

# EXISTING FABRIC AS GENERATOR FOR A 'NEW IDENTITY'

Re-connecting lost space





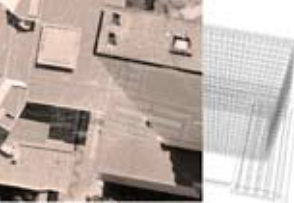
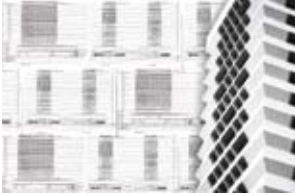

Fig. 1





Submitted in fulfilment of part of the requirement for the degree of Magister in Architecture (Professional) in the Faculty of Engineering, The Built Environment and Information Technology.

University of Pretoria

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# 1.theory



The University of Pretoria, as an ever changing institute of higher learning, is celebrating its centenary in 2008. This occasion provides an ideal platform for rethinking its past and possible future. Past developments on campus have achieved constructive form; however, the proposed project is a search for and a reconstruction of that which has been lost. In this sense, it represents a projective timeline. Its approach is anchored in the past in order to project into the future.

## 1.1 Abstract

Contextual research concludes that the University of Pretoria's main campus is set within fixed boundaries which prevent further expansion in any direction. The possibility exists to expand and integrate the main campus into the Hatfield commercial area towards the north. In addition, more satellite campuses could be developed elsewhere. However, this poses great challenges involving various problematic issues. The current situation indicates that the main campus of the university aims to stay within its existing boundaries and to keep functioning as the heart of the institution, instead of attempting integration with the surrounding city fabric. This would maintain comfortable walking distances between facilities, but it will also enforce the idea of a 'gated community'. Statistics indicate that student numbers at the University of Pretoria have almost doubled over the past 10 years. The rate at which the number of first year students is increasing at the University of Pretoria is placing additional pressure on the existing infrastructure. Higher education institutions are constantly faced with the challenge of creating better quality teaching and research accommodation on their campuses. The thesis explores a possible solution with regards to the future expansion of infrastructure and facilities, without losing the essence of campus life and sense of place currently experienced on campus (Lynch, 1981:131). Instead of destroying green spaces and exploiting more resources for expansion, perhaps the greater challenge is to adapt and improve existing buildings to generate benefits similar to those that new constructions would provide.

This dissertation deals with a terminally ill building and the surrounding public spaces that display similar symptoms. It also questions the impact of earlier design methodologies on the layout of the UP campus and its buildings. Traditional qualities of urban place and therefore space are lacking between the Humanities Building and the Department of Library Services. These buildings function as isolated objects, with undefined open areas around and between them. The thesis aims to re-connect the lost space at the foot of the podium of the Humanities Building to the surrounding urban landscape. This re-connection will interpret the site as a gateway to the campus, as well as a threshold towards the Student Centre. The thesis further investigates the Humanities tower as a somewhat outdated symbol of the university and looks into how this building can be adapted to represent the current zeitgeist. The investigation questions how the legibility of current elements and forms could be preserved whilst retaining the iconic qualities of the existing object. The proposed design aims towards a contemporary expression, by transforming one of the most iconic elements of the University of Pretoria campus into a visionary identity.

# Ou Lettere kry eerste plek, GW verloor ver

## 1.1.1 The real world problem -

### Building in existing fabric

In the publication *Building in Existing Fabric* Christian Schittich (2003:9) argues that working with existing buildings has long ceased to be only a question of preserving historical monuments and the city image; it has become an economic and ecological imperative. Schittich further states that in a time when resource and pollution issues are intensifying and population numbers are on the increase, working with the existing built environment has become the order of the day. This reduces the destruction of more green space and the exploitation of more resources (Schittich, 2003:11). Conversions and upgrades will continue to gain in importance in the near future, accounting for a steadily increasing percentage of the total building volume.



OLD ARTS  
(OU LETTERE) 1911



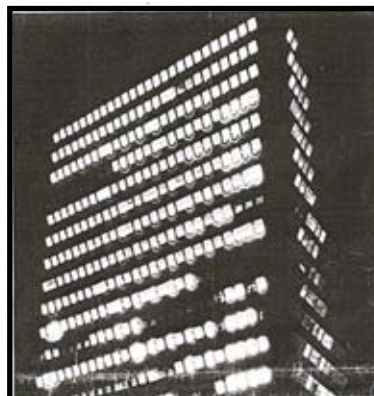
ADMINISTRATION  
(DIE SKIP) 1968



HUMANITIES BUILDING  
(GW) 1977

**2008**

**1977**



### 1.1.2 Objective/Goal

The goal of the proposed thesis is to merge two entities into a complex design. The product arranges dissimilar elements into a symbiotic relationship in an effort to create a meaningful whole. This would be done through the adaptive reuse of the existing fabric and implementation of a contemporary tectonic. With the application of appropriate skin/surface technologies this intervention will act as the gateway to the campus and aim to strengthen the identity of the main entrance of the University of Pretoria.

Fig. 1.2 (Top) A headline from the campus edition of a South- African national newspaper that states; 'Old Arts Building gets first place ,Humanities loses'. In a pole done by Kampus Beeld during April 2008 student were asked to choose their favorite and worst building on main campus. The heading clearly informs of who the winner and loser was. The first two images of iconic campus buildings are currently being used by the University in their marketing media to celebrate the university's centenary existence. The Humanites building however fail to feature. [Kampus Beeld, UP & Author,2008].

Fig. 1.3 (Bottom) In contrast to the above headline this newspaper heading and photographs from a 1977 local campus newspaper of the opening and celebration of the Humanities building on 28 October 1977. Humanities building architect Brain Sandrock on the left hand side of the photo. The headline states; 'Ideal Achieved' [Tukkiewerf ,1977]



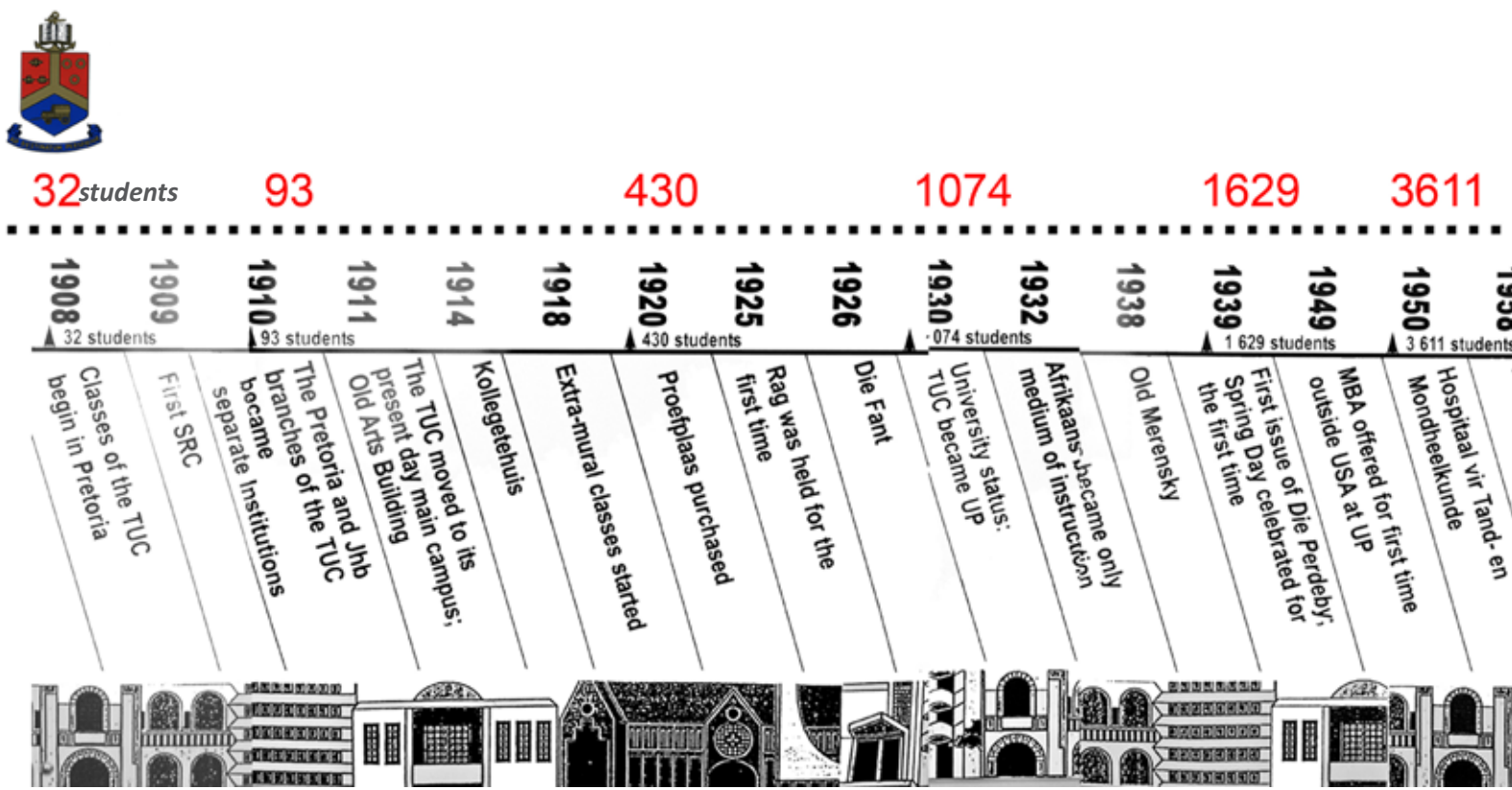
### 1.1.3 Research questions

1. How can the proposed intervention be implemented to create a new building while retaining the integrity of the existing one?
2. How can the existing fabric be transformed and manipulated to create a new identity or 'face' for the university?
3. Can architecture heal a sick building?
4. How can the visual perception of the building skin/surface be designed to create identity and adapt to change?
5. How can the site as entrance or 'gateway' to the university be improved to fit the current time and vision?
6. How can the genius loci of a place be maintained through expansion, densification and constraints, put in place by physical boundaries?

### 1.1.4 Assumptions and delimiters

- Assume that the densification and expansion of the university will happen within its current fixed boundaries.
- Assume that the main entrance of the university will remain in its current position at the crossing of Lynnwood Road and Roper Street.
- Assume that current facilities can temporarily be housed elsewhere while building works take place.
- Assume that underpinning/proping/temporary structural support can be put in place on the existing structures (Humanities and Department of Library Services) to accommodate the building works.
- Assume that funding would be available to take on a project of this magnitude.

Fig. 1.4 A Time line of the development and growth of the University of Pretoria over the last 100 years, indicating all major events and increase in student numbers. [University of Pretoria ,2008]



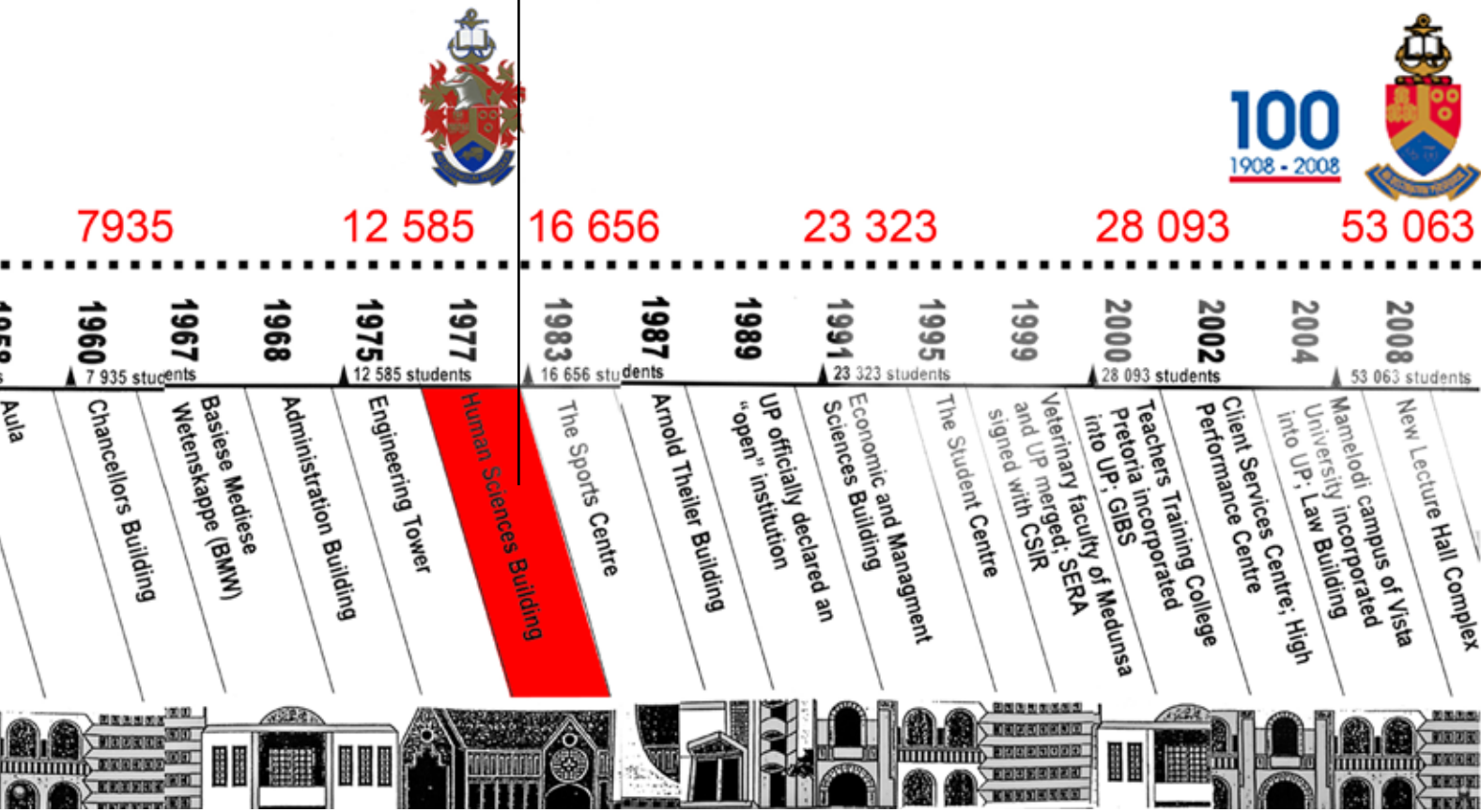
### 1.1.5 Design Concept

The design concept proposes to achieve the following:

- Repair circulation routes.
- Reinststate views.
- Introduce passive surveillance.
- Repair and extend activities.
- Enhance spatial qualities.
- Enhance the image of the extended entrance to the university.
- Unlock the limitations set by the object and introduce mediate planes between strong horizontal and vertical edges.
- Repair the urban landscape.



Fig. 1.5 A photo collage comparing the Humanities Building with iconic Hollywood monsters. [Author,2008].



## 1.2 The Idea of University

*University: "institution for advanced teaching, conferring degrees and engaging in academic research" - Oxford Student's Dictionary of current English*

*Campus: "level place, field, plain." - Latin Dictionary.*

### 1.2.1 Introduction

In recent times, significant changes concerning cultural, technological and social matters have transformed most traditional institutions. Universities will undergo major changes as they adapt their activities to meet present and future needs. Although higher education existed around 420BC, with Athens as the centre of Greek science, philosophy and culture, the educational institution is a legacy of the Middle Ages. The term "university" derives from the Latin *universitas*, meaning corporation or guild. During the Middle Ages university scholars were considered to be a guild of specialists.

### 1.2.2 Single Building

Hashimshony & Haina (2006) explain that universities evolved from cathedral schools and continued the tradition of the preservation of knowledge that had previously been the responsibility of monasteries. Universities had to develop to meet the new needs of urban society for professional training and were not housed in permanent buildings. They operated from existing buildings, usually no larger than the size of a city block. Where necessary, universities were divided into several unconnected buildings located in different parts of the city (Hashimshony & Haina, 2006). As student numbers increased and more fields of study were added, it became necessary to build buildings to house university activities in one location. The creation of permanent structures marked the establishment of the university as an independent institution (Cobban, 1992). The first important prototype for university design was the single college structure of which Merton College at Oxford is a good example (Figure 1A). Merton College has the distinct architectural structure of a square unit with an internal court. This layout and design reflected the social and educational character of the time. Over time, as the number of students increased, additional colleges were founded, forming clusters (Figure 1B) (Hashimshony & Haina, 2006). Stellenbosch University is a good example of a South-African university with an architectural structure similar to that of the single building.

### 1.2.3 Campus

According to Hashimshony & Haina (2006), American universities represent the concept of an "academic village" — a term coined by Thomas Jefferson, the designer of the University of Virginia in Charlottesville in 1817 (Figure 1C), to describe universities as communities unto themselves, where shared learning infuses daily life. The Latin term "campus" (field) describes the distinctive physical character of American universities. It was first used to describe the college grounds, but gradually came to denote the entire property, including buildings, and later became the synonym for all university compounds. This typology was subsequently adopted by many designers for campuses throughout the world. The University of Pretoria (Figure 1F) today reflects this typology.

### 1.2.4 Megastructures

With later campus designs the physical dimensions of the grounds became so large that the distances between buildings prohibited good communication among the separate entities. The university required radically different designs to support the increasing complexity of its organization. Universities were designed as a single large concentrated building, called a "megastructure". A number of university designs were based on this spatial model, e.g. the University of Essex in 1963 (Figure 1E) and the Rand Afrikaans University in South-Africa in 1974 (Figure 1I). The concept of the megastructure never fulfilled their designers' expectations. The megastructure also proved to be a failure in respect of flexibility. (Hashimshony & Haina, 2006).

### 1.2.5 Conclusion

The fact that the city of Pretoria was founded in 1855 makes it a relatively new city compared to the Western Cape university town of Stellenbosch, which was founded back in 1679. Over time Stellenbosch University evolved into a 'single building' university with its facilities scattered across town in a number of buildings, whereas the University of Pretoria expanded and eventually developed into an isolated and independent community. Land density and age are some of the factors that played a significant part in the development of the University of Pretoria into its current 'campus' layout. In 1908, when the University of Pretoria opened its doors to the first student, vast areas of land were undeveloped or used for cultivation. The university was fortunate to have acquired a reasonable area of land by 1921, which by the 1960s allowed the campus to further expand and develop towards the east. Today, Pretoria's peripheries stretch many kilometers towards the east as a result of urban sprawl. The current campus is set within an enclosed environment and acts in isolation towards its surroundings, due to various socio-economic factors. Current densities prevent further expansion, yet growing student numbers increase pressure on the existing infrastructure to expand. This leaves the option to either expand vertically, develop the few green spaces left on campus, or expand and renovate the existing terminally ill building fabric.

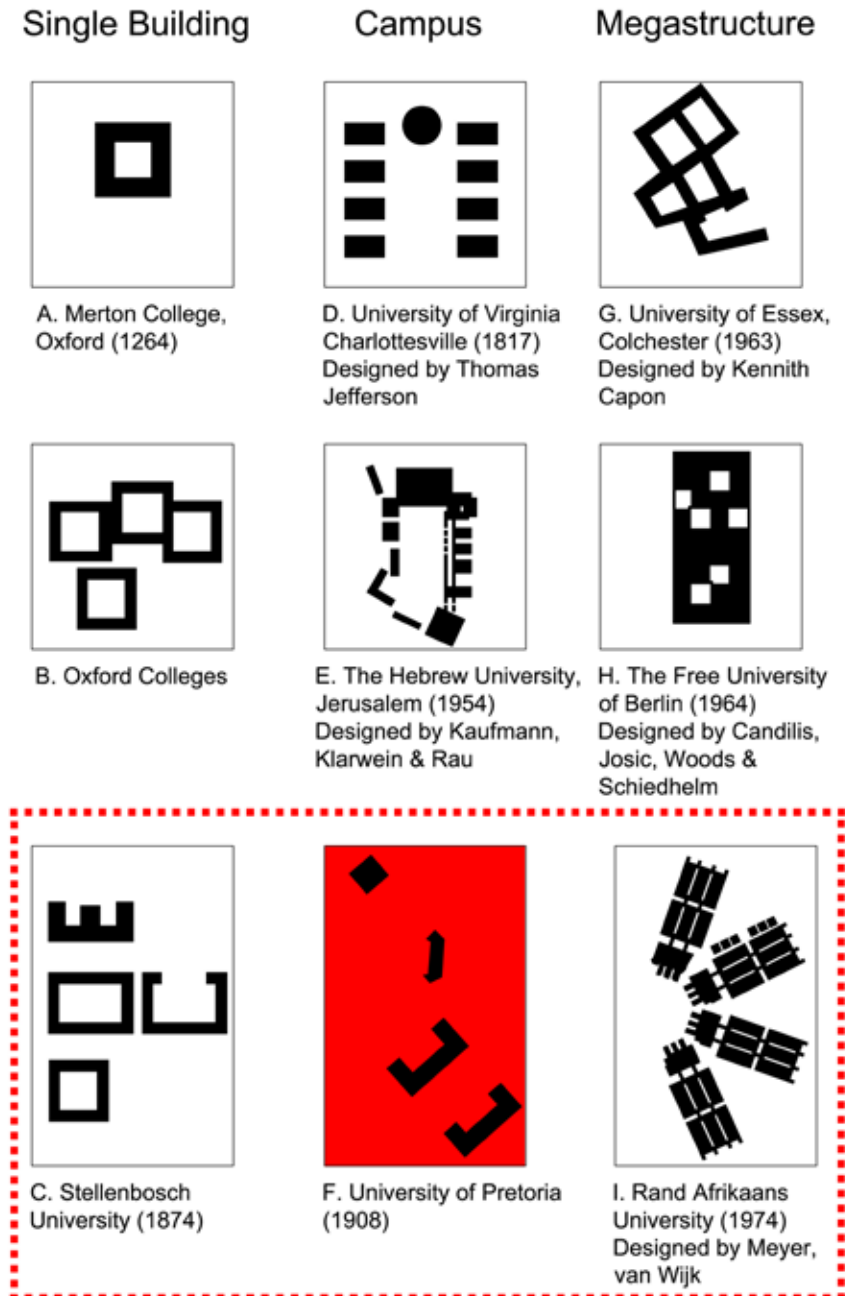


Fig. 1.6 A figure ground study of the evolution of the facilities that houses the 'university'. The study demonstrates where some of the South-African university's fit into a specific typology. Location and time of establishment are some of the conditions that resulted in the different typologies.





2.context





Fig. 2.1 A photograph and figure ground map of main campus. View from the west.





