



UNIVERSITEIT VAN PRETORIA
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Bridging the Gap

Interactive Architectural Incubator

Bridging the Gap

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I offer my deepest gratitude to my Heavenly Father, my Saviour and Friend for my passion, inspiration and talent. All Glory and Honour I give to Him who has given me strength and wisdom and blessed me abundantly.

A special thanks to:

My parents for their love, support and the gift of knowledge.

My mentor, study leader and editor for their guidance.

To my friends in Christ for carrying me with their continual prayers.

“For this reason I remind you to fan into flame the gift of God ... For God did not give us a spirit of timidity (of cowardice, of craven and fawning fear), but He has given us a spirit of power and of love and of calm and well-balanced mind, discipline and self-control ...”

2 Timothy 1:6-7

Bridging the Gap

Interactive Architectural Incubator

The main objective of the project is to create a gateway to the university campus which promotes public access onto campus, forming a clearly identifiable transition zone and threshold which delineates the transition from public to private space. By opening up the campus in such a controlled fashion, it will form the first phase in achieving integration of the university with the city. The project will function as a link between students and the public at large by means of a facility based on the business incubation model and will address some of the immediate needs of the current users of the campus.

The project will acknowledge the importance of the exterior spaces it creates, as well as the programmed space within, by encouraging the free exchange of ideas among students, faculty, industry professionals, academics, and the public. The scale, form and articulation of the structure will respond to traditional campus architecture while expressing an aesthetic that is progressive and will be clearly identifiable as a landmark indicating the threshold of campus.

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001 INTRODUCTION

A commonly accepted aspect of our education system is the giant leaps we need to take when passing from one phase to the next. The disparity between school and university is significant and the gap between graduation and your first working experience even bigger. The learning curve is staggering as we are thrown in at the deep end, trying to come to terms with applying theory to reality.

At the University of Pretoria (UP), as with most other tertiary institutions in the country, the educational emphasis is on the theoretical content of the courses offered and very little attention is given to so-called “soft skills”, such as entry level business, management and people skills, needed to launch a successful career. The lack of proficiency in these skills adds to the common perception that a huge gap exists between the university and the work environment.

I believe that more can be done to better equip graduates for their first work experience.

The goal is to create a sheltered environment in which related professions as well as professionals and students at different levels of proficiency in their profession, can interact and learn from each other as early on in the education process as possible. The emphasis is placed on the user-interface between the project and its surroundings by providing students and young professionals with maximum exposure to the outside world and vice versa; as well as on the interactive social and work related activities taking place within the building itself.

In addition to the above, clients are often unaware of the complexities of the design process and this lack of knowledge leads to reluctance to pay for quality design. By exposing

the public to the process of design, I hope to help propagate a better idea of the creative energy and effort involved and get potential students excited about the prospect of a career in the creative professions. A potential platform is thereby created where students and young professionals are continually challenged in terms of observing and being observed.

The architecture should itself promote interaction and serve as a branding image for the campus. The prominence of the proposed site opens up the possibility of investigating an iconic gateway building, indicating the threshold between public and private. This could be achieved in terms of movement patterns and alternative treatments of boundaries and barriers, i.e. ‘boundaries without barriers’.

002 HISTORICAL PREMISE

2.1 The City

2.2 The Campus

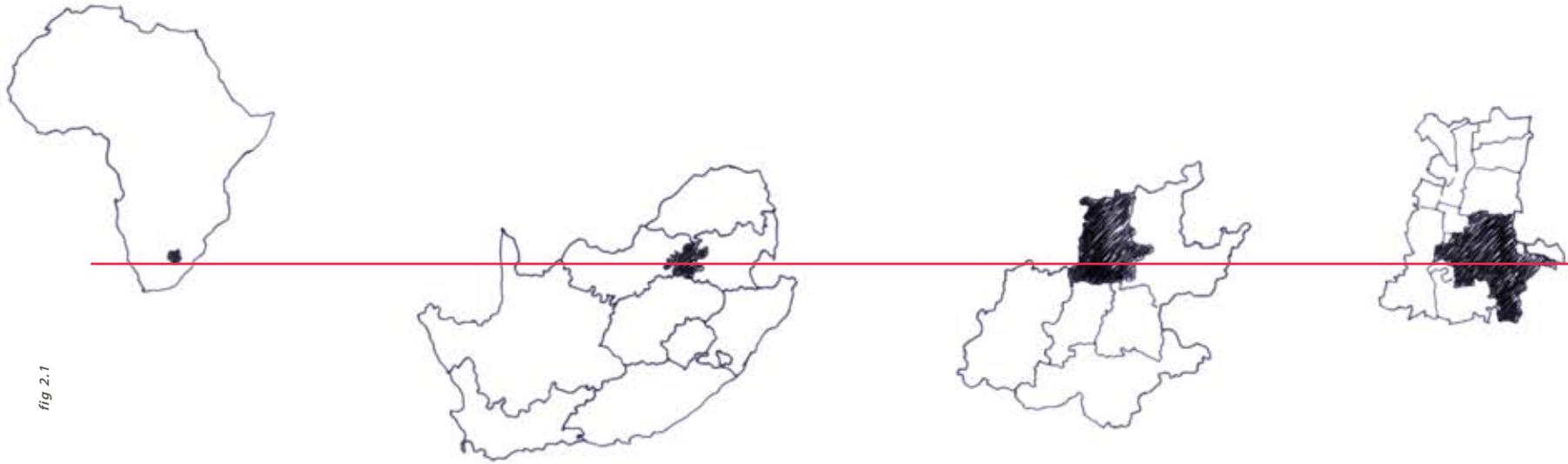


fig 2.1



fig 2.2

002 HISTORICAL PREMISE

2.1 The City

Pretoria falls within the City of Tshwane Metropolitan Municipality, in the Gauteng province and is the administrative capital of South Africa. The Tshwane City Vision states that Pretoria is “to become the leading international African capital city of excellence that empowers the community to prosper in a safe and healthy environment”. (<http://www.tshwane.gov.za/about.cfm>)

fig 2.1 location of The City of Tshwane within Africa

fig 2.2 aerial of Tshwane Metropolitan area

2.2 The Campus

Historically, the site on which the main campus of the ‘Transvaal University College’, the precursor of the University of Pretoria, was situated, formed part of the farm ‘Elandspoor’. The farm included the entire area on which the current campus is situated and continued up to the eastern bank of the Apies River. Gert Bronkhorst owned Elandspoor until 1857 when it was sold to Jan Schutte and appropriated by James Mears (Ad Destinatium, 1910-60:264).

The campus developed and expanded as student numbers grew. Prior to the 1940s the placement of buildings on the campus was entirely haphazard. Then in 1940, Gerhard Moerdyk devised a masterplan for the layout of campus. In 1953 Prof. A.L. Meiring defined the edges of the central quadrangle by locating buildings around its perimeter, with the focus on the Old Arts Building. He consciously strove to implement a more orderly campus plan, to

facilitate the creation of place (Ad Destinatium 1910-60:272). At this time the campus was bordered by the current Roper and University Streets, and stretched from Burnett Street in the north and towards the Pretoria Boys High School in the south. The placement of the buildings was influenced by the movement hierarchy and existing roads, of which Tukkies Laan was a main route (Ad Destinatium 1910-60:273). Except for minor alterations, the buildings remain true to their original design by means of continual maintenance.

As the university expanded even more and needed more space, it spread out towards the east crossing Roper Street. Roper Street became a central axis on campus and after 20 years of negotiations it was decided to close Roper Street to vehicles, but not to pedestrians (Ad Destinatium 1961-80:56). At some stage, due to security concerns, the University completely

closed the street to the public, giving the university sole access and creating the confined campus as it is today.

Today, the University of Pretoria exists as a fenced island in the midst of the greater urban environment, creating an enormous urban barrier. It is territorial in function, being homogenised internally and alienating externally. The boundaries of the campus are defined by an iron barrier of palisade security fence that is interrupted by student access gates.

The lack of permeability of a campus with limited and controlled access points should be a cause for concern. Bentley et al. (1985:35) states that “permeability is the key measure of responsiveness” and describes it as the “extent to which an environment allows the flow of people from place to place”. It is obvious that the permeability of the campus is affected negatively by the imposition of the security measures. The boundaries of the university are both physical and conceptual. They define the

sprout from this central point. To the north of the Student Centre is a major circulation spine with hundreds of students passing through daily. On either side of the route are a few hostel annexes and covered parking bays, but unfortunately, possibly because most of these buildings were acquired rather than built, the clean, planned layout of the original campus framework had not persisted.



fig 2.3

A university in principle is a public institution, predominantly subsidised by government funding, and in function serves the greater community. But as a result of crime and the desire to keep the students safe, the campus has been completely cordoned off, effectively severing all public-student interaction. The previously mentioned gap therefore exists not only on the level of applied skills but also in physical or spatial location.



fig 2.4

degree of accessibility to the university by determining the openness of the institution to different populations that are not part of the university community.

Currently, Roper Street forms an axis down the middle of the main campus and is a major channel with high volumes of student traffic with the Student Centre at the heart of it all. Practically all the main routes on campus



fig 2.5

fig 2.3 university of pretoria campus plan, 1930

fig 2.4 aerial photo of U.P. campus, 1950s

fig 2.5 aerial photo of U.P. campus, 1990

fig 2.6 locality of site and surrounding features



METRO RAIL STATION

BURNETT STREET COMMERCIAL HUB

UP ADMINISTRATION

OLD AGRIC

GAUTRAIN STATION

URBAN GATEWAY TO PRECINCT

TECHNICAL SERVICES

STUDENT CENTRE

UP MAIN ENTRANCE

PRETORIA OOS LAER SKOOL

GIRLS HIGH SCHOOL

STUDENT RESIDENTIAL



fig 2.6

003 THEORETICAL PREMISE

3.1 Designing the University of the Future

- 3.1.1 Current Campus Design
- 3.1.2 Factors Defining the Future University
 - 3.1.3 The University-City
 - 3.1.4 Conclusion

3.2 Safety in Urban Design

- 3.2.1 Behaviour v/s Urban Form
- 3.2.2 Enclosure v/s Encounter
 - 3.2.3 Safety v/s Diversity
 - 3.2.4 Conclusion

3.3 Safety Principles

- 3.3.1 Surveillance & Visibility
- 3.3.2 Natural Access Control
- 3.3.3 Natural Territorial Reinforcement
 - 3.3.4 Conclusion



003 THEORETICAL PREMISE

3.1 Designing the University of the Future

We are currently witnessing profound social, cultural and technological changes that are transforming traditional institutions. The university remains the primary centre of higher learning throughout the world, as well as the main repository of accumulated wisdom (Bell, 1973:10). Jacov Haina and Rifca Hashimshony in their paper 'Designing the University of the Future' (2006) argue that universities will undergo major organisational and physical changes as they adapt their activities to meet present and future needs.

The UP will have to adapt to these changing circumstances if it is to become the research institution with international renown envisaged in their vision. The highly varied and conflicting societal pressures placed on the university have generated discussion about the need to redefine the role of this institution to better serve the needs of contemporary society.

I will briefly look at how they and other authors expect the university of the future to change and then how these changes would affect its spatial layout.

3.1.1 Current Campus Design

Walking across a great university campus can be one of the most memorable and palpable experiences of place we ever contend with. Prospective students, their parents, and faculty consider the overall feel of a campus as one of the key deciding factors when selecting a school. The quality of a school is often judged by its sense of place and by the activities going on across the campus grounds as well as in adjacent streets, neighbourhoods and towns.

Successful campuses create an inherent sense of community by offering many ways for people to interact with each other in the spaces

between buildings. To create this interaction, campuses need a large variety of activities that are not specifically academic. It is not enough to build a university around the specialised needs of its academic programs; it also needs a collection of distinct gathering places that catalyse interaction.

Conversely, the isolated and over-administered university of today kills the variety and intensity of diverse perspectives at the university and also limits the student's opportunity to shop for ideas.

To re-create this kind of academic freedom and the opportunity for exchange and growth of ideas two things are needed. Firstly, the social and physical environment must provide a setting which encourages rather than discourages individuality and freedom of thought. Secondly, the environment must provide a setting which

encourages the student to see for himself which ideas make sense - a setting which gives him a multitude of opportunities and maximum exposure to a great variety of ideas, so that he can make up his mind for himself (Alexander, 1977: Pattern 43).

The ideal of a university has been a lively setting where students gather in pubs, coffee shops, public plazas, and diners to discuss what they've learned in class as well as flirt and philosophise. The University of Pretoria campus, I believe, falls far short of the mark in providing lively public spaces. Making the campus a better place for public interaction will enhance the creative atmosphere for students, teachers and administrators alike. There is a need for cross-fertilisation and collaboration now more than ever.

The key to making a campus more than the sum of its parts is the clustering together of activities to create a busy, dynamic place for many different types of people at different times of day. A campus that sits all by itself, cut off from the

commerce and life of the local community, solely devoted to classrooms and university activities, provides a barren and unrewarding experience for students.

Arguably two of the best campuses in the U.S. is the Savannah College of the Arts in Georgia, and the College of Charleston in South Carolina, because their buildings are actually woven into the city fabric rather than standing apart on their own separate sites (PPS, 2008).

A university and the surrounding community boost each other when they cooperate on a wide range of matters. The happy result is often a strong local economy with a highly skilled

workforce and cutting-edge businesses spun off through the presence of entrepreneurial professors and graduate students. More examples of this are Iowa City (with the University of Iowa) and Champaign-Urbana (University of Illinois) as vibrant communities with low levels of economic inequality that thrive on their connections with their universities (PPS, 2008).

As incubators of innovative ideas, universities are poised to pioneer sustainable building practices for the future. Campuses need to be thought about in terms of destinations, how the various buildings relate, where the gathering places are located, where you want walkways, and then fitting the streets into that vision.

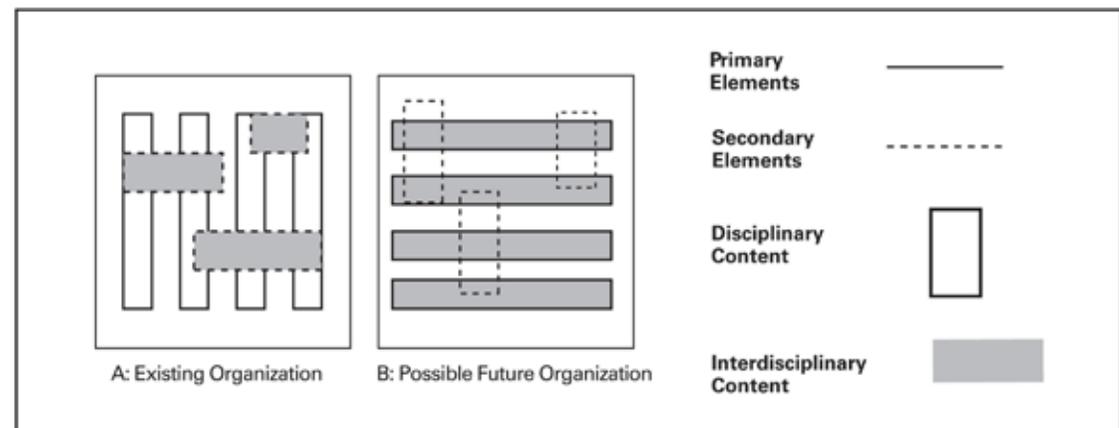


fig 3.1

3.1.2 Factors that may Define the Future University

Transportation in general has become a thorny issue at the UP. It obviously must be accessible for staff and students living off-campus, but not overrun by wide roads and huge parking facilities that destroy the intimate, pedestrian-scaled environment essential to a quality educational experience. Accommodating the automobile too much has resulted in the campus becoming a drab, uninspiring place sealed off from the life of the community around it. I would suggest aggressive efforts to promote bicycling, car pools and public transport. Dewar (et al. 1997:27) also stated that a city should be scaled on a model that uses pedestrian and public transport as baseline.

Delanty (2001:3) argues that the university is still the only institution in society where one can find research, education, professional training, and intellectual criticism together. With the expected changes to come, it is likely that the relative importance of these four activities will change. For example, the balance between research and teaching will change, while more tasks related to service to society may be added (Haina, et al. 2006:8).

fig 3.1 schematic description of changes in organisational structure of the university

fig 3.2 forces for change determining the future university

Decisions made about balancing these activities will have a critical impact on the distribution of spaces within the university. According to Haina and Hashimshony, the factors which will be particularly important in defining the nature of the future university are the following:

- Financial challenges

As government support for universities has declined, these institutions have been forced to look for new funding sources. The need has therefore arisen to commercialise knowledge in order to cope with the financial difficulties (Haina, et al. 2006:8). Jarvis (2000:52) states that “universities should now be more responsive to the demands of the market, recognise the need to change their ways, be less independent and become more efficient”.

- Collaboration with industry

The character of industry is changing rapidly in the face of the competitive forces of an increasingly global economy. The knowledge that can be provided by universities has encouraged the growth of collaboration between industry and the university (Haina, et al. 2006:8).

- Increasing student population and greater diversity

In recent years the growing student population has become increasingly heterogeneous. The change reflects the democratisation of higher education, the importance of knowledge to our society, and the changing structure of the labour force with a higher demand for educated workers and less demand for

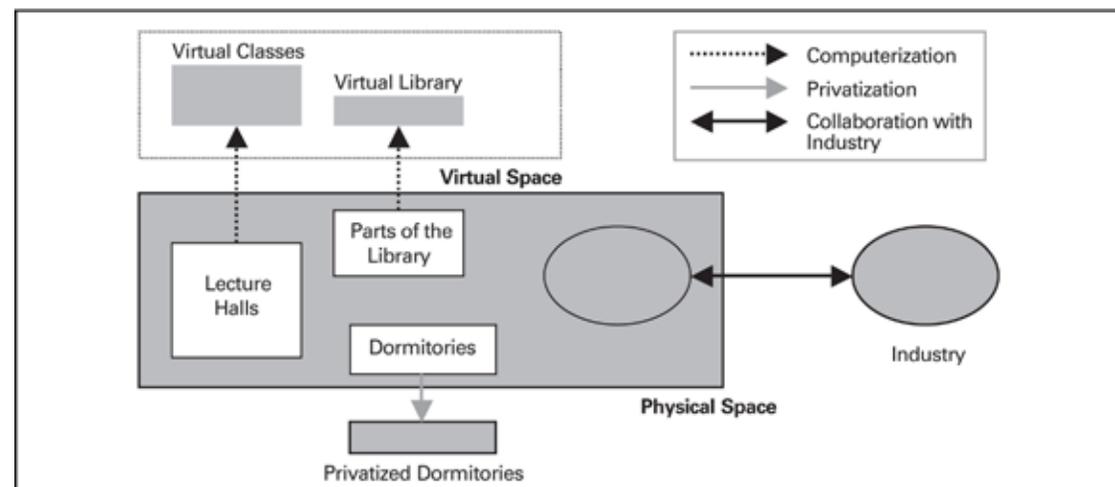


fig 3.2

labourers. This rapid growth of a more diverse student population will further increase both the number and type of institutions of higher education and will affect, in turn, the decisions about the missions and physical requirements of universities (Haina, et al. 2006:9).

- New patterns of teaching and learning

Major improvements in technology have provided access to digital knowledge resources and created the option of a virtual university in which virtual spaces replace the existing physical ones (Haina, et al. 2006:9). However, the physical campus should not be abandoned completely as it brings people together and allows for cross-fertilization of minds, and also creates a 'sense of community' and 'university spirit'. A combination of virtual and physical spaces should be considered.

- Growth of interdisciplinary fields of knowledge

Today's structure of knowledge is increasingly interdisciplinary in character. Interdisciplinary

frameworks may become primary elements and in time may need defined physical spaces (Haina, et al. 2006:10).

- Openness to the community

The opportunity for the public to attend lectures, special courses, and evening activities may strengthen the image of the university as a central institution, responding to the needs of society. The implication is an increasing interaction between the university and the 'outside world'. As a result, the boundaries of the university campus will become more permeable and its facilities will be used more efficiently for mixed activities (Haina, et al. 2006:10).

Rigid functional organisation or spatial zoning was appropriate when departments were isolated and knowledge was divided into discrete disciplines. However, collaborative research and interdisciplinary knowledge can have a major influence on the spatial structure of the university. The need for an environment of mixed uses is enhanced by

the existing possibility of studying and working from different places and by collaboration with industry (Haina, et al. 2006:11).

Multifunctional buildings, mixing different knowledge operations with leisure activities and even residence, may also appear. The mixed-uses strategy, with shorter physical distances between different functions, supports more flexible and spontaneous activities suited to current dynamic lifestyles (Haina, et al. 2006:11). Similarly, Jacobs states that "cities are natural generators of diversity and prolific incubators of new enterprises and ideas of all kinds" (1961:156).

The growing need for collaboration with industry, the new openness to the community, and the changes in the organisational structure of the university may well result in the blurring of its physical boundaries. The integration of students and academic staff in the life of the community and the emerging social role of the university as a bridge to the public also become highly important (Haina, et al. 2006:11).

3.1.3 The University-City

The basic architectural prototypes of university design, as described previously, should be re-examined in view of the forces of change that are affecting the missions of higher education institutions. For the University of Pretoria to stay an internationally recognised research and educational institution, they will have to adapt to these changing circumstances. With the UP's location in the ever expanding city, I believe it would need to merge with the city and become

what Haina (2006:11) refers to as the 'University-City'.

In the scenario of the University-City, a large volume of activities takes place in the virtual space, the organisation is physically decentralized, and the institutional boundaries are open.

The centrality of knowledge and its associations with components in the urban system, such as

schools, museums, industry, and leisure activities, blurs the limits between this type of university and the city. The university will be completely assimilated into the city and will become a unique entity. From an institutionalised point of view, this means a high degree of privatisation, a medium degree of computerisation, and a high degree of collaboration with industry and of openness to the community.

The University-City

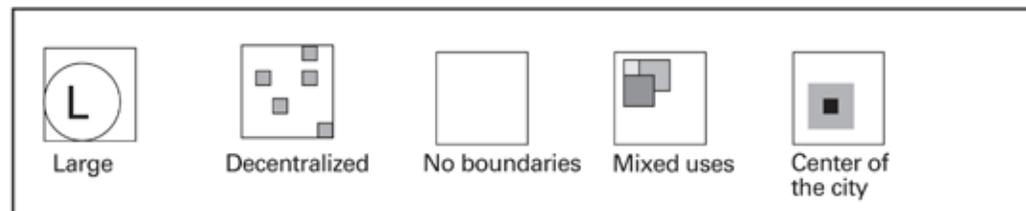


fig 3.3 graphic presentation of the spatial characteristics of the University-City model

fig 3.3

3.1.4 Conclusion

The focus shifts from what happens only on campus to include what happens in its immediate environment. Tadmor (2003:22) holds that the university “will become a science-technology city with the university at its core, surrounded by a large array of buffer institutions, industrial parks, technological incubators, science related cultural activities, science orientated youth camps, and international meeting places”. With this notion of spatial layout in mind, the university should shift its focus outside of its own boundaries and start looking at how the city can be beneficial to the university and how the university might add to the city.

The University-City opens new horizons for future developments and ideas with greater flexibility. The community of the university is the community of the city and thus not a discrete community, but a variety of communities, each fulfilling, in some way, the classical tasks of the university. It is the ultimate embodiment of the emerging knowledge society, emphasising both the democratisation of knowledge and its central role. It can provide varying spatial situations and balanced integration of green areas. Many parallel diverse systems will exist simultaneously, fulfilling the classical tasks of the traditional university (Haina, et al. 206:16).

I have analysed the influence of social, cultural, economic, and technological changes over time on the structure of the university and have discussed the implications of these changes for the design of the future university. However, this integration with the city in the current political environment brings the question of safety and security on campus and whether there are ways to keep it safe through urban design rather than with palisades.

3.2 Safety in Urban Design

Campus safety and security has always been a high priority for the University of Pretoria, which is the motivation for all the palisade fences. It raises the questions of whether there are better solutions to the problem and if there is a connection between safety and urban design. Because an integral part of the project's goal is public access to dedicated areas of campus, the need exists to investigate the broader relationship between urban design and social behaviour and whether it could provide a healthier alternative to the 'iron curtain'.

Since we are not criminologists, nor sociologists, I will not claim expertise in those domains and will conduct my investigation from an urban design point of view. I will briefly explore the relations between urban form and urban safety in general and then pose some questions on how dominant forms of the urban development are transforming this relationship and how these ideas could be implemented on the UP campus.

3.2.1 Behaviour v/s Urban Form

It is now widely accepted that there is a strong relationship between the design of urban spaces and all forms of public behaviour, crime and violence among them (Dovey, 1998:2). However, there is rather less agreement about the nature of this relationship or the degree to which urban form determines behaviour.

The idea that good buildings could produce a good society has haunted architectural practice ever since Le Corbusier proclaimed architecture as the liberating alternative to social revolution (Dovey, 1998:2). While the dreams of liberation through architecture are very much alive, I would suggest that the physical environment cannot cause behaviour, but it does seem to have an effect on it.

The sociologist Anthony Giddens (1984:230) argues that built form structures social behaviour through a combination of enabling and constraining. He

states: "at the most banal level, a wall constrains movement and enables privacy, but it does not cause any kind of behaviour." Therefore, built form can prevent things from happening in a given place, or it can enable them to happen, but it cannot determine anything. "Through architectural form of the structure, one can channel the movement of people through purposeful routes of movement and points of pause, influencing the nature of the users' responses" (Bacon, 1957:50).

Crime and violence are social practices, based within social relations which are mediated by urban form. Controls over land-use, the design of urban space and public access can indeed contribute to safety and danger in the city. While urban form mediates a certain distribution of crime and violence, the deployment of urban design as a means of 'designing out crime' is highly problematic, even though design interventions may re-distribute such practices and may do so with positive effects.

3.2.2 Enclosure v/s Encounter

Ways in which urban form mediates safety and danger is firstly, the ancient response to put either walls or distance between ourselves and what we perceive as a threat. In the burgeoning industrial city of the 19th century, public space was regarded as both masculine and dangerous, “a labyrinth of places of crime and danger from which women and children should be excluded” (Wilson 1991:34). This was the first phase of retreat to the suburbs as a safe place for family life. The dangers of the city were dealt with by an anti-urban impulse, which is the attitude to safety in urban space and the ‘ideal’ of a retreat from it that we are still dealing with today.

In the book ‘Defensible Space’, Oscar Newman (1972:65) focussed on the considerable incidence of crime in the newly created inner-city public housing estates where a kind of ‘no-man’s-land’ emerged between the street and the front door. Newman’s claim was that such crime could be prevented through designs which encourage a sense of control or responsibility over such space.

This has tended to lead to the enclosure of such zones, wherein strangers would be recognised, as was done with the university campus. However, Newman was severely criticised for his methods, as danger in public space is still dealt with by separating oneself from that which is strange or different, just as with the retreat to the suburbs.

A second opinion on how safety and danger can be mediated by urban design, that is in contrast to this tendency of retreat and enclosure, is the work of Jane Jacobs in ‘*The Death and Life of Great American Cities*’ (1961). This was also a critique on modernist planning but it was a broader criticism of the ideology which divided the city into zones according to function, destroying the vitality and diversity of streetlife and its informal modes of social control. Jacobs argued for a mixing of functions which would maintain activity on the street at different times of the day and week (Jacobs, 1961:67).



fig 3.4

There are many aspects to this argument, but the view on safety is that the volume of streetlife and a relation of buildings to the street which maintained 'passive surveillance' or 'eyes on the street' (Jacobs, 1961:60) is a highly effective control of anti-social behaviour. She states that "public peace of cities is not kept by police but is kept primarily by an intricate, almost unconscious, network of voluntary controls and standards among the people themselves" (Jacobs, 1961:41).

In this idea of passive surveillance there was some overlap between Jacobs and Newman, but the major difference was the encouragement of - even the reliance on - the encounter with strangers. Jacobs recognised urban vitality as dependent on a highly permeable urban structure with short blocks and multiple connections (Jacobs, 1965:193); which is the structural opposite of enclosure.

The more recent work of Bill Hillier (1984) on 'spatial syntax' leads in a similar direction: a "ringy" urban spatial structure which encourages

strangers but controls them by being near dwellings. The argument with regards to safety is that "strangers police the space, while inhabitants police the strangers" (Hillier & Hanson, 1984:18). One is not protected from contact with strangers; indeed such contact is seen as protective.

A healthy street culture could be beneficial to safety, quality of campus life, as well as commercial gain for the UP. Roper Street could be activated as a generator of energy and positive interaction with the public.

fig 3.4 photo of Roosmaryn front door as seen from Roper Street

3.2.3 Safety v/s Diversity

Christopher Alexander's seminal paper entitled 'A City is not a Tree' (1996) is another attack on modernist planning although his concerns were for urban vitality rather than safety. The metaphor of the tree is linked to the attempt to order the city hierarchically, and he argues that cities would be killed if they were treated like trees since they rely on high levels of connectivity and chance. This idea can be linked to the work of philosopher Gilles Deleuze (1985:136) who utilises the metaphor of the 'rhizome' for forms of life which move both horizontally and vertically, and in a fragmented or 'nomadic' rather than hierarchical manner.

The most creative corporations, communities, institutions and urban life are rhizomatic. Regardless of attempts to impose order on urban life, good cities have a capacity to enable diverse forms of life to shoot and take root, to migrate and sprout again. But crime and violence are also rhizomatic, as are the many informal practices of maintaining urban safety. Which raises the question: how can a city be rendered safe without the kind of totalitarian control that also kills off the diversity, vitality and creativity of urban life?

Jane Jacobs believes that diversity is essential to a safe and lively city and that diversity in cities is both healthy and economically uplifting. She gives three main qualities that city streets must have in order to make a safety asset out of the presence of strangers:

"First, there must be a clear demarcation between what is public and what is private space. Second, there must be eyes upon the street belonging to the natural proprietors of the street. And third, the sidewalk must have users on it fairly continuously". (Jacobs, 1961:44-45)

But for this natural energy to be harvested, one needs a healthy mix and interaction of people of all kinds. A university campus should not be regarded in isolation, but should rather be seen as part of a greater whole, as a key component of a contiguous community.

I believe that students would benefit greatly from the experience of mingling more with the public. It would also benefit the University in that the public could keep the university grounds alive, and therefore safe, during the recess periods when students are absent, while still providing the commercial facilities on campus with a steady income.

One might argue the need for diverse interaction in city life, but I believe it is crucial for optimal individual development and personal growth as well. Likewise, Richard Sennet (1996:24) believes that the unstructured face to face encounter with strangers and confrontation of difference is necessary to civilised human development.

"The somewhat anarchic diversity of functions, people and activities is what enables the development of culture, art and identity. We discover and construct who we are in the encounter and contrast with what is 'other' to our given identity. By contrast the fear of and retreat from difference leads to a stunting of identity and to a retreat to purified ideals of a closed community". (Sennet, 1996:25)

Jacobs (1961:93) also substantiates this notion and states "in real life, only from the ordinary adults of the city sidewalks do children learn the first fundamentals of successful city life". She also adds "the whole idea of doing away with city streets and downgrading and minimizing their social and economic part in city life is the most mischievous and destructive idea in orthodox city planning" (Jacobs, 1961:98).

3.2.4 Conclusion

Two kinds of mediation of safety and danger in urban space which can be loosely characterised as the 'enclosure' model and 'encounter' model have been discussed. This raises the question of what we are to make of this in terms of current urban development and more specifically urban design implemented on the UP campus.

In my view, while both retreat and enclosure can be appropriate measures for particular situations, the encounter model provides a far more sophisticated strategy for promoting urban safety. It is the only model which is truly sustainable, urban, civil and civilised as opposed to the absurd idea that it is 'civilised' to retreat from 'civic' space.

Safety and security are paramount considerations within the concept of private enclosure, but the broader effects on the safety and security of the public realm are highly problematic. The

enclosure model is a form of urban development which redistributes public danger in a manner that diminishes our collective willingness and capacity to deal with it.

This redistribution also occurs within public space where urban design moves the signs of social division and failure into invisible locations. Surveillance cameras, outdoor sprinklers and so called 'bum-proof' benches can be used to marshal the homeless or unwanted into spaces where they will not be noticed. Fences and cameras can be used to shift injecting drug users into someone else's toilet, alley or suburb. But since urban form does not cause homelessness, social division or drug use, it cannot be eradicated by moving it around.

One test of a good city lies in whether it allows us to walk the streets in safety; day or night, rich or poor, male or female, black or

white, old or young. But another test lies in the capacity for all its citizens to gain access to the overwhelming vitality and diversity of urban life. The task is not to choose between, but rather to reconcile these imperatives. To understand, manage and engage with safety and danger in a creative and civilised manner.

Therefore, a need exists for varying levels of contact - from privacy to public interaction - to stimulate a healthy campus life. The proposed site will form a transition space and the building itself will be designed to form a gateway, creating a definite awareness of crossing from public into semi-private space with effective surveillance, both active and passive, which could serve to limit crime and violence. The objective is to create a vibrant and active street culture in Roper Street which would enhance and enrich the atmosphere on the university campus.

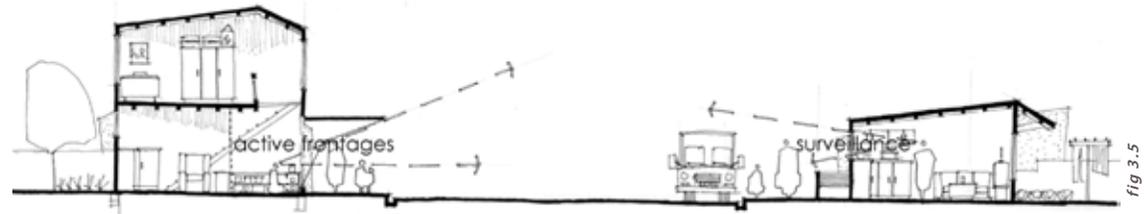


fig 3.5 sketch illustrating natural surveillance achieved through active frontages close to the street edge

fig 3.6 sketch illustrating natural territorial reinforcement

3.3 Safety Principles

Crime Prevention Through Environmental Design (CPTED) is a multi-disciplinary approach to deterring criminal behaviour where the strategies rely on the ability to influence offender decisions that precede criminal acts (Crowe, 2000:7). According to Jeffrey (1977:23), research into criminal behaviour shows that the decision to offend or not is more influenced by cues to perceived risk of being caught than by cues to reward or ease of entry. CPTED based strategies emphasise enhancing the perceived risk of detection and apprehension.

Consistent with the widespread implementation of defensible space, these guidelines are based solely on the theory that appropriate design and effective use of the built environment can reduce crime, reduce the fear of crime, and improve quality of life. The three most common

built environment strategies according to Luedtke (1970) are natural surveillance, natural access control and natural territorial reinforcement.

3.3.1 Surveillance & Visibility

Natural surveillance increases the threat of apprehension by taking steps to increase the perception of being seen. It occurs by designing the placement of physical features, activities and people in such a way as to maximise visibility and foster positive social interaction among legitimate users of public and private space (Luedtke, 1970:14).

- Place windows to overlook sidewalks and parking lots.
- Create landscape designs that provide surveillance, especially in proximity to designated points of entry.

- Use passing vehicular traffic as a surveillance asset.
- Use the shortest, least sight-limiting fence appropriate for the situation.
- Ensure that potential problem areas are well-lit and avoid poorly placed lights that create blind-spots.
- Avoid security lighting that is too bright as it creates blinding glare and/or deep shadows.
- Place lighting along pathways and other pedestrian areas at proper heights for lighting the faces of people.

Natural surveillance measures can be complemented by mechanical and organisational measures, for example closed-circuit television (CCTV) cameras.



3.3.2 Natural Access Control

Natural access control limits the opportunity for crime by taking steps to clearly differentiate between public space and private space and by selectively placing entrances and exits, fencing, lighting and landscape to limit access or control flow (Luedtke, 1970:17).

- Use a single, clearly identifiable point of entry
- Use structures to divert persons to reception areas
- Incorporate maze entrances to public restrooms, to avoid the isolation that is produced by an anteroom or double door system.
- Use low, thorny bushes beneath ground level windows.
- Eliminate design features that provide access to roofs or upper levels.

Natural access control is used to complement mechanical and operational access control measures, such as target hardening.

3.3.3 Natural Territorial Reinforcement

Territorial reinforcement promotes social control through increased definition of space and improved proprietary concern. An environment designed to clearly delineate private space does two things. First, it creates a sense of ownership, owners have a vested interest and are more likely to challenge intruders or report them to the police. Secondly, the sense of owned space creates an environment where 'strangers' or 'intruders' stand out and are more easily identified. By using buildings, fences, pavement, signs, lighting, landscape to express ownership and define public, semi-public and private space, natural territorial reinforcement occurs (Luedtke, 1970:19).

- Maintain premises and landscaping so that it communicates an alert and active presence occupying the space.
- Provide trees.
- Restrict private activities to defined private areas.
- Display security system signage at access points.

- Avoid cyclone fencing and razor-wire fence topping, as it communicates the absence of a physical presence.
- Placing amenities such as seating or refreshments in common areas in a commercial or institutional setting helps to attract larger numbers of desired users.
- Scheduling activities in common areas increase proper use, attracts more people and increases the perception that these areas are controlled.

Territorial reinforcement measures make the normal user feel safe and make the potential offender aware of a substantial risk of apprehension or scrutiny.

3.3.4 Conclusion

With the implementation of these strategies, Roper Street can be designed and controlled effectively, maintaining a healthy, diverse and active environment for all users, from school children to students, and general public alike. CPTED strategies are most successful when they inconvenience the legitimate user the least and when the design process is the result of the combined efforts of environmental designers, land managers, community activists and law enforcement professionals.

004 BRIEF

4.1 Vision

4.2 Problem Identification

4.2.1 Sub Problem 1 - Physical Divide: BOUNDARIES WITHOUT BARRIERS

4.2.2 Sub Problem 2 - Psychological Divide: INCUBATION

4.3 The Framework

4.3.1 Vision Statement

4.3.2 The University-City Integration

4.3.3 Key Indicators

4.3.4 Transport

4.3.5 Roper Street Development

4.3.6 Project Identification

4.4 The Project

4.4.1 Motivation

4.4.2 Site Selection

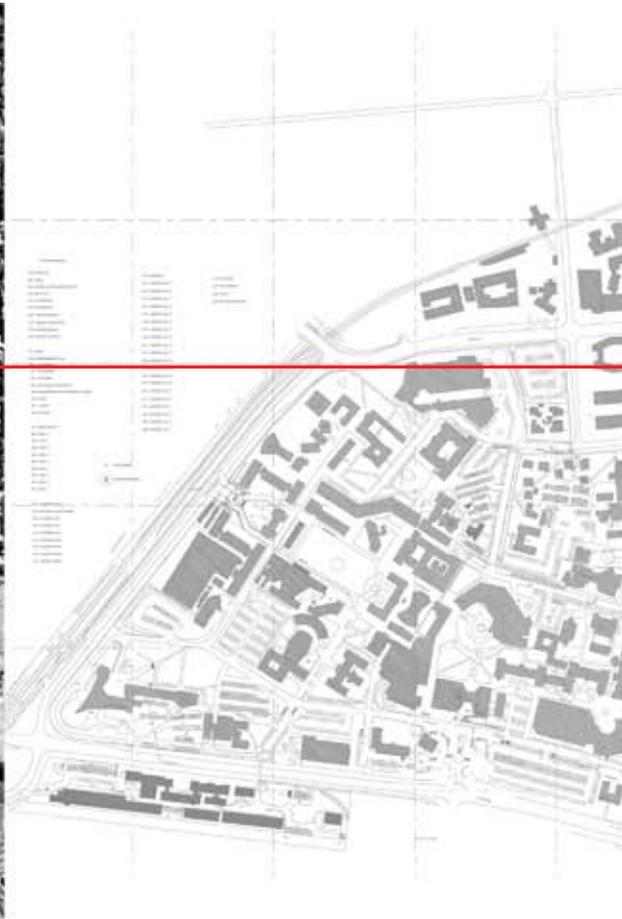
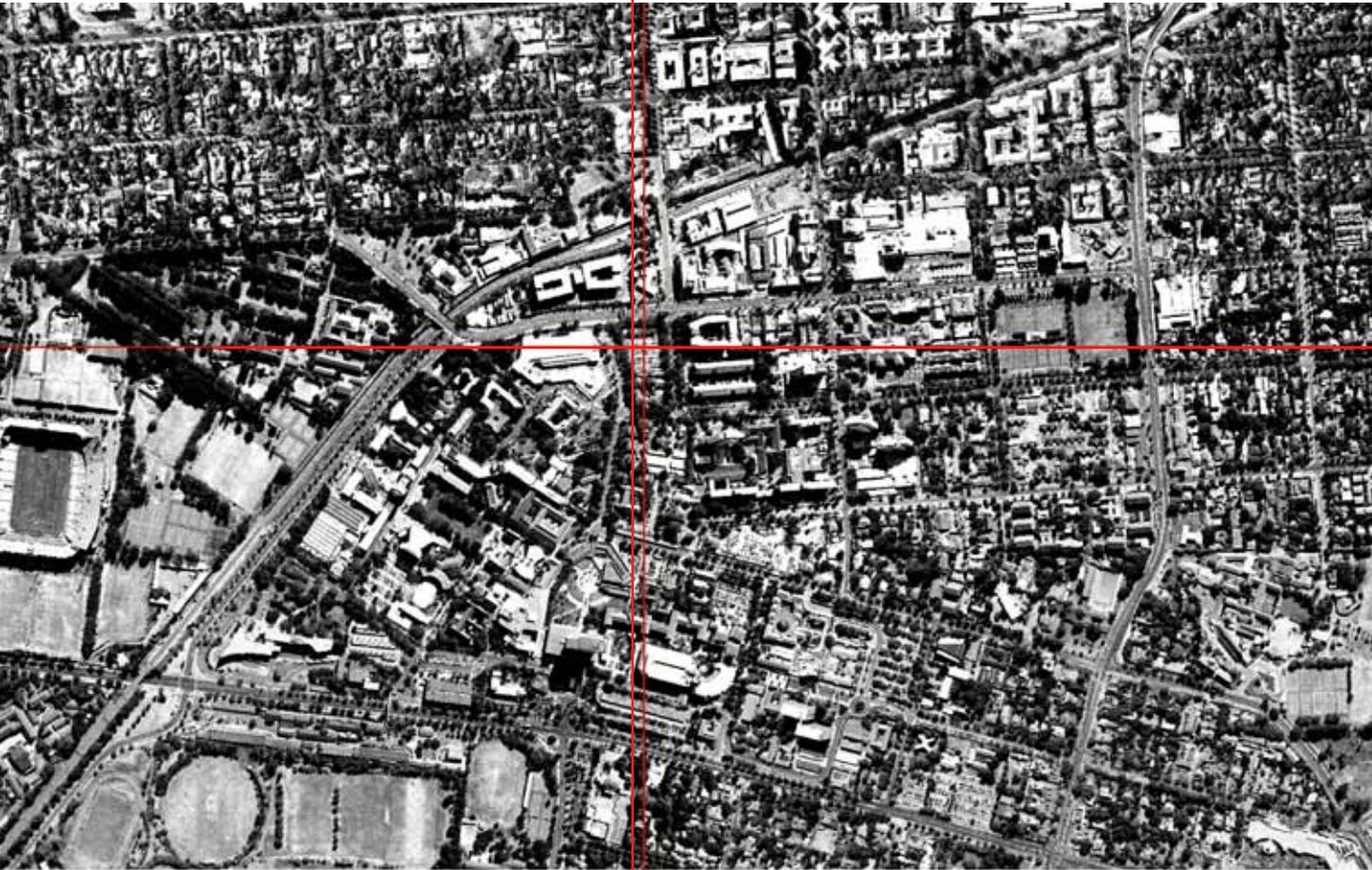
4.4.3 Project Discription

4.4.4 Accommodation Required

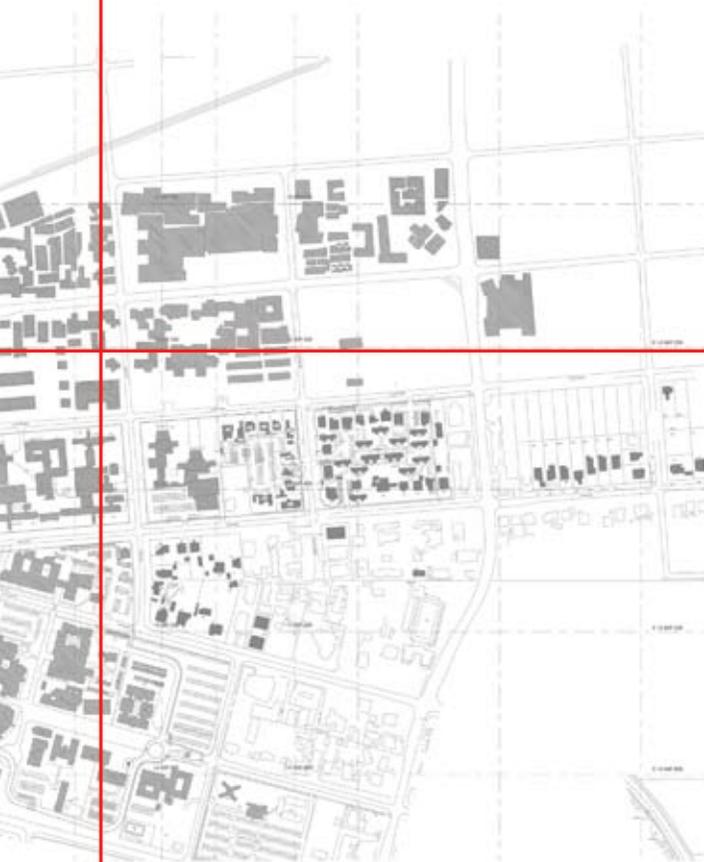
4.4.5 Stakeholders

4.4.6 Methodology

4.5 Conclusion



site



004 BRIEF

4.1 Vision

To establish a bridge between students and the workplace, to integrate students with the public realm and to close the gap on entering the workplace. In addition, to enhance public opinion of the architectural profession and creative professions in general by exposing the public to the creative process and thereby showcasing the profession as well as the university.

With the manifestation of permeability on the campus of UP in the proposed project, I will focus on eliminating the segregation between the campus and surrounding areas. This will both respond to as well as increase the level of activity around its periphery.



fig 4.1

4.2 Problem Identification

4.2.1 Sub Problem 1 - Physical Divide:

BOUNDARIES WITHOUT BARRIERS

- Campus is inaccessible and illegible to public
- Student access control causes congestion and impedes natural flow of movement
- Palisade barriers on the perimeter of campus create 'dead' edges facing the public, preventing interaction and alienating students from the public
- Public facilities and amenities frequently used by students are badly located and inaccessible
- Northern access gates and movement channels to and from it are not clearly defined
- No path definition across the site
- Limited parking in and around campus
- Students are only active in the area at specific periods during the year
- Student safety and security must be ensured
- Circulation and movement patterns are haphazard and uncontrolled

4.2.1 Sub Problem 2 - Psychological Divide:

INCUBATION

- No sense of community present.
- Psychological barrier exist between students and community.
- Only certain sectors of society are informed about tertiary education and opportunities, including career guidance, financing and accommodation.
- Public is unaware of the complexities of the creative process.
- Graduates lack "soft skills".
- Lack of networking system to help students find jobs, during studies and after.
- No internships and holiday work opportunities available for students in their field of study through coordinated programs with the university.

fig 4.1 problem identification on site

4.3 The Framework

“In urban design there should be a skilful deployment of architectural energy so that the influence of fine buildings radiates outward, articulating the whole fabric of the city” (Bacon, 1957:18).

4.3.1 Vision Statement:

University & Hatfield Precinct

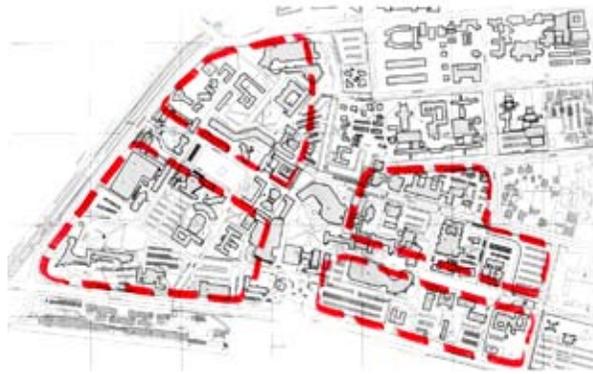
(As derived from the group Spatial Development Framework)

“TRANSFORMING THE UNIVERSITY OF PRETORIA FROM AN ISOLATED FRAGMENTED KNOWLEDGE PRODUCTION INSTITUTION, TO A UNIVERSITY CITY, A CITY OF INNOVATION.”

In the framework we aim to:

- Transform the University of Pretoria and the Hatfield precinct into a *UNIVERSITY CITY*, an integrated networked city of innovation and social cohesion, where the public sector interfaces with the private sector, interfaces with the academic sector.
- Remove physical, social and psychological boundaries that are constraining the growth of both the University and Hatfield precincts’.
- Create a social blend that celebrates and empowers the uniqueness, vitality, potential and culture of South Africa’s premiere academic community.

The university of the future is a city of knowledge. To achieve the University of Pretoria’s strategic objective of becoming a world class research institute, the surrounding Hatfield area and the university need to merge from two vibrant, independent, isolated entities to a flourishing coherent, spatially integrated community, without boundaries or borders. There is an intense need to allow the community to enter campus grounds to fully utilise all the facilities and integrate the community and student life.



4.3.2 The University-City Integration

The transformation will be a long-term undertaking and will have to be achieved in phases over time. Currently, the university is not ready to be integrated with the city, but needs to be prepared for the eventual merger by restructuring the urban fabric to first function as two separate entities and later as a single mechanism. In the initial phases, the campus will retain its own tangible and definable identity and vitality with clarity of circulation, dominated by pedestrians.

The urban fabric on campus needs to be at human scale, with the buildings serving as nodes of social and academic interaction, and

the exterior spaces acting as outdoor rooms for academic discourse and social play. A campus designed to function also at night, offering a vibrant and cultural night life. It should function as a community, working as an inter-related whole, a symbiotic relationship of allied units.

