betweeness

By
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Study Leader:
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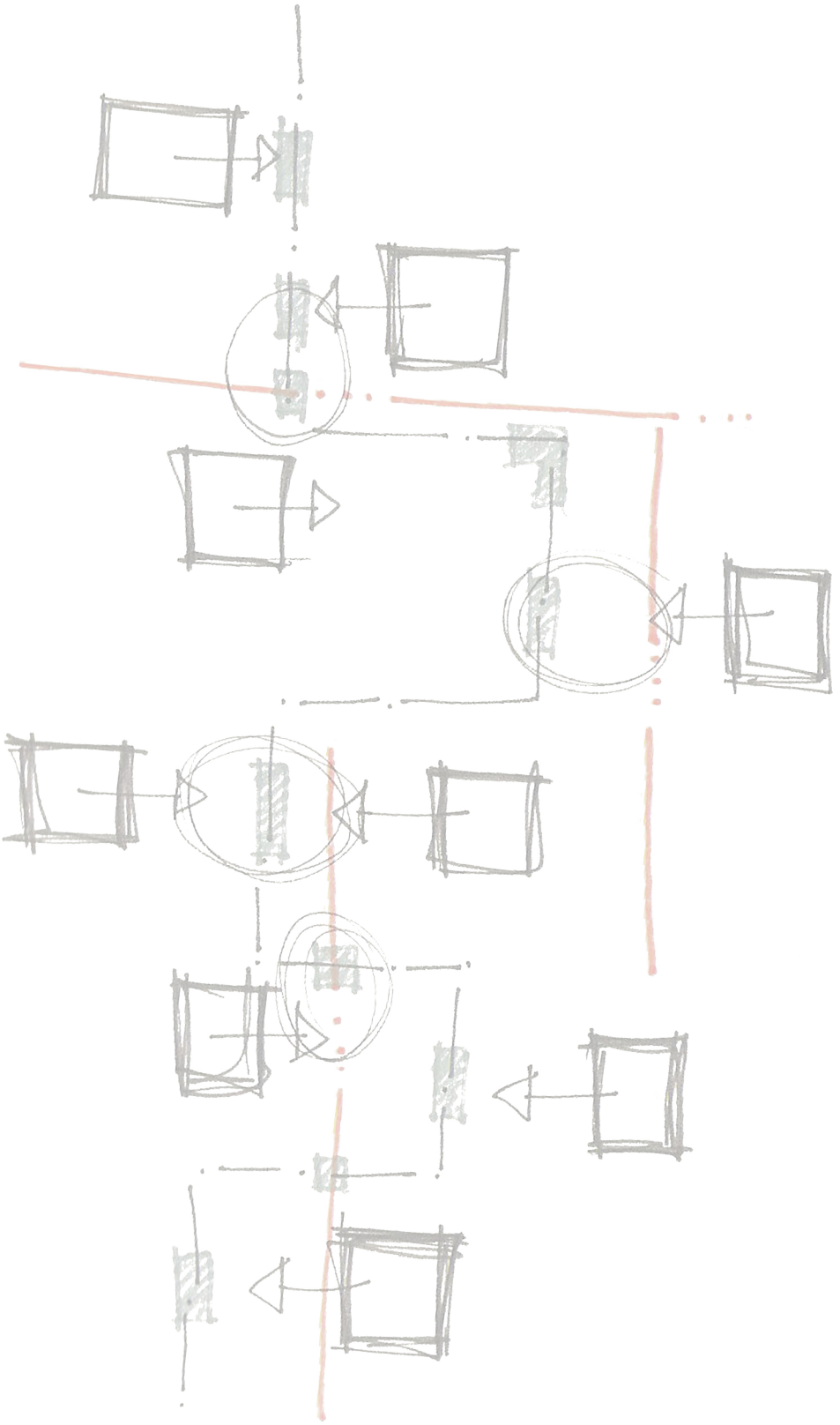

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Boundary/n.
Something that indicates bounds or limits; a limiting or bounding line.

Discipline /n.
A branch of instruction or learning, but within the same profession.

Information /n.
That which is known about a specific subject or situation.
Knowledge derived from study, experience or instruction.
Knowledge of specific events, or situation that has been gathered or received by communication – intelligence or news.
A collection of fact or data.
The act of informing or the condition of being informed.

Profession/n.
A distinct vocation or calling with specialist knowledge.

Translate /v.
To express in another language, while systematically retaining the original sense.
To change into a different form, substance, or state.
To express the meaning of in other, especially simpler, words.

In the information era of the 21st century, information is communicated through various ways or media. These include electronic media, print media for example publications, exhibitions and open days and face-to -face interaction, for example with consultants. The current situation is that the existing distribution of information through the different media is not successfully integrated causing the isolation of entities that distribute and communicate information. The solution proposed in this paper is to design an information hub where information is communicated through various media. The interior design should support and be conducive for an effective and integrated model for the communication of information.

In addition to this, the problem of the identity crisis of the discipline of Interior Architecture within the Built Environment Profession will be addressed. Public perception still is that Interior Architecture cannot

Fig 1.1 Touch Stone March 2008

stand firm in its responsibilities and identity. Interior Architecture therefore must in itself acknowledge and celebrate its legitimacy before pursuing greater recognition and formal acknowledgement.

"Interior Architecture is an essential need and it is important" (Caan, 2007:53)

Interior Architecture occupies and inhabits a space, which does not need to be fully enclosed but should rather reflect the condition of control over the space. This reveals the opportunity of exclusion as much as it reveals the ability of inclusion. The line between the two bodies carries an important weight and brings the argument back to the division of space.

This paper argues that the line itself represents more than a division of space, for the line holds in it the opportunity of being part of either space. This line becomes an issue of 'betweeness' which should be exposed to reveal the grey area that exist between Interior Architecture and Architecture.

2 CLIENT BODY AND USER GROUP

Fig 2

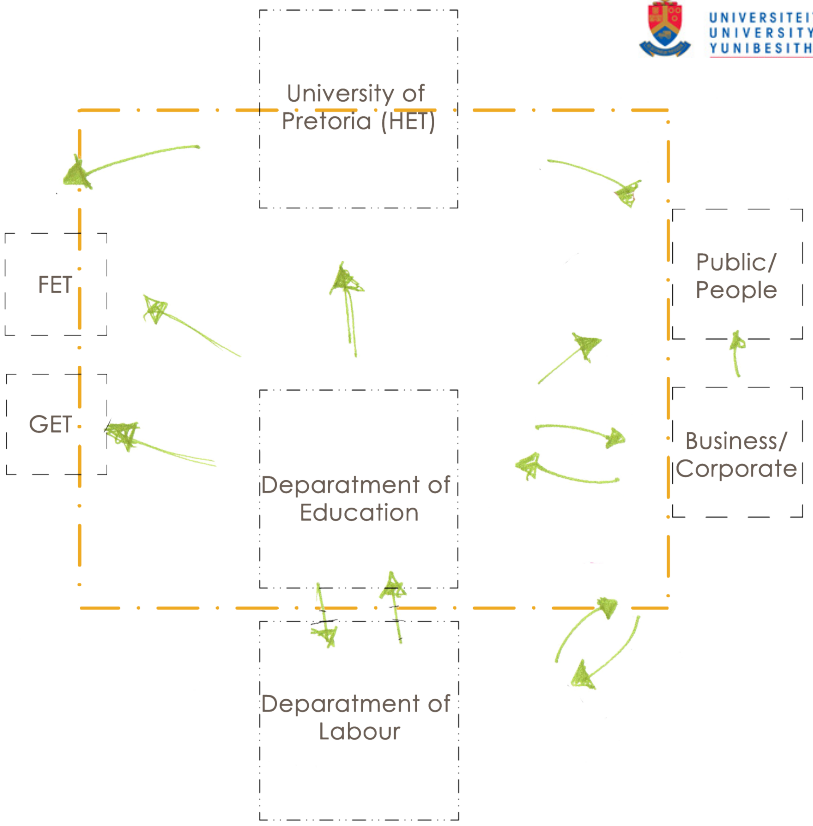


Fig 2.1 Diagram indicating existing and proposed relation between the different parties

CLIENT BODY

The HRD Strategy of South Africa aims to expose the people of South Africa to adequate opportunities of lifelong education and training (Human Resource Development Strategy. [Sa]). It seeks specialized knowledge and is an attempt to adhere to the social and economical needs of the 21st century (Human Resource Development Strategy. [Sa]).

The Strategy seeks to address the economical and professional needs of the nation, therefore relying on the different bands of education to translate knowledge to the participating learners, but also to potential learners, in order to gain professionals with the necessary skills to uplift the economy.

The three different bands of education that exist in South Africa are captured in the National Qualification Framework (NQF). Higher Education and Training (HET) can be referred to as tertiary education for it provides education and training to candidates with a NQF Level 4 qualification for example Grade 12 certificate. The terms for these institutions are stated in the Higher Education Act, 2003. Act No 101 of 1997 amendment 2003.

In the vision statement by the University of Pretoria as HET institution equal opportunities for potential students are promoted. The university states in its 'Strategic Thrusts and Objectives' document that it strives to be recognized on both national and international levels as a leading teaching institute for academic excellence (The Strategic Plan of the University of Pretoria. [Sa]).

In order for the University to reach its strategic goals, it should strive to reach out further than the boundaries set for Higher Education. Potential students that are in the FET phase of education can be identified and targeted to generate future interest in important economic fields. This will enable the university to recruit future students in specific fields where indentified skills needs had been recognized.

The university aims to ensure that the local impact is relevant to the needs of the country and the specific skills requirements of the economy (The Strategic Plan of the University of Pretoria. [Sa]). Transformation is of pertinent importance to enable the rich diversity of South Africa's intellectual students to flourish on an international level.

The University of Pretoria ensure excellence in Higher Education. They should not only reach the goals set out in the mission statement but also impact the broader scale of the nation through social responsiveness (The Strategic Plan of the University of Pretoria. [Sa]).

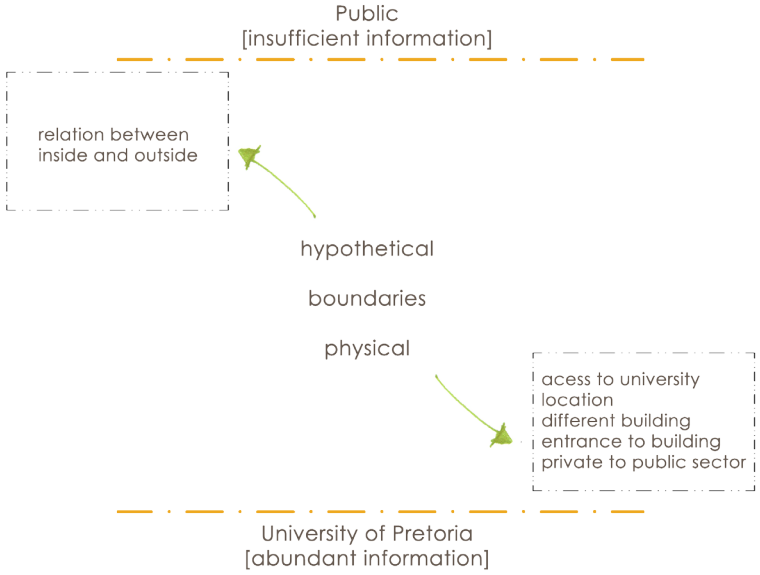


Fig 2.2 Diagram indicating existing boundaries for specific context

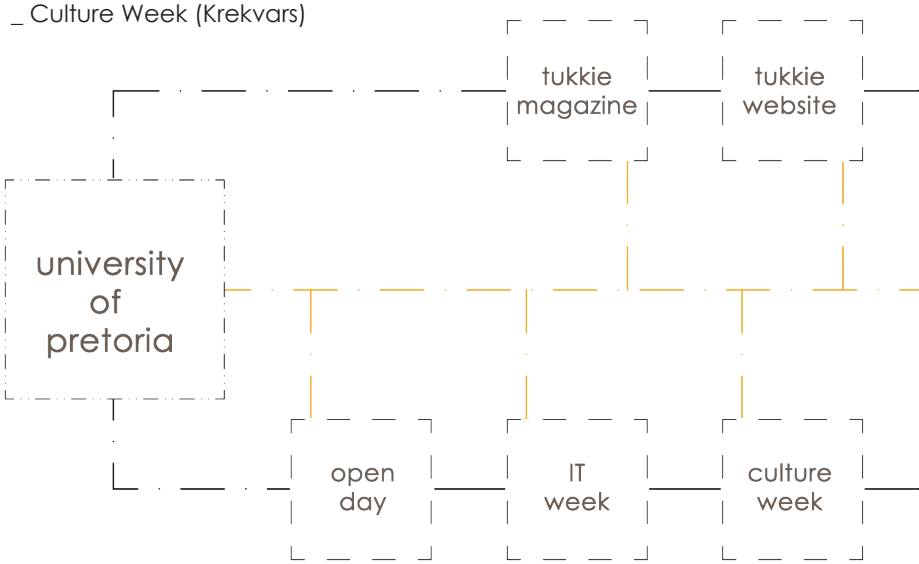
CURRENT SYSTEM FOR DISTRIBUTION OF INFORMATION

The university has existing systems in place to educate potential students about the different opportunities available. What this system lacks is the inclusion of other departments other than the Faculty for Science and Engineering. Adrie Krugel (2008), Senior Student Advisor, in a personal interview explained that the university identifies potential students with high marks in only Mathematics and Science. These students are then placed on a database for distribution of the local Junior Tukkie Magazine. The Junior Tukkie Magazine however, includes information from all the different departments at the university and it is of important that all potential students should be included in this distribution database.

The other existing systems in place can be divided into two categories:

Continuous activities through the year (permanent basis):
_ Distribution of the Junior Tukkie Magazine
_ Information uploaded onto the Junior Tukkie Website
_ Sci Enza
_ General Advertisements placed in various print media

Single events (temporary basis):
_ Open Day
_ Information Technology Week
_ Engineering Week
_ Culture Week (Krekvars)



What the existing facilities system lacks is the ability to operate continuously throughout the year, in order for the new system to operate to its full potential

PROPOSED DEVELOPMENT FRAMEWORK

The proposed framework to distribute information to potential students consists of three phases of translation of information, maintenance and support. These three phases is needed for the framework to work successfully.

- Phase One: Design an Information Hub that will be able to identify potential students and introduce them to the diverse academic courses.
- Phase Two: Maintaining support and assistance to the students during their study term.
- Phase Three: Additional support to the graduate in the specified field of expertise.

The study focus on Phase One with the different opportunities and media through which potential students can be informed and taking into account the existing support facilities to enhance it to its full potential. This study will propose an Information Hub to improve current systems of information communicated.

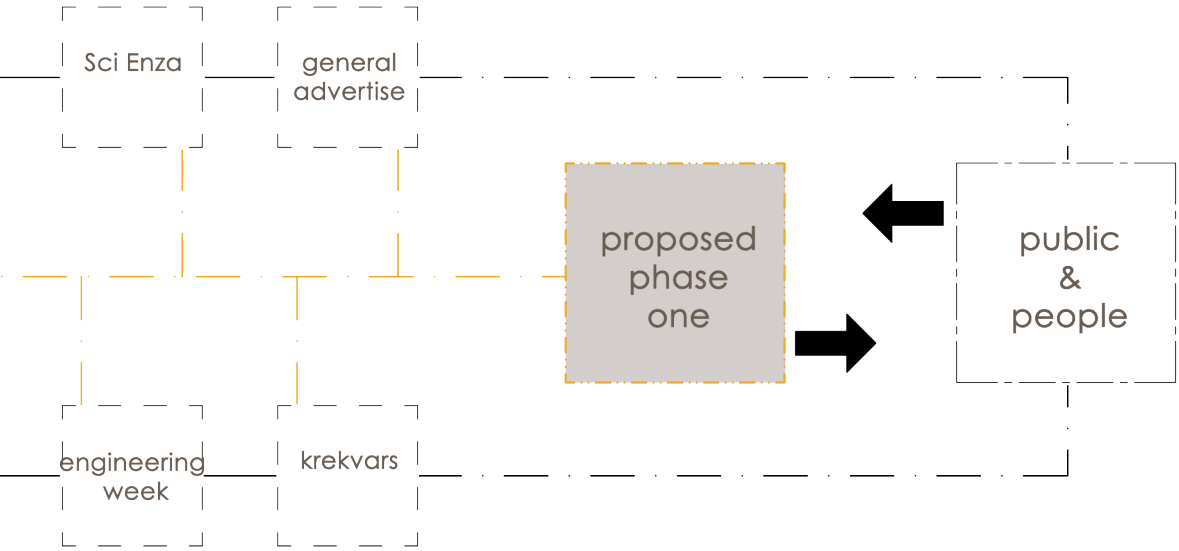


Fig 2.3 Diagram indicating Proposed Development Framework

3 PROBLEM AND ITS SETTINGS

Fig 3

RESEARCH PROBLEM AND OBJECTIVES

The University of Pretoria plays an important role as a Higher Education and Training Institution and for that reason should participate in providing information according to the needs of all potential students. The university currently has a diverse array of information which is distributed to its students and members using a variety of media. What the university needs is to distribute specific information to potential students in order to recruit students in specific areas of the national economic interest. This will benefit the university and nation in the long run.

For the purpose of this study, the need for academic tertiary institutions to communicate information frequently in an integrated manner has been identified. Furthermore, the need for recruitment in specific areas of expertise as identified in the Human Resource Development Strategy becomes imperative.

"The purpose of this HRD strategy is to provide a plan to ensure that people are equipped to participate fully in society so as to be able to find or create employment opportunities and to benefit fairly from them". (Human Resource Development Strategy. [Sa])

Fig 3.1 Touch Stone March 2008 Illustrating Trapped Info

Fig 3.2 Touch Stone March 2008 Illustrating Info breaking the boundary

Fig 3.3 Touch Stone March 2008 Illustrating Free flow of Info

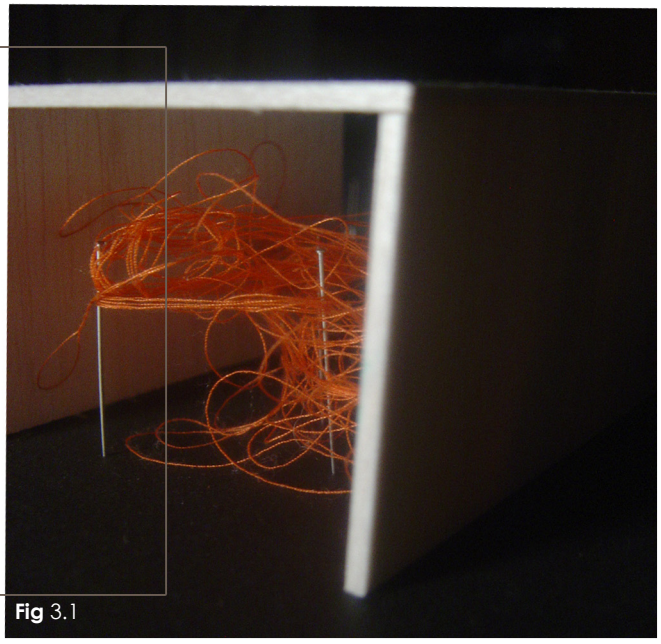


Fig 3.1

"Transforming the economy necessitates an overall audit of the country's human resources policy framework that will reposition South Africa to be globally competitive. The Vision in South Africa is that all people should have access to lifelong learning, education and training opportunities which in return will contribute towards improving the quality of life and building a peaceful, prosperous and democratic country." (PANDOR, 2008)

South Africa as a nation has potential for greatness but the inadequate operation of and fragmentation of existing information systems and design limit the nation to achieve its greater potential and to address the critical and scarce skills needs. The existing distribution of information is limited to different faculties within their own areas of expertise. This study and the subsequent design of the Information Hub is a proposed solution to break down these barriers and boundaries so as to make potential students and the public aware of the different academic activities available at the university. The Information Hub strives to integrate the fragmented entities through transparency in design. Taking into consideration the grey area that exists between Interior Architecture and Architecture.

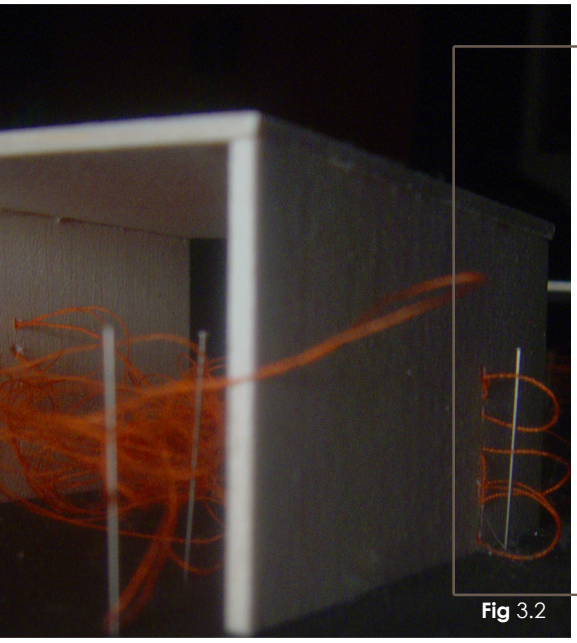


Fig 3.2

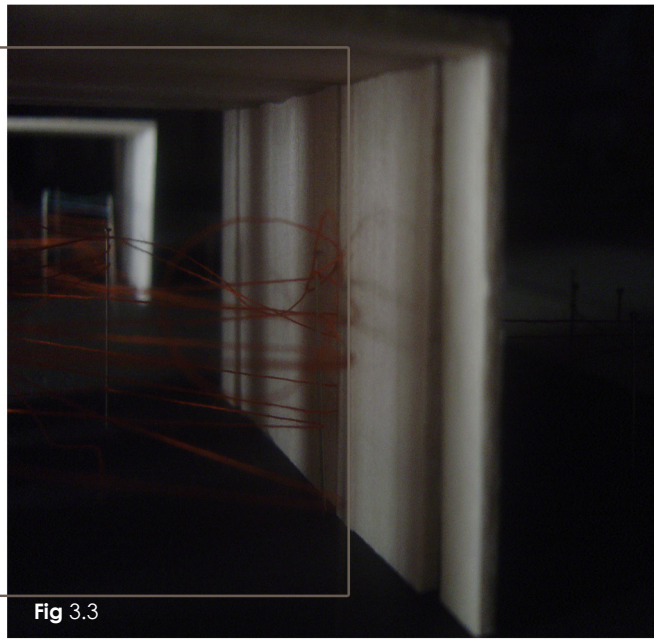


Fig 3.3

_Main Problem

In the design of the Information Hub for counselling and recruitment the principles of transparency and integration are to be applied in the design. The integration of the different media to communicate and distribute information should be reflected in the interior design in terms of mobility and free flow of information. In addition to this, 'betweeness' must be prevalent in the design in that the definite line between the exterior and interior should diminish.

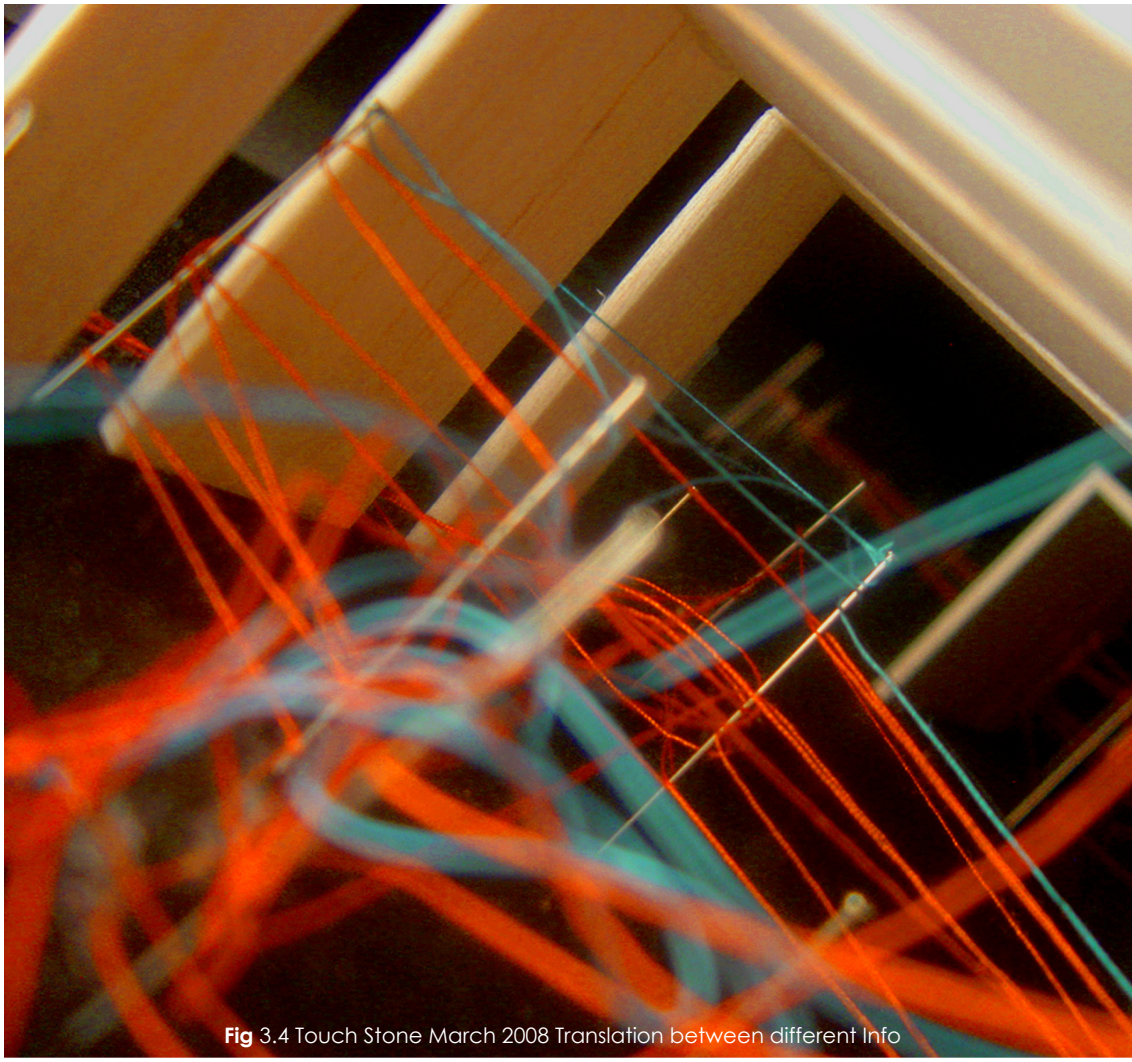


Fig 3.4 Touch Stone March 2008 Translation between different Info

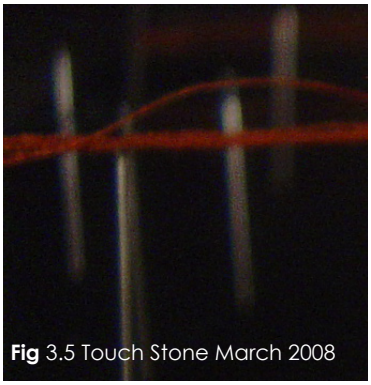


Fig 3.5 Touch Stone March 2008

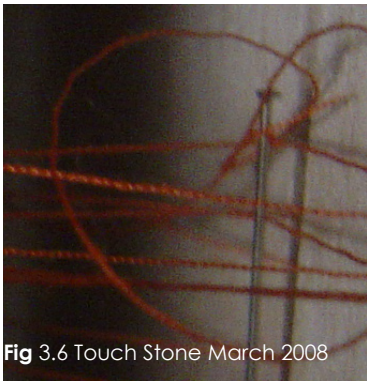
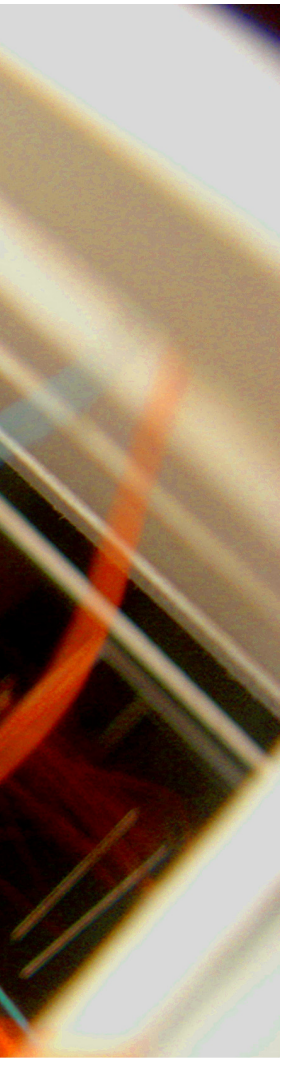


Fig 3.6 Touch Stone March 2008



_Subproblems

To address the above problem mentioned the following problems will be taken into consideration:

Subproblem 1 concerns the physical and hypothetical boundaries that exist between Architecture and Interior Architecture with relation to the specific site and proposed problem. The existing boundaries amplify the stigma of Architecture and Interior Architecture as separate entities without any recognition towards the other. The existing structure portrays an Architectural skin that has little or no concern to the interior environment and the work of Interior Architects follows as an afterthought.

Subproblem 2 concerns the current manner in which Interior Architecture translates information to its users, relating to the existing activities on site as well as to the opportunities that arise within the discipline. Currently the existing interior language has little concern with the comfort and quality of the space to visitors. The interior language involves the physical objects on display and the emotional quality it creates. The interior language should make use of all knowledge to stimulate and inspire the human senses.

Subproblem 3 concerns the opportunities that arise when information is shared between the university and the public. The existing approach is critically reviewed and the question is posed as to whether it is efficient to effectively communicate and distribute information.

_Delimitations

Boundaries regulate the interior and exterior of geometric instruments but it may be ambiguous in its relation to closure. This study will investigate the diverse boundaries that exist within the set parameters of the site to reveal the possibilities of both extremes but will not investigate the universal stigma behind boundaries.

The physical boundaries that will be dealt with are: the university to its immediate surroundings and the boundaries within the perimeters of the university specific to the site. Those will include the boundaries of the building in relation to its surrounding spaces, the boundaries between the interior and the exterior as well as the interior boundaries in relation to the exhibitions on display. The urban environment of the university will not be dealt with in detail but merely on a hypothetical level with regards to distribution of information to areas beyond the boundaries of the university.

The interior language translates information in many different approaches. The existing manner in which translation occurs must be dealt with to ensure excellent design that supports and enhances the proposed framework. This study will not attempt absolute solution to the universal problems and opportunities of interior architecture and technology in design.

The information distribution by the university is limited to information communicated to potential students within the context of recruitment. The relation between the interior language and the communication of information will be dealt with. For the purpose of this study the extent of the all media utilised and marketing strategies of the university will not be researched as well as the specific content of information distribution.

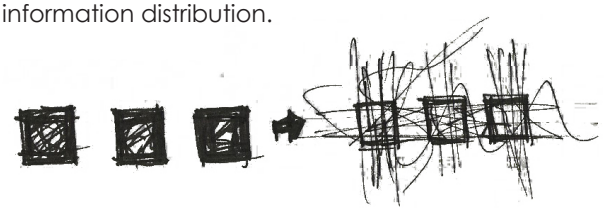


Fig 3.7 Concept Sketch for Touch Stone

Touch Stone designed March 2008 is an abstract illustration of information moving freely across boundaries to many visitors who receive the information without limitations. The information has the ability to travel through boundaries and stay with different users thereby encourages the movement of information.

