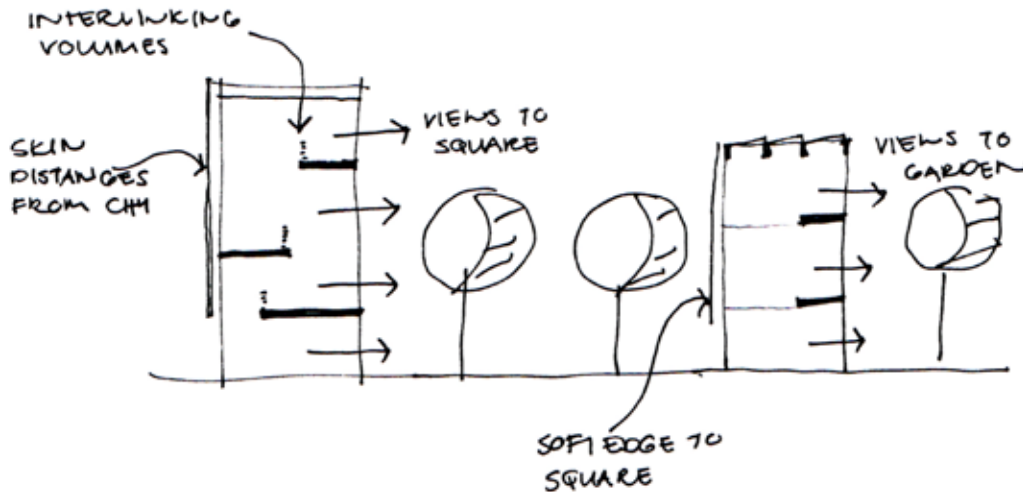

Fig 5.27   SECTION - RELATIONSHIP BETWEEN THE INSIDE + OUTSIDE

LIGHT

Light levels indicate different levels of interaction with space and with nature. In the gym, for example, ample daylight reaches the room through windows at different levels, as this is an environment charged with activity and awareness. In the big contemplation space, light enters from a high point on one side, leaving the other side of the room in relative darkness, which contributes to the contrast between the scales in the room (see fig. 5.28).

Fig 5.28   (below) CONTEMPLATION SPACE (left)+ CHANGE ROOMS (right) QUALITY OF LIGHT
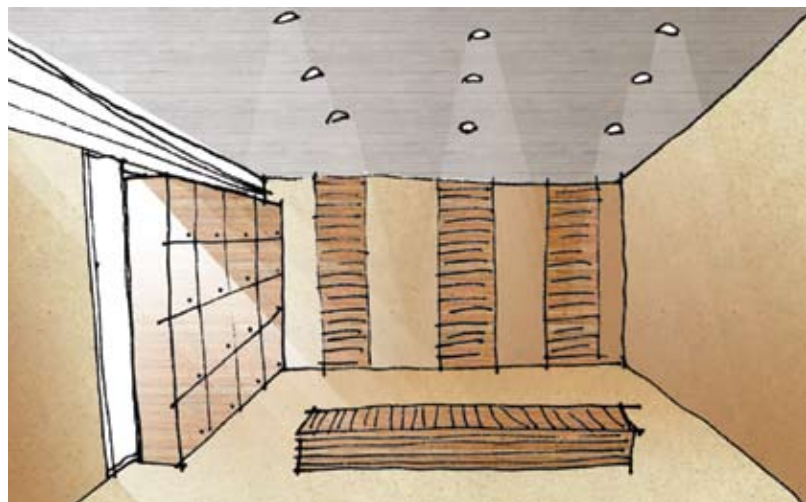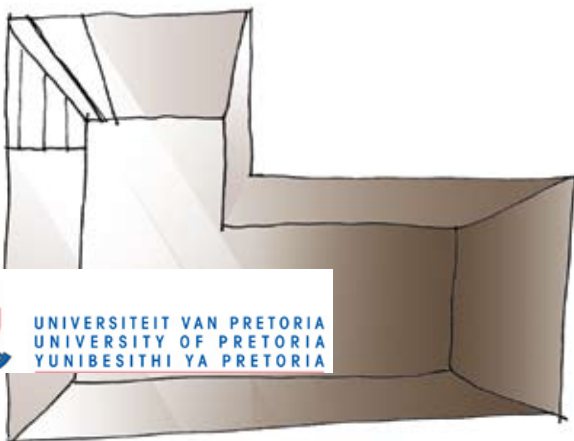
Strong patterns of light and shade indicate the passing of time, which is apparent in the cores, where beams with sky lights in between allow light to enter from above; and in the bridge, where a rhythmic pattern of columns will cast strong shadows which will move as the day progresses.