# Tshwane - Pretoria- University of Pretoria

John Vorster Tower

Reserve Bank

City Hall

ABSA Building

Samny Marks Square

Church Square

Sci

Fort Schanskop

CHURCH STREET

Voortrekker Monument

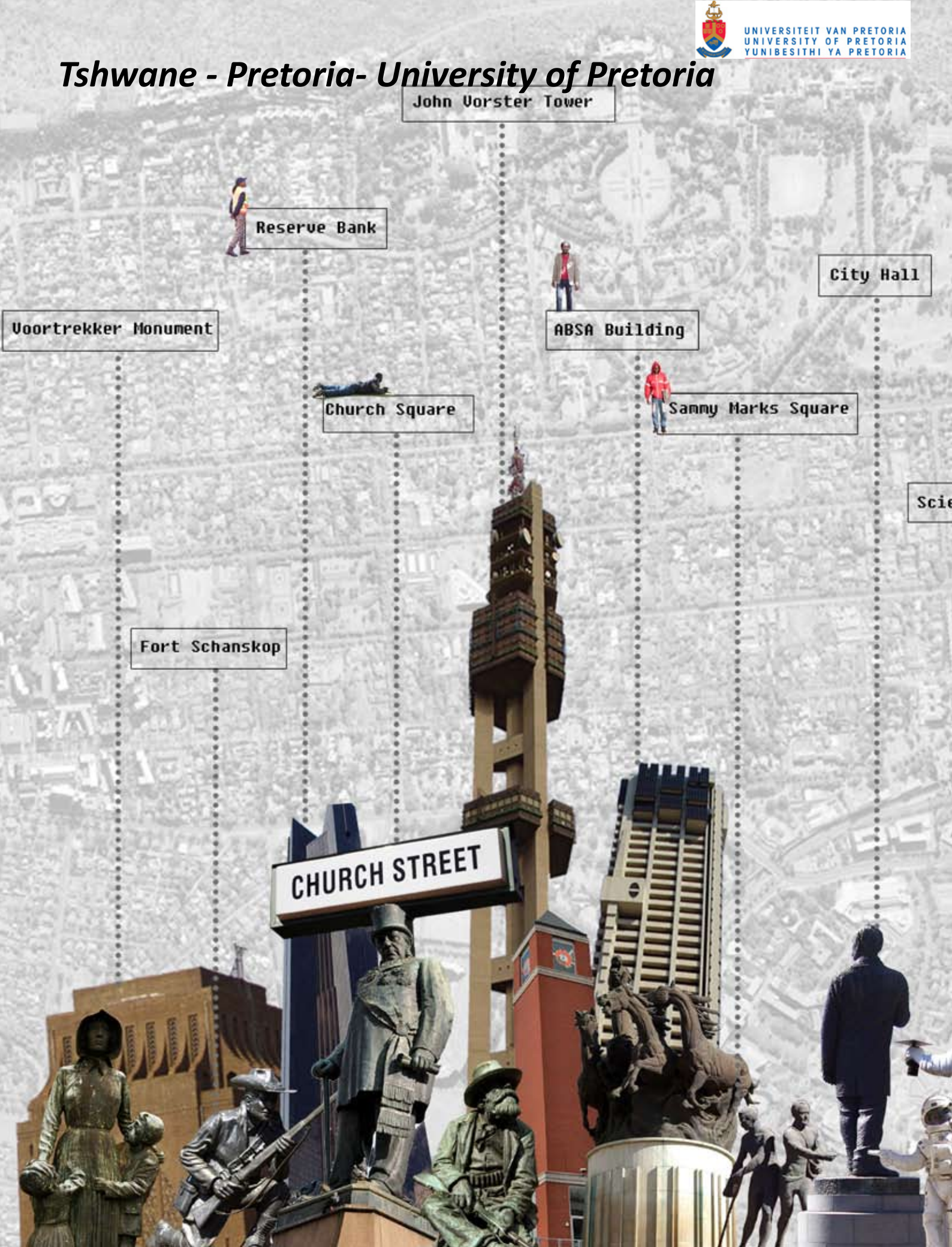
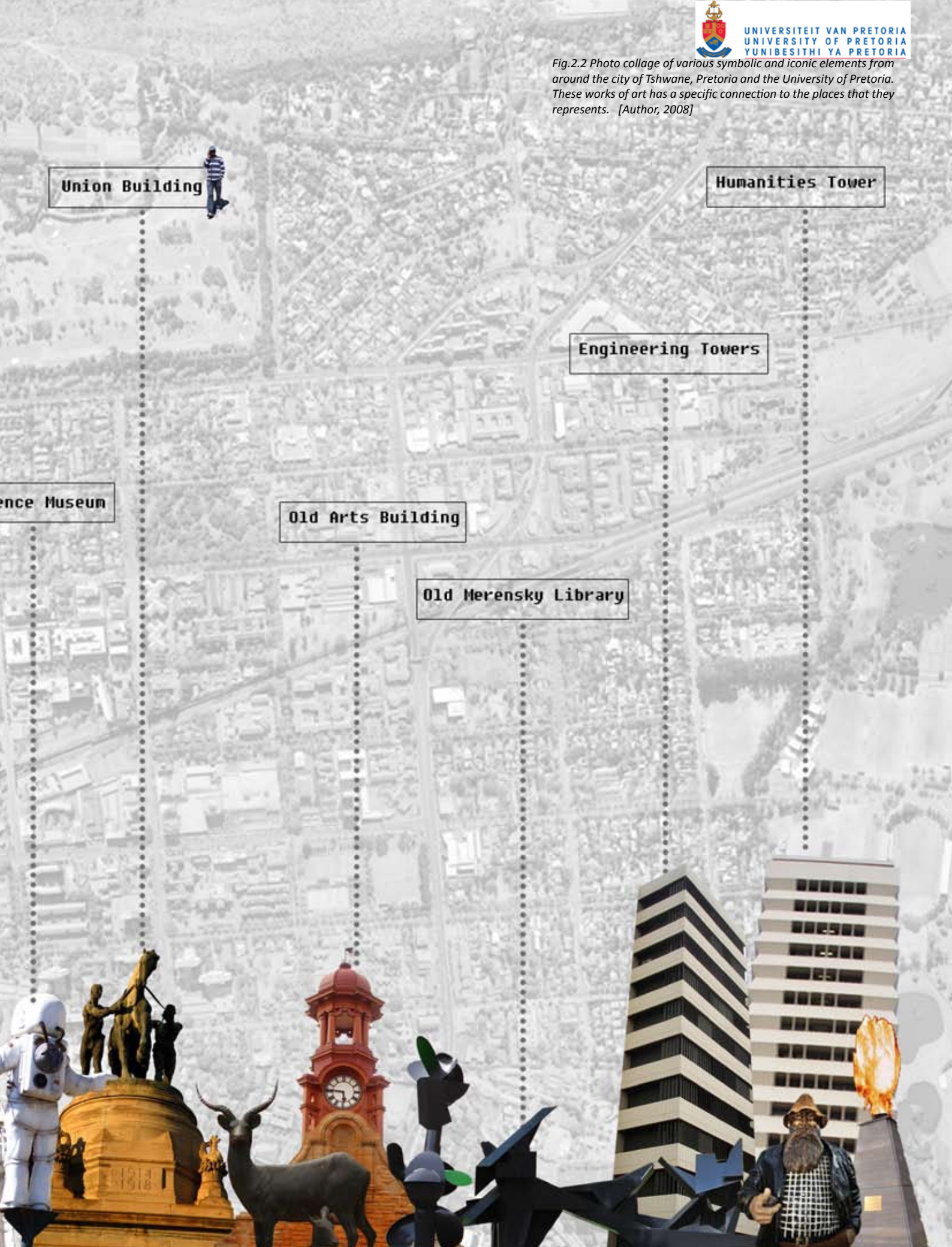




Fig.2.2 Photo collage of various symbolic and iconic elements from around the city of Tshwane, Pretoria and the University of Pretoria. These works of art has a specific connection to the places that they represents. [Author, 2008]



Union Building

Humanities Tower

Engineering Towers

Science Museum

Old Arts Building

Old Merensky Library





## 2.1 City Context

### 2.1.1 Background

The district of Tshwane boasts a rich history, a vibrant tourism industry, excellent educational facilities, world-class business nodes, a high number of foreign embassies, as well as a wide variety of cultures and ethnic groupings and housing types. There is an abundance of physical and natural features such as Meintjieskop, the National Botanical Gardens, Hartbeesspruit and its associated open space (Colbyn Valley), and the Witwatersberg. On the eastern periphery of the city natural features such as Strubenkop, Lynnwood Ridge and the Wolwespruit can be found. To the south and south-west Klapperkop, Skanskop, Salvokop and the entire Fountains Valley are form-giving elements that shape the city and give it its character and appeal. The residential population is approximately 85 000 and can mainly be categorised in the middle-income group (City of Tshwane, 2007).

In terms of built form, the inner city (Pretoria) is acknowledged as the primary metropolitan activity node, characterized by mixed land uses ranging from retail, offices, government buildings and high-density residential development. The south-western part of the region is characterized by cultural, historic and recreational elements (the Voortrekker Monument, Fort Skanskop and Fort Klapperkop), whilst land uses in the south and south-east consist mainly of residential areas and open spaces.

#### Location

Defined by the N1 highway on the EASTERN boundary, Monument Park extensions in SOUTH-WEST Groenkloof plantations and Fountains Valley in the WEST and Boom Street, Belvedere Street, Meintjieskop, Meintjies Ridge and the northern boundary of Colbyn up to the N1, in the NORTH. Heart of Pretoria and of Tshwane as a whole.

#### Gauteng Universities

- University of Pretoria - 5 x campuses
- University of South-Africa - 1 x campus
- Tshwane Institute of Technology - 3 x campuses
- University of Witwatersrand -
- University of Johannesburg -
- Vaal University of Technology -
- University of the NorthWest (Vaal Campus)

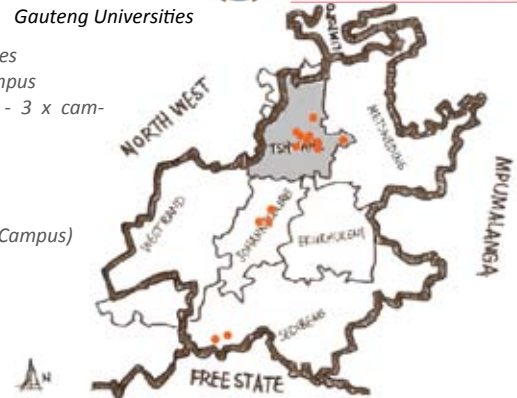


Fig. 2.3 Map of the Gauteng province municipalities illustrating where all the major Universities are located. [Author, 2008]



Fig. 2.4 Map illustrating the eight districts of the greater city of Tshwane, This region houses the University of Pretoria's main campus. [Author, 2008]



Fig. 2.5 Map illustrating the main arterials feeding the greater city of Tshwane & routes to nearby and





### 2.1.2 Development opportunities and potential.

The proposed Gautrain development will affect a large part of the region, namely the Salvokop area, the southern part of the Inner City, the southern part of Sunnyside, the northern part of Muckleneuk, and parts of Hatfield. The implementation of this development should improve the accessibility and development potential of the region. The Innovation Hub, an exciting new proposal for the extension of educational and research facilities in the north-eastern part of the region, could further entrench the area as the 'thinking region' of the city. The region is known for a balanced distribution of excellent medical facilities and hospitals, as well as other specialised nodes.

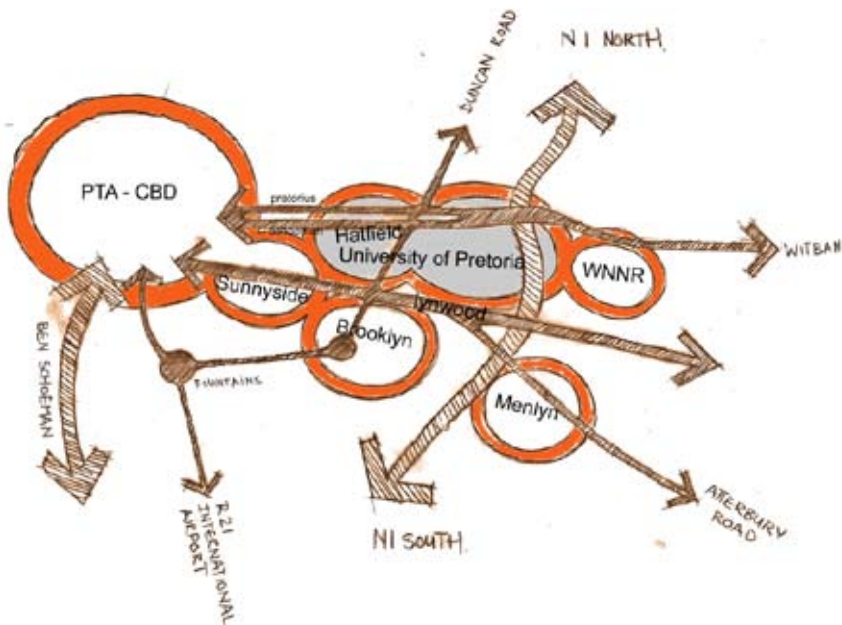


Fig. 2.7 Diagram illustrating all major vehicle axis and the location of the University of Pretoria's main campus in relationship to Pretoria C.B.D and adjacent neighbourhoods. [Author,2008]

### 2.1.3 Trends

City growth and suburban expansion since 1880 has given the region some fine suburbs – both architecturally and environmentally. However, accelerated growth in the northern, eastern and south-eastern directions from the 1950s onwards began to threaten these assets and the current trend is one of changes in land use, resulting in the gradual loss of the suburbs' inherent qualities. The trend of rapid decentralisation may ultimately lead to the decline of the inner city. The role and function of major roads and their immediate environments (such as Lynnwood Road, Charles Street, Duncan Street, and Atterbury and Brooklyn Roads) are constantly changing and non-residential uses are encroaching onto traditionally quiet residential areas.

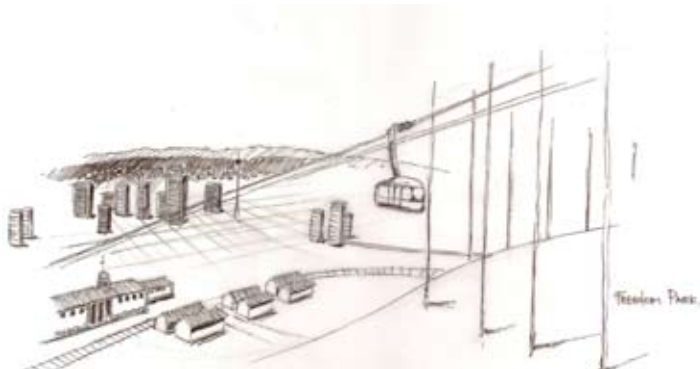


Fig. 2.8 Sketch of Pretoria city centre and train station. View from Freedom. [Author,2008]



Fig. 2.9 Diagram illustrating main arterials feeding University, links to CBD and adjoining areas. [Author,2008]



Fig. 2.6 Panoramic view over Pretoria city centre View from the Union Building. [Author, 2008]



## 2.2 Re-Thinking the University's Future

### 2.2.1 Analysis

**Edge Condition:** Edge conditions are important in architecture on many levels, from the behavioural to the technical. In all senses, and in the real world, they represent places of tension, of intensification and often of conflict. Porter (2004:66) states that edge conditions, in architectural terms, refer to the places where social territories meet. The edge condition requires special attention because it often mediates between very different social and physical conditions, generating complex and often competing priorities (Porter, 2004).

**Gateway:** A gateway marks boundaries and edges in order to create psychological transitions between 'conscious' and 'unconscious', 'past' and 'future', and physical transitions between 'inner' and 'outer', 'public' and 'private'. It also marks the difference between a sense of 'arriving' and a sense of 'arrival'. Gateways define the intersections of pathways and boundaries. They form an integral part of boundaries, and interface between different kinds of activities. In order to heighten the sense of transition, they often involve changes of topology, light and surface, and can take on various forms (Porter, 2004:87).

**Threshold:** The threshold is an architectural element with deep social and emotional significance. It is a transition zone that marks the passage between 'outside' and 'inside' – the beginning of dwelling, according to Martin Heidegger. It is at the threshold where one crosses the boundary into a 'place cleared for settlement'. According to Heidegger, the threshold is a place in the most basic sense, in that it is a highly defined 'location'. There is a directional bias associated with the threshold, namely that of moving from a less bounded to a more private, contained space; it expresses the idea of entering. From the earliest human settlements to the present, ritual and specific modes of behaviour have become associated with crossing the threshold – removing one's shoes or hat, paying respect to the protecting deities, exchanging greetings with the host, and more recently, submitting to security checks (Porter, 2004:93).

**Nodes:** Porter (2004:131) argues that the node is one of the 5 elements of a city, an aspect also described by Kevin Lynch in his *Image of the City* (1960). Nodes usually form part of transportation systems and are often located at the crossing or intersection of 'paths'. Train and bus stations, town centres and complex intersections where a number of different roads come together are all examples of nodes. They can also simply be concentrations, such as a street corner hang-out or a small park or plaza. Landmarks often work in conjunction with nodes as points of reference – navigational aids when moving through the city. Louis Hellman states that an architectural node is simply and intersection, a crossing point, a point where different forces meet (Porter, 2004).

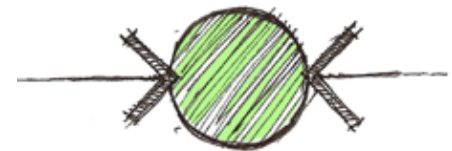
#### EDGE:



#### GATEWAY:



#### THRESHOLD:



#### NODE:

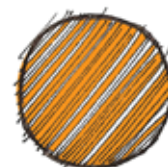


Fig. 2.10 Diagrams resembling various urban design patterns as mentioned by Lynch (1996). [Author,2008]



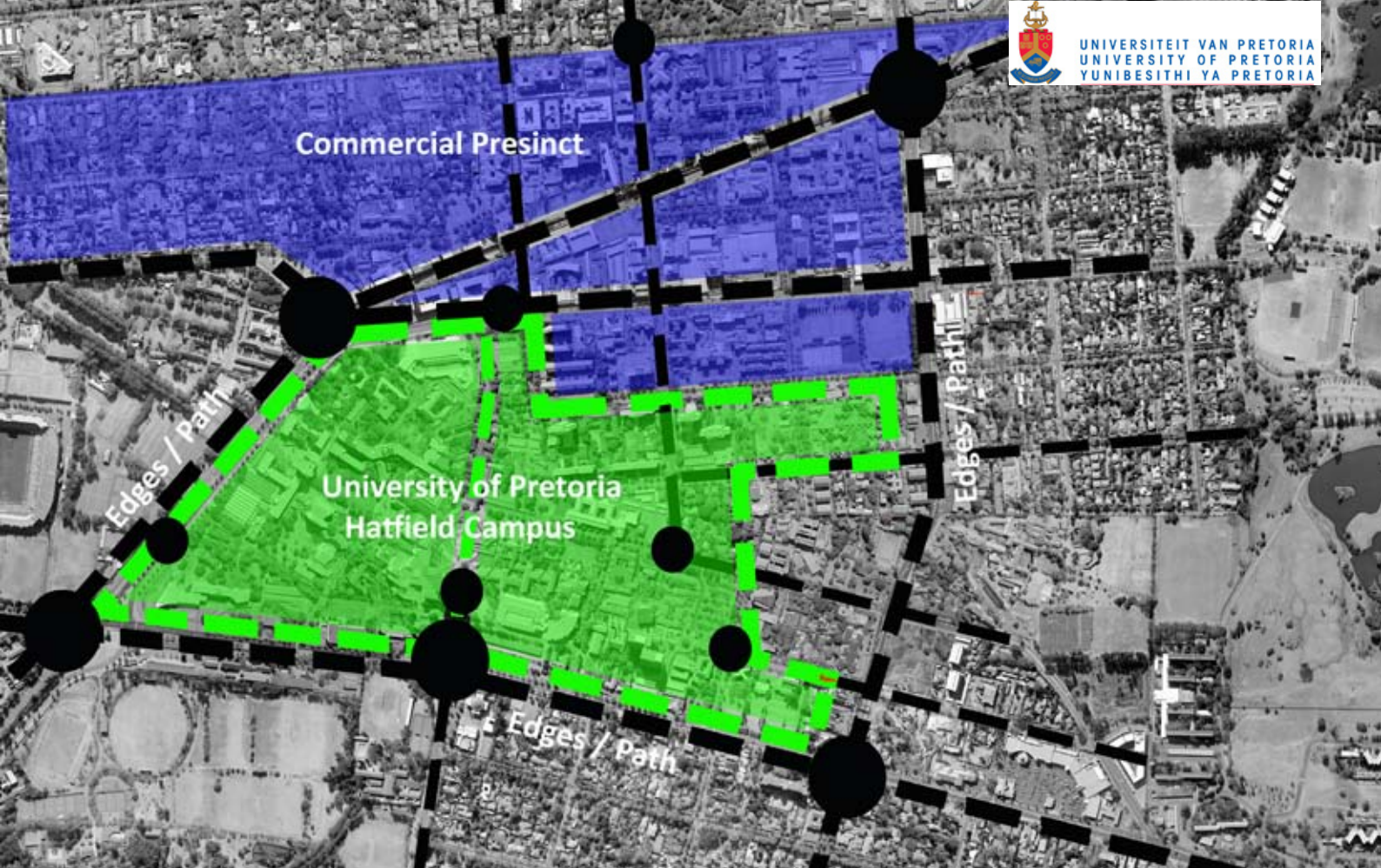


Fig. 2.11 Map indicating the boundaries of the University of Pretoria's main campus intersect all major crossings and interchange points on the periphery. [Author & I. Coetzee, 2008]

Fig. 2.12 Map identifying the proposed urban pattern of main campus and its adjacent precincts. [Author & I. Coetzee, 2008]





### 2.2.2 Vision Statement

Regarding the University of Pretoria as a densely developed 'village' is the first step in achieving a vision of future growth within the current set boundaries. The university could become a village where the urban fabric is designed at a human scale, where the buildings become nodes of social and academic interaction, and the exterior spaces act as outdoor rooms for academic discourse and social play; a village that has its own tangible and definable character, identity and vitality; a village that has clarity of circulation dominated by pedestrians; a village that is designed for the night, which has a vibrant and cultural night life. The university village will function as a community, working as an interrelated whole in a symbiotic relationship of allied units. This proposed transformation will strengthen and guide the campus to continue functioning as a holistic entity. [Graduate class of 2008]

### 2.2.3 "Front Door" of the University

According to Holm (1992:51) first impressions count, whether one refers to people, movies, books, cars, buildings or cities. First impressions determine one's judgments and attitudes, and also how one behaves in future. Architects and builders know why they spend so much time on the front door. It represents the extended hand. Entering a building from the back isn't nearly as spectacular as entering the same building through the front door. If one approaches Cape Town from the sea, then one enters via the front door. Think about the unforgettable image presented when one approaches Venice by boat, or the way in which the "white cliffs of Dover" greet one on arrival. Similarly, Pretoria has its own way of greeting visitors via the Fountains Circle (Holm, 1992).

In the same manner, the University of Pretoria has its own "Front Door", represented by the stature of the Humanities Building which greets staff, students and visitors at the Roper Street entrance.

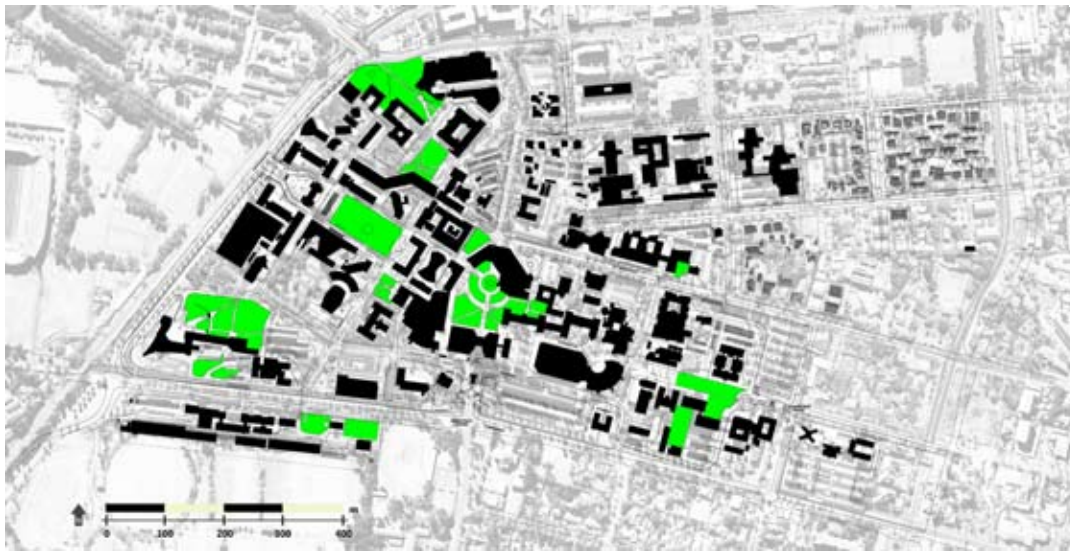


Fig. 2.13 Photograph of the University of Pretoria main campus, taken from the south west corner looking north west. [Ad Destinatam,]



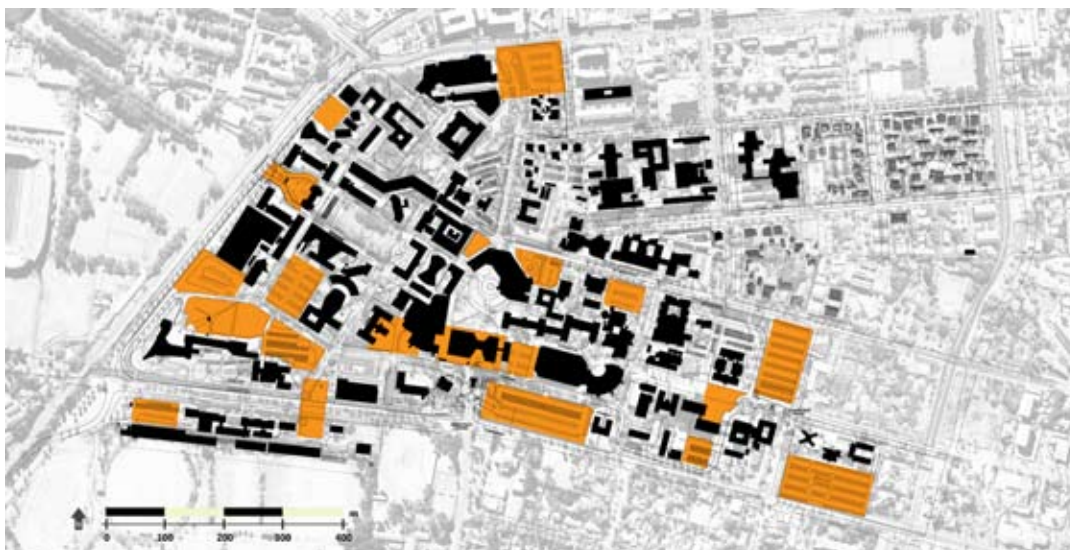
Fig. 2.14 Aerial Photograph of southern part and main entrance (Roper Street) of the University of Pretoria's main campus. [UP, Department of Geography, 2008]





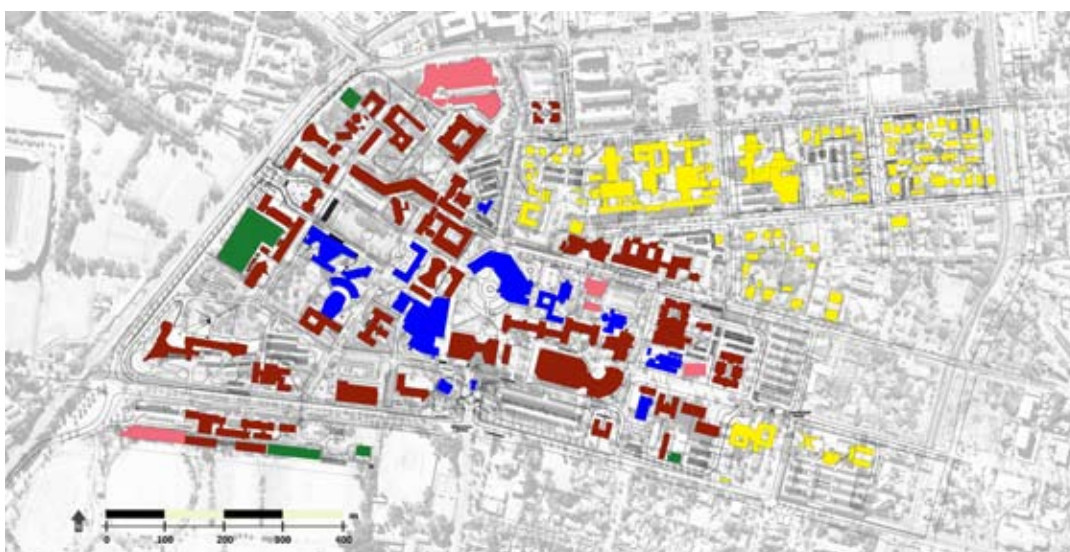
Existing green open space

Fig. 2.15 Figure ground study identifying all existing green open spaces on the main campus. [Author ,2008]



Areas with potential for development

Fig. 2.16 Figure ground study identifying spaces on main campus that has a good potential for future development. [Author ,2008]



- Academic & Academic Administration
- Laboratories
- Accommodation
- Technical, Storage etc.
- Undercover Parking
- Academic Support

Fig. 2.17 Land use map of main campus. [Author ,2008]