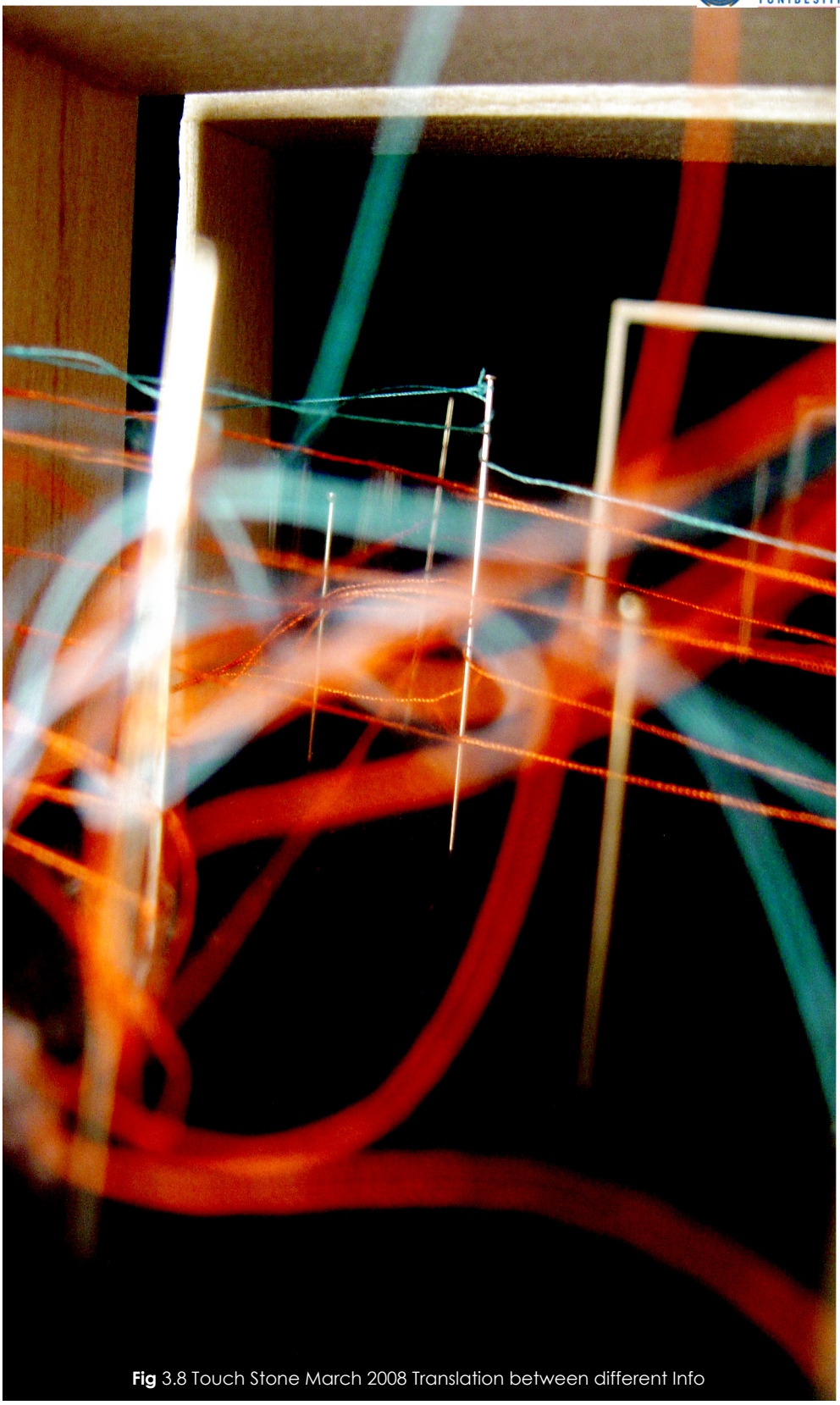


Fig 3.8 Touch Stone March 2008 Translation between different Info

4 CONTEXT AND SITE ANALYSIS

Fig 4

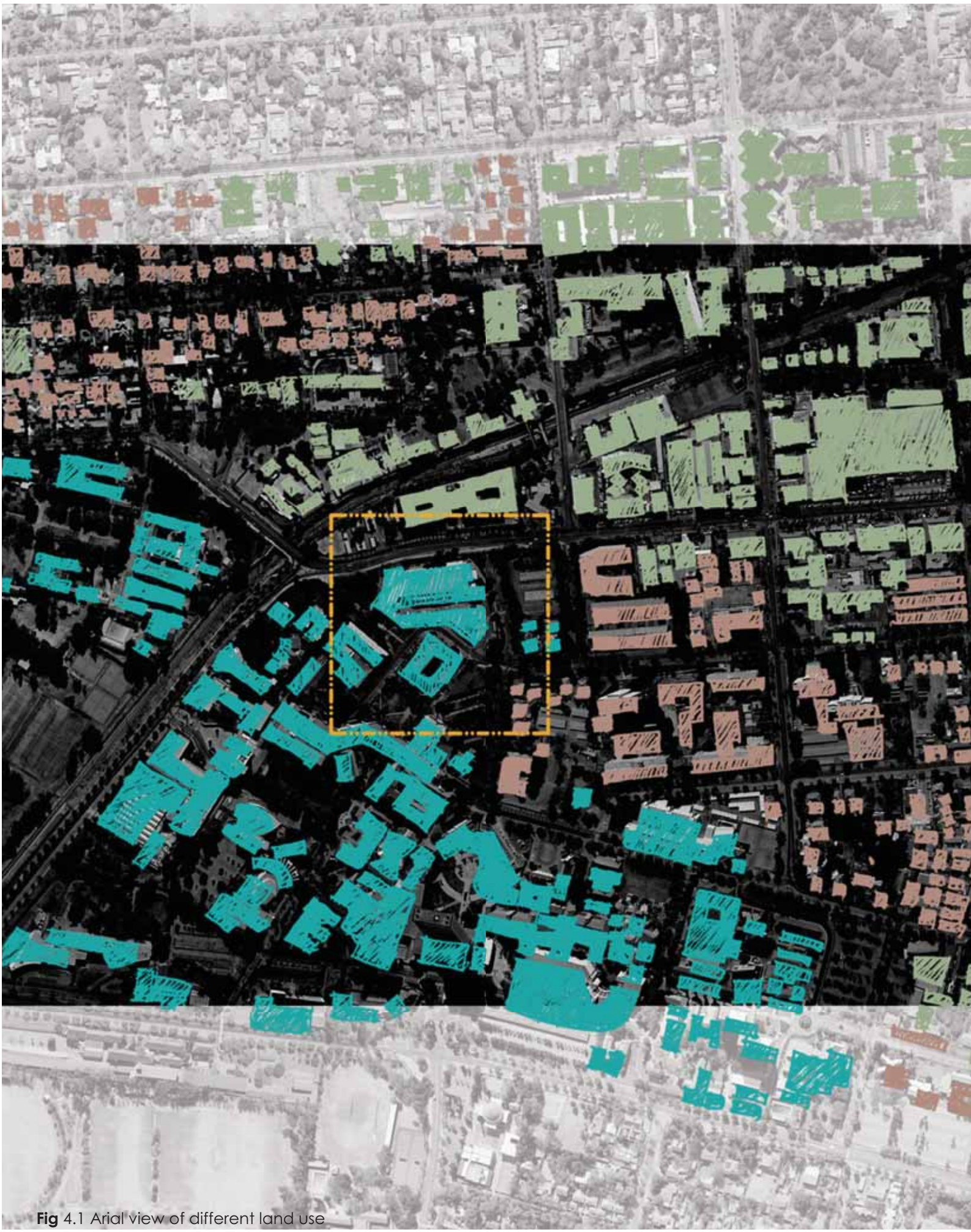


Fig 4.1 Arial view of different land use

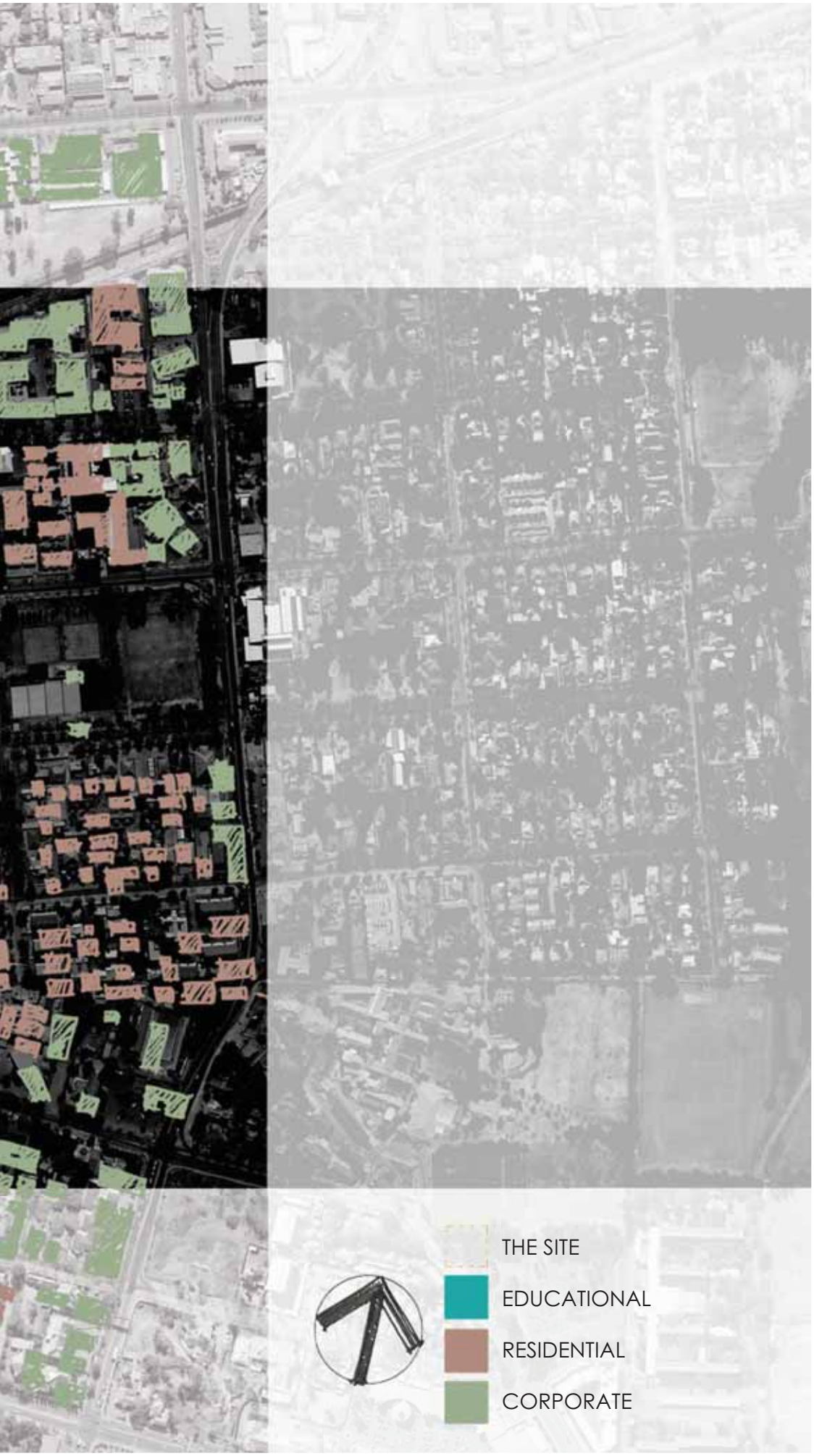

THE SITE
EDUCATIONAL
RESIDENTIAL
CORPORATE

Fig 4.2 Transport Nodes

The main campus of the University of Pretoria is situated in the Hatfield area. The adjacent land use includes corporate, residential, educational and recreational facilities. A number of factors were taken into consideration when the site for the specific project was chosen. The project necessitates a site which is accessible to the public and close to public transport access points on order to overcome the physical boundaries and barriers experienced.

The site should also reveal the opportunity to transform an existing dilapidated building into a representation of educational growth. The site should not be restricted to its existing footprint and must have the qualities of an adaptable building. According to Stewart Brand in his book 'How Buildings Learn' the adaptability of a building's change is between the sharing of the different building layers (Brand, 1994:13).

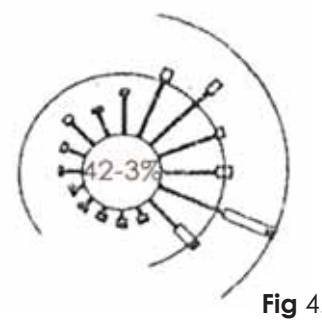


Fig 4.3 Windrose Pretoria January

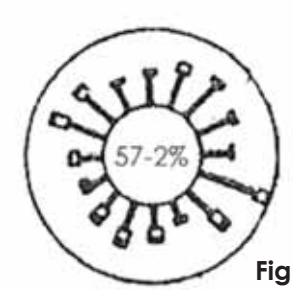


Fig 4.4 Windrose Pretoria June

The layers include:

_ site [geographical setting, eternal]
_ structure [foundation and load bearing elements, 30-300 years]
_ skin [+/- 20 years]
_ services [7-15 years]
_ space plan [layout, from three (commercial) to 30 (domestic) years]
_ stuff [furniture and belongings]
(Brand, 1994:13)

The greater the independence the better the building can adapt or change. When considering these aspects to the specific site it is evident that physical boundaries exist among these layers.

Fig 4.5 Public and Private Space to site

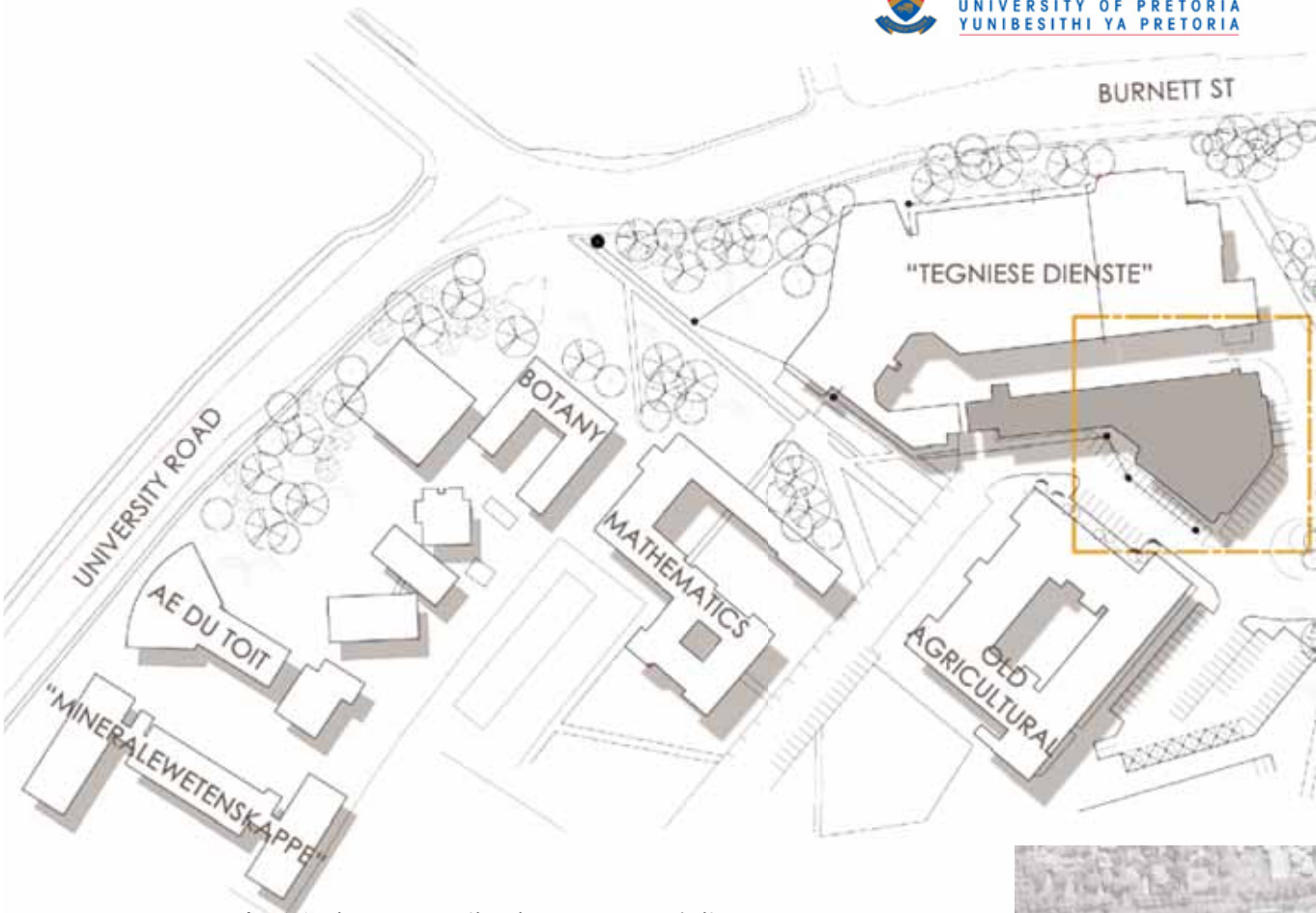


Fig 4.6 Diagrammatic view Proposed site

The site for the specific project is situated on the main campus at the northern end. The site is accessible at the main entrance on Roper Street or at the nearest entrance on Prospect Street. The ring road borders the site at the south facade. The site is ideally situated on the edge of the northern boundary of the university within walking distance to public transport nodes including the Hatfield Station, the Loftus Station and the future Gautrain Station. The building named "Tegniese Dienste" was erected in 1975 with its dominant white concrete structure and significant boxed windows. The site offers opportunities for expansion only to the immediate surroundings of the building. The site and building analysis is based on the six layers according to Brand.

_ SITE: Barriers

The courtyard to the north of the Tegniese Dienste building and the Administration Building limits expansion to the north, but creates sufficient space for services and deliveries. The generous pathway to the south of the building offers the opportunity of extension up to the ring road and the Old Agricultural Building to the south.

_ SITE: Accessibility

The site is easily accessible for pedestrians walking past, scheduled visitors transported with tour buses and local visitors driving past. The existing parking

bays to the east of the building have adequate parking for disabled visitors and buses. Students and visitors on their way to the Administration Building may pass the site on the southern and eastern side. Traffic moving on the ring road in both directions creates a movement at the south eastern corner of the building and this must be taken into consideration together with the location of the existing entrance. Generally high levels of pedestrian movement take place to the south and eastern facades of the building making these importance facades due to the level of exposure.

_ SITE: Edge

Different edges appear at the site which represents the break between two phases or spaces. The first is a clearly defined hard edge that is the boundary of the university to the north of the building along Burnette Street and University Road. The second falls within the university grounds and is not as clearly defined; the tall trees to the north and west of the building form a green edge alongside Burnette Street.

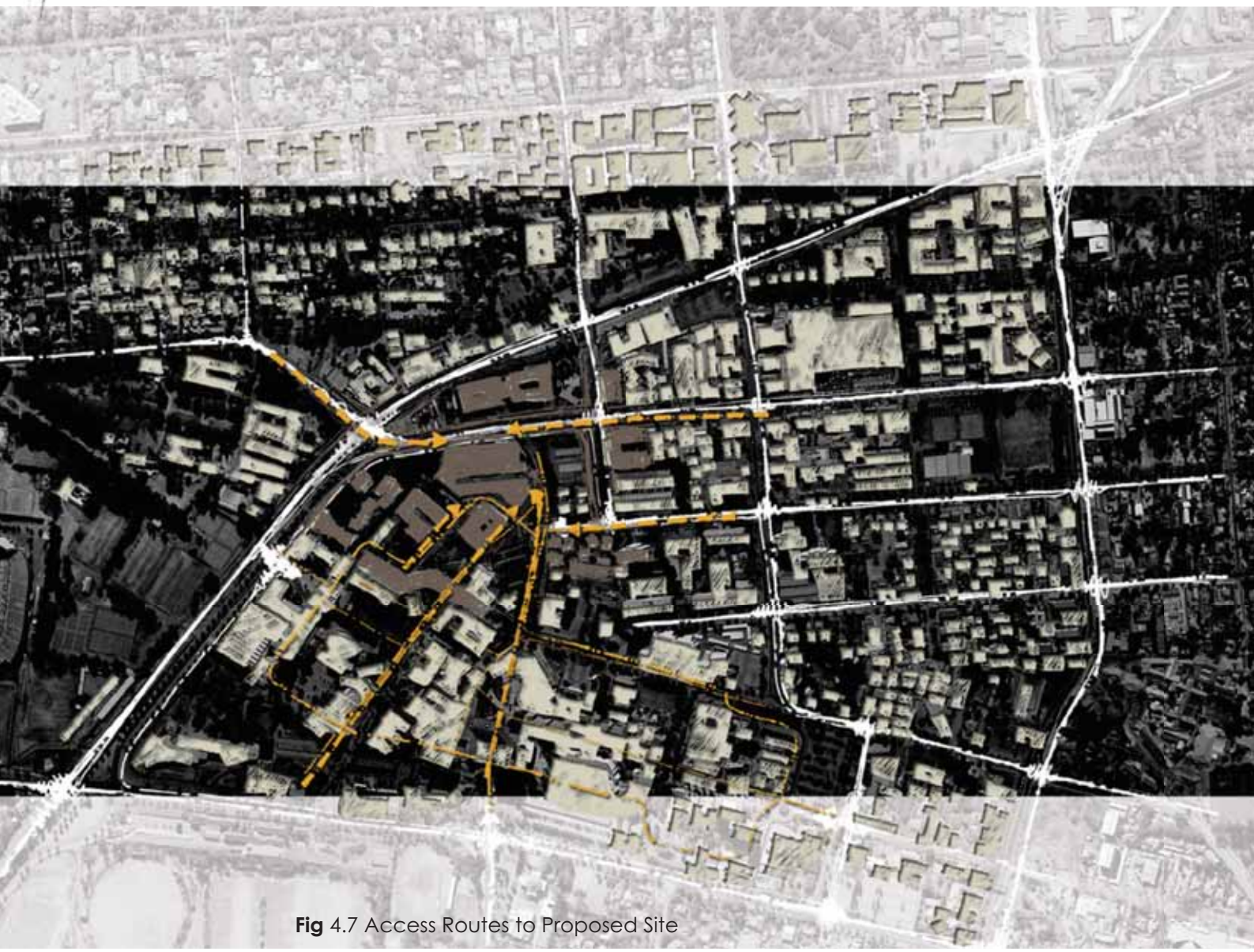


Fig 4.7 Access Routes to Proposed Site

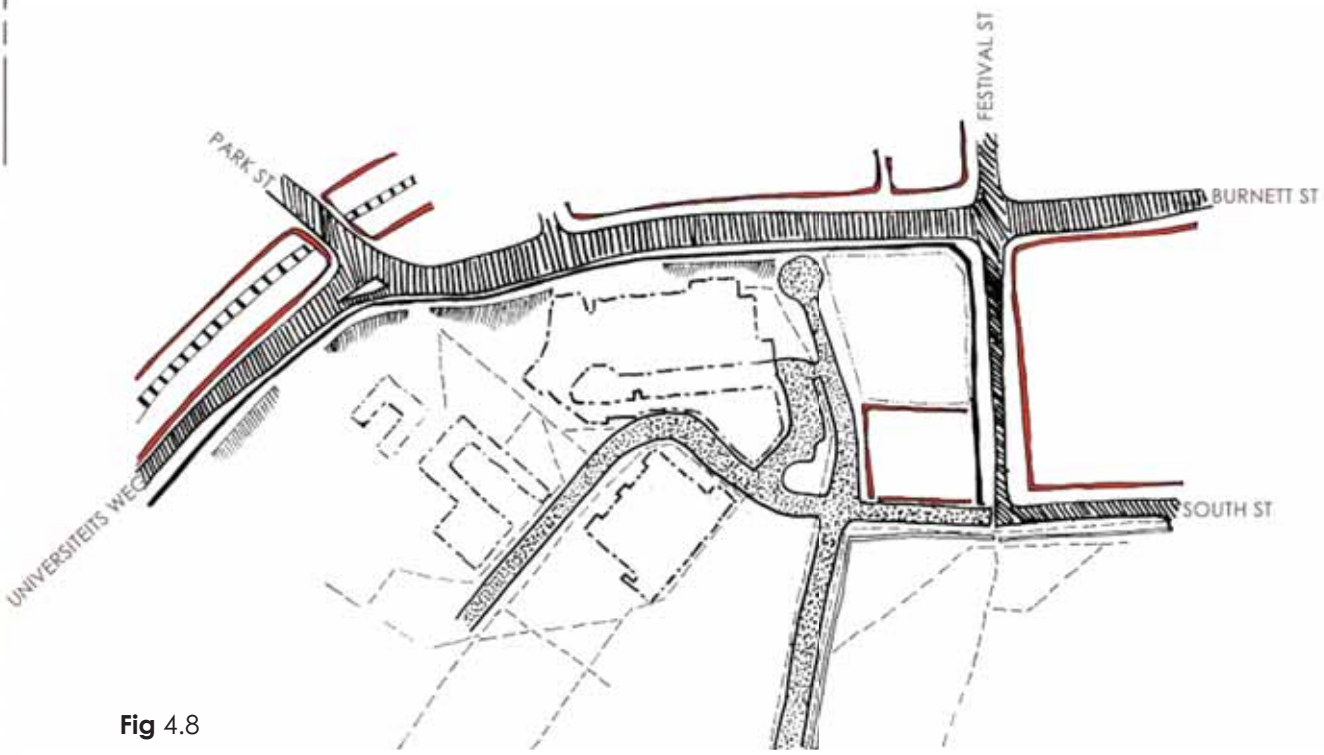

FESTIVAL ST
PARK ST
BURNETT ST
UNIVERSITEITS WEG
SOUTH ST

Fig 4.8

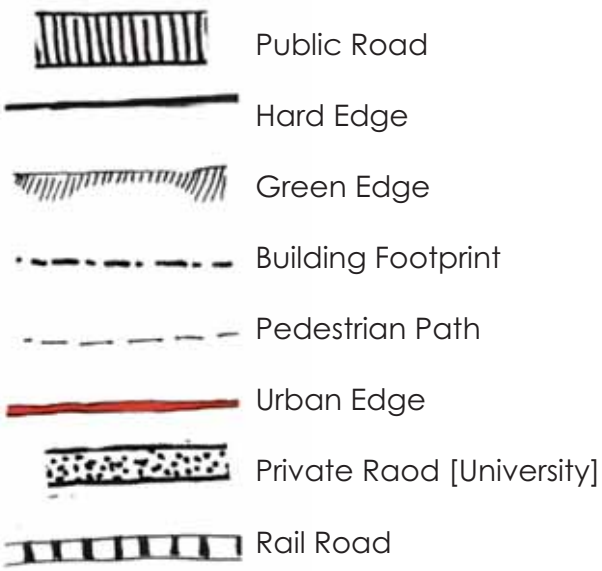

Public Road
Hard Edge
Green Edge
Building Footprint
Pedestrian Path
Urban Edge
Private Raod [University]
Rail Road

Fig 4.9

Fig 4. 8 Proposed Site indicating different edges and paths

Fig 4. 9 Extended Exterior View of Site

Fig 4.10 Site indicating existing boundaries

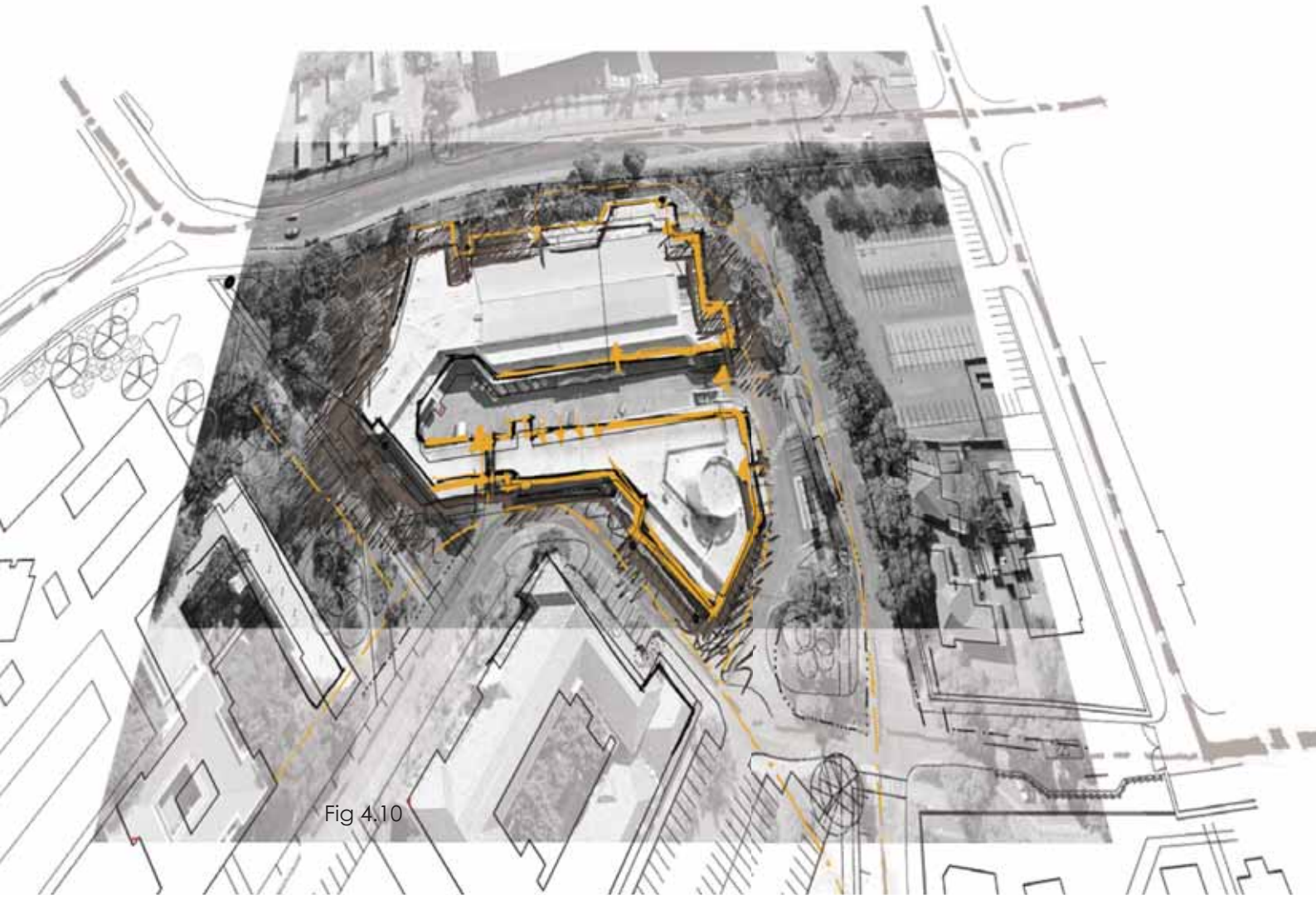


Fig 4.10

_Structure

The building's physical boundaries are apparent in the structure of the building that divides exterior space from interior space. The building consists of a two column grid structure that intersects on the south eastern end of the building. The design language of the structure relates to the building to the north, establishing a specific architectural language. The grid formation is dominantly visible on both plan and external elevation to the north. The interior use of structural columns was added over the years and is not at all a necessity for the overall structure.