The Hatfield precinct is to be developed into a destination place, a place of continual social, cultural and civic regeneration; a place that defines itself as the vital, multifunctional “body” of the “University City”. Hatfield is to serve as the entrance transition of the “University City” precinct. Hatfield’s continual transformation will be

driven by the creation of interdependent nodes including transport, mixed use, culture, commerce and political; allowing a dynamic interface for social expression. Hatfield must become a place for the people, for businessmen, academics, students, professionals, politicians, and workers. Hatfield must be a place for all.

The unification of these two distinct identities must not result in the dissolution of the unique identity of either, but rather reinforce key strengths and opportunities to allow a true city of knowledge to be born, a “UNIVERSITY CITY”.

4.3.3 Key Indicators

- VITALITY

Vitality in the proposed centre will be perceived on different levels of scale. Focus must be given to detail as the facility should provide enough visual stimuli to capture the viewer's imagination and entice him to enter the campus.

- INTEGRATION

The sense of urbanity is that which, with increasing agglomeration, individuals (groups and communities) can benefit from a greater range of opportunities. Different elements of the city require support from others to perform satisfactory (DEWAR, 1991: section 3.2).

- IDENTITY

Identity is important for the celebration of societal institutions in the organisation of urban space and for reflection of cultural expression in the making of urban space (DEWAR, 1991: section 3.2).

- ACCESSIBILITY

The building complex must be accessible to all, enriching students and public alike. "The urban environment should promote maximum freedom for individuals to act ... and strive to release the many talents of its users" (DEWAR, 1991: section 3.2). "Social interaction is fundamental to human development and also to urban development." (DEWAR, 1991: section 3.2).

- DIVERSITY

"By definition, successfully performing urban environments are necessarily complex. They contain a variety of overlapping conditions and activities. They provide opportunities for unexpected, spontaneous things to happen, and they accept conflict" (DEWAR, 1991: section 3.2). "The greatest potential of a city is always at places with the biggest interaction" (DEWAR, 1991: section 3.1).

- DENSITY

Compact the city and increase densities. This is necessary to create high performance urban environments. Sprawl causes smaller enterprises to die down due to low demand. Compact dense situations allow for (DEWAR, 1991: section 4):

- Economic diversification.
- Small scale economic growth.
- Higher levels of social and commercial services.
- More possibilities for transportation.
- Lower unit costs of social and other services.
- Social services tend to be less vulnerable

- EQUITY

Urban environments promote urban activities and processes of urban life through their structure and allow people easy access to the opportunities they generate (DEWAR, 1991: section 3.2).

- CONTROL

The making of positive urban environments requires both freedom and constraint. Environments are never complete entities and one should recognise the dynamic of the forces in operation (DEWAR, 1991: section 4). Keep in mind that:

- Excessive control and restraint cause sterile environments.
- Over-controlled comprehensive plans will try to impose a new way in which life is lived.
- Unrestricted pursuit would be detrimental to performance.

"Freedom only exists in the context of choice, and in turn, is created through constraint. The purpose of the "plan" is to give overall direction to urban growth while creating maximum meaningful manoeuvring space for individuals operating in their own self interest. Controlling actions are actions that constantly control freedom of decision making through restriction" (DEWAR, 1991:section 4).



fig 4.6

4.3.4 Transport

The concern of campus should not be the accommodation of vehicles, but rather purposely pedestrianising its facilities.

The introduction of the Gautrain will enhance the accessibility of the campus for people living as far as Johannesburg. Designated green bus stop areas have been identified in the effort to pedestrianise the entire Hatfield precinct.

fig 4.6 U.P. campus boundaries in relation to the Hatfield commercial precinct

fig 4.7



4.3.5 Roper Street Development

The entire length of the Roper Street spine has no facilities or functions that provide the students with a place to linger and is only a way of getting in and out. Research indicated that many students use Roper Street as the main access to their destinations.

In *Pattern Language* (1977: Pattern 43), Christopher Alexander suggests that a university should function as a market place. He says: "Make the university a collection of small buildings, situated along pedestrian paths, each containing one or two educational projects. Make all the horizontal circulation among these projects, in the public domain, at ground floor ... Connect all the pedestrian paths, so that, like a marketplace, they form one major pedestrian system, with many entrances and openings off it. The overall result of this pattern, is that the environment becomes a collection of relatively low buildings, opening off a major system of pedestrian paths, each building containing a series of entrances and staircases."

fig 4.8

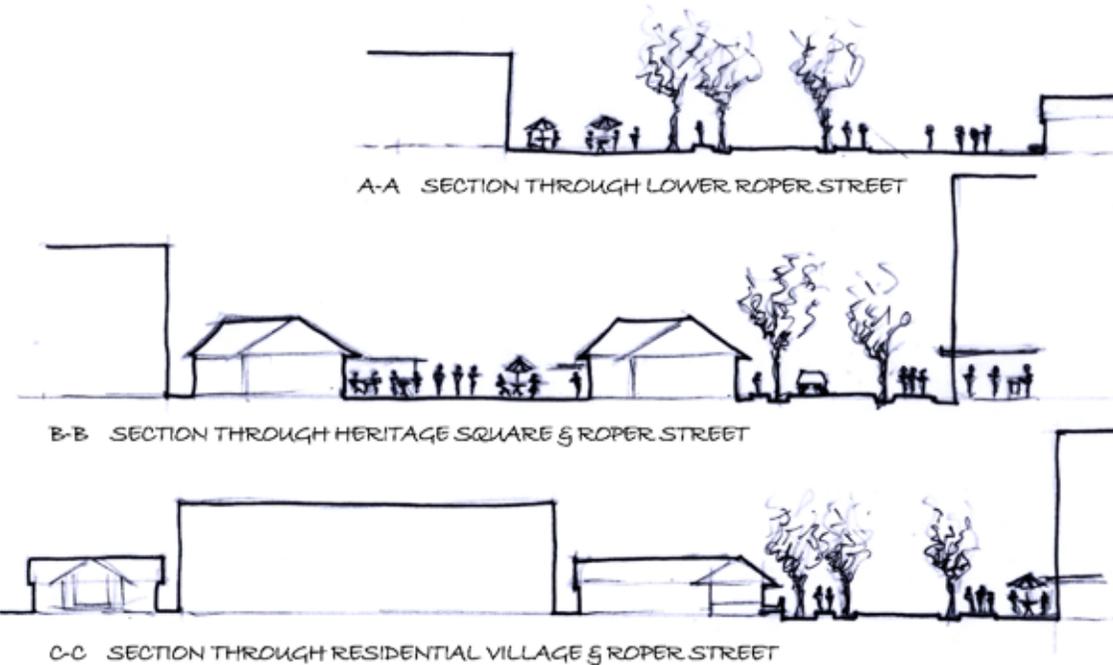


fig 4.9





- LYNNWOOD ROAD
- EXISTING 'GATEWAY'
- STUDENT CENTRE
- PROPOSED RESIDENTIAL VILLAGE
- PROPOSED 'FOYER'
- PROSPECT STREET
- HERITAGE ARTS SQUARE
- PROPOSED 'GATEWAY'
- SITE
- PROPOSED PUBLIC SQUARE
- BURNETT STREET
- SHELL SERVICE STATION

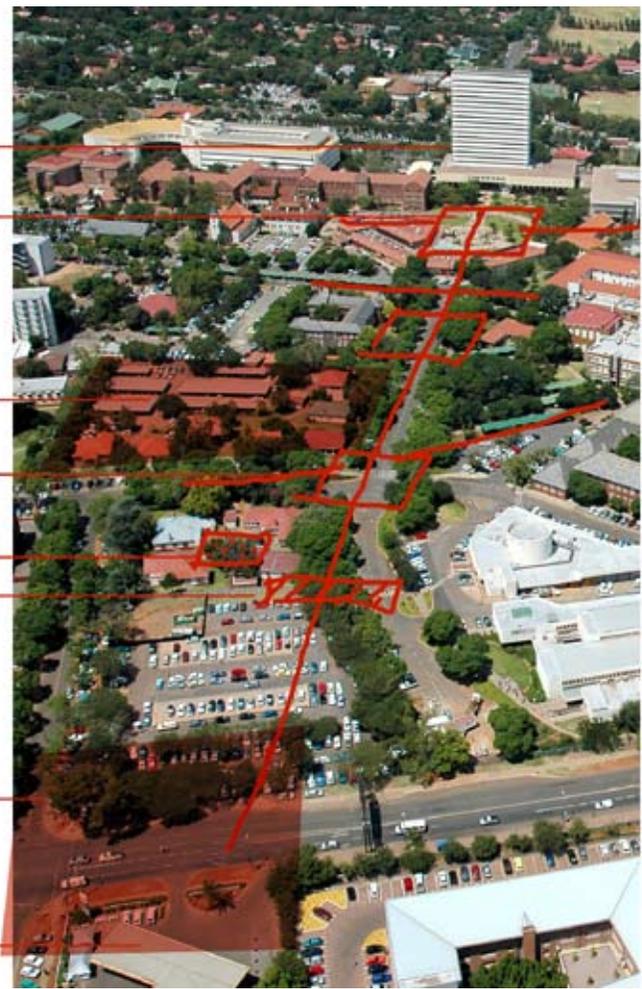


fig 4.10



fig 4.7 Roper Street East

fig 4.8 sections through Roper Street

fig 4.9 Roper Street West

fig 4.10 Roper Street development





“The life or lifelessness of public spaces depends very much on the quality of the spaces and whether they are welcoming to likely users to walk, stay, sit or otherwise enjoy spaces. Surveys from existing city areas, as well as new towns and new city districts and developments have shown the need for a more systematic and careful treatment of the public realm in order to secure good quality and to ensure spaces are welcoming to users” (Gehl, 1996:23).

“Pedestrian movement systems require interest, variety and impressions of rapid change” (Bacon: 1957:35). According to Paul Klee (Bacon, 1957:114), one should use the structural movement of energy in a city as guide and create “fields of quality” where these movement systems converge.

With this in mind, we propose to develop Roper Street into a high density, pedestrian street accessible to the public. The opening of Roper Street will form part of the first phase of implementing the framework and merging the university with the city.



fig 4.12

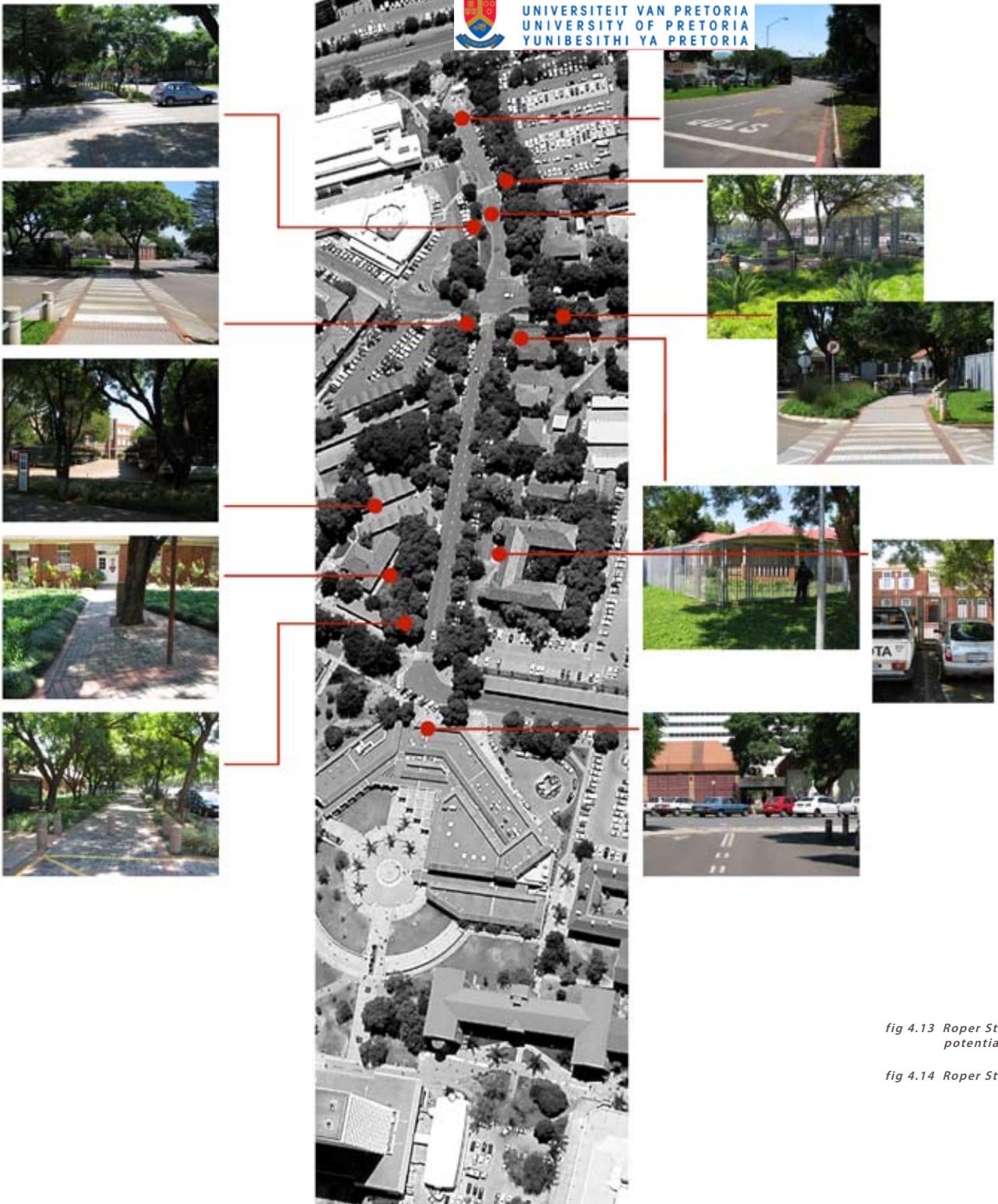


fig 4.13

fig 4.13 Roper Street problem identification & potential features to be exploited

fig 4.14 Roper Street development



METRO TRAIN STATION

SHELL SERVICE STATION

BURNETT STREET

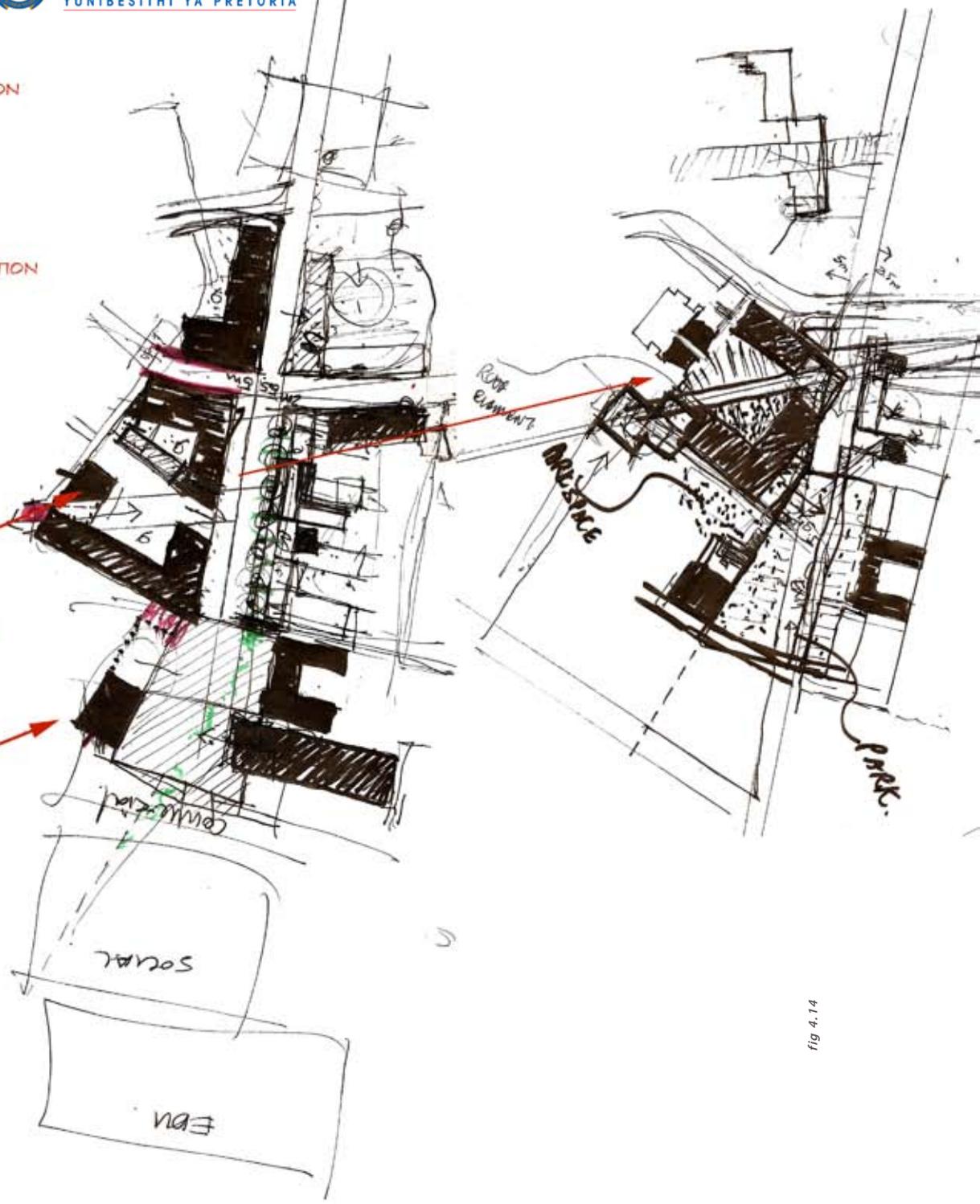
SITE

HERITAGE SQUARE

PROSPECT STREET

ROOSMARYN

STUDENT CENTRE



ROOF ELEMENT

BRIDGE

PARK

SOCIAL

EDU

fig 4.14

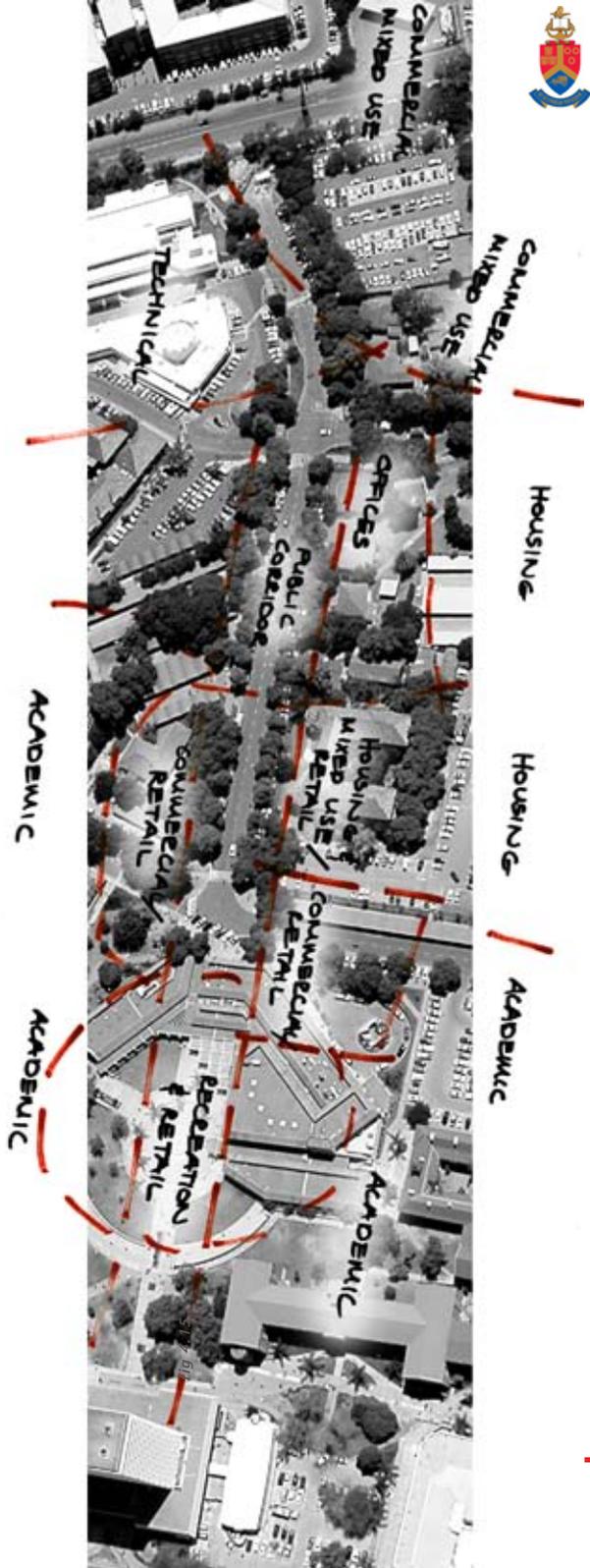


fig 4.15 proposed Roper Street land-use

fig 4.16 space diagram for proposed development

fig 4.17 Roper Street development process

fig 4.18 final urban design proposal for Roper Street development

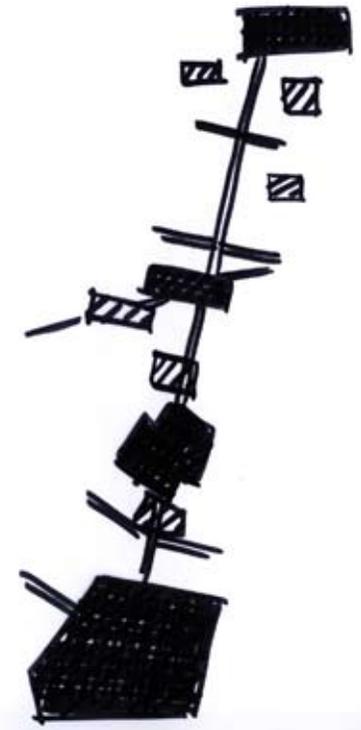


fig 4.16



fig 4.17

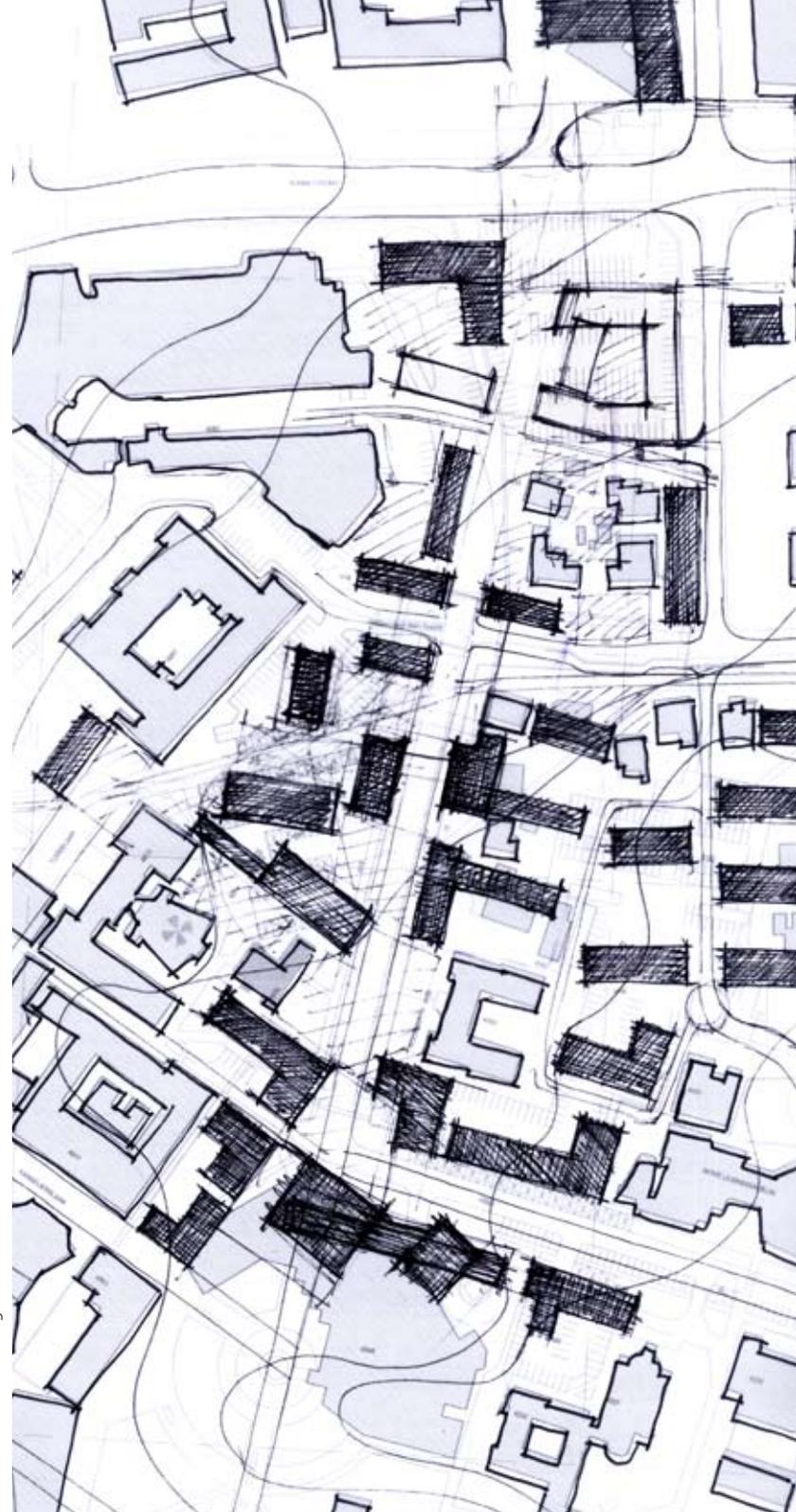


fig 4.18



METRO RISSIK STATION ADAPTIVE RE-USE

HUMAN SCIENCES PROJECT
SITE
STUDENT CENTRE
ARTS PRECINCT
GAUTRAIN DEVELOPMENT



fig 4.19

4.3.6 Project Identification within the Study Area

From the Group Spatial Development Framework, the following projects fall within the study area:

- Gautrain Surrounding Developments:

"Indabox - Giving the People a Voice" by Werner van der Watt

"African Dialogue Centre" - Pumlani Khuzwayo

- Arts Precinct in Festival Street:

"Visual Arts Centre" Riaan Kotze,

"Music Performance Lab" - Servaas de Kock

"Knoop: Fashion Design Studio" - Korine Stegmann

- Metro Train Rissik Station restoration: *"Adaptive Re-use"* - Calvyn Le Roux

- *"Bridging the Gap: Interactive Architectural Incubator"* - Christine Goosen

- Student Centre rejuvenation:

"Social Classroom: Symbol of Function Beyond Programme" - Francois Malan

- Human Sciences Building project:

"Re-Connecting Lost Space" - Edward Botha

All these projects support and enable the Roper Street development and reinforce the axis it forms, and continues past the campus boundary across the railway line.

The site selected for this project is ideally situated on the threshold between campus and the core business development in Hatfield, which focuses around Burnett Street. It also provides the opportunity to address access and opens up a gateway to campus, for students and public alike.

The Student Centre will be closely related to the project and will have complementary purposes in programme as well as in function. It will aim to create a transitional flow from public to private by means of the commercial activity spine down Roper Street. The commercial facilities will include:

- Copy centre
- Print shop, including large format printing
- Internet café
- Student travel agency
- Stationery shop
- Book shop, with 2nd hand swap-shop
- Computer shop
- Student loan banking divisions
- Cell phone shop
- Hairdressers
- Coffee shops
- Food stalls
- Pubs

In the first phase of the framework implementation, safety and security will be addressed by providing controlled access points between the commercial activities and buildings lining Roper Street where only students can pass, which can be opened on occasion. The campus perimeter will then be reinforced by the buildings around the spine rather than palisade fences, providing a less obvious yet safe atmosphere.

fig 4.19 project identification from group Spatial Development Framework within the study area



4.4 The Project

4.4.1 Motivation

Definition of Architecture according to Bacon (1957:21): "Architecture is the articulation of space so as to produce in the participator a definite space experience in relation to previous and anticipated space experiences".

A designer's problem, therefore, is not to create facades, but to create an all-encompassing experience, to engender involvement. The way buildings rise up from the earth defines the

quality of the entire structure. We have lost our vision and focus as to how a building should interact with people not only with each other. "Our buildings stand as miscellaneous features among areas confused and dehumanised by automobile spaces and by ill-placed and ugly street signs" (Bacon, 1957:27).

"Traditionally, new developments have been planned based on the formula, first buildings,

then spaces, then (perhaps) life. In the present-day planning, this formula should be turned about, and the questions should be: what kind of life do we want here, what kind of spaces will be needed for this life, and finally, how can the buildings in this area be placed and formed to support these spaces and the life in this area? In short, the formula must be: first life, then spaces, then buildings" (Gehl, 2004:5).

fig 4.20 panoramic view of site from Festival Street entrance gate



fig 4.20

4.4.2 Site Selection

4.4.2.1 Site Criteria & Motivation

The site was chosen based on the following factors:

- location of surrounding facilities and land use,
- hard urban edges such as railway lines,
- existing urban energy and pedestrian networks,
- future planning and development of the Hatfield CBD,
- Gautrain station location and its accompanying energy,
- Movement patterns on campus,
- Structure of urban fabric, and the original urban grid,
- Potential development of activities along Roper Street

4.4.2.2 Strategic Advantages

For the intervention to be successful, it needed a site that was on the boundary between the campus and a diverse commercial hub. Based on these indicators, the site chosen is the existing parking area located in the north-eastern corner of the campus on the corner of Festival and Burnett Streets.

The University campus creates an impenetrable urban barrier of considerable size between the station and several work outlets south of the campus. With the proposed opening of Roper Street to the public, an immediate amount of energy can be diverted to the proposed commercial amenities down Roper Street, as well as provide the project with the vitality it will need to be successful.

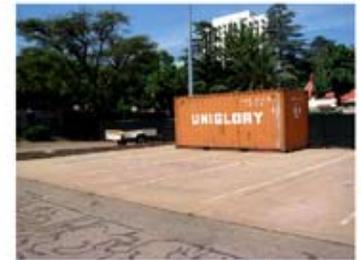


fig 4.21 site surrounding context



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA



4.4.3 Project Description

4.4.3.1 Aim of the Project

The aim of the project is to:

- allow controlled public access to campus
- accommodate public facilities on campus
- move student-only access control points to better suited locations
- prepare the buildings and facilities on campus for the systematic, full integration of the city and campus
- create a platform which will enable year-round public exposure to creative professions
- apply passive safety techniques as an alternative security measure to fences and allocating boundaries without barriers
- set up a networking system which will empower graduates and students by introducing them to people and investors in their respective industries
- provide academics and young innovative graduates with a platform to start new businesses and research possibilities
- enable different but related professions to interact and create mutually beneficial relationships for the future.
- enrich the site and contribute to the establishment of an edge to Burnett Street, creating a gateway onto campus through Roper Street.
- implement the site as a transition zone between public and private space
- accommodate existing vegetation as far as possible.
- acknowledge the vast number of existing and planned people moving next to and through the site
- make use of the scale of the building to promote its user-interface.

fig 4.22 the State Centre at Massachusetts Institute of Technology, designed by Frank O. Gehry, May 2004

4.4.3.2 Building Type

The building will be a multi-functional building with the core focus on exhibition and exposure. It will have a four-fold function as visitor centre, office, workshop and lecturing facility, as well as having a residential component. With the re-establishment of a studio culture, implementing the concept of the vertical studio, it will provide space for multi-disciplinary and multi-school involvement such as 'The Global Studio' initiative and other architectural competitions.

The State Centre at the Massachusetts Institute of Technology, designed by Frank O. Gehry (May 2004) was used as precedent for the building

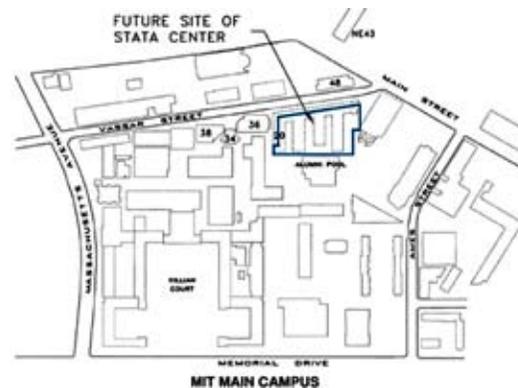
type. It houses three main tenants - the Computer Science and Artificial Intelligence Laboratory, the Laboratory for Information and Decision Systems, and the Department of Linguistics and Philosophy. In addition to the functional yet flexible work environment, it also contains lounges and gathering areas that are home to different research groups. A 'town square' provides meeting and socializing opportunities; a sky-lit 'student street', a public arcade for the MIT community, runs the entire length of the ground floor. There are also a café, a childcare centre for 80 children, a fitness centre, a faculty dining area, and many other related facilities (Haina, et al. 2006:12).

The integration with other related disciplines and professions, such as Construction Economics & Management, Geo-sciences, Quantity Surveying, Engineering, Graphic Design, Animation, Material Sciences, Fine Arts, etc., will be instrumental in providing graduates with a more rounded or systemic approach to knowledge and life.

The building will need to respond to its surroundings on all four sides, with the commercial spine from the south down Roper Street, the pathways from the south-west, Burnett Street and Festival Streets to the north and east and the projects within the precinct beyond them.



fig 4.22



4.4.3.3 The Concept of Incubation

Business incubators are organisations that support the entrepreneurial process, helping to increase survival rates for innovative start-up companies. Entrepreneurs with feasible projects are selected and admitted into the incubators, where they are offered a specialised menu of support resources and services (Richards, 2002:72). An example of an incubation facility in Pretoria is the Innovation Hub, which has been described as “a catalyst that will spur the next wave of knowledge-intensive industries in South Africa ... from large corporates and small and medium enterprises to start-ups participating in the incubation programmes” (Architect & Builder, 2005:63).

A Business Incubator is a facility designed to assist businesses to become established and sustainable during their start-up phase. The incubation period for an individual business is normally two to three years. An incubator significantly increases the chances of survival of start-up companies and provides the opportunity to coordinate with the university and its access to vast research.



fig 4.23



fig 4.23 the Innovation Hub in Pretoria

4.4.4 Accommodation Required

4.4.4.1 Foyers & Entrances

- Must be open and inviting, yet secure and easily surveyed.
- Movement must be clearly demarcated.
- Reception desks can be used as secretarial and/or reception desks during the day and as security stations at night.
- A high level of social interaction spaces should be provided.

4.4.4.2 Exhibition Spaces

- The permanent exhibition spaces, foyers and corridors will be combined to form the platform for an 'urban campus' network. The building should be transparent enough in this area to be inviting to the public and visitors. Security control will also be simplified if the public arenas are situated close to the entrances.
- The exhibition spaces will be utilised as a platform for educating, becoming an informal space where exposure to design and its process is the primary function.
- The gallery spaces should be provided with 'soft light' and be naturally lit as far as possible.
- The galleries should also function as social interaction spaces.

4.4.4.3 Architecture & Art Studios

- Spaces should be adaptable and flexible to accommodate any type of activity related to the creation of architecture and other creative professions. There should also be a system for safekeeping and lockable spaces.
- Technical support and services should be flexible.
- The studios should have an adaptable plan with generic spaces that can be altered in future to accommodate changing requirements.

4.4.4.4 Library & Bookshop

- The library and bookshop should be incorporated into the public area, spill out into the courtyard, and should accommodate a large extent of shelving and also reading space.
- The reading space will be adjacent to a coffee shop related to the bookshop.

4.4.4.5 Restaurant

- Should provide an informal social space for students, visitors, users and public.
- Should have use of the courtyard.
- The kitchen should preferably have direct access to the outside and service yards on Festival Street.
- Should provide seating for 200 guests
- Should have appropriately sized store rooms, empties storage areas, and cold storage facilities.

4.4.4.6 Offices

- Furnished, flexible offices should be designed with integration between different companies and professions in mind, as well as promote interaction between mentors and students.
- Should as far as possible be naturally lit and ventilated to decrease energy costs and the impact on environment, with sufficient lighting according to the NBR.
- Amongst others, office spaces should be provided for career guidance counsellors with access to meeting rooms for career indicator tests, recruitment agency and mentors. These could be used on a rotating / time-share basis.

4.4.4.7 Career Guidance

Should provide:

- Career indicator tests
- Information on careers and courses offered on campus.
- Database of relevant professors and lecturers in each department
- Collaboration with industry professionals who can assist in career guidance

4.4.4.8 Recruitment Agency

Should include:

- CV workshops
- Interview preparation and coaching
- Interactive database for job seekers and providers
- Internships
- Holiday jobs in students' profession
- Bursary opportunities

fig 4.24 diagram indicating functional links between accommodation

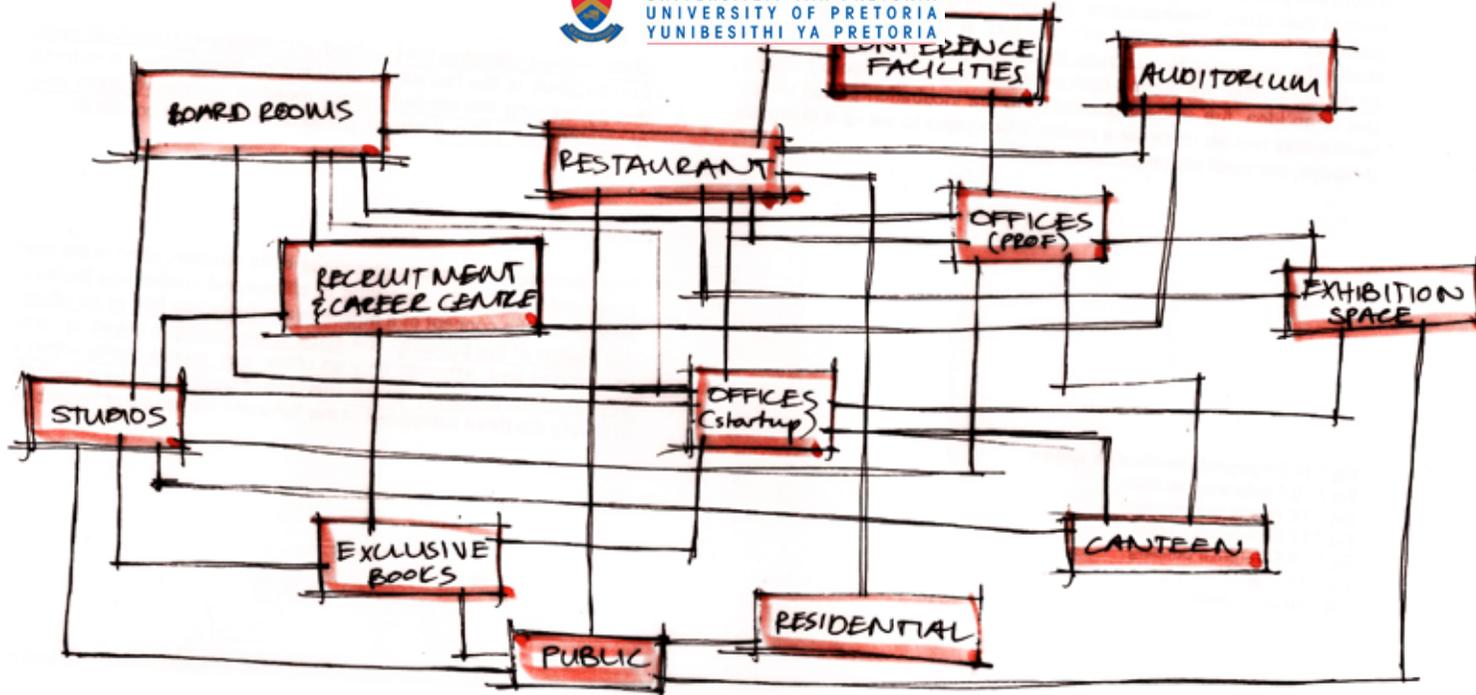


fig 4.24

4.4.4.9 Lecture & Conference Facilities

- Lecture room should be acoustically sound and provide seating for approximately 100 people.
- Audio visual facilities should be incorporated into the lecture hall. Network services should be robust to allow ease of access.
- Should have storage facilities and a technical support room

4.4.4.11 Residential

- Student apartments and residences for visiting lecturers.

4.4.4.10 Other Accommodation Required

- Shared conference rooms
- Building security facilities
- Cleaning & maintenance services

Technical support including:

- IT & internet services
- Audio-visual equipment
- Mail services, shipping & receiving
- Photocopier, fax
- Reception services

General and professional business services from the university including:

- Administration services
- Legal matters
- Intellectual property rights advisors
- Accounting
- Book-keeping
- Recruitment & staff selection
- Education & training
- Financing support

Management & business strategy services including:

- Preparation of business plans
- Marketing & business strategy formulation
- Public relations
- Research & development
- Employee relations
- International trade
- Government relations including procurement
- Networking
- Seminars with industry experts

4.4.5 Stakeholders

4.4.5.1 Client & User Groups

The client will be the University of Pretoria, who will provide the funding, site and counselling staff. They will in turn benefit from the commercial activities and provide students with the opportunity to run their own shops.

The user groups will include higher grade school children, students, young professionals and entrepreneurs, researchers and academics.

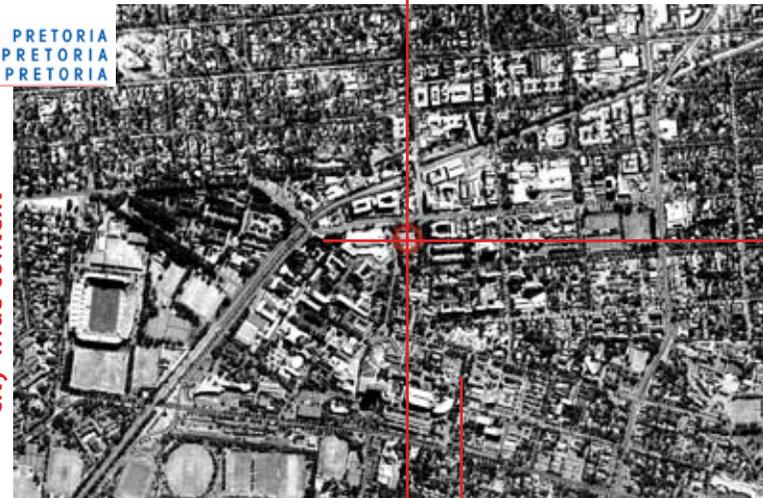
4.4.5.2 Funding Agencies

The University of Pretoria as principle client will be responsible for the capital outlay. Although the initial investment will be high, the return on

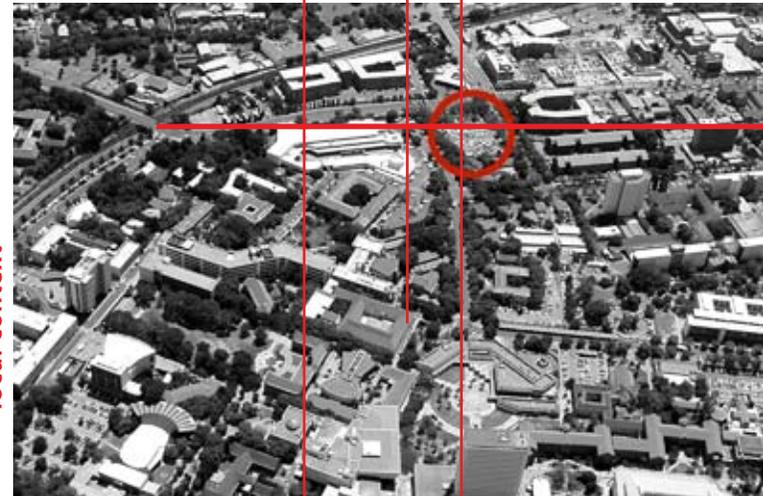
4.4.5.3 Interested & Affected Parties

University of Pretoria, surrounding businesses, public at large, students, and surrounding community.

city-wide context



local context



site context



fig 4.25

4.4.6 Methodology

The problem has been analysed on three different scales.

4.4.6.1 City-wide Context

Ways of integrating the area with the existing and future urban framework, especially with regards to the new Hatfield revival activities and the Gautrain. Consideration of how the university will be integrated with the city.

4.4.6.2 Local Context

The campus framework done by Holm-Jordaan Architects, the Gautrain Station Hatfield Spatial Development Frameworks, and the University-City proposal framework were used as basis for suggestions on how to improve its accessibility and functioning as a mixed use development that would be used at all times of the day. The appropriate location for the facility within the campus has been identified in accordance with these frameworks.

Key objectives of the University-City campus development framework is the spatial integration and ordering of the disparate areas of the campus; the organization of open spaces, the elimination of vehicle conflicts, and the placement of building sites in the plan designed to achieve a sense of campus integration and order. The integration of the campus will also be accomplished by consolidating academic and administrative activities that are currently segmented, and by creating a wider array of attractive indoor and outdoor gathering places for social and intellectual exchange.

By “infill” development in strategic locations and replacement of buildings that do not effectively utilize key sites, the plan establishes the capability to expand the building areas in the study area on campus, while retaining the essential open space character and low architectural profile as it exists today.

4.4.6.3 Site Context

The site has been selected according to the campus framework and analysed in order to produce an appropriate architectural intervention through the creation of an inclusive built environment.

fig 4.25 scales of investigation



4.5 Conclusion

The University of Pretoria has a rich cultural history that should be built upon. With the intended densification of campus this heritage should be preserved and enhanced where possible. New buildings should add to the academic ambience and enrich the intellectual exchanges and solitary inquiries. They should never be a mere personal statement by the architect or a clever display of technical ingenuity or artistic fashion.

The university should draw up a set of design guidelines that list what is essential in its campus architecture, including concern for the three fundamentals: academic purpose, human scale, and a special campus aesthetic. This identity will become especially important once the vision of a “University City” is achieved,

clearly distinguishing the university buildings from the urban fabric. Before the campus became an enclosed entity, many buildings on campus functioned as public facilities. I believe this forms part of the historical context which is to be considered and the reasons for it should be revisited.



005 PHYSICAL CONTEXT

5.1 Site Analysis

- 5.1.1 Location
- 5.1.2 Integration with the City
- 5.1.3 Movement & Access
- 5.1.4 heritage Considerations
- 5.1.5 Residential Accommodation

5.2 Urban Concepts

- 5.2.1 Urban Design Informants
- 5.2.2 Land-use

5.3 Conclusion

005 PHYSICAL CONTEXT

5.1 Site Analysis

A site analysis has been done to establish the opportunities and constraints of the site. See appendix 10.4 for the complete site analysis of the physical, visual, environmental, climatic, legislative socio-economic and political context.

Several key issues were identified from the site analysis in terms of opportunities and constraints concerning the location, integration with the city, heritage considerations and residential accommodation, and then summarised into a brief statement.

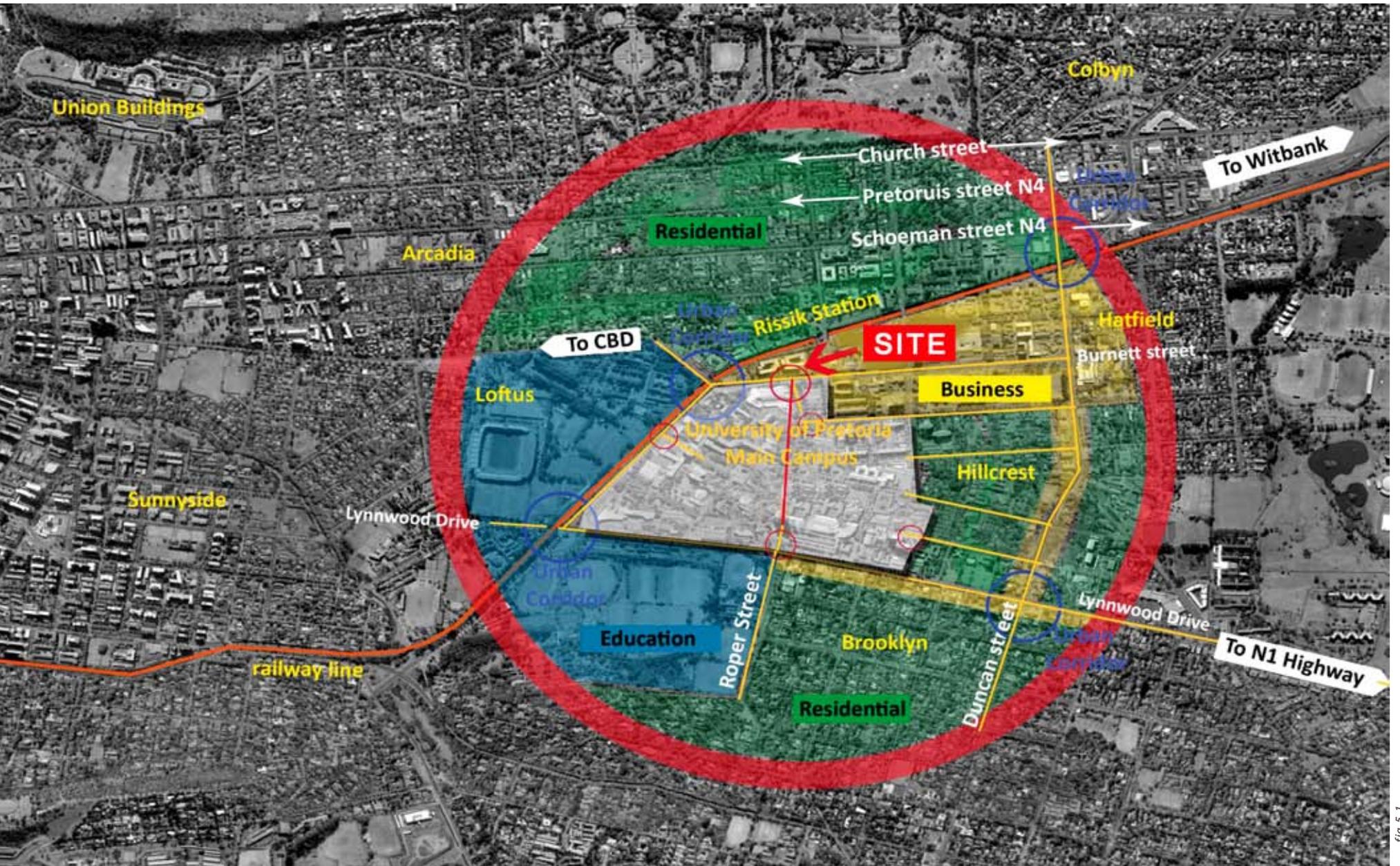


fig 5.1

5.1.1 Location

The site is situated on the boundary between the University of Pretoria and the Hatfield Core Business District on the corner of Burnett and Festival Streets.