Media rooms need diffuse light for a more homogenous internal light quality. Timber louvers will provide this, and allow for ventilation to take place. The reflection of light lends a tranquil air to a space. Light will be reflected by pools of water at the entrance of the change rooms, which will emphasise the split between the outer and the inner worlds. Light will filter through the skins to produce leaf-like patterns in both buildings, which will remind users of the presence of nature in the city.

AIR

Natural ventilation is employed in the buildings, and more openings (and thus more air movement) is provided in more active spaces, such as the gym and exercise room, and less in rooms with less activity, like the media rooms.

WATER

Water is utilised in the design of the square as well as in the entrance to the change rooms. In the square, a fountain provides white noise to filter the noises of the city, while the reflection pool reflects the sky and connects it to the earth (the square). In the change room entrance, water symbolises the cleansing process, and reflects filtered patterns of light from the external skin into the room.

GROUND

The square and garden connect the design to the ground be emphasizing the distance of the sky in relation to high surrounding buildings. The user becomes aware of the height of surrounding buildings and their perceptive disconnection from the sky.

Paley Park in New York City was used as a precedent for the size and ordering of the square.

Fig 5.29   (below) CHANGE ROOMS - WASH ROOM (left), ENTRANCE (right)
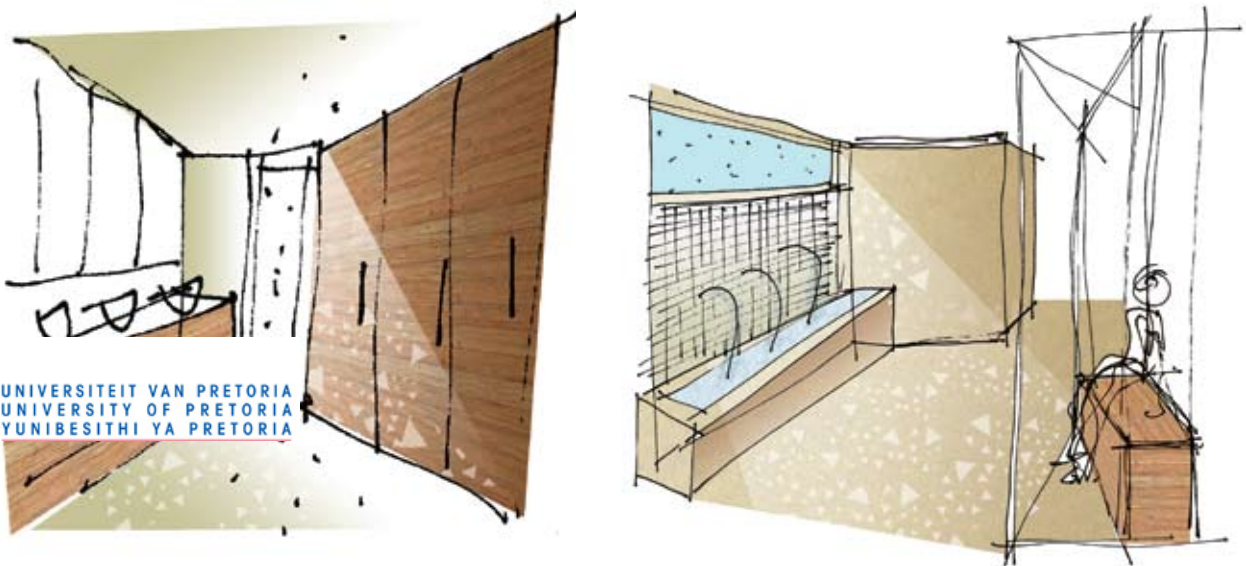
Paley Park
New York, USA

Zion and Breen Associates
1967

Paley Park is situated in the New York City urban landscape. It nestles between three high buildings, and is popular as a lunch-time retreat. Paley Park is only 390m² big, which classifies it as a vest pocket park.