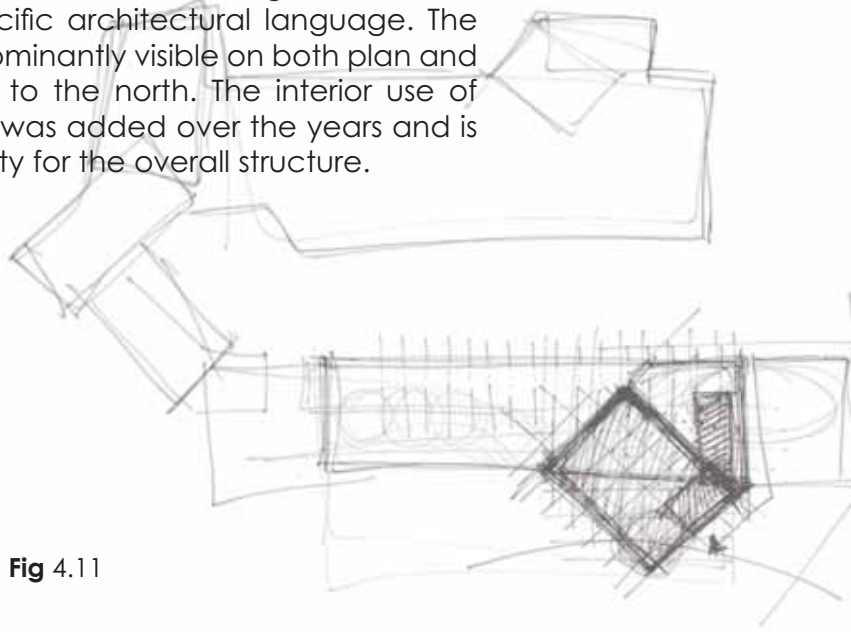


Fig 4.11

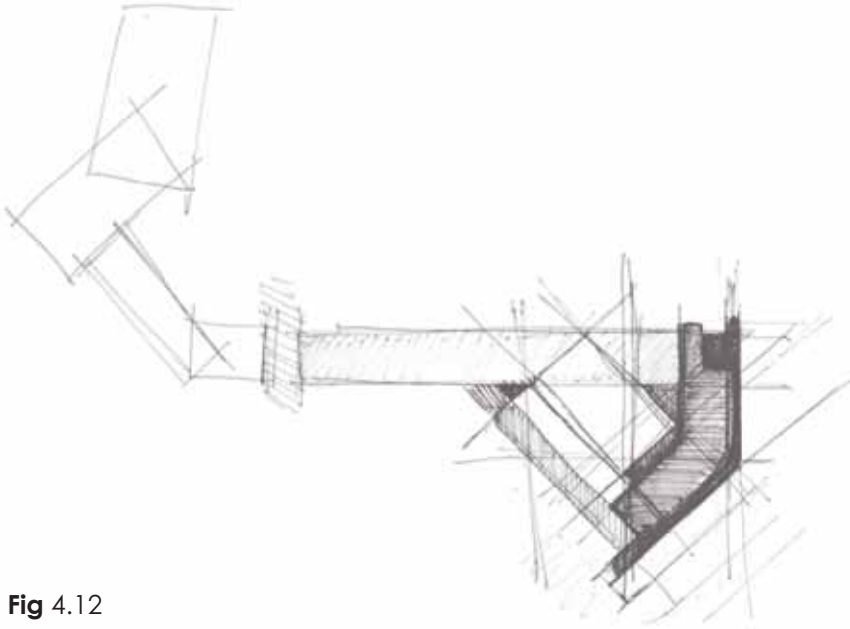


Fig 4.12

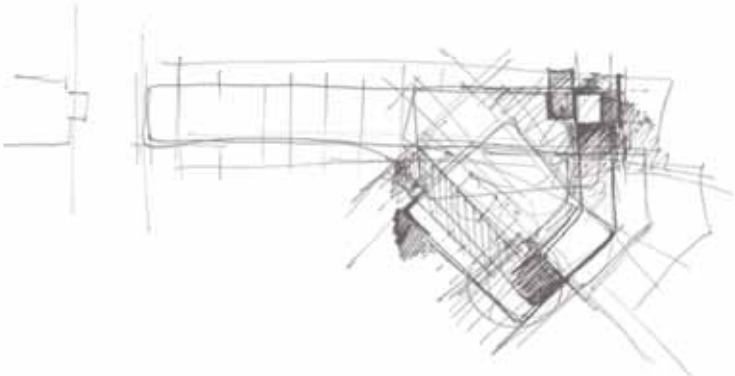


Fig 4.13

Fig 4.11 Existing building

Fig 4.12 Volume differences in existing building

Fig 4.13 Analysis of 2 axis and activity nodes

Fig 4.14 Existing dominant axis

Fig 4.15 Wire frame columns structure

Fig 4.16 Block illustration of existing volumes

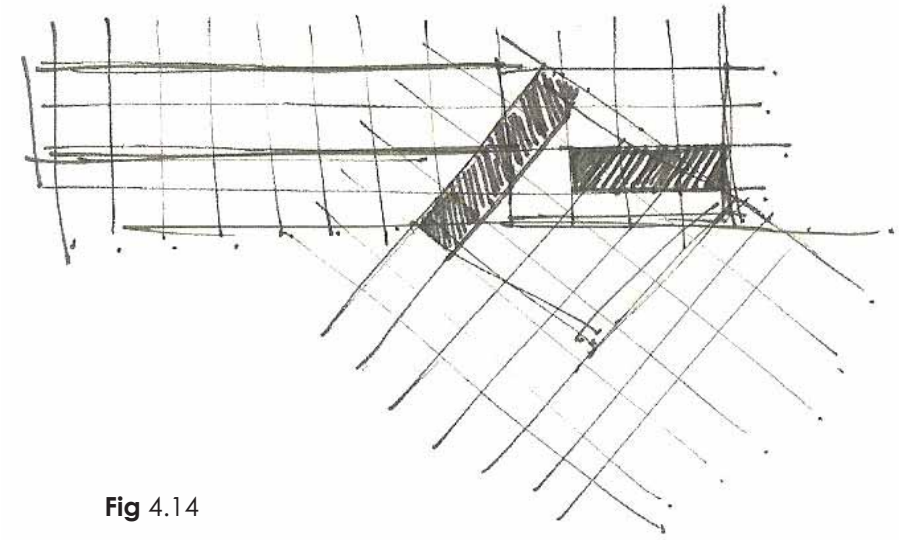
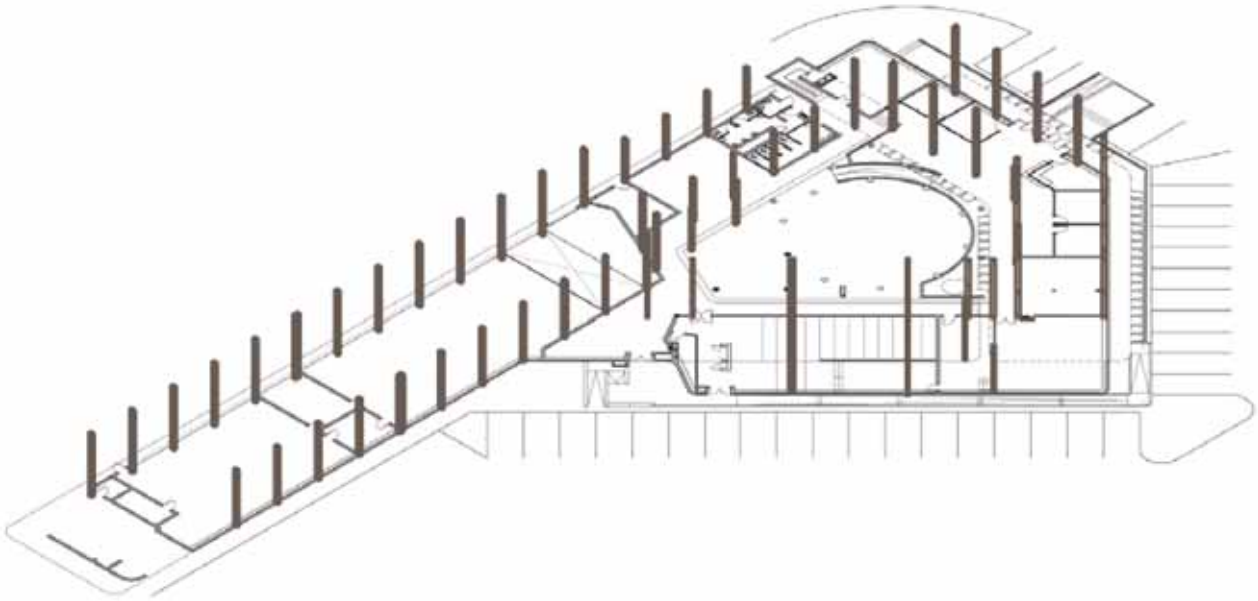


Fig 4.14



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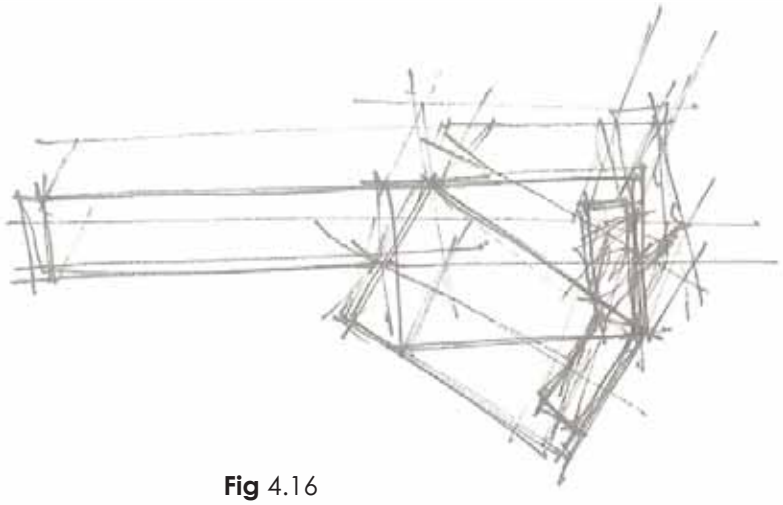
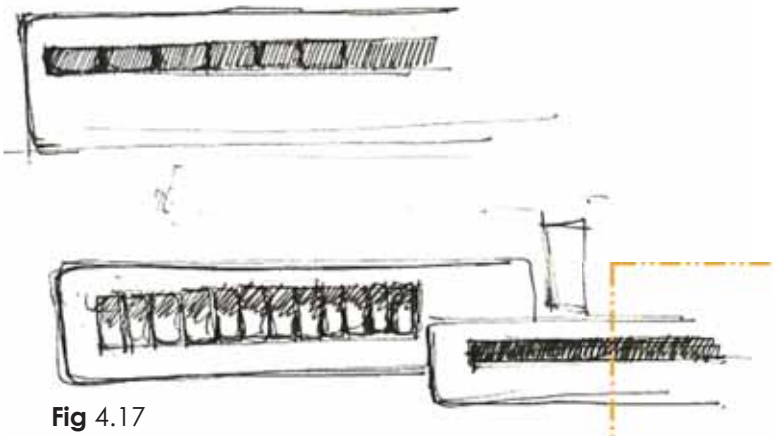


Fig 4.16



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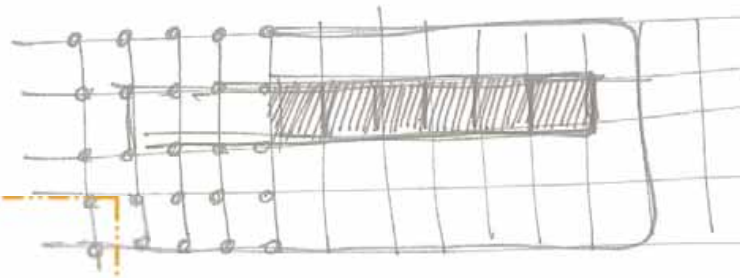


Fig 4.18

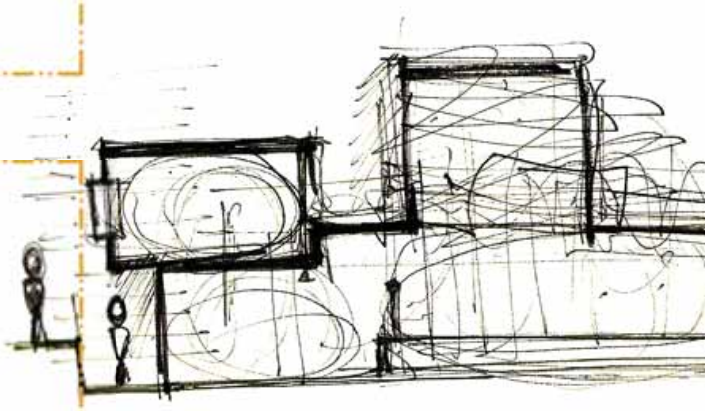


Fig 4.19

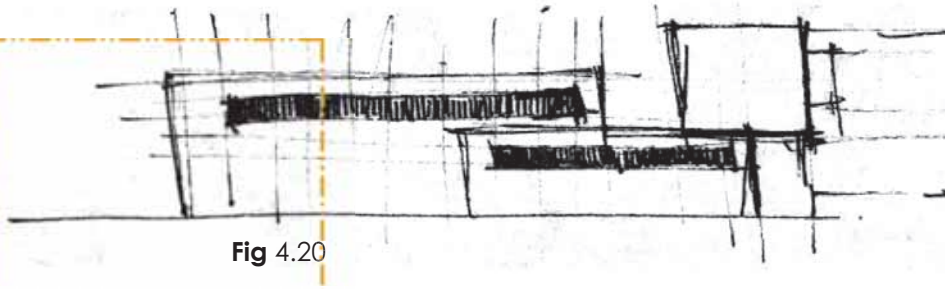


Fig 4.20

Fig 4.17 Exterior Skin, two main window patterns

Fig 4.18 Exterior Skin

Fig 4.19 Exterior Skin and the need to expand the interior through existing skin

Fig 4.20 South Elevation

Fig 4.21 Language for exterior skin

Fig 4.22 East Elevation

Fig 4.23 Extended Exterior View of building

_ Skin

The skin defines the definite boundary between the exterior and the interior and at present keeps the activities of both exterior and interior separate with no opportunity for interaction. The materials used for the skin consist of concrete and brickwork, plastered and painted white, with limited openings for windows and entrances. The concrete window details establish a specific language reading to the aestheticism of the building and reveal the structural quality of concrete. The possibility to break through the skin is supported by the fact that the skin carries little structural load. The southern and eastern facades have sufficient exterior space for expansion. The northern facade consists of columns with roller shutter doors in between and is currently used as storage space. The threshold between interior to exterior exposes unused opportunities and should rather enhance the spatial activities.

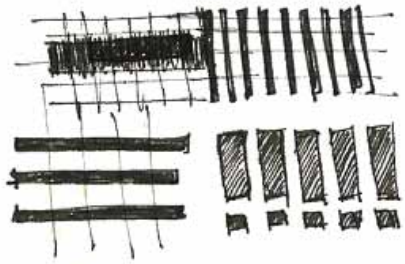


Fig 4.21

Fig 4.22

Fig 4.23

_ Services

Many of the services is surface mounted but have changed drastically over the lifetime of the building. The sewer system with existing duct is situated to the northern end of the building; it is easily accessible for all visitors including a wheelchair accessible toilet. The existing facilities must be inspected and upgraded to include added facilities.

_ Space Plan

The interior layout of the building changed immensely with changes to office layout and lecture halls. Some brickwork is visible to the interior but can be removed at areas due to sufficient structural stability of the columns. The many changes and grid layout of the building caused for some awkward interior spaces and it would be advisable to limit the interior walls to a few important walls in specific areas.

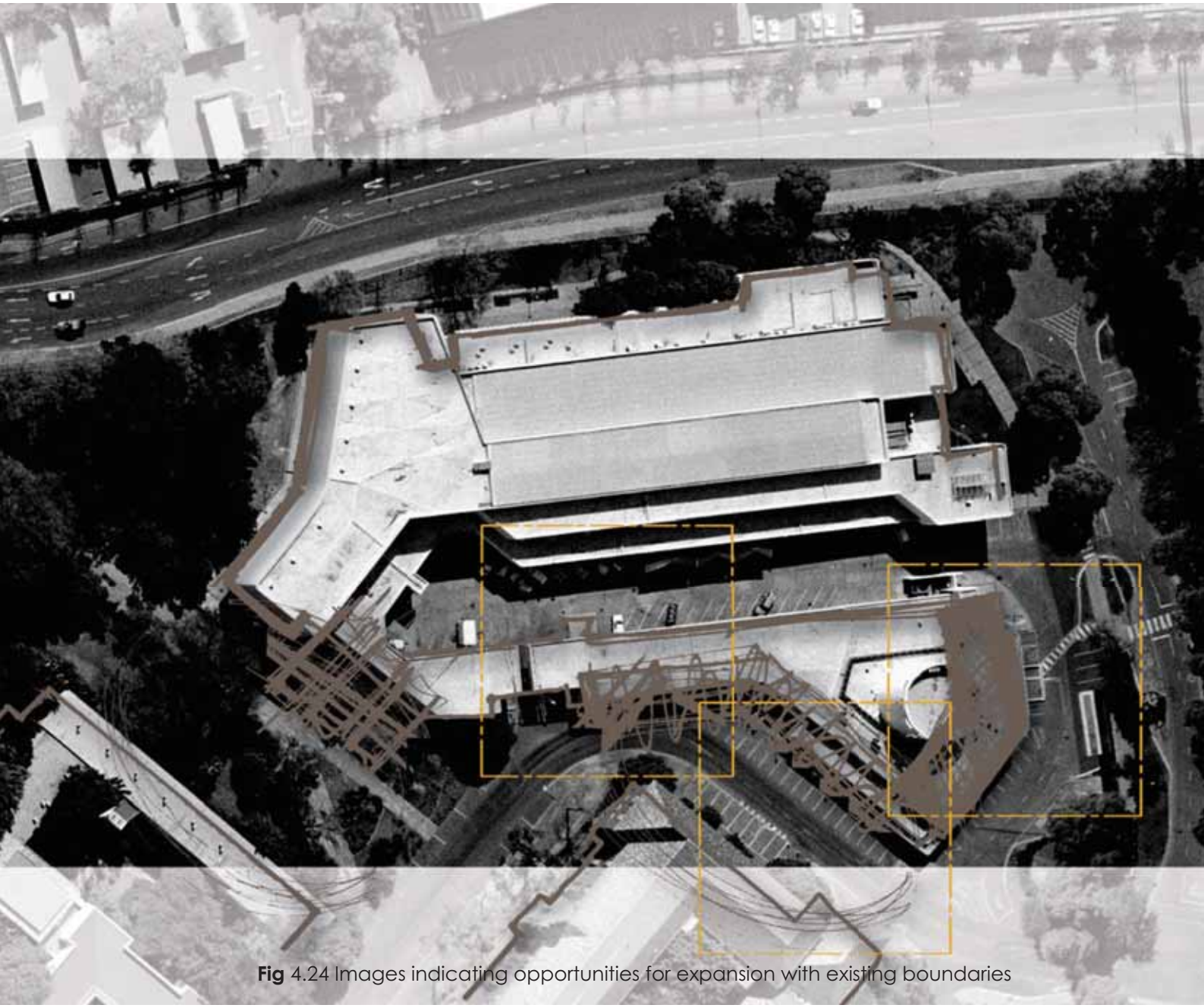


Fig 4.24 Images indicating opportunities for expansion with existing boundaries

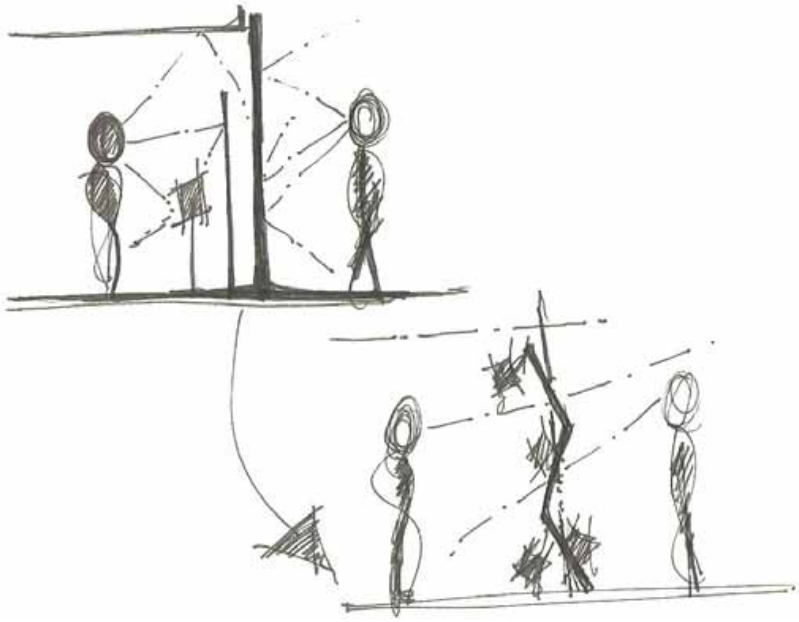


Fig 4.25 Illustrating changed boundaries

_ Stuff

The existing Science Exhibitions are out dated with little consideration to the interior language. The spatial experience is limited to a few interactive exhibitions. The furniture and equipment in the building are not up to standard and must be reworked together with the new design.

To conclude, in the building its current state variations of boundaries exist both physically and hypothetically. These boundaries need to be broken down or adapted in order for the building to be optimised to its full potential. Many of these boundaries are visible on site as well as in the poor use of interior spaces. Opportunities arise to improve the existing interior and exterior dilapidated spaces. The building is already associated with an exhibitions information node and is clearly visible from the entrance on Roper Street. The building would be an ideal space to explore the spatial qualities where inside meets outside. The building has the POTENTIAL to become an icon on campus TO PROMOTE the existing educational IDEALS that the university embraces.

Fig 4.26 Sketch of view on site towards new entrance

_ isolated entities

_ fragmented information

_ physical boundaries

_ bring information together

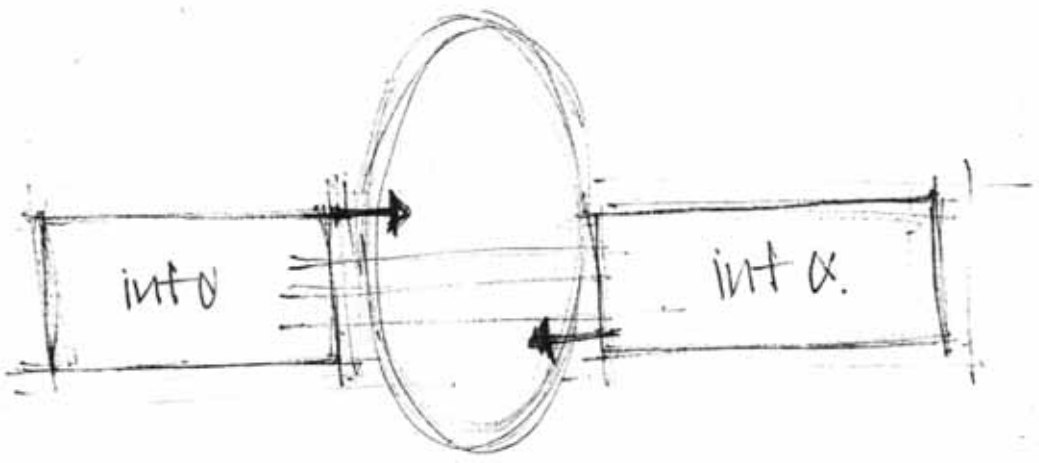


Fig 4.27 Betweeness in information

Fig 4.28 Arial view of University with its segregated information nodes

5 DESIGN PHILOSOPHY AND DESIGN APPROACH

Fig 5

DESIGN PHILOSOPHY

In today's society interior design is understood in many different genres, but is the discipline falsely understood under the presumption of interior architecture. The preconceived idea around interior architects as inferior decorators for architects and without the ability to rationally design structural elements of form and function, can be seen in the many ways that interior architecture is treated and presented.

This statement is supported by the work of Lucinda Kaukas Havenhand who practised as an interior designer for many years and prolonged her studies with a PhD. It was during the study of her PhD that she soon realised that society as a whole, not excluding the architectural profession perceives interior designers to only have the ability to decorate an interior (Havenhand, 2004: 32). Her article "*A view from the Margin: Interior Design*" reveals the stereotypical notion of women as interior designers and the manner in which interior design is perceived as feminine and imitative of the logical, inventive architecture. The stigmas associated with interior design ranged from feminine, decorative and emotional stereotypes which existed in the early modern movement driven by anti-decorative criticism.

Cathy Smith's article "*Inside-out: Speculating on the interior*" reveals the theory of two feminist philosophers, Luce Irigaray and Elizabeth Grosz, whose critique on space with reference to the work of Martin Heidegger concluded that according to Heidegger "interior is inferior and limited by the architectural form that contains it"(Smith, 2004:93-94). Inserting the stigma of the interior which is created only by the architectural skin that enfolds it, the skin dominates and limits the interior space. This caused a rapid growth of the stereotype that reigned that interior design is a design that is inferior and weak comparing to the organisational and structured sense of architecture (Havenhand, 2004:32-36).

The stigma is still associated with interior architecture today, as stated by Sashi Caan in his article "*Consensus or Confusion*". The article encourages the re-branding of the identity of interior architecture for it has an 'identity crisis' as well as a 'confused image in the public perception', which has been evident since the early modern movement (Caan, 2007:52-54).
Smith concluded in her writing that the interior and interior objects could be more than a contained space but should rather be questioned as to how

a space is inhabited(Smith, 2004:95). The interior is a space in its own, providing an opportunity for objects to redefine the boundaries set out by the envelope or spatial occupation.

Christine McCarthy examined the theory of interiority in her document "*Towards a definition of Interiority* ". In which she argues that 'interiority' is not absolutely dependent on the architectural envelope (McCarthy, 2005:112). This brings us back to the argument of where architecture ends and where interior architecture begins, McCarthy(2005:113) states that the focus must be placed on the 'condition of control' that contributes to the definition of interiority rather than the physical aspects known to divide spaces.

The physical and hypothetical boundaries are the core aspects that must be investigated. The study will attempt to estimate the line between architecture and interior architecture and whether it can by clearly defined as black or white. This desire to constrain or close space tries to impose geometry onto the psychological intimacy of space. The urge to clearly define a space reveals the grey areas between the different spaces. The grey areas expose the ability of a boundary to be either the departure point of the one space or the end point of the other (McCarthy, 2005:115). It is just this that creates the betweeness of spaces.

The betweeness is part of both inside and outside; this may be on the interior or the exterior of an architectural skin. For that reason the emphasis is on the boundary that exists between architecture and interior architecture, could this boundary be more than just a physical line parting the two bodies? Or should it rather not be seen as the skin between these two bodies that interact with each side or collapses the two bodies within each other.
The interior as a site already embraces these qualities where a space evolves from the intimate relation between inclusion and exclusion (McCarthy, 2005:115).

This stereotypical thinking could be used to its advantage for the potential and qualities that interior design possesses could only lead to more adequate design. The opportunity arises for interior design to reinvent the language used by designers in the discipline, creating a non-superficial identity that is true to its inhabitants and social environment. The difference from rationalist design would be the tendency to understand the language, warmth and intimacy of the space, bringing forth different qualities of the space which will influence the design decision immensely (Havenhand, 2004:38).

Stating a design language with specific terminology will rupture the historical stereotype of interior design and enhance the presence of interior design in the design discipline. Establishing a new set of design criteria will enable the shift of thought and demand new thinking about interior design. The existing qualities that have been de-emphasized through a rationalist design thinking must be reconsidered and reinstated. The question that arises is what the focus of interior design would consist of, which elements and aspects to consider designing a layer of interaction to the user between the empty space and the exterior structure that encloses the space (Havenhand, 2004:40). The layer must not only interact with the physical requirements of the user but also with his/her emotional, personal and specific needs. As stated by Caan, interior design ideally is poetic, it "touches the human soul" and causes discovery and enchantment (Caan 2007, 53). The new language would organize and communicate an improved level of social complexity; it is an attempt to articulate dynamic processes within a spatial and tectonic assembly (Hadid; Schumacher, 2004). The effect of such designed spaces would not only enhance the experience of the users, but on a broader scale enhance the political, economical and social aspects of the society it translates to.

For a new language to materialize the easiest technique would be to adapt the presentation and drawing style to suit the merits of interior design (Havenhand, 2004: 41). Specific views and angles would much rather enhance the qualities of the interior space than the standard sections and elevations used as norms in architecture. The view of an interior detail could reveal much more about the design and the emotion captured in the space than an elevated view from the exterior (Havenhand, 2004: 41). The opportunities that arise with the new language of technique expand the domain of digital design and express the need for design and technology to intertwine. The digital design media is pursuing design into tentative areas of design that must still be explored and studied to its full potential, but it also opens up doors to new and innovative design (Hadid; Schumacher, 2004:5).

Interior spaces have the opportunity to translate information to the users on a more intimate and interactive manner, creating a space that could be experienced by the many different senses. The relation between space, information and human senses must be closely examined to optimise the experience or the journey through the space, making it imperative for interior spaces to be at the forefront of design.

Interior design has an important role to play in the information age that we find ourselves in; to contribute to the fast evolving technology driven markets. Interior spaces must enhance the driving image rather than diminish it to a lower outdated version (Riewoldt, 1997: 7). New ways to translate information through architecture have developed even though interactive media is often understood as only the audio and visual devices. Opportunities that arise with the realm of other senses and the factor of real human senses should ensure that interactive spaces don't just evolve as screen-based media with adherence to imagery (Bullivant, 2006:9). The relationship between the digital and physical must be fully investigated to enhance the interior space with the physical qualities of depth and space as well as the digital information to the distributed.

To understand the significance of translated information through designed spaces, the knowledge and boundaries of information must first be understood. Information as defined in the Oxford English Dictionary is an act of information or the act of giving a form or shape to the mind. In the ancient Greek the word 'information' derives from 'eidos' meaning thought, proposition and concept. These definitions open up the concept of giving or translating information from one sender to a receiver. Translation is to express the sense of a word, sentence, speech or book in another language or in a simpler form so that it can be easily be understood. At the same time translation must interpret the significance of a situation, action or space and reform it into a new situation in a new context.

Information will be made public to be received through a specific medium; it must be understood and translated for future generations to gain the knowledge or information. The translation process becomes imperative and creates a link between the body of information, the receiver and the spatial environment it's represented in.

Buildings adapted and transformed with technology, in the sense that it can be digitally controlled to the way in which buildings adopt to their environment. Buildings became more self-sufficient with enhanced economic, ergonomic and ecological profiles (Riewoldt, 1997:9). The importance for Architecture in this Information Age is not to forget its basic functions; to design spaces that enhance the social-cultural and environmental qualities rather than to design for optimal accommodation and multimedia technologies (Riewoldt, 1997:11). Technology can add new dimensions to the existing qualities of the space but must not drive the fundamental features of design.

DESIGN APPROACH

Following on the design philosophy the design requires certain qualities to for the intended approach to prevail and to reveal the intention of interior design to enhance and transform existing architectural envelopes taking into consideration the existing structural context, history and orientation. Frazer Hay (2207:35) from the Napier University of Edinburgh argues that the transformation of existing architectural envelopes utilizes three systems or strategies, which are classified according to the understanding of the relation of the new to the old.

1. Intervention: Where the old can no longer feasibly exist independently and the old and new are completely intertwined.
2. Insertion: When the new is completely dictated by the old and built to fit exactly in the confines of the existing.
3. Installation: When the old and new exist independently of each other. The new elements are placed within the boundaries of the existing and the new elements may be influenced by the old but do not fit exactly. Should they be removed, the old would be able to revert to its original state.

The project specific design approach is a combination of insertion and installation. The existing structure will guide the design but not dominate it completely.

GUIDELINES TO DESIGN APPROACH

_Break the boundaries

The boundaries between interior and exterior must be investigated and adapted to transform the exiting constrained perimeter. The structural component must be identified to indicate areas where demolition and expansion can occur. The boundaries between active interior and exterior spaces must reveal the activities of both spaces. On the same basis of elimination should the interior boundaries be investigated to ensure that only the structural boundaries are kept.

_Ease of Access

The large entrance to the building will be accessible to all visitors including disabled visitors. When entering the building the different areas and walkways will be clearly indicated. Signage will be visible and highlighted throughout the building for visitors to have a clear orientation to the different activities.

_ Layering

The original structural column grid will be preserved with only the unnecessary walls removed to accommodate the new function. New structural elements are placed in specific spaces for these functions. The new materials are layered with the existing to create the opportunity for infill materials to form a new diverse environment.

_Transparency

To create a space that reveals its activities not just through visual transparency but create transparency in space, organisation and depth. The newly placed elements should be transparent to the existing constrained environments. This will enable spaces to complement each other and reveal their spatial qualities.

_Responsive Environments

The spatial experience will be designed to work with technically advanced exhibitions to ensure a rich and inspiring environment. The environments will have the ability to adapt to specific exhibitions.

_Visibility

The relation between physical visibility and phenomenal visibility must be introduced to ensure an awareness of the different activities of the specific design. This will enable interaction between inside and outside activities, resulting in attentive and inspired visitors.

6 PRECEDENT STUDIES

The following discussion will focus on the investigation of precedents that translate the meaning of transparency through architecture and attempt to create interior spaces that illustrate the meaning of responsive, interactive environments. The use of materials together with spatial organisation will be dealt with to investigate how well a space is occupied and adapted to its specific use. The relation to spatial experience comes into play with the occupants and must be understood and used as a guiding tool through the design on different development levels. The typologies of each precedent will be different and must be understood in its context to guide the design towards a successful development within its context. The approach to translating information and visibility to the public occupying these spaces will also be investigated and whether these have been done successfully or unsuccessfully. The international precedents that will be dealt with include the Phaeno Science Centre in Wolfsburg, Germany designed by Zaha Hadid Architect. The national precedents include the Sci Bono Discovery Centre in Newton, Johannesburg; the Science Park at Observatory Campus in Observatory, Johannesburg and the annual Design Indaba Expo held at Cape Town International Convention Centre, Cape Town.