## 2.3 Development time-line

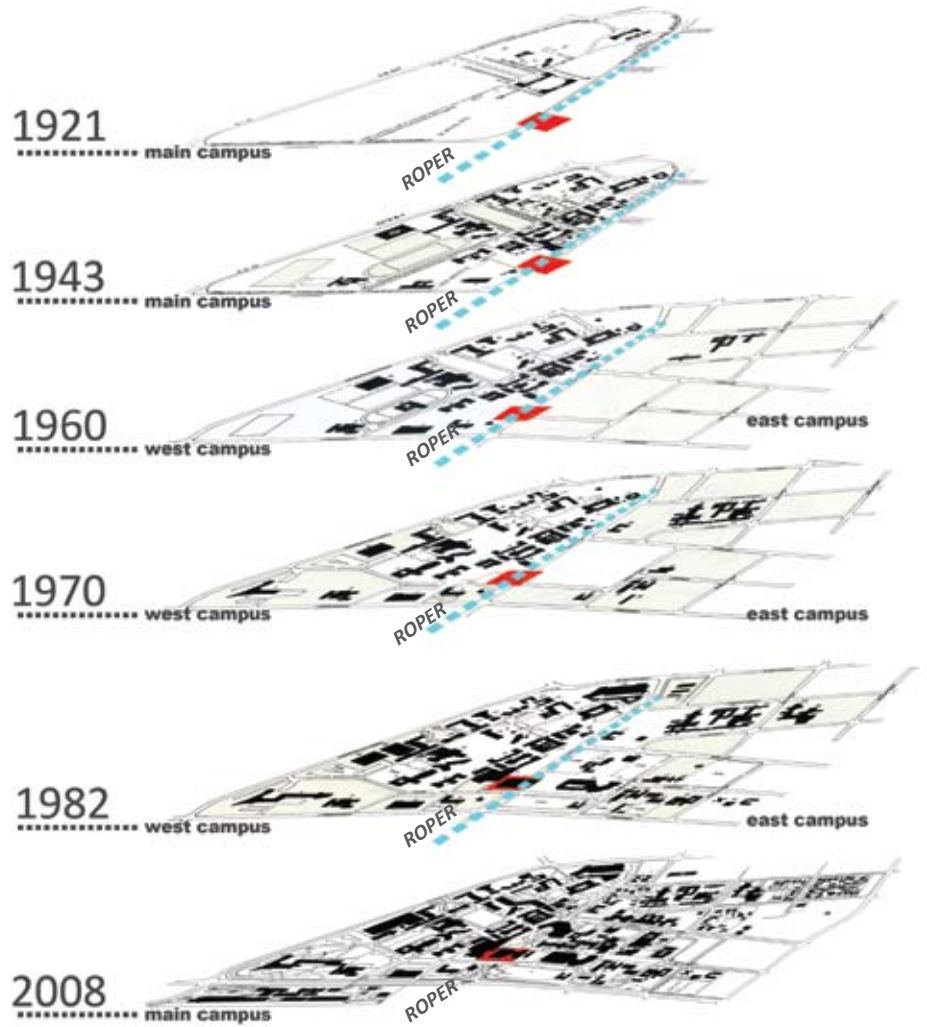


Fig. 2.18 A range of figure ground studies representing the layout and growth of main campus over the past 80 years. The study also indicates the location of the selected study area between the original west, and later developed east campus. East and west campus used to be divided by Roper Street running in a north south direction before the road was closed and pedestrianized in 1999. [Author, 2008]

### Buildings on campus 1908 -2009

Fig. 2.19 Map of main campus illustrating the growth and development of buildings on campus over the past century. [Author, 2008]

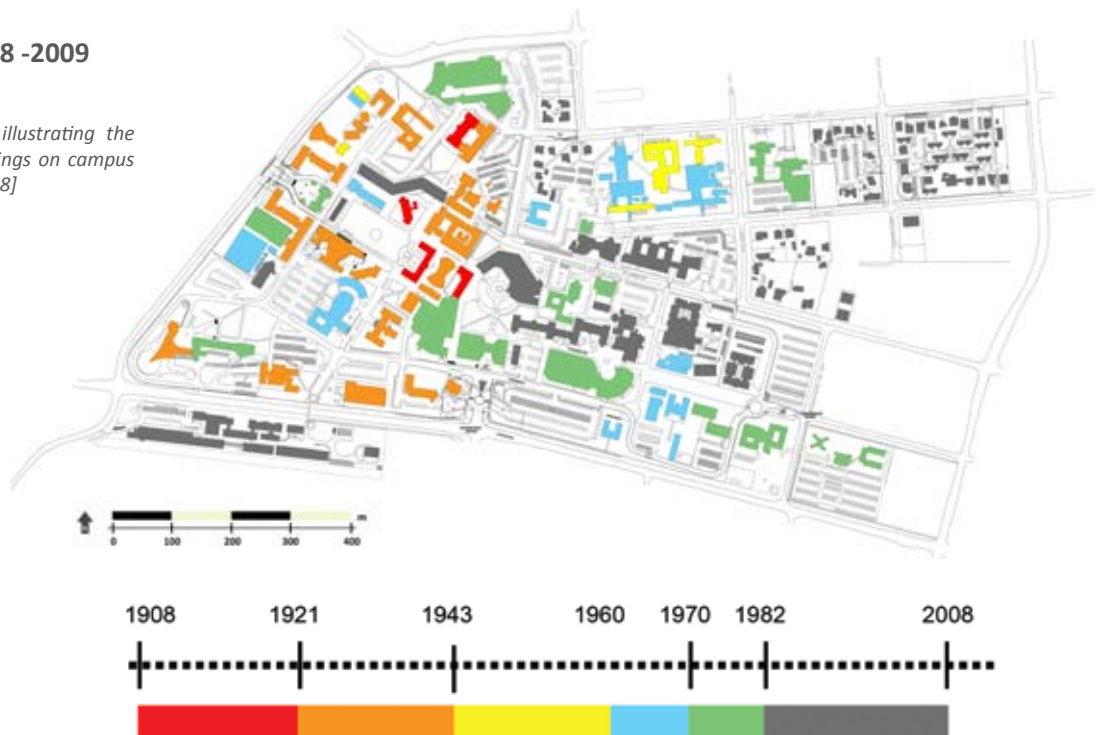




Fig. 2.20 Figure ground study with most major movement axis on and around the main campus of the University of Pretoria. [Author, 2008]

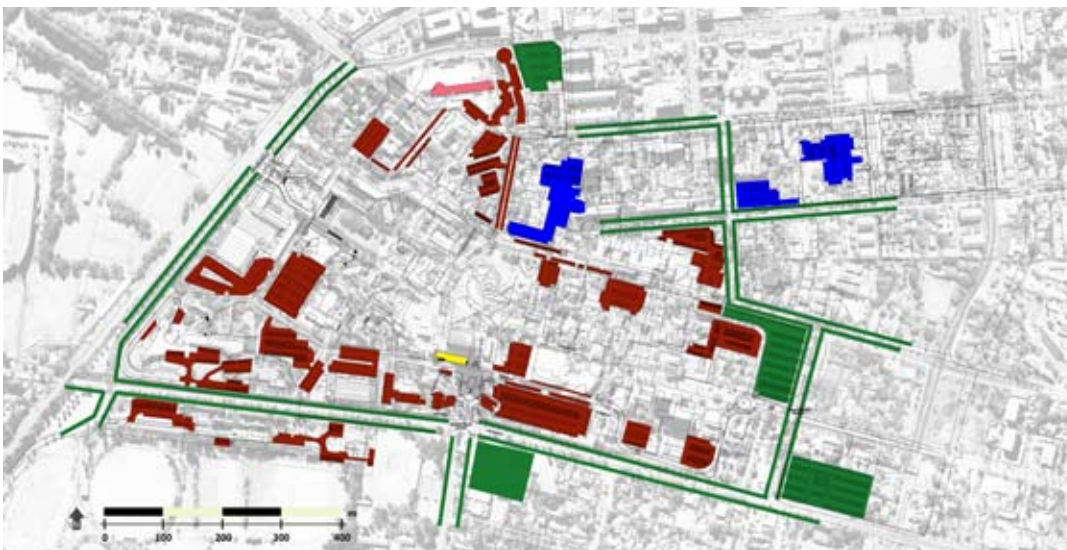


Fig. 2.21 Map illustrating all allocated parking areas on and around the main campus of the University of Pretoria. [Author, 2008]

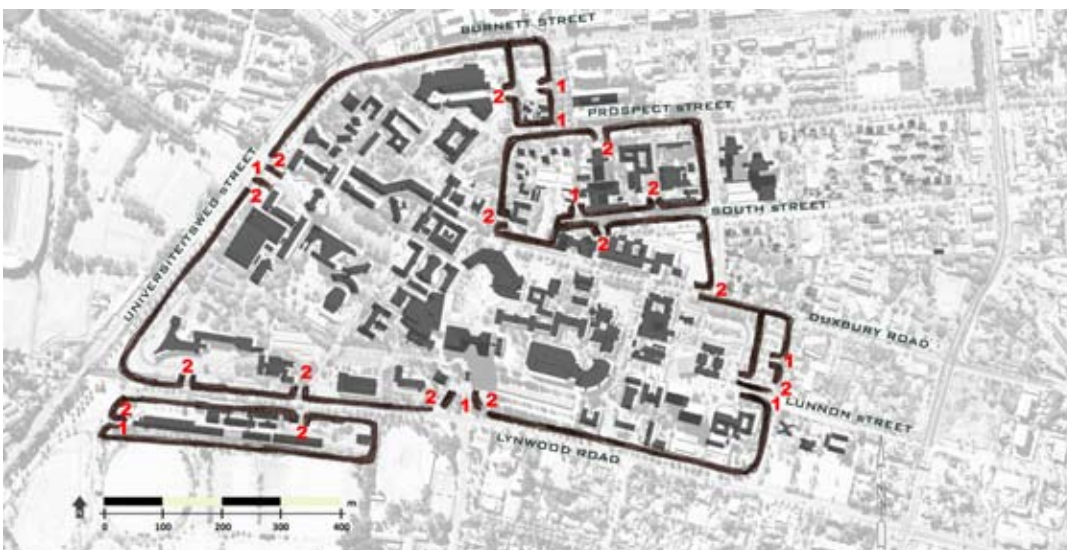


Fig. 2.22 Permeability map indicating the location of all vehicular and pedestrian security/access points to the enclosed environment of main campus. [Author, 2008]



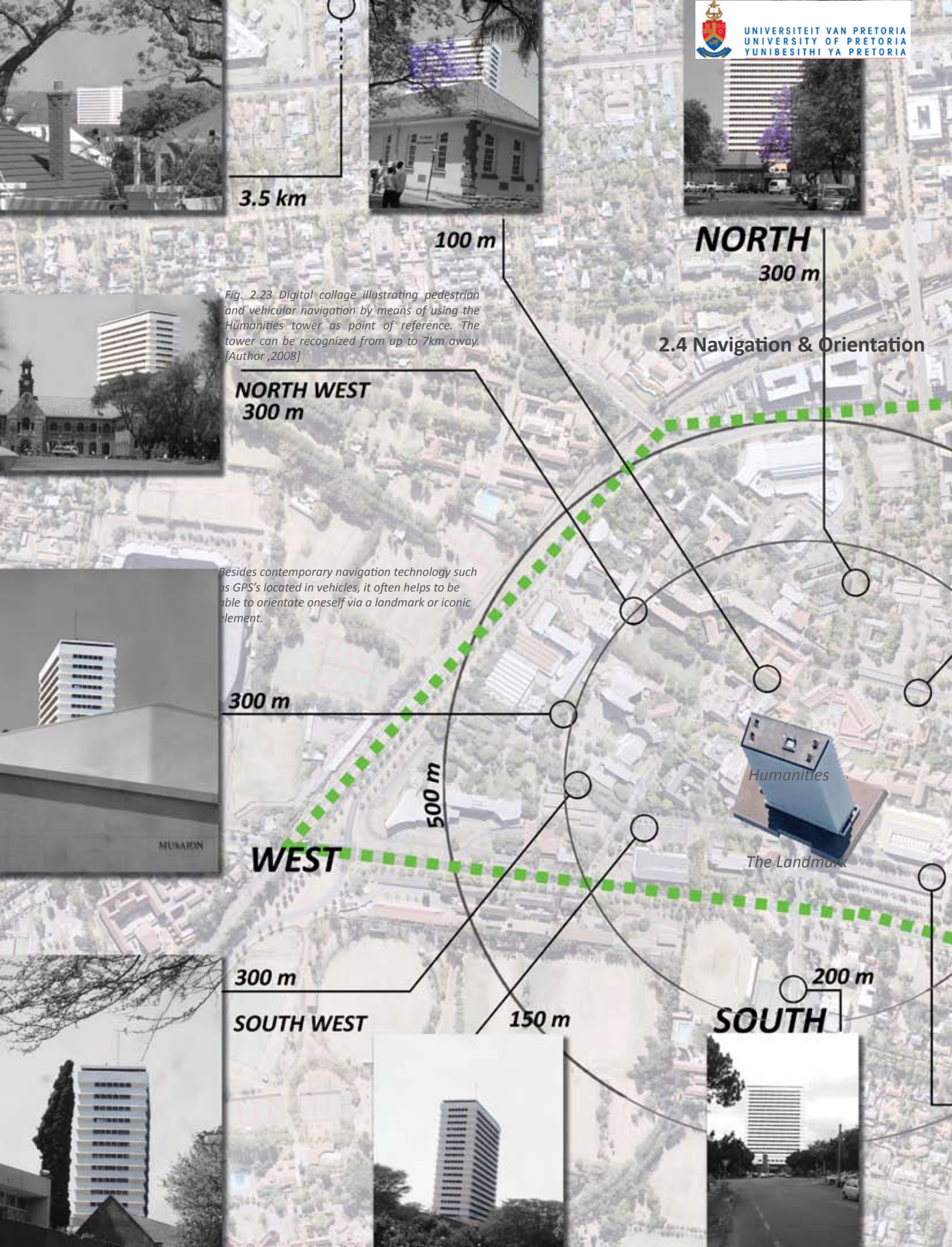


Fig. 2.23 Digital collage illustrating pedestrian and vehicular navigation by means of using the Humanities tower as point of reference. The tower can be recognized from up to 7km away. [Author, 2008]

## 2.4 Navigation & Orientation

Besides contemporary navigation technology such as GPS's located in vehicles, it often helps to be able to orientate oneself via a landmark or iconic element.

3.5 km

100 m

**NORTH**  
300 m

**NORTH WEST**  
300 m

300 m

**WEST**

500 m

Humanities

The Landmark

300 m

**SOUTH WEST**

150 m

**SOUTH**

200 m

MUKAIDN





200 m



7.0 km

250 m

### NORTH WEST

Lynch (1981:4) explains that when we navigate we are supported by the presence of others and by special wayfinding devices such as maps, street numbers, route signs and bus placards. However, once we get disorientated we are often overcome with a sense of anxiety and even terror. He goes on to state that the very word 'lost' means much more than simple geographical uncertainty; it carries overtones of utter disaster. In the process of wayfinding the strategic link is the environmental image, the generalized mental picture of the exterior physical world that is held by an individual. The image is the product of both immediate sensation and the memory of past experiences, and it is used to interpret information and to guide action (Lynch, 1981:4).

3.5 km



500 m

### EAST

*'Google-Earth' has shifted back the focus on monumentality from verticality to horizontality. In contemporary urbanism, the image is more real than reality itself: the image is how we navigate the city.*

SOUTH EAST 700 m

200 m

50 m





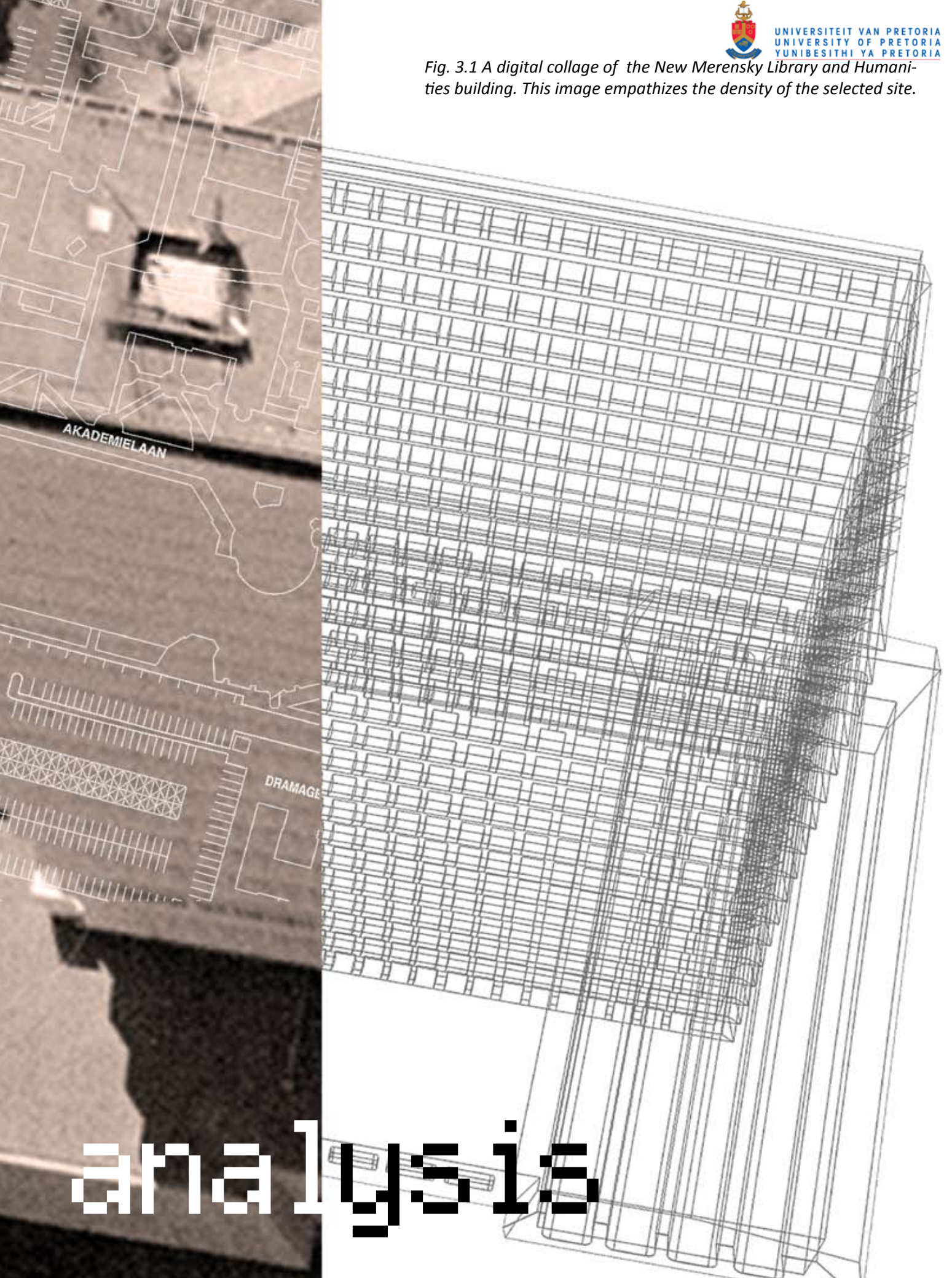


3.site





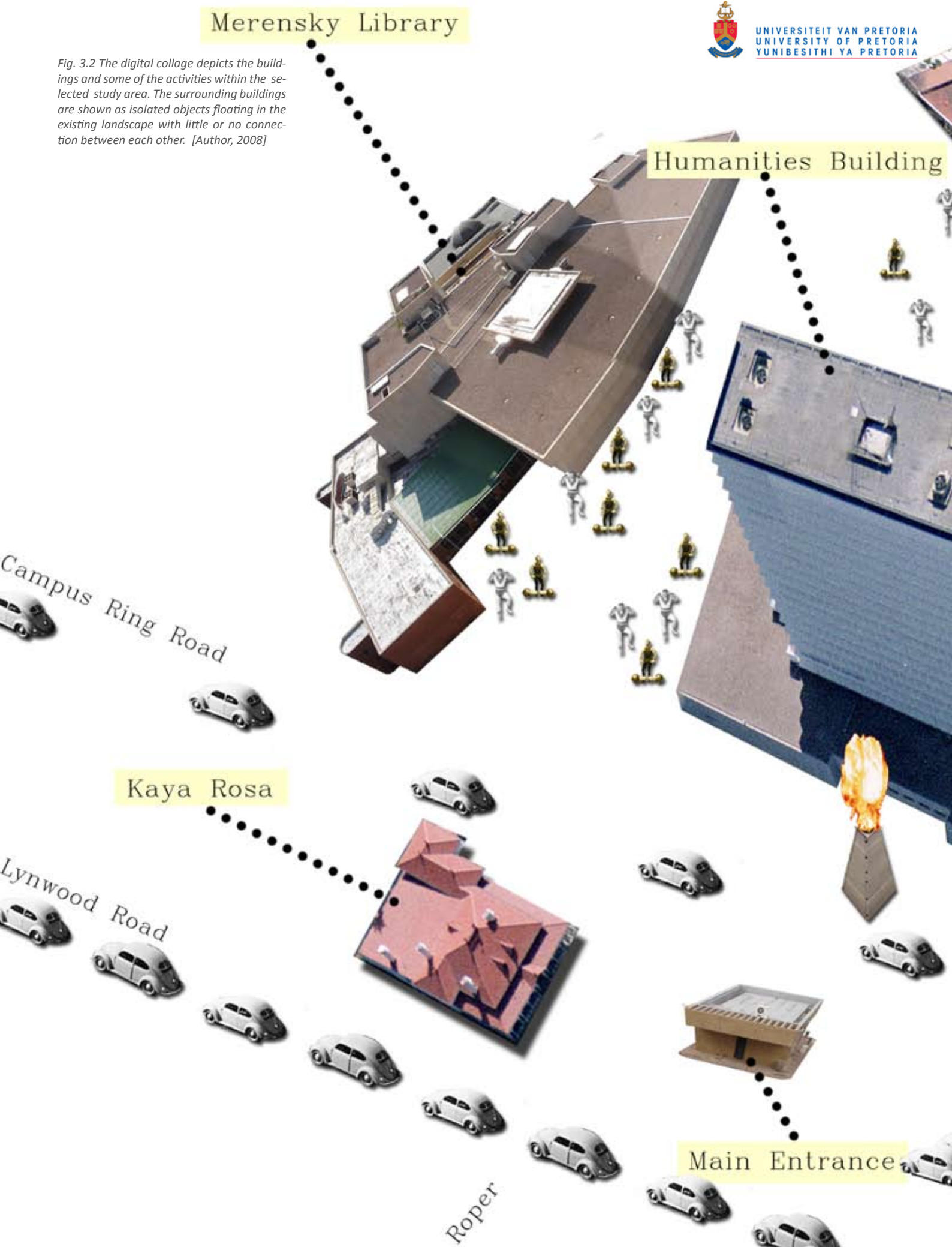
*Fig. 3.1 A digital collage of the New Merensky Library and Humanities building. This image empathizes the density of the selected site.*



analysis



Fig. 3.2 The digital collage depicts the buildings and some of the activities within the selected study area. The surrounding buildings are shown as isolated objects floating in the existing landscape with little or no connection between each other. [Author, 2008]



Humanities Building

Kaya Rosa

Main Entrance

Campus Ring Road

Lynwood Road

Roper





Student Centre

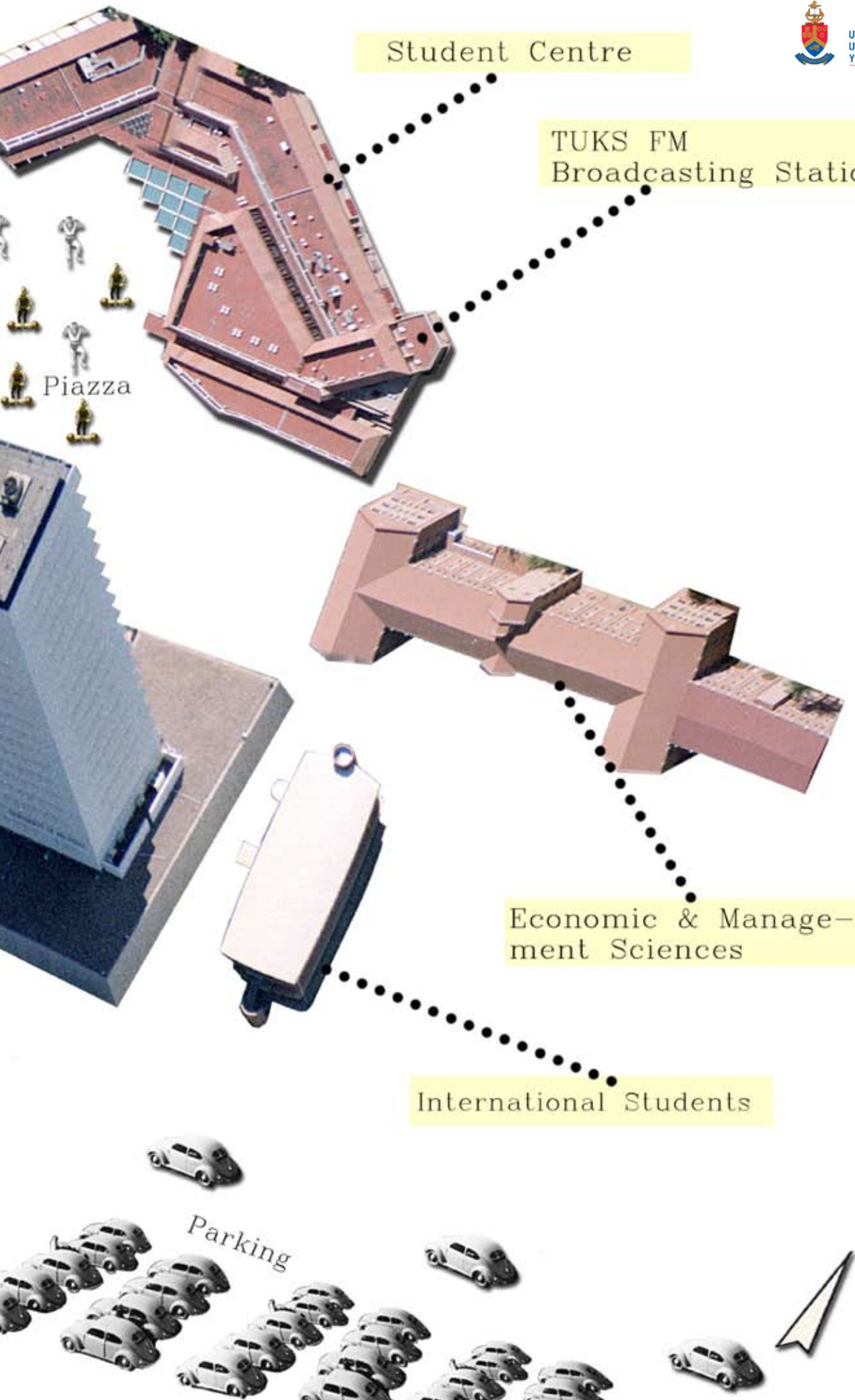
TUKS FM  
Broadcasting Station

Piazza

Economic & Manage-  
ment Sciences

International Students

Parking



### 3.1 Site Selection

The site for the proposed intervention is located on the main campus of the University of Pretoria, and includes both the Humanities Building and the Department of Library Services. It is positioned directly behind the main vehicular and pedestrian entrance of the university, west of Roper Street, north of Lynnwood Road and south of the University of Pretoria Student Centre.