5.1.1.1 Location Constraints

- Not in direct vicinity of art and architecture faculties
- Buildings to the south of the site has heritage value and will have to be accommodated in the design
- Burnett and Festival street crossing currently not very pedestrian friendly
- Shell garage and service station and the Africon building present unfriendly pedestrian environment

5.1.1.2 Location Opportunities

- Because of the increasing activity in the Hatfield precinct, and more specifically Burnett Street, the site is ideally located for the planned public-student interface and commercial activities.
- Gautrain station is within walking distance and will result in a huge upsurge of activities and a significant increase in the number of pedestrians in the Hatfield area.
- Metro rail station is also within walking distance.
- The site is an excellent location for a new gateway to campus as identified by the Holm-Jordaan framework
- Excellent visibility from east and west in Burnett Street as well as from the north in Festival Street provides opportunity for an iconic entrance building

fig 5.1 location of site in study area and surrounding land-use



5.1.2 Integration with the City & Community

The campus does not currently lend itself to free interaction between the students and the community.

5.1.2.1 Integration Constraints

- Controlled access & barriers
- Unattractive existing urban fabric
- Dead edges because of boundary fences
- Lack of safety and security on the surrounding streets
- The current campus design does not allow for much interaction between its users and does not inspire a sense of community.
- The barrier between students and public causes sense of segregation and resentment.

5.1.2.2 Integration Opportunities

- Due to its function, the site has the potential to become a node of activity, playing an integral role in the regeneration of the public-private interface.
- Roper Street can be opened to the public to create a clearly defined “public corridor” to initiate the integration with the city and the end-goal of becoming a fully integrated “University-City”.
- Commercial facilities along Roper Street will intermingle students and public.
- A link from the station to the south of campus and the Brooklyn area, will break the urban barrier formed by the UP.
- The creation of opportunities for students and public to interact would result in a greater sense of community to be cultivated in Hatfield.
- It would foster the development of a shared identity.
- School children from all socio-economic groups would be exposed to tertiary education possibilities.

5.1.3 Movement & Access

“The modern city has grown in size and therefore need multiple means of transport to get about. The city has become overlaid with a complex series of transportation methods, each with its own rate of movement and its own system of perception. In the past these systems have always been considered separately. All movement systems must be thought of simultaneously if the region is to produce the impression of a coherent whole” (Bacon, 1957:240).

5.1.3.1 Vehicular

Vehicles on campus are strictly controlled with specific, though inadequate parking areas. Parking on campus is a problem. Specific zones have been identified in the framework for parking garages to be built. The site itself is at present a parking area accessed only from Festival Street. This access point is also the only access for students through a turnstile gate. The result is uncontrolled movement of pedestrians through parked cars, which could result in vandalism and damage to the parked cars.

5.1.3.2 Pedestrian

The campus pedestrian network consists of passages, courtyards and landscaped gardens. Pedestrian access is controlled by means of an identification system and the use of turnstiles at all entrances, where congestion is prevalent. Once inside students are free to move where and however they wish.



fig 5.2 spatial syntax diagram of vehicular movement surrounding the site

fig 5.3 spatial syntax diagram of pedestrian movement surrounding the site

5.1.3.3 Pedestrian Network Constraints

- On an urban scale, the University forms a huge urban barrier which impedes public flow of movement from north to south and vice-versa.
- Pedestrian paths on campus are not clearly demarcated and students tend to follow the shortest routes to their destinations, resulting in a chaotic movement network.
- There is no pedestrian gate on Festival Street.
- There is no clearly defined path for pedestrians entering campus to use across the site.
- Access control results in congestion at turnstiles.
- On a local scale, sidewalks on streets surrounding the site provide an inhospitable environment to pedestrians.
- Serving and served areas are undefined.



fig 5.3

5.1.3.3 Pedestrian Opportunities

- The vast number of pedestrians passing the site provides the opportunity to harvest from an existing energy source.
- Opening Roper Street to the public will allow even more energy to pass through campus and eliminate the strong urban barrier formed by the campus.
- With the Gautrain station, still more energy will be created and with the provision of a pedestrian friendly path, people would probably prefer this route to others further to the south.
- A defined pedestrian circulation network and specifically located access control points will prevent pedestrians from moving into service or private areas.
- The site can become gateway to campus, allowing access to all by providing a transition space leading up to the threshold.
- A public square can be created on the corner of Burnett and Festival Streets.

5.1.4 Heritage Considerations

Section 38(3) of the National Heritage Resources Act (NHRA) (No 25 of 1999) (See appendix 10.6.1) mandates the assessment of heritage resources as part of the pre-design process for proposed development of a particular size and scale.



fig 5.4

5.1.4.1 Heritage Constraints

- According to the NHRA the buildings along the eastern side of Roper Street are deemed to be worthy of preservation as they are older than 60 years and indicative of a specific nature of the neighbourhood, forming part of a cultural landscape, and is therefore protected under Section 34(1) of the NHRA (See appendix 10.6.1).
- It is also in keeping with the vision to preserve the character of campus even when fully integrated with the city.
- These buildings will have to be respected when infill developments take place around them.

fig 5.4 historical development of U.P. campus

5.1.5 Residential Accommodation

In order to enhance the safety in the 'public corridor', there is a need for 24 hour activity. Locating accommodation on the edge will provide extra eyes in the area as well as create a sense of ownership.

5.1.4.2 Heritage Opportunities

- Heritage conservation supports development by adding value, but special solutions are needed to make people aware of the value of the historic buildings.
- It will enhance the character of Roper Street and the university and bring diversity and clear definition to the space as being different from public space.
- The existing function of the buildings (single residential) does not fit in with the development framework and will have to be re-allocated to allow for a small artistic square with coffee shops and small art galleries.
- Buildings on the eastern side of Roper Street can be renovated and linked to new residential developments behind them, forming the foyer spaces of the new high density buildings.

5.1.5.1 Accommodation Constraints

- Noise from the activities on Roper Street could be a source of disturbance
- Spaces between heritage buildings are limited and will need to be planned carefully.

5.1.5.2 Accommodation Opportunities

- There is a huge demand for accommodation close to or on campus for students and young alumni who wish to contribute to the university's research and incubation programmes, as well as for visiting professors.
- The eastern edge of Roper Street provides an excellent opportunity for provision of residential facilities situated in close proximity to existing student residences.
- Residential opportunities also exist in the proposed building development.

5.2 Urban Concepts

5.2.1 Urban Design Informants

- The possibility of Burnett Street becoming a pedestrian orientated street, with its commercial activities and the Gautrain station should be taken into consideration.
- The visual axis of Roper Street needs to be acknowledged.
- The permeability of the site is to be dealt with as to still allow for security but easy access for students and public.
- Serving and served areas need to be clearly defined within the new development.
- The northern side of the site must be used to establish a defined urban edge, providing a gateway experience, clearly marking the crossing from public to private space.
- Buildings are to be dealt with so as to create a hierarchy of spaces that define public and private areas.
- The historic buildings should be respected to serve as attractions as well as to keep alive the nostalgia for Hatfield as it used to be before the 1970s.
- The site must be rendered permeable in a way which allows students ease of access without compromising security.

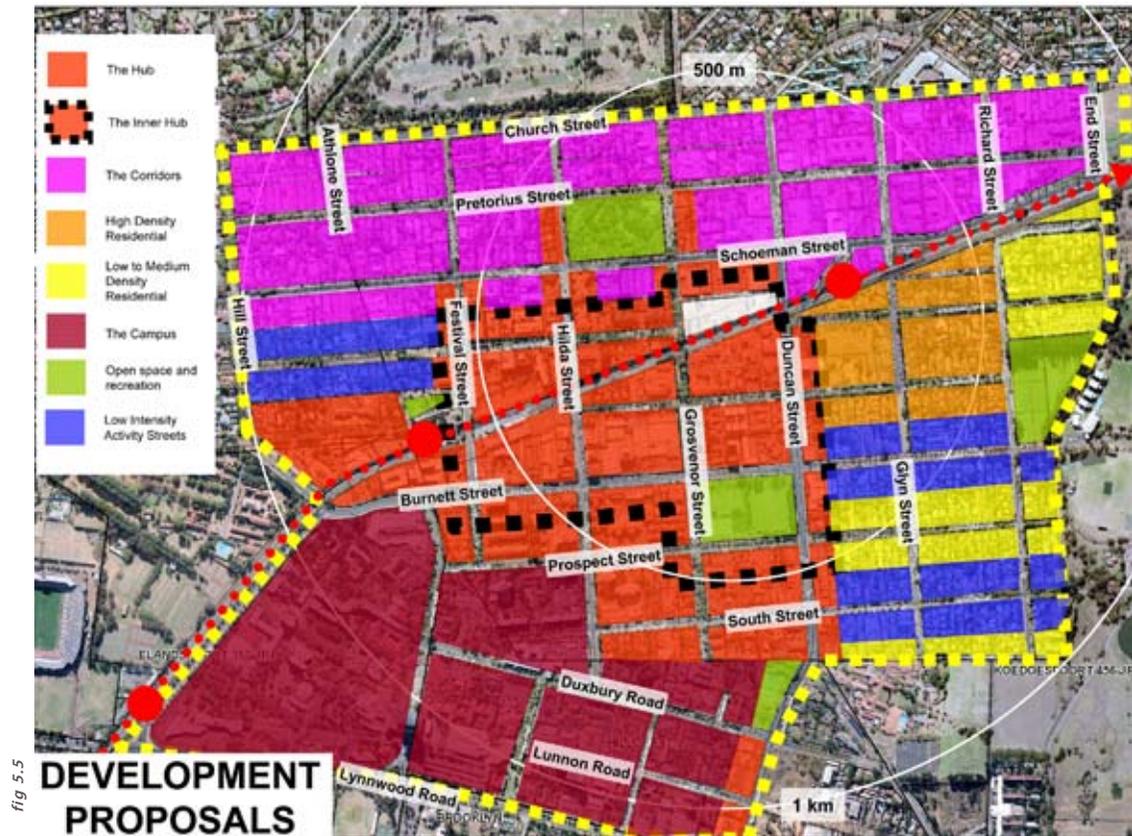
*fig 5.5 Hatfield Spatial Development Framework
- proposed land-use*

5.2.2 Land-use

The Hatfield area is being rejuvenated and re-zoned as a major commercial precinct and because of the Gautrain station, a very high increase in energy is envisaged in the area. With the anticipated increase in commercial activity and the large numbers of pedestrians expected to be using Burnett Street, the site is ideally situated for a commercial intervention and public gateway onto campus.

Where there are people - in buildings, in neighbourhoods, in city centres, in college campuses, in other recreational areas, and so on - it is generally true that people and their activities attract other people.

"People come where people are."
Scandinavian proverb.





5.3 Conclusion

Analysis of the site has provided a host of opportunities and constraints. It has become clear that a collective partnership between postgraduate students of the University of Pretoria, lecturers and career guidance staff from the University, the Innovation Hub, as well as local commercial enterprises and businesses could result in the site becoming a vibrant centre where students can find the link between their studies and the commercial world.

The site has the potential to become a place where students can learn commercial skills, while providing consumer facilities for the public and creating a threshold between the campus and public. This partnership could lead to a healthy interaction between students and the public, where they can live, work and play.

Establishing a node on this site has the potential to create a pedestrian throughfare between the main gate of the campus in Lynnwood Road and the development, thereby generating activity along Roper Street; as well as functioning as a catchment area for the entire campus through which to channel its flow of students.



006 DESIGN DISCOURSE

6.1 Design Philosophy

6.2 Site Implications

6.3 General Strategy

- 6.3.1 Spatial Organisation
 - 6.3.2 Circulation
 - 6.3.3 Courtyard
- 6.3.4 Transition Space
 - 6.3.5 Gateway
 - 6.3.6 Hierarchy
 - 6.3.7 Scale
- 6.3.8 Attention to Detail
- 6.3.9 Revealing Light

6.4 Conceptual Design

- 6.4.1 Initial Design Layout
- 6.4.2 Design Principles

6.5 Building Response

- 6.5.1 In Plan
- 6.5.2 In Section
- 6.5.3 Architectural Studio
- 6.5.4 Restaurant / Offices
- 6.5.5 Book Shop / Lecture Hall
- 6.5.6 Exhibition Space
- 6.5.7 Residential Apartments
- 6.5.8 Art Studios

006 DESIGN DISCOURSE

6.1 Design Philosophy

The primary concept for the project is based on the notion that creative professions are disregarded by the public in general, especially when they do not realise the full extent of the process required to achieve the end product. The concept therefore endeavours to reveal the processes as well as the products of the creative professions offered by the University of Pretoria.

Process is directly related to time and the project site, placement and shape aim to stimulate visual interaction with passing pedestrians on a daily basis as the creative process progresses.

The site provides a major thoroughfare for pedestrians using the Gautrain or metro-rail systems, as well as a major gateway to campus. The users will therefore be university students as well as general public. The re-opening of Roper Street and the affiliation of the project with the Gautrain and surrounding projects in the urban framework will also provide a safe pedestrian route for children attending any of the many secondary and primary schools in the immediate surroundings. Allowing school children access to campus will also expose them to tertiary education and the project becomes a permanent exposition, showcasing the creative professions and what it entails.

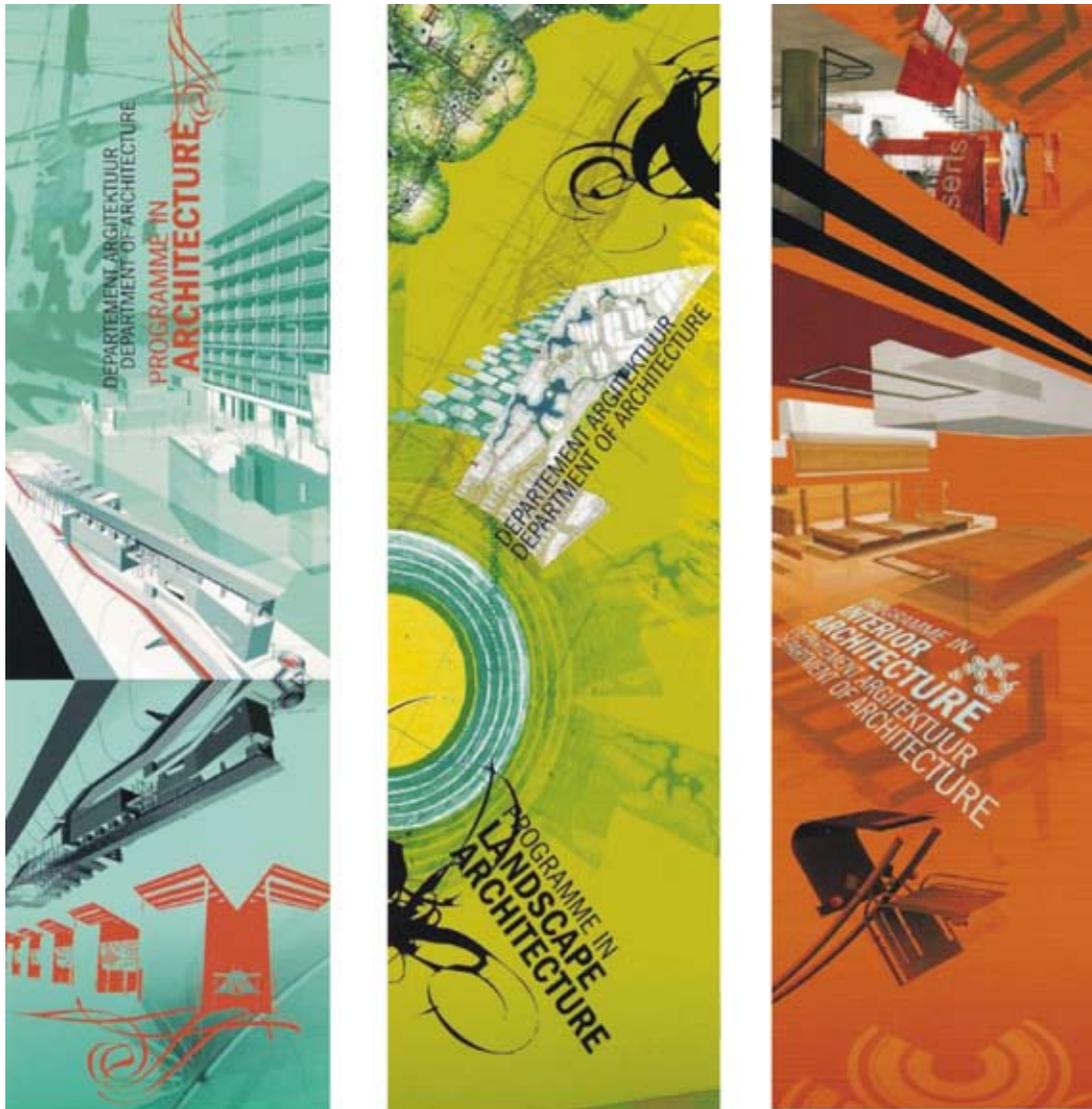


fig 6.1

DEPARTEMENT ARGITEKTUUR • DEPARTMENT OF ARCHITECTURE
ARGITEKTUUR • BINNE-ARGITEKTUUR • LANDSKAPARGITEKTUUR
ARCHITECTURE • INTERIOR ARCHITECTURE • LANDSCAPE ARCHITECTURE

The concept of revealing or exposure is realised throughout the design and technical investigation. Functions, structure, materials, services and circulation are hidden and revealed at unexpected moments and places. In the layout of the building, the functions are placed to reveal the processes involved during the creative process. The building is experienced on different levels and at varying scales, depending on one's location in and approach to the building, revealing the architectural articulation.

fig 6.1 promotional material for the Department of Architecture

fig 6.2 diagram illustrating the process of a heterogeneous catalyst

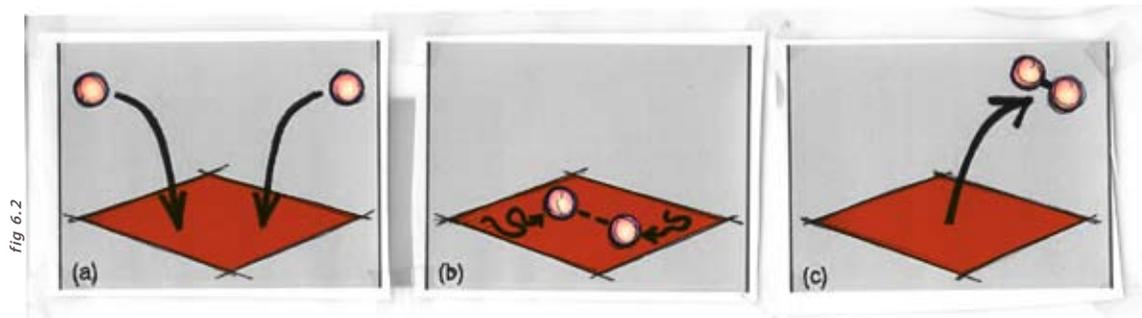
The second objective of the concept is based on the concept of a business incubator, where young professionals starting their careers benefit greatly from associating with more experienced professionals acting as mentors. Interaction between closely related professions, as well as interaction and exposure to people at different levels of accomplishment within a profession, significantly enhances a student or young professional's rate of development.

The project, therefore becomes a catalyst, which is defined as "anything that increases the rate of any reaction or process by providing an alternative reaction pathway, whilst remaining unchanged" (Wikipedia/catalyst). Heterogeneous Catalysts provide a surface for the reaction or process to take place on.

To summarise: the project provides a platform where students are able to interact with experienced as well as newly qualified professionals, who on their part can use the facilities to start their own companies and benefit from the input of mentors.

It further serves to blur the boundaries between varying levels of growth. Mentors will be lecturers or other professionals who can earn CPD points in association with the university.

In addition, the threshold or boundary between student and public life is blurred, not taken away; it merely provides a seamless edge while still acknowledging the differences.



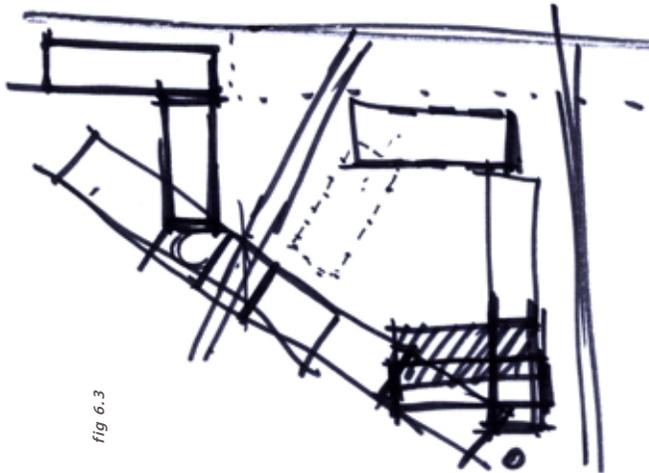
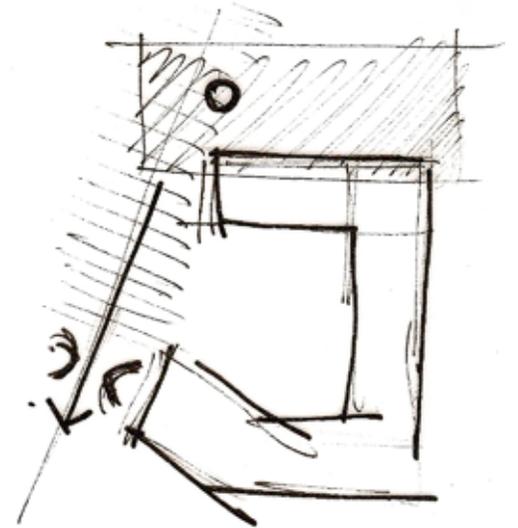
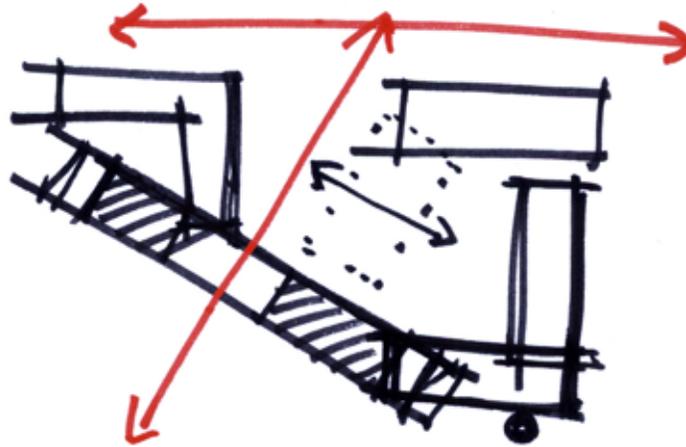


fig 6.3



6.2 Site Implications

From the site analysis, the site was clearly identified as a gateway or entry point onto campus. Access, movement and approach therefore dictate that the building should form a clear threshold, indicating where the public realm ends and the private starts, whilst still allowing public access. The threshold should be clear without the use of barriers, based on the concept of blurring boundaries.

Roper Street was identified as a key intervention opportunity to integrate the city with the university as well as to generate year-round activity, thereby eliminating the dead period to which all activities on campus are subjected. Roper Street will thus be extended and opened onto Burnett Street, as it had been originally, allowing public pedestrian access. From the framework, it has become clear that there are enough activities on both the northern and southern sides of the university to generate sufficient energy to justify commercial activities along this spine. Creating an active street culture, with café's and student orientated shops will enhance the student culture and experience such as one has with city integrated campuses.

fig 6.3 diagrammatic exploration of shape of the building in response to the site



fig 6.4

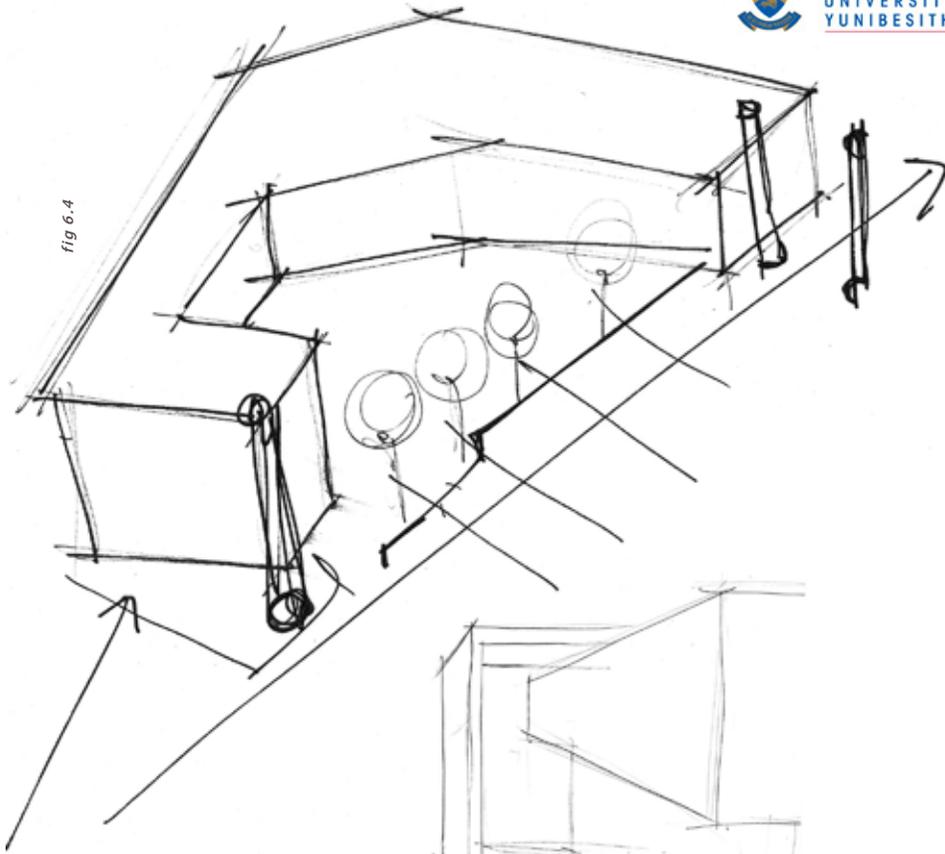


fig 6.5

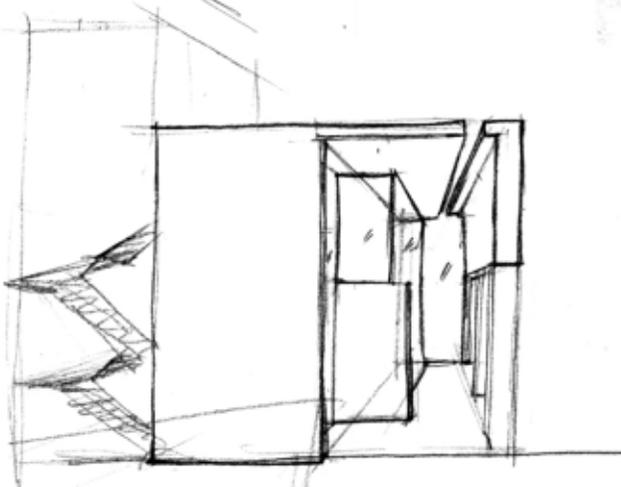
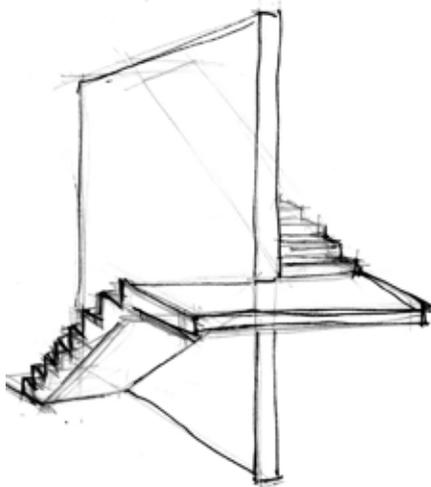
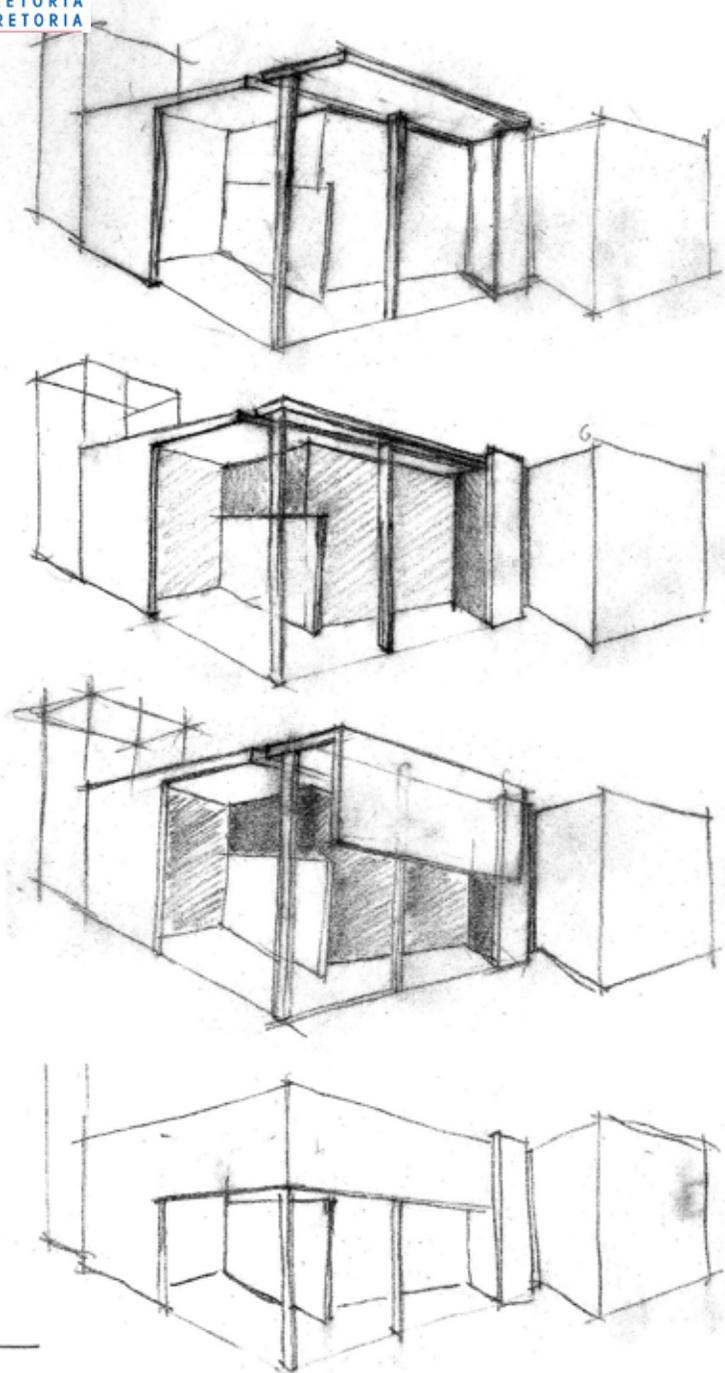


fig 6.6

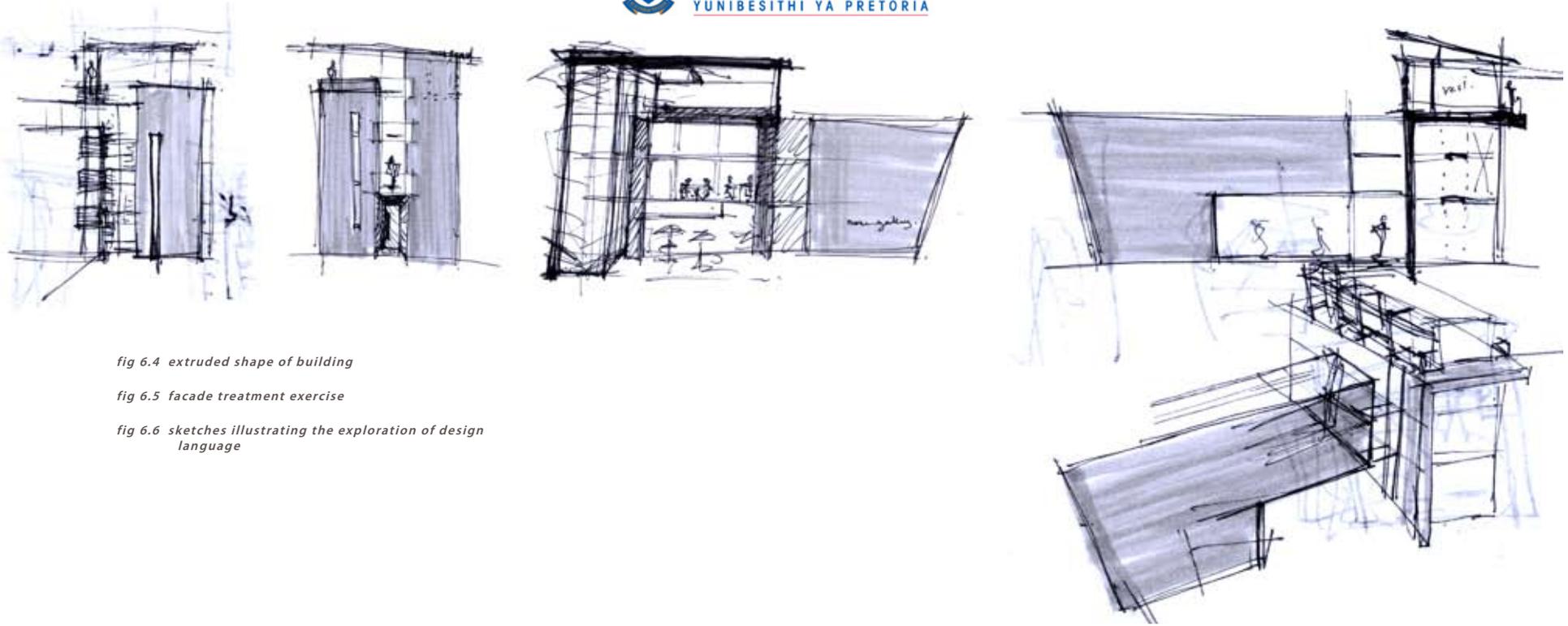


fig 6.4 extruded shape of building

fig 6.5 facade treatment exercise

fig 6.6 sketches illustrating the exploration of design language

The site therefore requires an iconic building placed on a direct axis running from the Human Sciences building, which indicates the main entry point on Lynnwood Road. This will create the tension necessary to generate movement as well as provide clear legibility and orientation points.

From the surrounding land-uses and proposed activity in Roper Street, it has been concluded that a multi-use building is required, including office, commercial and residential components. This will link with the activities on campus,

in Hatfield, and the surrounding residential facilities.

The site also forms an urban gateway to the Hatfield precinct which is indicated by a public square, which forms a resting place for commuters using the metro rail station. The site has numerous indigenous trees which form a natural barrier to indicate the edge of this square. The building will be located behind this line of trees, forming a soft buffer between public and semi-public. The Burnett Street façade aims to excite and invite the passing traffic and has

a hard street edge defining the public interface. In contrast, the facades facing the Roper Street pathway is interactive and on a much more intimate scale to entice the passer-by to enter the courtyard and linger.

On the southern side of the site a few buildings have been identified with heritage value which will need to be respected. Clear movement paths will need to be established to control movement.



fig 6.7



fig 6.8



fig 6.9

The uninspired building context present adjacent to the site, which contrasts manifestly with the rich, vibrant architectural culture established on campus to date represents a huge challenge in the search for a suitable architectural vocabulary for the proposed project. A language is required which will be in harmony with the existing buildings on campus yet completely fresh and new to add to the genre already established. The Baragwanath Taxi rank in Soweto, the High Performance Centre (HPC) at LC DeVilliers Sports grounds and the Canadian Clay and Glass Gallery were used as precedents for the language of the building.

Another challenge was that even though the building needed to be iconic, because of its function, it also needed to form a neutral backdrop for the creative products and processes that will form a permanent display. The quest for a language is rooted in the primary experience of space, experience of the art and architecture on display, and the experience of interaction.

The language therefore opts for brutalism with large imposing surfaces, which are left blank, forming a blank canvas for the displays. The entire shape and layout of the building is focussed on the display of end products as well as process.



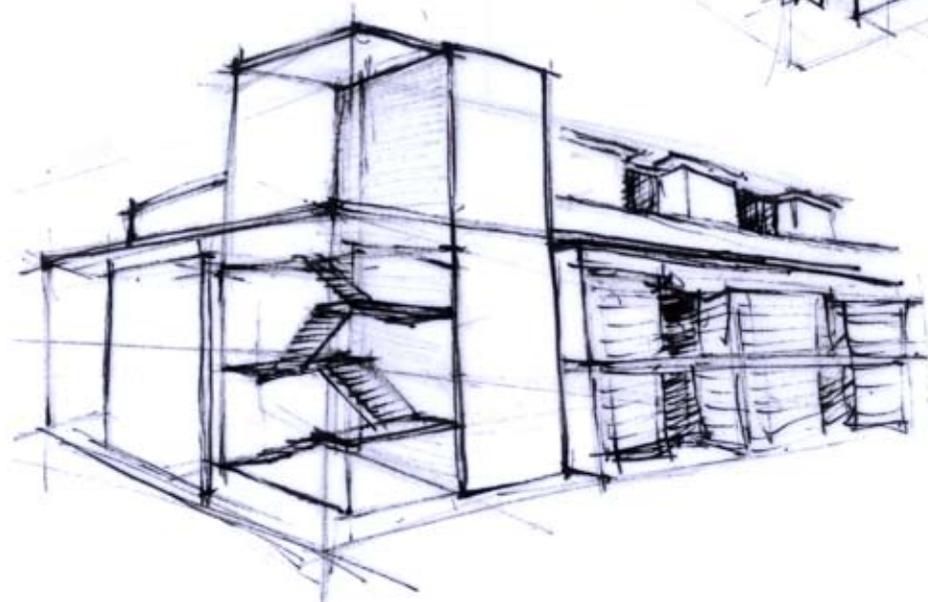
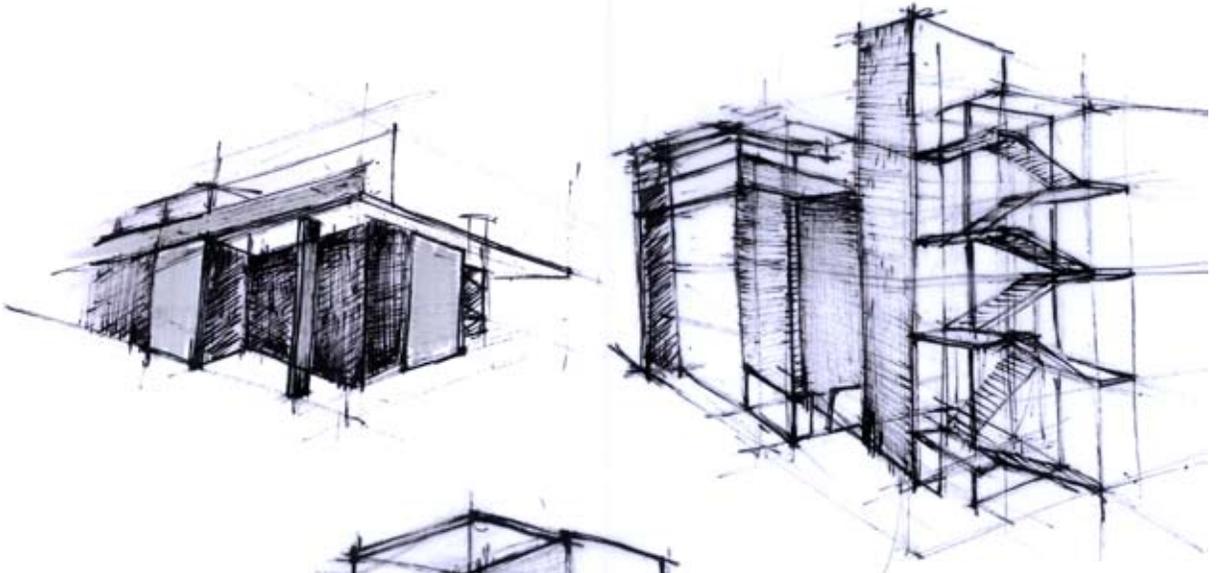
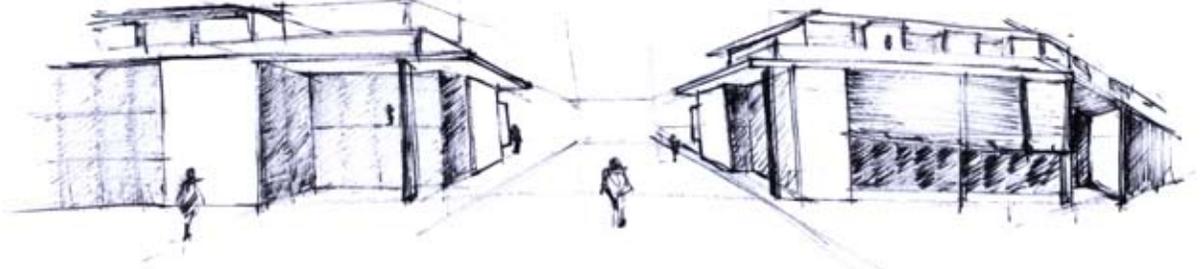
fig 6.7 the U.P High Performance Centre at L.C De Villiers Sports Grounds in Pretoria, May 2002

fig 6.8 Canadian Clay and Glass Factory by PATKAU Architects, 1986

fig 6.9 Baragwanath Taxi Rank in Soweto, by APC (African Professional Consortium), 2005

fig 6.10 design exploration

fig 6.10



The main pathway on Roper Street is lined with trees, separating slow and fast moving pedestrians. Two courtyards with different levels of intimacy balance each other on either side of the path. The broader walkway on the side of the sculpture yard promotes faster movement, providing the user with a different experience to that on the other side. The objects of interest are larger and needs to be experienced at a fast pace, joining the experience over time as the sculpture progresses. Seating separates the pathway from the sculpture yard to filter and slow down traffic as it enters the smaller and more private sculpture yard and also provide a resting place where one can view the art in progress.

The building aims to stimulate the experience of architecture and art in the building and unravel a different perspective to the user - a perspective of process, revealing how it came to be.

fig 6.11 diagrammatic plan layout

fig 6.12 building height investigation

fig 6.13 courtyard concept

fig 6.14 development of spatial organisation

6.3 General Strategy

6.3.1 Spatial Organisation

The building complex is organised as a cluster of forms and spaces.

This was due to three main considerations:

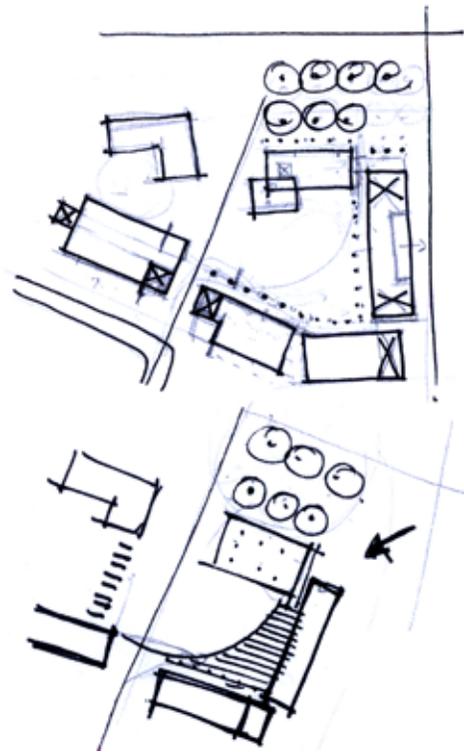


fig 6.11

- To allow for movement through the complex and maximum access to the courtyard

The traditional institutional building is one that is enclosed and inaccessible. This causes great speculation as to what happens inside the building. Through the design of permeable structures arranged in an accessible configuration, a transparent process is communicated.

- To allow maximum exposure to public

With studios, offices and other formal spaces spilling out into the informal passages, and large glass walling systems; visual access is maximised into all areas of the building.

- To create different types of spaces with various levels of public access.

The site is so vast that it became necessary to define smaller spaces in order to create more intimate and human scaled spaces.

A clear separation of functions, with a focus on the links or connections between the different professions and users rather than the components themselves is brought about.

All the functions have been placed to maximise exposure of the creative processes as well as the end products accommodated in the building. Architecture, being the amalgamation of art and science, forms the primary function. The architectural studios have therefore been placed in the front, indicating its prominence as the central function in the building. The exhibition spaces line the gateway indicating it as the second most prominent function.

fig 6.12

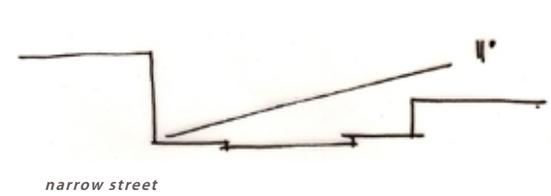
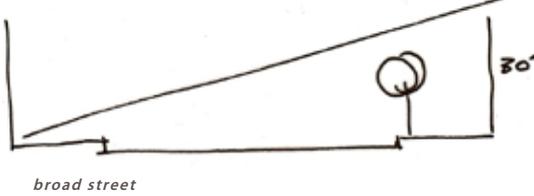
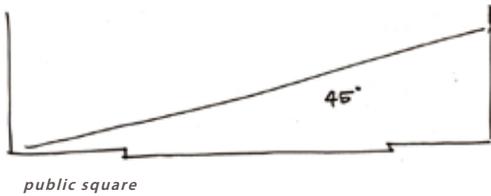


fig 6.13

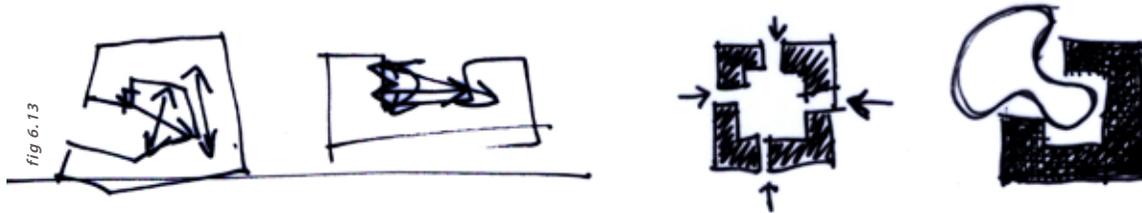
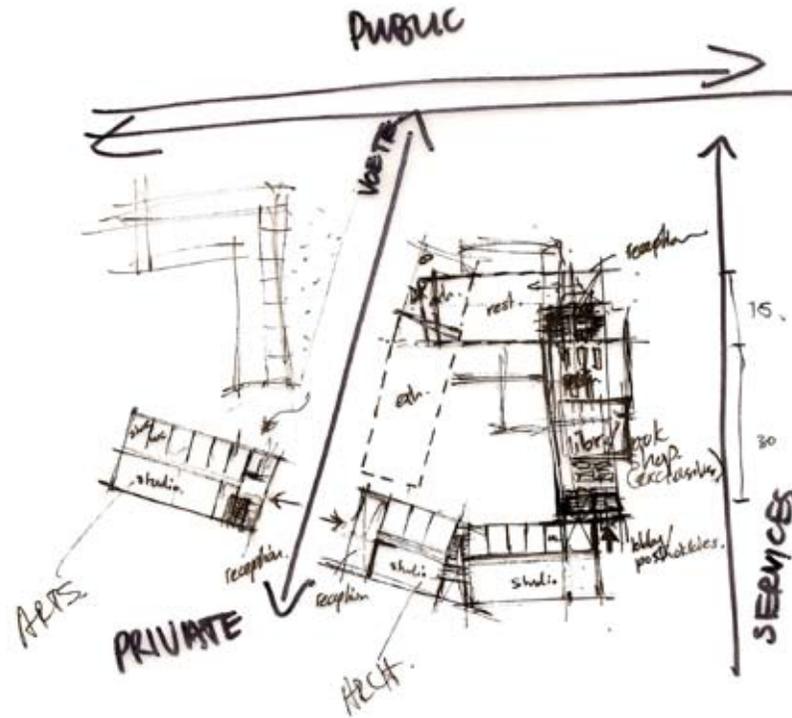


fig 6.14



The different approaches to the building have also dictated the exterior spatial layout of the site as well as the interior spatial layout. The primary approach firstly reveals the architectural process, then the sculpting process and finally the exhibition of the products, the building itself being the product of architecture.

The secondary approach first reveals a different aspect of process with a view of the art studios and then juxtaposed to that the exhibition space, forming a clear link between process and product. Then, as one passes the gateway, the intricate "inner world" of creating the product is revealed in the courtyard.

Other functions, such as the restaurant, book and coffee shop have been placed to invite entry into the courtyard, forming attractions at the back clearly visible to the passing public on the Roper Street pathway. Once inside the courtyard, a further aspect of the process is revealed by the architectural studio and workshop.

6.3.2 Circulation

Because of the nature of the site as an entryway, movement and circulation is of great importance.

“One does not physically experience space simply by gazing at buildings or looking at them from above. Space is experienced only through sequential movement. Space, like music, can be a source of elemental joy, something to which one can give up oneself entirely” - Fumihiko Maki (GEEL, 2005:98).

With the added experience of repetition as one uses the same paths over and over again, the displays will change as the processes evolve. Visual connectivity allows a transparent process to be maintained. This facilitates awareness, stimulation and way finding within the complex.

The circulation spaces are areas where events overlap, increasing the possibility of the unexpected event, interaction and networking. The balconies have the effect of an endless horizon with clear glass balustrades.