Fig 6

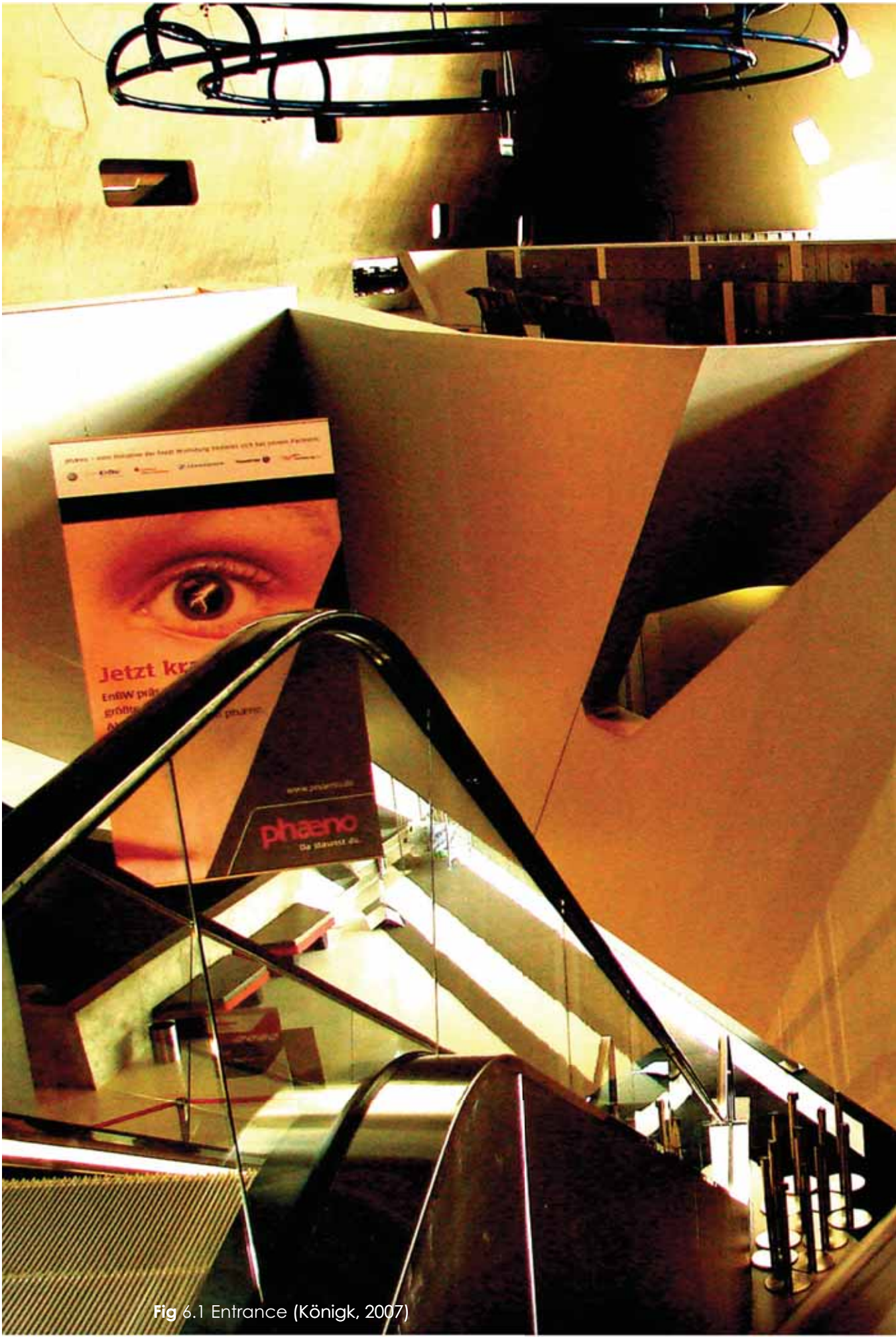
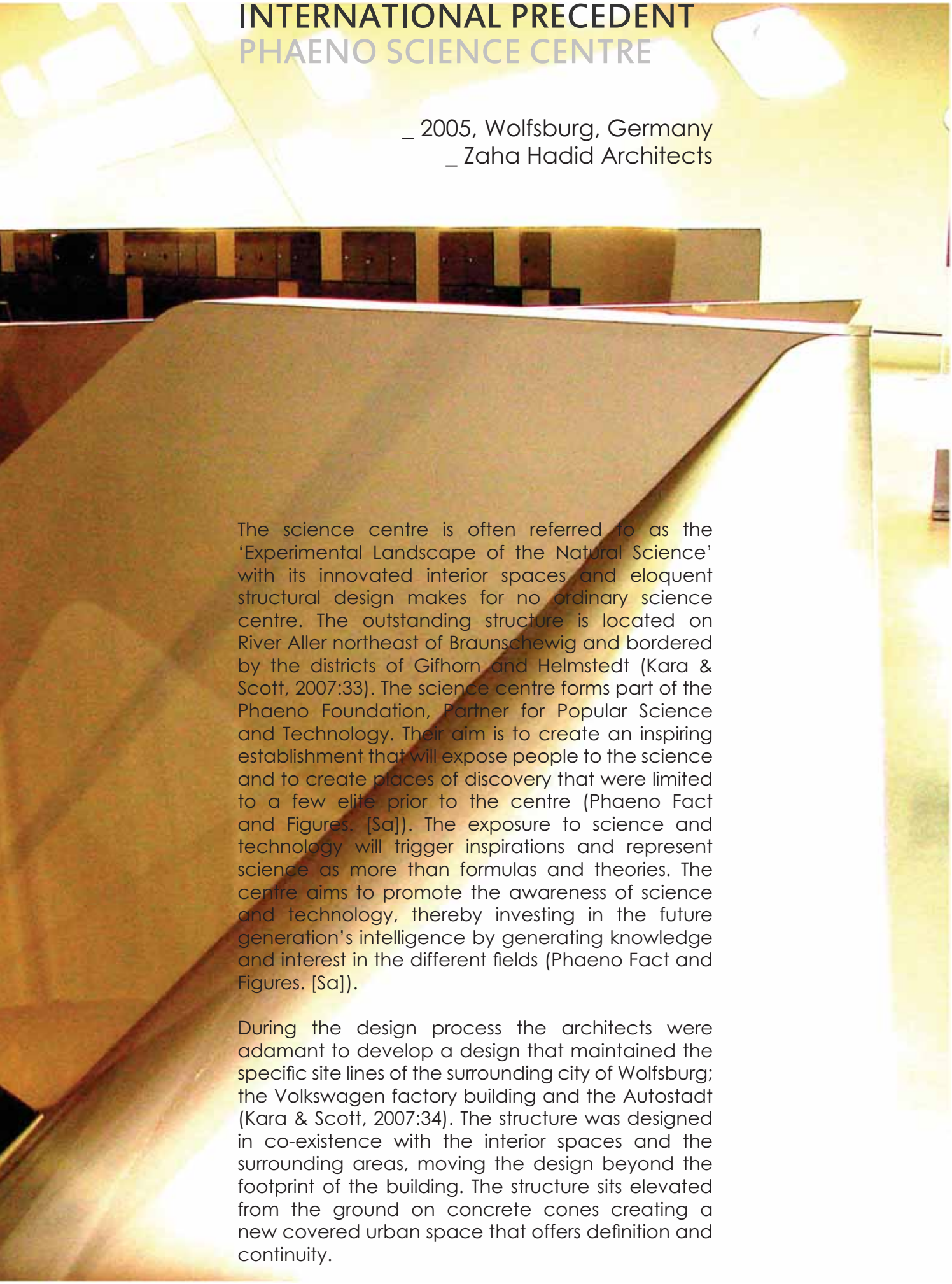


Fig 6.1 Entrance (Königk, 2007)

INTERNATIONAL PRECEDENT
PHAENO SCIENCE CENTRE

_ 2005, Wolfsburg, Germany
_ Zaha Hadid Architects



The science centre is often referred to as the 'Experimental Landscape of the Natural Science' with its innovated interior spaces and eloquent structural design makes for no ordinary science centre. The outstanding structure is located on River Aller northeast of Braunschewig and bordered by the districts of Gifhorn and Helmstedt (Kara & Scott, 2007:33). The science centre forms part of the Phaeno Foundation, Partner for Popular Science and Technology. Their aim is to create an inspiring establishment that will expose people to the science and to create places of discovery that were limited to a few elite prior to the centre (Phaeno Fact and Figures. [Sa]). The exposure to science and technology will trigger inspirations and represent science as more than formulas and theories. The centre aims to promote the awareness of science and technology, thereby investing in the future generation's intelligence by generating knowledge and interest in the different fields (Phaeno Fact and Figures. [Sa]).

During the design process the architects were adamant to develop a design that maintained the specific site lines of the surrounding city of Wolfsburg; the Volkswagen factory building and the Autostadt (Kara & Scott, 2007:34). The structure was designed in co-existence with the interior spaces and the surrounding areas, moving the design beyond the footprint of the building. The structure sits elevated from the ground on concrete cones creating a new covered urban space that offers definition and continuity.

The 10 tapered structural cones rise from the ground with variations in height to provide support to the building, both vertical and lateral support are achieved by the grouped structure (Kara & Scott, 2007:34). Each cone was designed with specific geometry and with a great deal of focus on the manufacturing and construction processes, leading to the knowledge that the development of the building and the geometric cones would need to be controlled parametrically.

Fig 6.2 Site Context

parametric/n
A constant or variable term in a function that determines the specific form of the function but not its general nature
One of the independent variables in a set of parametric equations

Most of the design work was done on 3D computerbased programmes to establish the spatial and architectural significance of the building, making the transfer between 3D models to conventional 2D drawings very difficult and unfortunate to the design process. The specific co-ordinates for the cones at the surface and the cutting planes needed to be resolved in order to produce standard sections and elevations for the building (Kara & Scott, 2007:34).

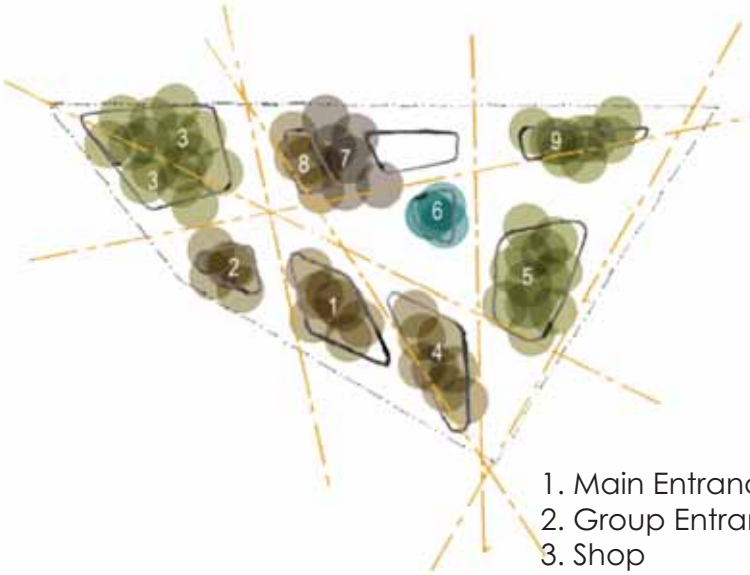


Fig 6.3 Floor Layout Entrance Level

1. Main Entrance
2. Group Entrance
3. Shop
4. Kitchen
5. Auditorium
6. Coffee Bar
7. Event Space
8. Staff
9. Laboratory
10. Ramp
11. Restaurant
12. Exhibition

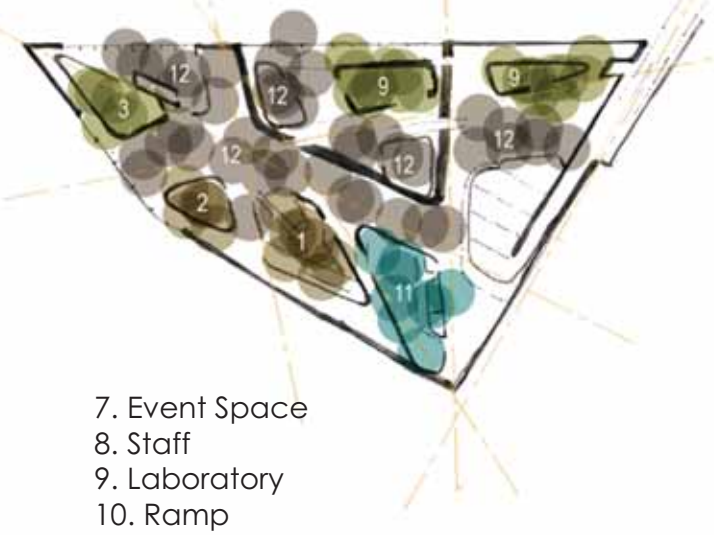


Fig 6.4 Floor Layout First Level

Fig 6.5 Exterior Ramp (Königk, 2007)

The link between the structure and the surrounding spaces is emphasized with multiple links of pedestrian and vehicle movement through the site, the building and the artificial landscape (Kara & Scott, 2007:33). The artificial landscape is an extension of the surging outdoor plaza in front and speaks of transparency and permeability to the immediate site and surrounding areas. The main exhibition space is uninterrupted by structured columns, doors or floor-to-ceiling partitions creating diagonal views to the different exhibitions areas, as well as big volumes

Fig 6.6 Interior view of Exhibition Area (Königk, 2007)

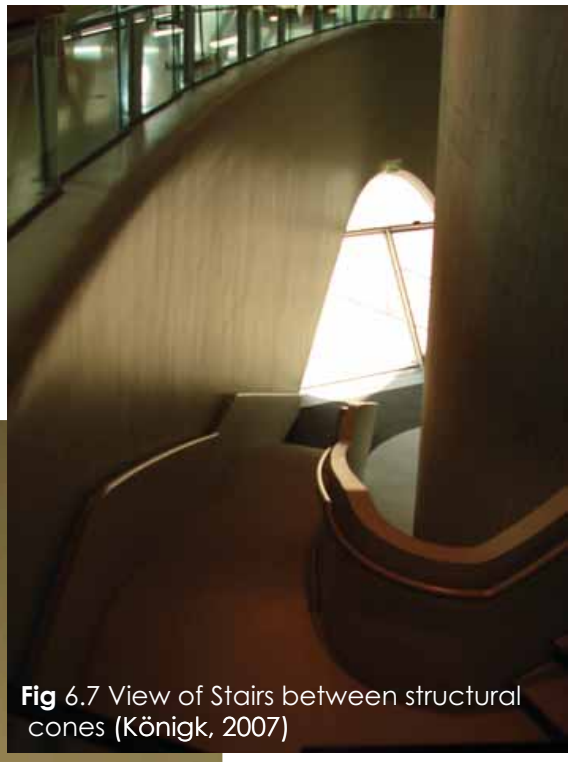


Fig 6.7 View of Stairs between structural cones (Königk, 2007)

Fig 6.9 View of Exhibition Area (Königk, 2007)

of differently used spaces that protrude to the exterior (250 Experimental Stations and a diversity of programmes. [Sa]). The different spatial qualities are created by the low rising sloping walls not obstructing the views, different ceiling heights and level changes with partially enclosed areas (Pearson, 2006:80). Light is of much importance to exhibitors therefore spaces were created with different light qualities to assist the different exhibitions (Pearson, 2006:80). The protruded volumes visually link the interior to the exterior allowing exposure to the diverse activities that occur in the interior spaces. The interior space strives to evoke the aspiration in making discoveries in the fields of science and technology, for discoveries of new and innovative ideas. Therefore, it is imperative that the interior spaces speak the language it hopes to evoke.

The 250 experimental displays are distributed throughout the main exhibition space like elements in the field, with the unfortunate outcome that they seem disengaged from the architectural space (250 Experimental Stations and a diversity of programmes. [Sa]). The activities available at the Phaeno Science Centre are the experimental stations and laboratories that offer visitors a firsthand view of and insight into nature and technology, because visitors can join in and research interests of their own. The Science Theatre is an extravagant venue for science shows, special performances, experimental lectures and exceptional conferences for science leaders from all over the world. The Ideas Forum offers people the opportunity to generate creative ideas and brainstorm about science and theories that interest them. The Phaeno Shop offers everything from highly

proclaimed science books to fundamental science experiments and games as well as construction kits and technical models (Phaeno Fact and Figures. [Sa]). The Phaeno Shop inferior to the extraordinary structure it finds itself in but enhances the qualities of the structure by offering stunning views and with leading passages that link the shop to the experimental stations.

It thus can be said that the science centre paves the way for physical visibility and creating views from different areas of views of others. It opens up the interior and creates a sense of interest, luring visitors to experience the whole centre. Transparency is also dealt with in the structure but not just as literal transparency but through phenomenal transparency where the space, depth and organization create provocative spaces.

Influences on the design approach:

_ design triggers inspiration towards exhibitions or information
_ structure was designed together with interior spaces
_ easy access to and through the site
_ create different spatial qualities by changes in volume
_ relation between exterior and interior activities (visual connection).

Influences on schedule of accommodation:

_ experimental displays
_ laboratories
_ science theatre
_ phaeno shop
_ coffee bar
_ restaurant.

NATIONAL PRECEDENT

SCI BONO DISCOVERY CENTRE

_ Old Electric Workshop Building
_ Newtown, Johannesburg
_ personal visit on 26 February 2008

The Sci Bono Discovery Centre is a unique Science Centre in the heart of the inner city renewal programme of Johannesburg, initiated by the Gauteng Department of Education and the private sector representatives (About Sci Bono [Sa]). The Science Centre prides itself in the fact that it's the largest Science Centre in Africa and creates the opportunity for exposure in the fields of Science Technology and Mathematics (About Sci Bono [Sa]). It is centrally located in the precinct of Newtown, enabling locals to visit the centre as well as the many tourists visiting Newtown.

The aim of the centre is to support education in the fields of Science, Technology and Mathematics as well as improve community engagement and interest in these fields (About Sci Bono [Sa]). Exposure and interest in the different fields will assist the community in the knowledge of education in these different fields. It is of national importance that these economically important fields are promoted and made accessible to the community.

Fig 6.10 Exhibition Area

The Science Centre is constructed in the Old Workshop building with its extraordinary structure and massive interior volumes that were adapted to enhance the existing qualities. The historical steel structures that were used in the Old Workshop were kept and placed on display for visitors to explore the history of the building together with the new vibrant information. The steel structure was accentuated to expose the structural use of building material to the visitors. The

The activities available at Discovery Centre are:
_Exhibitions that visitors can participate in;
_Workshops to illustrate a variety of Science and Mathematical concepts and
_A Science Stage for scientific shows (About Sci Bono [Sa]).

The cafeteria situated on the ground floor is vacant at the moment and if in operation provide economic contribution to the centre. As one enters the extraordinary space, it is easily noticeable where the activities are and how to gain access to the different exhibitions. Two floors were introduced using mainly a steel structure that is painted grey, which is in contrast to the red historical steel structures. Ramps offer disabled visitor the same experience as able visitors. Two large clearly indicated lifts on either side of the building provide for comfort able access to visitor's areas and areas applicable for delivery.

Fig 6.11 View towards cafeteria

Fig 6.12 Ground Floor Exhibition Area

Fig 6.13 View towards exhibition area

Most of the exhibitions are translated in an audio-visual manner and through information sheets that must first be read to understand what must be done. The different areas are displayed in the same style but with little regard to the interior spaces which they occupy. The stands where the exhibitions are displayed are distributed on the different floors and stand loosely next to the perimeter walls. The installations are thus made transferable, but do little to enhance the spatial qualities of the interior. Some sections of the exhibition are temporary but most are permanent exhibitions that could have been designed to incorporate the spatial and structural qualities of the building.

Influences on the design approach:

_ a dilapidated building adapted and transformed for a new usage, without destroying its historical value
_ bring life back to a stranded building
_ exposing the old from the new. The new materials are inserted into the exciting historical areas
_ interactive exhibitions excite the visitors
_ ramps and two lifts make for sufficient access even for disabled visitors.

Influences on schedule of accommodation:

_ workshops
_ interactive exhibitions
_ science shows.

Fig 6.14 Interactive Exhibition Area

Fig 6.15 Mirror Maze

SCIENCE PARK

JOHANNESBURG OBSERVATORY

_ 2003, Observatory, Johannesburg
_ personal visit on 26 February 2008

The Johannesburg Observatory was acquired by the South African Agency for Science and Technology (SAASTA) in 2003 and is currently refurbished to accommodate a comprehensive interactive Science Park with its main focus on Astronomy and Engineering (Science Awareness Platform [Sa]).

The Science Park includes the main Observatory, three telescopes, a refurbished exhibition space and experiment laboratories (Masevhe, L.). The exhibition displays include laser interactive displays, science experiments, a maze of mirrors and an infinity room. The displays operate on a more interactive basis than observing the exhibitions from a distance, making the visitors part of the display and experience. The large domeshaped white infinity room attempts to take visitors into space and display the magnitude of the universe (Masevhe, L.).

The following activities are planned for the public to participate:

_The Observatory Tour will expose learners, teachers and the public to Astronomy, Astrophysics and Optics through various exhibits and displays.
_The Forensics Science Laboratories are specifically for scholars from Grade 9 to Grade12 as well as for their teachers. These laboratories will assist the scholars in curriculum-based problem solving and scientific experiments.
_The Science Teachers Forum offers conferences to senior or more experienced Lecturers of Science, Technology, Biology, Geography and Mathematics.
_The Techno Youth holiday program is aimed at previously disadvantaged scholars and underprivileged youth from townships in and around Johannesburg to experience Science and Technology in a casual and exciting manner.
_The Computer Laboratory provides access to computers for scholars/students so as to work on their school projects and will assist students in becoming computer literate.
_The Resource Centre acts as an information centre for visitors to acquire books, information, experiment equipment and general information about the different science careers.

_Night Tours are be made accessible to visitors to view extraordinary space with its occupying stars and planets. The tours will be organized in collaboration with the Astronomy Society of South Africa (ASSA). (Science Awareness Platform [Sa])

The Sci Bono Discovery Centre and the Science Park, Johannesburg Observatory, aims to introduce Science and Technology to the same community group. The exhibition displays are similar in many cases but the Science Park has evolved their methods of display and interacts on a broader scale to the visitors. Visitors can take part in the experiments and physically move through a few of the exhibitions to experience it on a human scale.

Influences on the design approach:

_ technology enhanced exhibitions
_ grandeur scale exhibitions
_ working with the curriculum to increase student knowledge.

Influences on schedule of accommodation:

_ laboratories for different functions
_ exhibition areas, separated areas with different activities.

Fig 6.16 Exhibition Area

Fig 6.17 Exhibition Area

DESIGN INDABA

_ Cape Town
International Conference Centre

The Design Indaba Expo has been running since 2004 in conjunction with the Design Indaba Conferences. Over the years the Design Indaba grew from 55 exhibitors (in 2004) and 9 000 visitors to with 240 exhibitors (in 2007) and more than 20 000 visitors (Attendance Profile. [Sa]). The Expo hosts the work of some of South Africa's top designers in the different fields, ranging from architecture, landscapers, interior designers, fine artists, graphic designers, decorators, fashion designers, film directors, jewellers and crafters. The prestigious event is held annually at the Cape Town International Conference Centre and is open to the public. Many members of the press visit the event and press coverage is both nationally and internationally (Attendance Profile. [Sa]). These would include journalists and editors of TV shows, radio personalities, and magazine and newspapers journalists. The event therefore receives publication and media coverage on many different levels and is ensuring that the public takes note of the event.

The expo is supported by the Department of Trade and Industry. International buyers are invited to attend the event which gives the exhibitors international exposure and encourages trade agreement (Ideas: Design Indaba10. 2007:17). Apart from the international buyers national buyers from leading retailers and smaller boutiques are invited. The aim of the event is exposure and accessibility to good design. As a result other designers are inspired to take part in the event. The end goal is to encourage good designs and to uplift the economy through trade and industry.

The Design Indaba offers various activities for the public to take part in and through these activities attempts to expand the method in which exhibitions take place. The fashion show sponsored by the SABC is not like any ordinary fashion show with an elevated ramp, but has a more performance orientated approach with a small fashion boutique that retails the clothing items (Previous Expos. [Sa]). There is a South African short film festival that can be viewed by visitors as well as a music video festival celebrating South Africa's young talent. The graphic designers show off their talents with live shows, for example how the graphic designs are applied to

Fig 6.18 Exhibition Area

Fig 6.19 Passages between Exhibition Areas

motor vehicles. In conjunction with Woolworths My School Project the expo provides interactive hands-on opportunities for scholars to learn about design and the different fields (Previous Expos. [Sa]). For a refreshing break the visitors can join the many contemporary refreshments bars.

The exhibition spaces are designed with a master plan and the exhibitors must use the set exhibition stands. Different variations are available for the exhibitors to view beforehand and choose the appropriate stand for their specific exhibition.

Influences on the design approach:
_ an event that inspire the nation
_ specific branding and marketing strategies for each expo
_ a specific designed exhibition system that is adapted and transformed by each exhibitor.

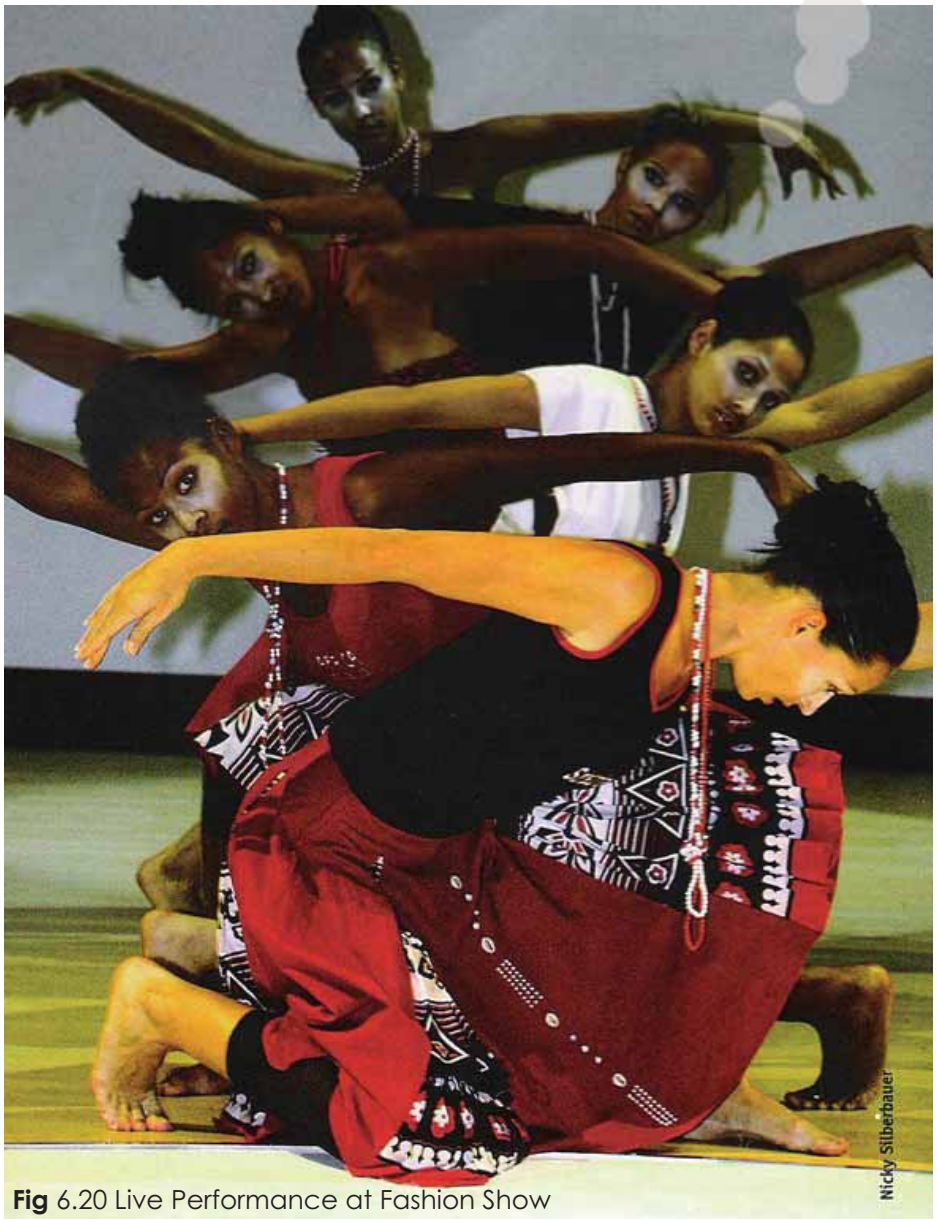


Fig 6.20 Live Performance at Fashion Show

7 THE DESIGN

DESIGN DEVELOPMENT

Fig 7.1 Concept model of betweeness

The schedule of accommodation includes the following areas:

_ reception

_ exhibitions (inside & outside)

_ lecture room

_ laboratories

_ deli

_ consultants

_ computer area

_ reading area

The relationship between the different areas must overcome the physical boundaries which create easy access and sufficient orientation. When entering the site, the access to the different areas should be transparent with the exhibition areas acting as transitions between the main facilities.

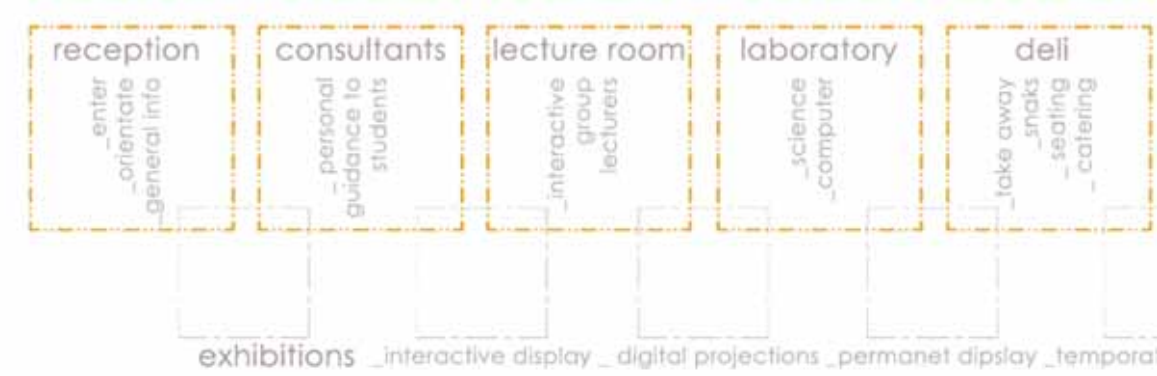


Fig 7.2

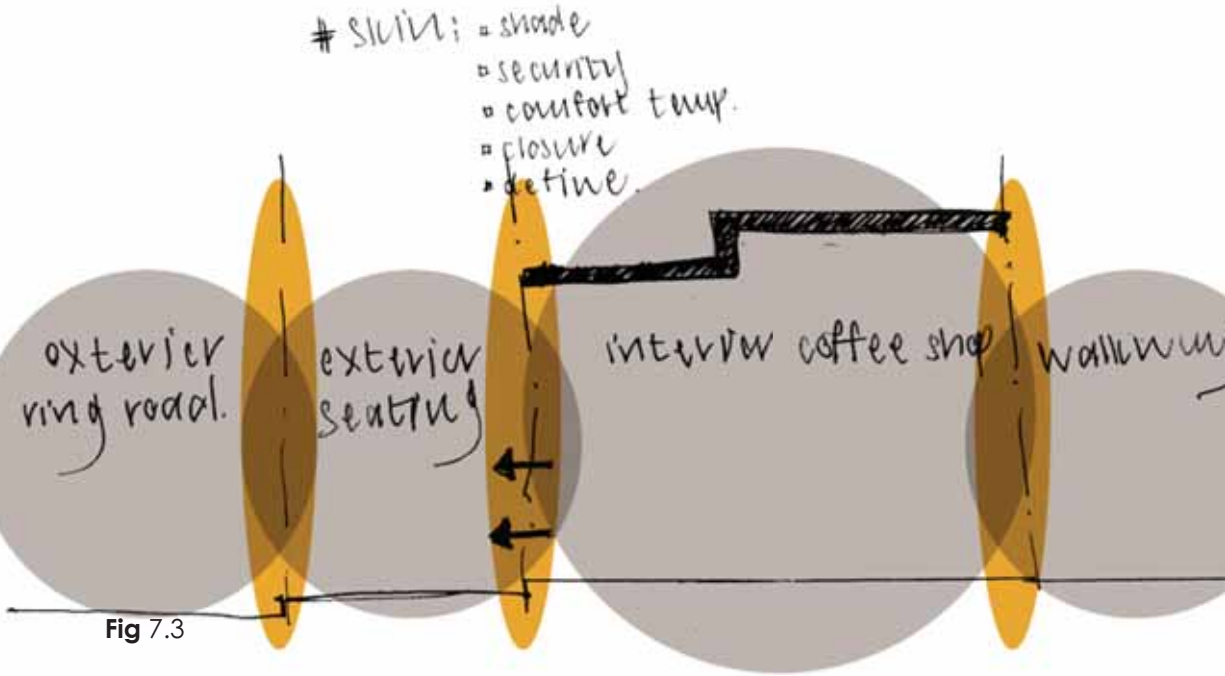


Fig 7.3

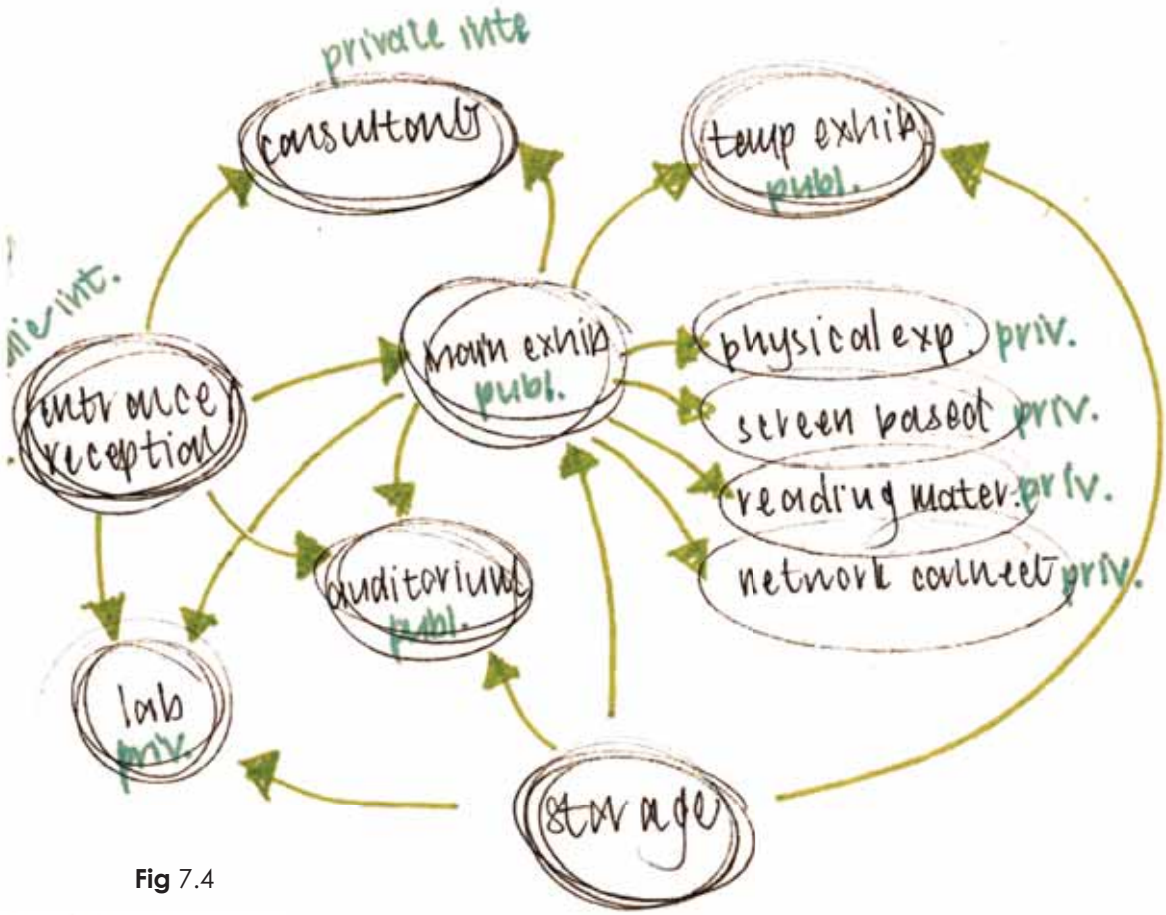


Fig 7.4

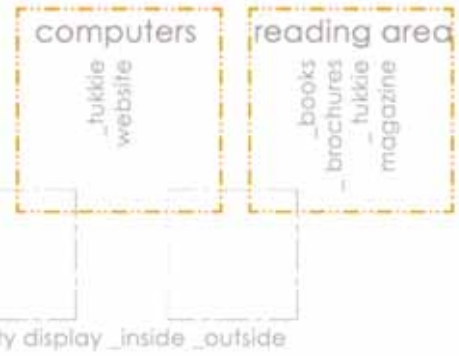
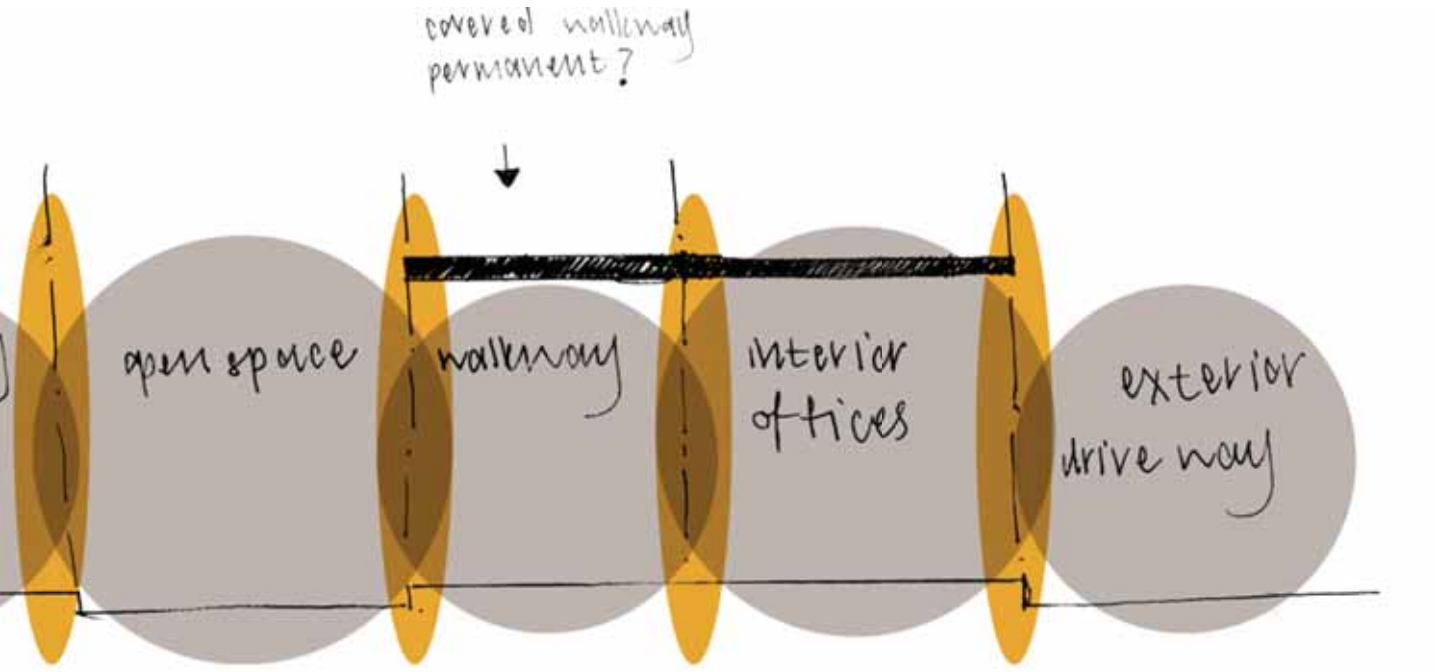