The site has design potential with regards to its location, dense campus setting and iconic image. However, any intervention faces a range of problematic issues. The podium of the Humanities Building functions in complete isolation from its surroundings. Both the library and the Humanities tower were designed on a monumental scale, with very strong edge definitions. The buildings do not relate well to the surrounding environment, and traversing the spaces between them proves intimidating and overpowering at times. When observed from inside out, the user finds that light quality is ignored, with few windows and minimal natural light penetration allowed.

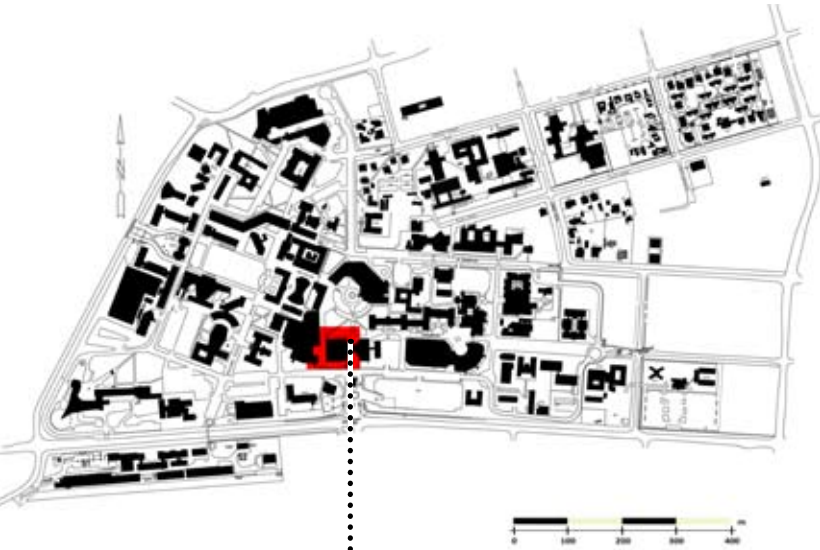


Fig. 3.3 Figure ground map of main campus with location of selected study area.

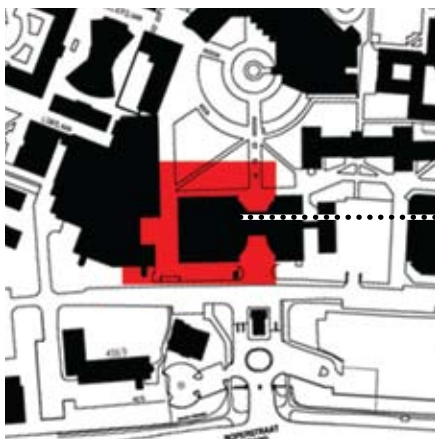


Fig. 3.4



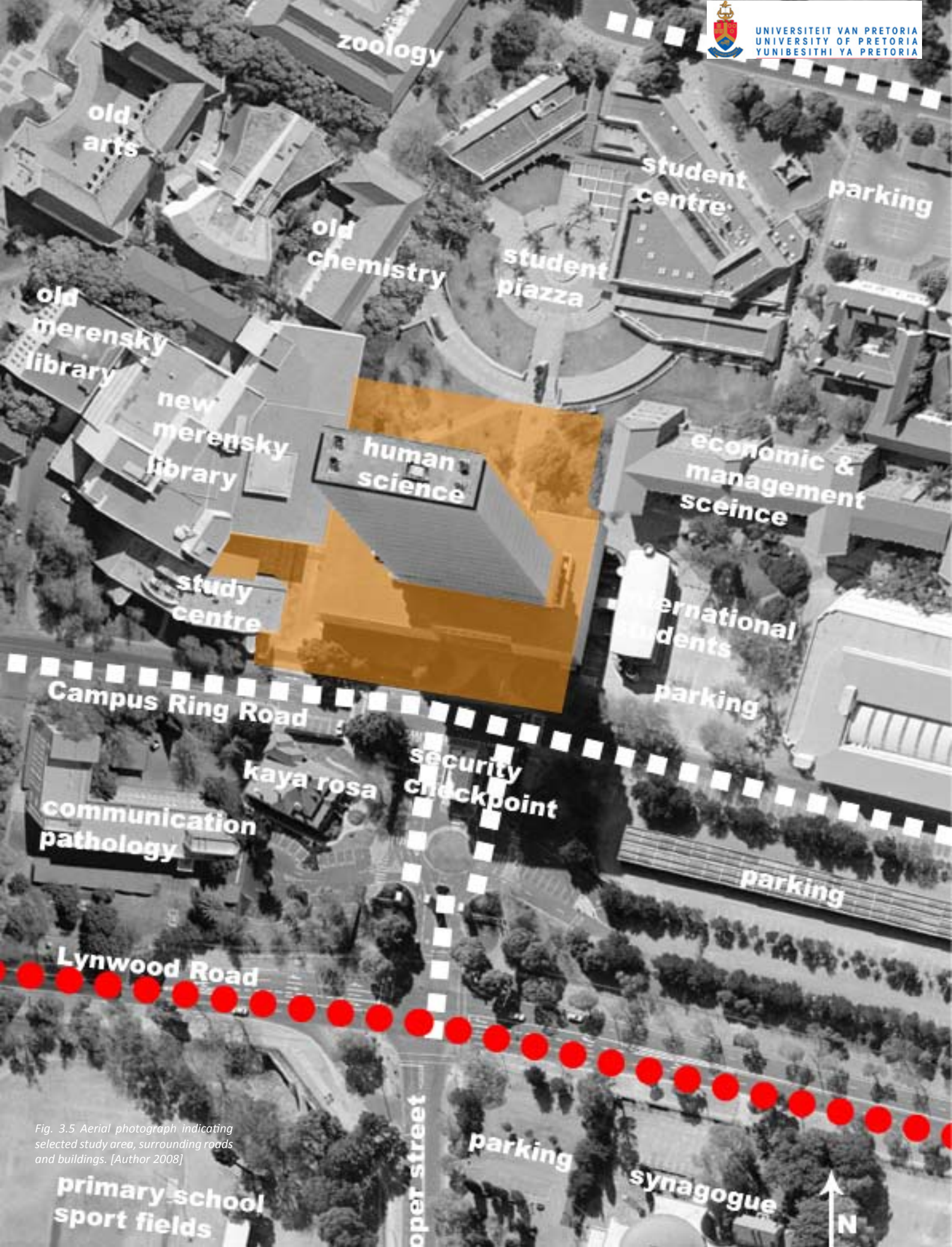


Fig. 3.5 Aerial photograph indicating selected study area, surrounding roads and buildings. [Author 2008]

## 3.2 Contextual Response - Surrounding Buildings

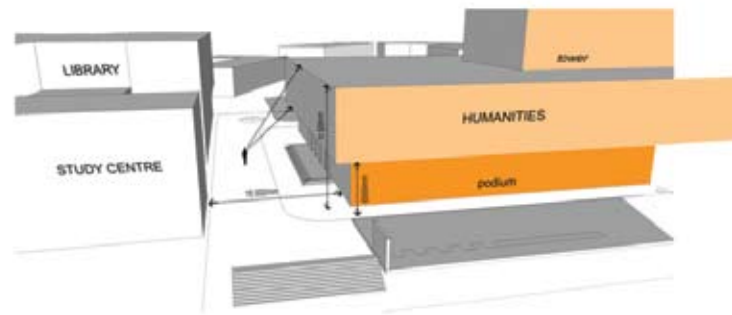
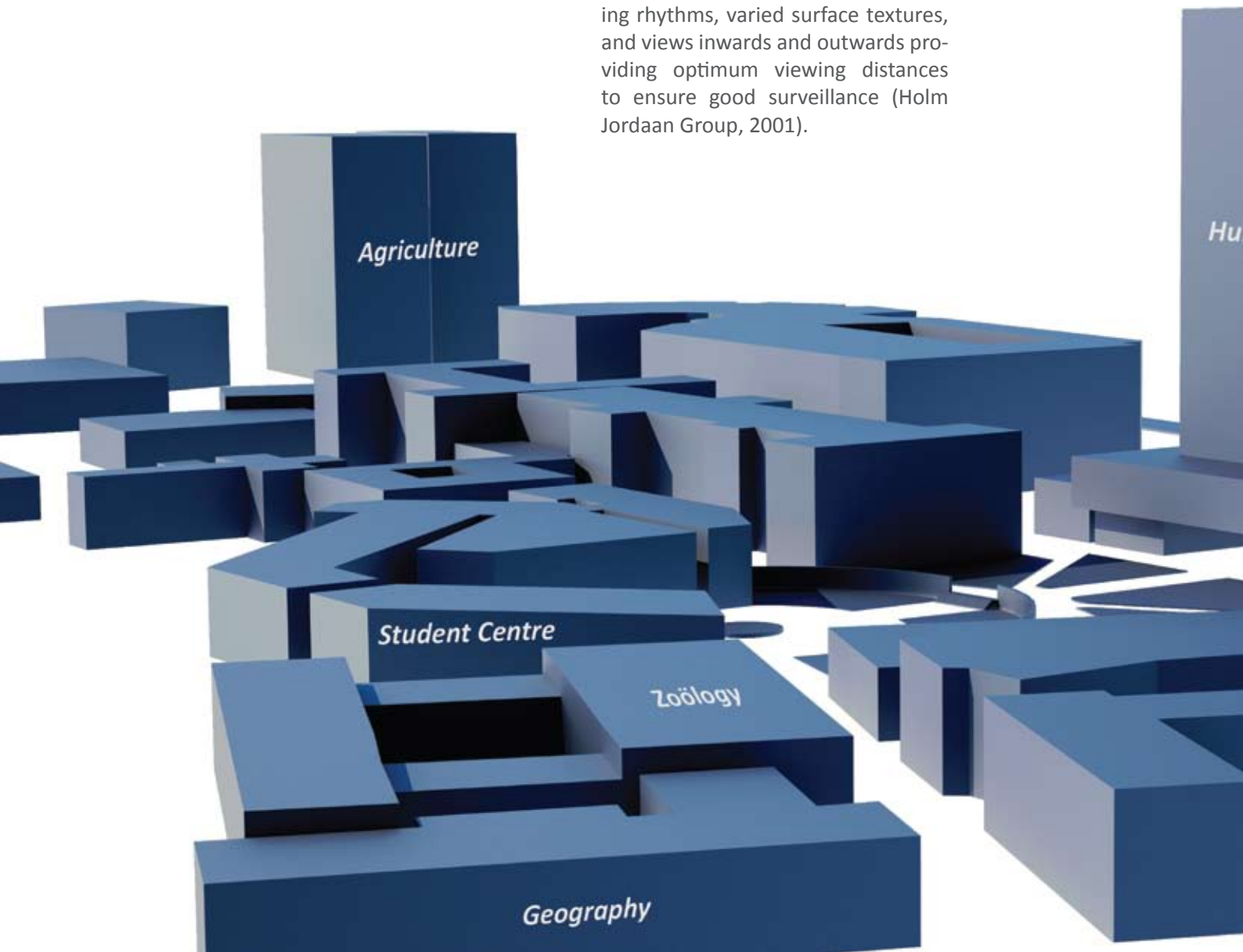


Fig. 3.6 3D diagram illustrating the scale of the space between the Human Science building and the Academic Information Centre. [Author, 2008]

**Scale:** The battle for quality is won or lost at a small scale.

The building should take account of human scale and proportions, movement on foot and the full range of the senses, including fine-scale articulating rhythms, varied surface textures, and views inwards and outwards providing optimum viewing distances to ensure good surveillance (Holm Jordan Group, 2001).





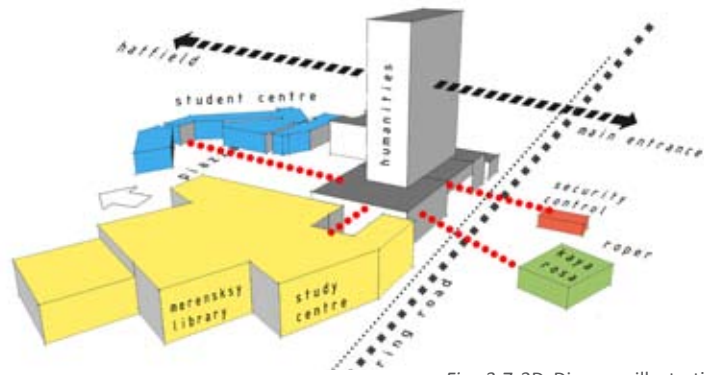


Fig. 3.7 3D Diagram illustrating site context, views and main circulation axis. [Author, 2008]

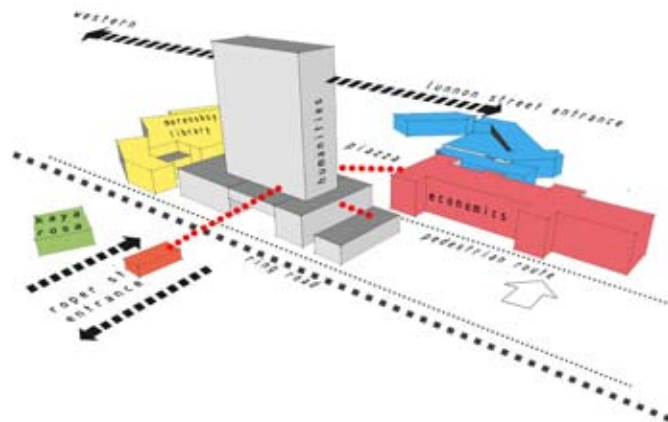


Fig. 3.8 3D Diagram illustrating site context, views and main circulation axis. [Author, 2008]

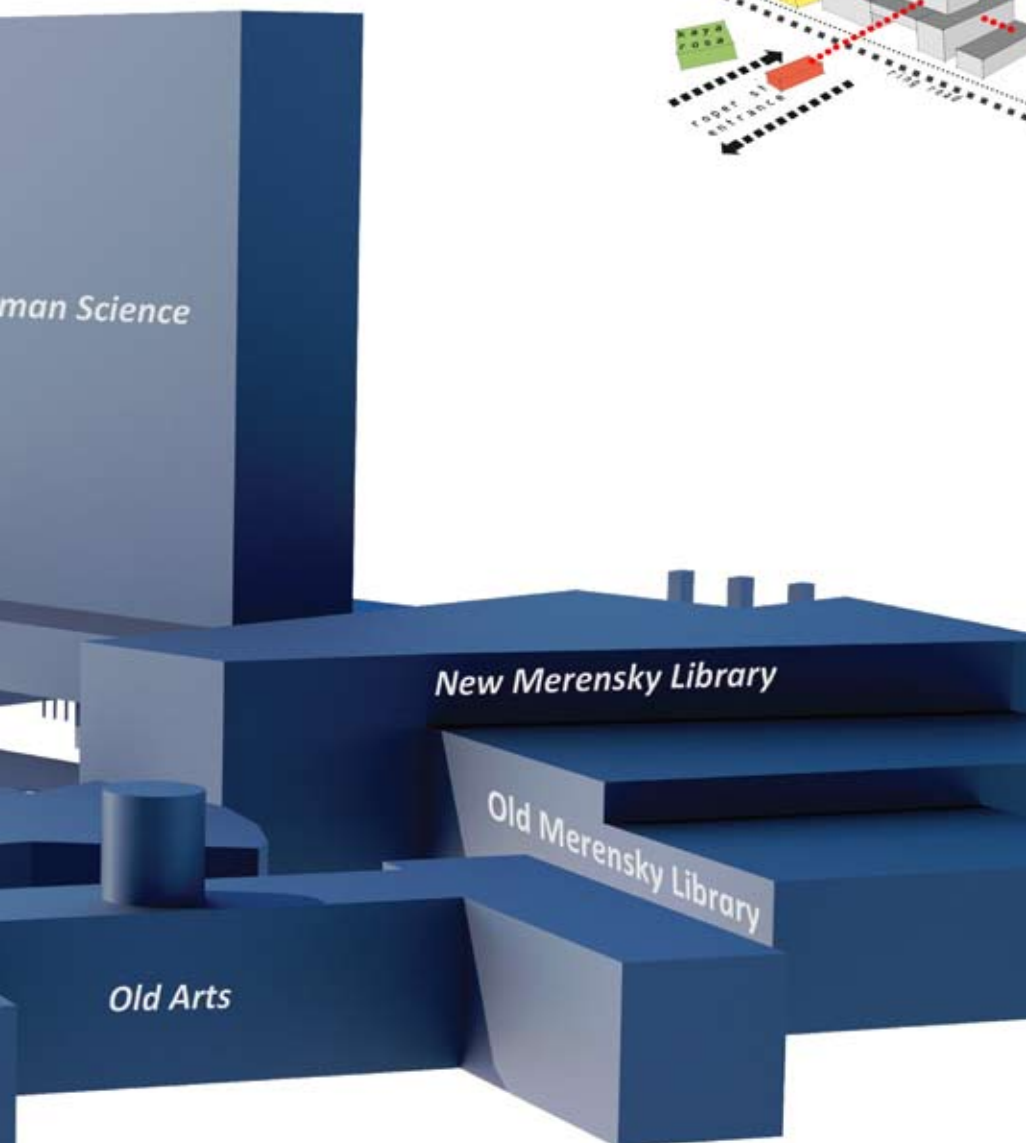


Fig. 3.9 3D rendering of the central part on the main campus of the University of Pretoria. View from East towards West. [Author, 2008]

### 3.3 Climatic Data

Steppe climatic zone.

#### Temperatures

Minimum monthly average is 4.5°C in Jun/July.

Maximum monthly average is 28.6°C in January.

#### Mean annual rainfall:

Approximately 700mm, of which 80% falls in summer

(November - March).

Precipitation is mainly in the form of heavy thunderstorms, sometimes accompanied by falls of hail.

#### Humidity

Average monthly humidity: 59%.

#### Vertical sun angles

Summer solstice (21 March / 23 September) – 64.24°

Winter solstice (22 June) – 40.73°

Solar incidence is high in the Pretoria region with a maximum of 80% sunshine in summer and a minimum of 67% sunshine in winter. The percentages translate into solar radiation energy as 8Whr/m<sup>2</sup>/day in summer and 4.5Whr/m<sup>2</sup>/day in winter (AAL 310, 2002:19).

Shading devices on the northern and western facades are crucial.

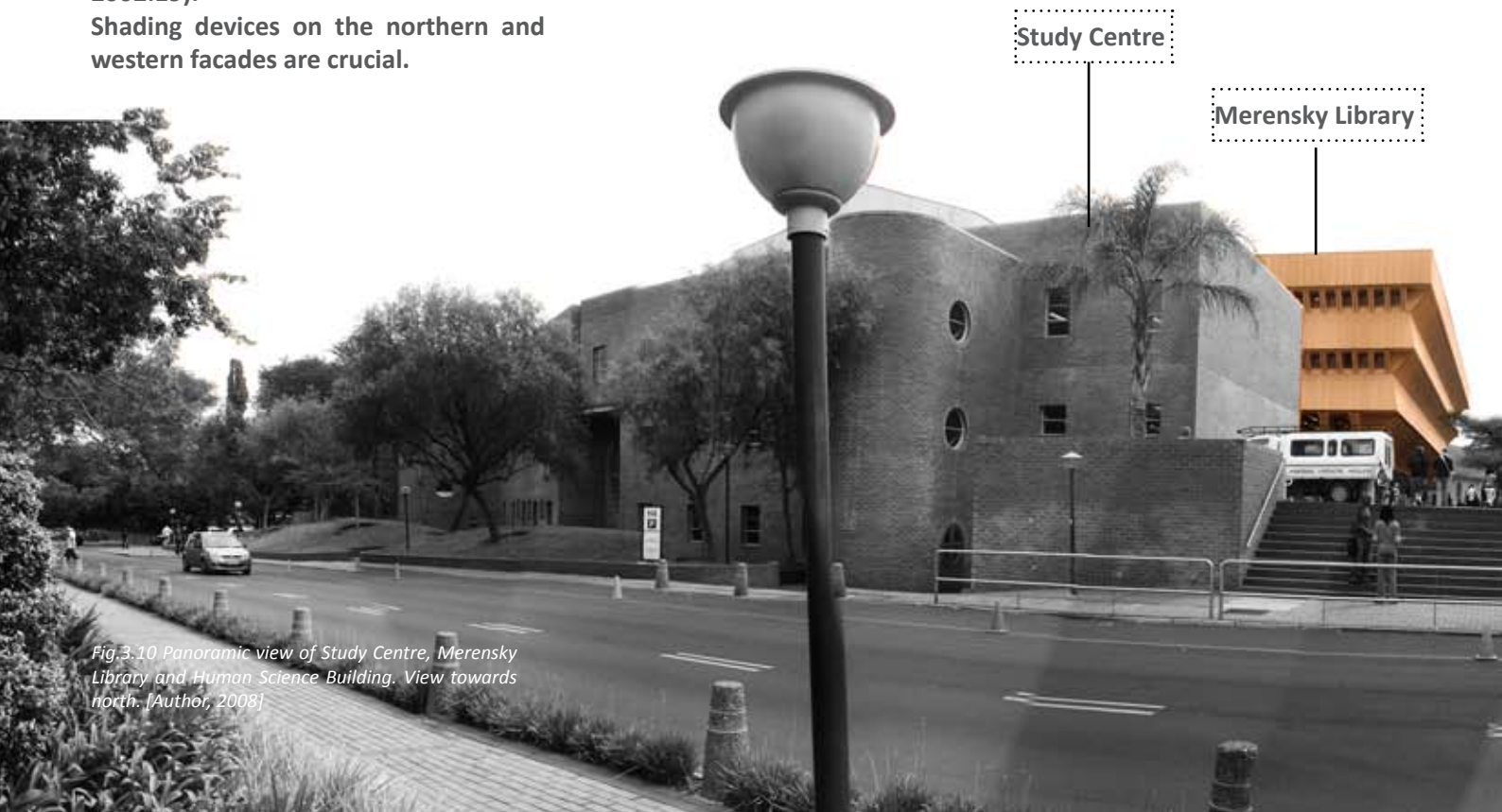


Fig.3.10 Panoramic view of Study Centre, Merensky Library and Human Science Building. View towards north. [Author, 2008]



Wind channels are generated as a result of the scale and density of the existing fabric surrounding the site. This alters the micro-scale atmospheric pressure, increasing wind velocity. The area between the Department of Library Services and the Humanities Building becomes an intense wind channel during late winter.

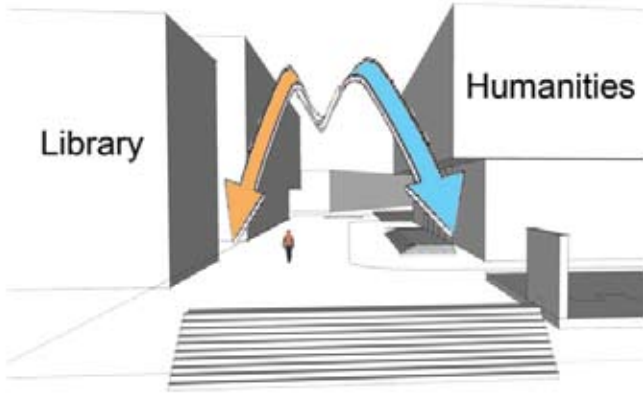


Fig. 3.11 3D model demonstrating wind channeling between Human Science Building and the Academic Information Centre. [Author, 2008]

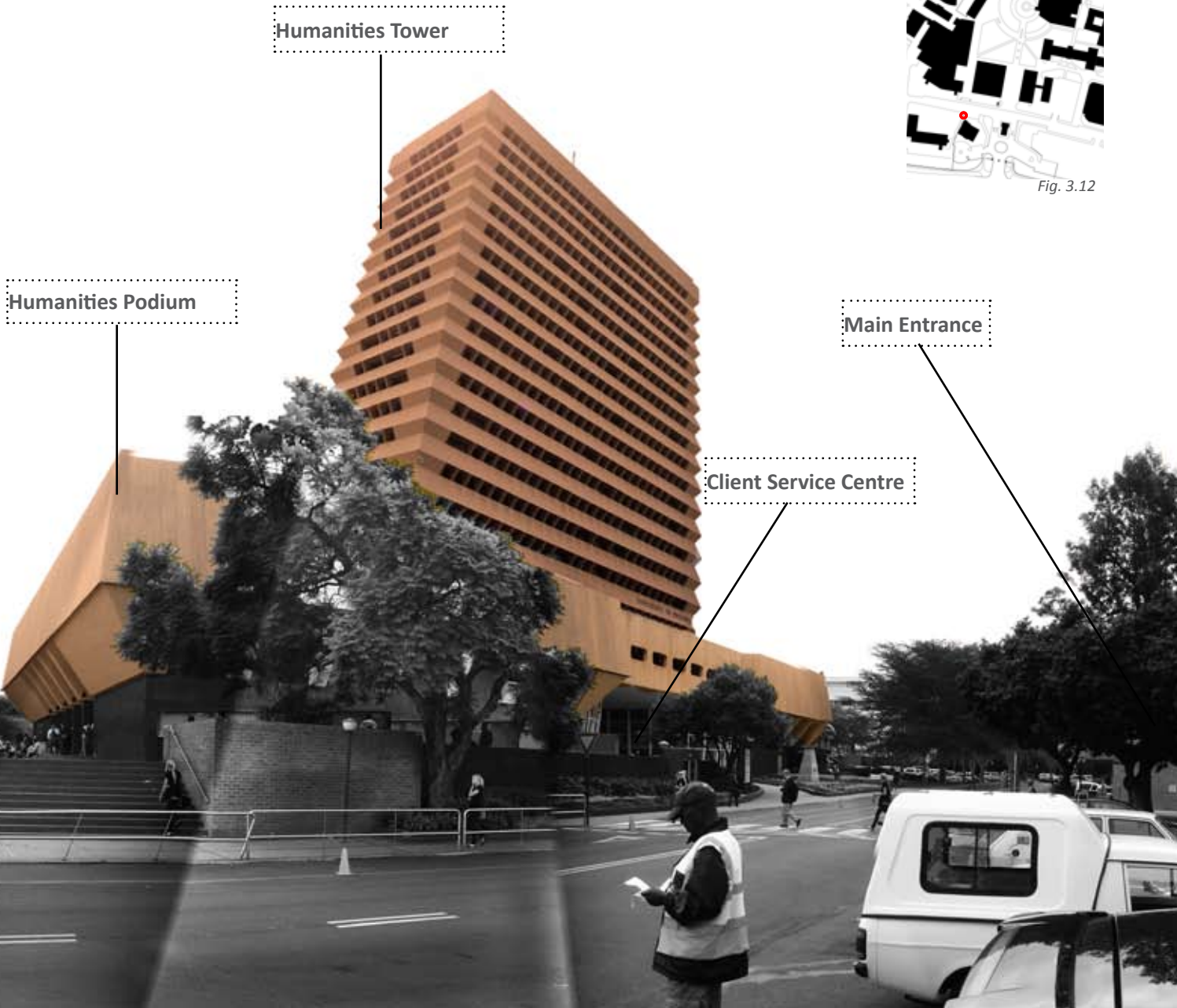


Fig. 3.12

## Winds

Winter: South-Western and North-Eastern.