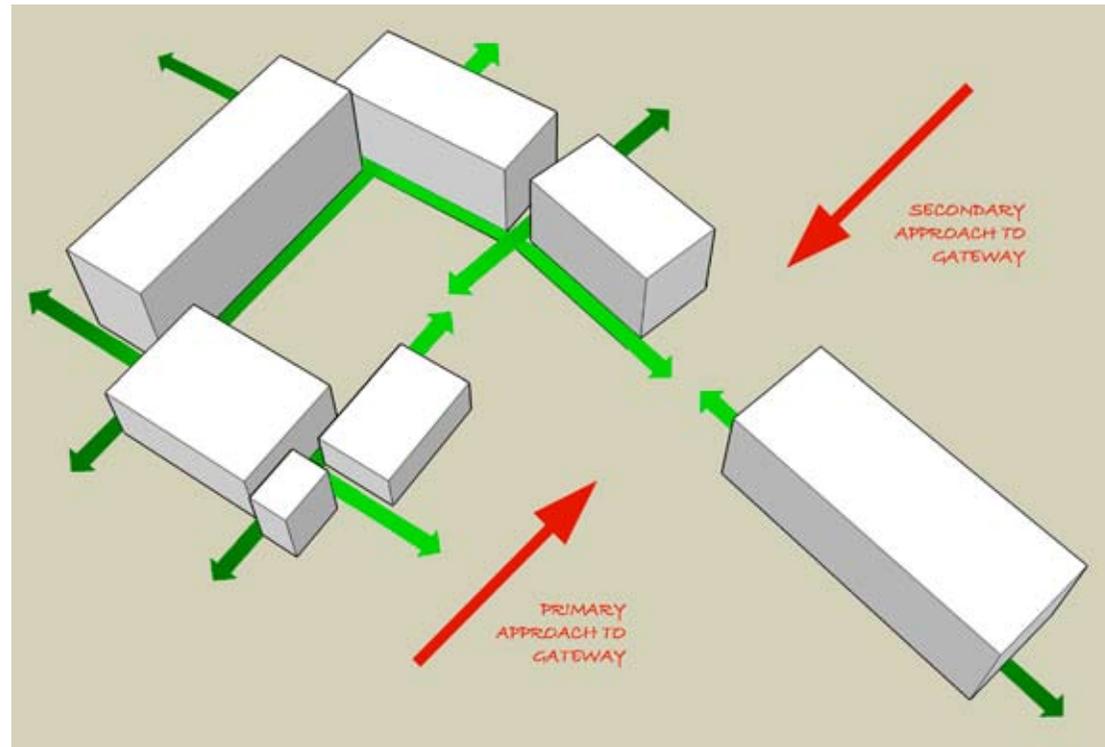


fig 6.15

The building layout has been fractured into smaller building components linked together by the primary circulation passages. On ground floor it allows the building to be accessible from all directions, drawing the public into the semi-public courtyard while still maintaining a clear indication of when one is moving over the thresholds between public, semi-public and private. This also allows maximum entry to the courtyard yet remains secure, in keeping with the theoretical investigation on safety.

Because of the fractured nature of the building, emphasis is placed on the links between components rather than the components themselves. The passages are wide and encourage interaction on every level and junctions are accentuated by social interactive spaces, promoting the idea of cross pollination. The visual links from the various roads towards the site are acknowledged by means of the passageways located between the building fragments. Through these passageways, the pedestrians will gain access to the courtyard.

The passageways are open to the outside for three reasons:

- Firstly to emphasise the separation of the building components leaving the ends open to the outside.
- Secondly to provide a 'weather buffer' by creating large overhangs and deep recesses to protect against the harsh western and northern sun.
- Thirdly to promote interaction between users on every scale, with wide passages which provide easily accessible space for lingering and networking. It also creates a visual connection with users in the courtyard, enhancing the intimacy of the courtyard. All the social interaction spaces 'spill out' into the passages, reinforcing the link between inside and outside, obscuring the boundary between public and private.

The external circulation is made possible by the mild climate in Pretoria.

fig 6.15 external circulation and movement



fig 6.16

6.3.2.1 Approach to Gateway

The building will have two main approaches for pedestrians utilising Roper Street from the north and south. The primary approach is from the clear public realm of Burnett Street, with the building changing from large scale to small. As one approaches, the building steps back and both courtyards are revealed. The bulk of the building is hidden and becomes revealed as one passes the workshop, revealing the courtyard and all the functions in it. The 'gateway' is lined with two exhibition spaces, exhibiting the products.

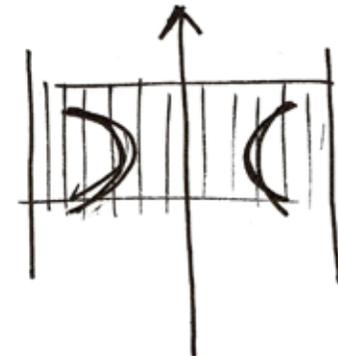


fig 6.17



fig 6.18

The secondary approach is from the southern side, from the vibrant, dynamic street with activities lining the street up to the curb. The building steps in, forming a bottleneck and stands out; forming vast glass surfaces on either side. One's attention is drawn to the exhibition. The two buildings forming the 'gateway' has been placed in a juxtaposed position to promote a natural flowing movement into the courtyard under the double volume colonnade, which steps down to a single volume space once the user enters the more intimate space of the courtyard and building.

Both these approaches strengthen the awareness of the courtyard and the threshold objective.

fig 6.16 primary approach to gateway from north

fig 6.17 gateway concept

fig 6.18 secondary approach to gateway from south

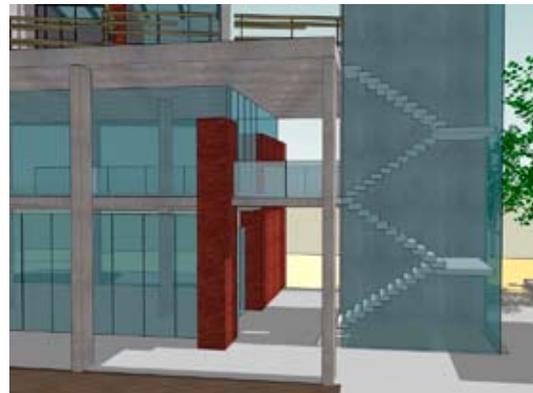


fig 6.19 views of building entrances

fig 6.20 building entrances

6.3.2.2 Entrance

The building and site have many entry points, allowing maximum access to the courtyard, while still providing an intimate sheltered environment. Each building and is differentiated in scale and size to indicate importance. E accommodate a specific user who will mainly be using that spec

The buildings form a gateway and clear entry point onto campus

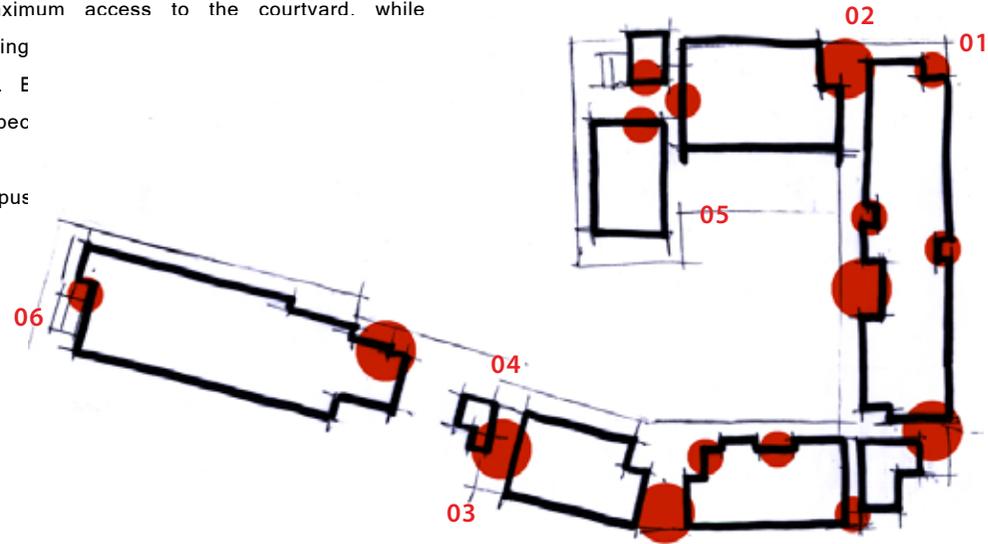


fig 6.20

6.3.2.3 Internal Circulation

While primary circulation is exposed, the secondary circulation within each building component has been enclosed, in keeping with the concept of 'hiding and revealing'. The movement systems become part of the buildings and are defined by spatial elements and columns.

These elements are dynamic and enhance the notion of movement through their rhythmic

configuration. Where there is no movement, the building becomes enclosed, indicating a grounded, static form.

All staircases are celebrated and exposed to the outside, indicating the vertical connection and revealing the life blood of the building. They form a focal point of each component connection and are visible from all major approaches.

According to Christopher Alexander:

"A staircase is not just a way of getting from one floor to another. The stair is itself a space, a volume, a part of the building; and unless this space is made to live, it will be a dead spot, and work to disconnect the building and to tear its processes apart."

"Therefore, place the main stair in a key position, central and visible"

(ALEXANDER, 1977: Pattern 133).

6.3.3 Courtyard

The main function of the courtyard is to create an intimate environment within the public realm. The intimacy of the courtyard is contrasted with the public nature of the square on Burnett Street. In creating this space, it provides the public with a quiet place to linger as well as give the users of the building a space where they can relax without being cut-off from the public. It has a distinct and definite shape, creating a positive outdoor space described by Alexander (1977: Pattern 106). The Convent of Latourette by Le Corbusier and the Electric Ladyland Offices by OMM Design Workshop were used as precedents for a courtyard building.



fig 6.21

fig 6.21 view of courtyard

fig 6.22 Monastery of Sainte Marie de la Tourette, Eveux France, Le Corbusier, 1953

fig 6.23 Electric Ladyland Offices, Kloof Durban, OMM Design Workshop, 2003

fig 6.24 section through courtyard

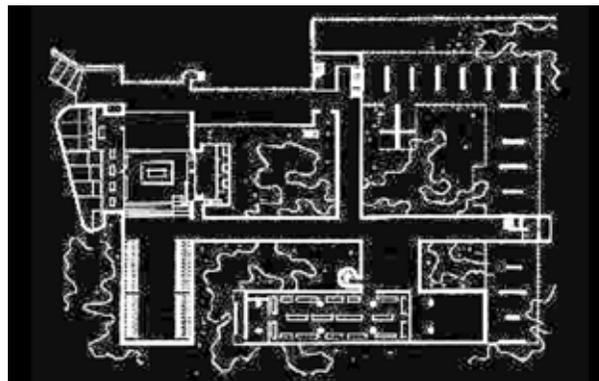


fig 6.22

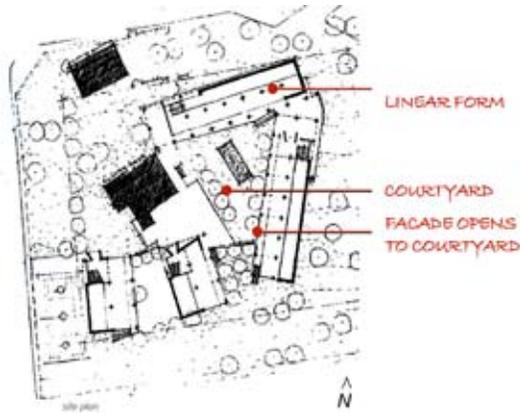


fig 6.24



fig 6.23

Each floor faces onto the courtyard, strengthening the intimacy and interactive qualities of the building. The “spill out” spaces from the auditorium, and the balconies of the apartments are examples of this.

The courtyard has been refined and its character completed by making certain that the space always has a view out into the larger public area of the path or into the buildings and its processes. The building has been designed to offer passers-by a view of the product of creative processes while the courtyard provides

the opportunity to view the processes themselves as these take time to become apparent. The architectural studio and workshop therefore face the courtyard while the exhibition spaces line the pathways. For this reason also, all exhibition spaces have been placed in foyers and next to major movement paths.

According to Pattern 114 (Alexander, 1977):

“Outdoors, people always try to find a spot where they can have their backs protected, looking out toward some larger opening, beyond the space immediately in front of them.”

6.3.4 Transition Space

In order to firmly establish the threshold between the campus and the public realm, the entire site acts as a transition space, leading the user from public to private realm, physically as well as psychologically. The transition exists, as an actual physical place, between the outside and the inside, and the view, and sounds, and light, and surface which you walk on, change as you pass through it.

"It is the physical changes - and above all the change of view - which creates the psychological transition in your mind"

(Alexander, 1977: Pattern 112).



fig 6.25

6.3.5 Gateway

As it has been argued in the theoretical investigation, in order for safety to be maintained passively, without barricading the campus, a clear threshold needs to be established where the user is physically and psychologically aware that they have passed into a private and therefore surveyed space, deterring them from vandalism or crime.

Alexander (1977: Pattern 112) states that:

“While people are on the street, they adopt a style of “street behavior.” When they come into a house they naturally want to get rid of

this street behavior and settle down completely into the more intimate spirit appropriate to a house. But it seems likely that they cannot do this unless there is a transition from one to the other which helps them to lose the street behavior. The transition must, in effect, destroy the momentum of the closedness, tension and “distance” which are appropriate to street behavior, before people can relax completely.”

For this purpose, a gateway has been established creating a transition between the “outside” public world and the less public inner world.

“If the point where the path crosses the boundary is invisible, then to all intents and purposes the boundary is not there. It will be felt, only if the crossing is marked. And essentially, the crossing of a boundary by a path can only be marked by a gateway”

(Alexander, 1977: Pattern 53).

The feeling of transition on passing through the gateway has been emphasised by a change in level and surface, as well as a change in light from the stairwells at night. The gateway forms the starting point of the pedestrian circulation inside the campus.

fig 6.25 view of gateway

6.3.6 Hierarchy

A clear hierarchy of public to private space has been included on various scales in the design, from the site to the building and even in the detailing.

According to Alexander (1977: Pattern 127):
"Homogeneity of space, where every room has a similar degree of intimacy, rubs out all possible subtlety of social interaction in the building."

The spaces have been arranged to create a sequence which corresponds to their degree of "privateness", beginning with the entrance and most public parts of the building and site, then leading into the slightly more private areas and finally into the most private domains. Each threshold is clearly identifiable, whilst flowing from one space to the next over a seamless floor.

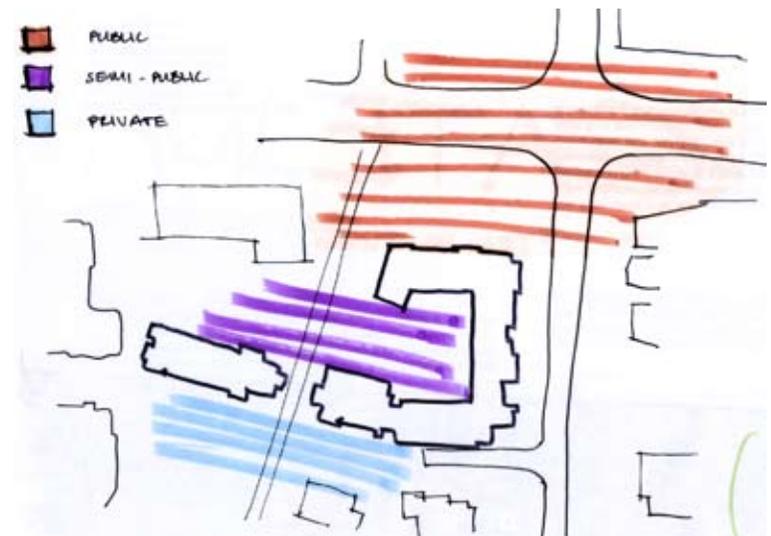


fig 6.26

6.3.7 Scale

Scale is an important factor in the perception of a space. The impression of space often dictates or accommodates the type of contact we make. Different scales have been used for different types of spaces. Where the nature of the spaces change from public to private, the scale has been adapted to imply the use of the space.

While the walls of a space provide enclosure, the height of the ceiling plane overhead determines its qualities of shelter and intimacy. Accordingly, ceiling height varies in accordance with function, indicating that the lower levels are mainly for public use and as one ascends the levels become more intimate and private, ending with the residential. On the ground floor, certain areas and passages have been designed with double volume spaces where hierarchy dictates this.

fig 6.26 site hierarchy of space from public to private

6.3.8 Attention to Detail

The attention to detail lends a quality of complexity and refinement to the building. Each connection and joint has been celebrated with the separation of elements, highlighting the coming together of the different materials. The links are emphasized and become more important than the whole, conveying the honest integrity of the materials.

6.3.9 Revealing Light

Throughout the building, light plays a prominent role in the design, illustrating the concept of revealing or 'bringing to light'. All the major passages are in some way illuminated with natural light, either with skylights or slots cut into the slabs. Light becomes a guiding element, directing the flow of movement as the building is revealed to the user. People are by nature phototropic, meaning they move toward light, and, when stationary, they orient themselves toward the light. As a result, people will automatically orientate themselves to the courtyard.

All entrances and key points in the circulation system have been designed to be systematically lighter than its surroundings, with light (daylight and artificial light) flooded there by means of double-volume glass walls, so that its intensity becomes a natural target in accordance with Alexander (1977: Pattern 135).

All internal stairwells have floating reinforced concrete stairs fitted to a reinforced concrete wall in the middle and lit from beneath to convey an impression of lightness. The stairwells are all

encased in glass and become major visual focal points throughout the building. Alternating areas of light and dark are also created between the central walls and lift shafts, promoting flow of movement up the stairs.

All external stairs will be artificially lit at night to draw attention to the paths. Beneath the external benches around the planters spaces have been left open to allow for natural lighting and ventilation in the basement which is also artificially lit at night.

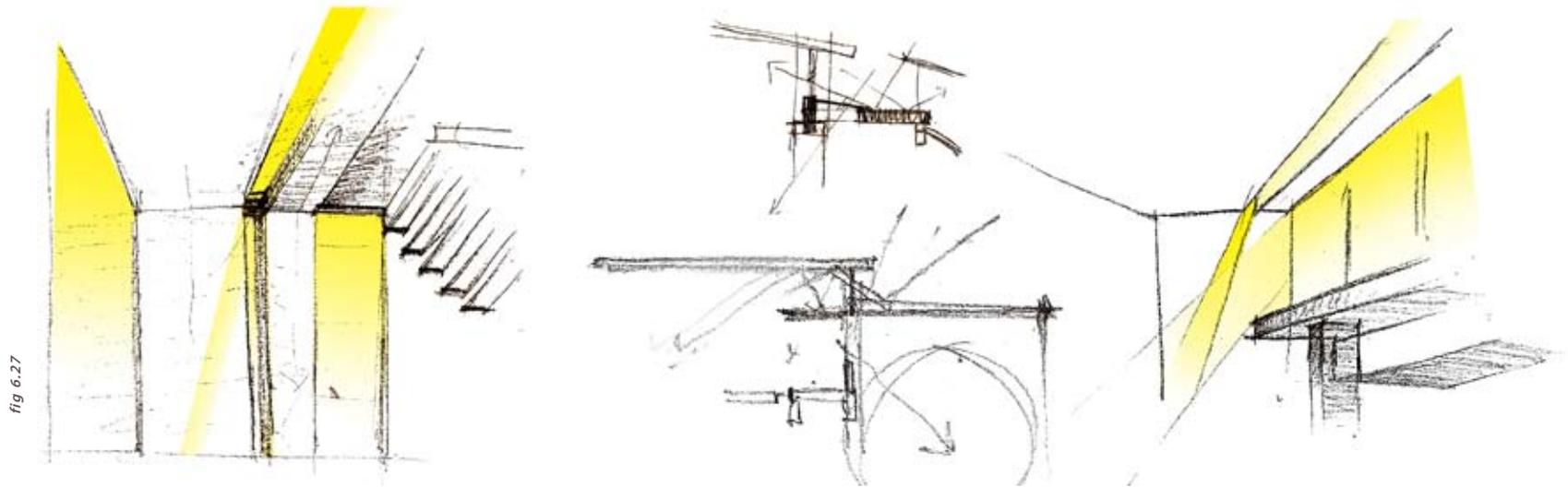


fig 6.27

fig 6.27 sketches illustrating use of light

fig 6.28

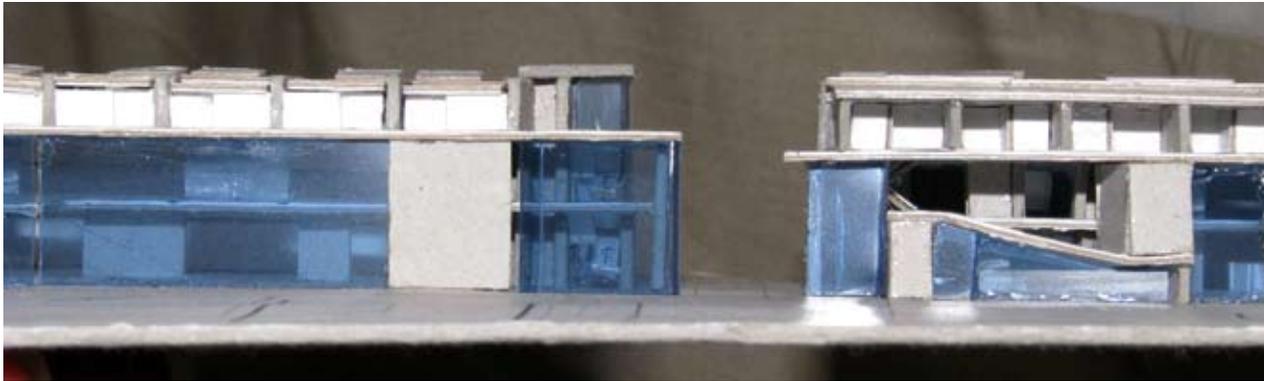


fig 6.29



fig 6.28 concept model showing gateway

fig 6.29 diagram of gateway concept

fig 6.30 process model

fig 6.31 primary approach - view from Burnett Street

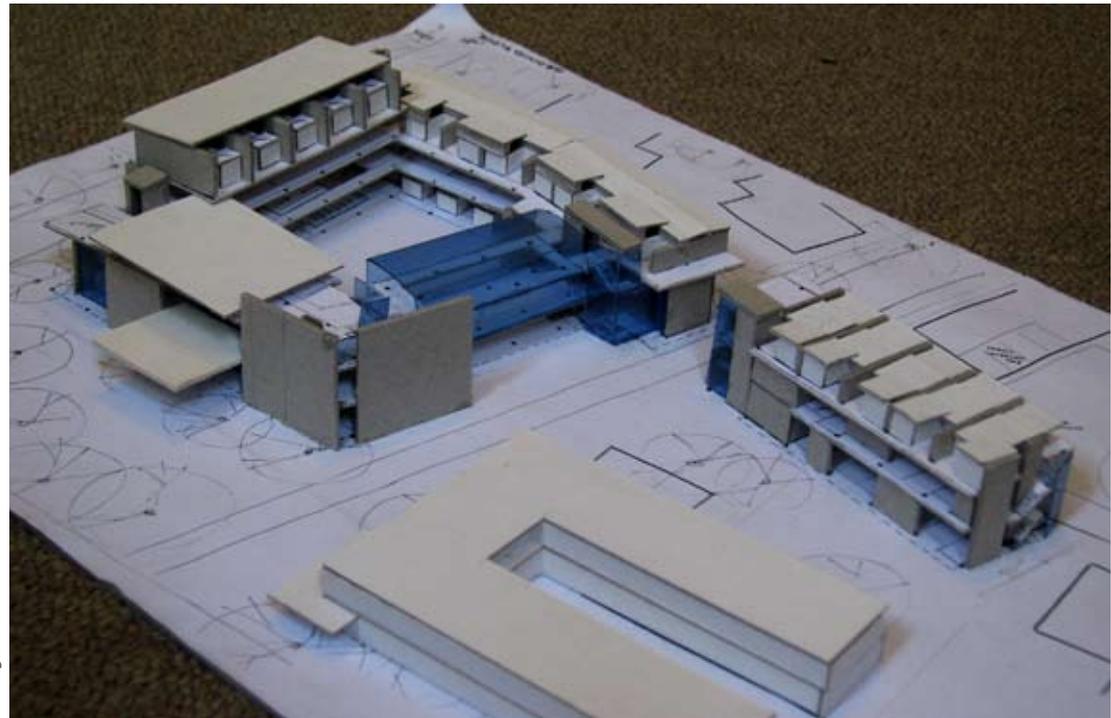
fig 6.32 initial design layout - ground floor plan

fig 6.33 revised design layout - ground floor plan

fig 6.34 initial design layout - first floor plan

fig 6.35 revised design layout - first floor plan

fig 6.30



6.4 Conceptual Design

The postulated context, the precedent studies along with a study of structures and buildings, informed the conceptual design of the building. The conceptual design is the result of intuition, desire and the constraints of the particular building and site.

The concept design took form from the opportunities and constraints of the site. The initial idea was a single structure to host the various aspects of the programme as well as to act as a gateway. After the initial design,

the concept of 'gateway' was revisited and it was decided that a gateway not necessarily encompassed but could be two separate iconic features, speaking the same language across the gap.

According to Alexander (1977: Pattern 53):

"A gateway can have many forms: a literal gate, a bridge, a passage between narrowly separated buildings, an avenue of trees, and a gateway through a building. All of these have

the same function: they mark the point where a path crosses a boundary and help maintain the boundary. All of them are "things" - not merely holes or gaps, but solid entities"

(Alexander, 1977: Pattern (53).

The programme was then divided into separate components linked by circulation elements. The components were divided according to programme, loosely translated as architecture, art, exhibition, office, and commercial.



fig 6.37

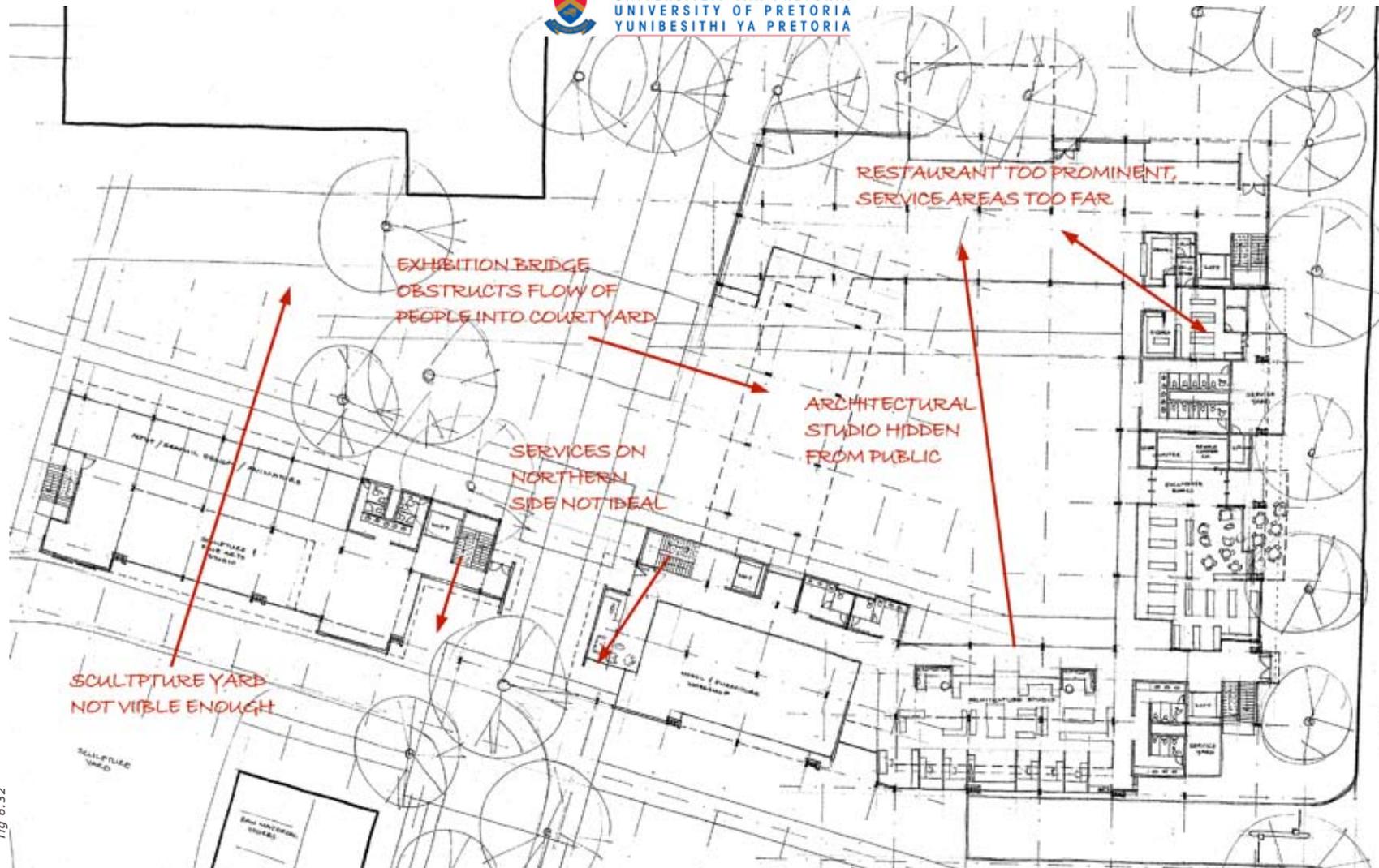


fig 6.32

After the initial design layout was generated, the concept was revisited and the design analysed accordingly. The layout of functions was found to be flawed, new priorities were established and a new layout was designed. The following changes were made:

The position of the architectural studio allowed no view from the outside of the process, thereby defeating one of the fundamental objects of the concept. The ramp to the basement denied people close access to view the studio and the private cubicles placed behind the passage obstructed viewing from the courtyard. Its position caused

it to be hidden from public view and lose prominence as the primary function. The studio was therefore moved to the front where the work could be viewed by the public, as well as from the courtyard. The circulation was moved to the centre to cause minimal obstruction.

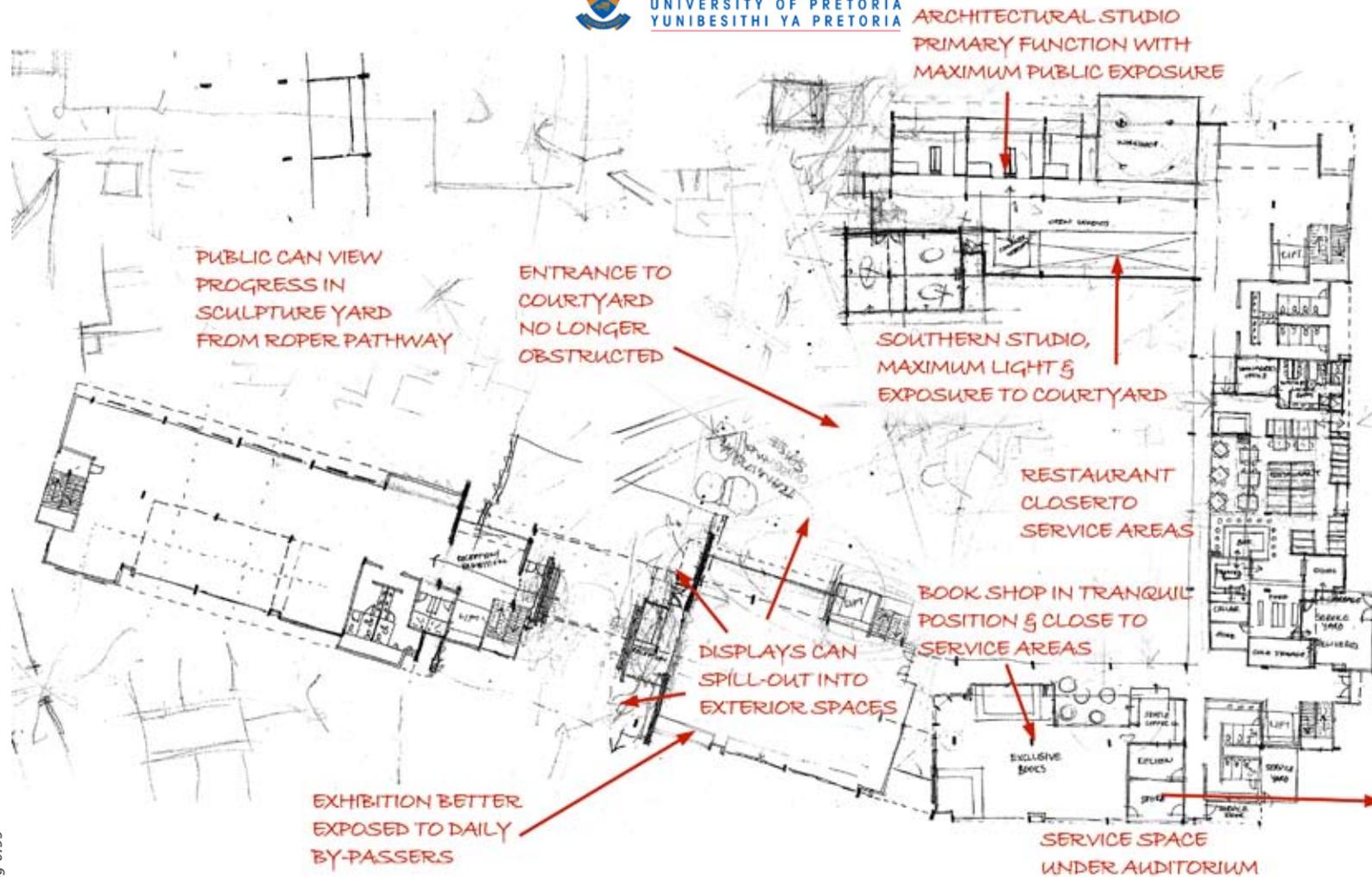


fig 6.33

The exhibition bridge was found to obstruct and enclose the courtyard instead of inviting people in. Because it was raised above the ground, it was found that passers-by would not be able to see and fully experience the art on display. The exhibition space was then given a prominent position next to the gateway to indicate its importance in terms of the concept. The pieces on exhibition could now not only be seen

prominently from both approaches, but could also spill out into the courtyard and pathway, further engaging the passer-by.

The sculpture yard was too hidden where it was on the southern side and was moved to the front to enhance its visibility and engage the viewer

Initially the auditorium was placed next to the gateway in order to articulate the gate with its sloped floor. After consideration, it was decided that its function was not prominent enough for this and that it would need a quieter position. The walls would also need to be obscure in order to prevent distraction when it was in use. The views possible from this elevated position would not be used to best advantage.

ENOUGH FOR POSITION,
WASTED OPPORTUNITY

EXHIBITION TOO HIGH
FOR BYPASSERS TO
SEE DISPLAY

AUDITORIUM DOES NOT
NEED TO BE ON EXHIBIT
& REQUIRES A QUIETER
POSITION

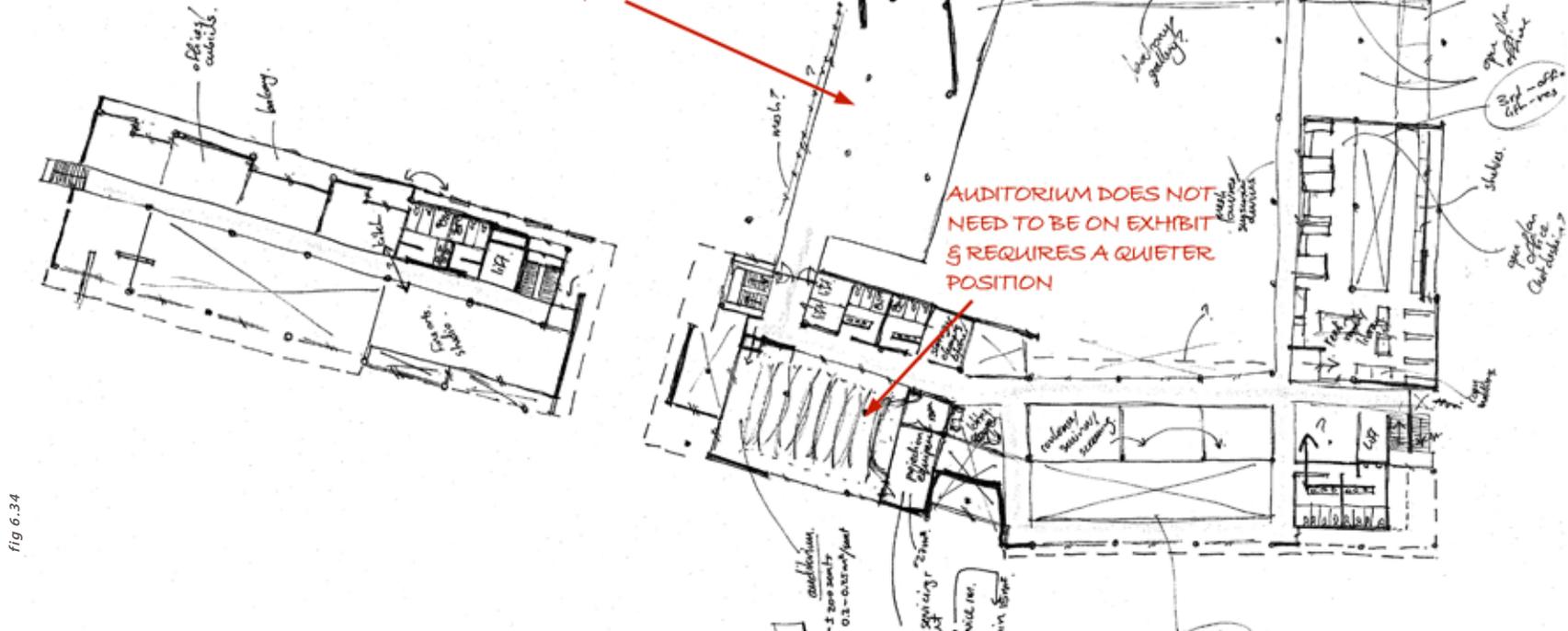


fig 6.34

The auditorium was therefore moved to where the architectural studio had been on the first floor.

Because the floor of the auditorium steps down from the entrance, the floor to ceiling space reduced to form a more intimate space beneath and it was decided that this would offer an ideal

position for the coffee shop and service spaces associated with the bookshop. The bookshop would also mainly be used by the users of the building and needed a tranquil setting, away from the Festival Street front where it was planned initially.

The restaurant was initially placed in the front

of the building because it was seen as a public function and major attraction point, opening onto the public square as well as the courtyard. Even though this was a sound principle, there were however a few problems. Firstly, the restaurant was not a primary function of the building and therefore locating it in such a prominent position could not be justified. It would also cause many

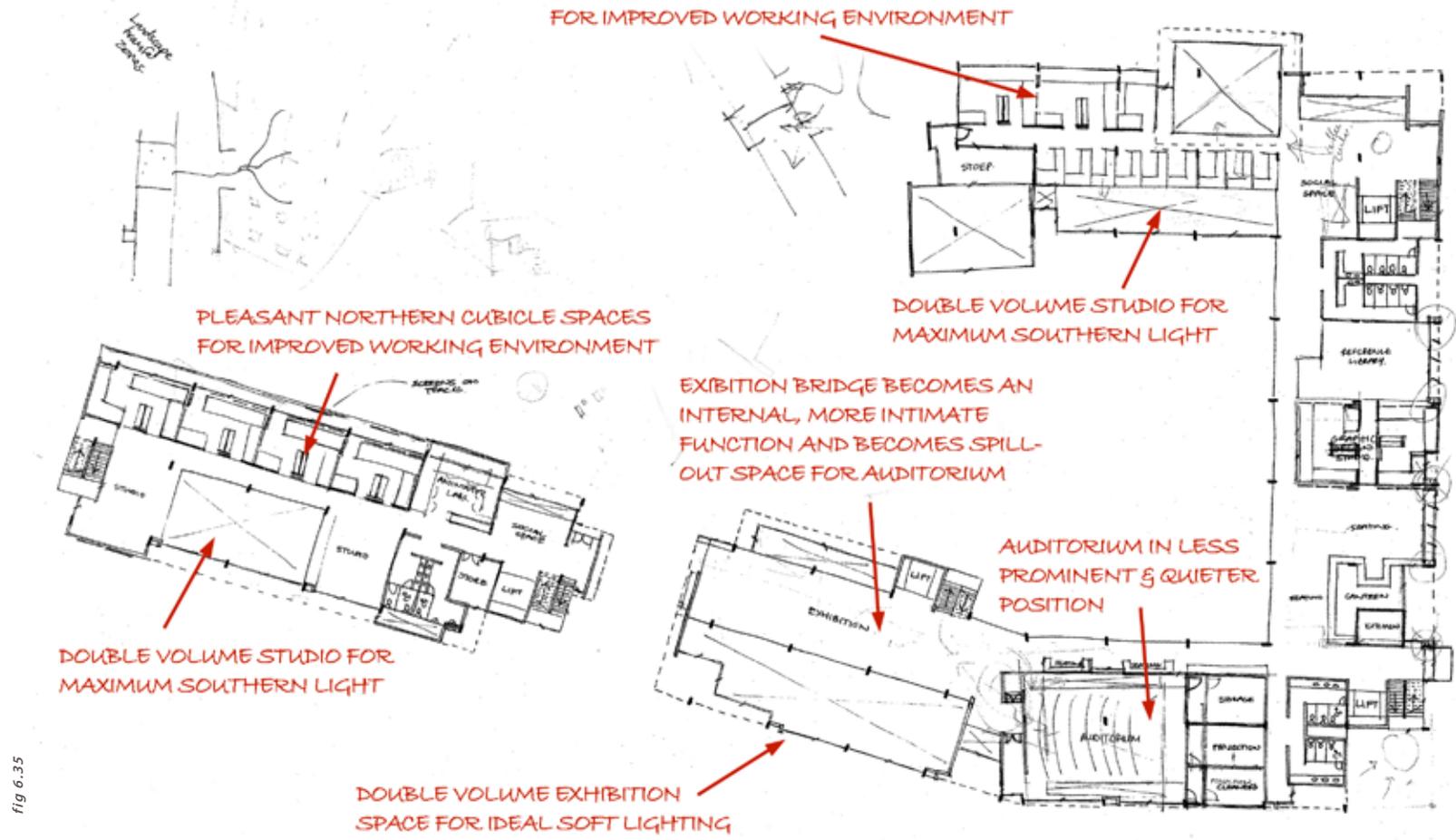


fig 6.35

users to only use the restaurant and ignore the rest of the functions, entirely missing the point of exposing the public to the process as much as possible.

Secondly, the kitchen and service areas needed to be close to the service street for deliveries and waste disposal. This caused the restaurant seating area to be extremely large and the

preparation areas very far from the serving areas. It also had to cross the main circulation of the building, obstructing the natural flow and activities of the office and other areas. It was therefore decided to move the restaurant to the component on Festival Street.

Service areas were improved, and it still had a street front for signage and attraction which was

not placed so far back that it would not be seen from Burnett Street. The main advantage was that the character of the restaurant could be changed to match that of the quieter courtyard atmosphere. It would now also draw people from the Roper Street pathway as well as customers who could use it as a meeting place for business purposes.

6.4.2 Design Principles

6.4.2.1 Design Exploration

- Limited fenestration to be provided on east and west facades with proper sun screening.
- The legibility of the building should extend into the surrounding areas, including appropriate street furniture and landscaping.
- The structure and facades should provide a high degree of visual stimulation due to the prominence of the site in terms of passers-by.
- The specific micro-climate of the site and surroundings should be investigated and responded to.

6.4.2.2 Efficiency of Use

The structure will be occupied almost daily throughout the year. The nature of the professions located within the building is such that studio spaces would be used extensively and with no specific time limits during the day.

6.4.2.3 Construction & Viability

The permanent concrete frame structure will be built on a grid to promote modular dimensions of elements, limit wastage, as well as allow for a relatively simple basement and parking layout. The grid ties the plan together and forms the basis of mass, coherence, rhythm and expression.

6.4.2.4 Running Costs

The concrete frame structure and face brick requires minimal maintenance. The timber louvers will have to be treated continually to prevent buckling. The courtyards and surrounding landscape requires maintenance that could be delegated to groups of landscape architecture students.

6.4.2.5 Parking

Parking for staff and students remains a major cause of concern for the University of Pretoria. The ever increasing student numbers exacerbates the problem. Provision of vehicular parking over and above the requirements will be made for the proposed building.

6.4.2.7 Landscaping

Existing trees on site should be kept as far as possible. Endemic plants that are drought resistant must be specified to minimise the amount of water required for irrigation, such as *Acacia Xanthophlea* (Fever Tree). Trees that can take battering and require minimum area for root systems must be specified for the courtyard planters.

6.4.2.8 Datum

Datum refers to an element to which other elements in a composition can relate. The main circulation path (Roper Street extension) acts as a datum element on plan, forming a common edge within the organisation.

6.4.2.9 Rhythm

Rhythm organises lines, shapes, forms or colours harmoniously. The space-defining columns form repetitive structural bays and modules of space within the composition.

6.5 Building Response

6.5.1 In Plan

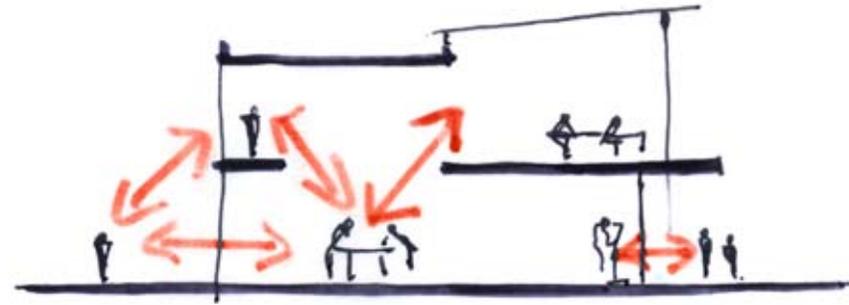
The interior of the building comprises a complex programme of events that have been superimposed to allow for unexpected events to occur. The ground floor is host to the public functions of the building, including a restaurant, book shop, exhibition space, and studios, while the first floor allows for semi-public facilities which require a certain degree of privacy, such as the lecture hall and reference library. The spaces permit cross programming between events. The entire building layout has been organised to promote the gradual transition from public to private.



fig 6.36

The entire site is built on a basement and therefore has no site levels to contend with. The building footprint has been elevated to emphasize the threshold between inside and outside but is sloped to allow seamless access to the entire building. Various ramps and stairs allow access onto the platform. The 'bridge' between the two main building components forming the gateway

has been elevated to be level with the building floor levels, promoting movement between the buildings as well as clearly identifying the threshold onto campus. The threshold between the pavement and the ground floor is seamless. The exterior floor finish is rough textured epoxy mortar while the floor finish upon entering is a highly polished epoxy mortar finish.



6.5.2 In Section

Within the building the structural system is revealed to the user through honesty of construction. The section of the building was refined to reveal the concrete structure and the columns without cluttering the space with walls. The columns remain freestanding and simply support the concrete slabs of the floors. This allows the floors to become an infill of walls and glass. The columns are placed on the outside of the building to reveal their structural function to the viewer. Various functional spaces are experienced as a person moves through the building.

As previously mentioned, the building layout has been fragmented and is linked by the circulation elements with service cores joining the components where they meet. These service cores form pivot points around the vertical circulation. All the components have differing heights for clearer definition and play with levels of scale.

Portions of the circulation on the ground floor become double volume voids, allowing for visual connectivity of most functions of the building.

The visual connectivity is achieved through the application of vertical superimposition. Miralles and Pinos's Civic Centre in Barcelona was used as a precedent for interaction between users of a building. Curtis (1999:15) describes the centre as an institutional interpretation which insists upon such values as communal interaction and casual meeting. *"It is a building which seems to imply social emancipation and participation"*.

fig 6.36 site plan

fig 6.37 Civic Centre, Barcelona Spain, by Miralles and Pinos



fig 6.38



fig 6.38



fig 6.39

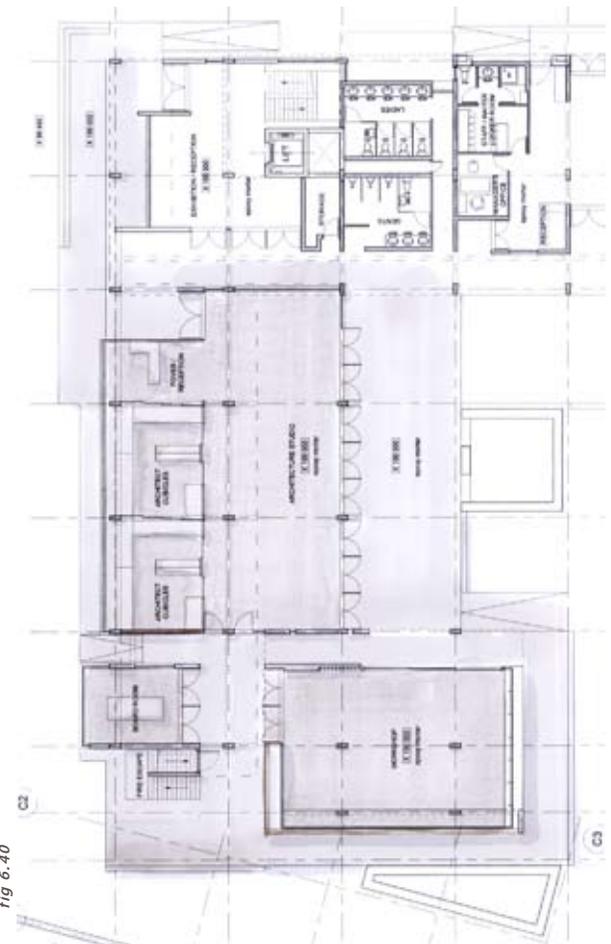
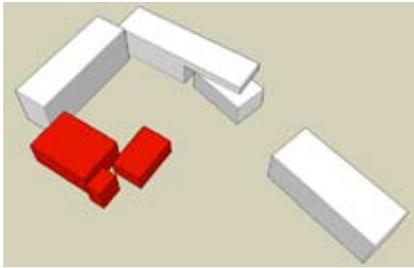


fig 6.40



6.5.3 Architectural Studio & Workshop

The studio layout was inspired by the Electric Ladyland Offices, in Kloof, Durban by OMM Design Workshop. This building was divided into two parts with a programme-specific half which includes services and circulation, whilst the un-programmed half allows for transformable office space that can adapt to the user's requirements. A suspended mezzanine floor can be retracted or removed to create a double volume space, allowing the building to be completely transformable to the needs of the inhabitants.