Fig 7.2 Diagram indicating different activities

Fig 7.3 Concept sketch of different spaces and boundaries

Fig 7.4 Concept diagram of schedule of accommodation



The models reveal a single skin that is broken up into segments, the definite line between two spaces is distorted and the betweeness in the line itself is created. The line falls both inside and outside the two adjacent spaces.

The opportunities lie within the betweeness.

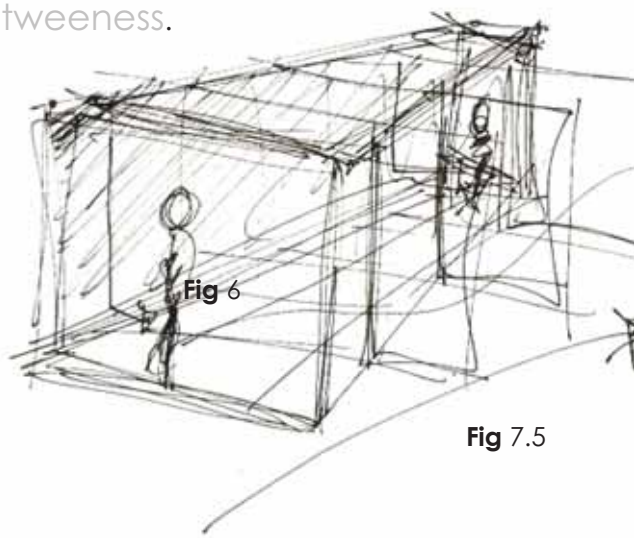


Fig 6

Fig 7.5

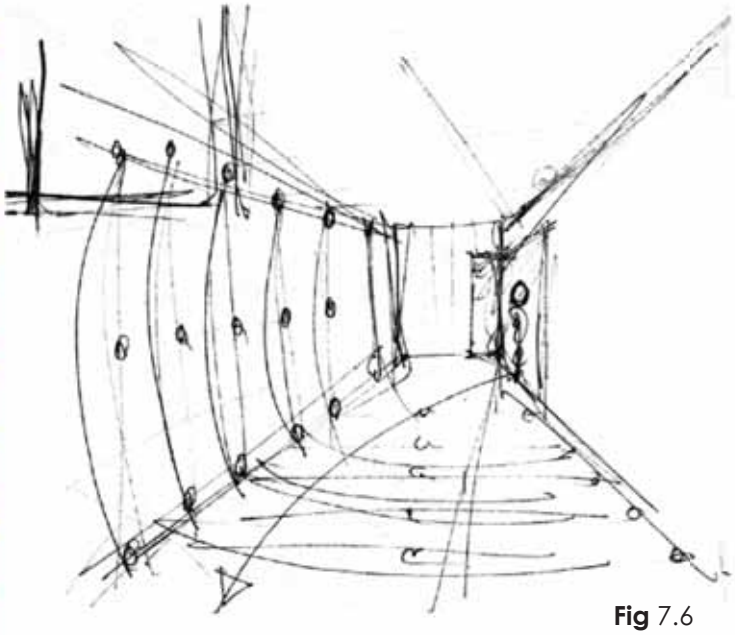


Fig 7.6

Fig 7.5 Concept sketch investigating limit to boundary

Fig 7.6 Concept sketch of interactive skin

Fig 7.7 Concept model of interactive skin

Fig 7.8 Concept model of a skin broken into different segments that form a fragmented boundary

Fig 7.9 Concept Plan 1

Fig 7.10 Concept model of interactive skin

Fig 7.7

Fig 7.8

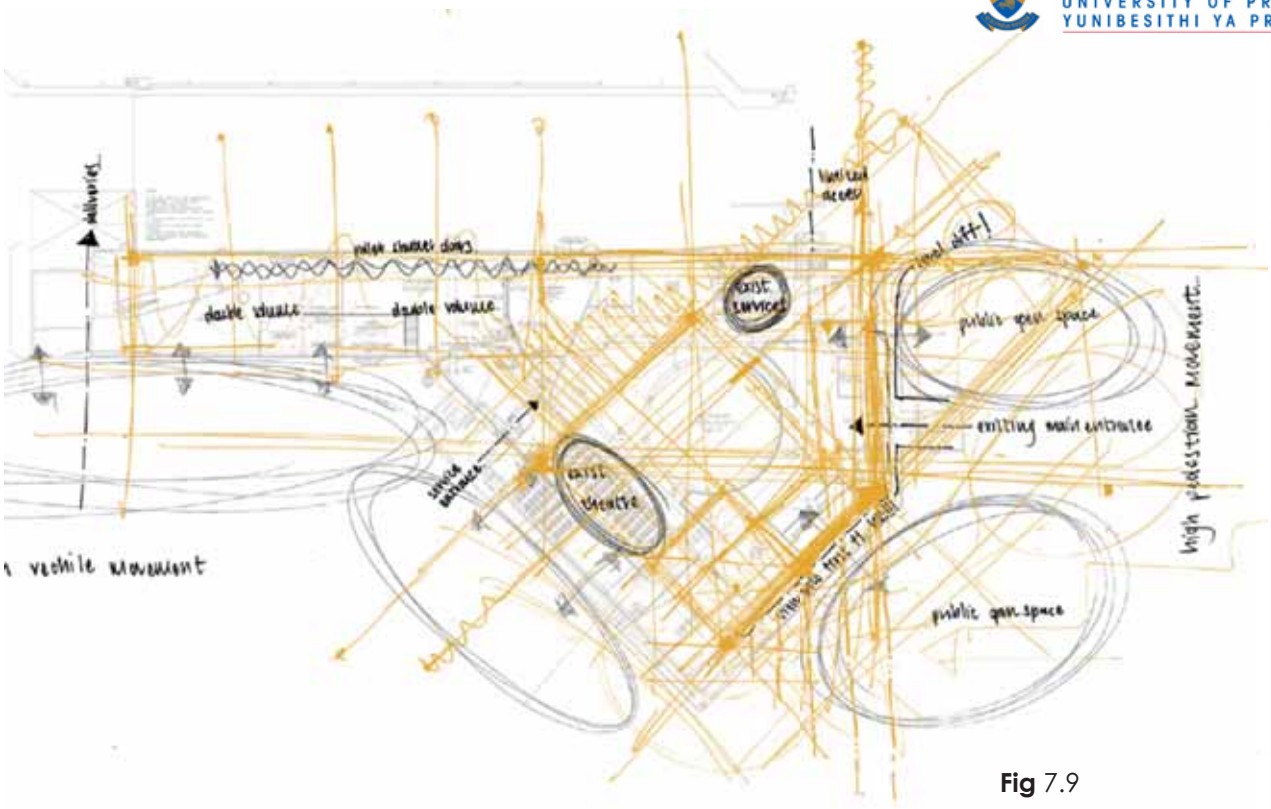
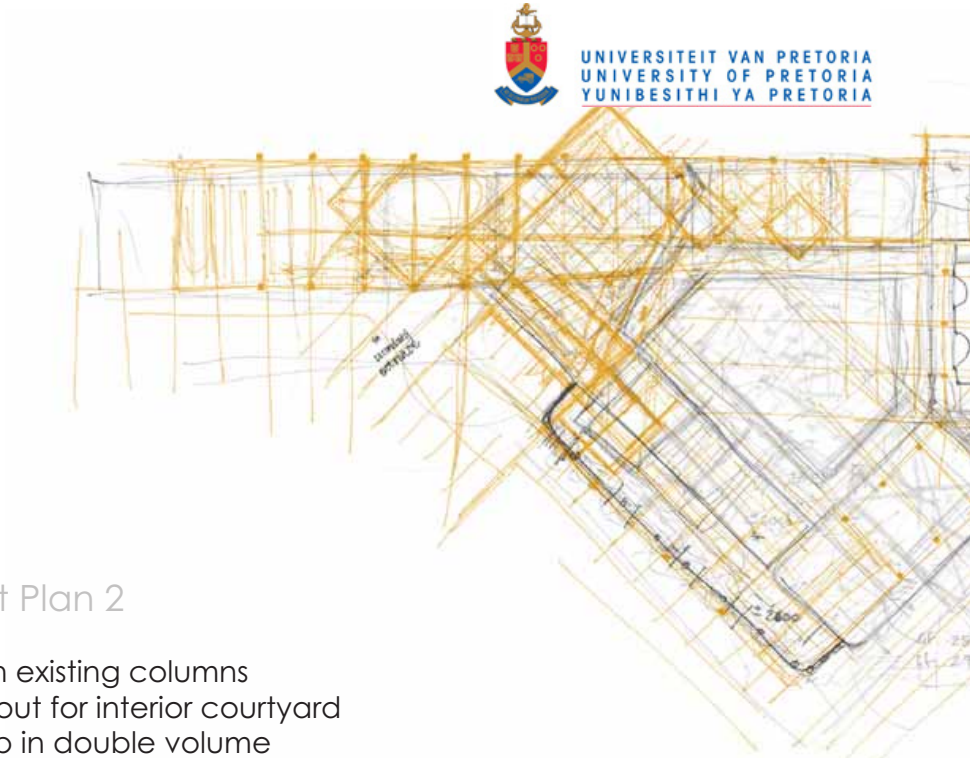


Fig 7.9

Concept Plan 1

_ analyse existing spaces
_ entrance hidden away
_ insufficient natural lighting to interior
_interior columns obstruct movement
_ awkward interior spaces
_ double volume inadequate use
_ no sense of orientation

Fig 7.10



Concept Plan 2

_ work with existing columns
_ slab cut out for interior courtyard
_ insert slab in double volume
_ move entrance to south eastern facade
_ slab cut out for double volume at entrance

Fig 7.11

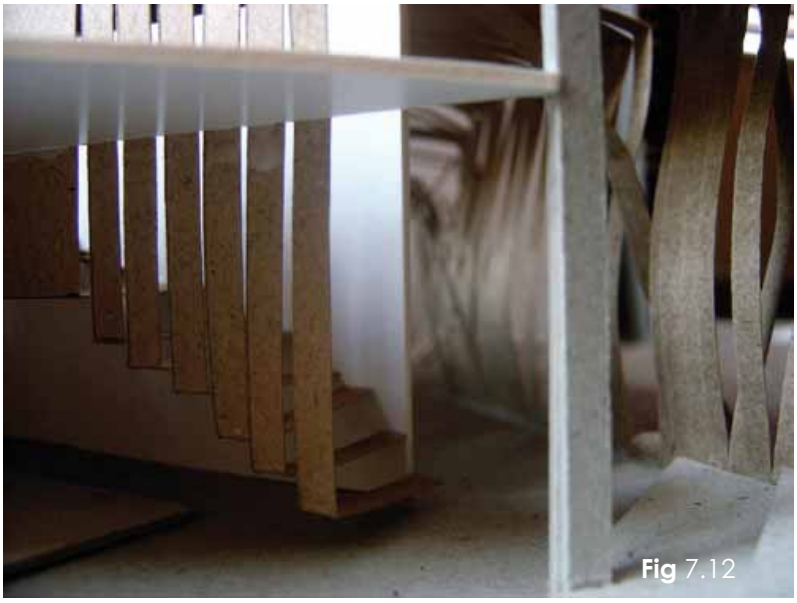


Fig 7.12

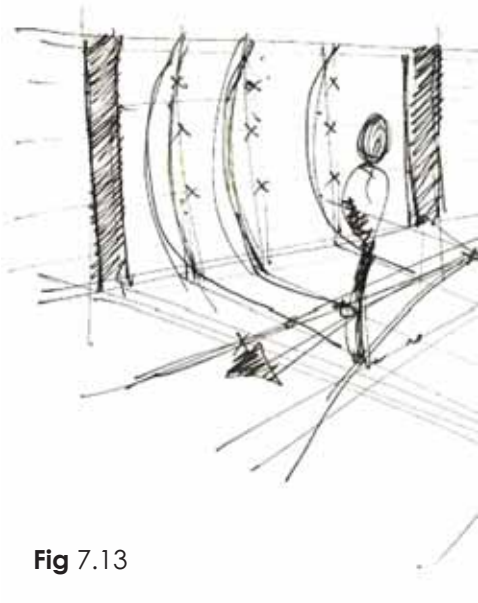


Fig 7.13

Fig 7.14

Fig 7.11 Concept Plan 2

Fig 7.12 Concept model of existing structural column with new elements

Fig 7.13 Concept Sketch of interactive plain

Fig 7.14 Concept model of visibility

Fig 7.15 Concept Plan 3

Fig 7.16 Concept Plan 4

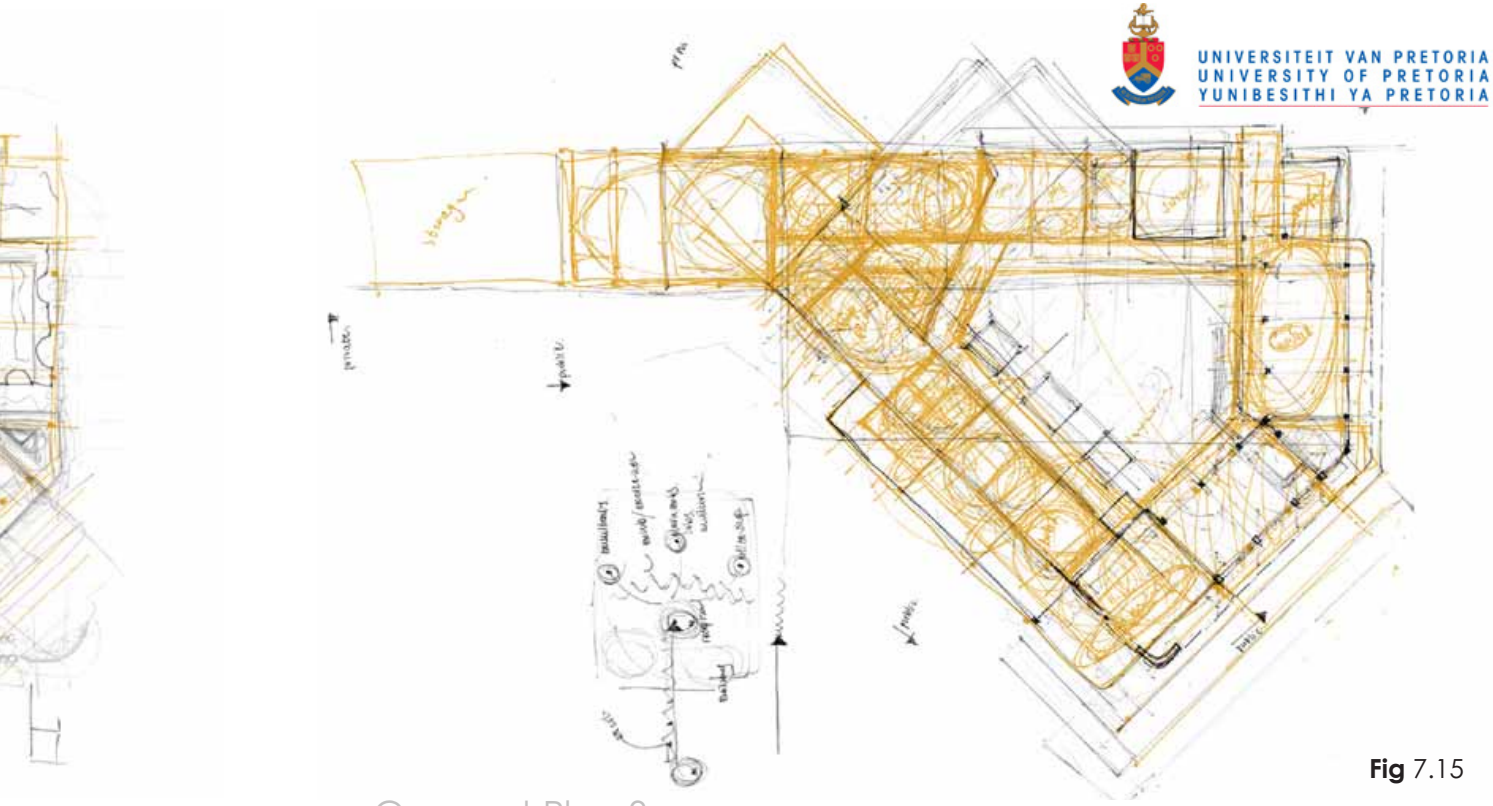
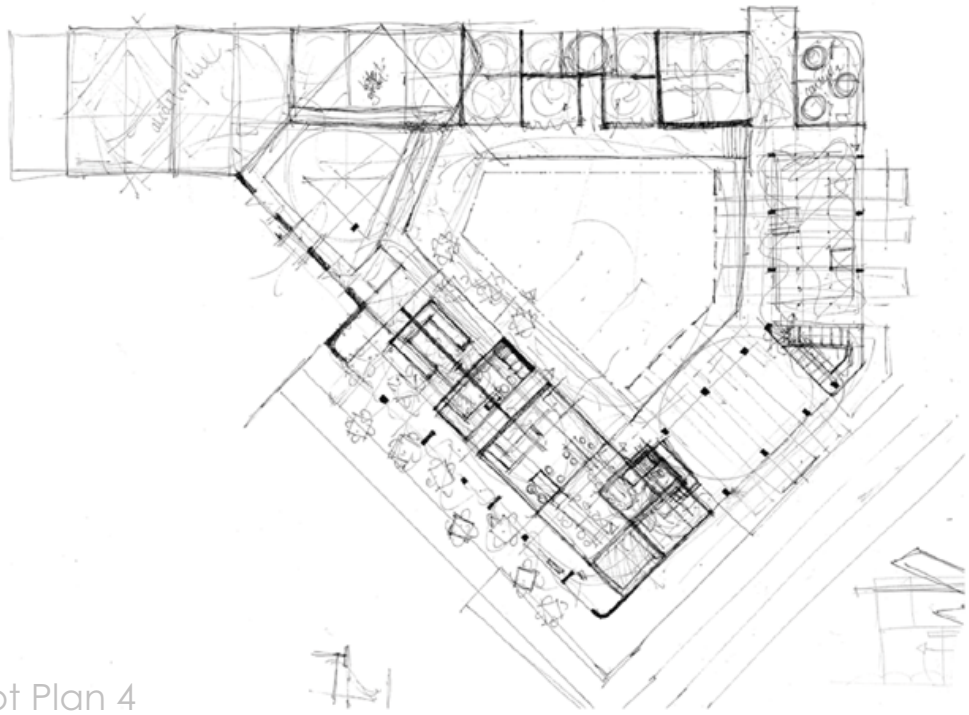


Fig 7.15

Concept Plan 3

_ investigate expansion to northern facade
_ investigate expansion to southern facade
_ eastern facade more public area
_ western facade more private area
_ most exterior activities to south eastern facade



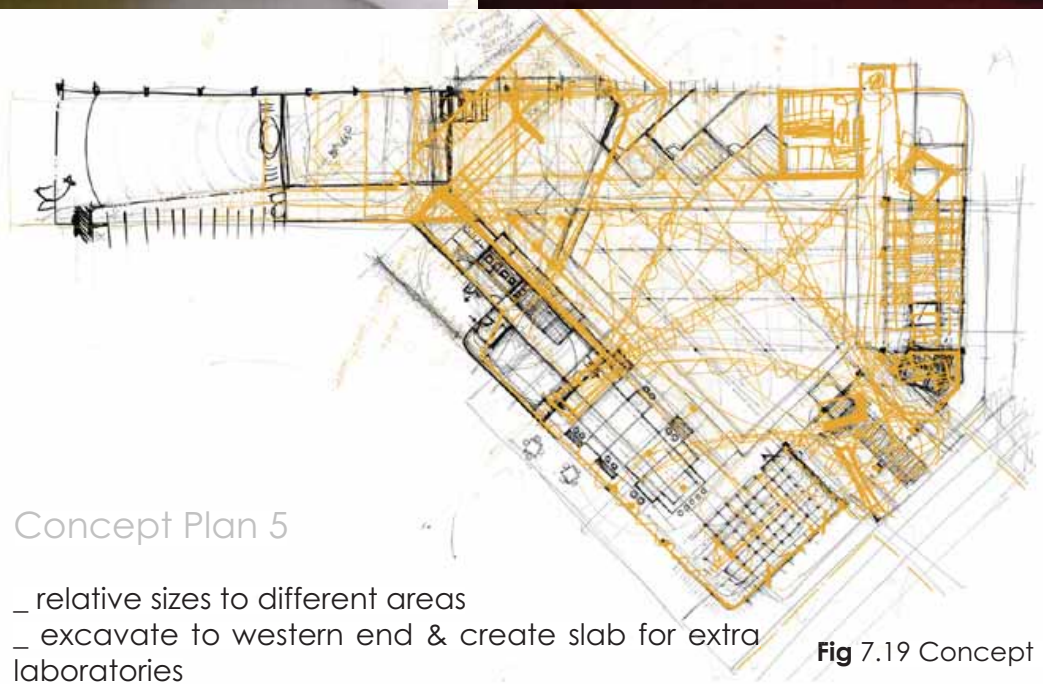
Concept Plan 4

_ area allocation
_ deli placed for most exposure
_ exhibition & entrance together
_ no level difference between areas
_ consultants, lecture room, labs to more private spaces

Fig 7.16 Concept Plan

Fig 7.17 Concept Model of new structural elements

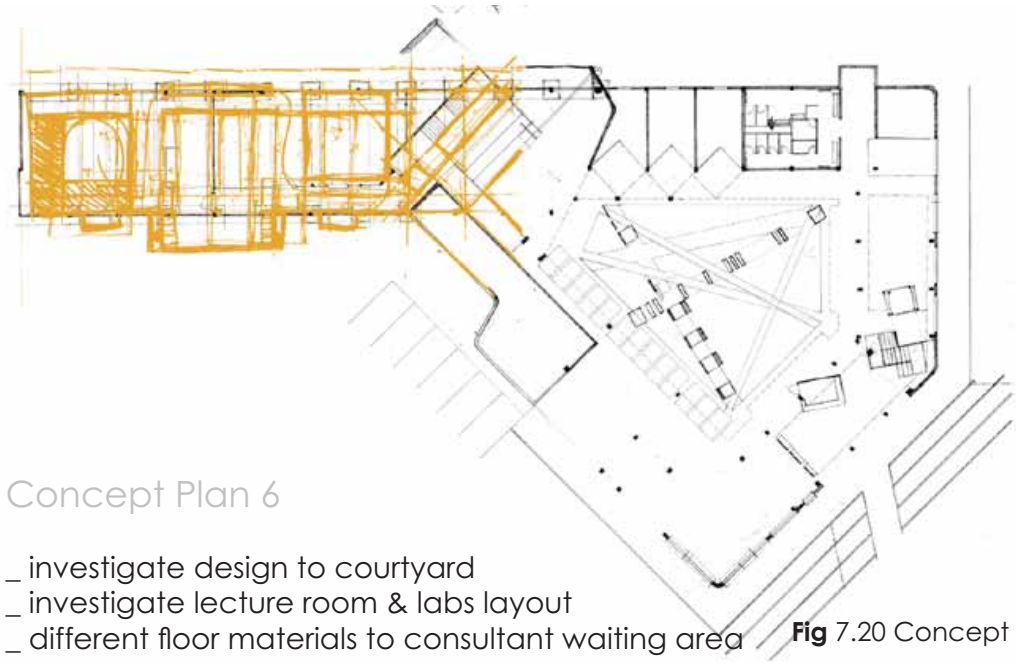
Fig 7.18 Concept model of existing structural eleme elements and infill material



Concept Plan 5

_ relative sizes to different areas
_ excavate to western end & create slab for extra laboratories
_ double volume at deli
_ investigate movement through courtyard

Fig 7.19 Concept Plan 5



Concept Plan 6

_ investigate design to courtyard
_ investigate lecture room & labs layout
_ different floor materials to consultant waiting area

Fig 7.20 Concept Plan 6

The sketch investigates the opportunities for interactive environments where existing ordinary boundaries are cut through in specific intervals. Implementing spatial transparency to a space reveals an environment that gradually changes from one space into the other.

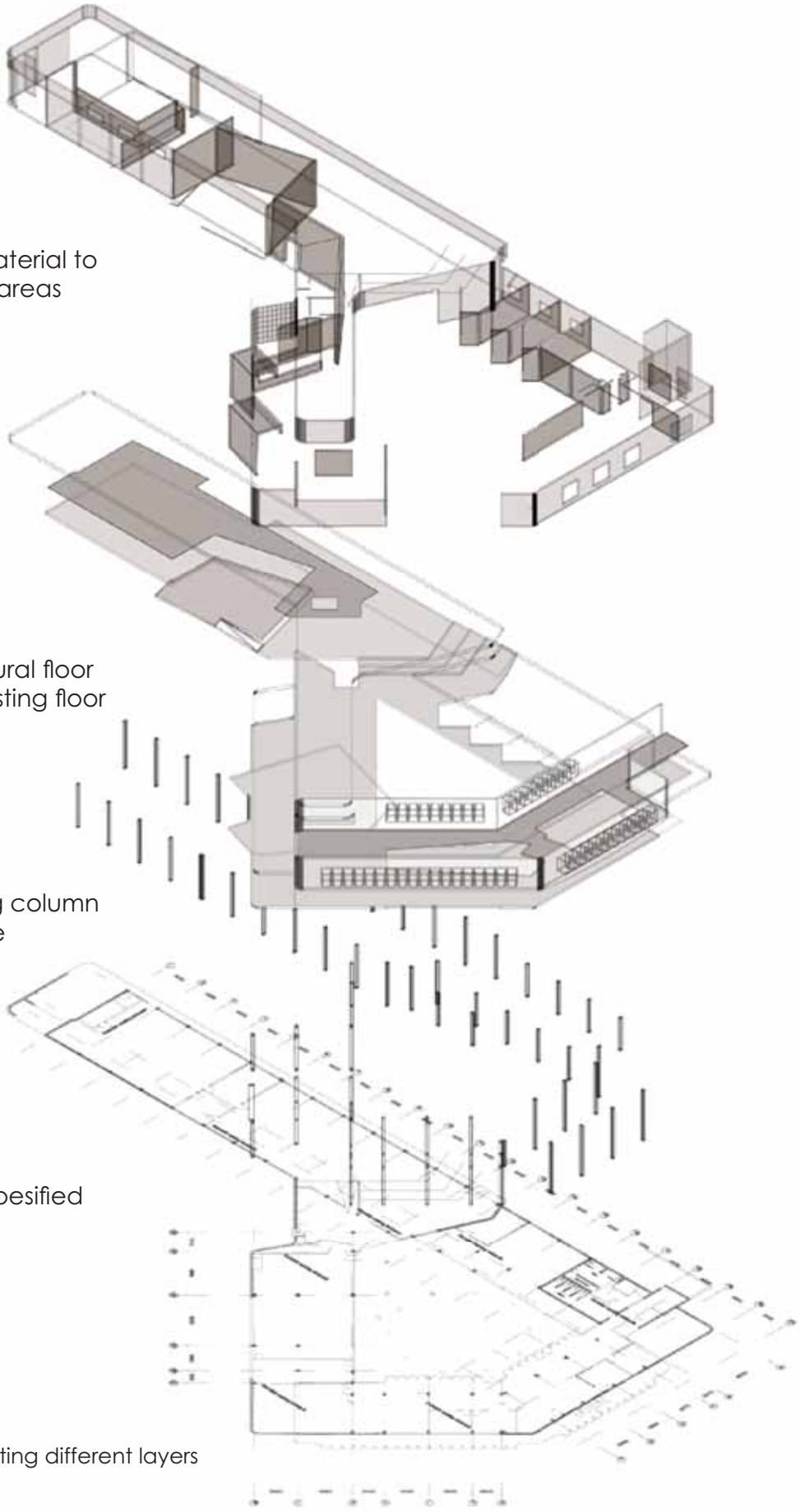


Fig 7.21 Illustrating different layers

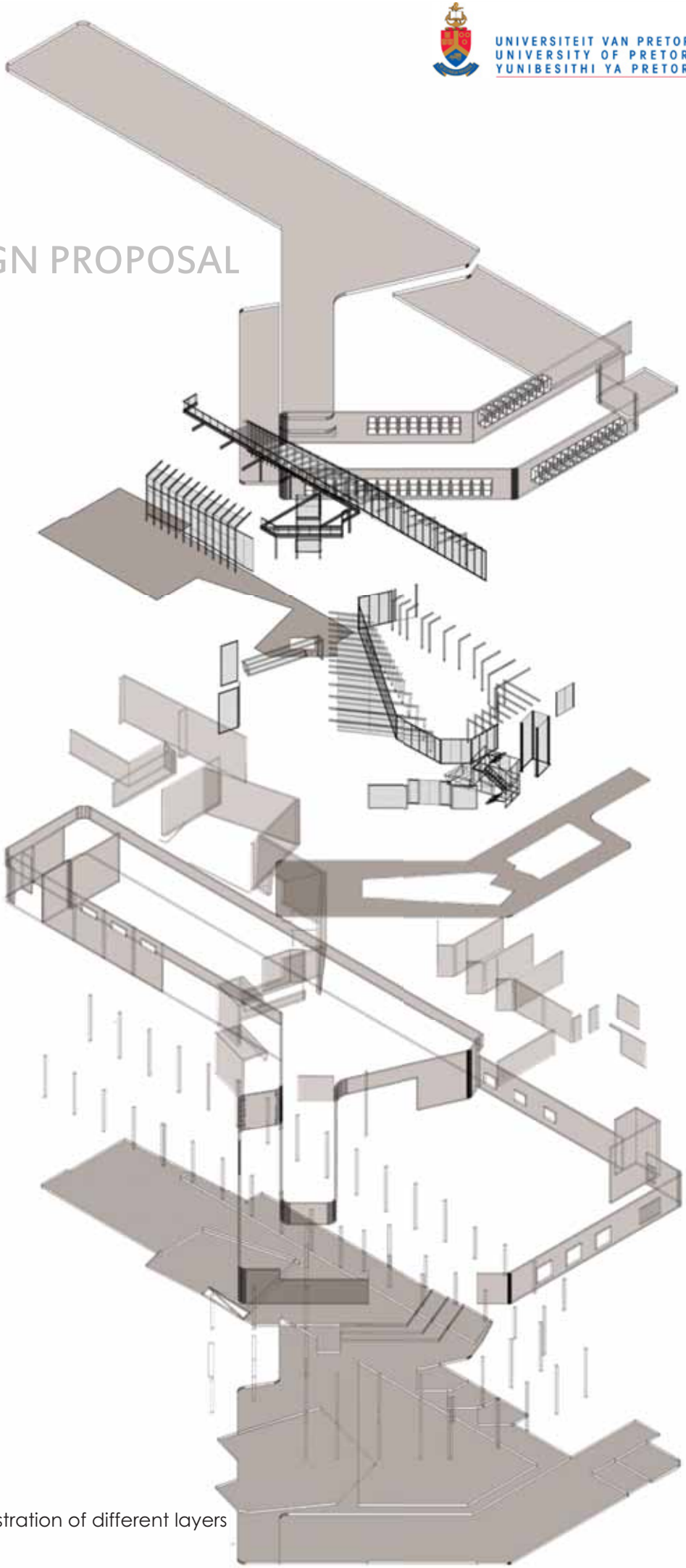


Fig 7.22 Illustration of different layers

Fig 7.23 Concept Layout Ground Floor

Fig 7.24 View towards southern elevation

_ENTRANCE

As you enter the site on the south eastern end, the existing parking is removed and large landscaped steps are brought in that step down to the new entrance. The new entrance at the eastern facade is filled with glass panels and automatic glass sliding door that provides for easy access. The reception area is visible to people walking past breaking the existing boundary and revealing the activities on the inside. The approach of transparency comes into play with the idea of showing the viewers on the outside what is happening inside in order to create an awareness of and interest in the activities. This is a total change to what is happening with the existing space.