Summer: East /North-Eastern to East-South Eastern

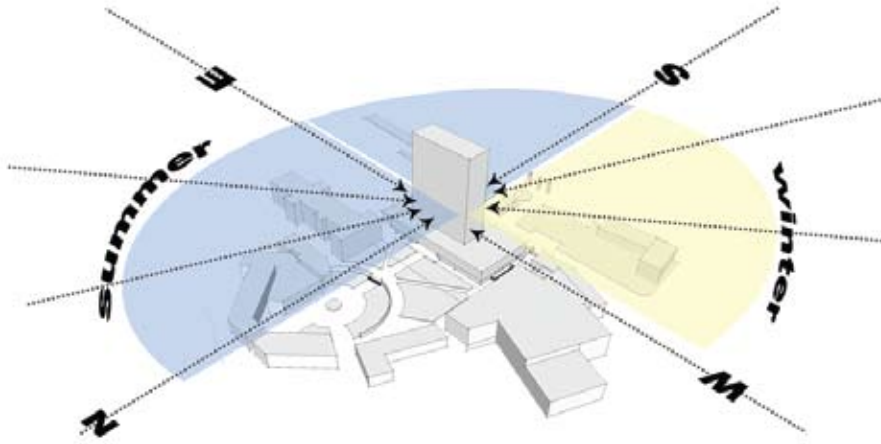
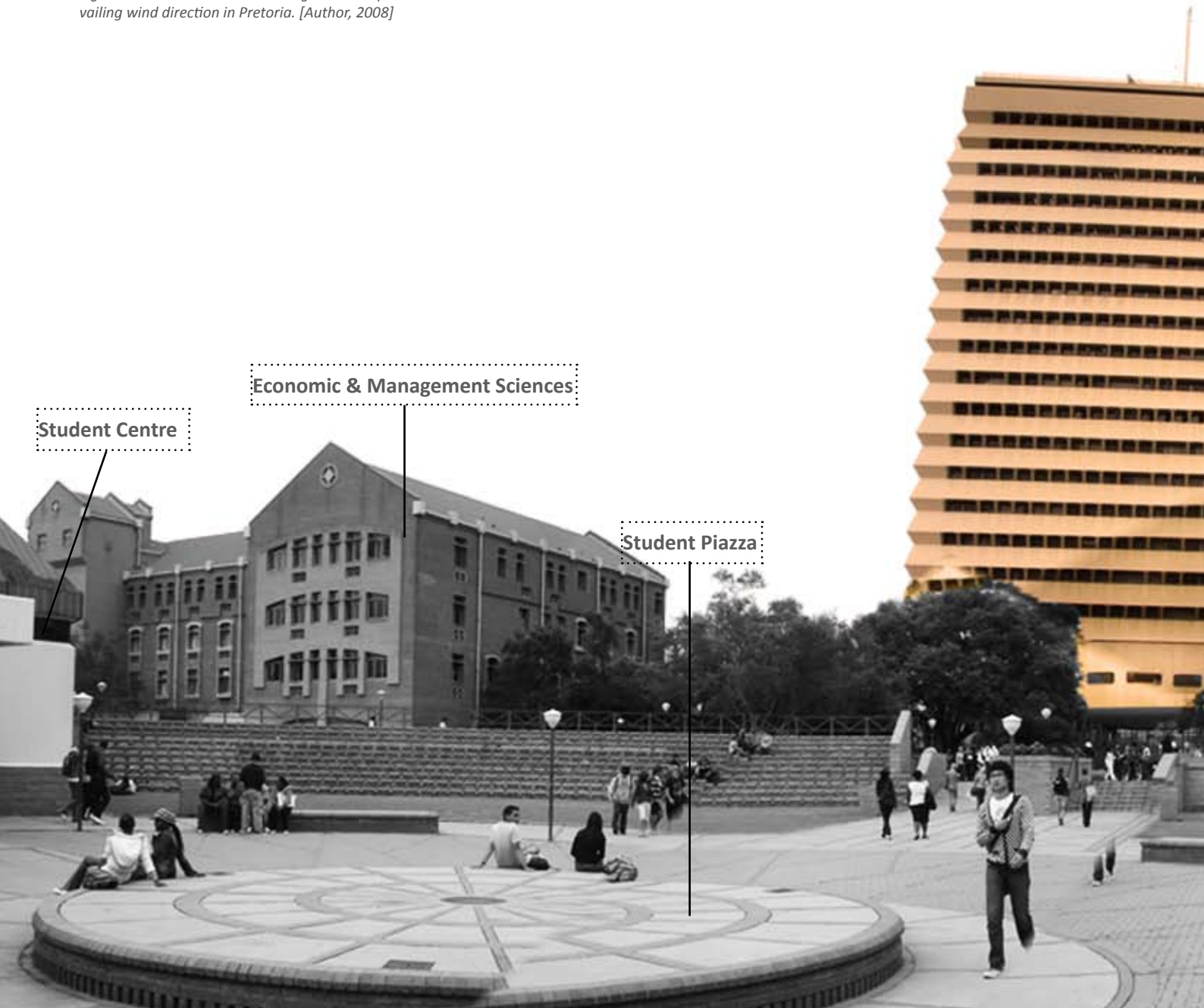


Fig. 3.13 3D model demonstrating seasonal prevailing wind direction in Pretoria. [Author, 2008]





X - Roper Street (Main Entrance)  
 Y - Lynwood (East/West)  
 Z - Humanities Tower (Vertically)

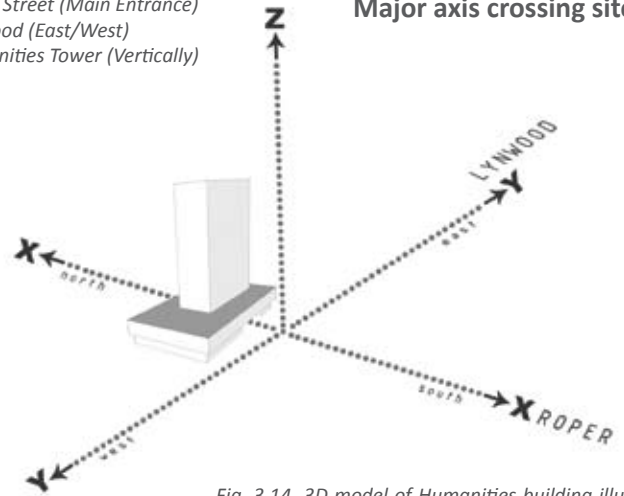
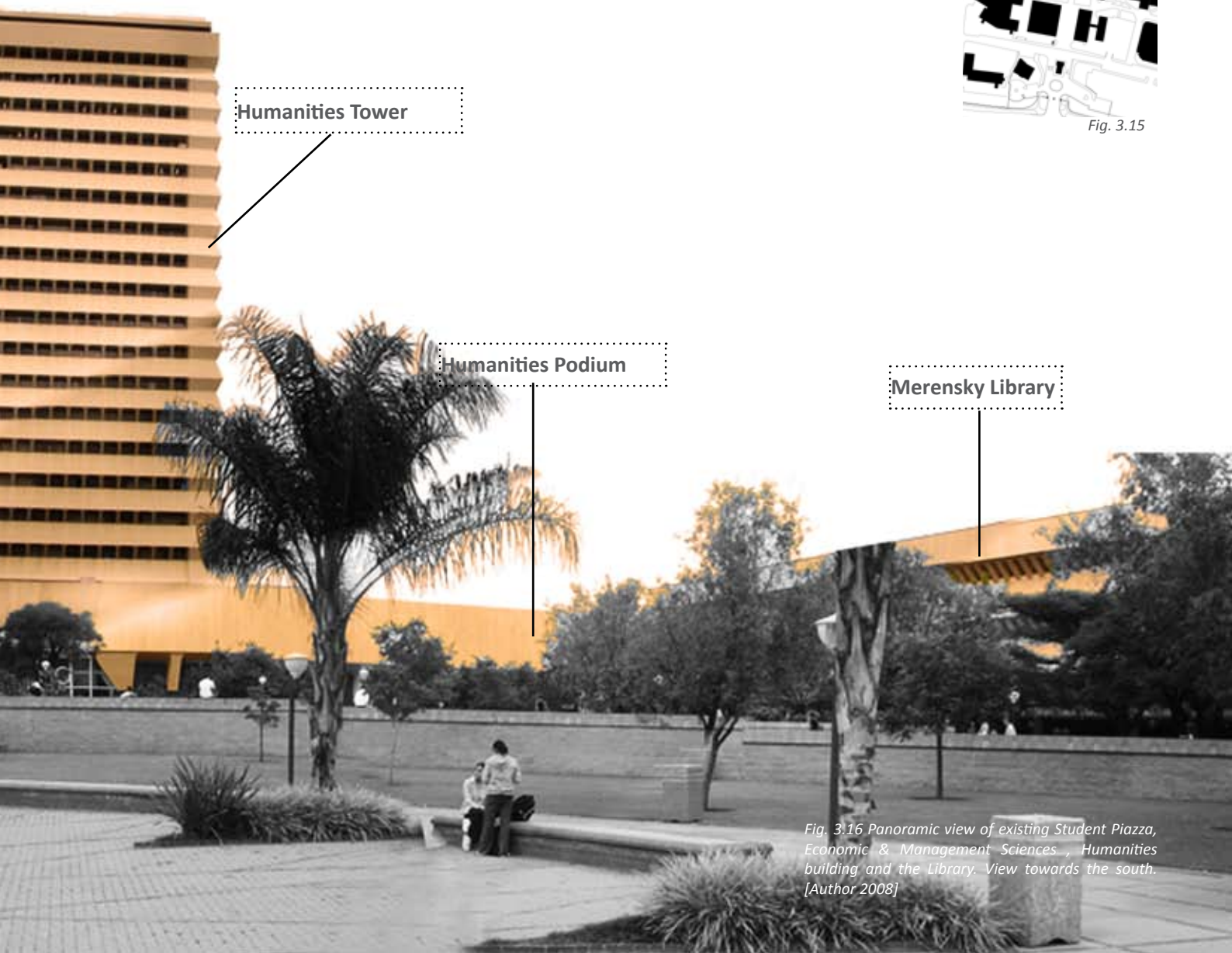


Fig. 3.14 3D model of Humanities building illustrating the three major crossing axis. [Author, 2008]



Fig. 3.15



Humanities Tower

Humanities Podium


Merensky Library


Fig. 3.16 Panoramic view of existing Student Piazza, Economic & Management Sciences, Humanities building and the Library. View towards the south. [Author 2008]

### 3.4 Pedestrian pattern & activities

- 

**stand**  
smoke \* talk \* eat \*  
\*wait \* show off
- 

**sit**  
reading \* talking \* eating \*  
\* rest \* smoke \*
- 

**walk**  
hurry \* talk \* eat \*  
\* smoke \*
- 

**play**  
run \* jump \* relax \*

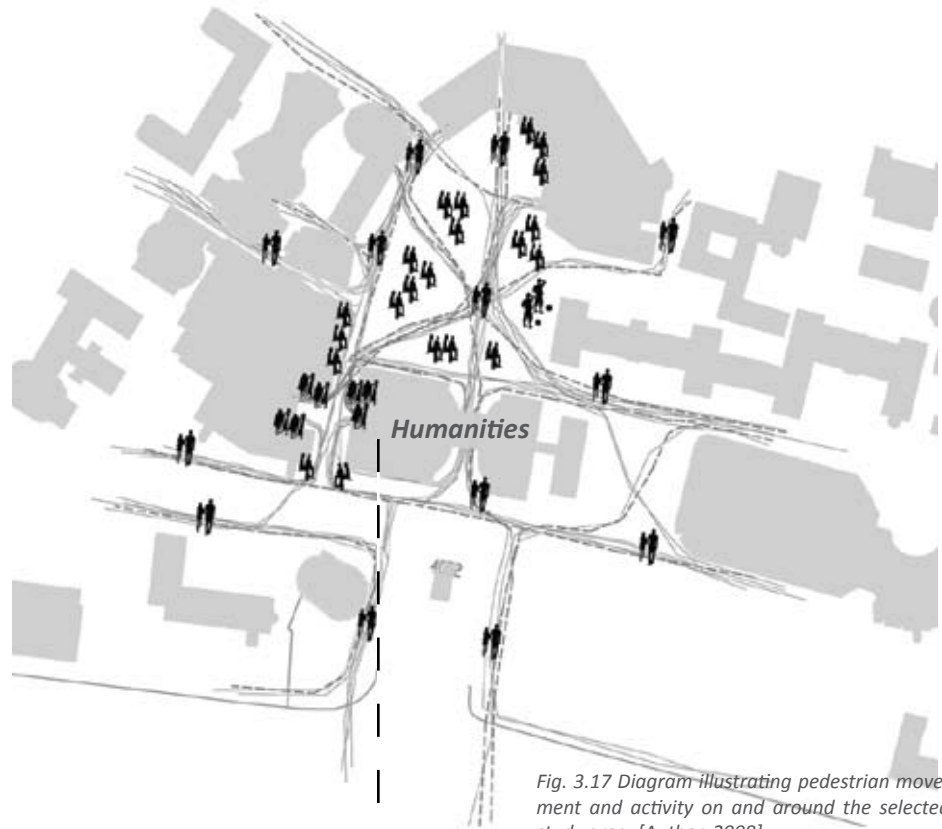


Fig. 3.17 Diagram illustrating pedestrian movement and activity on and around the selected study area. [Author, 2008]

The images depict where the greatest concentration of student activity occurs between the Humanities Building and the library. These specific areas make an attempt to accommodate the users of the buildings. However, they lack proper infrastructure. The highest concentration of activity tends to occur around the major building thresholds. The colour-filled section indicates pedestrian 'dead' zones. These zones are vast and mostly formless and require serious redesign for a more efficient use of space.

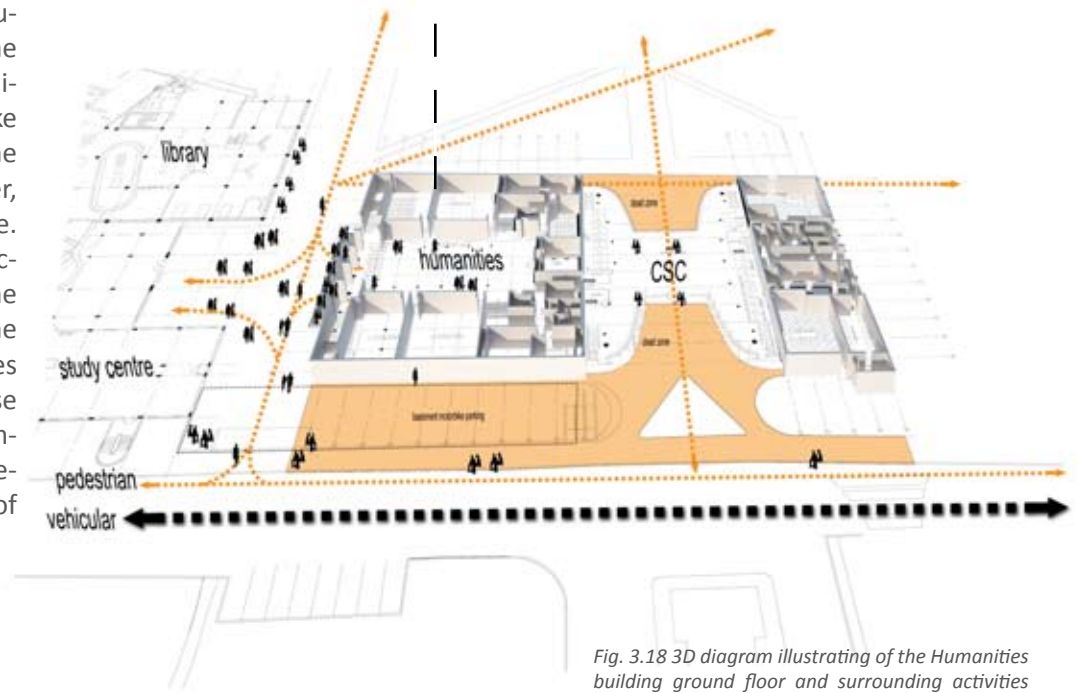


Fig. 3.18 3D diagram illustrating of the Humanities building ground floor and surrounding activities and circulation. (Author 2008)





Fig. 3.20 Student Activity - Piazza. View towards north [Author, 2008]



Fig. 3.21 Green Space. North of Humanities [Author 2008]



Fig. 3.22 Green Space. North of Humanities [Author, 2008]



Fig. 3.23 Entrance to Academic Information Centre [Author, 2008]



Fig. 3.24 Space in between Academic Information Centre & Humanities. View towards north [Author, 2008]



Fig. 3.25 Main entrance to Humanities building [Author, 2008]



Fig. 3.19 3D Figure ground map of central campus. [Author 2008]

### 3.5 Shadow Study

Summer Solstice

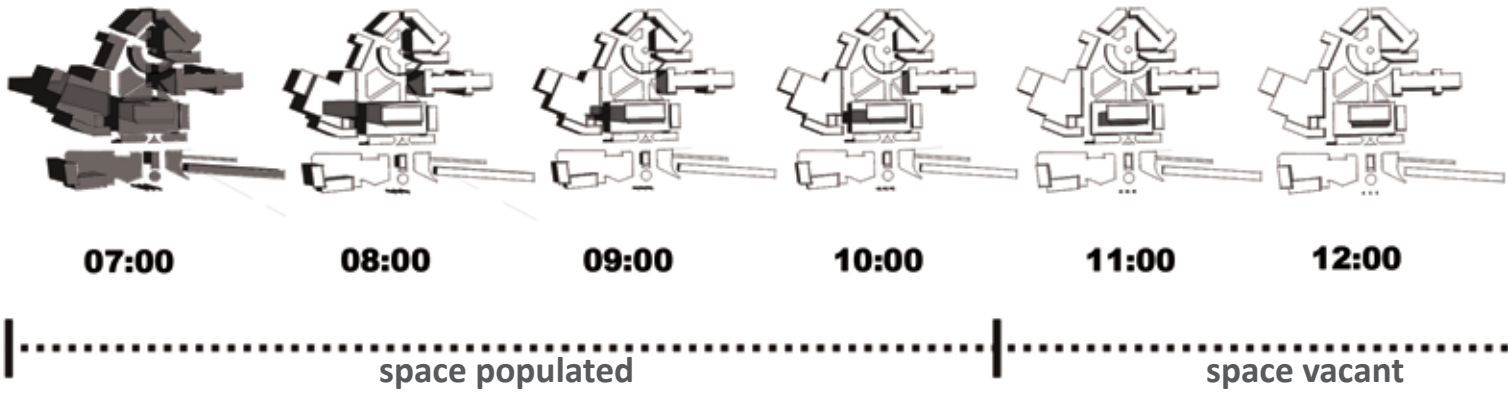
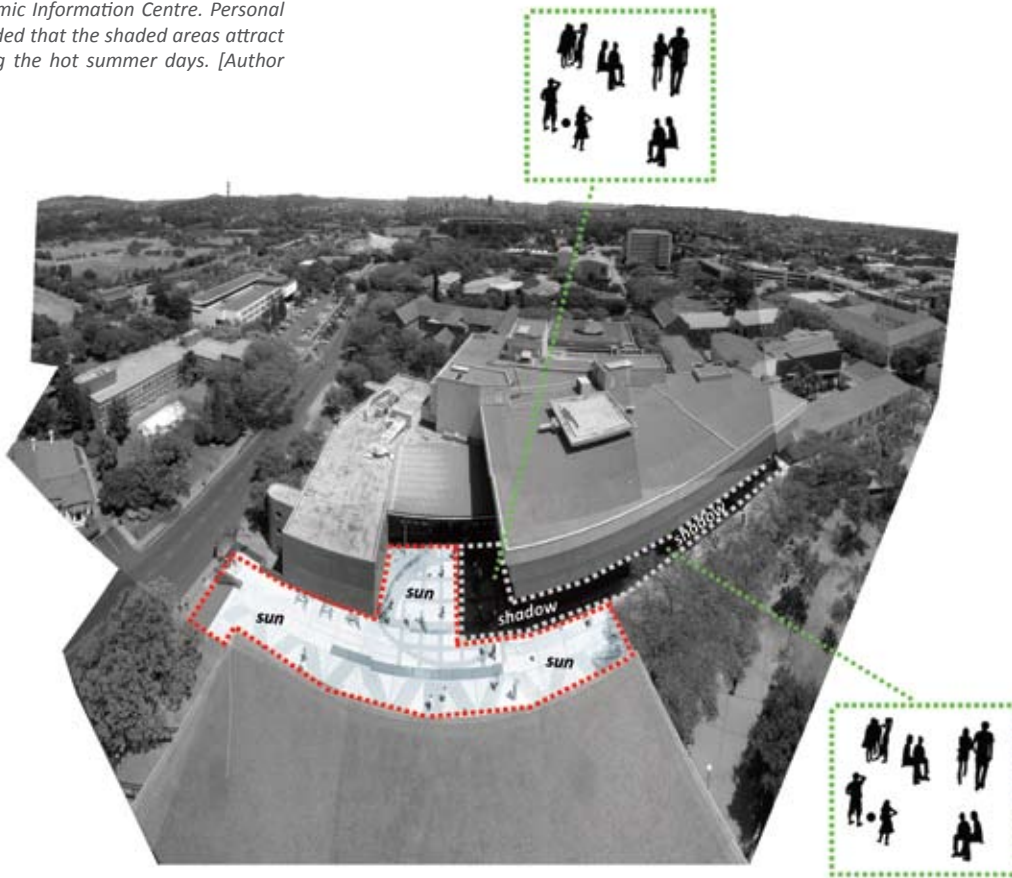


Fig. 3.27 Photograph of space between Humanities podium and Academic Information Centre. Personal observation concluded that the shaded areas attract more people during the hot summer days. [Author 2008]

**11:00**  
October



Winter Solstice

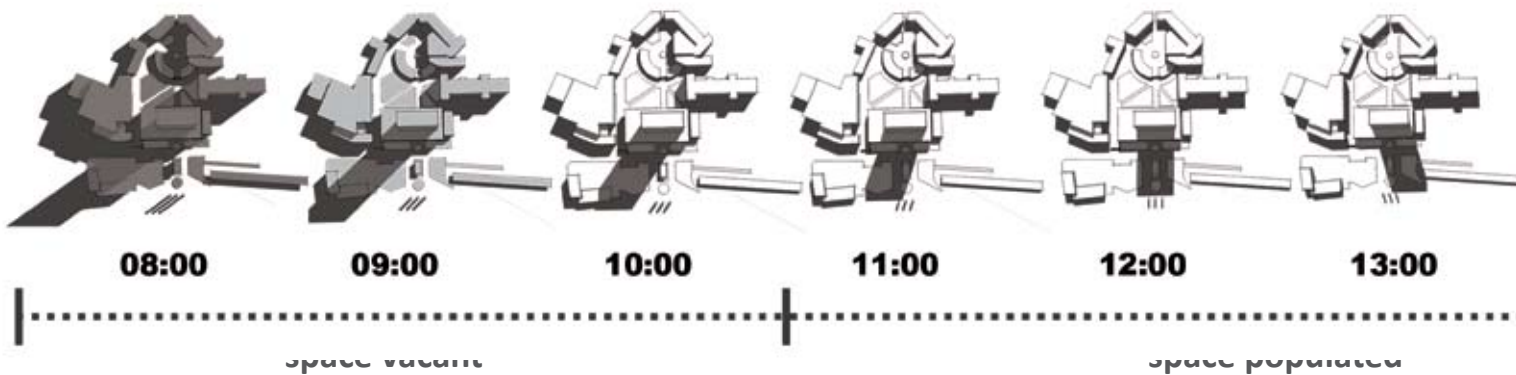




Fig. 3.26 A shadow study of selected study area during the height of summer. During the warmer months of the year student take hiding in the shaded areas surrounding the buildings. [Author, 2008]