The park is defined on three sides by walls, and on the fourth edge the street invites the user in. The opposite edge houses an 8m high waterfall, which provides white noise to fade out the noises of the city. Ivy creeps up the other walls, and trees provide shade in summer. These elements soften the edges of the park, and add to the serenity of the space (*www.pps.org*).

The park is situated on a slightly higher level than the street, which lends a degree of privacy to its users. Paley Park illustrates how even a very small park or square can have a positive impact on the surrounding area.

PROPOSED SQUARE

The proposed square will be 390m² big (23m x 17m). The square has three levels of privacy and interaction – the western component, onto which the restaurant spills; separated by trees, the next level houses the reflection pond and seating, which is less active; and beyond this a dividing wall screens off the service yard.

Due to the site slope from south west to north east, the square starts at the same level as the street at the south western corner, and ends at 700mm above street level. Stairs lead to this higher level, which can also become seating.
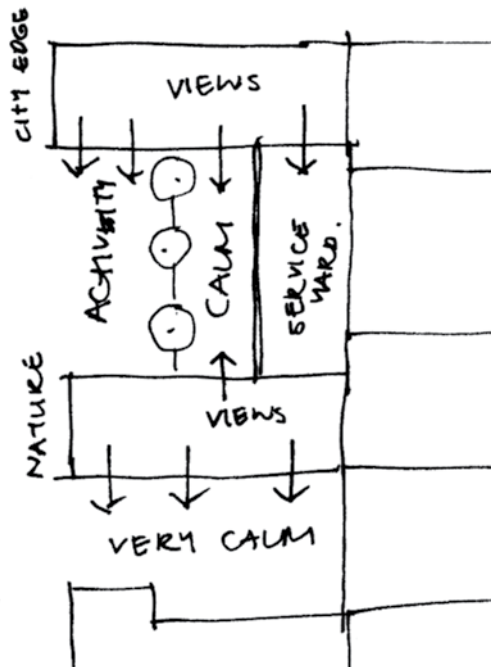

Fig 5.30   SQUARE - LEVELS OF INTERACTION
Fig 5.31   (below, left to right) PALEY PARK: SOCIAL GATHERING SPACE; LONGITUDINAL SECTION - LEVEL
              DIFFERENCES

CONVERSATION BETWEEN BUILDINGS

The buildings are similar in their façade articulation (skins which wrap around two façades) and basic organisation – a central core creates a break in each building and in its skin, and a floating roof articulates their connection to the sky.

The difference between the buildings occurs in their cores, where the most movement takes place. The northern building caters to programmes relating to the body, and its core consists of simple interlinking volumes, which contribute to the legibility of the building. The southern building caters to programmes relating to the mind and spirit, and its core is a more intuitive space – a single volume which grows towards the heavens, with overlapping staircases hanging centrally from the space. Shading structures cast strong patterns of light and shadow in both cores. These patterns articulate the passing of time, and activate the spaces. These shading elements have a vertical emphasis in the northern building, and a horizontal emphasis in the southern building.
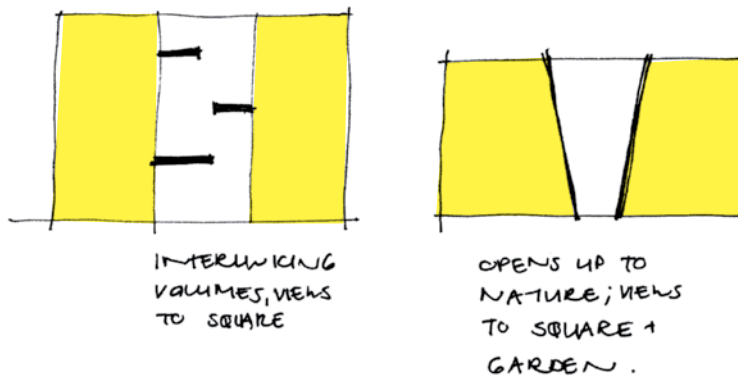
Fig 5.32   DIFFERENCE IN CORE TREATMENT - NORTHERN BUILDING (left) + SOUTHERN BUILDING (right)
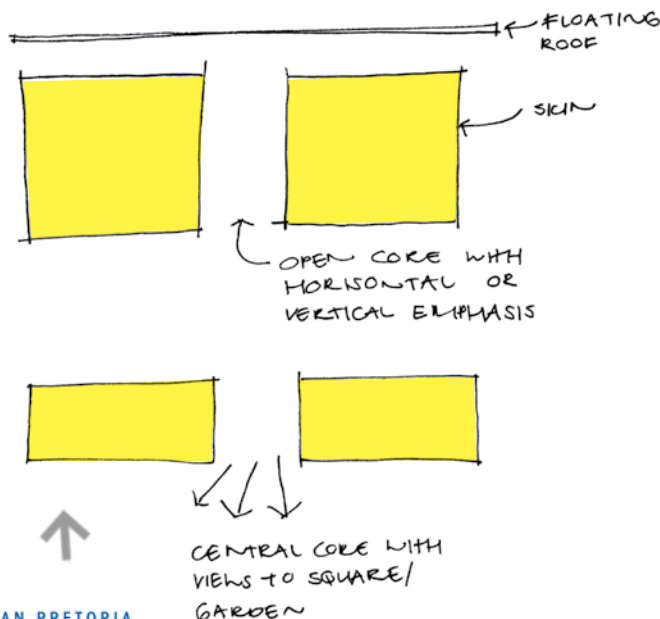
Fig 5.33   MASSING OF BUILDINGS - ELEVATION (top) + SECTION (bottom)