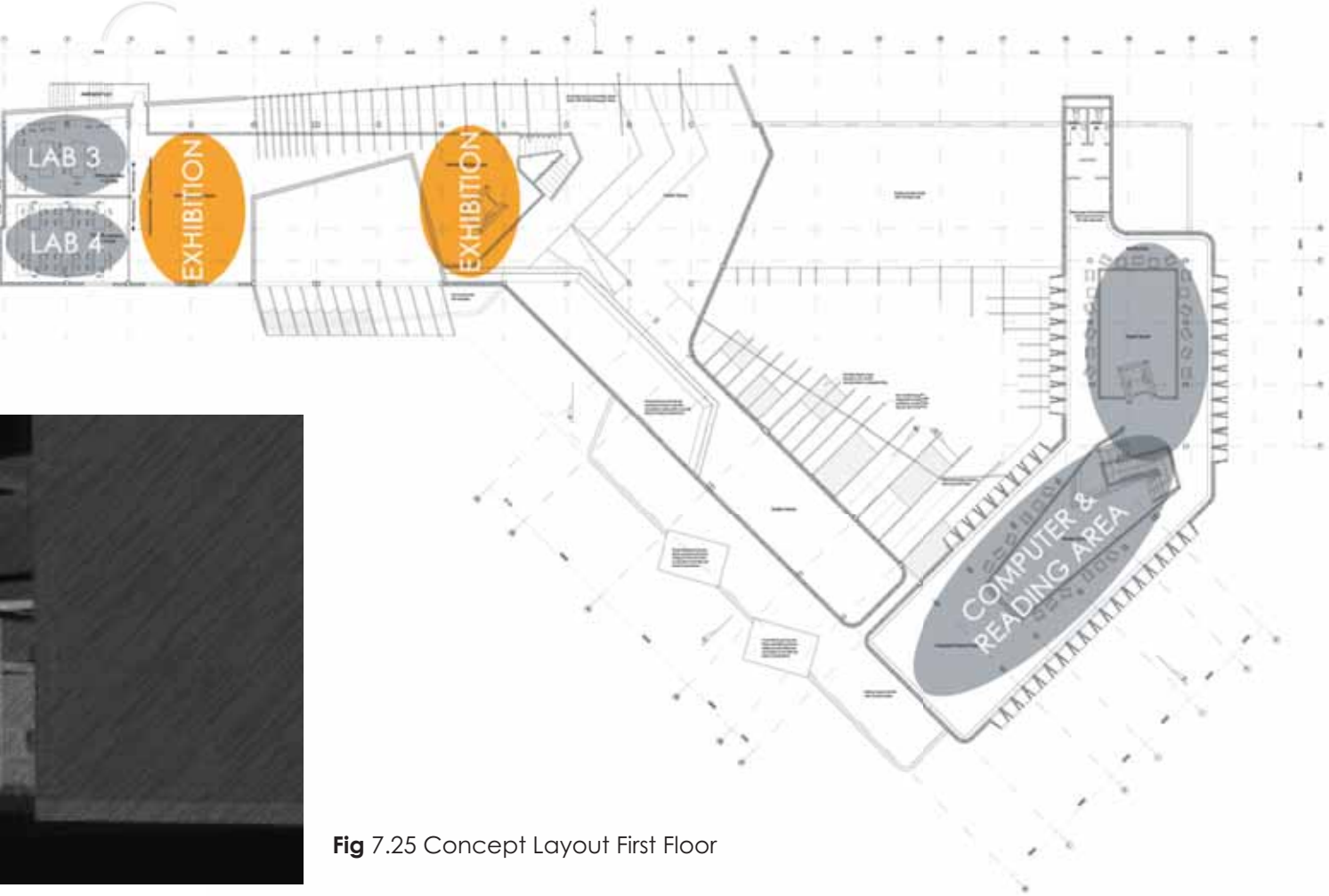


Fig 7.25 Concept Layout First Floor

_ WALKWAYS

The use of ramps with large steps ensures the accessibility for disabled visitors, the level differences only changes to the western end of the interior space where an adequate ramp is introduced next to the steps. Changes in floor levels were kept to a minimum to ensure easy access for all visitors. Visibility is enhanced with the use of wide walkways throughout the interior and with definite change in the floor materials used so as to indicate different areas. Lifts are introduced to the first floors and are distinctly visible with the use of 3 Form, 'Cranberry' Chroma panels.

Fig 7.26 Concept model of view from walkway

Fig 7.27 Illustrating movement analysis from entrance

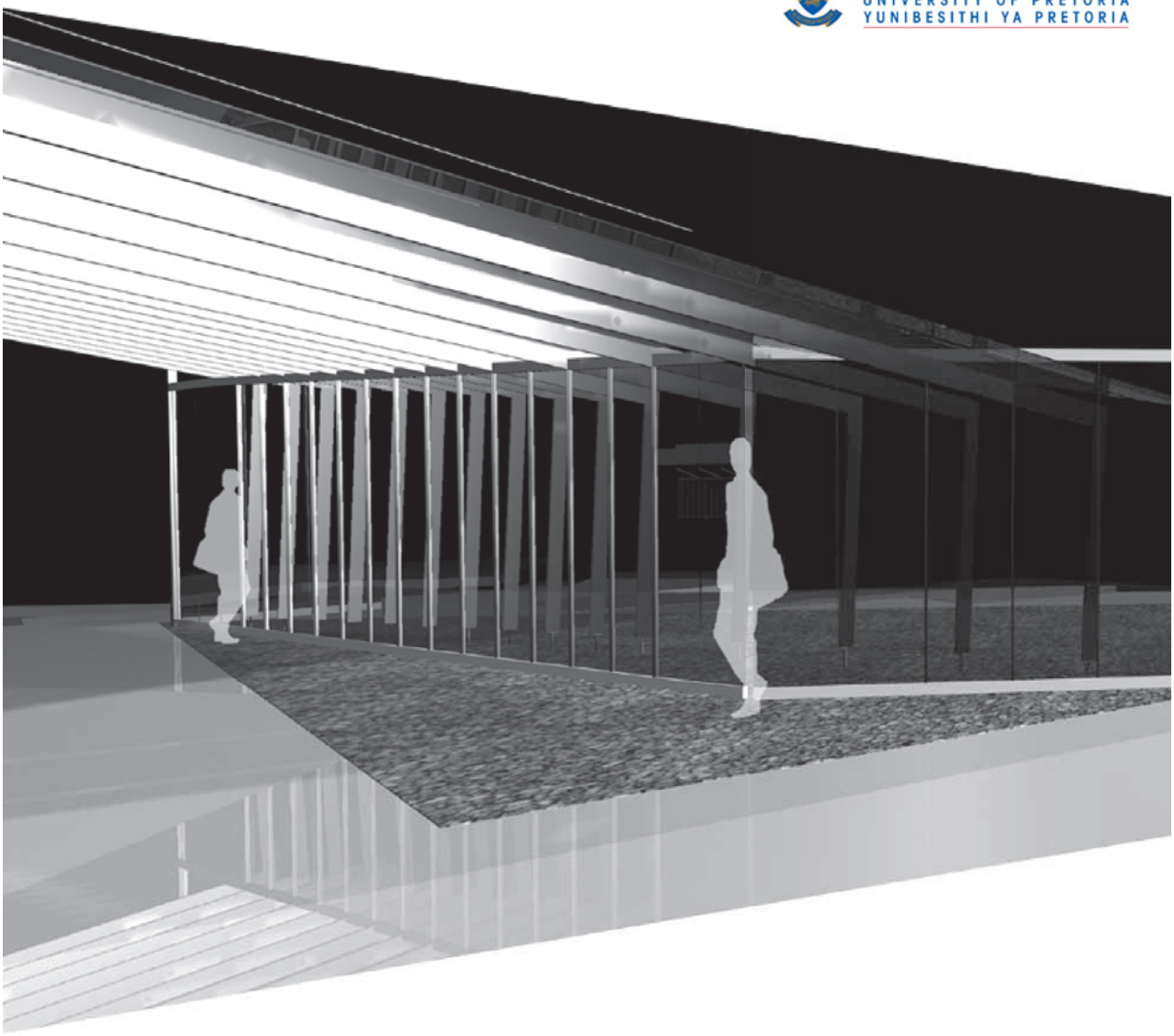


Fig 7.28 Concept model of volume in space

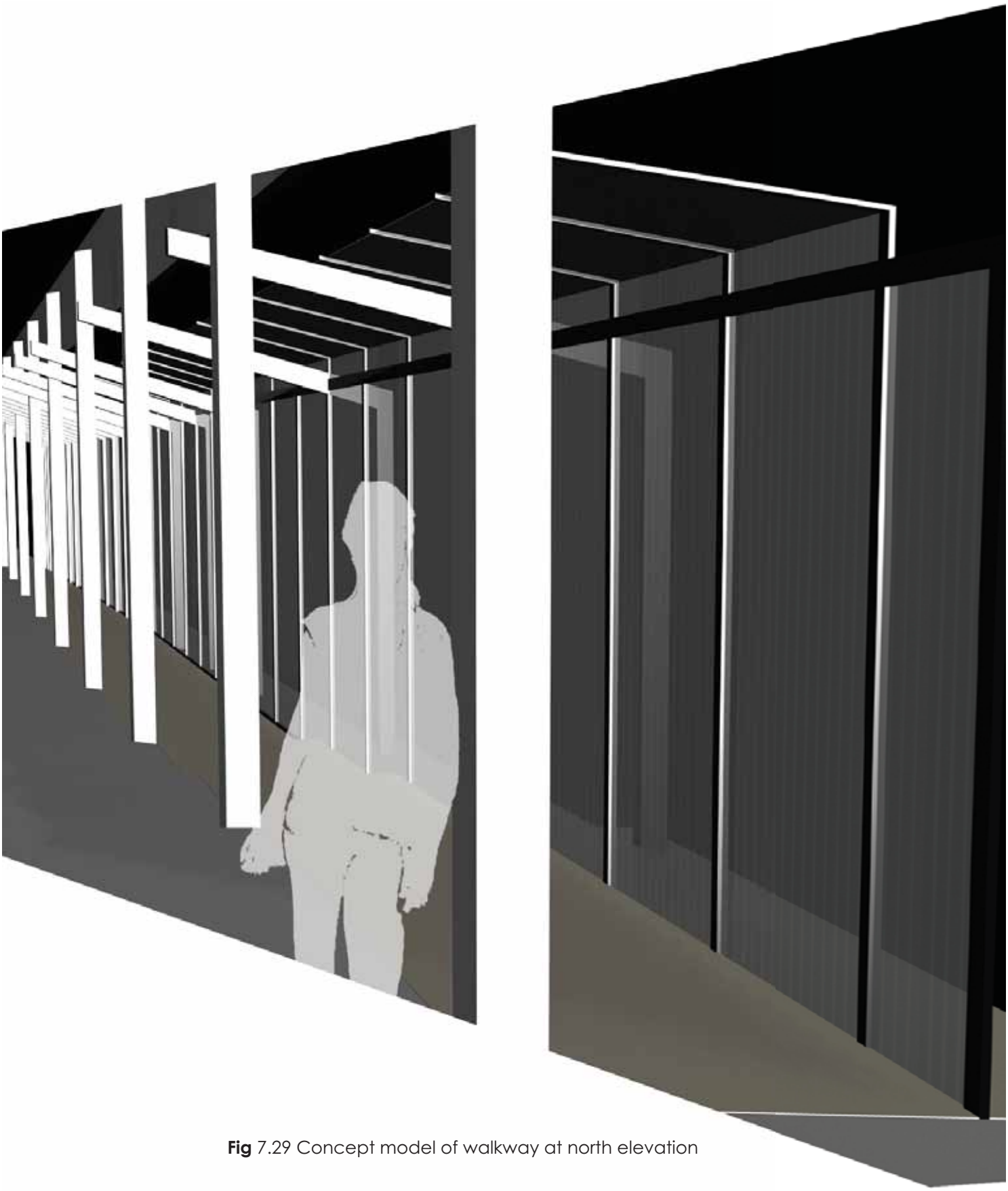


Fig 7.29 Concept model of walkway at north elevation

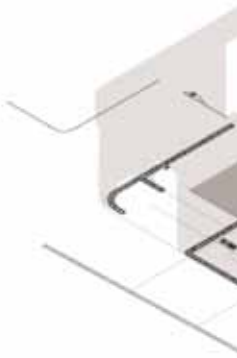
_DELI

The Deli caters for the visitors and staff. The Deli allows for 50 seating visitors but includes a take-away facility for fast meals. The seating is placed as to direct visitors on the main walkways and more private seating areas are created inside the deli. The sunscreen panels to the northern facade of the deli are placed at right angles to allow afternoon sun to shine through but to block out most direct sun rays. The kitchen has a separate private entrance door for deliveries and waste collection; the waste collection will happen with the existing scheduled waste collection of the university. A waste area is created outside the kitchen and is screened off with metal screens out of view from the public.

Fig 7.30 Concept mod

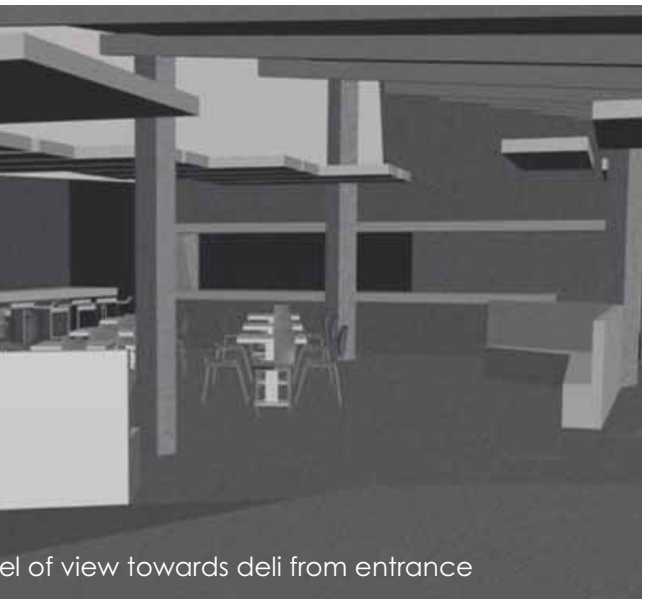
_CONSULTANTS

The offices of the consultants are allocated in a more private area of the building with adequate walkways passing the offices. The use of different floor materials indicates waiting areas from office areas. The waiting areas can also serve as informal meeting area with consultants thus making the interaction between a consultant and the student visible for visitor. This will result in awareness and interest amongst visitors. For more private consulting sessions, areas are available inside offices to ensure sufficient space, confidentiality and comfort.



_ SERVICES

The existing services were upgraded and more WC's were added on the ground floor. The new sewage pipes must connect to the existing system at the northern end of the building. A wheelchair accessible WC is also available on the ground floor to enable easy access.



el of view towards deli from entrance

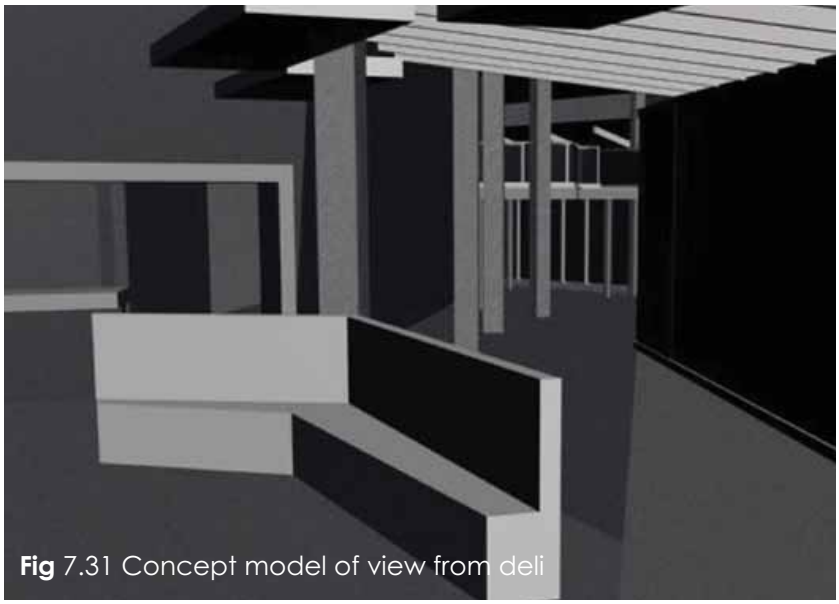


Fig 7.31 Concept model of view from deli

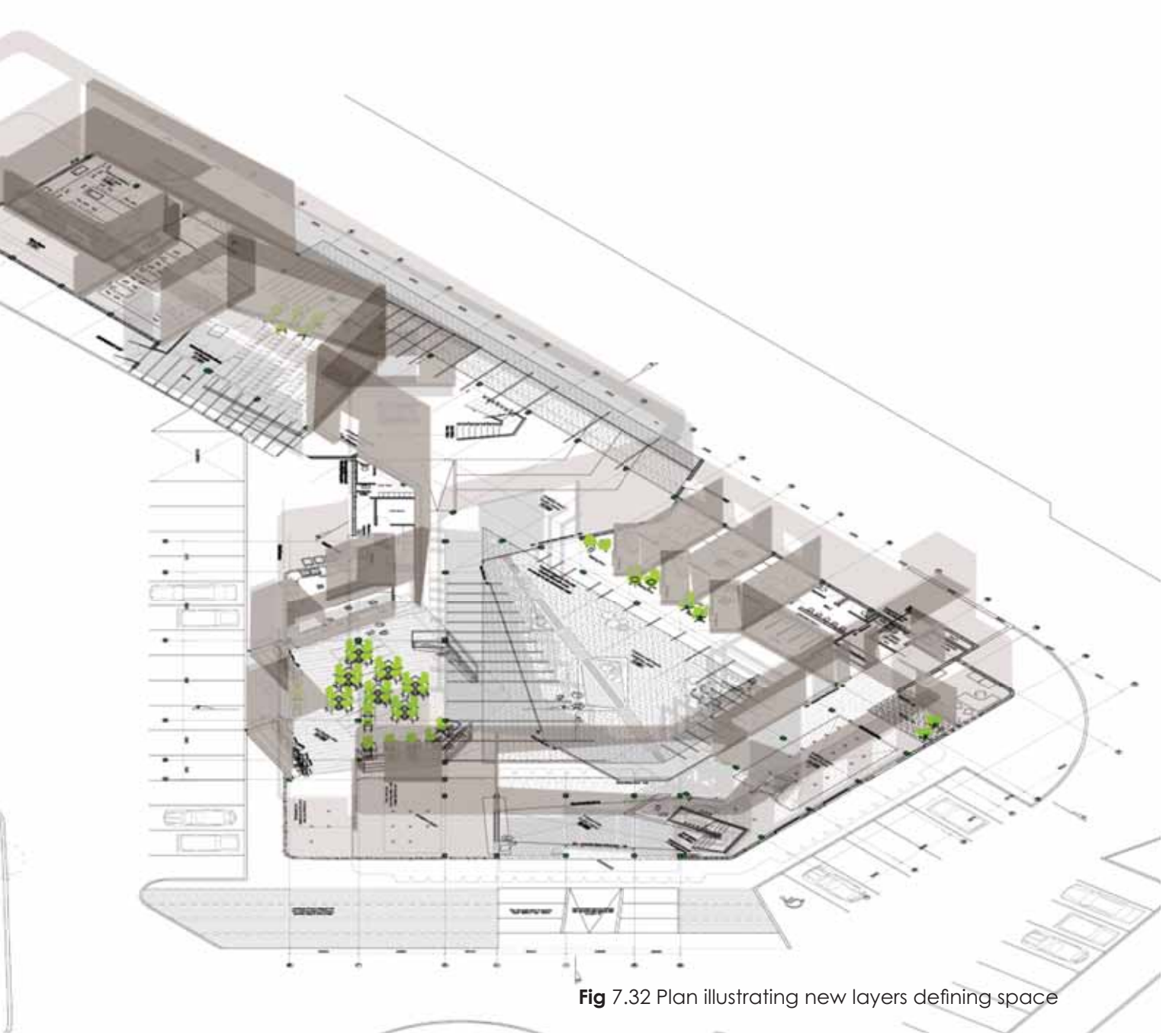


Fig 7.32 Plan illustrating new layers defining space

_LECTURE ROOM

The lecture room includes the latest technology and materials for lecturers. These include the 'clicker', video recorders, interactive smart pads as well as the smart podium. This lecture room will enable interaction with students and enhance the level of education. The use of these technological enhanced devices enables international lecturers and corporate representatives to interact with students more easily without the constraints of inadequate technology support.

_ LABORATORIES

The four laboratories with the objective to educate students in different areas of expertise will provide students with the opportunity to interact physically with experiments. The laboratories have a glass facade to the front to enable students passing by to view and experience the activities of the class.

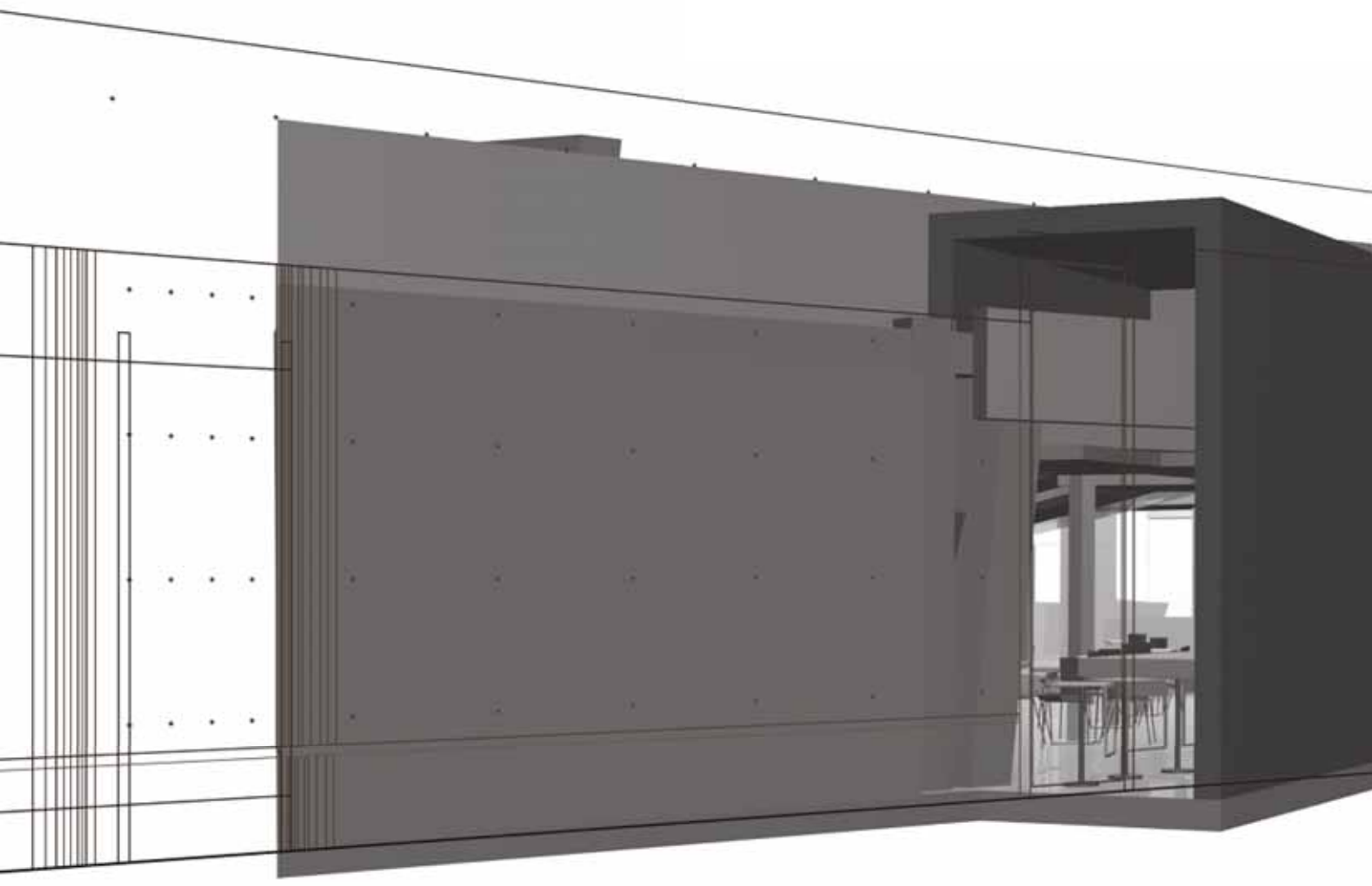
_EXHIBITIONS

The spaces allocated for exhibitions are placed in between the different areas of the building. The approach in exhibition design is to generate attention to the information to be translated through the exhibitions. This will be the first step of interaction between user and information. Afterwards the student then consults with a consultant on a more one-on-one basis and the information is further translated to the user.

_ COMPUTERS & READING AREA

This space is more private-orientated and requires a student to access the information available, either by making use of the reading material or the digital information. The area is situated on the first floor at the entrance with comfortable seating placed in specific areas. The seating enables students to access the information in a relaxing and comfortable context.