This idea of separating the building into two halves allowed for the layout to be designed to be as flexible as possible whilst allowing for lockable cubicles which can be rented out to start-up companies. The double volume studio allows for maximum adaptability where workshops and group projects or competitions can be held. The cubicles can be subdivided or joined with neighbouring cubicles transforming to the needs of the inhabitants.

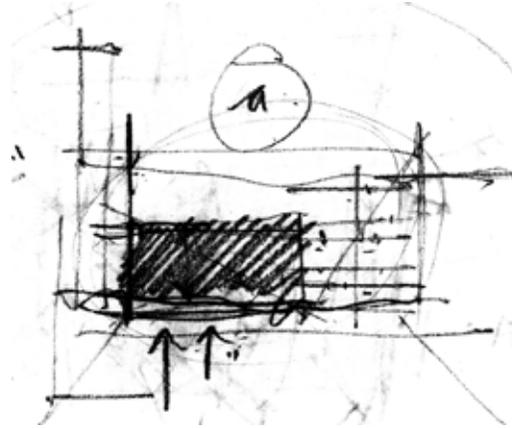
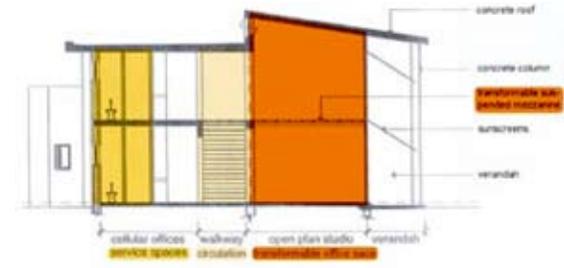


fig 6.38 section through architectural studio

fig 6.39 view of architectural studio from the north

fig 6.41 Electric Ladyland Offices, Kloof Durban, OMM Design Workshop, 2003



TYPICAL SECTION

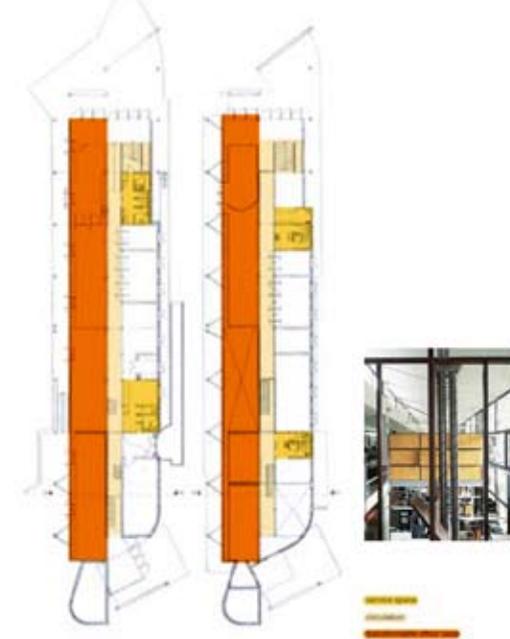


fig 6.41

In keeping with the idea of exposing the process to public or students, the studio space can be viewed from all sides as well as from the cantilever walkway above. For this reason this part of the building has been designed as a glass cube, allowing maximum southern light.

The northern façade has been designed with suitable sun shading devices that form part of the internal cubicle structure, as well as functioning as a light shelf, allowing for soft diverted light to enter. The raised platform on which the building is set, steps down into



fig 6.42

fig 6.42 view of architectural studio and workshop from north-west



fig 6.43

fig 6.43 view of architectural studio and workshop from the south

fig 6.44 design development - architectural studio

fig 6.45 design development - workshop

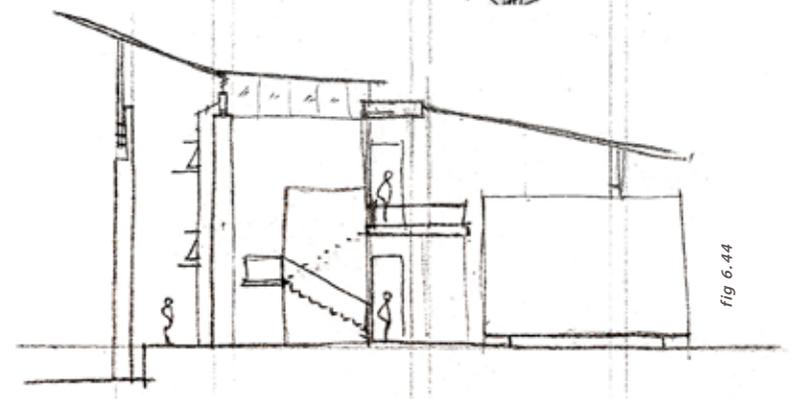
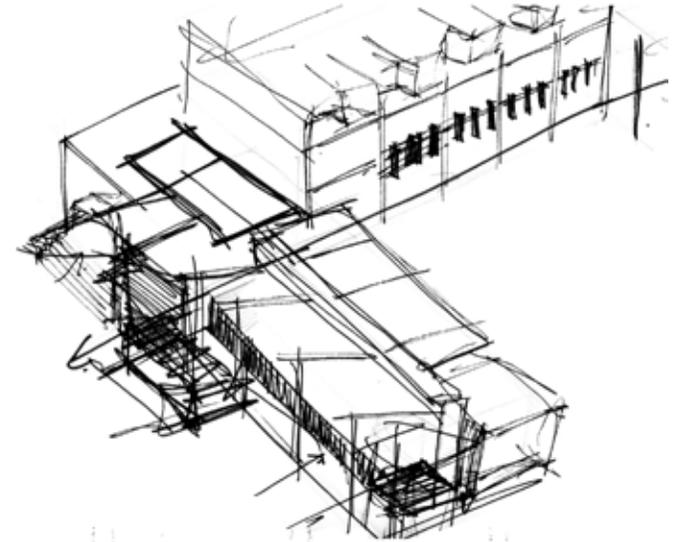


fig 6.44

the public square just behind the natural tree line, providing a shaded seating area. This also acts as a buffer between the public and private activities inside to minimise disturbance, creating a boundary without a barrier.

The main circulation in the studio is illuminated by a south facing skylight, allowing for soft light to wash the concrete beam and guide the user down the passage. The ceiling steps up in line with the walkway, further defining the space and allowing for the rafters to be revealed, in keeping with the concept. The walkway links up with the entry from the main building foyer on the east and the secondary entrance and fire

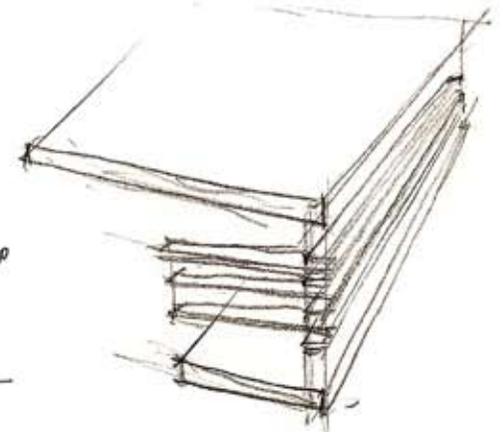
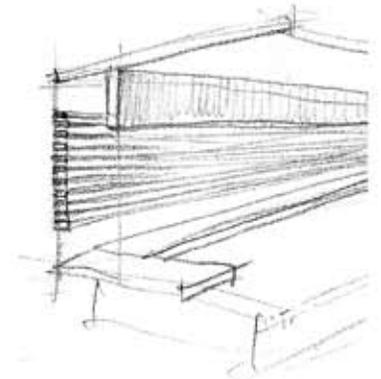
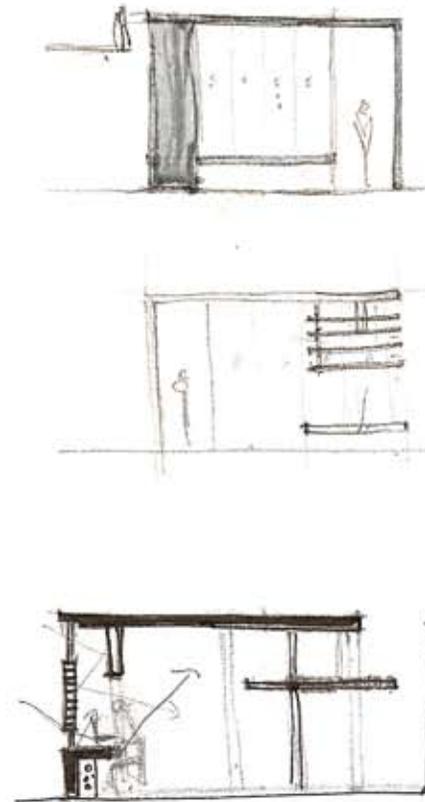
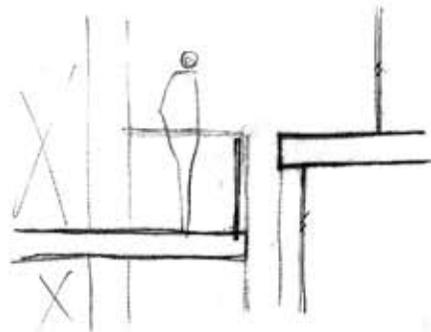
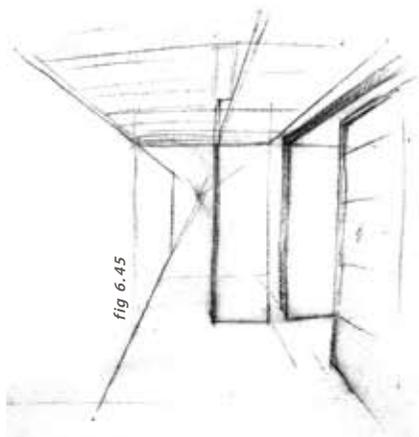
escape to the west. In the west, the walls fall back to create a secondary fragmentation separating the boardroom and workshop from the studio and linking with the courtyard. This secondary walkway allows the user to move directly past the workshop, with the idea of capturing their interest. The boardroom is isolated to minimise disturbance.

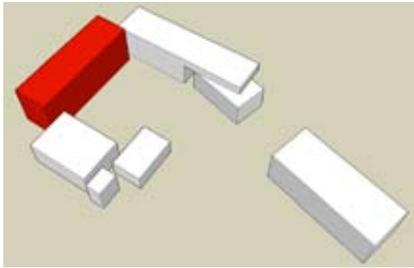
The Burnett Street façade has been designed to clearly indicate the changing functions beyond.

The intention behind the shape of the workshop, which will mainly be used for model building purposes, was to form a protective shell around the activities, while opening

up and showing its contents to the courtyard from where it can be viewed at leisure. It has also been isolated to minimise disturbance. The western side has been equipped with horizontal hardwood louvers spaced close enough to block the harshest rays. A reinforced concrete beam functions as a structural element, as well as a vertical light

shelf allowing soft light to wash the space. Directly beneath it, a concrete bench and secondary light shelf allows for occupants to set down their computers and connect with the network. Large, top-hung sliding doors allow for the entire eastern façade to be opened up to the courtyard and to slide away into a recess in the wall.





6.5.4 Restaurant / Offices

This component is the tallest and provides the main barrier between the service road (Festival Street) and the residential facilities beyond it, and the courtyard and building activities. The foyer forms the main attraction point from Hatfield and Burnett Street the metro rail station and pedestrian path from the north. The design gently steps back from the public square, inviting you into the building. Once inside, the building breaks away with frameless glass doors to reveal the courtyard beyond. The Balearic Technological and Business Innovation Centre in Majorca, Spain was used as a precedent for the doors.

The passages are placed on the outside, providing a weather buffer with deep overhangs to protect against the western sun. The walkways are lined with columns on the outside, revealing the structure and forming a repetitive rhythm and unifying element repeated throughout the building. The walkways are separated by strips cut away



fig 6.46

fig 6.46 Balearic Technological and Business Innovation Centre, Majorca Spain

fig 6.47 section through restaurant and offices

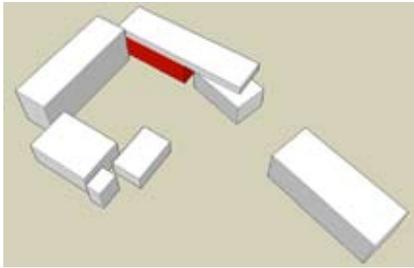
fig 6.48 ground floor and second floor plans of restaurant and offices

fig 6.49 view of restaurant and offices from courtyard

fig 6.50 view from Festival Street



fig 6.47



6.5.5 Book Shop & Lecture Hall

The function of the book shop is to act as an 'in-house library' for established architectural firms as well as to draw a specific demographic group, which will enhance the character of the building and precinct.

The slab of the auditorium interrupts the continuity of the first floor slab sloping down for a more intimate enclosed space formed in the coffee shop and service areas. This interruption opens the view from the ground floor to the double volume exhibition space.



fig 6.55

fig 6.55 section through lecture hall

fig 6.56 ground & first floor plans of lecture hall and book shop

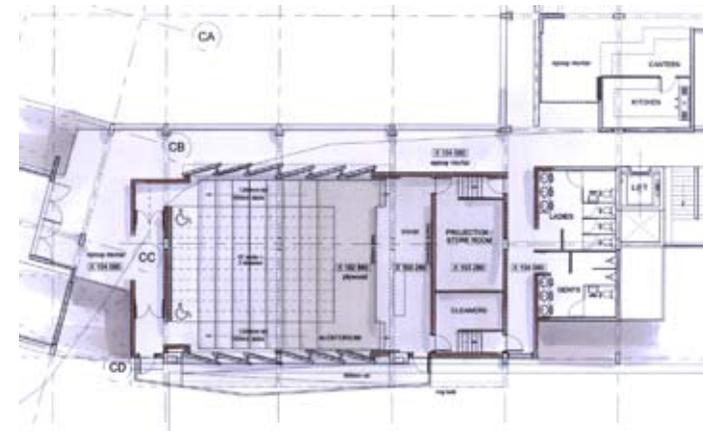
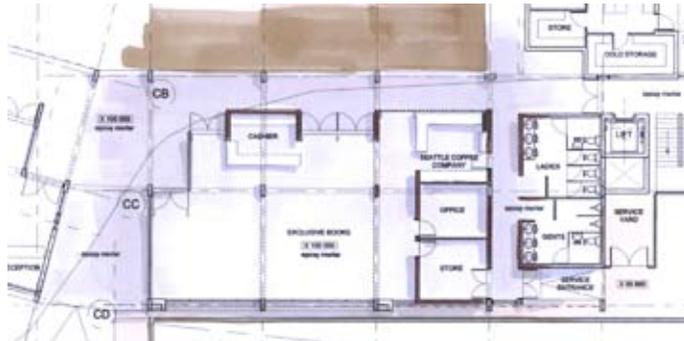


fig 6.56

The side walls of the auditorium have been angled for maximum acoustic advantage as well as to allow reflected natural light to enter unobtrusively. A ramp has been provided to allow access for disabled lecturers in wheelchairs, as well as providing an outdoor breathing space.

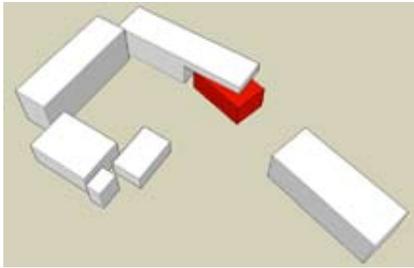
Two central columns were removed in order to prevent visual obstruction. Transfer beams of approximately 1500mm deep were necessary to

carry the slab and apartments above. Because of the great depth of these beams, they were taken up into the dividing walls between the apartments. Because of this and the service ducts running down next to the columns, the walkway had to be cantilevered past the columns. Where the exhibition space grid step back, the duct automatically moved with it and therefore the walkway could be stepped back. The resulting shape echoes that of the ramp wrapped around

the building on the first floor level and provides it with overhead cover.

This part of the building and exhibition space is connected by a bridge element formed by the residential apartments. The entrance from the south steps back with a floating walkway leading to the entrance of the lecture hall. The scale of the apartments relates to the neighbouring heritage buildings.





6.5.6 Exhibition Space

The Beyeler Foundation Museum was used as a precedent of an exhibition space that is naturally lit. It was built to house the private collection of Modern art belonging to Ernst Beyeler. The 127m long building is described as resembling “a ship lying anchored alongside the busy road” (Beyeler Foundation, 2007). Beyeler wanted a naturally lit, calm and restful environment, hence the idea to create a non-monumental space open to direct contact with nature, based on the design of day-lit spaces under a sheltering roof



fig 6.59

fig 6.57 view of book shop from courtyard

fig 6.58 view of lecture hall and book shop from the south

fig 6.59 Beyeler Foundation Museum, Riehen Basel, Renzo Piano, 1997

fig 6.60 ground and first floor plan of exhibition space

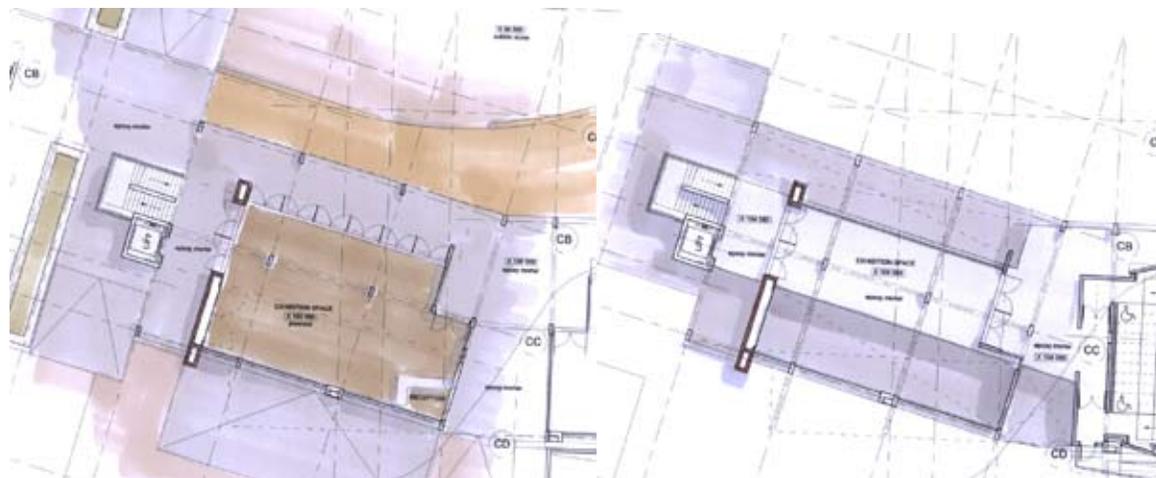


fig 6.60

fig 6.60



that filters the sky. The lightweight over-sailing roof contrasts with the seemingly heavy-weight archaic walls. These walls are interrupted and broken in order to provide a range of gallery spaces.

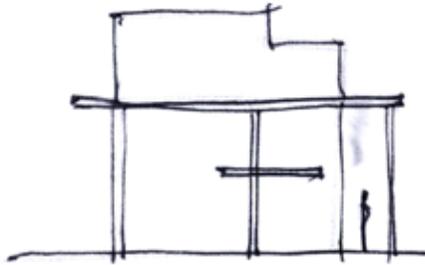
The building's steel roof structure provides support for various glass layers, including a glass ceiling and internal louvers, double glazing, and posts that carry external inclined glass shading. The

transparent roof consists of a projecting steel structure suspended horizontally like a flying carpet. It supports the glass of the transparent roof and the brise-soleil that protects the interior against direct overhead sunlight. This roof provides the whole of the interior with the natural light desirable for viewing art. In terms of efficient light usage, the building has climatic buffer zones (e.g. service and ancillary rooms) that help to reduce reliance on mechanical systems.

In the proposed project, the exhibition space has been placed on the grid which aligns with Roper Street, while the apartments on the second floor continue on the original grid. This creates the illusion of the exhibition space popping out from beneath the grid, forming an imposing element which draws attention to it and the art it exhibits. The exhibition space has large glass facades, allowing ample soft southern light to illuminate the space.

fig 6.61





The walkway on the second floor links to the spill-out space in front of the lecture hall and continues to form a double cantilever, floating walkway extending into the double volume exhibition space. Both sides take advantage of the endless horizon effect with a glass balustrade facing the interior and a structural glass wall to the north.

The vertical circulation has been separated from the exhibition space and linked only with the walkway to create a slower channel of movement to pass before the entrance. The walkway also forms an overhead cover leading into the main entrance. A large red facebrick wall indicates the entrance to the exhibition space and provides a surface for advertisements or notices. The wall has been hollowed out to allow for easily accessible storage space. The main storage space has been placed in the basement to be out of the way and is accessed by the lift.

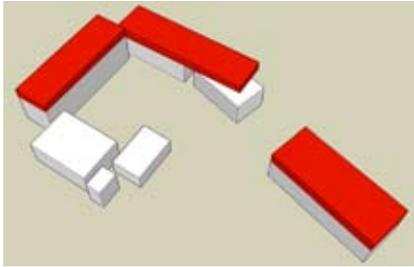


fig 6.62

The entrance opens up into a broad double-volume colonnade which has an overwhelming effect on the user as well as forming a large overhang to protect against direct northern sun light. To the side frameless glass doors opens up the exhibition space and allow for displays to spill out into the courtyard.

The southern glass wall has toughened frameless sliding doors to allow large art pieces to be moved into the space from the road.

The vertical circulation on either side of the gateway forms two focal points indicating the threshold between public and private.



*fig 6.63 Residential Building on Oak Lane, Melrose
Arch Joburg, Savage & Dodd Architects*

fig 6.64 view of apartments from the courtyard

fig 6.65 apartment floor plans

6.5.7 Residential Apartments

The residential levels hover above a two-storey plinth, which houses the commercial components. Rather than creating private gardens that exclude all but the users of those gardens, the building presents an interactive face to the public courtyard and thereby performs a function beyond its private realm.

The residential component consists of 16 apartments ranging in size from 1 bedroom bachelor (+/-40m²), to 2 bedroom (+/-55m²) units to accommodate the specific target market of students, young professionals and visiting professors and lecturers.

The Melrose Arch Residential building on Oak Lane in Johannesburg by Savage & Dodd Architects was used as a precedent. The key principles in their design were to 're-conceptualise' an apartment building within the context of an urban street-based model, that also opened up to create meaningful external spaces within the units, whilst respecting and responding to a difficult climatic orientation.

Because of the depth of the building and the grid spacing, the apartments are elongated rectangular shapes which which did not allow sufficient natural light to reach the central areas. The roof over the living areas has therefore been lifted to create a light shelf on the northern side to allow light to be bounced into the darker recesses of the space.

The spaces have also been stepped to allow maximum light to enter and create private outdoor social spaces.

Externally the apartments respond directly and deliberately to their orientation. Crisp, clean and contemporary lines define the edges while shielding the building's facades from the extremes of climate through the use of deep vertical and horizontal overhangs. Views are maximised through full-width and height glazing.

In order to minimise the service ducts, the layout of the plan was mirrored in the back whilst retaining a regular rhythm in the front.



fig 6.63



fig 6.64

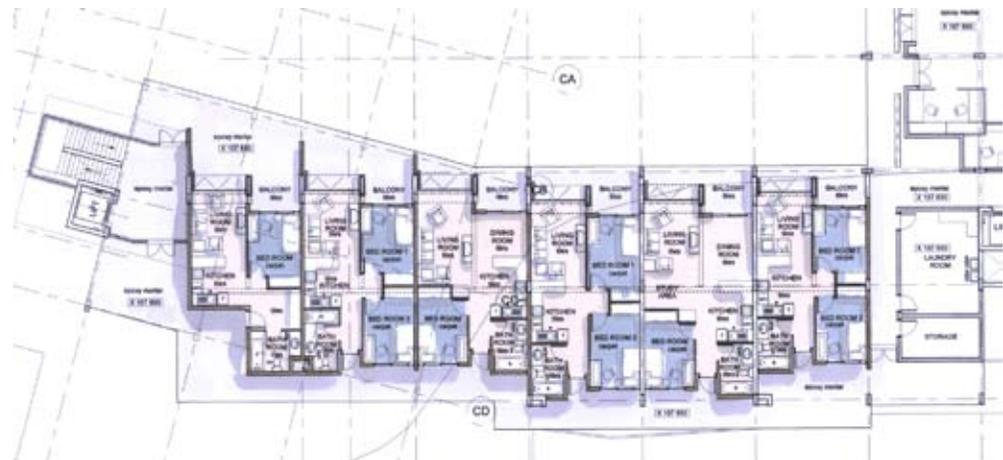


fig 6.65



fig 6.67



fig 6.68

fig 6.67 section through living area

fig 6.68 section through bedroom

fig 6.69 front view from the north

fig 6.70 design development



fig 6.69

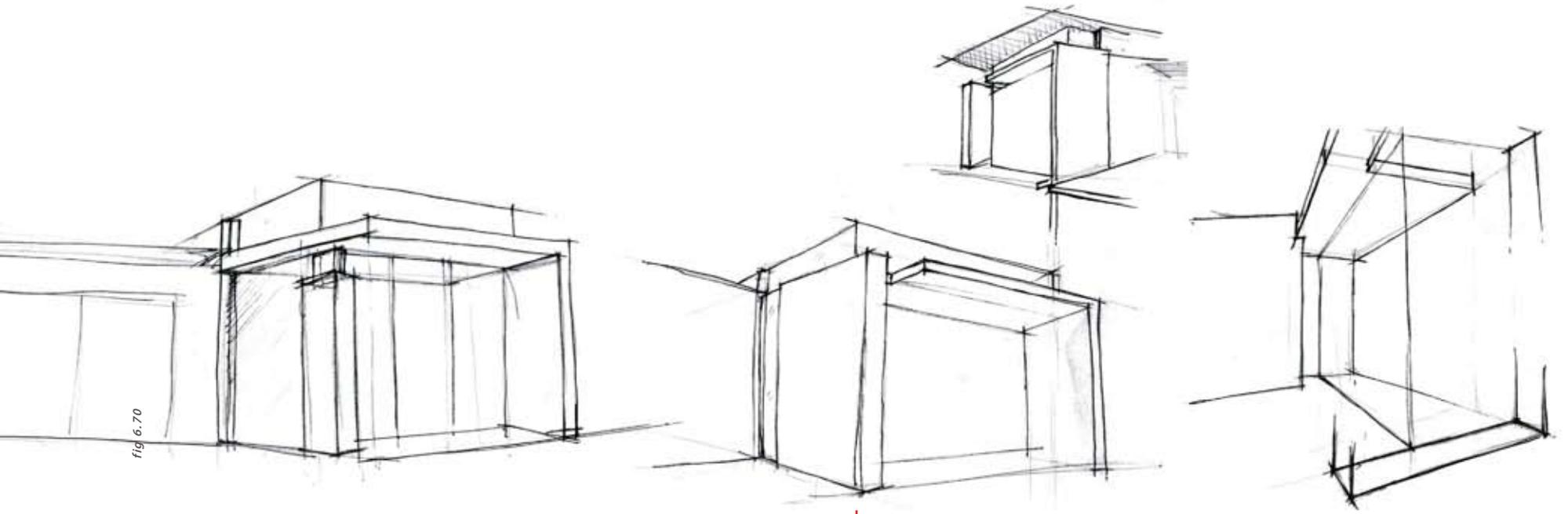
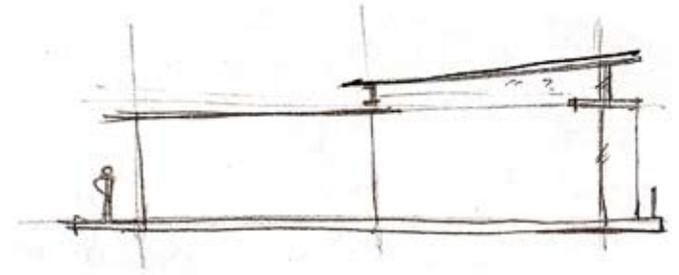


fig 6.70

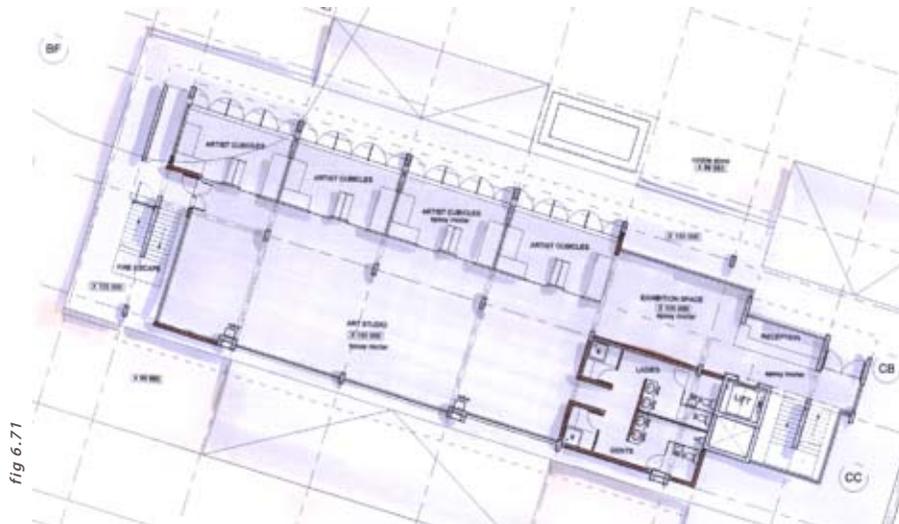
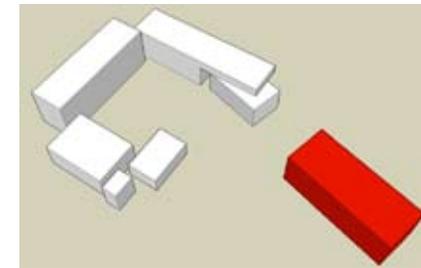


fig 6.71



6.5.8 Art Studios

The art studios building forms the other side of the gateway, and has been designed in the same language whilst not mirroring the other building exactly. The grid of this building lines up with the colonnade and deck extending in front of it in order to promote the flow of movement entering into the courtyard.

The building has been designed on the same principles as the architectural studio, with lockable cubicles on the one side and double volume studios to the south, with the exception of the cubicles opening into the sculpture yard in front and large sliding doors to the south allowing access for heavy vehicles from the road connecting to the technical building.



fig 6.72

fig 6.71 ground floor plan of art studio

fig 6.72 section through art studio

fig 6.73 design development

fig 6.74 view of art studios from the north

fig 6.75 view of fire escape from the south-west

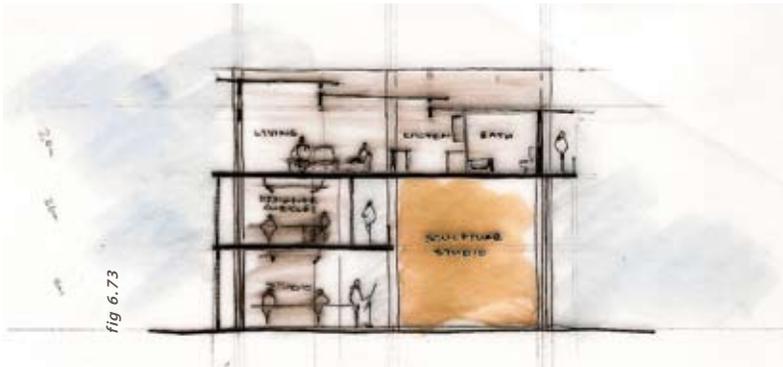
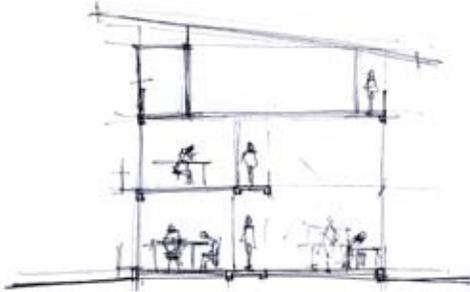


fig 6.74



fig 6.75

007 TECHNICAL INVESTIGATION

7.1 Revealing Structure

7.2 Revealing Materials

7.2.1 Concrete

7.2.2 Glass

7.2.3 Steel

7.2.4 Finishes

7.3 Revealing Detailing

7.4 Revealing Systems

7.4.1 Orientation

7.4.2 Ventilation

7.4.3 Solar Control

7.5 Revealing Services

7.5.1 Site

7.5.2 Acoustics

7.5.3 Rainwater Harvesting

7.5.4 Ducts & Circulation

7.5.5 Fire

7.5.6 Facilities for the Disabled



fig 7.1



fig 7.2

fig 7.1 reinforced concrete column and slab structural system

fig 7.2 structural system showing basement

007 TECHNICAL INVESTIGATION

7.1 Revealing Structure

The building and structure are integrally related and cannot be separated. Therefore, one of the primary design concerns was that of revealing the structure, and consequently also revealing the architecture of the building. The building developed as a response to the structure and the structure accommodates the design to reach a harmonic solution.

Adolf Loos in his book 'Ornament and crime', 1908, wrote:

"He who hides away part of the framework not only deprives architecture of its sole legitimacy, but also strips from its most beautiful ornament. He who hides a column makes a blunder, he who makes a fake column commits a crime" (Perret, 1952:34-35).

The structural system of the building consists of a concrete column and slab construction, forming a linear weight distribution system, with infill structural steel elements, functioning as support for the roof. The intention of the structural design is to expose the primary structural members to the extent that their function can be read by the user. Therefore, the primary structural elements are treated in a distinctive manner as to set them apart from the rest of the structure and thereby clearly defining the weight distribution throughout the structure.

The structural design exploits the expressive potential of the structural elements; it becomes the ornament - through repetitive rhythm, beauty and honesty of construction. This ornament is not added on but rather incorporated into the design so that the structure falls into harmony with the building as a whole.

7.2 Revealing Materials

The materials used in the building are naturally rich and varied and were selected for their inherent qualities as much as their economy or utility. The materials have been left mainly untreated to reveal their true nature and to express the concept of exposure. The various materials used in the building attribute sensory qualities to certain spaces within the building, while still maintaining a common language throughout.

fig 7.3 Concert Hall, St Polten, Austria

fig 7.4 Kunsthaus, Bergenz, Austria

7.2.1 Concrete

Concrete was chosen because of its common association with structure and using it in its natural form can be seen as an expression of structure. It was also chosen for its high mass that attributes to good thermal insulation and sound isolation necessary for the auditorium.

Reinforced concrete slabs will be used for all floors and has a maximum span of 7480mm. Through



fig 7.3



fig 7.4

consultation with an engineer, it was decided that 255mm thick slabs would be sufficient for spanning the required 6m. The floor slabs will be cast in-situ. Two-way spanning slabs will be used for most of the building, but in places where the slab has been cut away for illumination purposes, one-way spanning slabs will be used with the reinforcement acting in one direction only between two support beams, 425mm deep.



fig 7.5



fig 7.6

7.2.2 Glass

The other dominant material used in the building is glass, which originated from the concept of being able to experience the structure and spaces without any obstructions. Glass offers unobstructed views in order to maximise integration, interaction and exposure to all the processes, keeping the building as clear and visually accessible from all angles as possible, providing seamless connection between inside and out.

Special care was taken to ensure that sufficient solar shading was provided to minimise solar gain despite the large glass surfaces. A safety glass system is used for the majority of the balustrades.

fig 7.5 example of glass balustrade

fig 7.6 Broadfield House Glass Museum, Broadfield, London

fig 7.7 Stone Hill Centre, Williamstown USA, Tadao Ando

fig 7.8 design development - steel details

fig 7.9 Beyeler Foundation Museum - ventilated floor



fig 7.7

7.2.3 Steel

Hot rolled structural steel is used for all components of the assemblage. Bolted connections will mainly be used as this is the most common connector, requiring little special equipment. The precedent used for concrete, steel and glass design was the Stone Hill Centre in Williamstown by Tadao Ando.

All connections between concrete and steel have been accentuated, bringing focus to differences in treatment while successfully integrating the various properties of the materials. Steel hovers over the concrete, creating a synthesis where the two main structural materials of the building meet.

7.2.4 Finishes

Floor finishes on the heaviest trafficable areas are seamless epoxy mortar. The exhibition space floor is plywood with a seamless finish. The majority of the wall covering in the lecture room perforated plywood with absorptive material behind to attain acoustic properties.

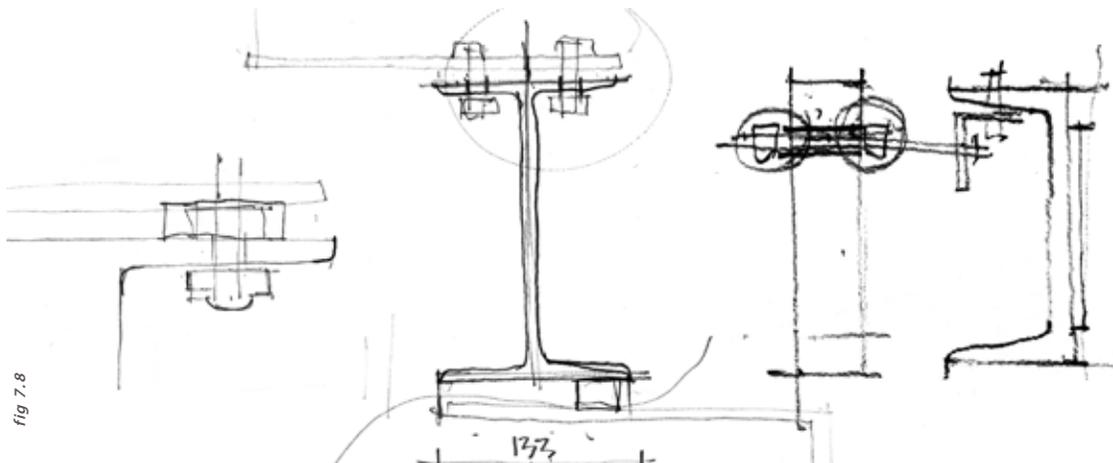


fig 7.8



fig 7.9

7.4 Revealing Systems

Because of the unique shape and nature of the building, its five facades were all treated differently, depending on orientation, approach and response to the immediate surroundings, e.g. the courtyard, or public street.

fig 7.10 detail of architectural studio light shelf

fig 7.11 construction details - see chapter 8

7.4.1 Orientation

Orientation was an important determinant in the design of the facades, namely:

- Elimination of direct heat gain and solar radiation by means of overhangs and shading devices.
- Maintaining views, natural light and ventilation regardless of the shading devices.

Each component was designed to optimally exploit the northern and southern aspects of the building, thereby overcoming any constraints imposed by the orientation while making the most of the opportunities offered.

7.4.2 Ventilation

For the most part the building makes use of natural ventilation. Strip windows allow for cross ventilation and reflected natural light. However, due to the nature of the building and its functions it is not possible to rely solely on passive ventilation systems.

The formal areas of the auditorium and offices require mechanical ventilation to achieve optimum human comfort levels. When the function of a room makes the use of sound isolation essential, a mechanical system is also needed. The air-conditioning system used in the building consists of split units with the compressors and condensers located in the basement. The service shaft behind the lift has an opening to allow for sufficient air supply.

A deliberate attempt was made to reduce the demand on the mechanical ventilation system and to save energy by applying the following principles:

- High thermal mass is provided by concrete floors and walls and brick walls, taking advantage of the fly wheel effect (term used to describe the property of a material to remain at a given temperature).
- Light coloured concrete is used for exterior walls and light coloured roof sheeting, reflect solar heat instead. (Dark colours absorb solar heat)
- Ample overhangs and circulation elements form weather buffers on the north and western facades.

- Glazed surfaces on the western and eastern sides of the building are kept to a minimum to reduce solar heat gain or loss. Where glazing occurs on these facades, proper shading devices have been provided. North-facing glazed facades are also provided with effective shading. Large south-facing glass areas allow maximum soft southern light into exhibition and studio spaces without solar gain.
- Openings in the basement at the front and around all planters, as well as above the ramp permit natural cross ventilation
- Where plywood floors are used, ventilation grilles have been placed between the battens on either end allowing for ventilation.

7.4.3 Solar Control

Lighting of the building interior is mainly by means of daylight, supplemented by artificial light where necessary. The predominantly linear shape of the building allows for good natural lighting in all spaces. Daylighting strategies consider heat gain, glare, variation in light availability, and solar penetration. These are addressed through opening size and spacing, shading devices, glazing materials and surface reflectance materials.

All studios and exhibition spaces were placed on the southern sides with large double storey glass walls to provide soft southern light in these spaces. East, west and northern fenestration are controlled to permit good daylighting while limiting direct solar penetration and heat gain.

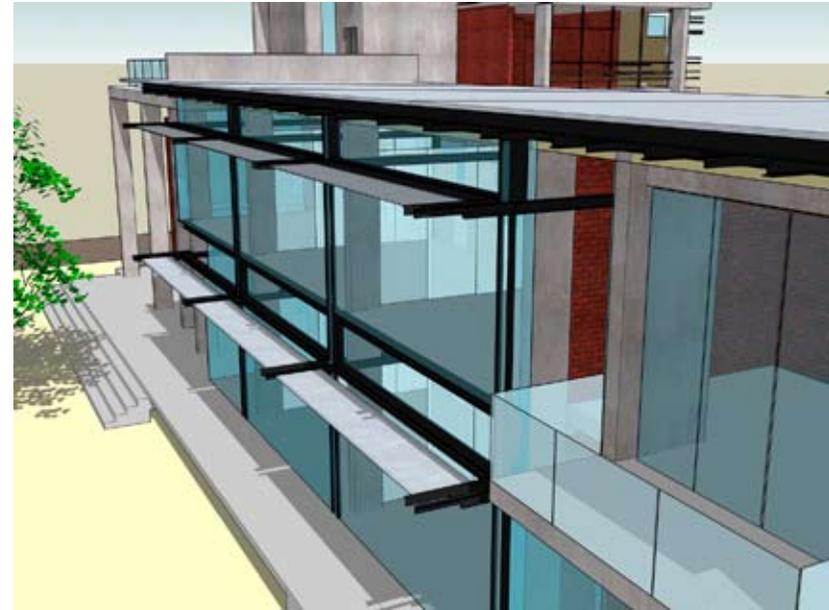


fig 7.12

fig 7.12 light shelf and sun shading - architectural studio

fig 7.13 timber louvres - workshop



fig 7.13

fig 7.14 timber louvers - offices

fig 7.15 timber louvers - 25 Daleham Mews, London



fig 7.14



fig 7.15



7.5 Revealing Services

Louis Kahn on services:

"I don't like pipes. I don't like ducts. I hate them thoroughly, but because I hate them thoroughly, I feel they have to be given their place. If I just hated them and took no care, I think they would invade the building and completely destroy it" (Frampton, 1996:217).

The design of the services provided was refined several times from the concept design to the final product. The most important decisions were made on the basis of ensuring services that functioned optimally without cluttering the spaces in between.

The services in the building were regarded as design opportunities rather than constraints. Because of the fragmented nature of the building, the service cores and shafts were used to connect the separate building elements vertically as well as on plan, forming pivot points throughout the building.

7.5.1 Site

The proposed project is situated on a 'Brownfield' site that is currently used as a parking lot. The parking area is finished with impermeable asphalt that is detrimental to biodiversity. A basement parking level has replaced and added to the existing number of parking spaces available.

7.5.2 Acoustics

The auditorium is fitted to allow for optimum acoustic performance. Standing waves between parallel walls may cause the enhancement of certain frequencies. This is undesirable, as optimum sound produces the same amount of enhancement across all frequencies. To avoid this, the auditorium has non-parallel walls along the sides so that the standing waves are not trapped. The contents of a room affects the amount of absorption and in turn the reverberation time. For this reason the auditorium has seats that act as sound absorbers for shorter reverberation (speech).

In the auditorium the speaker in front produces the sound and for this to be clearly audible in a direct sound path, all the listeners sit on stepped seats within eyesight of the speaker.

For excellent sound enhancement, the ceiling and side walls of the rooms are finished with plywood panels that reflect and disperse sound. The plywood panels have absorptive material behind them to absorb background noise.

Where the floor and ceiling are parallel where the speaker stands, flutter echoes will occur between the two surfaces. The speaker will hear himself and will therefore tone down his voice and will thus not be heard at the back of the

room. This can be prevented by an additional angled sounding board suspended above the speaker to reflect sound where it is desired.

To further improve the acoustics in the auditorium, the back wall and a third of the ceiling were made absorbent. Plywood panels fitted to the rear wall have 6mm diameter perforations, to allow the sound through to be absorbed by the porous material behind the panels.

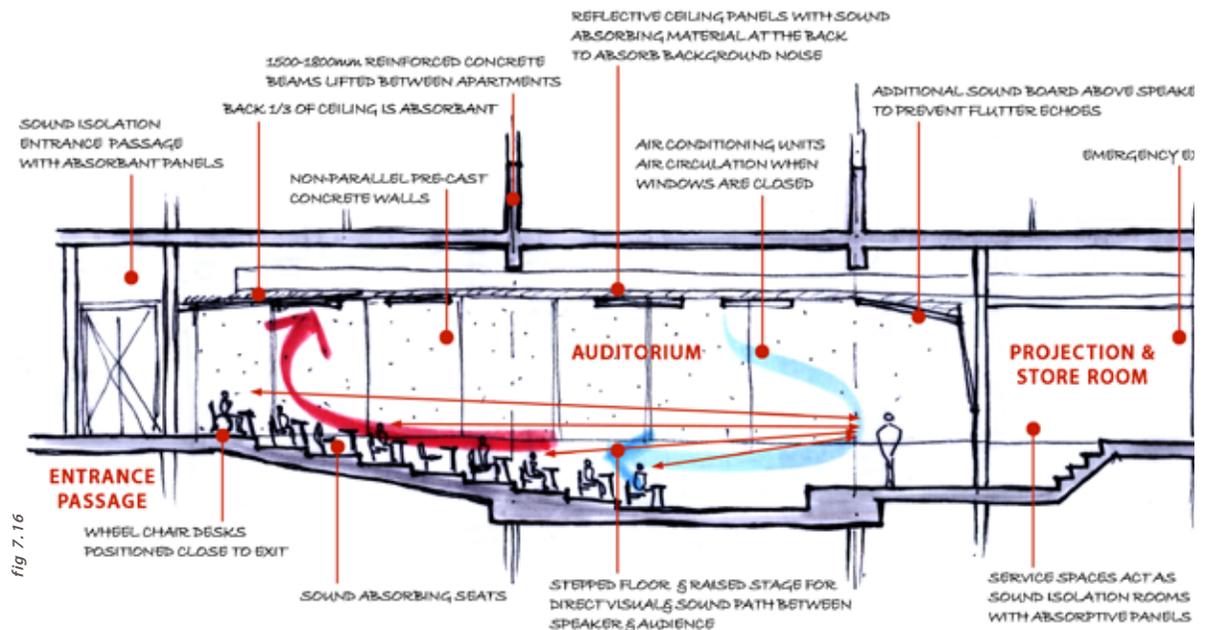


fig 7.16

fig 7.16 acoustic treatment of lecture hall

7.5.3 Rainwater Harvesting

Rainwater harvesting will be feasible, due to the large roof area of the project. The water harvested will be used for irrigation purposes only and not for human consumption. This implies that there will be no need for water treatment. Rainwater can simply be stored for use when needed, or used directly for irrigation.

The drainage surfaces on the roof consists mainly of profiled sheeting as well as some exposed concrete surfaces. All water is drained toward outlets and gutters leading to 80mm diameter mild steel galvanised down pipes placed in columns which drains into storage tanks.

The basement has openings allowing for natural ventilation and lighting and this may lead to minimal amounts of rainwater getting into the basement. This water is drained via a granolithic surface laid in a herringbone pattern with a minimum slope of 1:70 and laid to fall toward the sump indicated on plan from where it is mechanically pumped to the surface and planters.

Excess surface water is drained into the main municipal storm water management system.

Amount of collected water:

$$= \text{collection area (m}^2\text{)} \times 0.7\text{m/year}$$

TOTAL WATER HARVESTING AREA = (1 717m²)

MONTH	AGGREGATE RAINFALL IN mm / MONTH FOR PRETORIA	TOTAL AMOUNT OF WATER HARVESTED (kl)
January	101.3	174
February	108.8	187
March	63.8	110
April	37.5	64
May	48.4	83
June	3.8	7
July	2.3	4
August	2.3	4
September	11.3	19
October	82.5	141
November	168.8	290
December	112.5	193
TOTAL	745.27mm	1276kl

Financial gain brought about by water harvesting: 1276kl of water at a cost of R6,90 (July, 2008) per kl of water, R8804 can be saved annually.



fig 7.17

fig 7.17 cove 6, Pezula Golf Estate, Knysna, Stefan Antoni Architects



fig 7.18 diagram showing circulation shafts and service cores

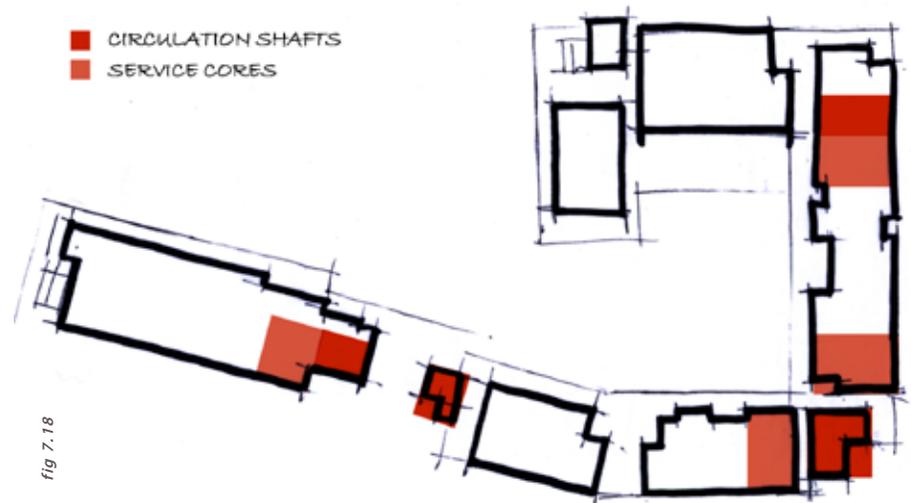


fig 7.18

7.5.4 Ducts & Circulation Shafts

Sewage will be collected at one point along the perimeter of the building and connected to the municipal line in the north-east corner of the site. Wet core services have as far as possible been kept to a minimum. The main soil pipes are fixed to the soffit of the coffer slab in the basement and run horizontally from the ducts to the main pipeline.