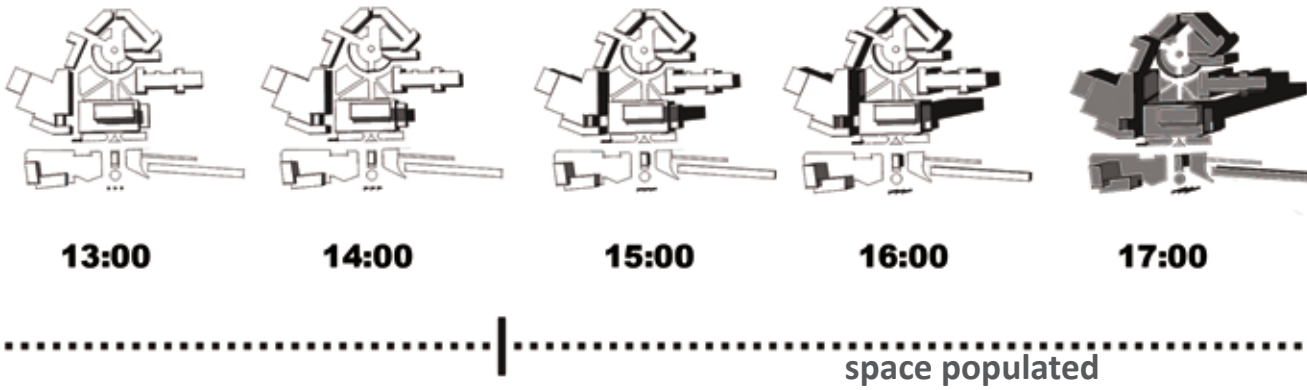


Fig. 3.28 Photograph of space between Humanities podium and Academic Information Centre. This demonstrates that the sunny areas are less occupied than the shaded areas during the warmer months. [Author 2008]

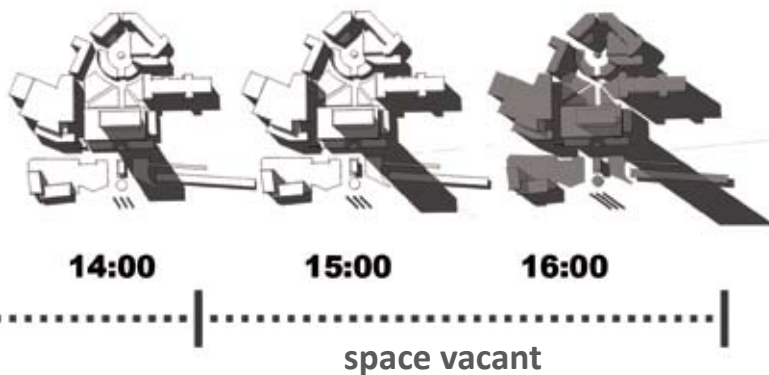
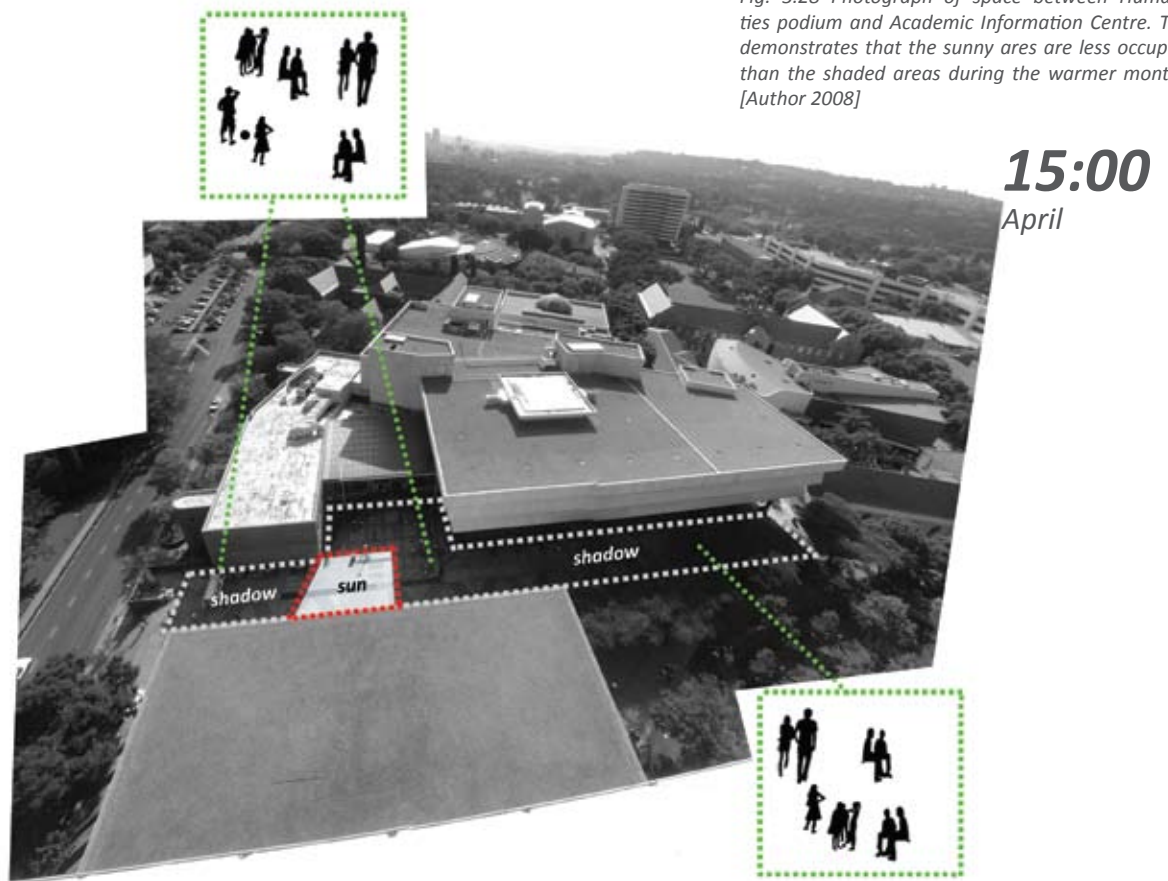


Fig. 3.29 A shadow study of selected study area during middle winter. In contrast to summer the colder months of the year is a time when the users tend to rather follow the sun around when looking for a place to rest. [Author, 2008]

### 3.6 Alterations to existing fabric



Client Service Centre

Fig. 3.30 Photograph illustrating new alteration (Client Service Centre) to an existing building (Humanities Building). North Elevation. [Author, 2008]



Fig. 3.31(above) & Fig. 3.32(left) Photograph of area between Library & Humanities. View towards north. [Author, 2008]



Fig. 3.33(above) & Fig 3.34(left) Photograph illustrating new alteration (Client Service Centre) to an existing building (Humanities Building). South Elevation (Author, 2008)



Fig. 3.35(above) & Fig. 3.36(left) Photograph of main entrance security control building, south elevation. [Author, 2008]



### 3.7 Historical Context

Brian Sandrock introduced his long term development plan for the university in 1965. It was evident that the only logical direction for development would be to the east, largely due to certain edge restrictions such as railway lines to the west and north, and Lynnwood Road to the south. Thus the development plan required the closure of Roper Street, the busy north-south artery between Lynnwood Road and Burnett Street. Sandrock's intention was to accommodate the basic sciences at the centre of the campus and to locate the applied sciences on the periphery, aiming to keep the largest number of students at the centre of campus (Tukkiewerf, 1991).

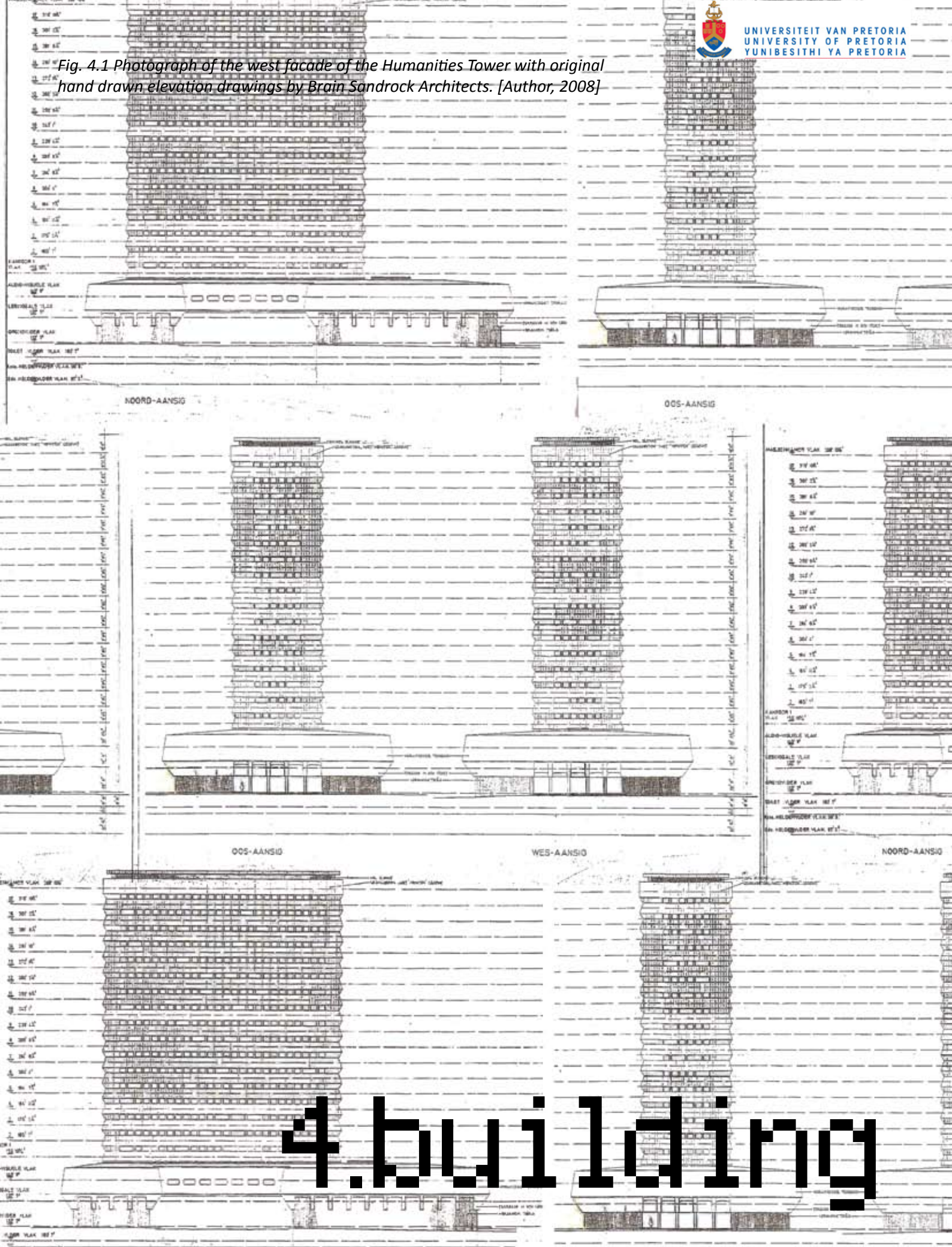
In 1970 the university started negotiations with the town council for the closure of Roper Street between Lynnwood Road in the south and Burnett Street in the north. The public was outraged by the idea of the Roper Street closure and vigorously objected the university's proposal. Years of negotiations, heated debates and 155 formal objections followed. In 1999 the Pretoria City Council (now City of Tshwane Metropolitan Municipality) finally agreed to close Roper Street between Lynnwood and Prospect Streets, and an important shift occurred in the campus layout. The University of Pretoria acquired a portion of Roper Street, pedestrianised it and developed a student centre at the Duxbury/Roper Street intersection in 1994. The student centre with its circular piazza is framed by the Old Chemistry building, the Humanities Building, the library and the Economic and Management Sciences building. The piazza immediately became the new core of the campus and the Roper Street pedestrian route the new main north-south axis (Die Perdeby, 1989).



Fig. 3.37 Historical map of main campus indicating a possible merger between the original west to the newer east campus as proposed by architect Brian Sandrock. (Tukkiewerf, 1991) The Humanities building bestrides Roper Street. [Tukkiewerf, 1991]

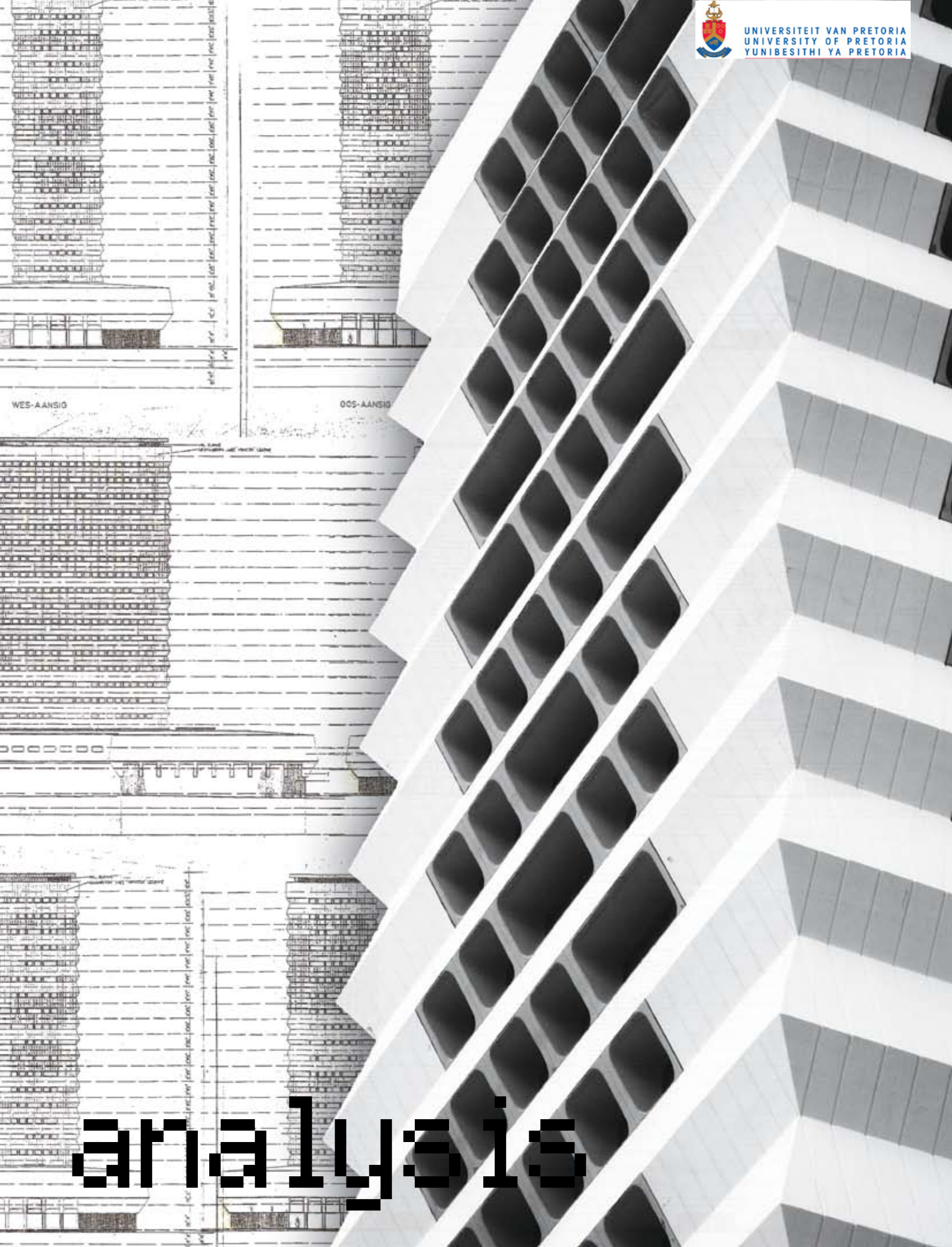


Fig. 4.1 Photograph of the west facade of the Humanities Tower with original hand drawn elevation drawings by Brain Sandrock Architects. [Author, 2008]



4 building





# analysis





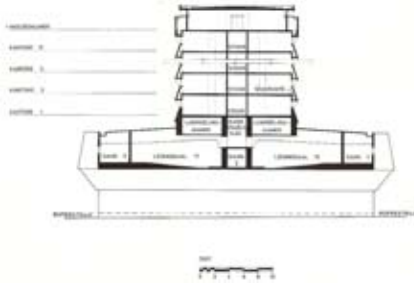


Fig. 4.5 Partial section through Humanities building indicating structural elements. [Planning 22,1977]

On the western side of Roper Street (on the side of the old campus), the Humanities Building has two basement levels accommodating lecture halls and language laboratories. The ground floor houses lecture halls. On the eastern side of the ground floor, electrical and mechanical services are provided by a recently added power substation on the north-eastern corner of the podium. The first level above the ground floor spans across Roper Street and houses several lecture halls. According to the consulting engineer's report (Planning 26, 1977:17), the section crossing the road is carried by a total of six concrete walls spanning 27 metres. The four external walls were designed as conventional reinforced concrete beams. The two internal walls are also major load bearing elements for the tower block. There are several complicated concrete grid systems suspended from concrete walls at higher levels. These are found in the lower part of the building. Concrete was extensively used throughout the building for both the structure and the unique geometry of the tower.

The tower block has 17 typical office floors and spans symmetrically across Roper Street. The tower is supported internally by two 7500mm x 750mm walls spanning between the lift shaft on the western side and two columns on the eastern side of the road. These walls are perforated by several irregularly placed door openings. Externally the loads are carried by a beam at the bottom of the facade itself. The beams are continuous over four prestressed columns. The facade consists of a complicated in situ concrete structure that was prestressed on each level. The whole facade, including the beams, forms a complex structural unit. Extensive use was made of computer-aided design during the design phase.

According to Mr. Piet Labuschagne (architect employed at the office of Brain Sandrock & Partners during construction) the entire western side of the podium is supported by a structural system separated from that of the tower (Labuschagne, 2008).

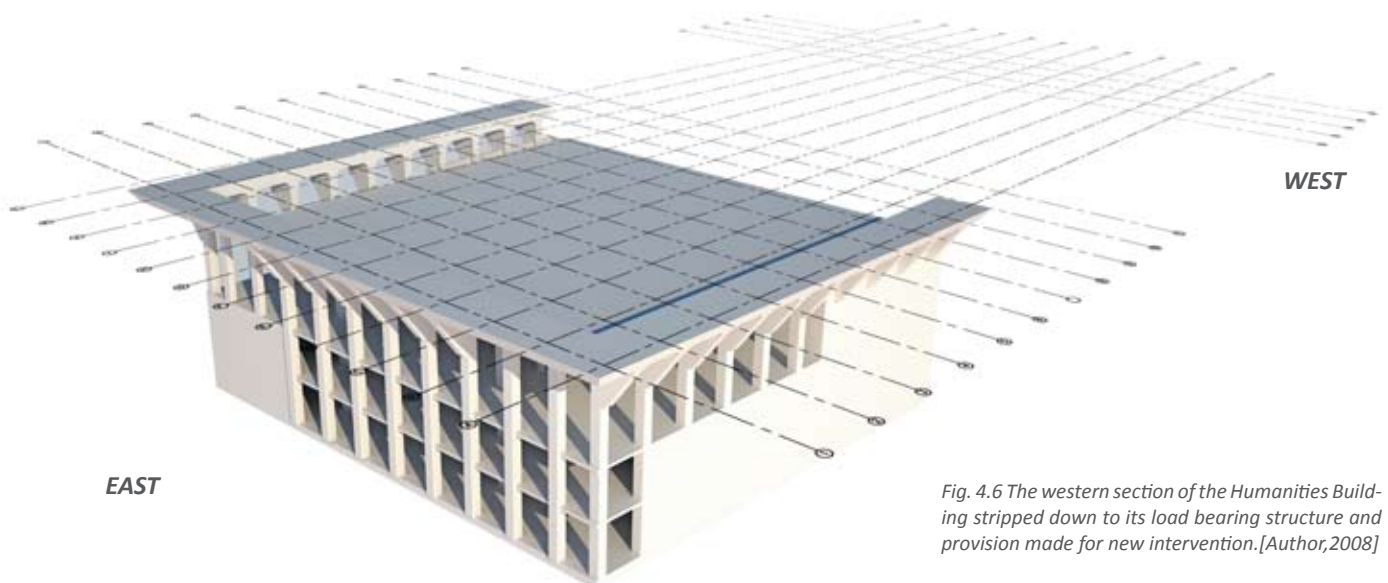


Fig. 4.6 The western section of the Humanities Building stripped down to its load bearing structure and provision made for new intervention. [Author,2008]

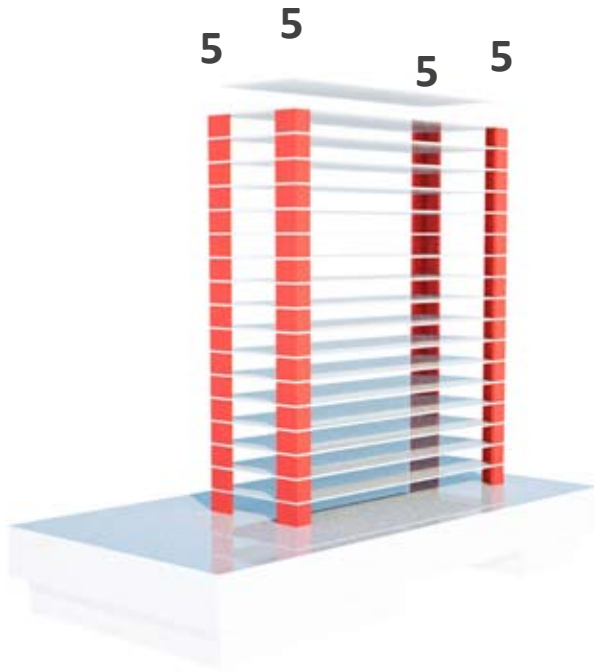


Fig. 4.7 3D model diagram of Human Science building indicating the load bearing elements at the four corners of the tower. [Author,2008]

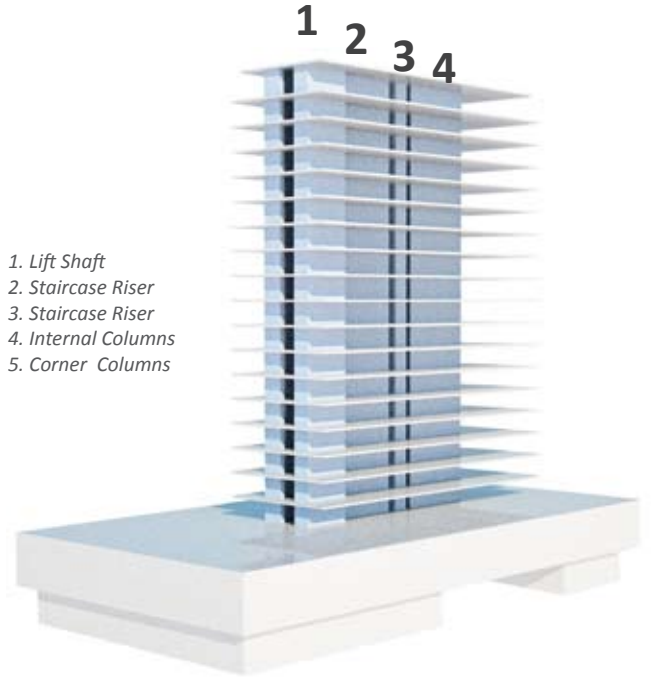


Fig. 4.8 3D model diagram of Human Science building indicating the core load bearing elements. [Author,2008]

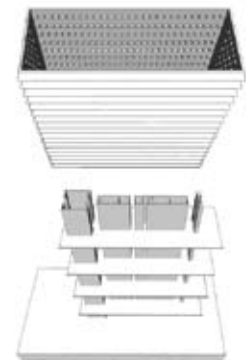


Fig. 4.9 3D model illustrating the Humanities tower enclosure and its core structural supports. [Author, 2008]

Fig. 4.10 Humanities Building Tower - Thirteenth floor approaching completion . [Skalblad 22,1975]





## 4.2 Existing Building - Performance Criteria (Podium)

<b>Social</b>	<b>41 ½/80</b>	<b>Economic</b>	<b>42 ½/70</b>	<b>Environmental</b>	<b>16 ½/60</b>
<b>Occupant Comfort</b>	<b>6 /20</b>	<b>Efficiency</b>	<b>16/25</b>	<b>Water</b>	<b>7 ½/25</b>
Daylighting		Capacity		Rainwater	
Ventilation		Occupancy		Water Use	
Thermal Comfort		Space per occupant		Runoff	
Views		Communication		Grey Water	
		Material & Components		Planting	
<b>Inclusive Environment</b>	<b>19 ½/40</b>	<b>Adaptability</b>	<b>14 ½/25</b>	<b>Energy</b>	<b>4/20</b>
Information		Vertical Heights		Ventilation	
Space		External Spaces		Heating & Cooling	
Toilets		Internal Partition		Appliances & Fitting	
Participation and Control		Modular Planning		Renewable Resources	
Environmental Control		Furniture			
Lighting Control					
Social Spaces					
Sharing Facilities					
<b>Health and Safety</b>	<b>16/20</b>	<b>On going cost</b>	<b>12/20</b>	<b>Waste</b>	<b>5/15</b>
Safety		Induction		Organic Waste	
Awareness		Consumption & Waste		Inorganic Waste	
Material		Metering		Sewerage	
Accidents		Cleaning & Maintenance			

## The Battlefield in Humanities

Hein de Vries Die Perdeby, 12 March 2001

"Gladiators, a-a-a-r-r-r-e-e you readyyyyy? Contestants, a-a-a-r-r-r-e-e you readyyyyy?" Often I wonder what the next level of adventure sport might bring. Alas, my fair question gained an unduly answer.

"... And tonight, the ultimate challenge, the final frontier, a quest for survival of the fittest... It is the Humanities building!" The first challenge, affectionately called the classroom killer, requires our contestants to endure an entire lecture in the freezing bowels of the building.

Congratulations, can all of you who did not contract pneumonia or a common cold please step to the left to go to the next round.\* As the tournament officials remove the frozen bodies of those who fell asleep during the lecture our brave contestants move to the next round.