6   ORGANISATION

LEVELS OF PRIVACY

The design progresses from public to private from north to south; from bottom to top; and in the buildings from west to east. The southern building is detached from the activity in the square by its entrance on the first floor, through the bridge from the northern building, with only maintenance access on the ground floor. The square is made more private from the street (semi-public instead of public) by a slight difference in height between the pavement and the square.

Fig 5.34   SECTION - LEVELS OF PRIVACY

PROGRESSION OF SPACE

The design is an intermediate space between busy Church Square to the south, busy Vermeulen to the north, and calm Mutual street in between. It reacts to this by a series of layers (see Levels of Privacy, above). As one approaches it, the design will reveal itself to you – from the west: first the rusted façade of the northern building, then the square, then the vertical garden which shields the southern building; then the garden; and then the Ons Eerste Volksbank building, which leads one into Church Square.

On an architectural scale, the procession into the building follows the ritual employed in the ancient Roman baths (see Chapter 4 Precedents), which starts with a cleansing process in order to enter further into the building. This creates a metaphysical separation between the city chaos and the inner world of this urban sanctuary. Thus, when the users enter, they go to the change rooms to change into suitable attire first, after which they proceed to the main functions of the building (see fig. 5.34).
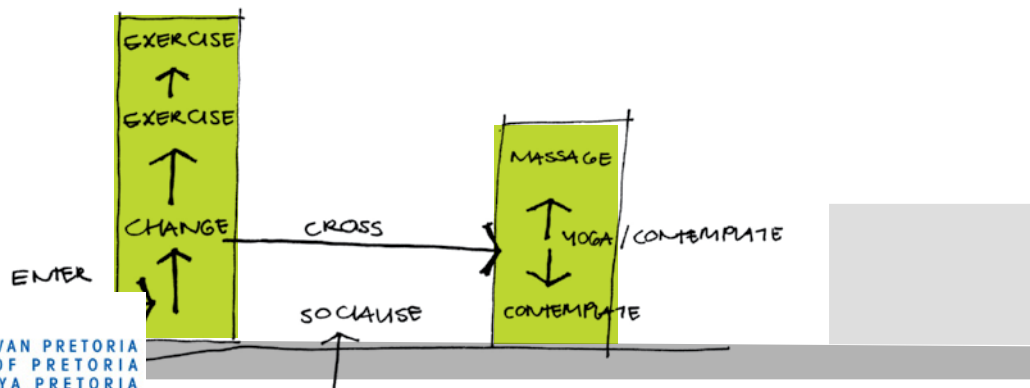
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Fig 5.35   SECTION - PROCESSION THROUGH SPACE

Fig 5.36   THREE-DIMENSIONAL VIEW OF DESIGN