See appendix 10.4.7 for Sewage lines and municipal connections.

7.5.5 Fire

A rational fire design will have to be done by a professional. The entire building will comply with the Standard Building Regulations, with a suitable sprinkler system and fire fighting devices in place.

According to SABS 0400 TT7, structural elements in a 3-10 storey building must have the following resistance:

OCCUPANCY	CLASS OF OCCUPANCY	FIRE RESISTANCE (minutes)
Workshops	B2	120
Offices	G1	60
Restaurant	A1	120
Book Shop	F2	120
Auditoria	A3	90
Parking Garage	J4	60
Exhibition Hall	C1	120
Residential	H3	60

Structural steel will require a fire resistant coating. This will consist of a primer, an intumescent base coat, and a decorative top coat.

According to SABS 0040 section TT16.4, the travel distance measured to the nearest emergency escape access door must not to be more than 45m from any point in the building. The greatest distance to travel in the building to a fire escape is 28m and therefore complies with the regulations.

According to SABS 0040 TT17.1 a lecture room that has a population of more than 50 persons should have a minimum of 2 exit doors. The auditorium has 2 emergency exit doors as well as the main entrance doors and therefore complies with the regulations.

7.5.6 Facilities for the Disabled

According to SABS 0040 section S, all facilities should be fully accessible to persons with disabilities. Accordingly the building has been designed to be fully accessible to persons in wheelchairs. Ramps and lifts have been provided, as well as toilets for the disabled in all bathrooms.

According to SABS 0040 section SS8, at least 1 parking space per 200 provided must be suitable for parking of vehicles used by disabled persons and must be located as near as possible to the building access points. Of the 124 parking spaces provided, 5 are disabled spaces and placed as close to the lift shafts as possible. Ramps lead up to the lift platforms.

008 TECHNICAL DOCUMENTATION

8.1 Plans

8.2 Sections

8.3 Details

8.4 Elevations



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA



BRIDGING THE GAP
Interactive Architectural Incubator

SITE PLAN

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 1250

datum
date

NOV 2008

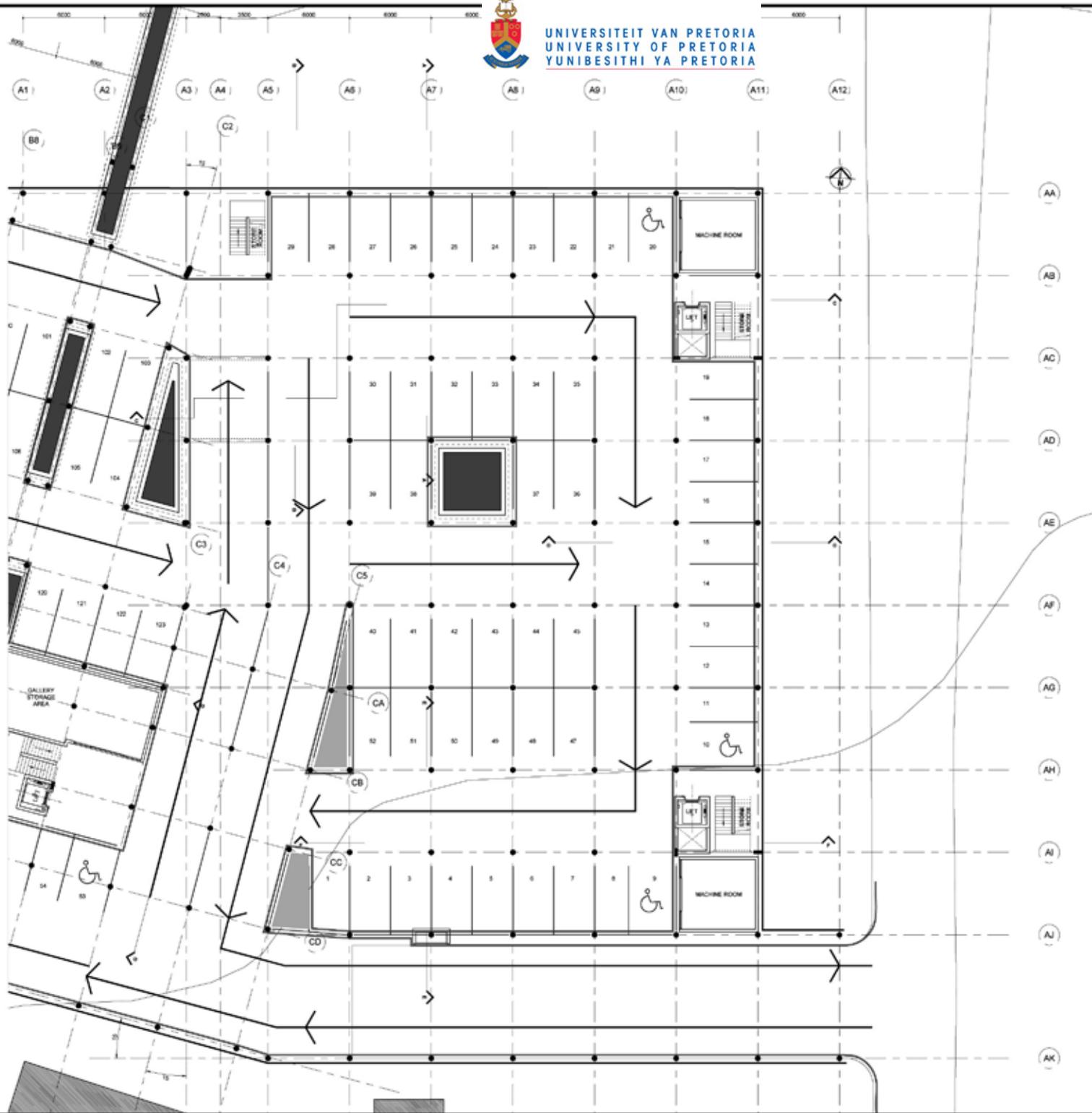
studente nommer
student number

20098465

tekeningnommer
drawing number

001





BRIDGING THE GAP
Interactive Architectural Incubator

BASEMENT PLAN

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 400

datum
date

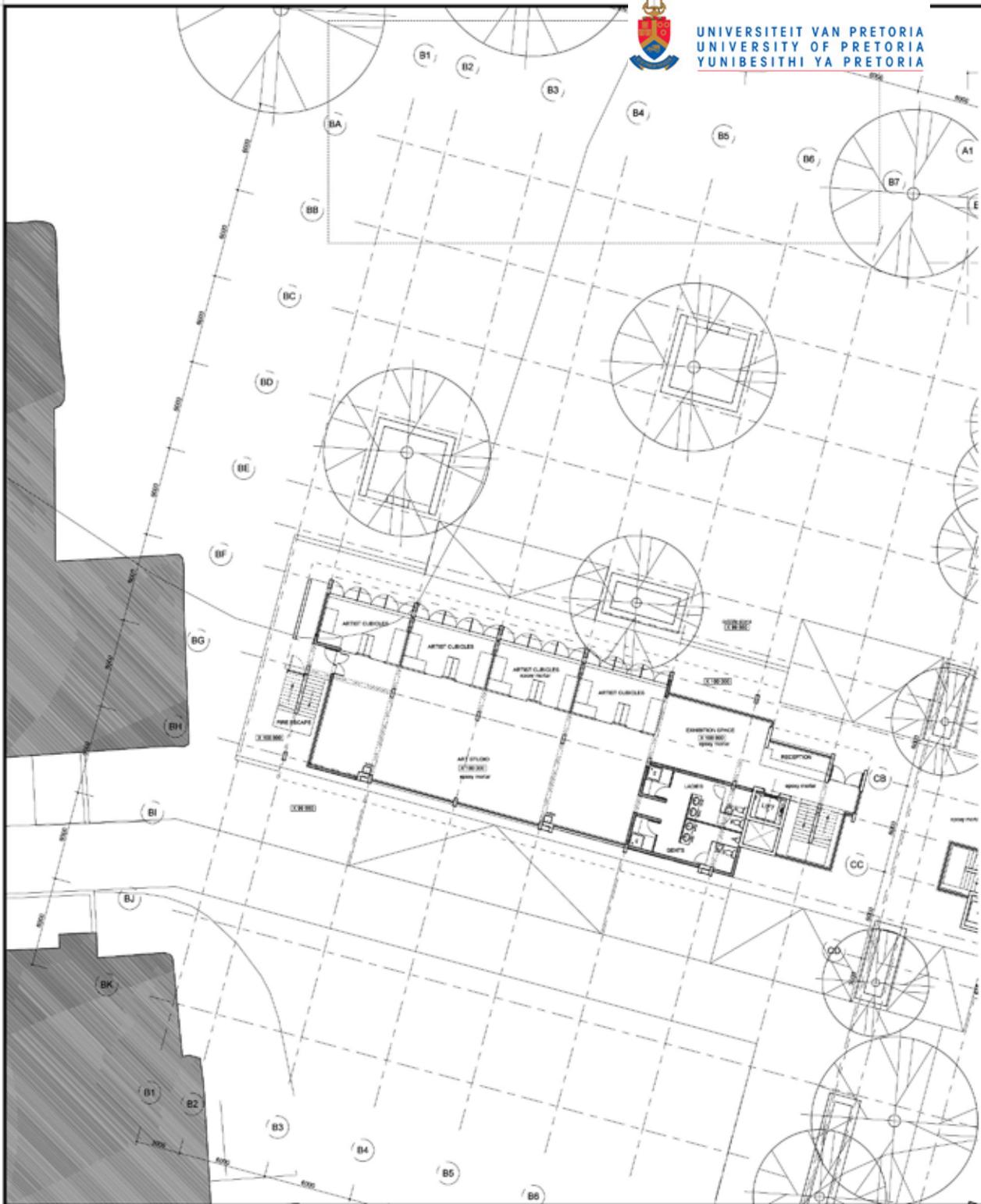
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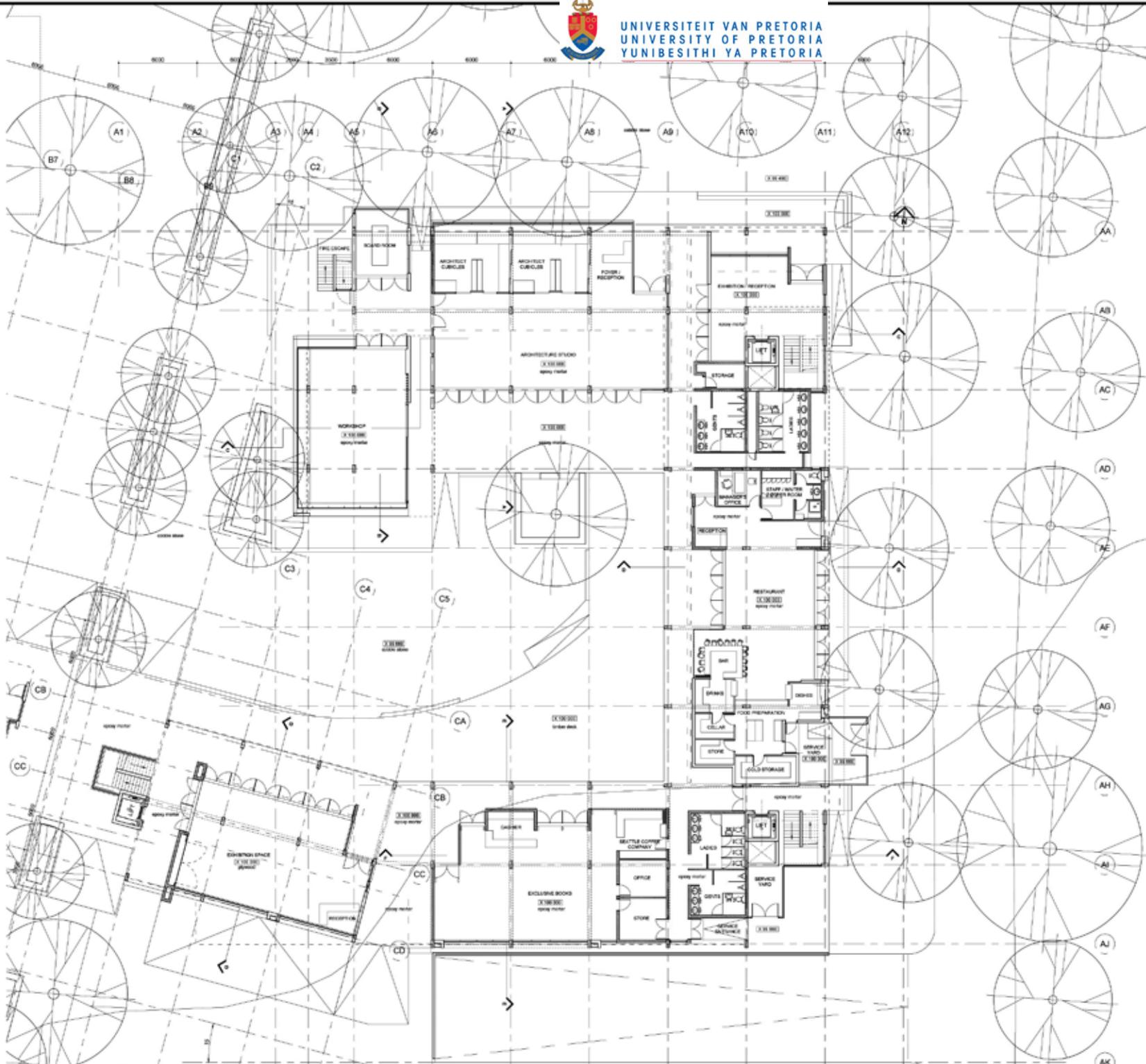
studente nommer
student number

20098465

tekeningnommer
drawing number

002





BRIDGING THE GAP
Interactive Architectural Incubator

GROUND FLOOR PLAN

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 400

datum
date

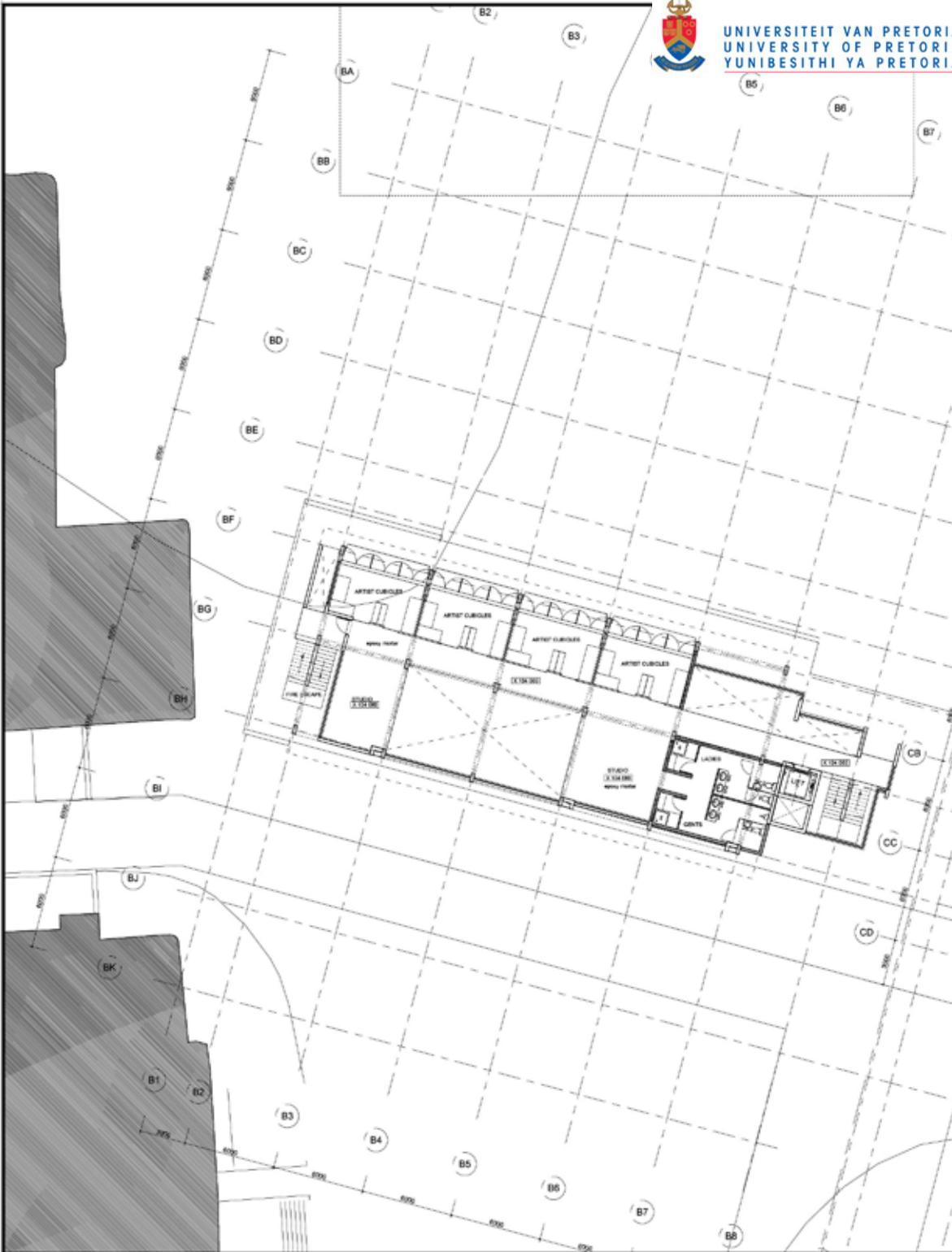
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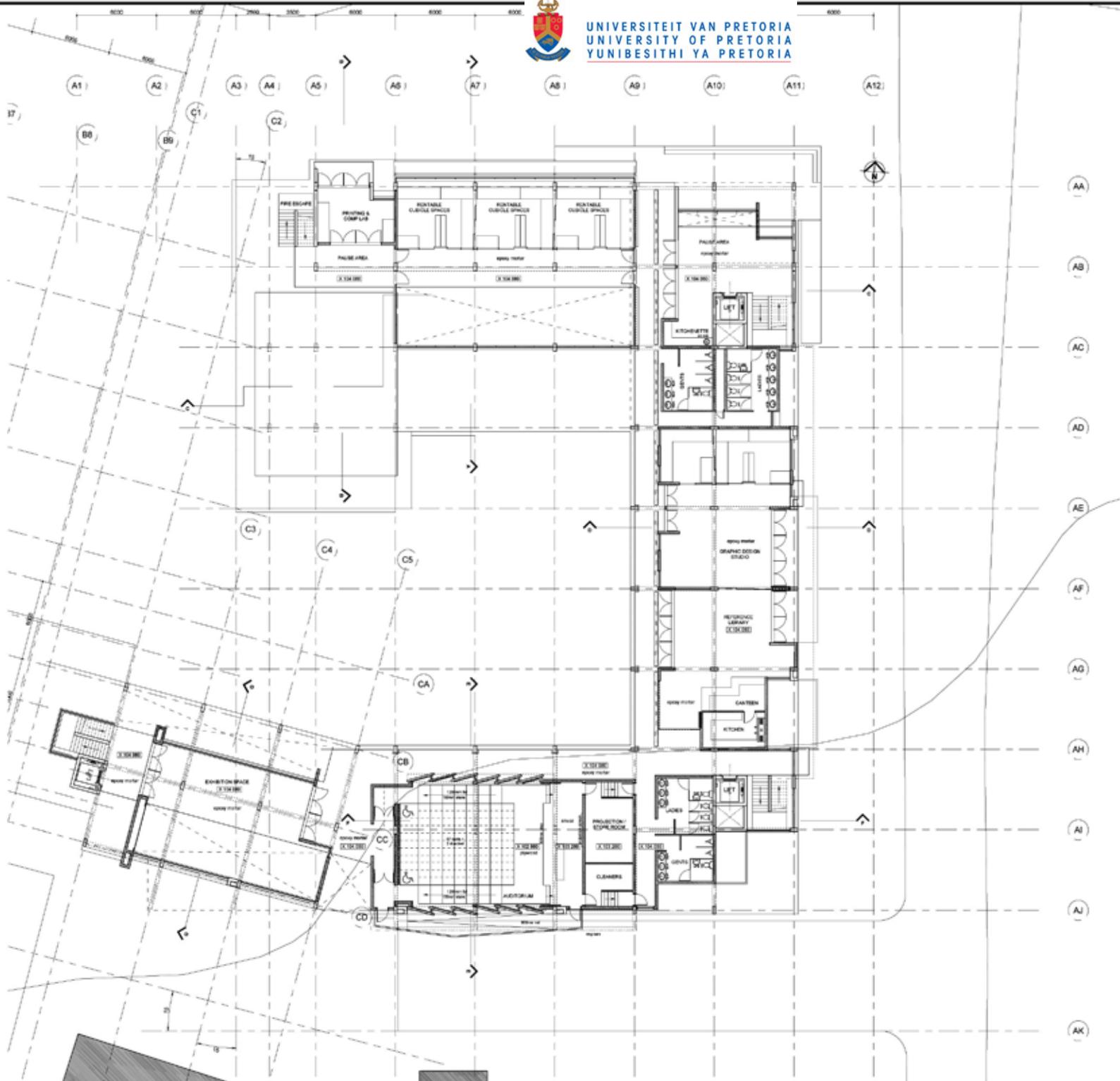
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student number

20098465

tekeningnommer
drawing number

003





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Interactive Architectural Incubator

FIRST FLOOR PLAN

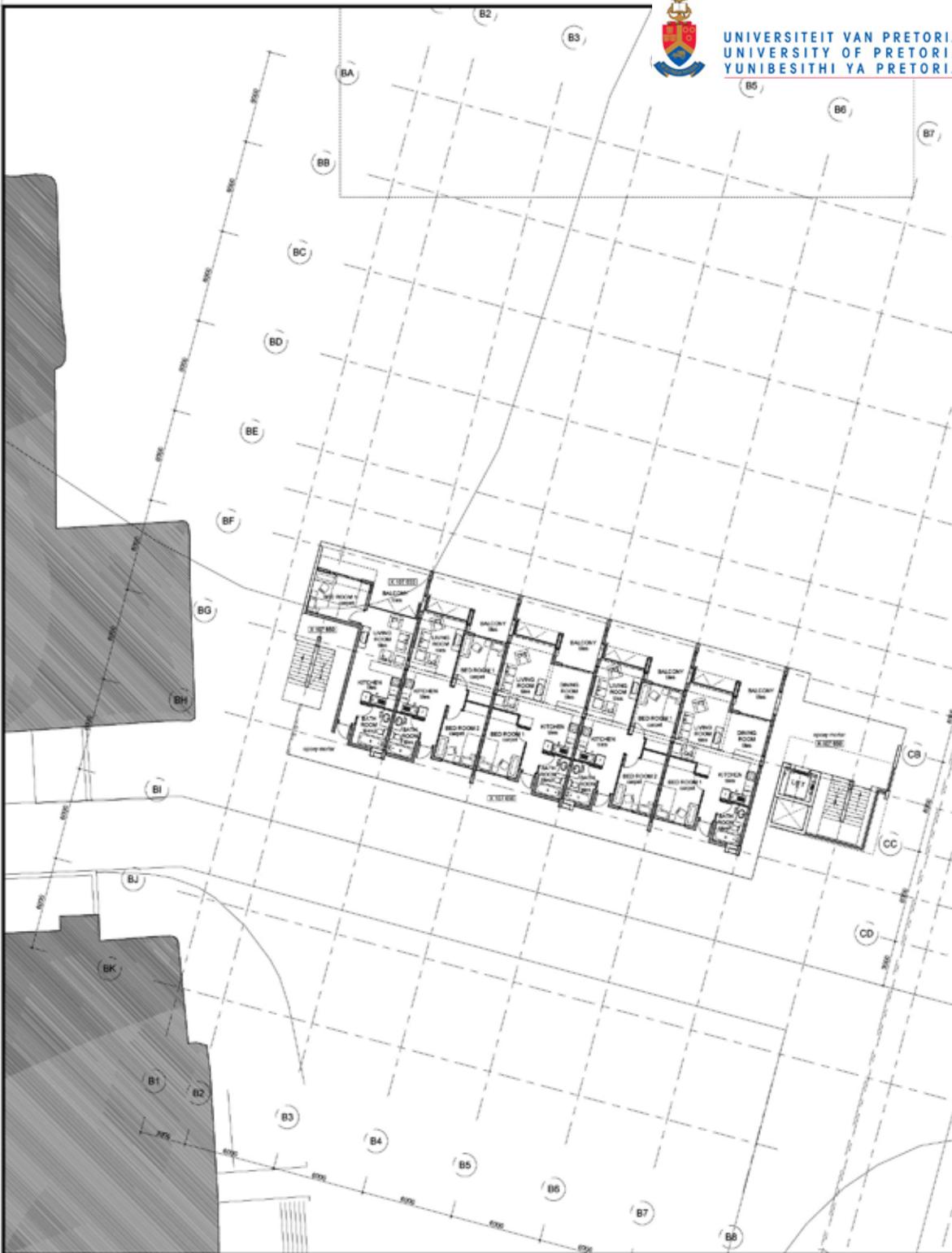
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name
CHRISTINE GOOSEN
skaal
scale

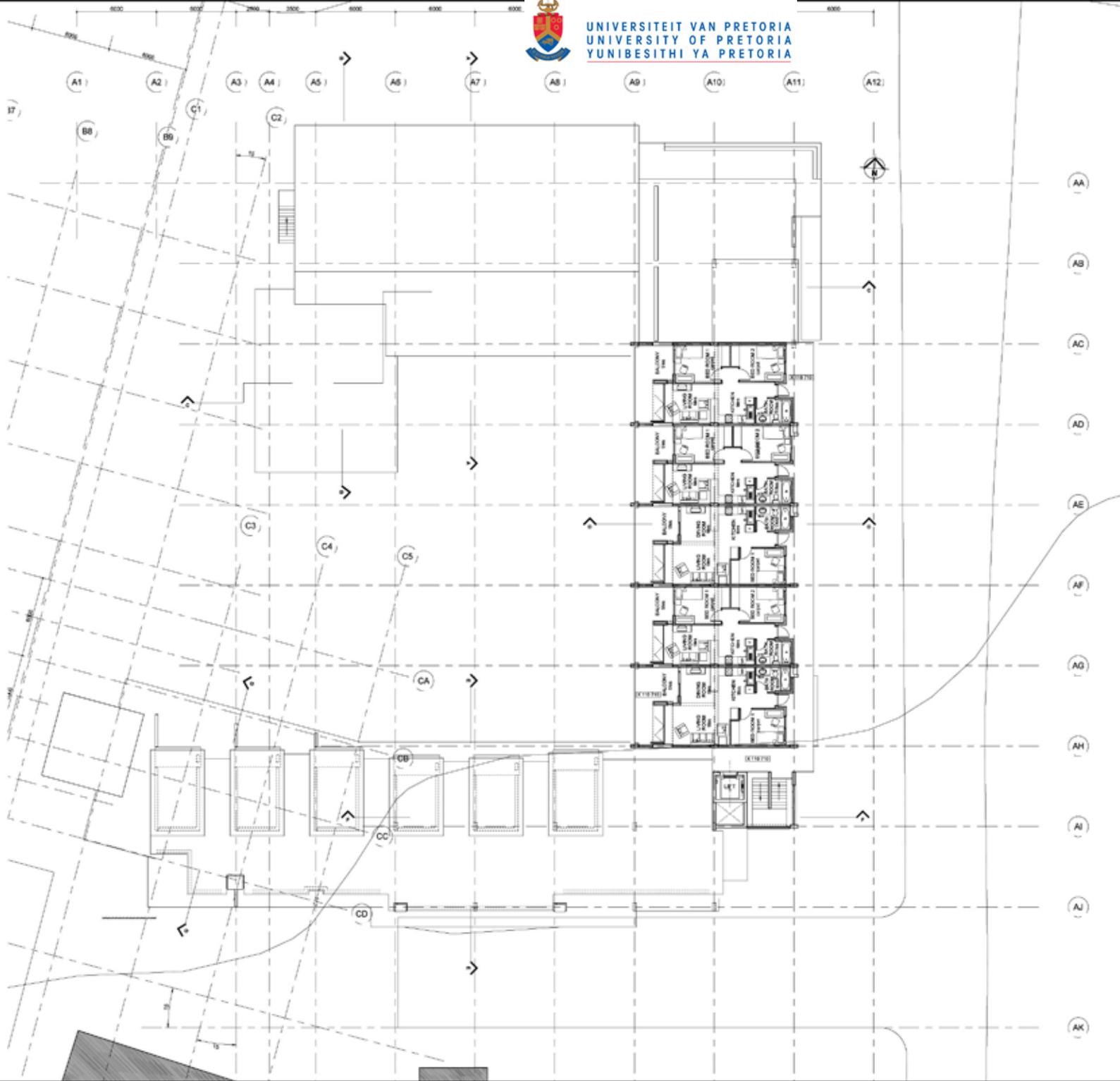
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datum
date
NOV 2008

studente nommer
student number
20098465

tekeningnommer
drawing number
004





BRIDGING THE GAP
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THIRD FLOOR PLAN

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 400

datum
date

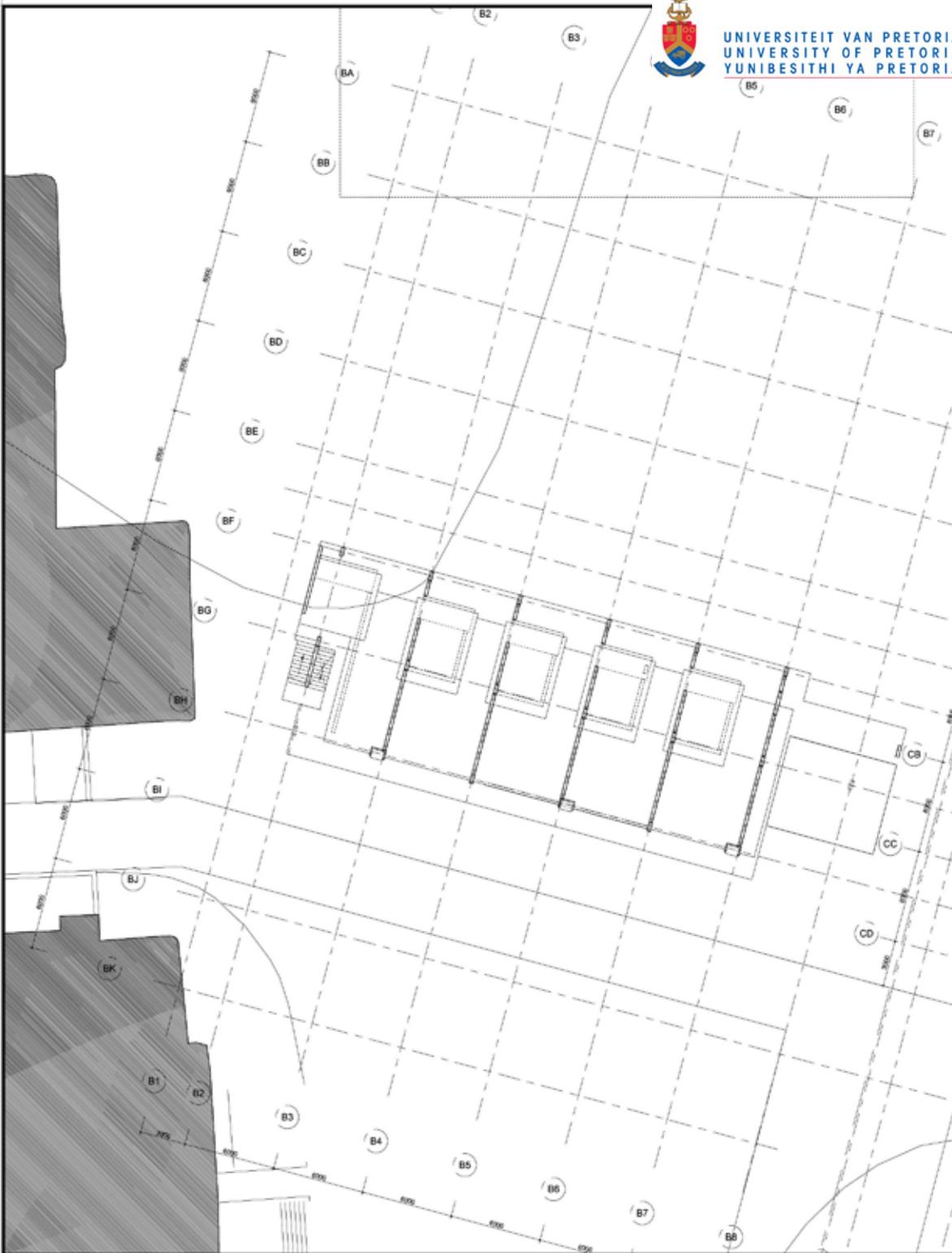
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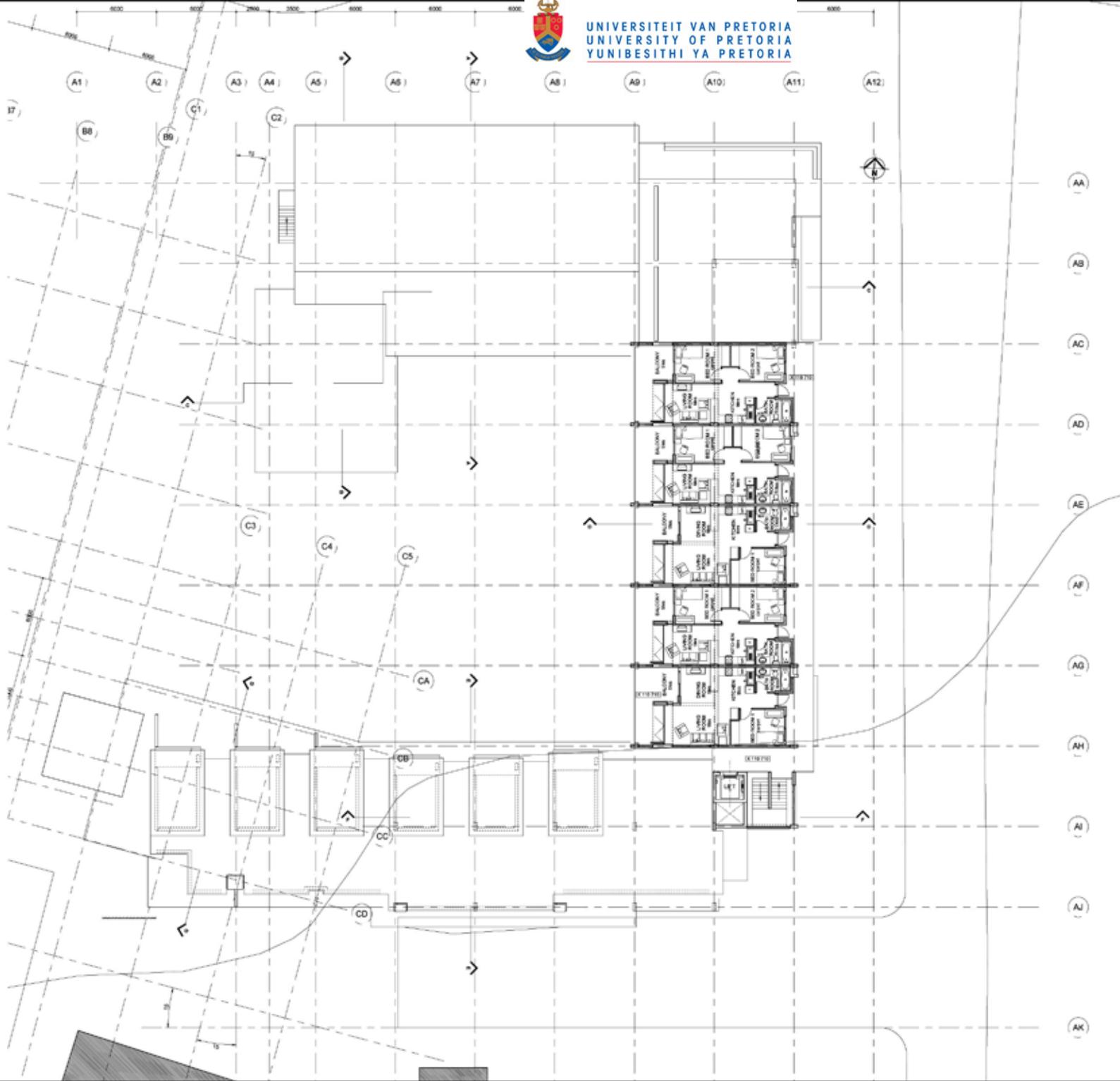
studente nommer
student number

20098465

tekeningnummer
drawing number

006





BRIDGING THE GAP
Interactive Architectural Incubator

THIRD FLOOR PLAN

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 400

datum
date

NOV 2008

studente nommer
student number

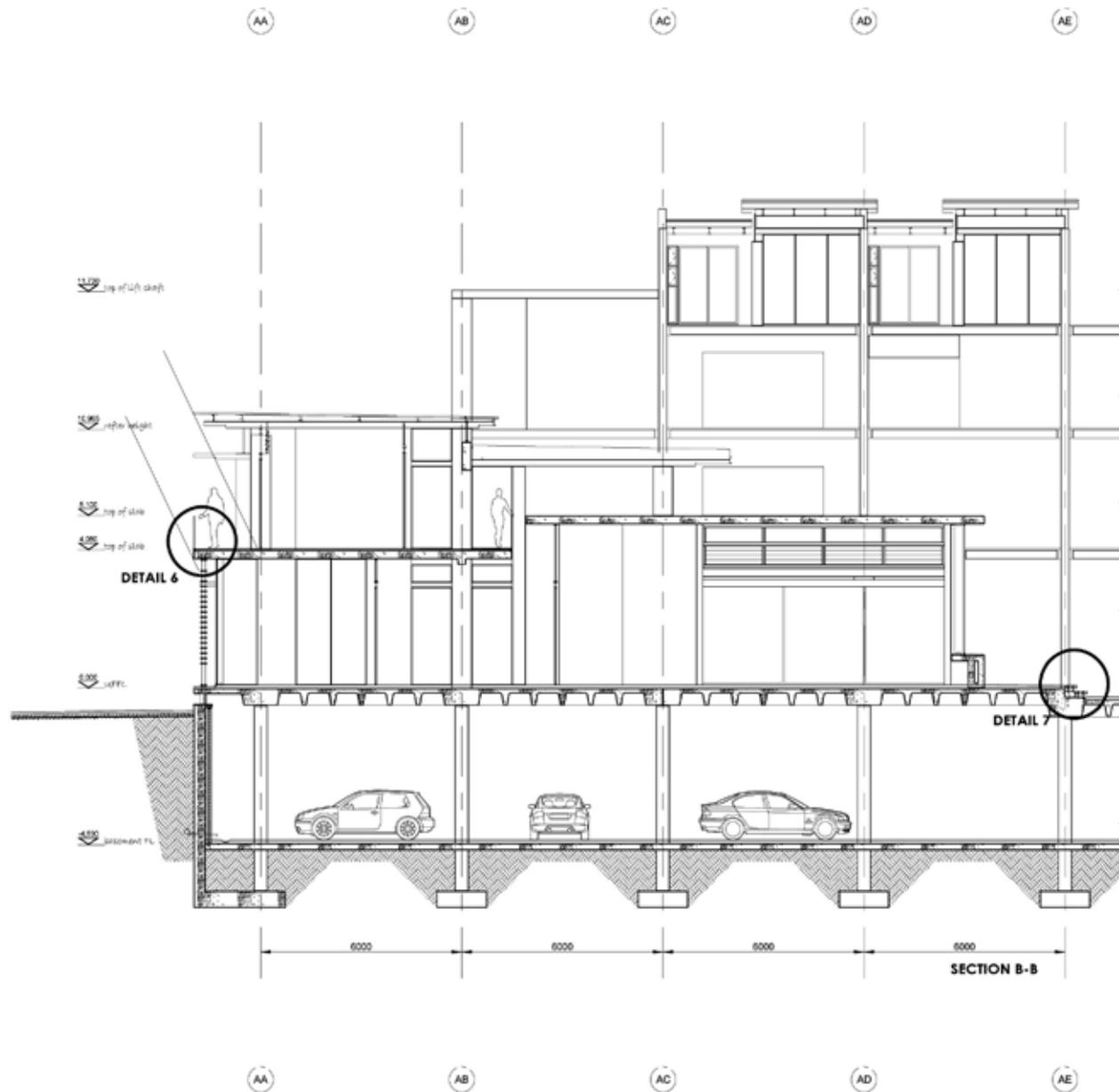
20098465

tekeningnommer
drawing number

006







BRIDGING THE GAP
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SECTION B-B