Randomly the fearless survivors are shoved into the lifts. Up and down they go; where they stop, no one knows. As the lifts

descend, game officials and eager onlookers wait for the moment of truth. "Congratulations, can all of you who are not suffering from stinging pains in your left arms please make way for the medics. You have survived the traitorous four to eight storey drop, so frequently experienced by Tuks students and personnel." As the janitor cleans away the dead pile of broken bones whose descendants was halted by the basement the contestants face the final challenge.

"You are free to roam the building in a hopeless ploy to find the phone number of risk management, like so many late working students. The first to get out of the building wins. If no one gets out the last of you to starve will be pronounced the winner and the prize money will be deposited in the bank account of your next of kin."

Students a-a-a-r-r-r-o-o-o you readyyyyy?

## Help, there's chaos!



Heatie Kruger  
A new evacuation plan was recently implemented at the Human Sciences Building (HSB), following a bomb threat of about two weeks ago. The plan was widely criticized by students...  
Foto: Louisa Bezuidenhout  
The evacuation plan, it is in fact the most logical and simple plan for a building of the HSB's size and structure, and if carried out correctly, it can also be an efficient way to prevent a major catastrophe.  
Na aanleiding van die valselige boombreëgting in die HSB, is daar 'n nuwe ontspanningsplan ingestel, waardeur studente en personeel deur middel van 'n interkomstelsel in verskeie getreëde kamers word vaa 'n noodtoestand. Hier sprake van die kritiese deur studente, dat dit 'n oneffektiewe plan is, is dit dalk die beste manier om 'n ramp te voorkom.

Die Perdeby 18 Oktober 1999



Fig. 4.11 An article taken from the local campus newspaper expressing the 'life threatening' state of occupancy comfort in the Humanities Building. The writer compares occupying the Humanities building to that of a being on a battlefield, where the chance of ever returning alive is relatively poor. [Die Perdeby, 2001]

Fig. 4.12. This article expresses the chaotic circulation and escape plan for the Humanities building. [Die Perdeby, 1999]

### 4.3 Accommodation Schedule - Faculty of Humanities

*Departments, centres, institutes & units, interfaculty institutes, academic faculty committees, schools*

22 - Faculty Human Science - Ancient Languages  
- Academia Latina - Modern European Languages  
- Unit for Creative Writing - Research Committee - School of Social Sciences - Vacant

21 - International Political Studies - Institute for Strategic Studies - Employment Health & Safety Committee

20 - Philosophy - Institute for Women and Gender Studies

19 - Sociology

18 - Historical & Heritage Studies - School of Social Sciences

17 - Unit for Academic Literacy (UAL) - Creative Languages Service

16 - English - Vacant

15 - Afrikaans - Centre for Research in the Politics of Language (CentRePol)

14 - Modern European Languages

13 - Centre for Academic Development

12 - Psychology - Computer Committee

11 - Psychology - Computer Committee

10 - Social Work & Criminology - Education Innovation Committee (EI Committee)

09 - African Languages - Programme Committee - School of Languages

08 - Anthropology & Archaeology - Post Graduate Committee

07 - Research Committee (ResCom) - Research Proposal & Ethics Committee (ResEthics) - Marketing Advice Committee - Marketing Committee - Administrative Officer : Facilities & Services (Humanities) - Finances - Laptops & Data Projectors (booking) - Marketing

Office (Humanities) - Staff Matters

06 - Office Space

04 - Academic Administration & Lecture Halls

03 - Academic Administration & Lecture Halls - Client Service Centre (CSC)

02 - Communication Pathology

01 - Academic Administration & Lecture Halls

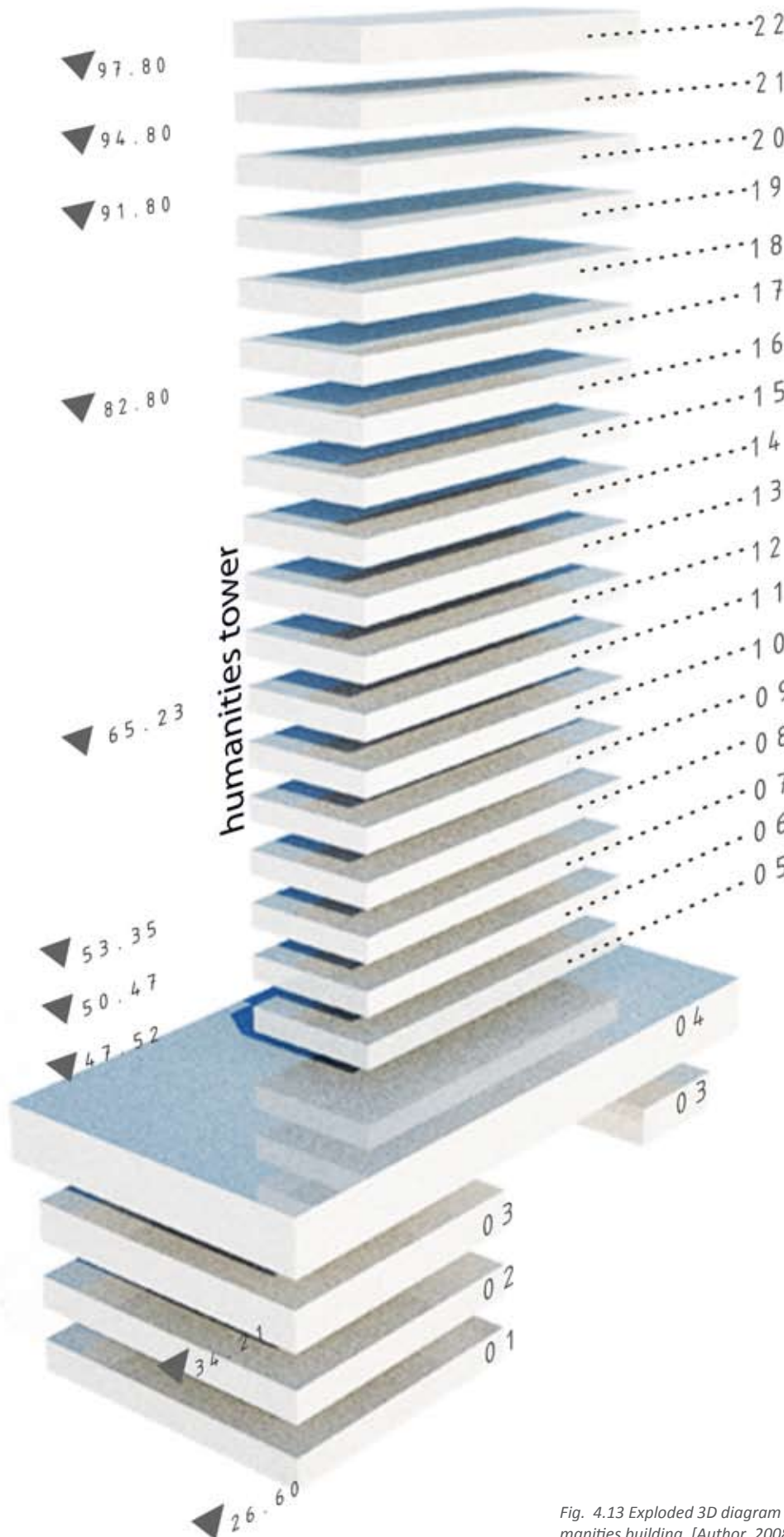


Fig. 4.13 Exploded 3D diagram of the Humanities building. [Author, 2008]



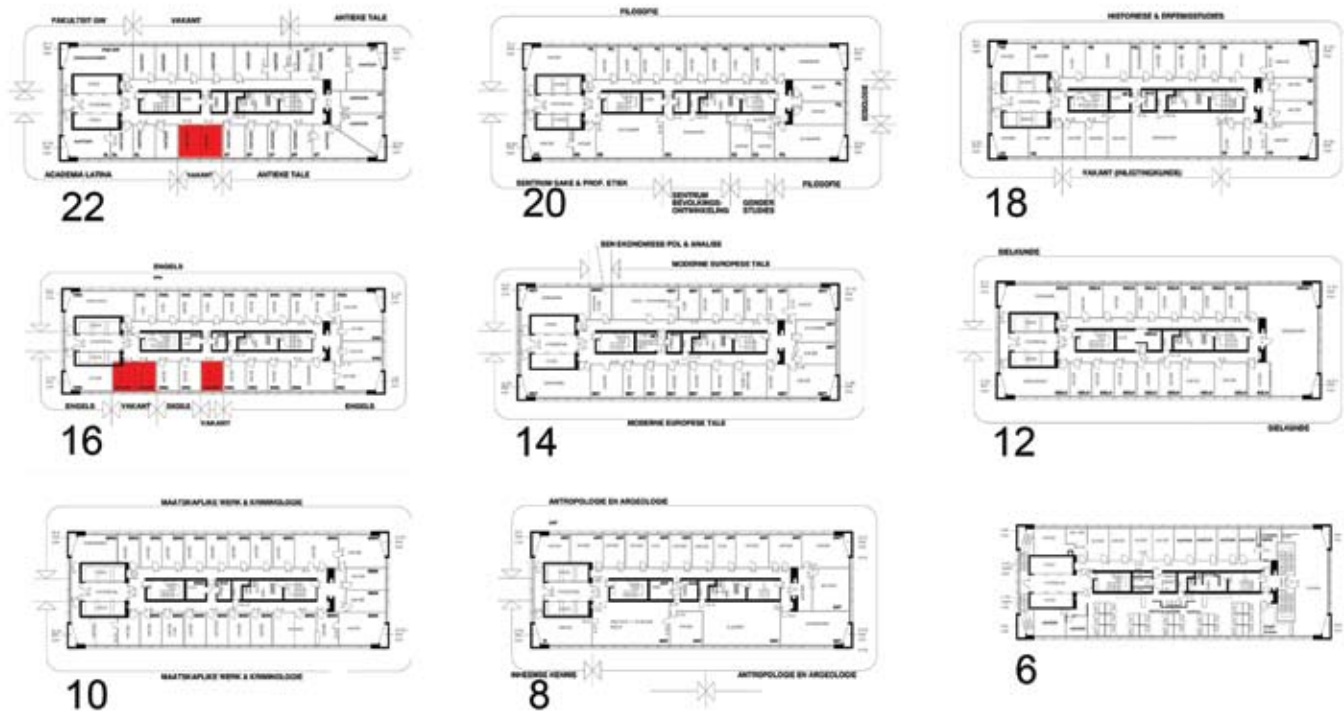
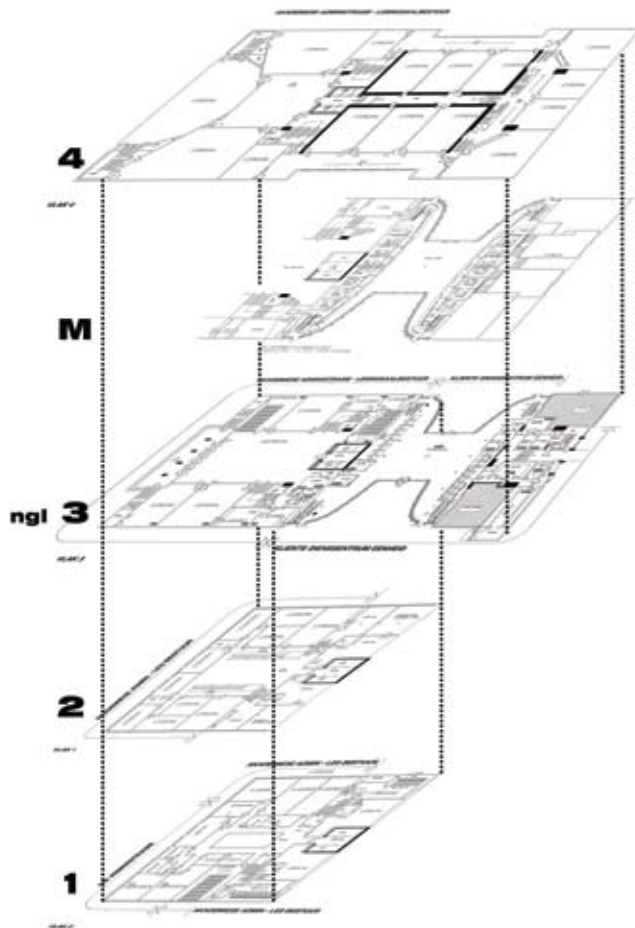


Fig. 4.14 Floor plan layout of various Humanities tower levels.



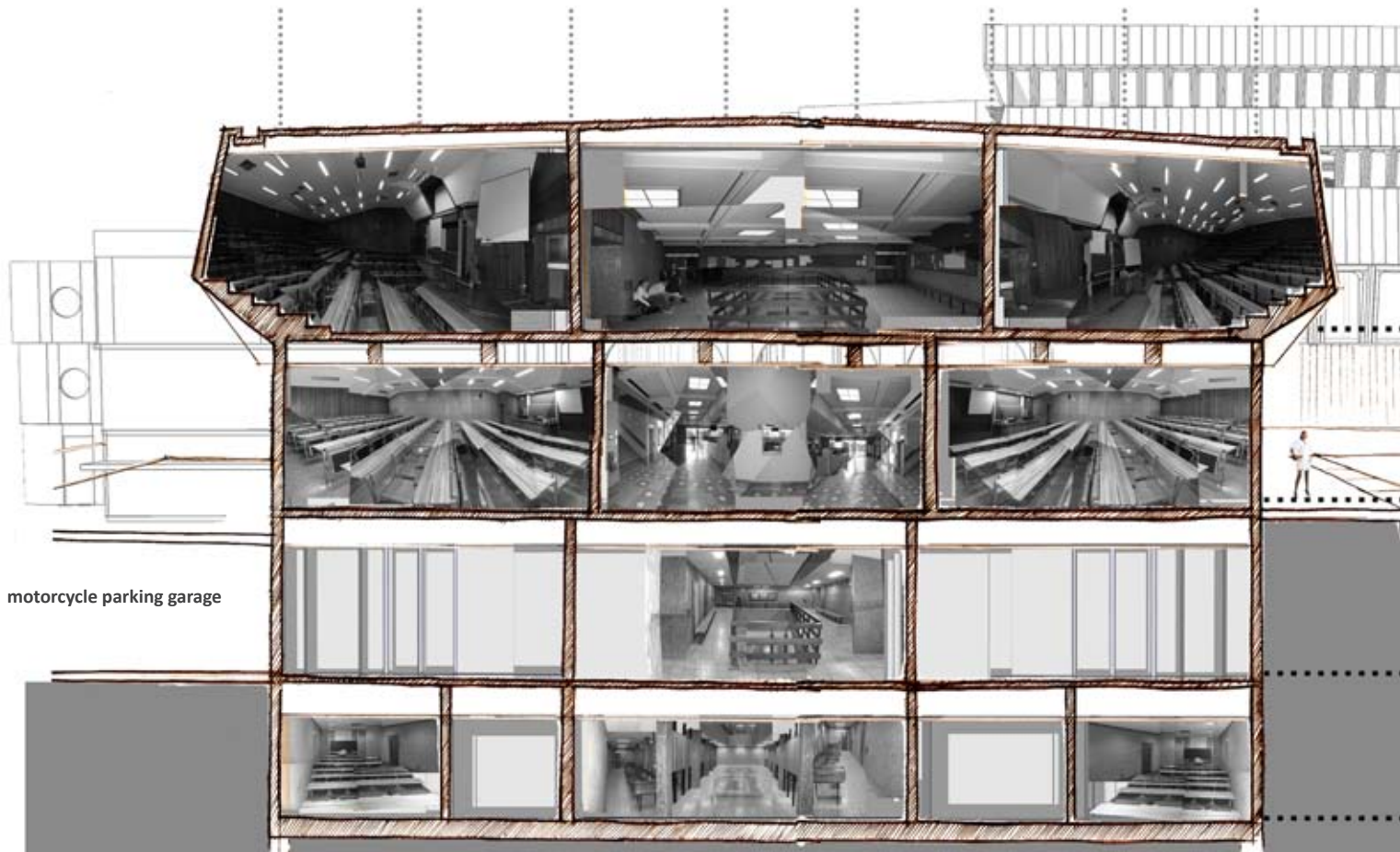
<b>Level 4</b>	
<b>Total Area</b>	:2964.62 m <sup>2</sup>
1. Atrium & Circulation	:934.00 m <sup>2</sup>
2. Lecture Halls	:1974.00 m <sup>2</sup>
3. Storage	:39.42 m <sup>2</sup>
4. Plant & Services	:17.24 m <sup>2</sup>
<b>Mezzanine</b>	
<b>Total Area</b>	:485.49 m <sup>2</sup>
1. Atrium & Circulation	:1151.91 m <sup>2</sup>
2. Classrooms	:89.18 m <sup>2</sup>
3. Office	:183.64 m <sup>2</sup>
4. Storage	:28.88 m <sup>2</sup>
5. Plant & Services	:31.88 m <sup>2</sup>
<b>Level 3</b>	
<b>To Total Area</b>	:2354.00 m <sup>2</sup>
1. Atrium & Circulation	:1198.00 m <sup>2</sup>
2. Lecture Halls	:385.38 m <sup>2</sup>
2. Classrooms	:112.70 m <sup>2</sup>
3. Office	:68.60 m <sup>2</sup>
4. Storage	:32.27 m <sup>2</sup>
5. Ablution	:32.00 m <sup>2</sup>
6. Seminar Room	:47.12 m <sup>2</sup>
7. Tea Room	:29.34 m <sup>2</sup>
8. Counters	:112.21 m <sup>2</sup>
9. Computer Lab	:50.39 m <sup>2</sup>
10. Safe	:22.61 m <sup>2</sup>
11. Plant & Services	:247.32 m <sup>2</sup>
<b>Level 2</b>	
<b>Total Area</b>	: 1147.97 m <sup>2</sup>
<b>Level 1</b>	
<b>Total Area</b>	:1278.91 m <sup>2</sup>
1. Atrium & Circulation	:414.91 m <sup>2</sup>
2. Lecture Halls	:464.82 m <sup>2</sup>
3. Storage	:22.50 m <sup>2</sup>
4. Plant & Services	:376.68 m <sup>2</sup>

#### Existing floor area ratios- podium

1.Total Atrium Circulation	2958.16 m <sup>2</sup>	35.94%
2.Total Lecture Halls (x30)	2897.99 m <sup>2</sup>	35.21%
3.Total Classrooms (x9)	384.19 m <sup>2</sup>	4.67%
4.Total Plant & Services	897.79 m <sup>2</sup>	10.91%
5.Total Storage	123.07 m <sup>2</sup>	1.50%
6.Ablution	131.74 m <sup>2</sup>	1.60%
7.Office	271.25 m <sup>2</sup>	3.30%
8.Counters	112.21 m <sup>2</sup>	1.36%
9.Other	454.59 m <sup>2</sup>	5.52%
<b>TOTAL</b>	<b>8230.99 m<sup>2</sup></b>	<b>100.00%</b>

Fig. 4.15 Plan perspectives of Humanities podium.

## 4.4 Existing Building - Spatial Analysis



**North-South section through Humanities Podium view to west**

Fig. 4.16 Sectional drawing and photo collage through Humanities podium demonstrating some of the internal spatial qualities of the podium and its isolation to its surroundings. (Object in landscape) [Author, 2008]



Fig. 4.17

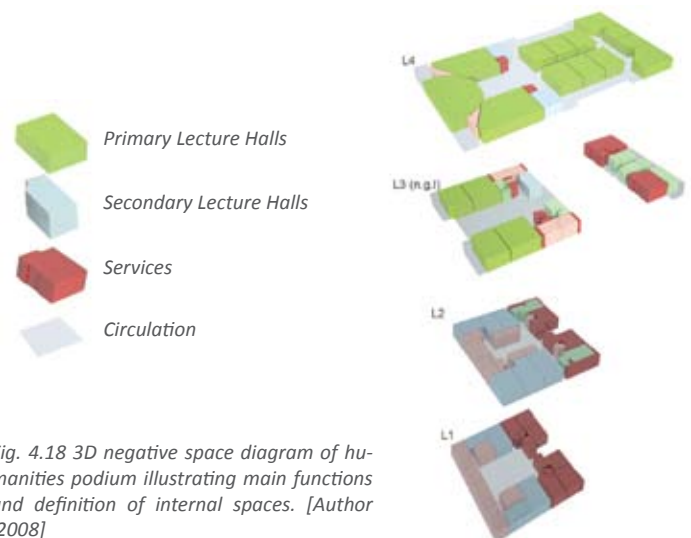
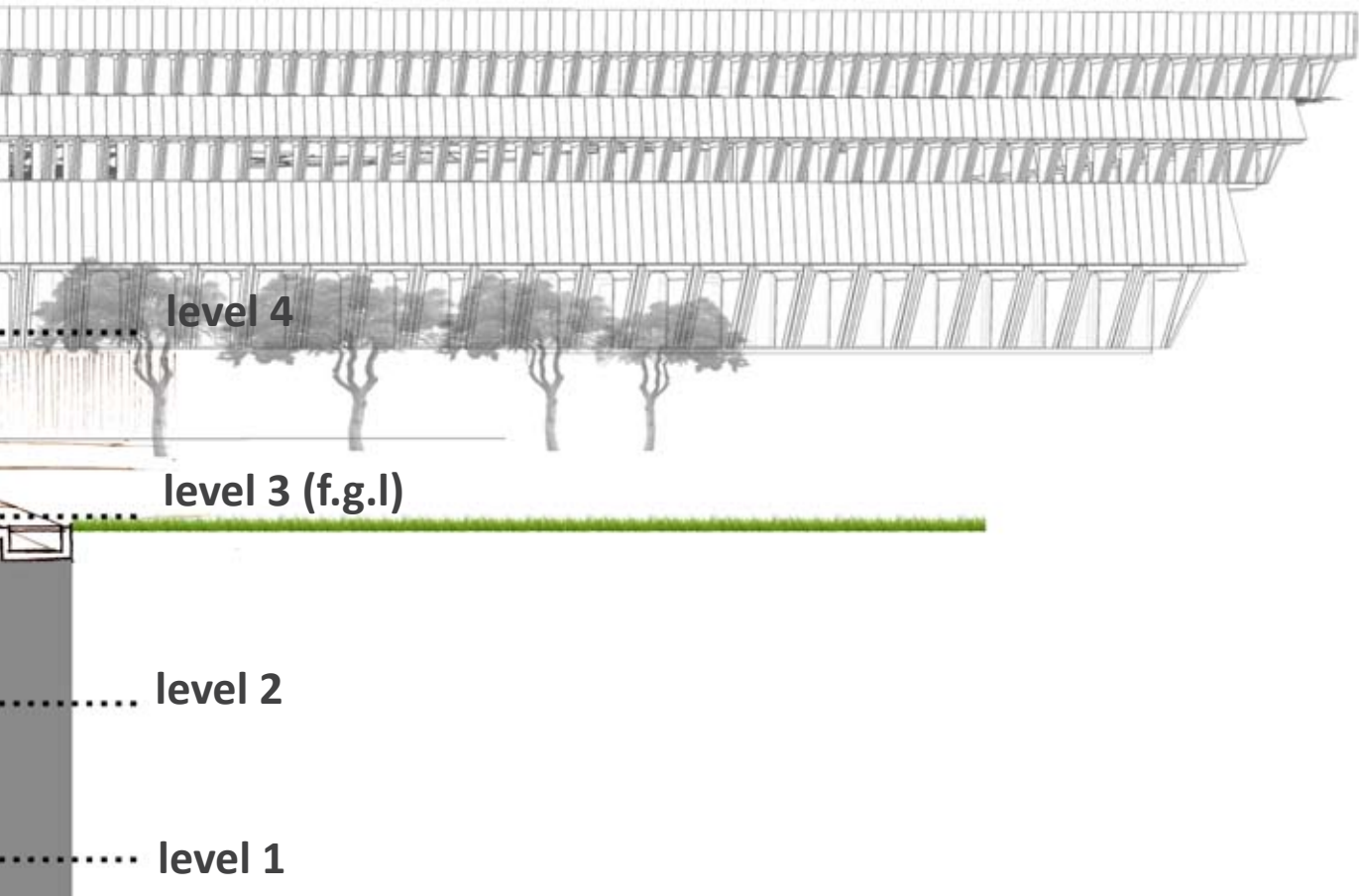


Fig. 4.18 3D negative space diagram of humanities podium illustrating main functions and definition of internal spaces. [Author, 2008]



MERENSKY LIBRARY



Spatial Hierarchy

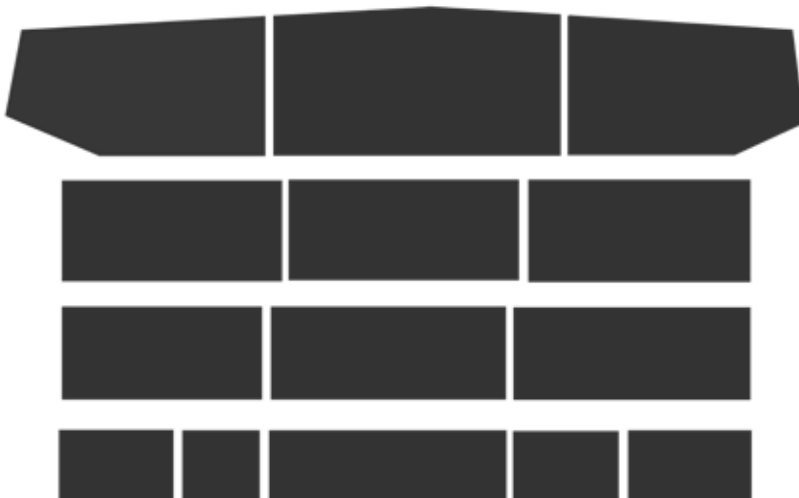



Fig. 4.19 Photograph of student activity on northern edge of Humanities podium, with the new Merensky Library in the background. [Planning 22,1977]

Fig. 4.20 Sectional figure ground study of the Humanities podium. The diagram illustrates the spatial hierarchy from basement level to the top floor. [Author,2008]

*Fig. 5.1 Photograph of the north facade of the Humanities Tower with all four faces of the envelope folded out to give a matrix-like pattern. [Author, 2008]*