Fig 7.33 Concept model of walkway to lecture room



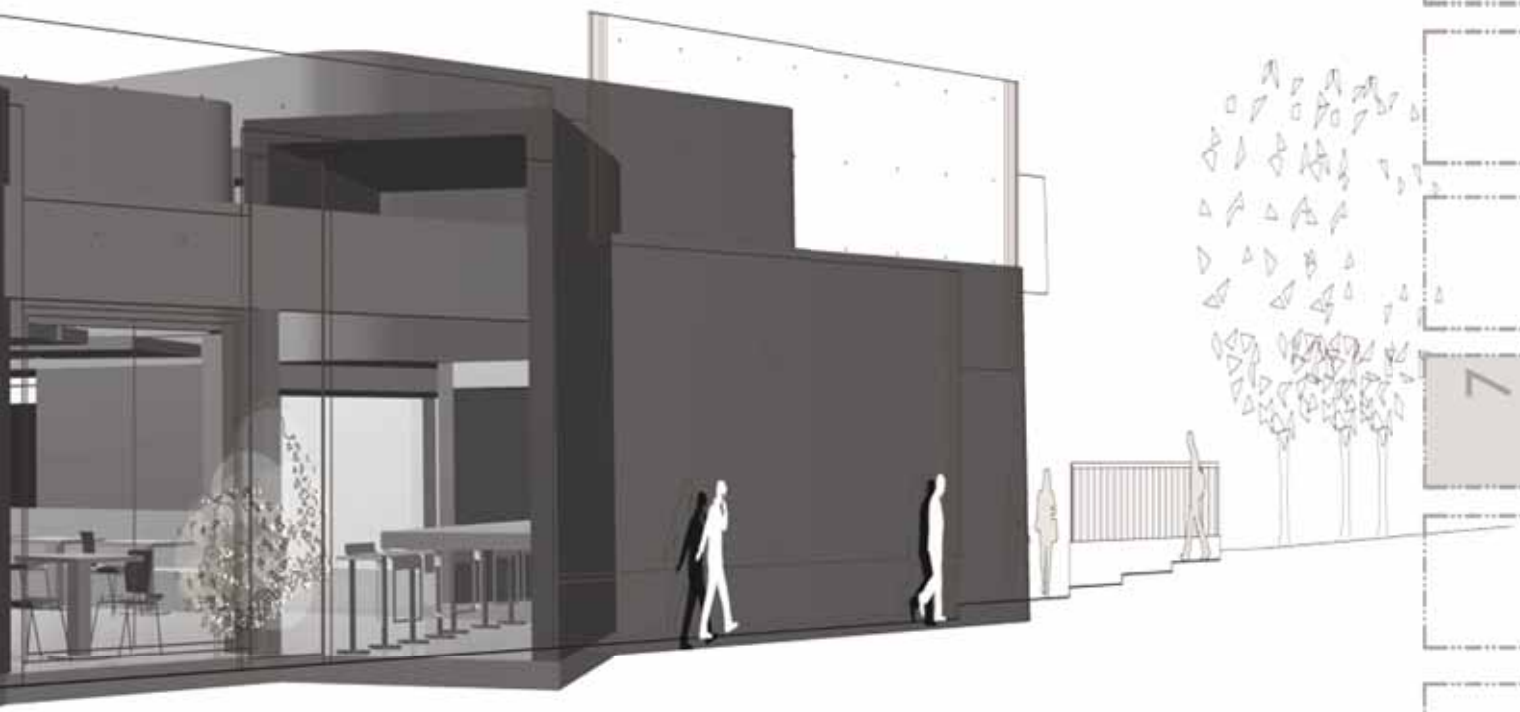


Fig 7.34 View of south elevation towards entrance

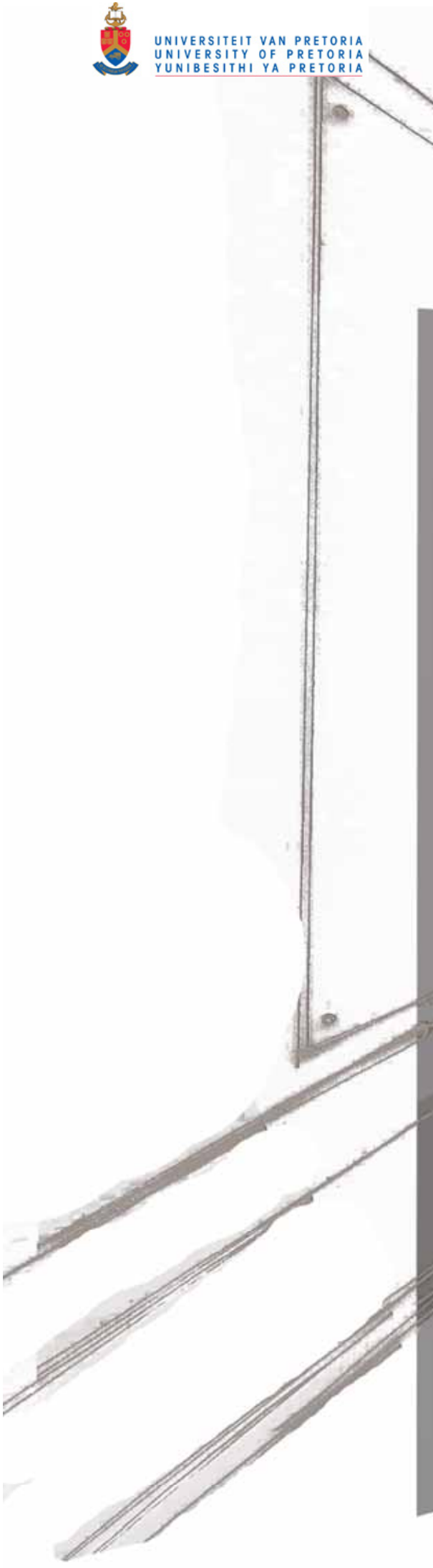


Fig 7.35 View from entrance towards deli

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

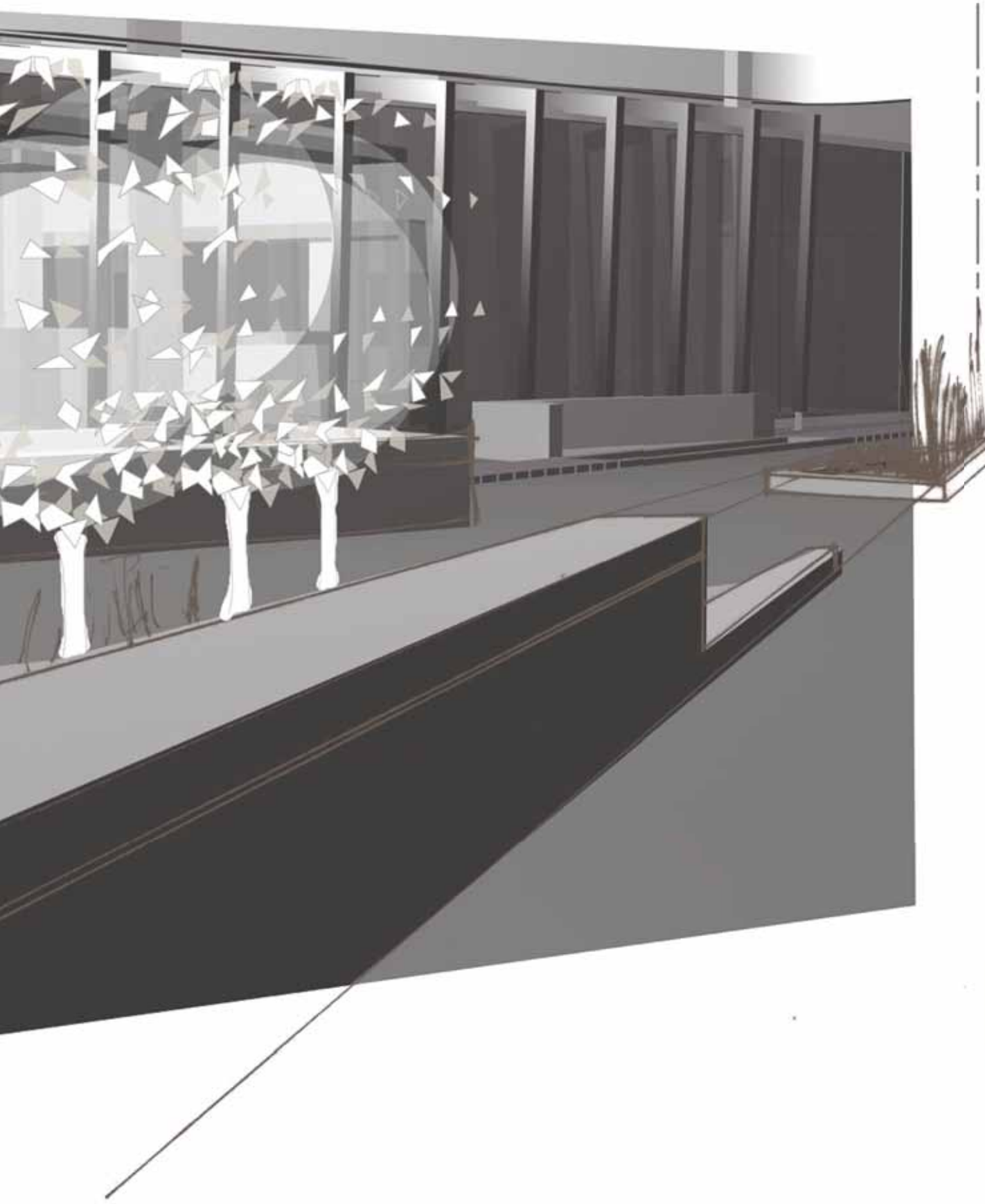


Fig 7.36 View towards courtyard

8 TECHNICAL INVESTIGATION

Fig 8

The following text is supplementary to the set of drawings and motivates decisions that were made on a technical level. The more important technical aspects are revealed in this chapter with its main focus on the interior design aspects towards the project. The design interventions are not just spatially visible, but apparent in the different use of materials and construction methods.

The existing structure consists mainly of concrete with the wooden planks used during construction imprinted on the exterior walls. The two existing grids are evident from the existing plans. The first grid runs horizontal with four meters spacing between columns but the second grid runs at a 45 degree angle with various column spacing, less structured than the first grid.
The concrete soffit is removed to re-establish the interior courtyard, bringing more natural light and ventilation into the building. The existing concrete first floor to the east of the building is demolished to specific parameters to ensure structural stability; creating extravagant double volume spaces for the entrance and exhibition area.

The secondary structural elements are placed in specific areas to allow for movement through the spaces and improve the overall circulation in the building. The circulation areas are moved to the outer edges of interior spaces. Critically stated these routes could be referred to as 'outside' for most of these routes fall outside of the existing footprint of the building.

The material used for these structural elements include Mild Steel Rectangular Tubing fixed elegantly to the existing concrete structure. The infill material is site specific, enhancing the qualities required for the specific activity.

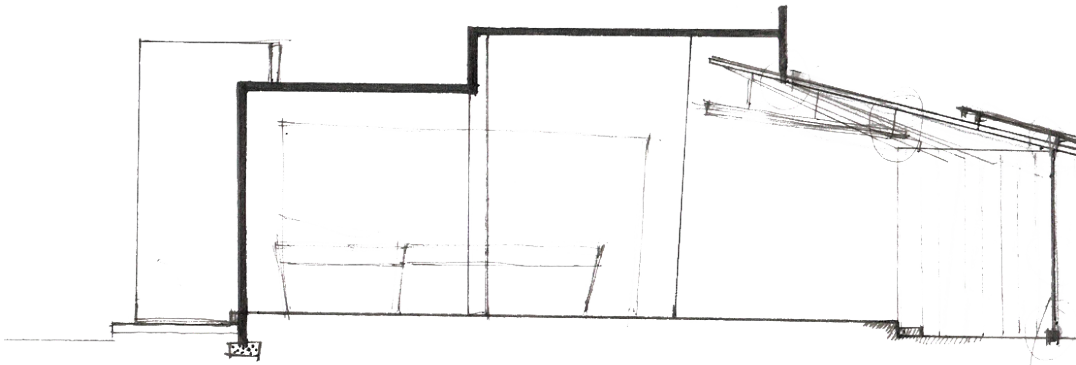


Fig 8.1 Concept sketch of new structural element

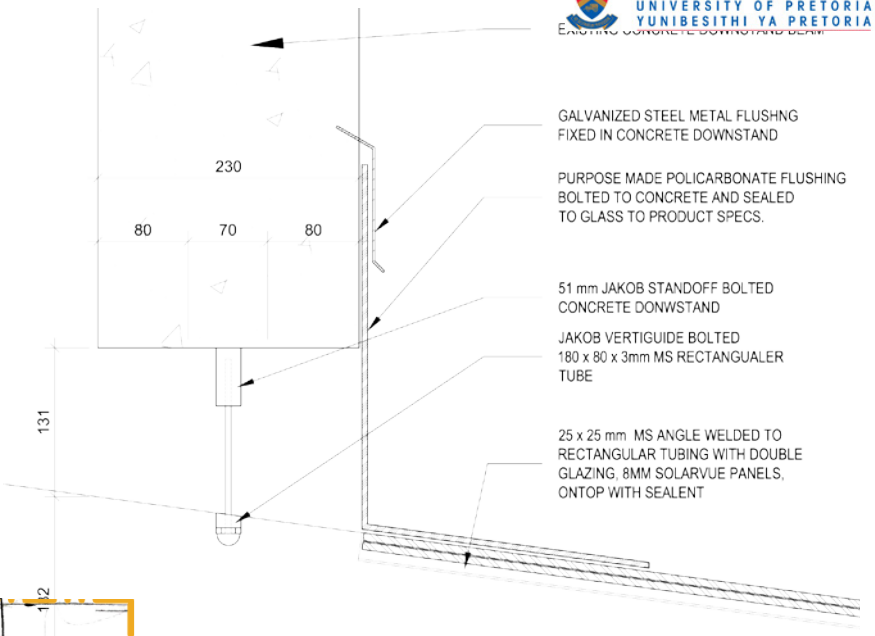


Fig 8.2 Detail for rectangular tubing connection to concrete

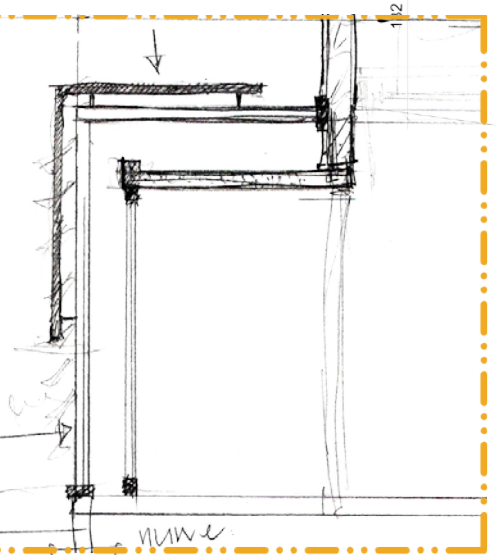


Fig 8.3 Concept sketch of new structural element

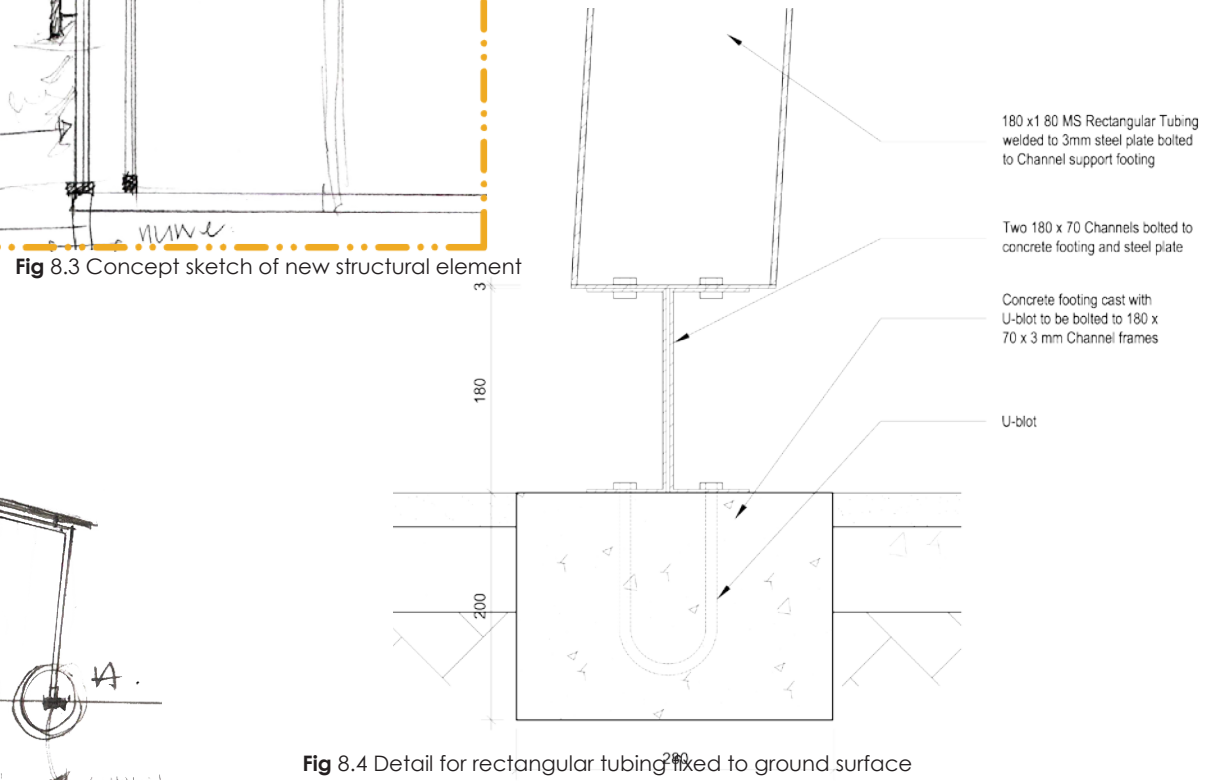


Fig 8.4 Detail for rectangular tubing fixed to ground surface

The floor covering material mainly used in the building is compact acoustic resilient flooring; the material is designed for heavy traffic commercial areas. The material caters for both acoustic comfort and indentation resistance. The screed floors must be carefully examined before installation to ensure that no damp or cracks appear on the surface. The definition of different spaces is signified by the different floor covering colours and patterns. The floor covering used in the laboratories is specialised optic compact flooring with specialised qualities that make for excellent use. The optic compact range is made of 30% recycled material, has low energy consumption and is 100% recyclable. The material has a long life span, is resistant to colour stains and is easy to clean. Carpets are placed in the consultant offices, creating an intimate and warmth space for consultants to meet with potential students.

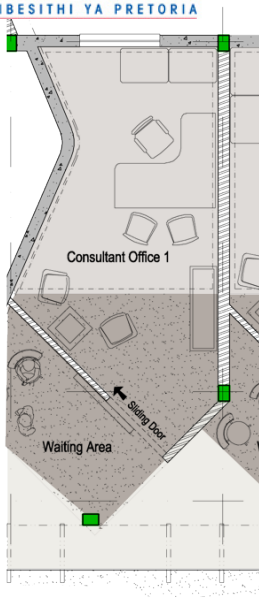


Fig 8.5 Plan indicates ceiling in exhibition area

The ceilings introduced in the exhibitions areas do not solely aspire to the technical aspect of acoustic comfort but also define the spatial boundaries to a vast open space. The ceiling void in most areas will be used to hide services for lighting and air-conditioning. All ceilings will return back to the soffit to end the corners off neatly.

The lighting dedicated for exhibitions areas will run on a track system to ensure flexibility. In general lighting to exhibition spaces will consist of low voltage halogen lamps which generate good quality lighting and colour rendering. Fluorescent lamps will be

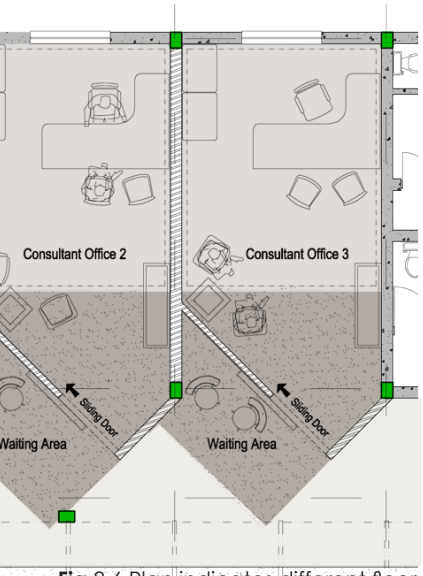


Fig 8.6 Plan indicates different floor materials

used in the laboratories, which be fixed to a metal track braced back to the soffit. The lecture room will have a combination of clustered Light-Emitting Diode (LED) which generate very little heat, have a lifespan up to 100 000 hours and produce a diffuse light. These lights will include dimmers that allow the speaker to adjust the lighting qualities.

The existing sewage services will be inspected and upgraded according to building regulations. The new WC will be connected to the existing system and a duct will be added for the facilities on the first floor.

Fire hydrant units are placed throughout the interior space to comply with the regulations of SABS 0400 Part T. The units are placed with 30 meter radius coverage from each other. The clearly indicated emergency exits are allocated in specific areas for ease of access.

The added structural elements placed in the design are constructed in an approach of steel frame structures acting as the main support frames which are then connected to the existing structural elements. The secondary material gives a spatial definition to the steel frame with the tertiary materials that reveal the qualities of the specific space. With reference to the above approach the following aspects of the design reveal the approach in more detail. The design of the entrance staircase counter is discussed in more detail to reveal the approach towards loose objects in the design, and then the design of the interactive lecture room will be dealt with to reveal a similar approach to an interior space.

STAIRCASE COUNTER

The reception counter will be a landmark for visitors to receive information and guidance to the activities on site.

Main Structure

- Mild steel channel frames fixed to existing concrete floor to support balustrade panels
- Mild steel channel frames fixed to existing concrete floor to support counter
- Hot rolled rectangular tubing to support staircase

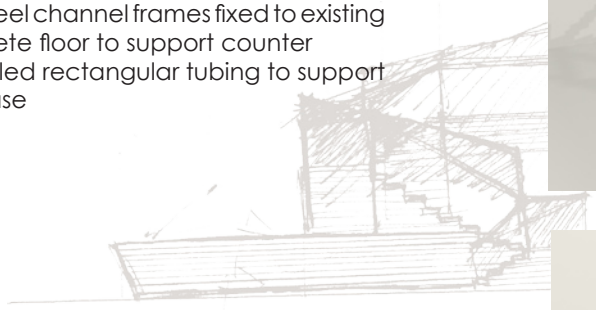


Fig 8.7 Concept sketch of staircase

Substructure

- Mild steel square tubing fixed to main structure for additional support
- Mild steel square tubing fixed to main structure to create shape of counter
- Custom-made steel tread plates bolted to rectangular tubing

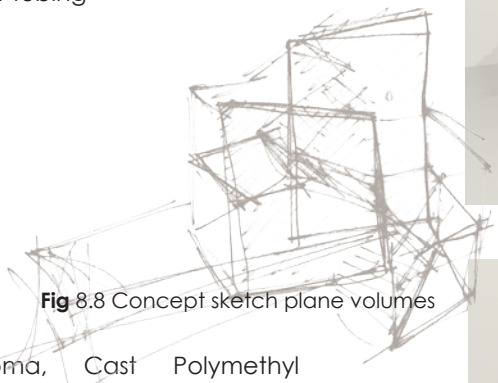


Fig 8.8 Concept sketch plane volumes

Cladding Structure

- 3Form Chroma, Cast Polymethyl Methacrylate (PMMA), resin panels are bolted to the substructure to create balustrade walls
- 3Form Chroma, Cast Polymethyl Methacrylate (PMMA), resin panels are bolted to the substructure to create counter face
- Timber panels are bolted to substructure to create counter face
- Timber treads slide into steel treads and bolted to stay in position