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 200

datum
date

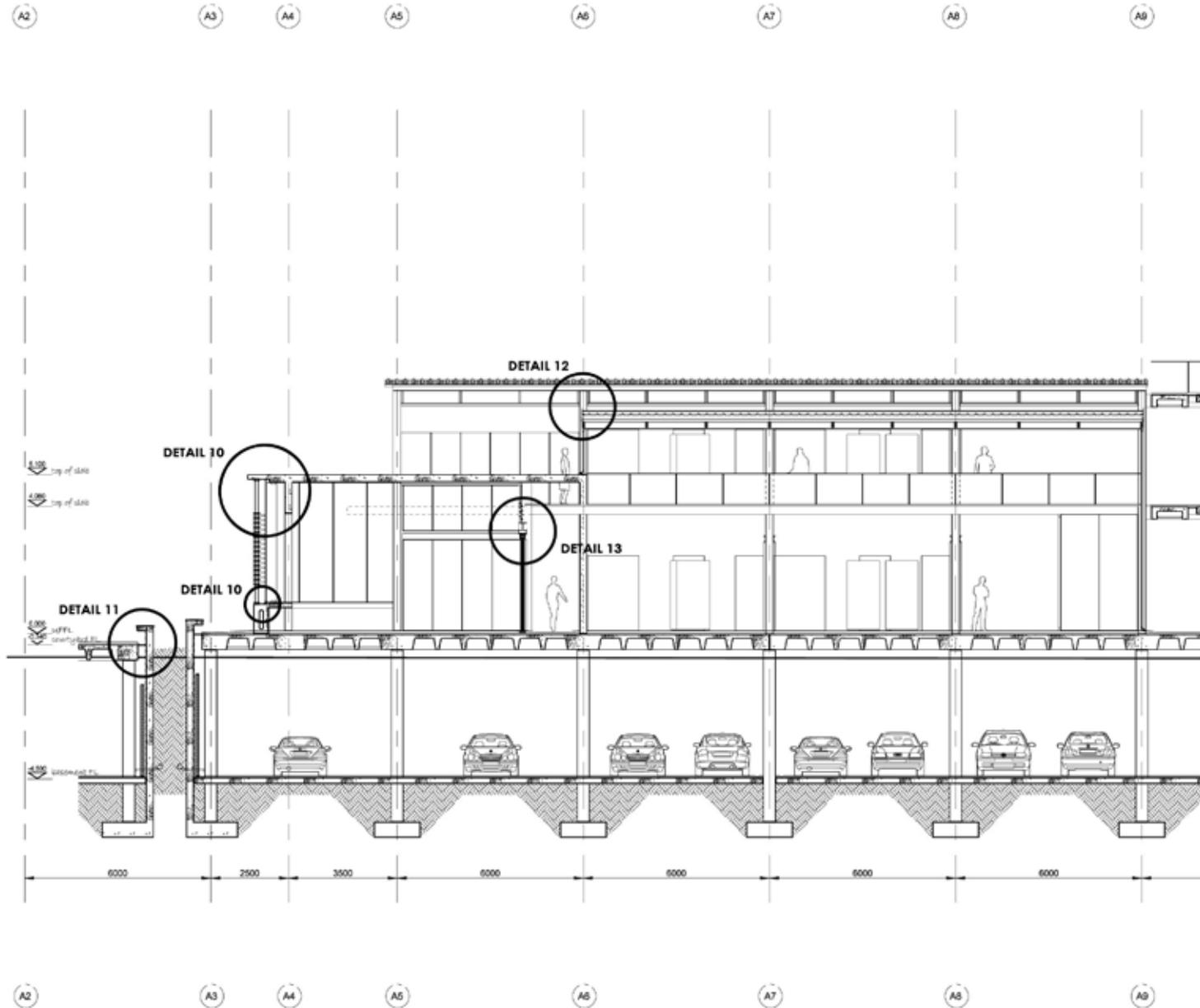
NOV 2008

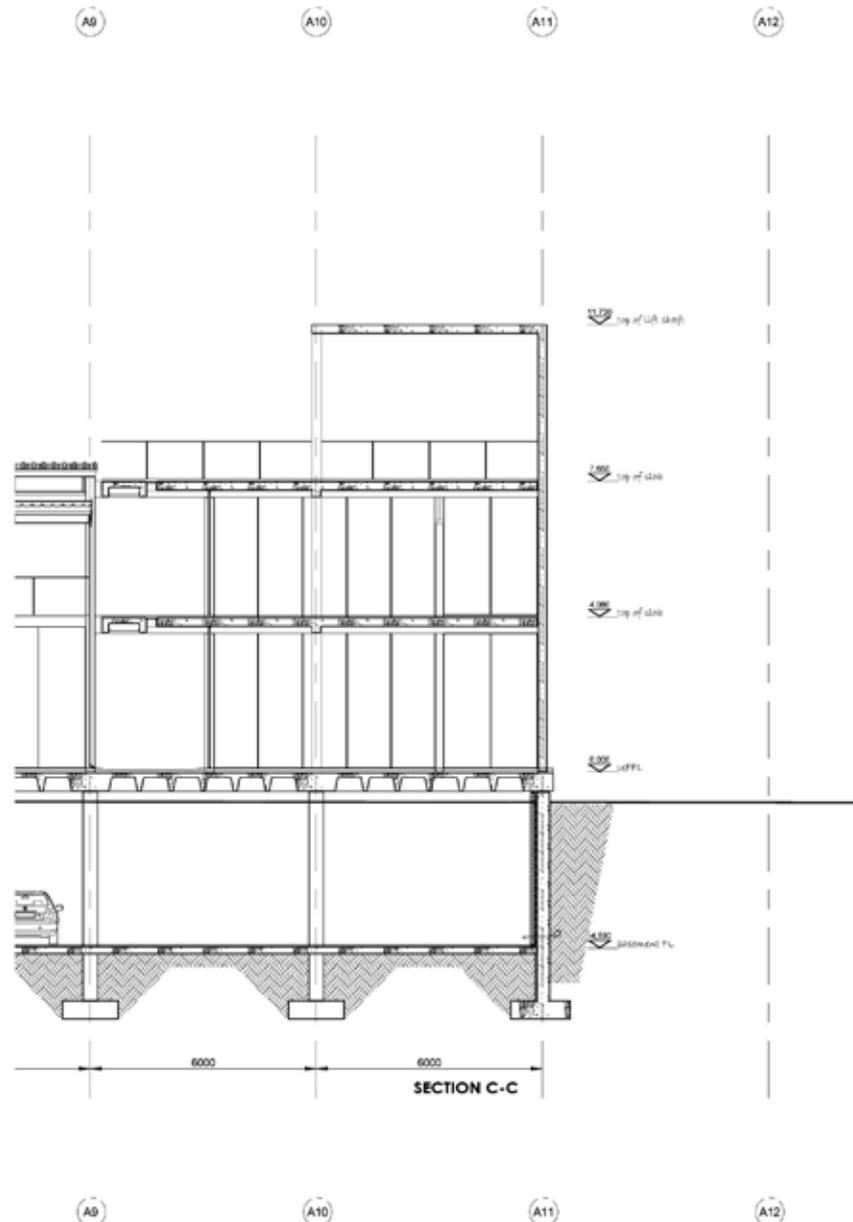
studente nommer
student number

20098465

tekeningnommer
drawing number

009





BRIDGING THE GAP
Interactive Architectural Incubator

SECTION C-C

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 200

datum
date

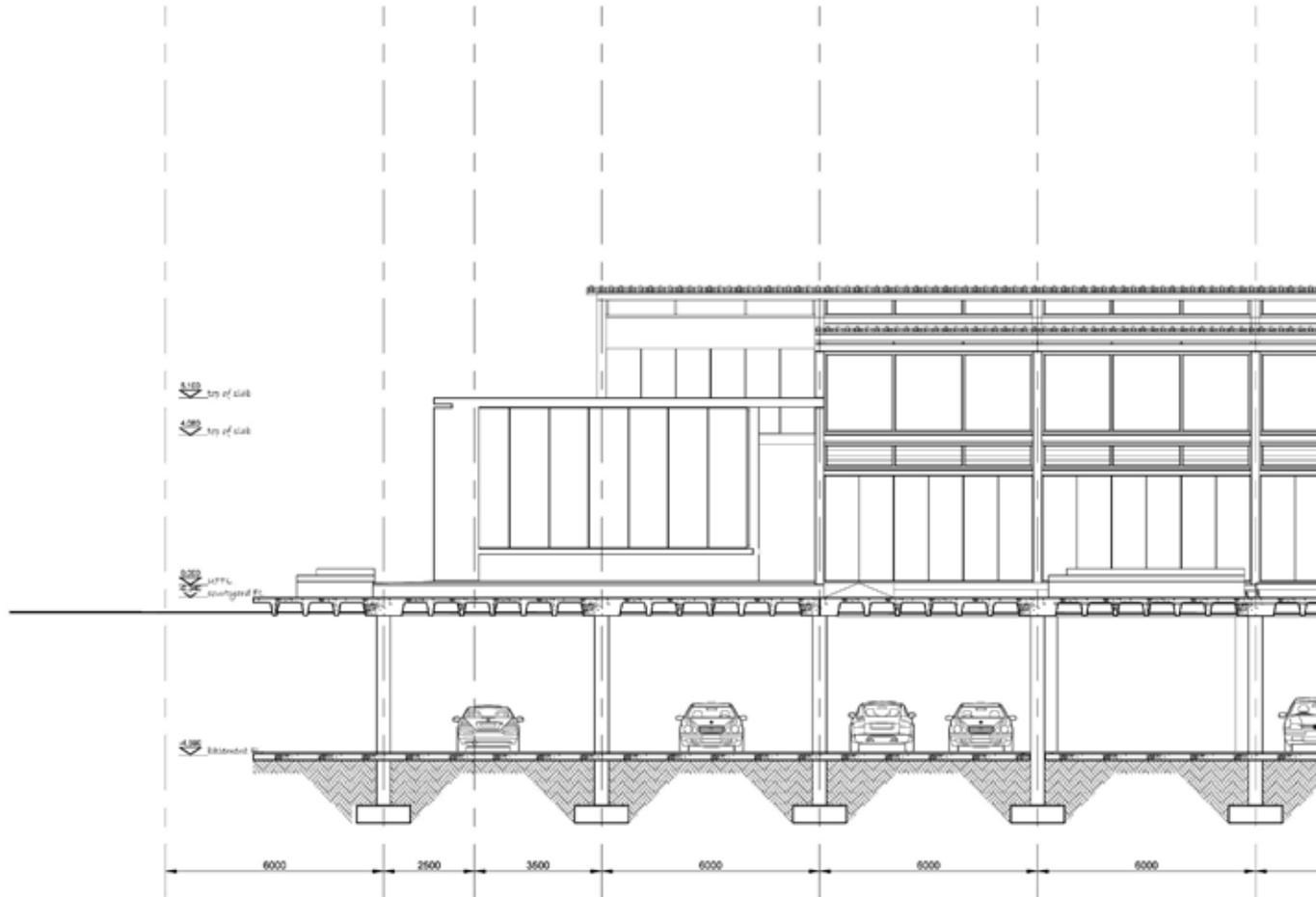
NOV 2008

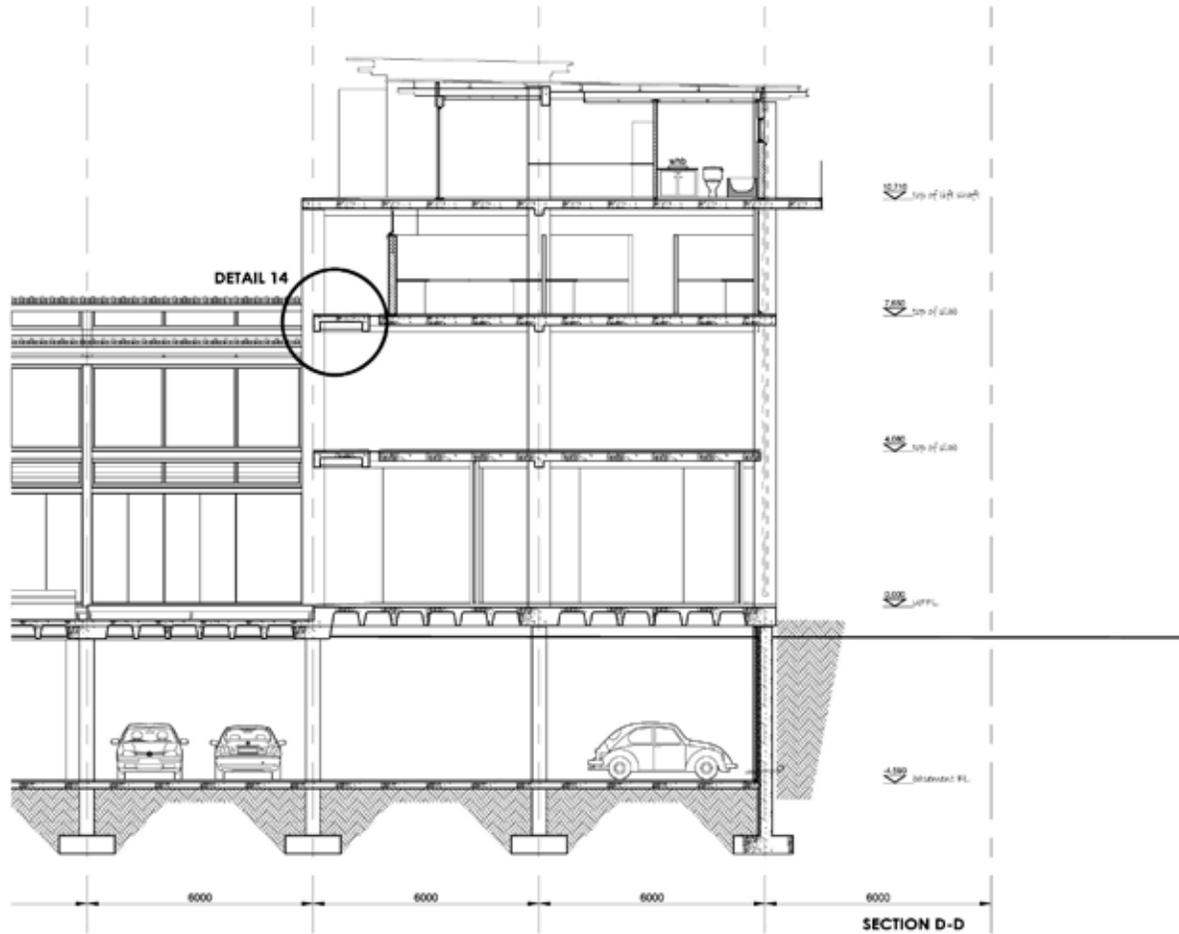
studente nommer
student number

20098465

tekeningnommer
drawing number

010





BRIDGING THE GAP
Interactive Architectural Incubator

SECTION D-D

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 200

datum
date

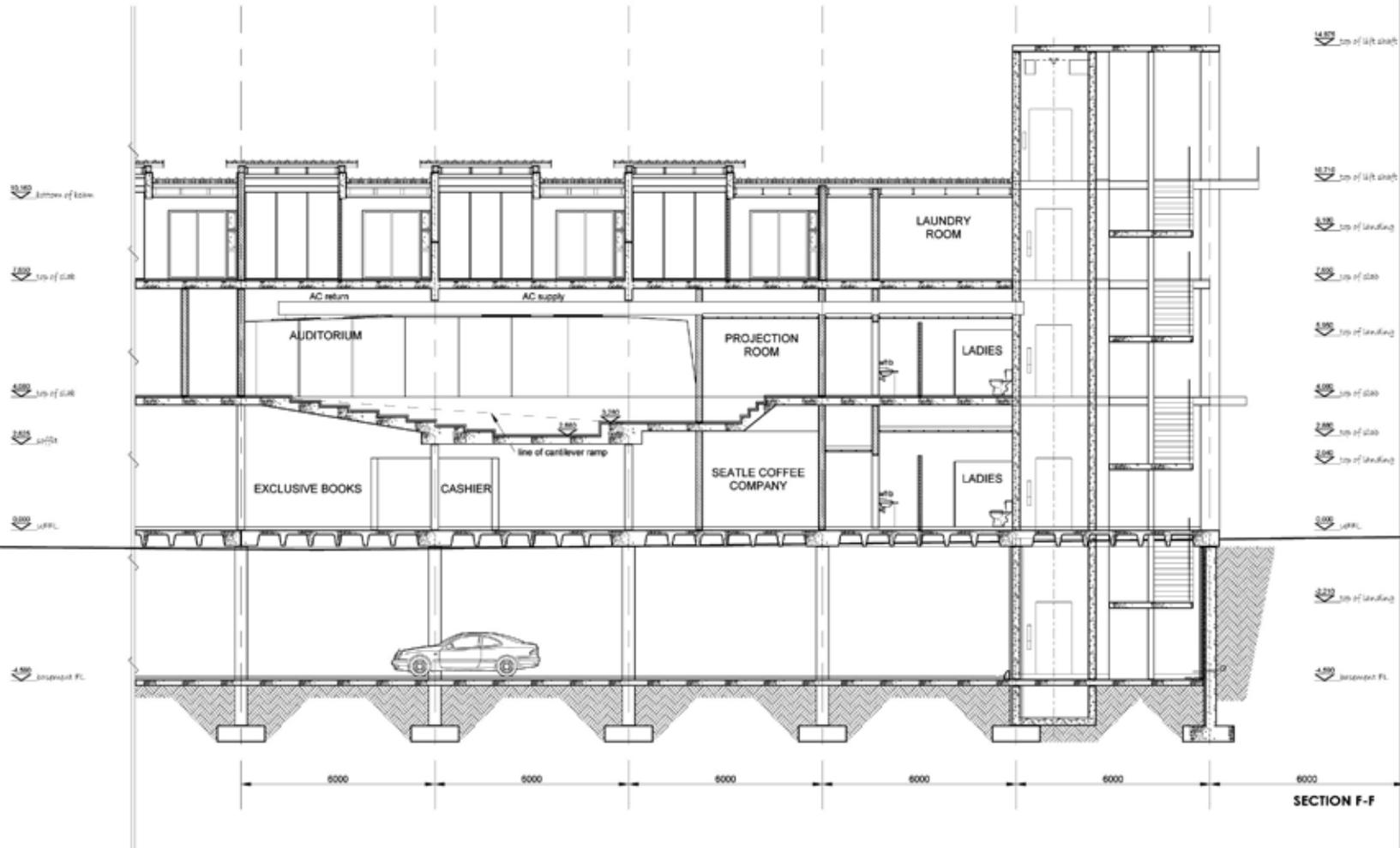
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studente nommer
student number

20098465

tekeningnommer
drawing number

011



BRIDGING THE GAP
Interactive Architectural Incubator

SECTION F-F

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 200

datum
date

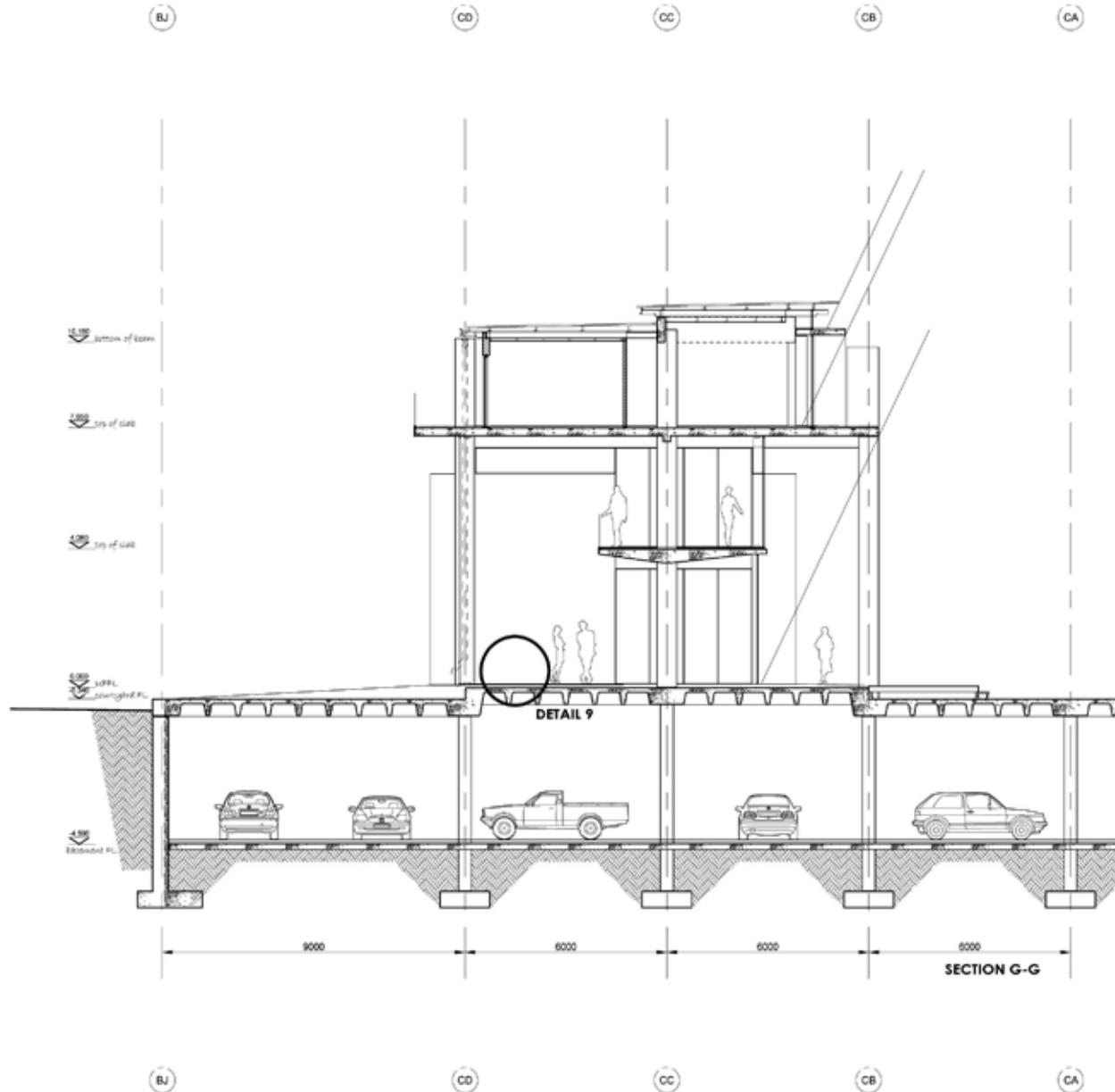
NOV 2008

studente nommer
student number

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tekeningnommer
drawing number

012



BRIDGING THE GAP
Interactive Architectural Incubator

SECTION G-G

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 200

datum
date

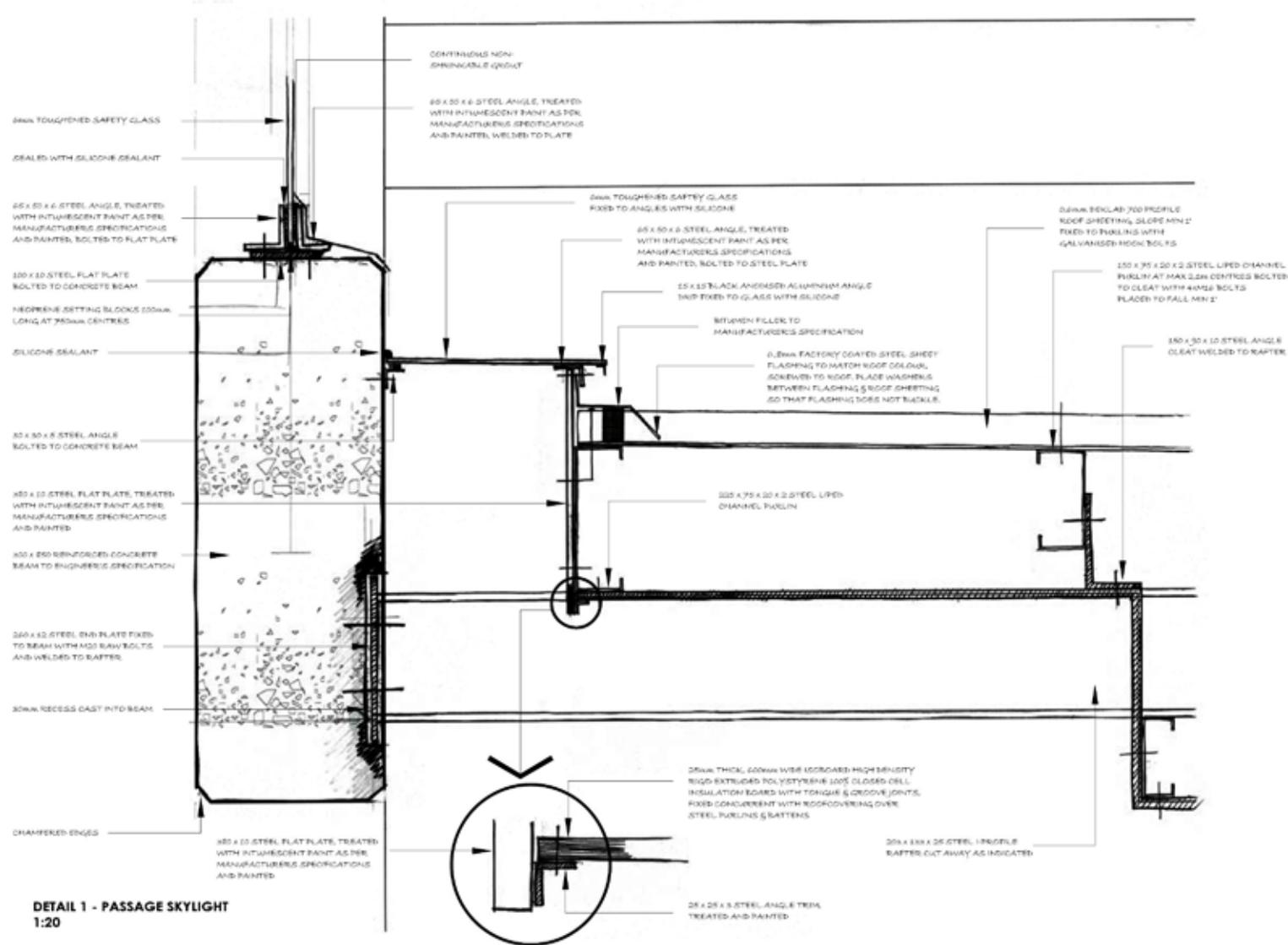
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studente nommer
student number

20098465

tekeningnommer
drawing number

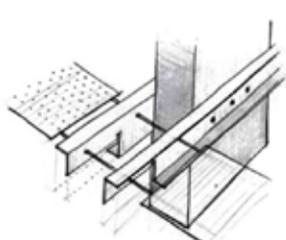
013



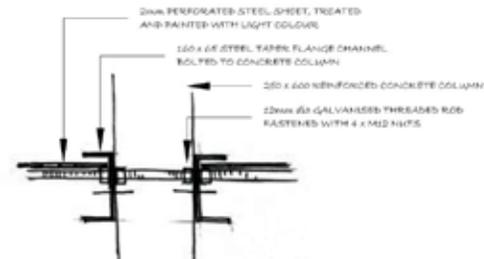
DETAIL 1 - PASSAGE SKYLIGHT
1:20



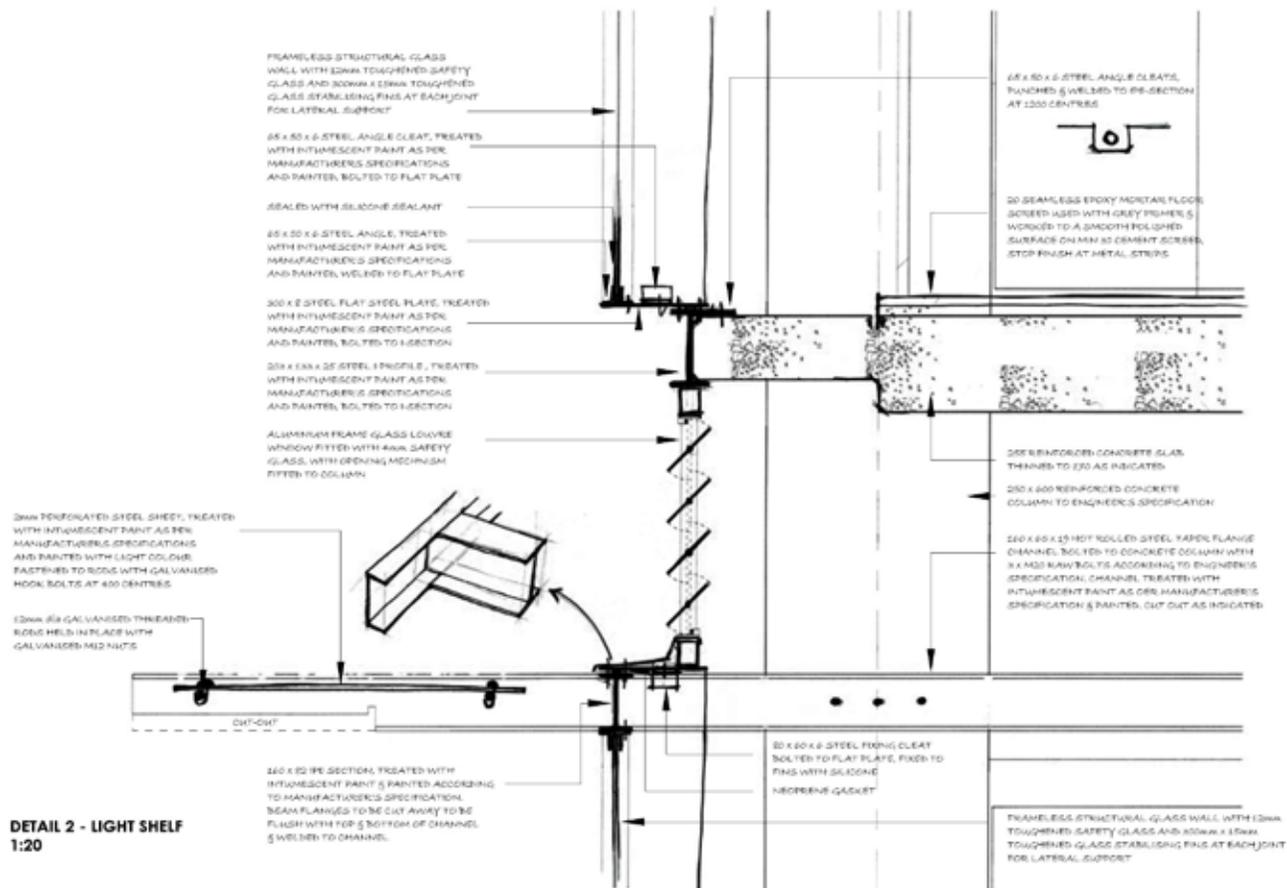
LIGHT SHELF & SUN SHADE CONCEPT



PERSPECTIVE - CHANNEL LIGHT SHELF



ELEVATION - CHANNEL LIGHT SHELF



DETAIL 2 - LIGHT SHELF
1:20

BRIDGING THE GAP
Interactive Architectural Incubator

DETAILS 1 & 2

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 20

datum
date

NOV 2008

studente nommer
student number

20098465

tekeningnommer
drawing number

014



0,2mm FACTORY COATED STEEL SHEET
FLASHING TO MATCH ROOF COLOUR,
JOBBER TO ROOF, PLACE WASHERS
BETWEEN FLASHING & ROOF SHEETING
SO THAT FLASHING DOES NOT BACKLIE.

12R x 75 x 20 x 2 STEEL LIPED CHANNEL BURLIN
AT MAX 25mm CENTRES BOLTED TO CLEAT WITH
RIBBED BOLTS PLACED TO FALL, MIN 1" RIGID TO
BURLINS WITH HDGK BOLTS

12R x 75 x 6 STEEL ANGLE
CLEAT WELDED TO RAFTER

12R x 75 x 6 STEEL ANGLE
WELDED TO RAFTER

0,2mm BENG LAB 700 PEOPLE
ROOF SHEETING, SLOPE MIN 1°

200 x 100 STEEL IPE SECTION RAFTER
CUT AWAY AS INDICATED, TREATED
WITH INTUMESCENT PAINT AS PER
MANUFACTURERS SPECIFICATIONS,
PAINTED & WELDED TO CHANNEL

120 x 70 x 22 TANK FLANGE CHANNEL TRIM,
TREATED WITH INTUMESCENT PAINT AS PER
MANUFACTURERS SPECIFICATIONS,
PAINTED & WELDED TO ANGLE

65 x 50 x 6 STEEL ANGLE, TREATED
WITH INTUMESCENT PAINT AS PER
MANUFACTURERS SPECIFICATIONS,
PAINTED & WELDED TO CHANNEL

65 x 50 x 6 STEEL ANGLE
BOLTED TO ANGLE

6mm TONIGHTED SAFETY GLASS

SEALED WITH SILICONE SEALANT

CONTRACTORS NON-SHRINKABLE GROUT

65 x 50 x 6 STEEL ANGLE, TREATED
WITH INTUMESCENT PAINT AS PER
MANUFACTURERS SPECIFICATIONS
AND PAINTED, BOLTED TO CONCRETE

35 x 30 x 5 STEEL ANGLE, TREATED
WITH INTUMESCENT PAINT AS PER
MANUFACTURERS SPECIFICATIONS
AND PAINTED, BOLTED TO CONCRETE

NEOPRENE SETTING BLOCKS 600mm
LONG AT 750mm CENTRES

CEMENT SCREEN MIN 30
LAD TO FALL 1/70

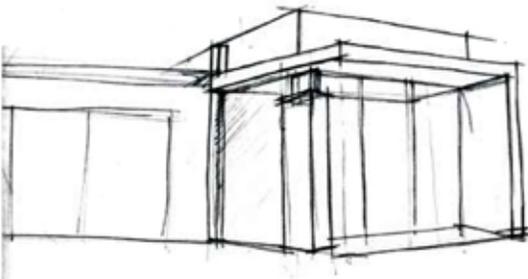
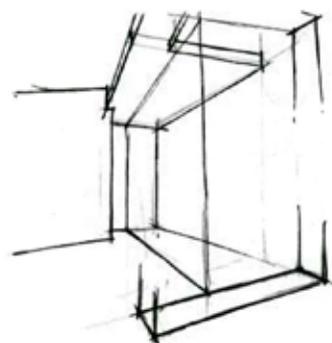
170 x 1500 REINFORCED
CONCRETE SLAB, STEPPED
60mm TO INTERIOR

20mm DRIP JOINT

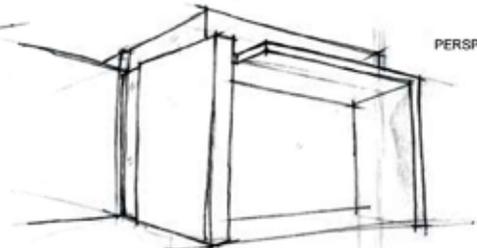
SLIBING STACKING DOORS

REINFORCED CONCRETE
BEAM ACCORDING TO
ENGINEER'S SPECIFICATION

DETAIL 3 - LIGHT SHELF IN FLAT
1:20



PERSPECTIVES - FLAT FRONT FACADE



PERSPECTIVE - INTERIOR VIEW



600mm SMC LAB 700 PROFILE
ROOF SHEETING, SLOPE 4MIN/1"
FIXED TO PURLINS WITH
GALVANISED HOOK BOLTS

50 x 100 x 20 x 8 COLD FORMED
STEEL LIPPED CHANNEL PURLINS
BOLTED TO RAFTER

200 x 100 STEEL IPE SECTION RAFTER
CUT AWAY AS INDICATED, TREATED
WITH INTUMESCENT PAINT AS PER
MANUFACTURERS SPECIFICATIONS,
PAINTED & WELDED TO CHANNEL

1 x 800 x 0,6 GALVANISED STEEL
ITER, LAB TO FALL, MIN E200

200 x 95 x 25 TAPER FLANGE CHANNEL TRIM,
TREATED WITH INTUMESCENT PAINT AS PER
MANUFACTURERS SPECIFICATIONS,
PAINTED & WELDED TO RAFTER

750mm 60 x 0,6 GALVANISED STEEL
SHEET RAIN WATER PIPE, FITTED INTO
CAST PIPE IN COLUMN

CAST IRON FUNNEL TYPE RAINWATER OUTLET
FIXED IN POSITION WITH 4 x M20 BOLTS

800mm 60 x 0,6 GALVANISED STEEL SHEET
RAIN WATER PIPE CAST INTO COLUMN

200 x 600 REINFORCED CONCRETE
COLUMN TO ENGINEERS SPECIFICATION

DETAIL 4 - ROOF END & GUTTER
1:20

STRUCTURAL GLASS FINS

ENAMELLESS STRUCTURAL GLASS
WALL WITH 1200mm TONGUED SAFETY
GLASS AND 300mm x 150mm TONGUED
GLASS STABILISING TIES AT EACH JOINT
FOR LATERAL SUPPORT

80 x 80 x 8 STEEL FIXING PLATE
BOLTED TO CONCRETE AND FIXED
TO FINISH WITH SILICONE

20 SEAMLESS EPOXY MORTAR FLOOR
SCREENED USED WITH GREY PRIMER &
WORKED TO A SMOOTH POLISHED
SURFACE ON MIN 30 CEMENT SCREEN,
STOP FINISH AT METAL STURD

600 REINFORCED CONCRETE SLAB
TO ENGINEERS SPECIFICATION

400mm 60 REINFORCED
CONCRETE COLUMN ACCORDING
TO ENGINEERS SPECIFICATION

80 x 80 x 8 STEEL ANGLE, TREATED
WITH INTUMESCENT PAINT AS PER
MANUFACTURERS SPECIFICATIONS
AND PAINTED, BOLTED TO CONCRETE

600 x 600 x 8 STEEL ANGLE, TREATED
WITH INTUMESCENT PAINT AS PER
MANUFACTURERS SPECIFICATIONS
AND PAINTED, BOLTED TO CONCRETE

CEMENT SKEED
LAB TO FALL

CEMENT SKEED
LAB TO FALL

CHAMFERED EDGE

50mm BRP JOINT

DETAIL 5 - COFFER SLAB EDGE
1:20

1200mm TONGUED SAFETY GLASS
BALUSTRADE ACCORDING TO SLAB

5 - 10mm SILICONE TOPPING

CONTINUOUS NON-SPRINKABLE GROUT

40 x 115 GALVANISED STEEL CHANNEL
THE LENGTH OF THE BALUSTRADE

NEOPRENE SETTING BLOCKS
100mm LONG AT 750 CENTRES

250 x 8 STEEL PLATE, TREATED WITH INTUMESCENT
& PAINTED TO MANUFACTURERS SPECIFICATION,
FIXED TO FLOOR SLAB WITH M20 BOLTS &
EXTENDED 300mm BELOW SLAB TO FORM DRIP

80 x 80 x 8 UNEQUAL STEEL ANGLE WITH 50mm
FLAT BAR EXTENSION, TREATED WITH INTUMESCENT
PAINT & PAINTED TO MANUFACTURERS
SPECIFICATION, BOLTED TO CONCRETE

20 SEAMLESS EPOXY MORTAR FLOOR SCREENED USED WITH
GREY PRIMER & WORKED TO A SMOOTH EXTERIOR SURFACE
ON MIN 30 CEMENT SCREEN, STOP FINISH AT ANGLE

200 REINFORCED CONCRETE SLAB
THINNED TO 120 AS INDICATED, TO
ENGINEERS SPECIFICATION

100mm 60 STEEL ROUND ANCHORS

NEOPRENE GASKET

DETAIL 6 - BALUSTRADE
1:20

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Interactive Architectural Incubator

DETAILS 3, 4, 5, 6

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 20

datum
date

NOV 2008

studente nommer
student number

20098465

tekeningnummer
drawing number

015



30 x 50 x 5 STEEL ANGLE ENDING TREATED WITH INTUMESCENT PAINT AS PER MANUFACTURERS SPECIFICATIONS AND PAINTED, FIXED TO CONCRETE WITH MASONRY NAILS

30 SEAMLESS EPOXY MORTAR FLOOR SCREED LAD WITH QUOTE NUMBER 5 WORKED TO A ROUGH EXTERIOR SURFACE ON MIN 40 CEMENT SCREED STOP FRESH AT ANGLE LAD ON DARK POLYURETHAN DAMP PROOF MEMBRANE (SUMP)

IN-SITU CAST REINFORCED CONCRETE STEP

30 x 120 x 20 x 3 COLD FORMED STEEL UPRIG CHANNEL PURLIN TREATED WITH INTUMESCENT PAINT AS PER MANUFACTURERS SPECIFICATIONS AND PAINTED, BOLTED TO CONCRETE WITH M12 BOLTS AT 400 CENTRES

NEOPRENE GASKET

30 x 50 x 5 STEEL ANGLE WITH INTUMESCENT PAINT AS PER MANUFACTURERS SPE AND PAINTED, FIXED TO CONCRETE WITH MASONRY NAILS

300 x 75 PRE-CAST REINFORCED CONCRETE PLANK SLAB WITH CASTED HOLES, BOLTED TO CHANNEL WITH 2 x M12 BOLTS AT 400 CENTRES. HOLES TO BE FILLED WITH EPOXY

ELECTRICAL CONDUIT CAST INTO PLANK

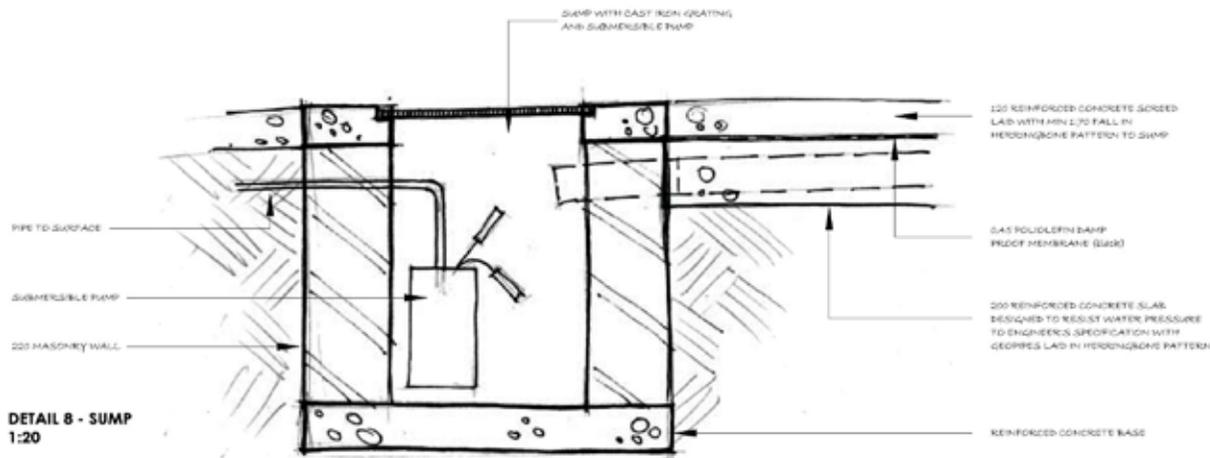
EXTERIOR WATERPROOF LIGHTING TUBE, FITTER ACCORDING TO ELECTRICIAN

CORRUG STEEL PAVING LAD ON CEMENT SCREED LAD TO FALL, MIN 1:70 ON 0.45 POLYURETHAN DAMP PROOF MEMBRANE (SUMP)

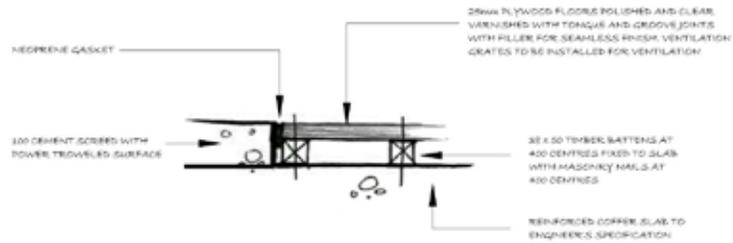
REINFORCED COPPER SLAB TO ENGINEERS SPECIFICATION

CAST IRON MENTIS GRID OVER RAIN WATER CHANNEL

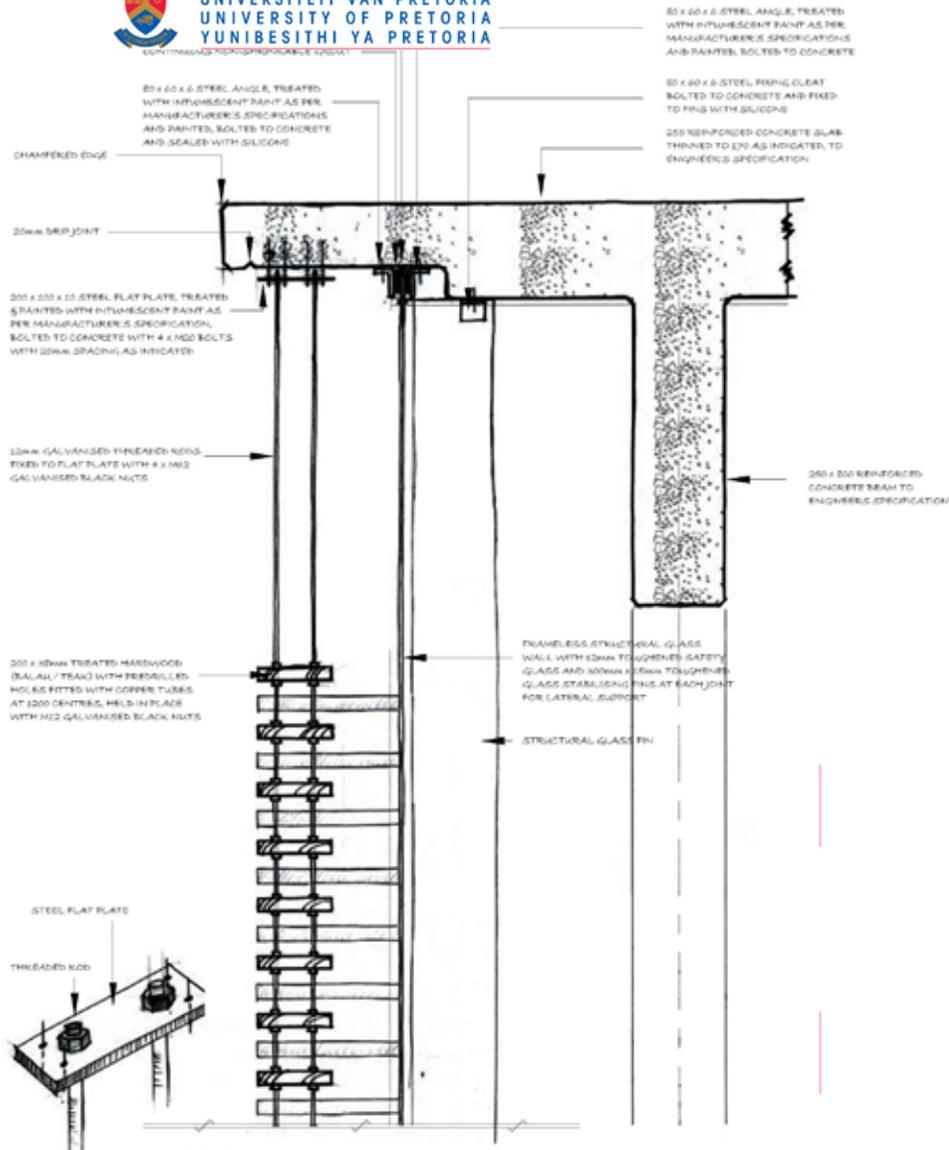
DETAIL 7 - EXTERNAL STAIRS
1:20



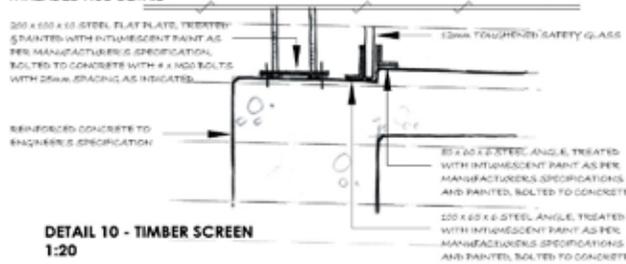
DETAIL 8 - SUMP
1:20



DETAIL 9 - EXHIBITION FLOOR
1:20



STEEL PLATE & THREADED ROD DETAIL



DETAIL 10 - TIMBER SCREEN
1:20

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Interactive Architectural Incubator

DETAILS 7, 8, 9, 10

naam
name
CHRISTINE GOOSEN
skaal
scale

1 : 20

datum
date

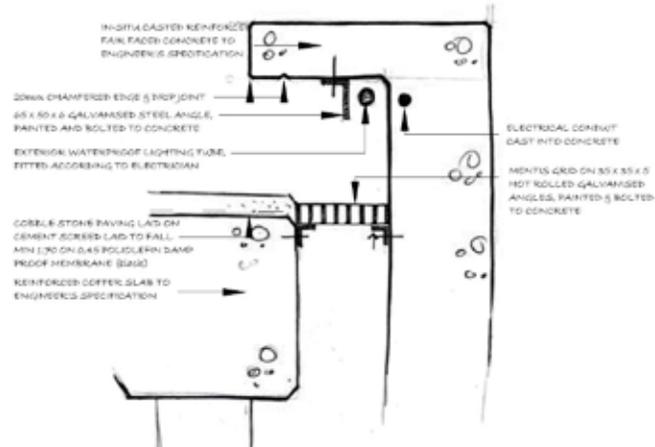
NOV 2008

studente nommer
student number

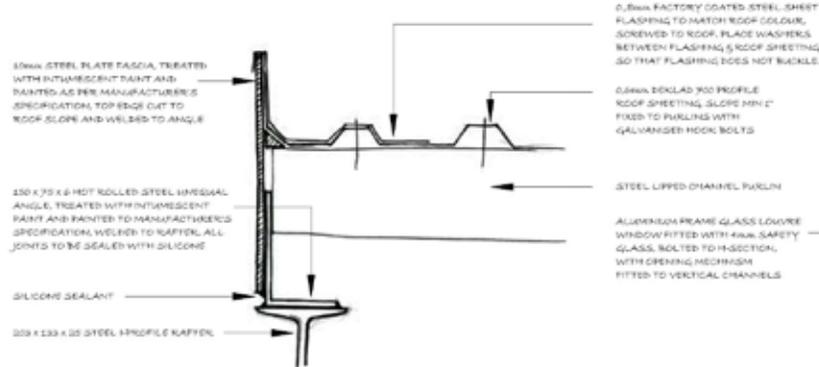
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tekeningnommer
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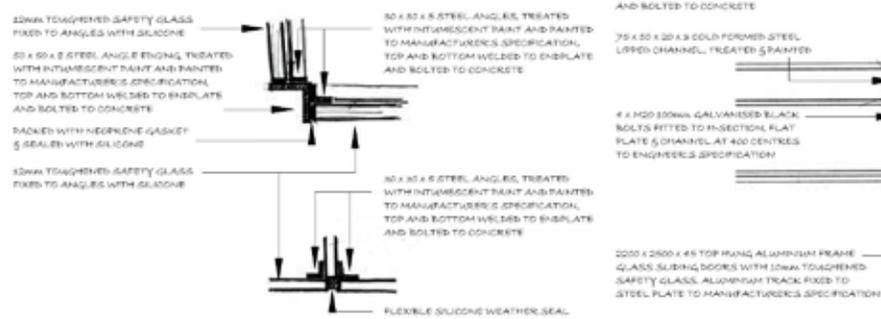
016



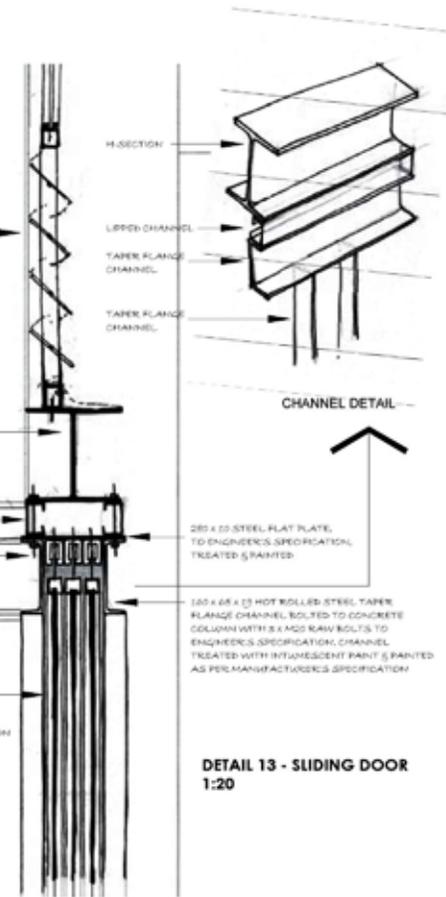
DETAIL 11 - PLANTER SEATING
1:20



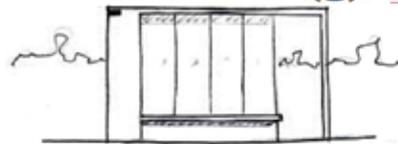
DETAIL 12 - ROOF END
1:10



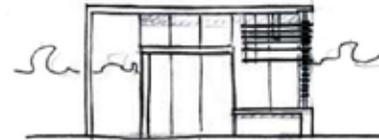
STRUCTURAL GLASS CORNER & JOINT DETAIL



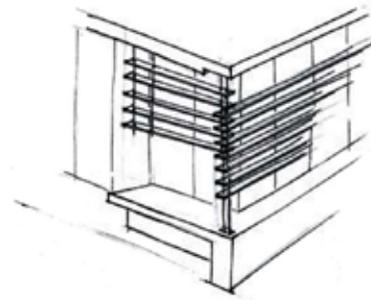
DETAIL 13 - SLIDING DOOR
1:20



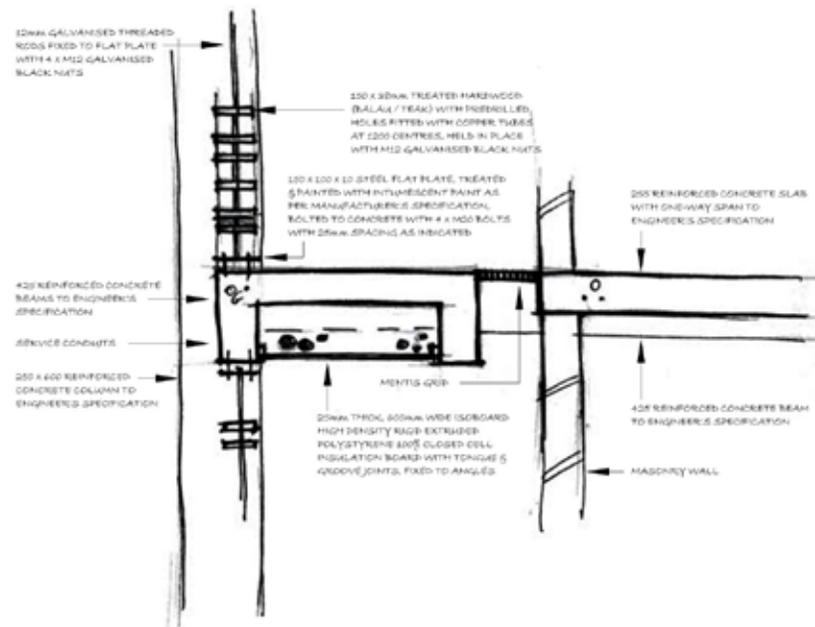
SOUTH ELEVATION - WORKSHOP



NORTH ELEVATION - WORKSHOP



PERSPECTIVE - WORKSHOP NORTH-WEST CORNER



DETAIL 14 - PASSAGE

BRIDGING THE GAP
Interactive Architectural Incubator

DETAILS 11, 12, 13, 14

naam
name

CHRISTINE GOOSEN

skaal
scale

1 : 20

datum
date

NOV 2008

studente nommer
student number

20098465

tekeningnommer
drawing number

017



north elevation



south elevation



west section - elevation



east elevation



west elevation

009 CONCLUSION

The building and the landscape are perceived as a whole. The building radiates into the landscape as an extension of the open spaces within the building. The nature, the institutions and the context are cast into an interactive relationship to benefit the community, university and students alike. The architecture has been set to enhance the individual experience and create a shared social landscape.

The language of the building is free from literal translations and instead, sets a neutral language by looking into the future and not the reminiscence of the past. The building provides a rich collision of events, where the boundaries of one event blend into that of the next, setting

the stage for unexpected events to occur, with functional integration and professional interaction at the core.

The unexpected combinations of movement, events and space contribute qualities of vitality to the building that are relevant to the reality of contemporary architecture, resulting in the embracing of urban life in its most exciting manifestations.

The building achieves multi-faceted unity: on plan, in section and detailing, as well as in sensory experience of the space. The expressive presence of the building is true and honest in construction. The user can truly experience architecture by moving through spaces that

change shape to accommodate and communicate changes in function, natural light that leads you through spaces, and unexpected entrances and views into other parts of the building.

It exposes the user to architecture and art in an interactive and fresh way, by revealing not only the product but the process. The experience is thus propelled through time as well as space, as it changes with the ebb and flow of the creative inhabitants. Through guidance, exposure and interaction, creative professions are promoted, to future artists and public alike.

A place where students, professionals and general public can rest, play, learn and work.