**5.design**



West

South Elevations

East

North Elevations

# parameters

# 5.1 Learning from the past

1.2 The University  
coat of arms before 1927  
and after 1928.



## 5.1 Learning from the past

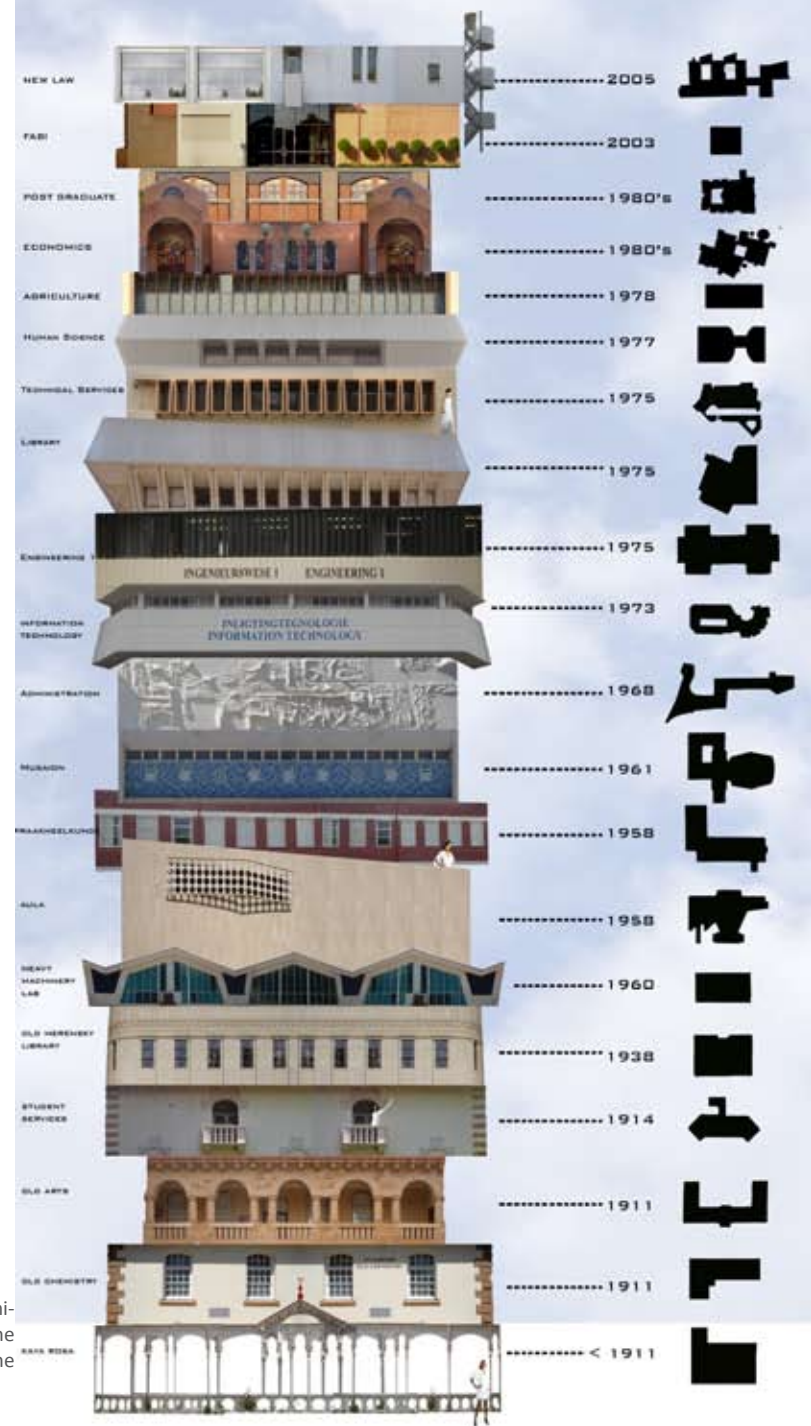


Fig. 5.3 This University of Pretoria Architectural timeline illustrates some of the different architectural styles over the past hundred years. [Author, 2008]



## 5.2 Fragments & Layers



Fig 5.4 Photo manipulation study illustrating fragments of mass taken from surrounding contextual fabric to produce new design possibilities [Author,2008]

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### Transparency and grid



Fig 5.5 Photograph study combining contextual fragments to emphasize transparency and grid. [Author,2008]

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### Pattern



Fig 5.6 Photograph study of merged patterns taken from the surrounding contextual fabric to demonstrate new design possibilities. [Author,2008]

### 5.3 Creative treatment of existing buildings

“It is a matter of discovering a multitude of qualities in the ‘already finished product’, beyond a superficially inscribed unambiguity of the object, and to express them in a new form with the means of design. This ‘art of observing’ reveals ambiguous and varied readings of the apparently fixed old substance. This overlap of project development is constantly reinvented and tells not only one but many stories” (Schittich, 2003).

Three different approaches can be identified for the creative treatment of existing buildings.

*Fig 5.7 Digital collage illustrating multiple Humanities towers. [Author,2008]*





## Preserving the Old in its entirety - seeking inspiration in the original

This approach, traditionally associated with heritage protection, seeks first and foremost to identify a new use that bears a close resemblance to the original intent of the structure. The design ideal is to focus on authenticity and formal preservation of the Old in its entirety.

It subscribes to the aesthetic idea of an image of the original, which determines the formal expression of the conversion as an “old substance in its entirety”.

## Layers and fragments: the idea of difference

The approach of the second group of design strategies is fundamentally based on the idea that Old and New discover their expression side by side in a converted building, where differing historic layers are brought into relation with each other. The idea of the homogeneous whole is replaced by a two or multi-layered model, where spaces are composed of different fragments which formulate a new whole as a result of their interaction. The new component is an obvious addition, clearly legible in the image and fundamentally different from the

existing substance. A distance is created, a distance that is different rather than conflicting. A spatial tension arises between the different temporal and iconic layers, which is identified and treated as a design theme.

Old and New are generally treated in an equal manner; both undergo the same intensive treatment. The existing building is thus dissected into different historic layers in the course of the design process. The work of Carlo Scarpa is the stylistic model for this compositional strategy in working with existing buildings. No building of the recent past offers a better illustration of the “art of the fugue” than the Castelvecchio in Verona (1956-1964). The strategies aimed at emphasizing differences do not seek to completely revise the existing object. On the contrary, the historic structure is seen as an opportunity for reinterpretation. This attitude operates on the principle of the collage, contrasting different, distinct set pieces, which usually appear in a common context. The Old is treated as a stage to showcase the New.

## The existing fabric as material for the “new entity”

This approach regards the existing building as freely available and changeable “building material” and uses it directly in order to fashion a “new entity”. The transition between existing structure and addition is seamless, the threshold between old and new building is fluid – there is no joint. The existing fabric can be manipulated and interpreted at will; there are no constricting guidelines or laws and no “demand for authenticity”.

This type of assembly is neither distinctively old nor distinctively new; instead it encompasses both without rendering either legible as category or layer. The converted building presents itself as a homogeneous whole. (Schittich,2003).



## 5.4 Existing fabric as design generator

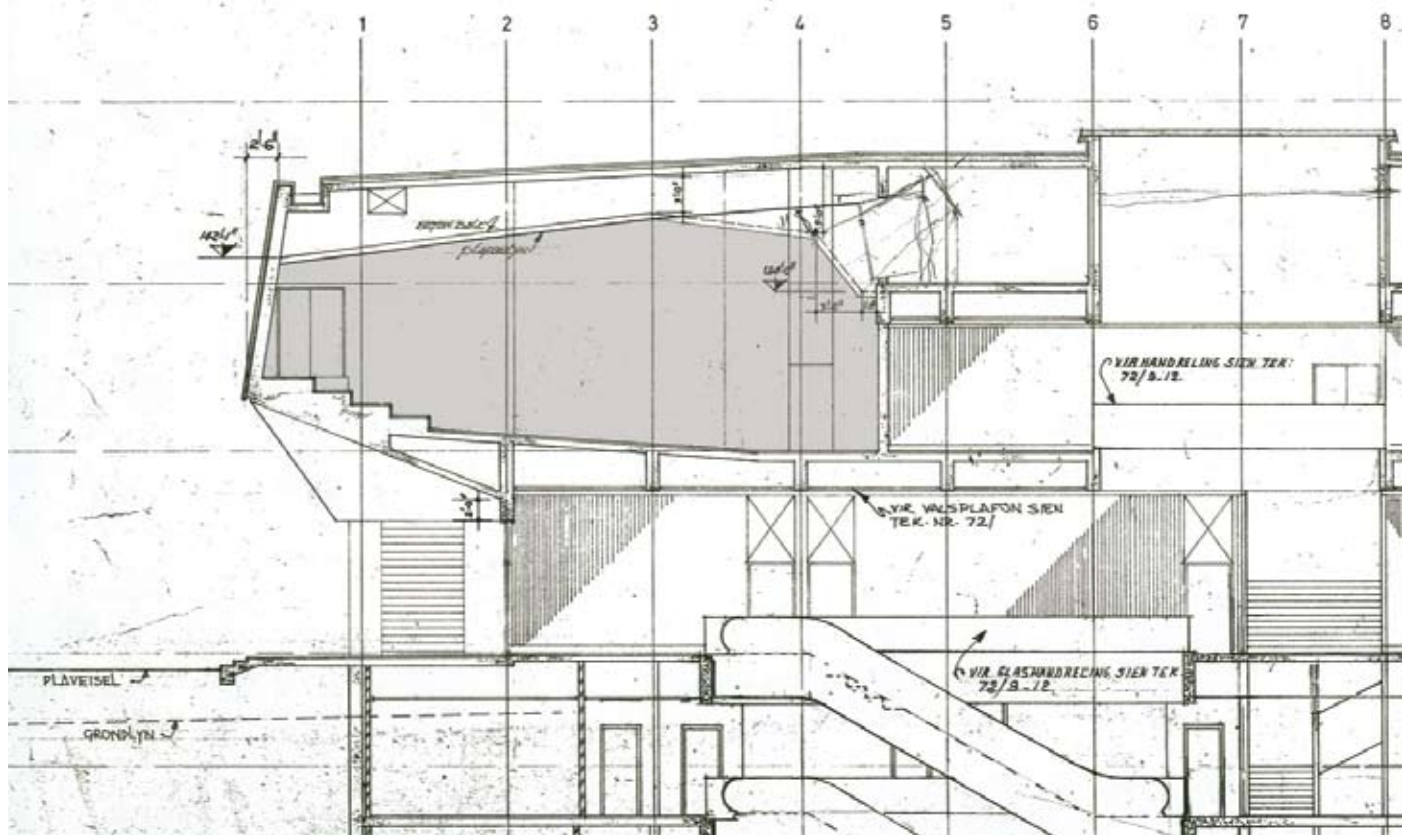


Fig. 5.8 Original Humanities Building construction drawings of western podium section. The highlight indicate and define the geometry of a lecture hall.

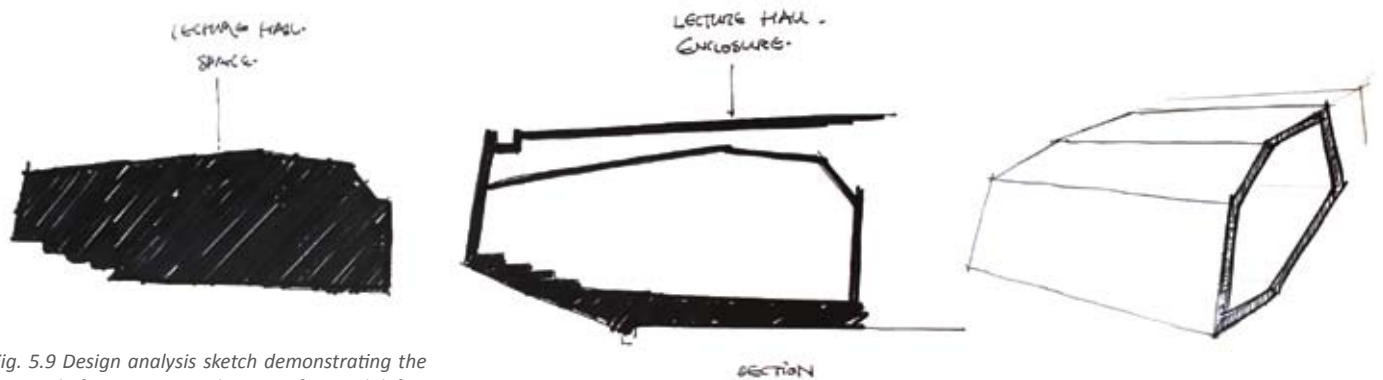
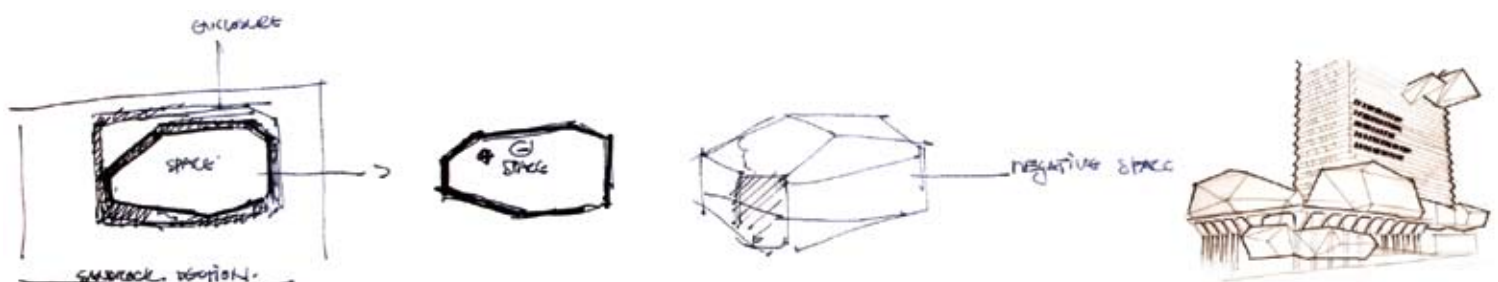


Fig. 5.9 Design analysis sketch demonstrating the removal of an existing enclosure to free and define the negative space. [Author,2008]

Fig. 5.10 Design development sketch illustrating design progression through application of the above mentioned analysis. [Author,2008]





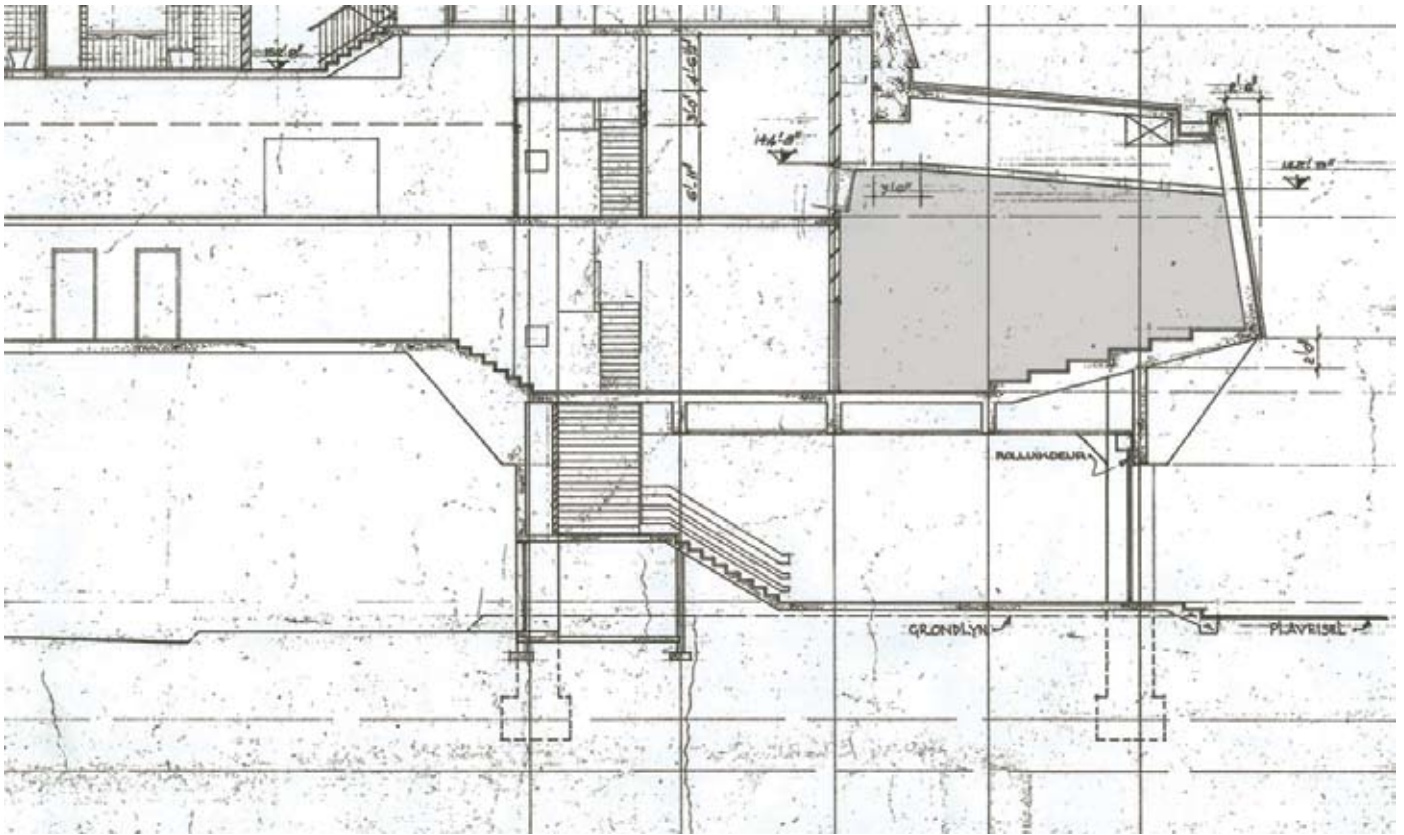
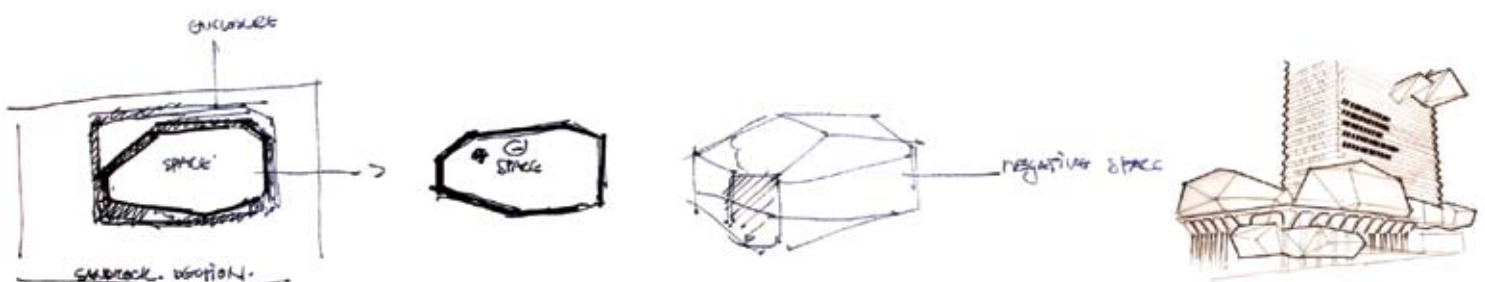


Fig. 5.11 Original Humanities Building construction drawings of eastern part of podium This drawing indicates and defines the geometry of a lecture hall.



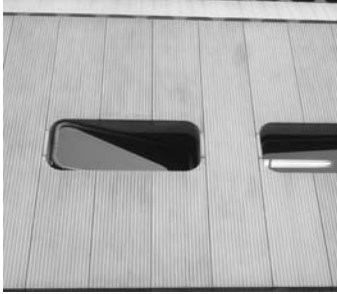
Fig. 5.12 Design analysis sketch demonstrating the removal of a smaller lecture hall enclosure to free and define its negative space. [Author,2008]



## 5.5 Design rules - Existing lecture halls

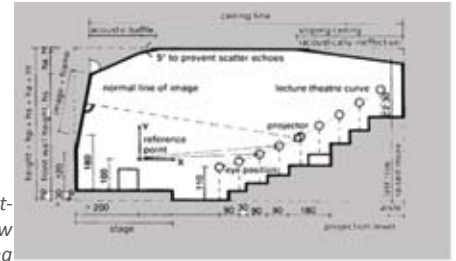
Enclosure

Inside Space



L4

Fig 5.13 Photograph illustrating podium bridge internal view and windows piercing building enclosure. [Author,2008]



L4

Fig 5.15 Photograph illustrating internal and external view of a typical Humanities lecture hall on level 4 [Author,2008]



Fig 5.14 Long section demonstrating some of the requirements when designing lecture halls. Geometry of the internal space.



L3 (f.g.l)

Fig 5.17 Photograph illustrating internal and external view of typical Humanities level 3 (ground floor) lecture hall. [Author,2008]

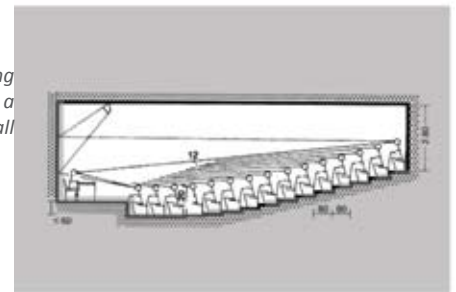
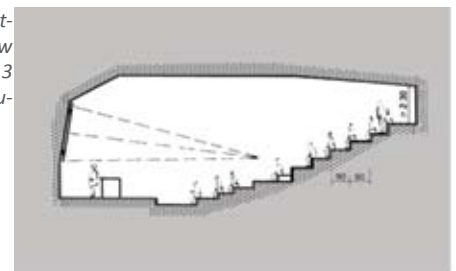


Fig 5.16 Sectional drawing demonstrating a standard lecture theatre shape.



L2

Fig 5.18 Photograph illustrating the inside and outside of a Hu- Fig 5.19 Drawing illustrating a more steeply raked Humanities basement lecture hall.lecture theatre. [Author,2008]





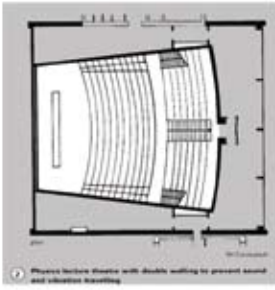


Fig 5.20 Plan layout of trapezoidal lecture theatre with double walling to prevent sound and vibration travelling.

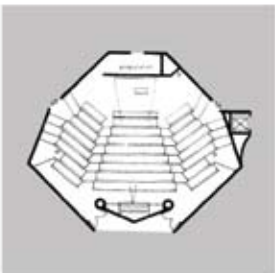


Fig 5.21 plan layout of 200 seat lecture theatre.



Fig 5.22 Plan drawing of a 400 seat trapezoidal lecture theatre.

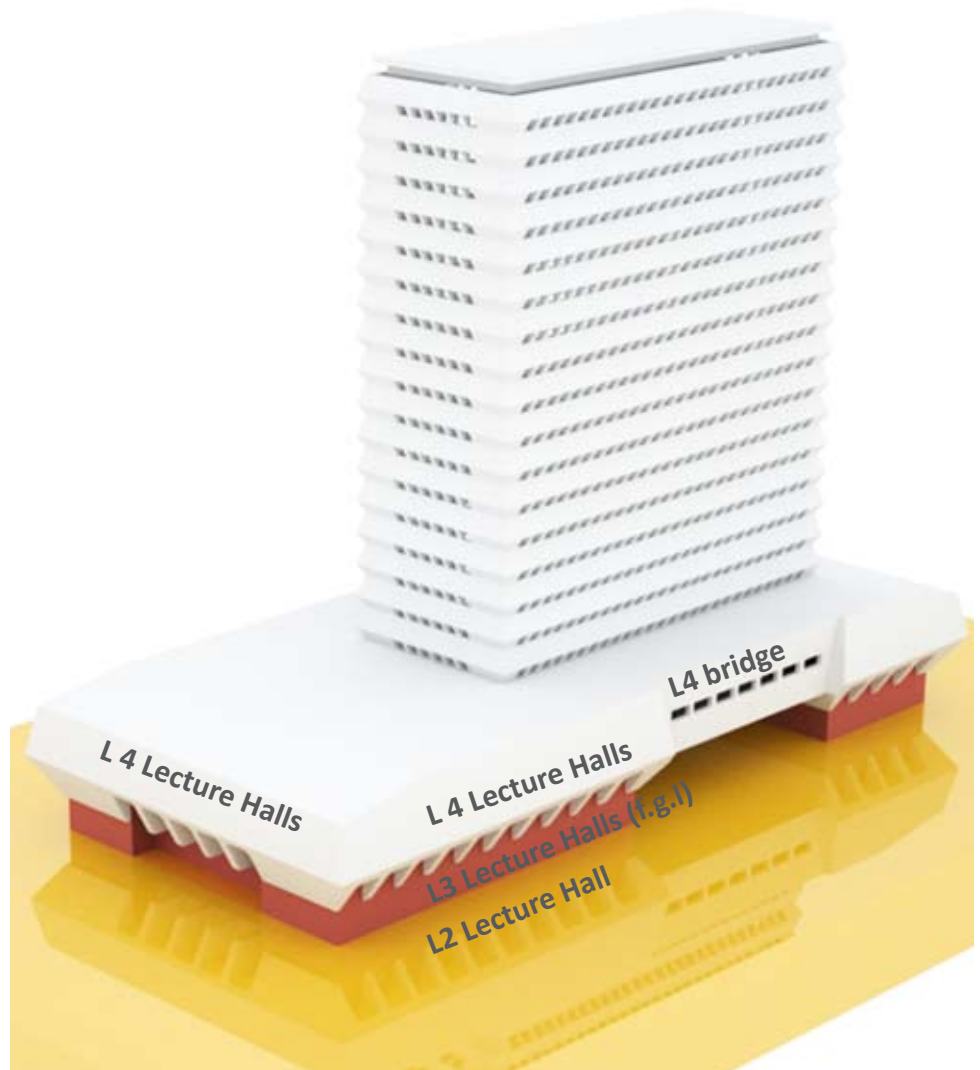


Fig 5.23 3D model of Humanities building illustrating location of podium lecture halls. [Author,2008]

Fig 5.24 Panoramic view illustrating a typical lecture hall layout on level 3. [Author,2008]