010 APPENDICES

- 10.1 References**
- 10.2 List of Figures**
- 10.3 Frameworks**
- 10.4 Site Analysis**
- 10.5 Legislation**
- 10.6 Research Methodology**
- 10.7 Baseline Criteria**



010 APPENDICES

10.1 References

10.1.1 Articles, Documents & Reports

- ALEXANDER, C. 1996, A City is Not a Tree, in LEGATES, R & STOUT, F. (eds) The City Reader, Routledge: London.
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Contact Details:

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Tel: 012 420 4001

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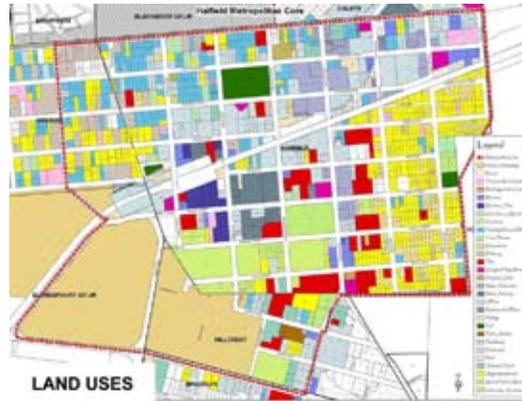
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HATFIELD METROPOLITAN CORE URBAN DEVELOPMENT FRAMEWORK

Presented by Metropolitan Spatial Planning
City Planning, Development and Regional Services
Department

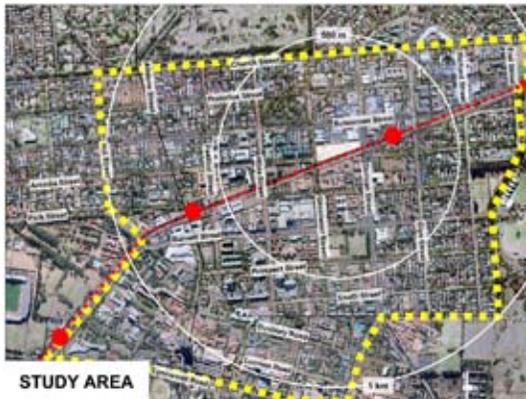
14 August 2007



LAND USES

UNDERSTANDING TRANSIT ORIENTED DEVELOPMENT

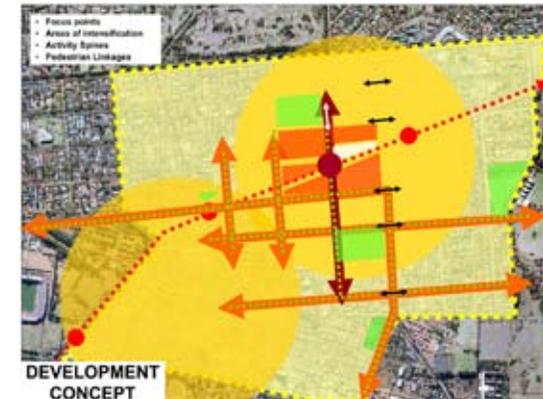
- "Transit Oriented Development is the exciting new fast growing trend in creating vibrant, livable communities. Also known as Transit Oriented Design, or TOD, it is the creation of compact, walkable communities centered around high quality train systems. This makes it possible to live a higher quality life without complete dependence on a car for mobility and survival."
- The components of Transit Oriented Design are –
 - Walkable design with pedestrian as the highest priority
 - Train station as prominent feature of town center
 - A regional node containing a mixture of uses in close proximity including office, residential, retail and civic uses
 - High density, high-quality development within 10-minute walking radius surrounding train station
 - Collector support transit systems including trolleys, streetcars, light rail and buses
 - Designed to include the easy use of bicycles, scooters and walking as daily support transportation systems
 - Reduced and managed parking inside 10-minute walking radius around town center/train station



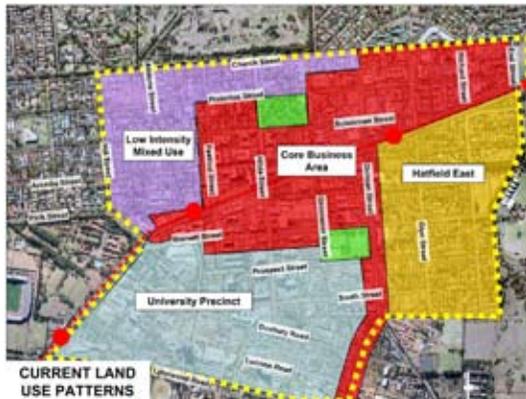
STUDY AREA



URBAN MANAGEMENT



DEVELOPMENT CONCEPT



CURRENT LAND USE PATTERNS



KEY DRIVING FORCES



DEVELOPMENT PROPOSALS

10.3 Frameworks

10.3.1 Hatfield Spatial Development Framework

The Hatfield area may be regarded as an international window for the larger City of Tshwane Metropolitan Area due to the fact that the majority of international embassies and trade missions in South Africa are located in this area. The overall vision for the Hatfield Gautrain Station is to create a highly accessible, pedestrian friendly environment where all major destinations are connected. However, Hatfield must continue to be an "urban place" where people want to be, creating a safe, clean, attractive and user-friendly environment to retain existing business and attract further investment. It is important to consider that with the development of the Hatfield Gautrain Station, the Hatfield area will be an evolving locale (www.tshwane.gov.za).

Urban Design Objectives:

- Implement generous sidewalks to facilitate pedestrian movement.
- Ensure appropriate assistance signage.

- Reduce lack of permeability
- Ensure appropriate lighting and safety.
- Guide development to enhance the public domain
- Restrict informal development.
- Allocate space and co-ordinate interaction at modal transfer points.
- Road improvements to cater for pedestrian movement.
- Develop and monitor the potential spatial structure.
- Promote mixed use developments
- Support and extend the CID
- Promote linkages through existing developments.

Hatfield Station Development Framework guidelines:

- Open space development
- Provision of a range of residential units
- Pedestrianisation
- building massing
- Housing typologies
- Building Fabric
- Interface conditions
- Street hierarchy and treatment.

10.3.3 Group Framework in association with the Holm-Jordaan Campus Framework

VISION STATEMENT

"TRANSFORMING THE UNIVERSITY OF PRETORIA FROM AN ISOLATED FRAGMENTED KNOWLEDGE PRODUCTION INSTITUTION, TO A UNIVERSITY CITY, A CITY OF INNOVATION."

Transforming the University and the Hatfield precinct in to a UNIVERSITY CITY, an integrated networked city of innovation and social cohesion, where public sector interfaces with the private sector, interfaces with the academic sector. Removing physical, social and psychological boundaries that are constraining both the University and Hatfield precincts growth. Creating a social blend that celebrates and empowers the uniqueness, vitality, potential and culture of South Africa's premiere Academic community.

The University City

The University of the Future is a city of knowledge. To achieve the University of Pretoria's strategic objective of becoming a world class research institute, the surrounding



Hatfield area and the university need to merge from two vibrant successful independent isolated entities to a coherent spatially integrated community, without boundaries and borders. There is an intense need to allow the community to enter upon campus grounds to fully utilise all facilities and integrate community and student life.

The transformation is a long term undertaking and will have to be achieved in phases over time. Currently, the university is not ready to be integrated with the city, but needs to be prepared for the eventual merger by designing the urban fabric to first function as two separate entities and later as a single mechanism. The campus will keep its own tangible and definable character, identity and vitality, that has clarity of circulation dominated by pedestrians. The urban fabric will be designed at 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 campus designed for the night time, which has a vibrant and cultural night life. It will function as a community, working as an inter-related whole, a symbiotic relationship of allied units.

Social Hub

Hatfield precinct is to be developed to create destination place. A place of continual social, cultural and civic regeneration; a place that defines itself as the vibrant, multifunctional "body" of the "University City", Hatfield is to be the gateway of the "University City" precinct. Hatfield's continual transformation will be driven by the creation of interdependent nodes including, transport, mixed use, culture, commerce and political, allowing a dynamic interface for social expression. Hatfield must become a place for the people, for businessmen, academics, students, professionals, politicians, workers; Hatfield must be a place for all.

The unification of these two distinct identities must not allow the dissolution of either's unique identity but rather reinforce each other's key strengths and opportunities to allow a true city of knowledge to be born, a "UNIVERSITY CITY".

Five concerns addressed within the precinct:

- a) Public transport services and facilities,
- b) Pedestrians and bicycles,
- c) Traffic and parking
- d) Security
- e) University as isolated community

Performance Criteria:

- a) Vitality
- b) Accessibility
- c) Diversity
- d) Equity
- e) Control

Clues for Intervention:

- Edges
- Nodes
- Precincts
- Paths (activity links & visual links)
- Gateways
- Areas of Intervention
- Thresholds
- Green Spaces



10.4 Site Analysis

10.4.1 North, Contours & Area

10.4.1.1 Location

Pretoria: 25°44' south longitude,
28°12' east latitude

10.4.1.2 Street Address

South-western corner of Burnett and Festival Streets.

10.4.2 Geology

To determine the exact geological profile of the soil type on the proposed site will require a technical survey. However, the Tshwane Inner City Proposed Spatial Development framework (DPW, 2005) describes the composition of the general soil profiles for the city region as "Hekpoort Andesite which generally consist of an upper residual clay horizon followed at depth by jointed moderately weathered rock which is often water bearing. Below this there is hard competent rock".

"There are various options available for retaining the vertical perimeter edges of the excavations. The proposed soil support system which is currently used extensively is the augmented pile system. Spacing of piles is determined by the actual soil conditions and could range from 2m centres to interlocking secant piles which are very high risks of collapse or high ground water tables" (DPW, 2005:6)



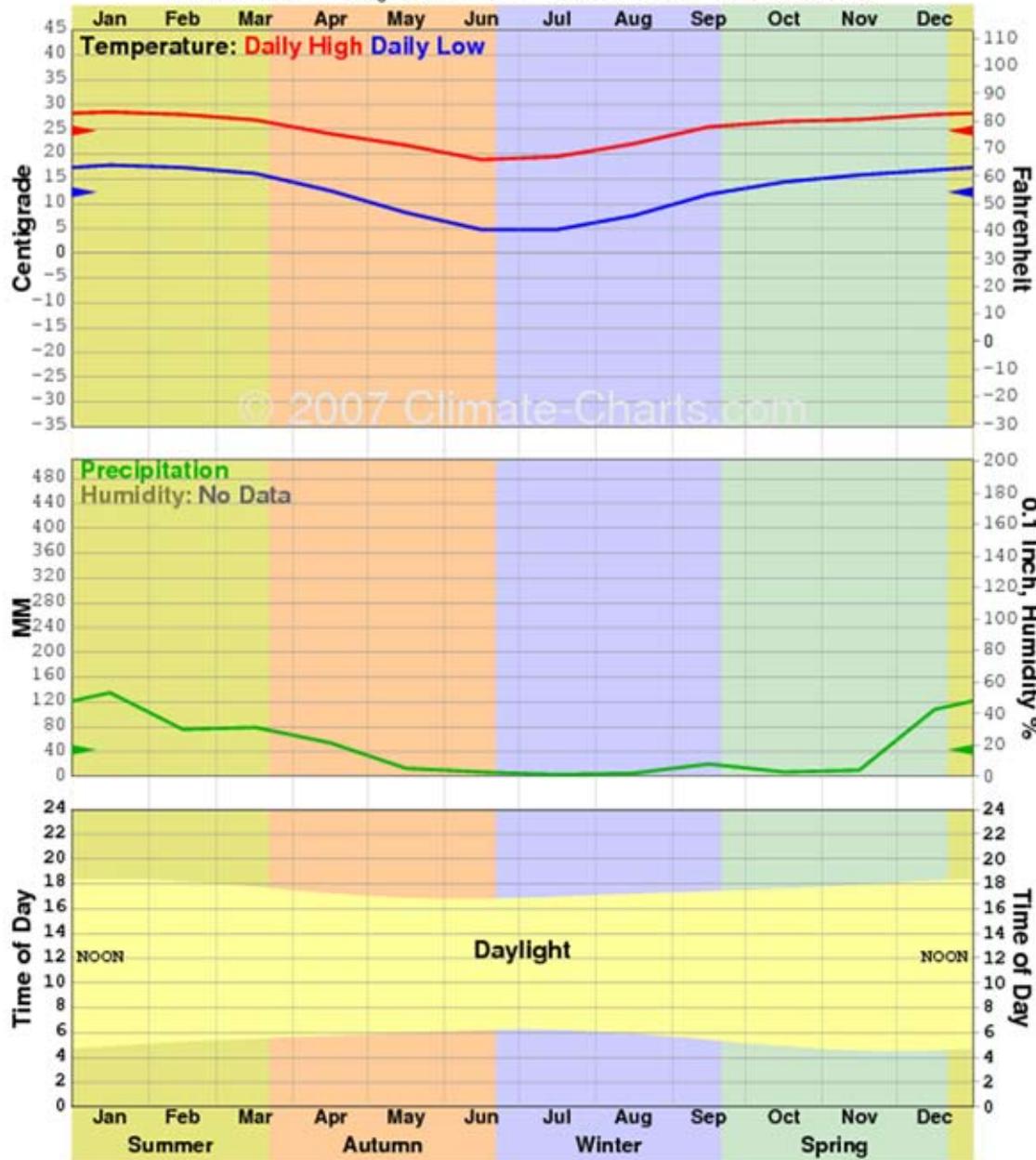
10.4.3 Existing Physical Features





Pretoria, South Africa

Latitude: 25°44'S Longitude: 028°11'E Elevation: 1330m Station: UA68262



10.4.4 Climate Data

10.4.4.1 Macro-Climature

Pretoria is located in the 'Highveld' or Northern Steppe climatic zone which is characterised by warm summers with occasional afternoon showers and winters that are dry and cool.

10.4.4.2 Micro-Climature

Pretoria, being a densely built urban environment is subject to the heat island effect created in most city centres. Buildings store and emit large amounts of heat due to long-wave re-radiation. This coupled with heat generated by people, traffic, industry, and by the heating of the interiors of buildings contributes to increased temperatures within the city necessitating shaded areas for pedestrians and increasing the need for cooling within the buildings. The tree lined streets of Pretoria help overcome this problem by filtering the air and providing shade. The site's climate can be described as unpleasant. Designing for the micro- and macro climate will have to be an important consideration in the surfacing of the site and the building. (Shultz, 1986:49)

TEMPERATURE	Summer: 20-38°C Winter: 10-27°C	Highest Maximum: 36,3°C; average monthly max (January) 24,8°C Lowest minimum: -5,5°C; average monthly minimum (June/July) 12,1°C	Pretoria is characterised by generally high temperatures due to thermal mass of the built environment. Relatively high local humidity can combine with high afternoon temperatures to cause uncomfortable heat.
HUMIDITY	Minimum (Sept): Maximum (March): Average relative humidity:	57% at 08h00 to 29% at 14h00 75% at 08h00 to 48% at 14h00 59%	101
RAINFALL	Average: Rainfall Season: Peak: Thunderstorms:	674mm per year Summer between Nov & March January Rate of 90-100mm per hour	Varies between 125-375mm in summer and 62-250mm during winter. 50-80 rainy days per year with some hail expected.
SUN ANGLES AT 12h00, DAYLIGHT & SUNSHINE	Summer (22 Dec): Winter (21 June): Equinox (21 March & 23 Sept):	88° altitude 44° altitude 64,23° altitude	Pretoria receives high amounts of solar incidence with approximately 80% during the summer months and 67% during the winter months. The percentages translate into solar radiation energy as 8Whr/m ² /day in summer and 4.5Whr/m ² /day in winter (AAL 310, 2002:19)
CLOUD COVER	Average 33%	Varying between 13% in July to 54% in December	
WIND	Summer: Winter:	North-easterly to south-easterly direction North-westerly direction	Light to Moderate. The density of the built fabric surrounding the site forms wind channels that alters micro scale atmospheric pressure, increasing wind velocity.
VEGETATION	According to Ad Destinatum 1910-60, the vegetation existing in 1910 on the future campus-site, was primarily thorn trees (presumably various <i>Acacia</i> -species) and <i>Rhus Lancea</i> . The existing vegetation is primarily perennial shade trees for the current parking area. The parking area is lined with <i>Sesiquia Ceretonia</i> (Carob) trees.		

10.4.5 Cadastral Information

2. KADASTRALE SAMESTELLING

Lot 779 bestaan uit die volgende gekonsolideerde Lotte:

KADASTRALE INLIGTING (VERWYS NA PLAN 1) LOT 779, HATFIELD				
Kadastrale samestelling	Oppervlakte	Diagram Nummer	Vorige erf beskrywing	Aanhangsel
Lot 759, Hatfield	8752m ²	8090/2001	Restant en Gedeeltes 1, 2 en 4 van Erf 45 en Erf 632, Hatfield	"A5"
Lot 760, Hatfield	32704m ²	8091/2001	Erwe 750 en 596, Hatfield	"A6"
Lot 762, Hatfield	7898m ²	8093/2001	Erwe 122, R/123, 1/123, 124, R/125, Erf 574 en 1/126, Hatfield	"A7"
Lot 778, Hatfield (gedeelte van Suidstraat)	4642m ²		Voorheen 'n gedeelte van Suidstraat	"A8"
TOTAAL LOT 779, HATFIELD	53989m²		Voorheen Lotte 759, 760, 762 en 778, Hatfield	



10.4.7 Services & Servitudes

NOTARIËLE VERBINDING: LOT 165, HILLCREST, LOT 779, HATFIELD EN GEDEELTE 468 VAN DIE PLAAS ELANDSPOORT 357 JR

A. GEKONSOLIDEERDE LOT 779, HATFIELD (sien Aanhangsel "A1")

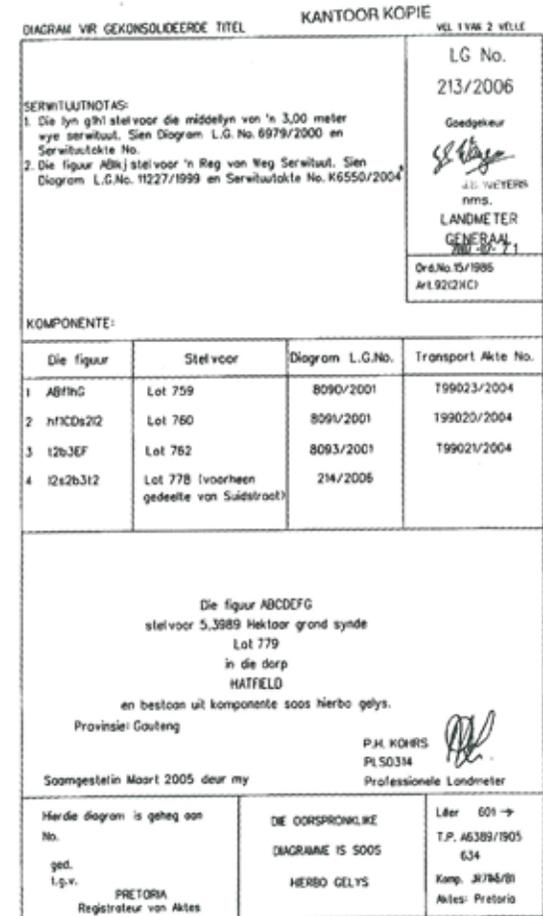
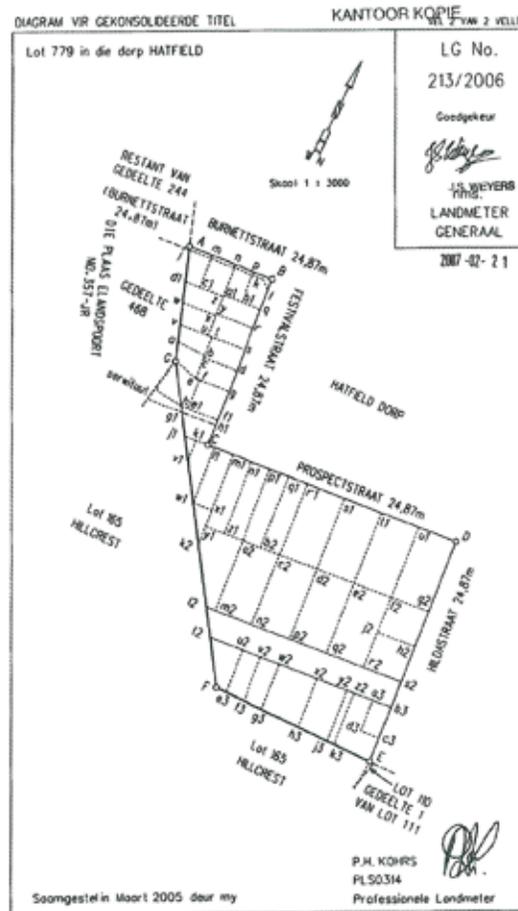


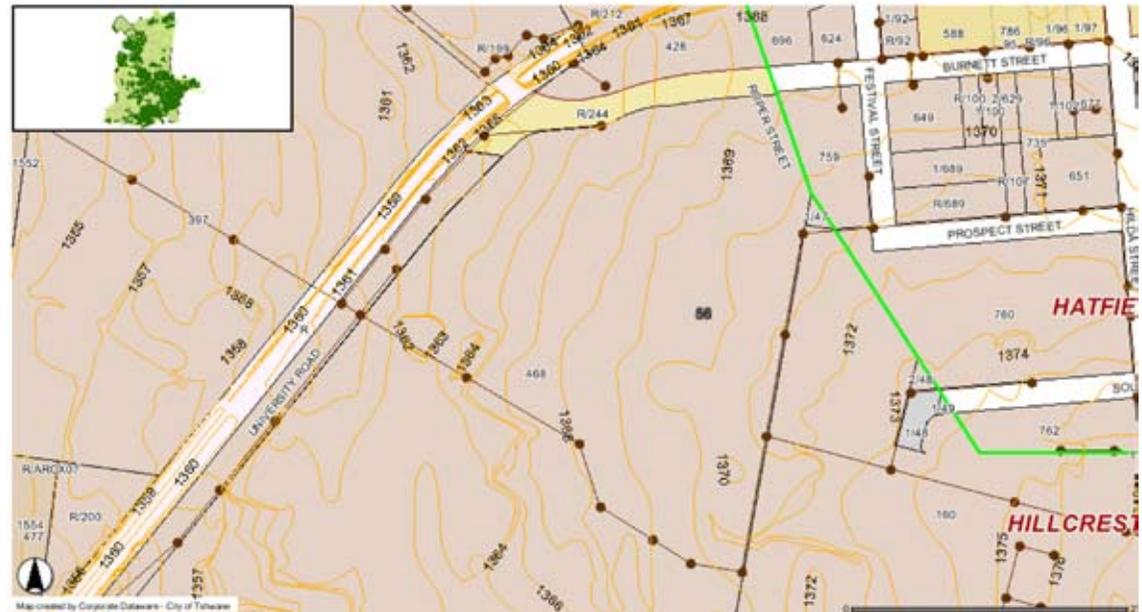
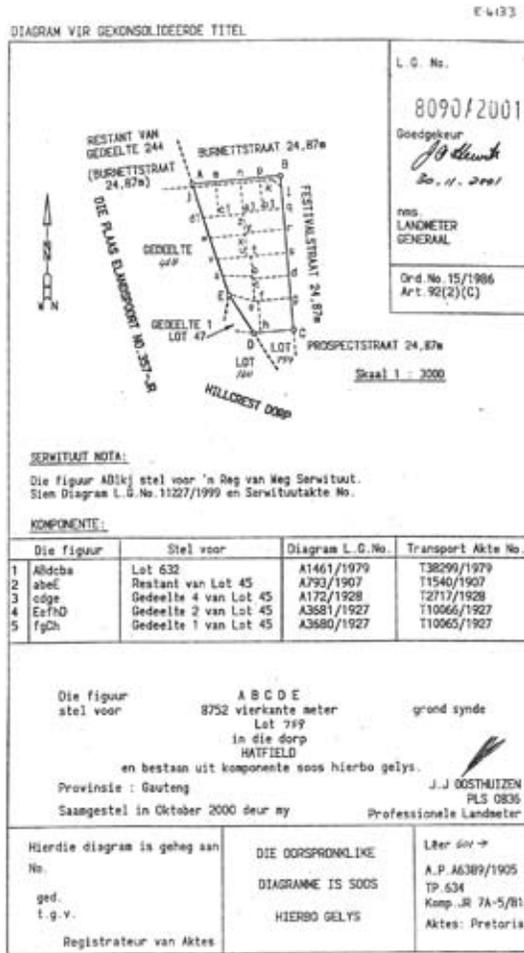
1. SERWITUTE

Aangeheg is die Algemene Plan van die Dorp Hatfield A6309/1905 (sien Aanhangsel "A2")

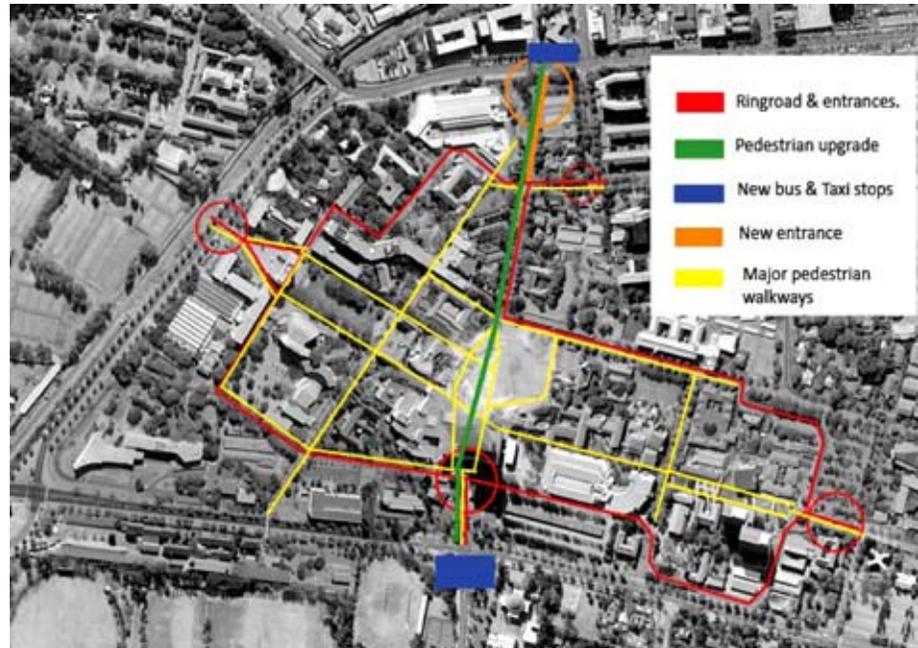
Lot 779 (5,3996ha groot) word deur sekere serwitute geraak naamlik:

- 1.1 L.G. No. 8979/2000 (Aanhangsel "A3");
- 1.2 L.G. No. 11227/1999 (Aanhangsel "A4")





10.4.10 Movement Patterns



10.5 Legislation

10.5.1 National Heritage Resources Act, 1999 (Act 25 of 1999)

Section 34:

- 1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.
- 2) Within three months of the refusal of the provincial heritage resources authority to issue a permit, consideration must be given to the protection of the place concerned in terms of one of the formal designations provided for in Part 1 of this chapter. This making provision for a structure to be declared as a Provincial Heritage Site.

Section 38. Heritage resources management

- 1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as--
 - a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
 - b) the construction of a bridge or similar structure exceeding 50 m in length;
 - c) any development or other activity which will change the character of a site--
 - i) exceeding 5 000 m² in extent; or
 - ii) involving three or more existing erven or subdivisions thereof; or
 - iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
 - d) the re-zoning of a site exceeding 10 000 m² in extent; or

e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

f) must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1)--

a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or

b) notify the person concerned that this section does not apply.

3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

- a) The identification and mapping of all heritage resources in the area affected;
- b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;
- c) an assessment of the impact of the development on such heritage resources;
- d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- g) plans for mitigation of any adverse effects during and after the completion of the proposed development.

4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development, decide--

- a) whether or not the development may proceed;
- b) any limitations or conditions to be applied to the development;
- c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
- d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
- e) whether the appointment of specialists is required as a condition of approval of the proposal.

5) A provincial heritage resources authority shall not make any decision under subsection (4) with respect to any development which impacts on a heritage resource protected at national level unless it has consulted SAHRA.

6) The applicant may appeal against the decision of the provincial heritage resources authority to the MEC, who--

- a) must consider the views of both parties; and
- b) may at his or her discretion--
 - i) appoint a committee to undertake an independent review of the impact assessment report and the decision of the responsible heritage authority; and
 - ii) consult SAHRA; and
- c) must uphold, amend or overturn such decision.

7) The provisions of this section do not apply to a development described in subsection (1) affecting any heritage resource formally protected by SAHRA unless the authority concerned decides otherwise.

8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements

of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

9) The provincial heritage resources authority, with the approval of the MEC, may, by notice in the Provincial Gazette, exempt from the requirements of this section any place specified in the notice.

10) Any person who has complied with the decision of a provincial heritage resources authority in subsection (4) or of the MEC in terms of subsection (6) or other requirements referred to in subsection (8), must be exempted from compliance with all other protections in terms of this Part, but any existing heritage agreements made in terms of section 42 must continue to apply.

10.5.2 Statutory Legal Regulations

The Floor Area Ratio for developments on campus is 2.5, with a height restriction of six storeys (+/- 18m). If developments occur on existing parking areas, alternative parking should be provided.

NOTARIELE VERBINDING: LOT 779, HATFIELD, LOT 165 HILLCREST EN GEDEELTE 468, ELANDSPOORT 357 JR

GEKONSLIDEERDE LOT 779, HATFIELD

GEKONSLIDEERDE LOT 759, HATFIELD (L.G. NOMMER: 8090/2001)

ERF BESKRYWING	OPP. VAN ERF m²	GEBOU NR.	FOOTPRINT TOTAAL	F/PRINT BIJGEBOU	F/PRINT HOOGBOU	AANTAL VLOERE	TOTALE VLOER OPP.	BESTAANDE VRV	BESTAANDE DEKKING %	WYSIGING SKEMA NR.
632	6247.00	4138	281.81		111 x 60	4	111 x 60	0.04	4.24	9926
6465	488.00	4133			184 x 5		184 x 5	0.38	37.74	9926
6465	606.00	4133			184 x 5		184 x 5	0.33	33.42	9926
6465	493.00	4119	280.22	218.62	41 x 8	1	280.22	0.53	52.78	9926
6465	858.00	4124	276.22	28.68	247 x 54	1	276.22	0.32	32.19	9926
TOTAAL	8752.00		1208.09				1208.09	0.14	13.80	

TOELAATBARE VRV EN DEKKING IN TERME VAN WYSIGINGSKEMA 9926

Erf Beskrywing	VRV	Dekking	Grondgebruik	Hoogte
Lot 759, Hatfield	0	0	Parkeerterrein	0



GRONDGEBRUIKSONE: V "OPVOEDKUNDIG"

Doelindes waarvoor geboue opgerig of gebruik, of grond gebruik mag word indien die eiendom "Opvoedkundig" gesoneer is in terme van Sone 5 van die Pretoria Dorpsbeplanningskema, 1974:

Grondgebruiksone	Primêre Reg:	Toelaatbaar met toestemmingsgebruik aansoek	Toelaatbaar met hersonerings aansoek
Opvoedkundig	-Onderrigplekke, -Geselligheidsale, -Plekke vir Openbare godsdiensoefening	-Inrigtings -Spesiale Geboue, -Woongeboue, -Woonhuise, -Tuisondernemings ingevolge Schedule IX(g)	Ander gebruike nie onder die vorige kolomme genoem nie.

(i) WOORDOMSRYWINGS

- Onderrigplekke:** Beteken 'n gebou en grond gebruik vir 'n skool, kollege, tegniese instituut, akedemie, lesingsaal, monnikelooster, nonneklooster, openbare biblioteek, kunsmuseum, museum, kleuterskool, kinderbewaarhuis-cum-kleuterskool, kinderbewaarhuis-cum-kleuterskool-cum-naskoolsentrum of ander opvoedkundige sentrum en omvat 'n koshuis vir persone wat enige van die voorgenoemde bywoon maar omvat nie 'n gebou wat ontwerp is om uitsluitlik of hoofsaaklik as 'n gesertifiseerde verbeterings- of nywerheidskool gebruik te word nie.
- Geselligheidsale:** Beteken 'n gebou ontwerp of gebruik vir, onder ander, gesellige byeenkomste en ontspanning en 'n nie-residensiële klub maar dit sluit nie dié gebruike soos onder 'n "Vermaaklikheidsplek" gedefinieer in nie.
- Plekke vir Openbare Godsdiensoefening:** Beteken 'n gebou ontwerp of gebruik vir 'n kerk, kapel, sinagoge, Sondagskool of 'n ander plek vir openbare godsdiensoefening en omvat 'n inrigting of ander gebou vir die doel van gesellige verkeer en ontspanning op dieselfde terrein en verbonde aan enigeen van die

voorgenoemde geboue, maar omvat nie 'n begrafniskapel of roulokaal nie.

(ii) VRV, DEKKING EN HOOGTE

Die Gebruiksone "Opvoedkundig" spesifiseer in die Hatfield en Hillcrest-gebied dat die VRV, Dekking en Hoogtebepalings van Sone 5 van die Pretoria Dorpsbeplanningskema, 1974 geld.

Stadsbeplanningkontroles

Gebruike

VRV vir Sone 5:	1,5	Vir Duplekswonings, Woonstelle, Hostelle en blokke huurkamerwonings.
	2,0	Vir alle ander gebruike ingevolge die woordomsrywings toelaatbaar.
Dekking vir Sone 5:	60%	Vir alle ander gebruike ingevolge die woordomsrywings toelaatbaar.
	40%	Vir blokke Duplekswonings, blokke Woonstelle en blokke huurkamerwonings.
Hoogte vir Sone 5:	19m	Vir alle gebruike.

(iii) GEVOLGTREKKING

Indien die bovermelde toelaatbare VRV, Dekking en Hoogte onder Item 3. vergelyk word met die bestaande gebou inligting onder Item 4. kan die volgende gevolgtrekking gemaak word:

- Die bestaande geboue opgerig op die Universiteitsgronde val binne die beperkings van die VRV en Dekking vereistes van die Pretoria Dorpsbeplanningskema, 1974.
- Die rekords van die Universiteit sal waarskynlik wys dat toestemming verkry was om die hoogte beperkings soos gestel in die Pretoria Dorpsbeplanningskema, 1974, t.o.v. die geboue wat 'n hoogte van 19m oorskry verkry is.



4. BESTAANDE GEBOUE

Hierby aangeheg is 'n tabel uiteensetting van alle bestaande geboue op Lot 779, Hatfield (sien Aanhangel "A14")

BESTAANDE GEBOU INLIGTING LOT 779, HATFIELD							
Erf Beskrywing	Opp. Van geboue op Erf / m ²	Opp van Erf / m ²	VRV	Dekking %	Maksimum Hoogte	Lys van bestaande geboue Aanhangel	Berekening van bestaande VRV ens. Aanhangel
Lot 759, Hatfield	1208.09	8752	0.14	13.8	1 verdieping	"A15"	"A14"
Lot 760, Hatfield	27866.55 (afdakke 221.56m ² uitgesluit)	28876	0.97	38.04	13 verdiepings	"A16"	"A14"
Ged EFGH	165.88	2552	0.7	6.5	1 verdieping	"A16"	
Ged JKMN	0	1276	0	0	0	"A16"	
Lot 762, Hatfield	4976.90 (afdakke 1189.50m ² uitgesluit)	7898	0.63	38.82	4 verdiepings	"A17"	"A14"
Lot 778, Hatfield (gedeelte van Suidstraat)	0	4642	0	0	0		"A14"
Totaal Lot 779	-	53996m²					

TABEL 3

Notas: VRV: Vloer Ruimte Verhouding
TOP: Terrein Ontwikkelings Plan
BVO: Bruto Vloer Oppervlakte
Opp: Oppervlakte

10.5.3 Promotion of Equality & Prevention of Discrimination Act, 2000 (Act 7 of 2000) - regarding disability.

No person may unfairly discriminate against any person on the ground of disability, including -

- a) Removing any supporting facility necessary for their functioning in society.
- b) Contravening the code of practice or regulations of South African Bureau of Standards, that govern environmental access.
- c) Failing to eliminate obstacles that unfairly limit or restrict persons with disabilities from enjoying equal opportunities.

10.5.4 SABS Building Regulations 0400-1990

The building has been designed in accordance with the South African Bureau of Standards - National Building Regulations.

Part S of the National Building Regulations (NBR) and its associated code 0400 includes regulations setting out national requirements for an accessible built environment.

Barrier-free Access:

The built environment contains a number of barriers that prevent people with disabilities from enjoying equal opportunities. For example: structural barriers such as flights of stairs, inaccessible toilets and bathrooms and uneven pavements; inaccessible entrances due to security systems such as turnstiles; poor town planning such as schools, clinics positioned at the highest point in town, narrow pavement areas, and lack of demarcated parking bays; and poor interior design such as fixed seats in restaurants, cluttered overall spaces, bad lighting, and inaccessible tables.

10.6 Research Methodology

10.6.1 Research Methods

The research methodology comprises several different methods of research for the different aspects of the project. It will also be a combination of a Linear and Systems approach to problem solving. Because of the nature of Architecture, the project has a systemic focus but will also progress generally in a linear fashion and will constantly be updated and corrected as the research and analysis produces more data.

The Objective will therefore be: the optimisation of the system (Systemic) as well as produce the best answer to the problem (Linear). The Process will be: building and modifying the system to the ideal (Systemic) while using analysis and synthesis to reach this goal. The Accent will be equally on the components of the problem (Linear) as well as the linkages between components (Systemic).

10.6.2 Historical & Analytical Research Method

For the theoretical investigation parallel to the project, I will use a combination of the Historical and Analytical research methods.

The historical method will be used to analyse and investigate other Architectural theorists and their writings (historical and literary data) on relevant topics to my theoretical investigation.

The precedent studies will be undertaken as analytical research method, studying its functional aspects, characteristics and qualities. By analysing different projects of similar form, function or structure, I will deduce successful methods of implementing such practices in

10.6.3 Descriptive Survey Method

the project.

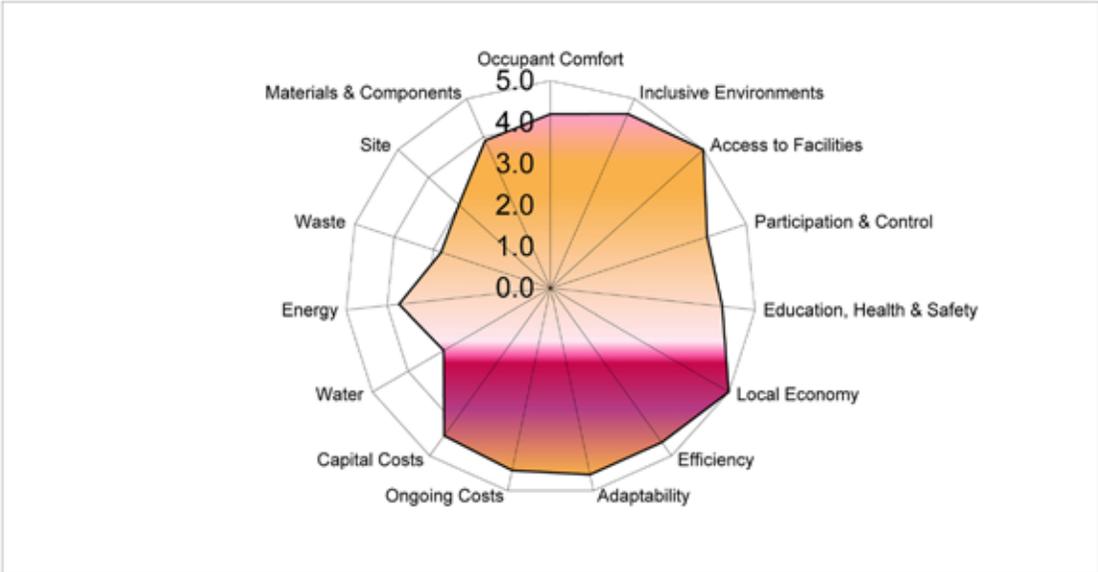
A small part of the research for the project will be the analysis of contextual data collected from observation of student movement patterns, energy flow on and onto campus, and volumes of traffic handled by various access routes and points. The objective will be to identify

10.6.4 Grounded Theory Method

movement patterns, norms, criteria, standards, and the aesthetic context.

The bulk of the project research will be done according to the Grounded Theory Method as information is generated inductively from the analysis of the contextual data. It will be the most applicable research method as it is context-centred and will lead to fit the context theoretical frameworks and design guidelines leading to a grounded design (De Villiers, 2008). The grounded theory method will help me to define sets of methods, so that a Grounded Theory will emerge systematically and inductively through ongoing covariant data collection and analysis. Through this ongoing process a grounded theory will grow, be adjusted, expanded and refined (Lincoln & Guba, 1985). The method includes interviews, observation, fieldwork, documenting and recording, videotaping, and analysis.

SUSTAINABLE BUILDING ASSESSMENT TOOL (SBAT- P) V1



10.7 Baseline Criteria

Constant comparative coding will form part of the validation process, patterns will be identified, new data coded into categories, reviewed and expanded as the theory emerges (De Villiers, 2008).

This baseline study serves as a guideline to direct the conceptual process towards an integrated sustainable outcome. The Sustainable Building Assessment Tool (SBAT), which was developed by the Sustainable Building group of the CSIR in Pretoria, has been selected to generate the baseline guiding criteria and performance targets.

The tool is used to assess the performance of a building but its main aim is to influence the design of buildings and construction early on in the planning process, stressing the importance of sustainable development and allowing sustainability to become an integrated aspect rather than a retrofit attempt. The sustainability rating obtained can then aid in setting benchmarks and also allows for comparative sustainability and performance analysis between buildings.



Building Performance - Environmental

Criteria	Indicative performance measure	Measured	Points
EN 1 Water			3.0
EN 1.1 Rainwater	% of water consumed sourced from rainwater harvested on site	80	0.8
EN 1.2 Water use	% of equipment (taps, washing machines, urinals showerheads) that are water efficient	80	0.8
EN 1.3 Runoff	% of carparking, paths, roads and roofs that have absorbant/permeable surfaces (grassed/hatched/fooselaid paving/ absorbant materials)	30	0.3
EN 1.4 Greywater	% of water from washing/relatively clean processes recycled and reused	30	0.3
EN 1.5 Planting	% of planting (other than food gardens) on site with low / appropriate water requirements	80	0.8
EN 2 Energy			3.7
EN 2.1 Location	% of users who walk / use public transport to commute to the building	100	1.0
EN 2.2 Ventilation	% of building ventilation requirements met through natural / passive ventilation	90	0.9
EN 2.3 Heating & Cooling	% of occupied space which has passive environmental control (no or minimal energy consumption)	100	1.0
EN 2.4 Appliances & fittings	% of appliances / lighting fixtures that are classed as highly energy efficient (ie energy star rating)	80	0.8
EN 2.5 Renewable energy	% of building energy requirements met from renewable sources	0	0.0
EN 3 Waste			2.8
EN 3.1 Toxic waste	% of toxic waste (batteries, ink cartridges, fluorescent lamps) recycled	80	0.8
EN 3.2 Organic waste	% of organic waste recycled	80	0.8
EN 3.3 Inorganic waste	% of inorganic waste recycled	80	0.8
EN 3.4 Sewerage	% of sewerage recycled on site	0	0.0
EN 3.5 Construction waste	% of damaged building materials / waste developed in construction recycled on site	40	0.4
EN 4 Site			3.0
EN 4.1 Brownfield site	% of proposed site already disturbed / brownfield (previously developed)	100	1.0
EN 4.2 Neighbouring buildings	No neighbouring buildings negatively affected (access to sunlight, daylight, ventilation) (100%)	100	1.0
EN 4.3 Vegetation	% of area of area covered in vegetation (include green roofs, internal planting) relative to whole site	40	0.4
EN 4.4 Food gardens	Food gardens on site (100%)	0	0.0
EN 4.5 Landscape inputs	% of landscape that does not require mechanical equipment (ie lawn cutting) and or artificial inputs such as weed killers and pesticides	60	0.6
EN 5 Materials & Components			3.9
EN 5.1 Embodied energy	Materials with high embodied energy (aluminium/plastics) make up less than 1% of weight of building (100%)	80	0.8
EN 5.2 Material sources	% of materials and components by volume from grown sources (animal/plant)	80	0.8
EN 5.3 Ozone depletion	No materials and components used requiring ozone depleting processes (100%)	100	1.0
EN 5.4 Recycled / reuse	% of materials and components (by weight) reused / from recycled sources	60	0.5
EN 5.5 Construction process	Volume / area of site disturbed during construction less than 2X volume/area of new building (100%)	80	0.8



Building Performance - Economic

Criteria	Indicative performance measure	Measured	Points
EC 1 Local economy			5.0
EC 1.1 Local contractors	% value of the building constructed by local (within 50km) small (employees<20) contractors	100	1.0
EC 1.2 Local materials	% of materials (sand, bricks, blocks, roofing material) sourced from within 50km	100	1.0
EC 1.3 Local components	% of components (windows, doors etc) made locally (in the country)	100	1.0
EC 1.4 Local furniture/fittings	% of furniture and fittings made locally (in the country)	100	1.0
EC 1.5 Maintenance	% of maintenance and repairs by value that can, and are undertaken, by local contractors (within 50km)	100	1.0
EC 2 Efficiency			4.6
EC 2.1 Capacity	% capacity of building used on a daily basis (actual number of users / number of users at full capacity*100)	60	0.8
EC 2.2 Occupancy	% of time building is occupied and used (actual average number of hours used / all potential hours building could be used (24) *100)	100	1.0
EC 2.3 Space per occupant	Space provision per user not more than 10% above national average for building type (100%)	100	1.0
EC 2.4 Communication	Site/building has access to internet and telephone (100%), telephone only (50%)	100	1.0
EC 2.5 Material & Components	Building design coordinated with material / component sizes in order to minimise wastage. Walls (50%), Roof and floors (50%)	60	0.8
EC 3 Adaptability			3.2
EC 3.1 Vertical heights	% of spaces that have a floor to ceiling height of 3000mm or more	50	0.5
EC 3.2 External space	Design facilitates flexible external space use (100%)	60	0.8
EC 3.3 Internal partition	Non loadbearing internal partitions that can be easily adapted (loose partitioning (100%), studwall (50%), masonry (25%))	50	0.5
EC 3.4 Modular planning	Building with modular structure, envelope (fenestration) & services allowing easy internal adaptation (100%)	60	0.8
EC 3.5 Furniture	Modular, limited variety furniture - can be easily configured for different uses (100%)	60	0.6
EC 4 Ongoing costs			4.5
EC 4.1 Induction	All new users receive induction training on building systems (50%), Detailed building user manual (50%)	100	1.0
EC 4.2 Consumption & waste	% of users exposed on a monthly basis to building performance figures (water (25%), electricity (25%), waste (25%), accidents (25%))	50	0.5
EC 4.3 Metering	Easily monitored localised metering system for water (25%) and energy (75%)	100	1.0
EC 4.4 Maintenance & Cleaning	Building can be cleaned and maintained easily and safely using simple equipment and local non-hazardous materials (100%)	100	1.0
SO 4.5 Procurement	% of value of all materials/equipment used in the building on a daily basis supplied by local (within the country) manufacturers	100	1.0
EC 5 Capital Costs			4.4
EC 5.1 Local need	Five percent capital cost allocated to address urgent local issues (employment, training etc) during construction process (100%)	60	0.8
EC 5.2 Procurement	Tender / construction packaged to ensure involvement of small local contractors/manufacturers (100%)	100	1.0
EC 5.3 Building costs	Capital cost not more than fifteen % above national average building costs for the building type (100%)	60	0.8
EC 5.4 Sustainable technology	3% or more of capital costs allocated to new sustainable/indigenous technology (100%)	60	0.8
EC 5.5 Existing Buildings	Existing buildings reused (100%)	100	1.0

Building Performance - Social

Criteria	Indicative performance measure	Measured	Points
SO 1 Occupant Comfort			4.2
SO 1.1 Daylighting	% of occupied spaces that are within distance 2H from window, where H is the height of the window or where there is good daylight from skylights	90	0.9
SO 1.2 Ventilation	% of occupied spaces have equivalent of opening window area equivalent to 10% of floor area or adequate mechanical system, with unpolluted air source	90	0.9
SO 1.3 Noise	% of occupied spaces where external/internal/reverberation noise does not impinge on normal conversation (50dBa)	60	0.8
SO 1.5 Thermal comfort	Temperature of occupied space does not exceed 28 or go below 18°C for less than 5 days per year (100%)	60	0.8
SO 1.5 Views	% of occupied space that is 6m from an external window (not a skylight) with a view	60	0.8
SO 2 Inclusive Environments			4.6
SO 2.1 Public Transport	% of building (s) within 400m of disabled accessible public transport	100	1.0
SO 2.2 Information	High contrast, clear print signage in appropriate locations (100%)	60	0.8
SO 2.3 Space	% of occupied spaces that are accessible to ambulant disabled / wheelchair users	100	1.0
SO 2.4 Toilets	% of space with fully accessible toilets within 50m	100	1.0
SO 2.5 Fittings & Furniture	% of commonly used furniture and fittings (reception desk, kitchenette, auditorium) fully accessible	60	0.8
SO 3 Access to Facilities			5.0
SO 3.1 Children	All users can walk (100%) / use public transport (50%) to get to their childrens' schools and creches	100	1.0
SO 3.2 Banking	All users can walk (100%) / use public transport (50%) to get to banking facilities	100	1.0
SO 3.3 Retail	All users can walk (100%) / use public transport (50%) to get to food retail	100	1.0
SO 3.4 Communication	All users can walk (100%) / use public transport (50%) to get to communication facilities (post, telephone and internet)	100	1.0
SO 3.5 Exercise	All users can walk (100%) / use public transport (50%) to get to recreation / exercise facilities	100	1.0
SO 4 Participation & Control			4.0
SO 4.1 Environmental control	% of occupied spaces able to control their thermal environment (adjacent to openable windows/thermal controls)	60	0.8
SO 4.2 Involvement	% of users actively involved in the design process (workshops / meetings with models / large format drawings)	60	0.6
SO 4.3 Social spaces	Social informal meeting spaces (parks / staff canteens / cafes) provided locally (within 400m) (100%)	100	1.0
SO 4.4 Sharing facilities	5% of facilities shared with other users / organisations on a weekly basis (100%)	60	0.8
SO 4.5 User group	Active representative user group involved in the management of the building / facilities / local environment (100%)	60	0.8
SO 5 Education, Health & Safety			4.2
SO 5.1 Education	Two percent or more space/facilities available for education (seminar rooms / reading / libraries) per occupied spaces (75%). Construction training provided on site (25%)	100	1.0
SO 5.2 Safety	All well used routes in and around building well lit (25%), all routes in and around buildings (25%) visually supervised, secure perimeter and access control (50%), No crime (100%)	100	1.0
SO 5.3 Awareness	% of users who can access information on health & safety issues (ie HIV/AIDS), training and employment opportunities easily (posters/personnel)	60	0.6
SO 5.4 Materials	All materials/components used have no negative effects on indoor air quality (100%)	100	1.0
SO 5.5 Accidents	Method in place for recording all occupational accidents and diseases and addressing these	60	0.6

10.7.1 Economic State

The tool was specifically designed for buildings in developing countries and it therefore focuses on pertinent issues in the economic, social and environmental domains as summarised below:

"Responsive systems and technologies that are able to

10.7.2 Social State

accommodate change and ensure that limited resources are used and maintained as efficiently and effectively as possible to provide for the needs of existing and future populations without damaging the biophysical environment" (Gibberd, 2003:115).

10.7.3 Environmental State

"Safe, happy, healthy, cohesive, fulfilled, societies that have organisational structures and are able to develop innovative solutions, which enable them to share limited resources equitably and in ways that enable all existing and future populations' needs to be met" (Gibberd, 2003:115).