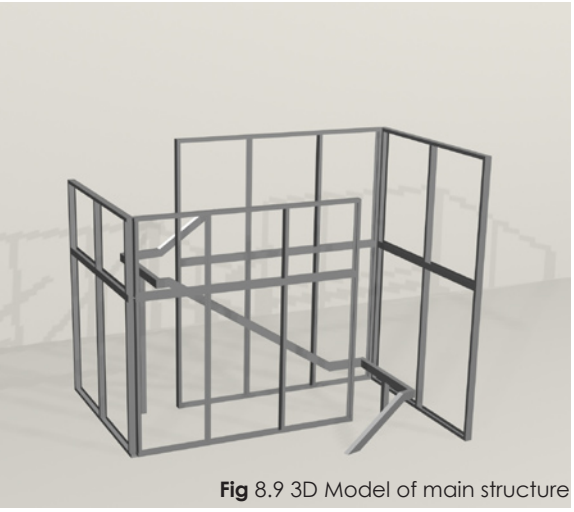


Fig 8.9 3D Model of main structure

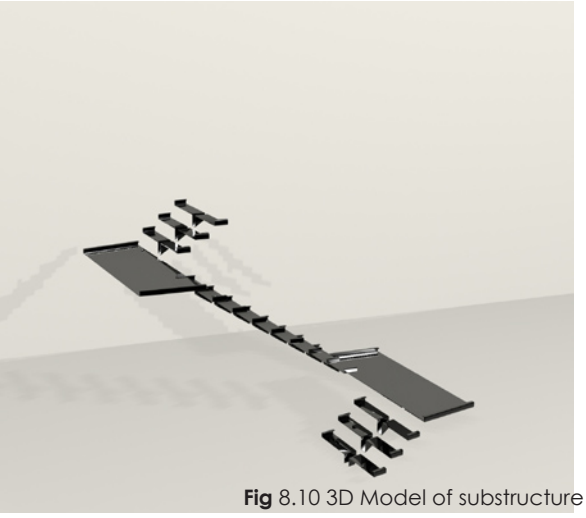


Fig 8.10 3D Model of substructure

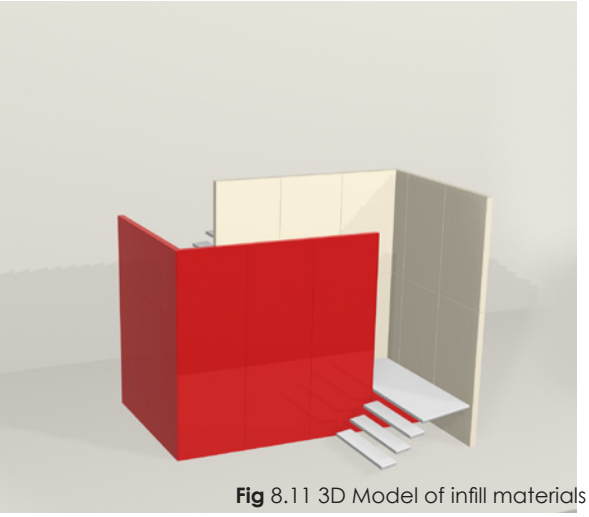


Fig 8.11 3D Model of infill materials

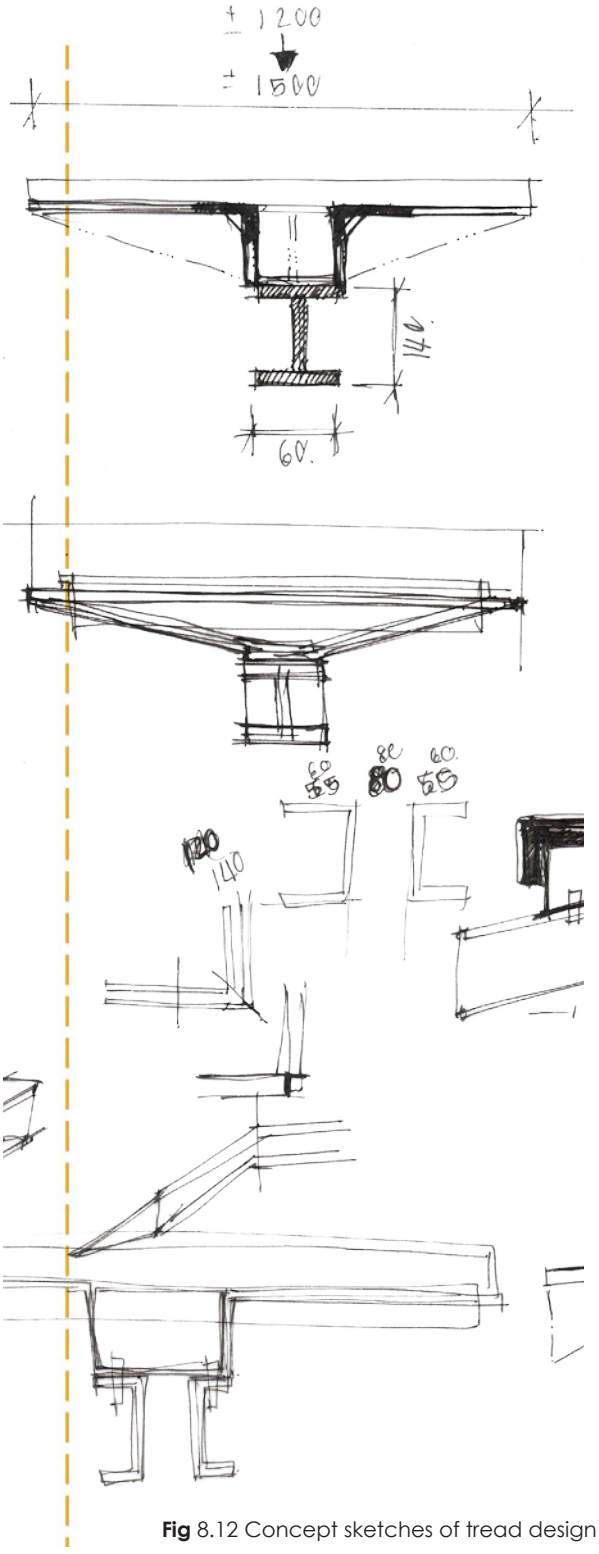


Fig 8.12 Concept sketches of tread design

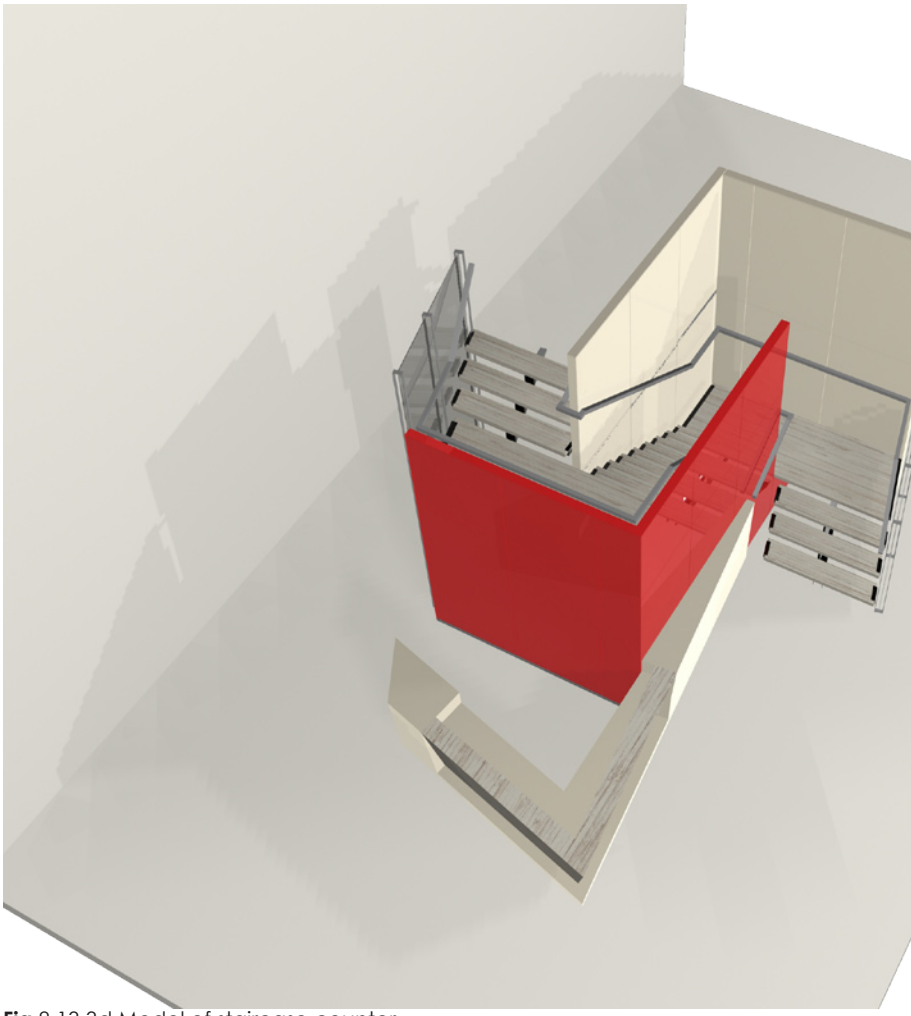


Fig 8.13 3d Model of staircase counter

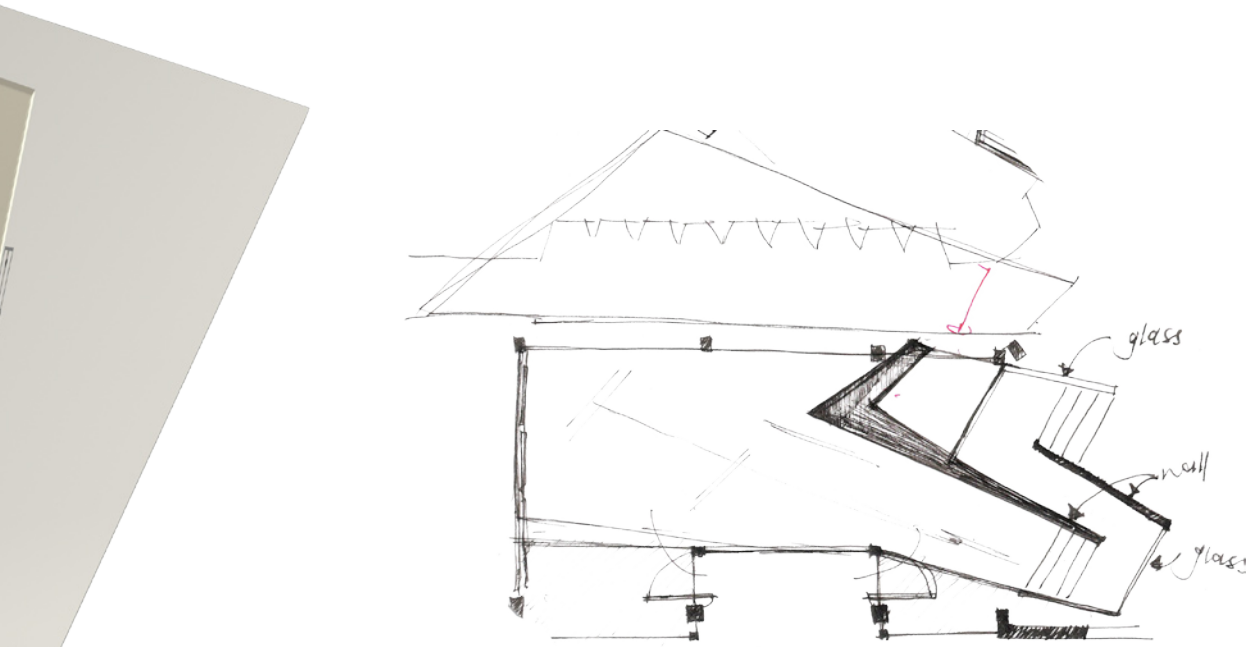


Fig 8.14 Concept sketch investigating materials and angles

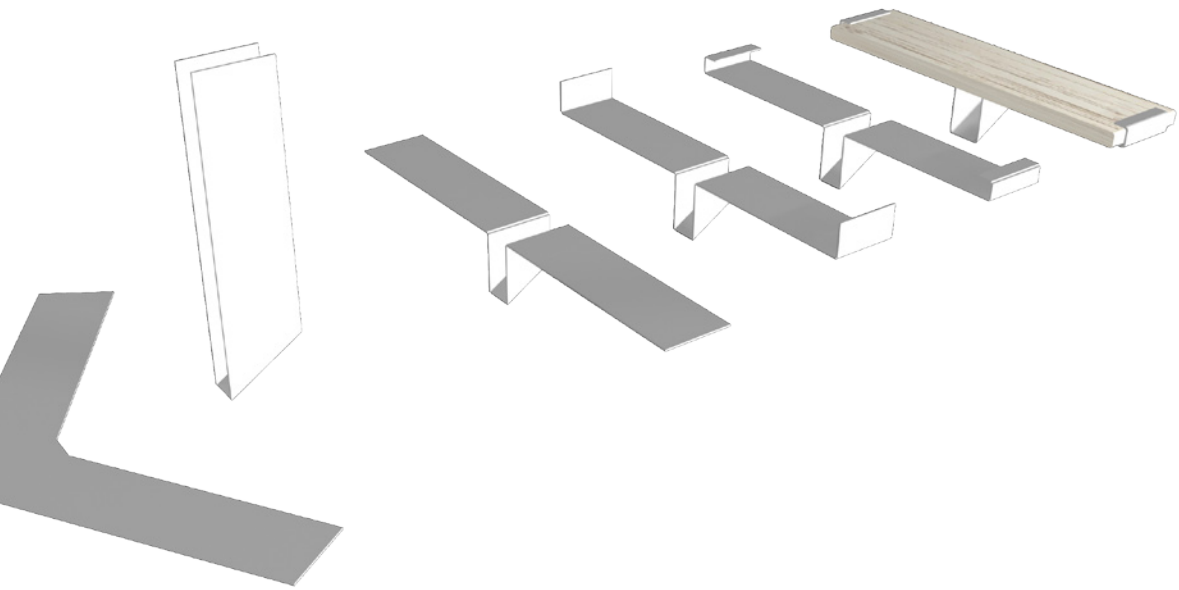


Fig 8.15 3D Model of steel tread plate bent to profile

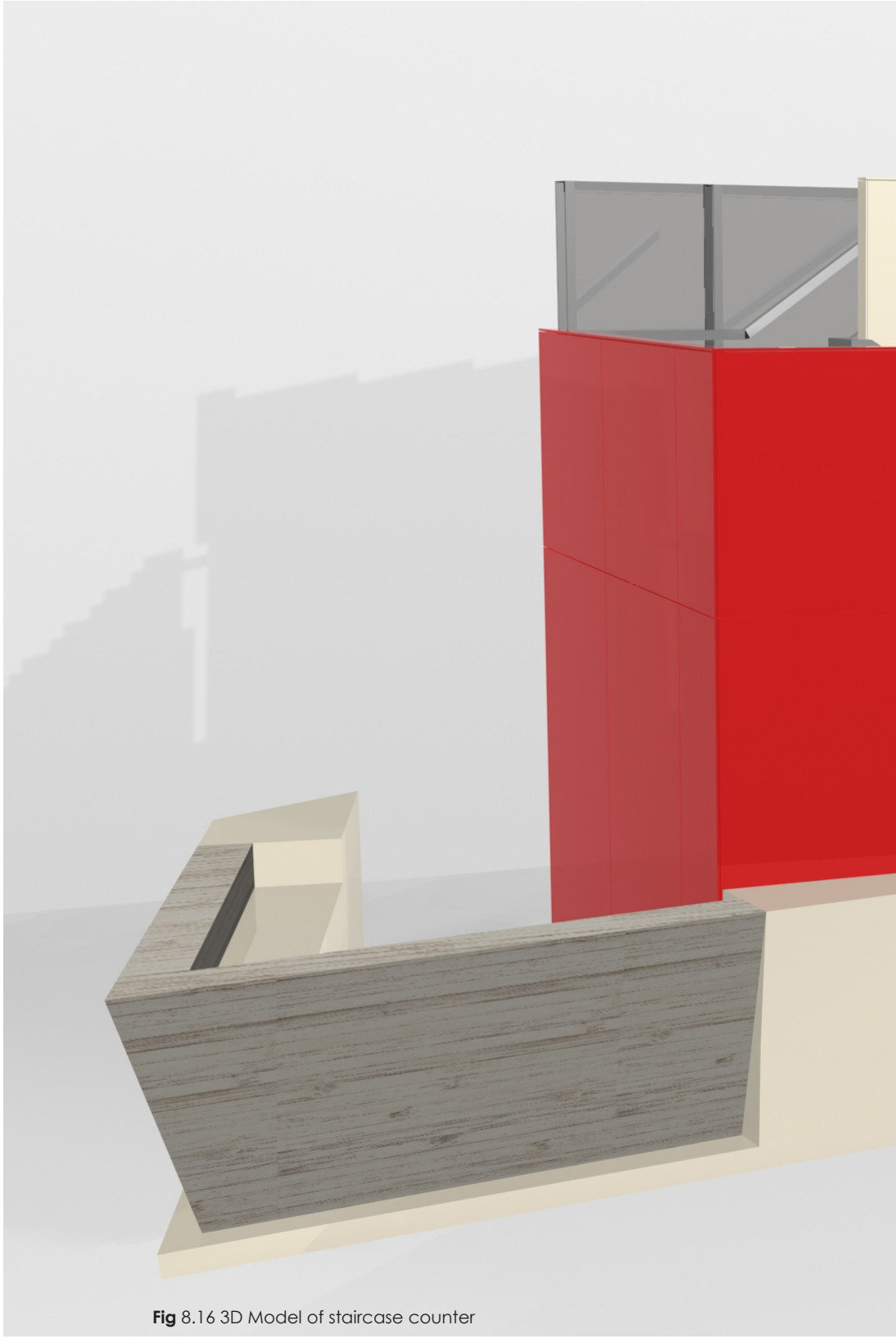
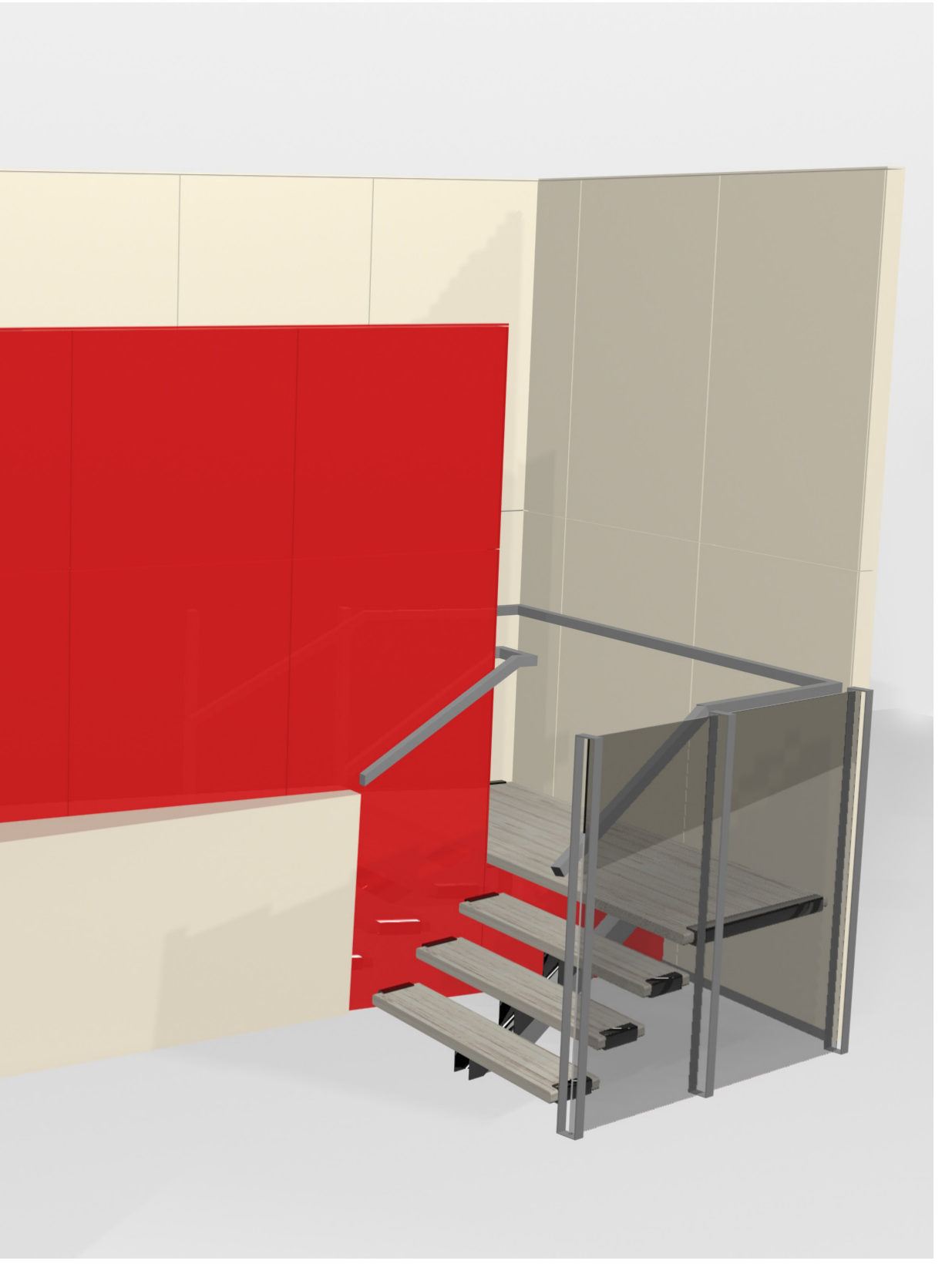


Fig 8.16 3D Model of staircase counter

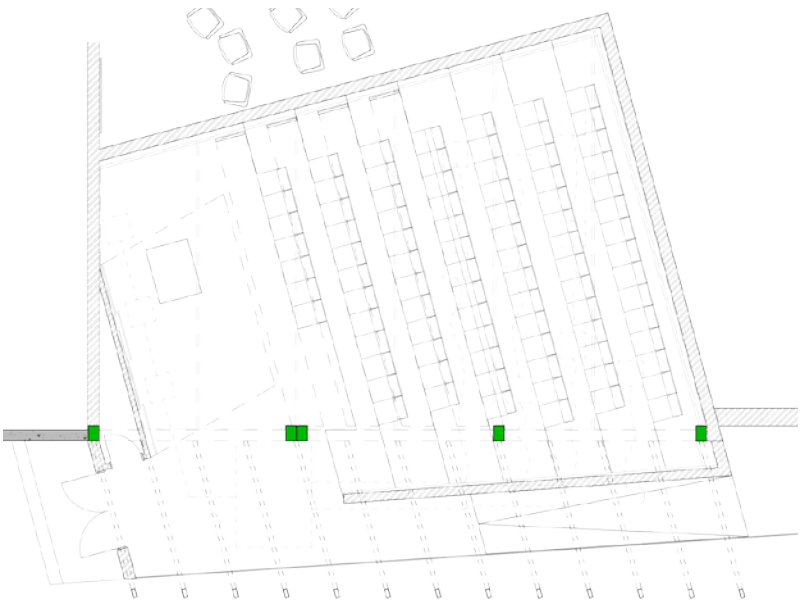


INTERACTIVE LECTURE ROOM

The Interactive Lecture Room with the objective to educate students in different areas of expertise will provide students with the opportunity to interact with lecturers.

The shape of the interactive lecture room prevents the unwanted echoes of sound waves, referred to as standing waves. Standing waves occur when sound waves are trapped between parallel walls. For that reason the room evolved to its current form with no parallel walls or floor to ceiling. The overall interior size of the room is between 1.2 and 2 times the length to the width, the parameters are ideal for auditoriums and make optimum use of the shape and space (Greeff, 2007:62).

To ensure optimum viewing the seats are placed at the correct distance from the screen; i.e. placing the front row not closer than 2 times the width of the screen and the back row between 6 or 8 times the width of the screen (Dr, Freysen, 2008). Seats that are raked to the back, limits the risk of sound shadows behind seats and ensures direct sound paths to the audience.



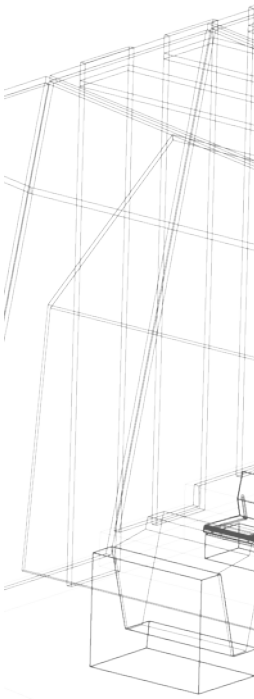


Fig 8.17 Illustration of plan for interactive lecture room

Dr, Freysen from the University of Pretoria assisted in the development of the technological equipment used for the lecture room. In a personal interview, held on 10 September 2008, Dr, Freysen revealed the problems with existing lecture rooms on campus as well as the opportunity of using new equipment researched and designed by the University.

_ The existing lecture rooms on campus are not universal according to the equipment used
_ Chalk boards are still the preferably choice of media and the use of white screens must be limited.
_ Problems occur when guest lecturers do not that have the sufficient media at hand to perform quality lecturers
_ Equipment must be fixed in position as to limit theft
_ The Smart Podium offers a universal model that can be used in all lectures
_ This will enable lecturers to work freely from one lecture room to other

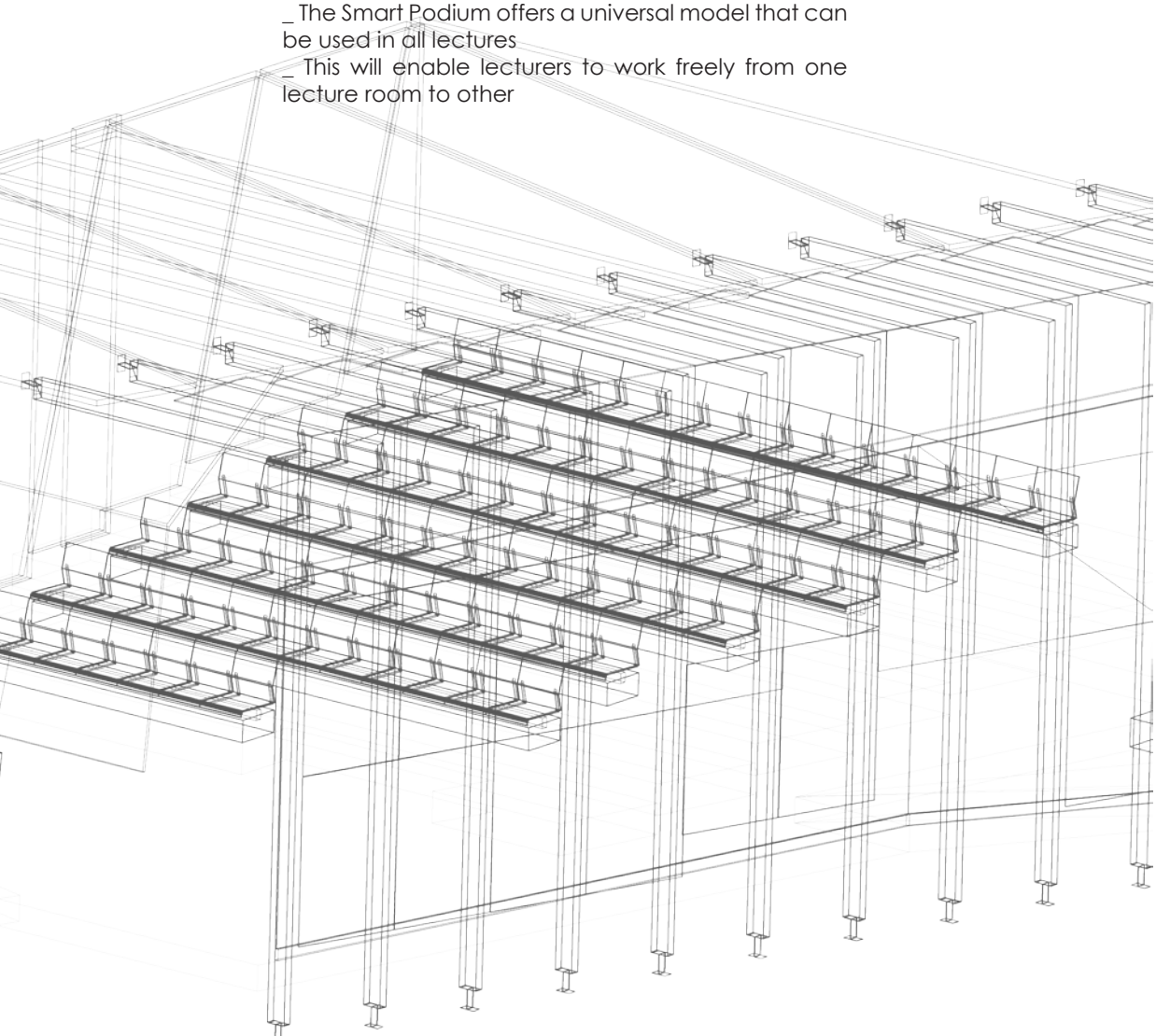


Fig 8.18 3D Model of exterior view towards interactive lecture room

_Acoustics

The acoustic quality of the room can be calculated with the reverberation time of the room, which will indicate the time it takes the sound to travel from the speaker to the audience. The preferred reverberation time for speech purposes is one second but not less than 0.25 seconds (Joubert, 2008). The calculated reverberation time is 0.4 seconds with the specified materials which is well in the specified field resulting in sufficient absorption materials.

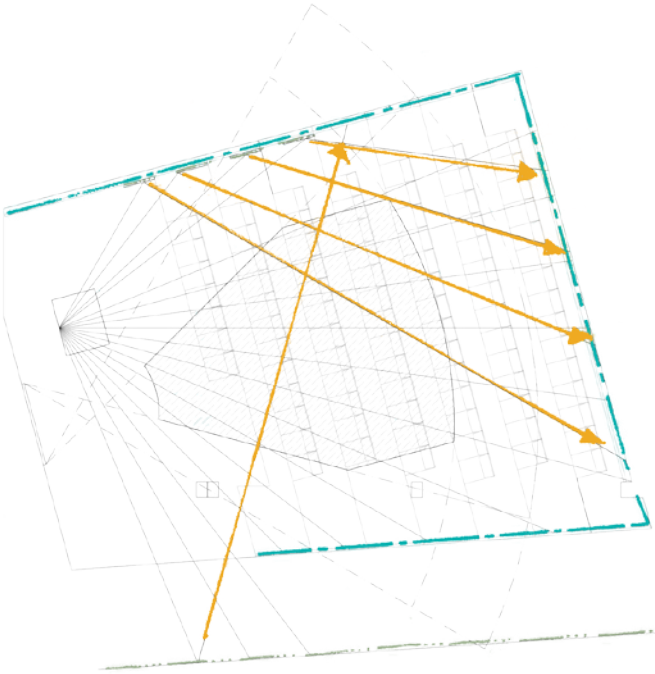


Fig 8.19 Illustration of sound reflection from wall panels

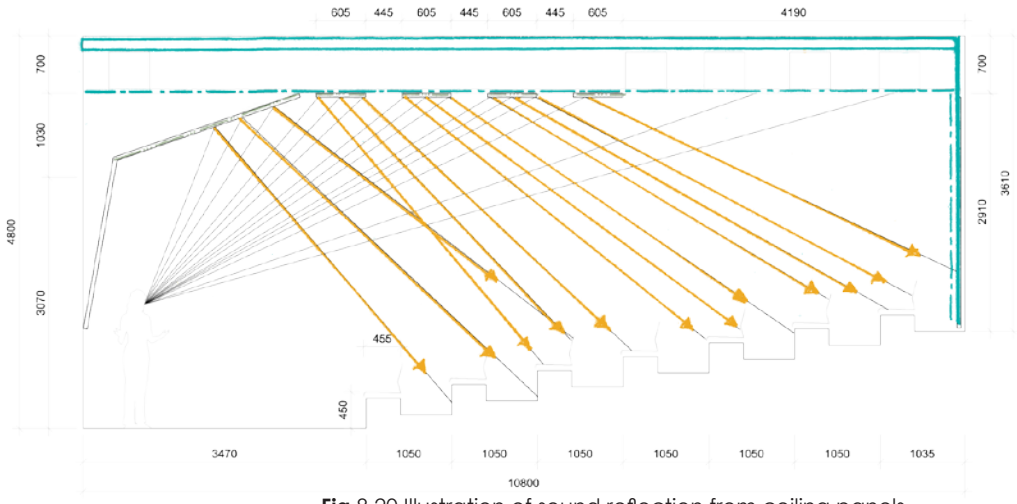


Fig 8.20 Illustration of sound reflection from ceiling panels

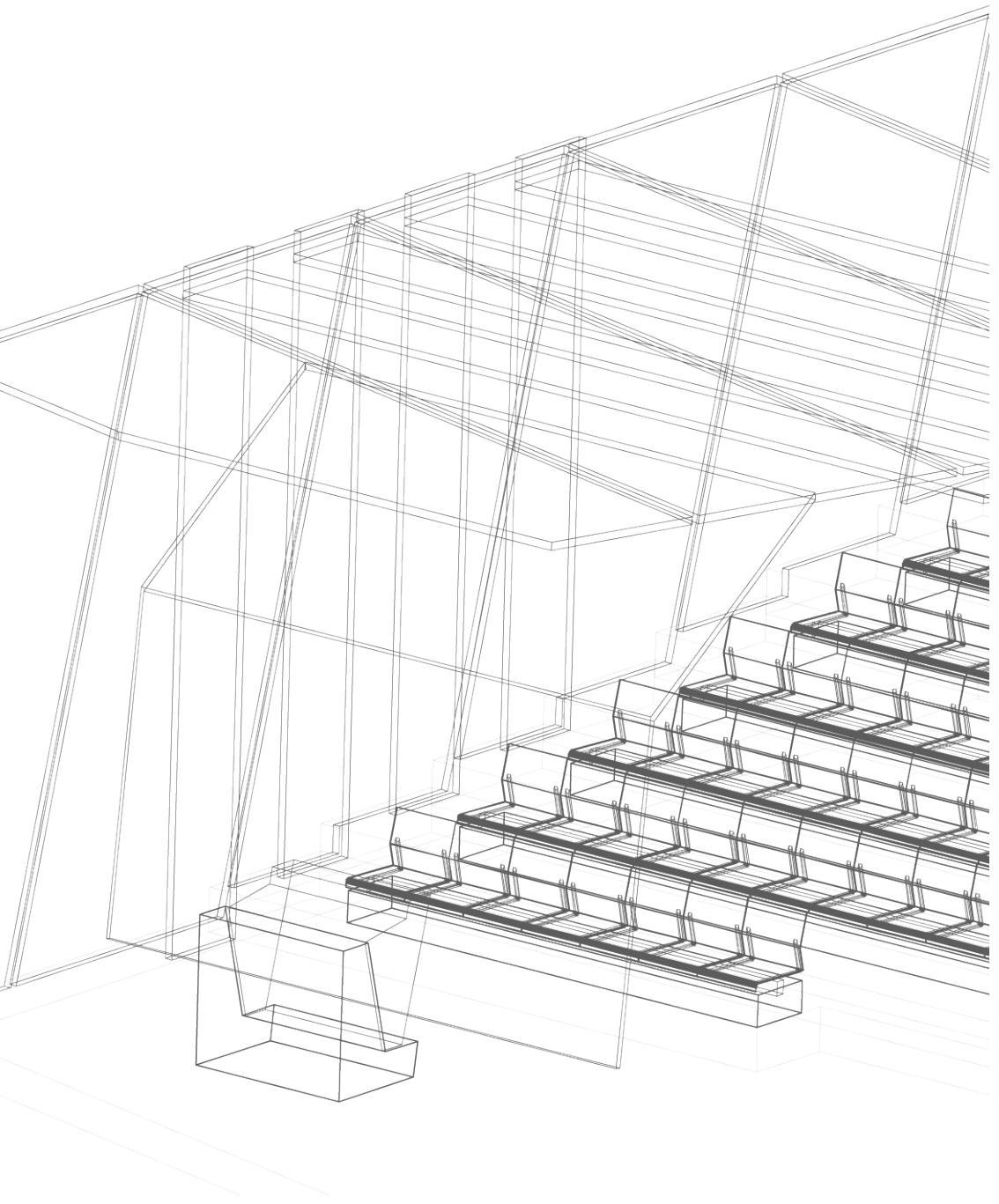


Fig 8.21 3D Model of interior view of interactive lecture room

_Ventilation

The room will be ventilated mechanically with a Rooftop Package Unit that will diffuse cold clean air to the back of the room and take the return air from behind the speaker. This will enable cold air to run over and past the audience to the front of the room behind the speaker where the now hot air will rise to the ceiling. The hot air will be returned to the unit on the outside of the room, thus creating a U-shape air flow from the back to the front. The unit will be placed to the new concrete slab on the outside of the building. The unit will be visually hidden with metal cladding fixed to the structural rectangular tubing to add sufficient access for maintenance. The flexible piping that will be used to supply cold air to the room will be specific insulated piping to ensure that the noise level be kept to a minimum level. Sufficient ceiling space is kept for the piping to be installed above the ceiling panels and this increase the noise reduction of the air-conditioner.

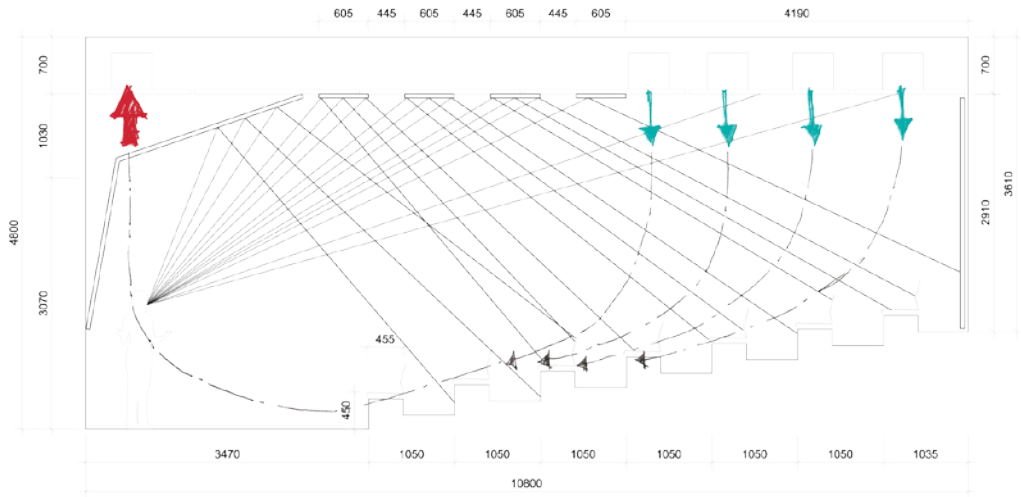


Fig 8.22 Illustration of air movement

Fig 8.23 Tapiflex Optic 4

In the main scheme of the project materials were chosen for their aesthetic qualities as well as for functionality in creating a new improved space with specific needs.

Tapiflex Optic 4, compact acoustic resilient flooring, is used for the floor covering.
This advanced material is used for heavy traffic commercial areas with an excellent balance between acoustic comfort (17db) and indentation resistance (0.10mm). The need for maintenance and cleaning is reduced due to the PUR-reinforced PVC wear layer that improves resistance to scuffing and abrasion.

Perforated Gypsumboard, Pregybel C10 n°8
The high performance system meets the needs of both noise reduction and aesthetic appearance in commercial buildings. The ceiling boards are very cost effective and ease of installation is achieved as results as to the protective glass mat which is glued to the back of the board and which prevents dust emission. The perforation rate is 13.4% with square blocks of 10 x 10mm square perforations, increasing the absorption of low frequency sound waves.

Fig 8.24 3Form Chroma

3Form Chroma, Cast Polymethyl Methacrylate (PMMA) Resin.
Colour: Smoke Grey
Texture: Renewable Matte
The material acts as the reflective panels in the room, placed in front of the Pregybel Gypsumboard on the wall and ceiling. With a durable finish and ease of installation the material enhances the qualities and aesthetic qualities of other materials used in the room. The panels are engineered to be re-coloured and resurfaced over and over, thus increasing their life span and keeping them from the waste cycle.

PFG Building Glass Smartglass, Insulvue.
Insulvue works on the principle of two panels of glass held apart by a metal spacer and bonded with a primary and secondary seal, trapping dehydrated air between the glass. Using triple glazing increases the sound absorption as well as the energy efficiency in the room.

Absorption Co-efficient

Room size: 10.87 x 7.025 x 4.1

Freuquency	Hz	250	500	1k	2k
Floor		0.04	0.05	0.05	0.07
Walls (Pregybel)		0.96	0.72	0.6	0.49
Walls (Chroma)		0.2	0.65	0.9	0.95
Ceiling (Pregybel)		0.96	0.72	0.6	0.49
Ceiling (Chroma)		0.2	0.65	0.9	0.95
Glazing		0.06	0.04	0.03	0.02
Seats Occupied 75% (per seat)		0.25	0.38	0.3	0.35
Air (per m³)		0.001	0.003	0.006	0.011
Absorptioin	m²	250	500	1k	2k
Floor	86	3.44	4.3	4.3	6.02
Walls (Pregybel)	83.4	80.064	60.048	50.04	40.866
Walls (Chroma)	9.2	1.84	5.98	8.28	8.74
Ceiling (Pregybel)	52.8	50.688	38.016	31.68	25.872
Ceiling (Chroma)	15.2	3.04	9.88	13.68	14.44
Glazing	10	0.6	0.4	0.3	0.2
Seats Occupied (people)	66	16.5	25.08	19.8	23.1
Air (per m³)	313	0.313	0.939	1.878	3.443
Total Absorption in Room (A)			144.643		
Room Total Surface (S)		256.6			
Average absorption co-efficient (a)		0.56			
Reverberation Time (T60)		**0.4**			

Calculatioin: $a = \frac{A}{S}$

$T60 = \frac{0.161\ V}{A}$

Fig 8.25 Table for calculation of reverberation time

CONCLUSION

The Information Hub introduced a space that has the potential to integrate fragmented entities and through design reveal the qualities of transparency. This creates adequate opportunity to break physical and hypothetical boundaries in information media. The information brought together through design enables the user to visit one centre and experience a vast array of information. The design reveals the 'betweeness' of space and how this aspect can be adapted and transformed to translate information more efficient.

The investigation of the line between Interior Architecture and Architecture concludes that 'betweeness' exist and with sufficient design, will result in a centre that promotes the ease of access and the transparency to information shared between inside and outside. The design delivers a space that relates to activities both inside and outside. It aims to achieve transparency through space, organisation and depth which is provided with a structural skin that attempts to define 'betweeness' in a physical space. The Information Hub succeeded in the design of 'betweeness' which resulted in accessible information.

The investigation demonstrates the significance of considering the context in which a design project is based. The Information Hub, in this way, contributes to the distribution and communication of information thus enables the University of Pretoria to distribute adequate information to potential students. The need for South Africa in a broader scale to effectively distribute and communicate information was met by the Information Hub.

References

About Sci Bono. [Sa]. [O]. Available:
http://www.sci-bono.co.za/index.
php?option=com_content&task=view&id=
29&Itemid=40
Accessed 20.02.2008

Attendance Profile. [Sa]. [O]. Available:
http://www.designindabaexpo.com/
default.asp?cID=1&sID=18
Accessed 10.03.2008

BULLIVANT, L. 2006. *Responsive Environments:* Architecture, Art and Design. London: V&A Publications.

BRAND, S. 1994. *How Buildings Learn:* What happens after they're built. Vicking Press.

CAAN, S. 2007. Consensus or Confusion. In *Thinking inside the box: a reader in interior for the 21st century.* Edited by F. Hay, E.D. Hollis, A. Milton, D. Plunkett, A. Milligan and S. Gigli. p. 49-55

Dr. FREYSEN, J, Head of Education Technology, University of Pretoria. 2008. Interview by author. 10 September. I.T. Building 3-58. University of Pretoria

Exhibitor Manual. [Sa]. [O]. Available:
http://www.designindabaexpo.com/
default.asp?cID=5&sID=95
Accessed 10.03.2008

GUREL, M.O. & POTTHOFF, J.K. 2006. Interior Design in Architectural Education. *International Journal of Art & Design Education. 2006,* vol. 25.2, p217 – 228.

HAY, F. 2007. Interior Architecture. In *Thinking inside the box: a reader in interior for the 21st century.* Edited by F. Hay, E.D. Hollis, A. Milton, D. Plunkett, A. Milligan and S. Gigli. p. 33 -42

HORAK, R, Curator of Sci Enza, Department Natural & Agricultural Science. 2008. Interview by author. 2 June. University of Pretoria.

HORAN, T.A. 2000. *Digital Places:* Building Our City of Bits. Union Land Institute; Washington DC. p. 29-31

Human Resource Development Strategy. [Sa]. [O]. Available:
http://www.labour.gov.za/documents/useful-documents/skills-development/human-resource-development-strategy/?searchterm=human%20resource
Last modified 23.10.2007 at 11:55
Accessed 08.03.2008

Ideas: Design Indaba10. 2007. *Design Indaba:* Fanfest 2010 A Design Indaba Project. 2: 12-19.

JOUBERT, J.P. Mechanical Engineer. 2008. Interview by author. 18 August. University of Pretoria.

KARA, H. & SCOTT, P. *The Structural Engineer:* Design and Construction of the Phaeno Science Centre, Wolfsburg, Germany. p. 33-38.

KRUGEL, A, Client Service Department, Senior Student Advisor (Junior Tukkie co-ordinator). 2008. Interview by author. 19 February. University of Pretoria.

KöNIGK, R. 2007. *Photos taken on personal visit to Phaeno Science Centre*. [CD-ROM].

MASEVHE, L, Education Officer, Johannesburg Observatory. 2008. Interview by author. 26 February. Johannesburg.

McCARTHY, C. 2005. Toward a Definition of Interiority. *Space and Culture,* May 2005, vol.8 no.2, p112-125. Available:
Internet: http://sac.sagepub.com/cgi/reprint/8/2/112
Accessed 20.02.2008

McCORMACK, F.P, CAGAN, J. & VOGEL, C.M. 2003. Speaking the Buick Language: capturing, understanding and exploring brand identity with shape grammars. *Design Studies,* January 2004, vol 25. no1, p. 1-29.

McCOY, K. 1990. Professional Design Education: An Opinion and a Proposal. *Educating the Designer,* Autumn 1990, vol.7 no.1, p. 20-22. Available:
Internet: http://links.jstor.org/sici?sici=0747-360%28199023%297%2A1%3C20%3APDEOA% 3E2.0.CO% B2-0
Accessed Feb 2008

PANDOR, N. FNB Conference Centre. 22 Feb 2008. Proceedings. Johannesburg: Sandton, Bank Seta Graduation Ceremony by Minister of Education.

Phaeno Fact and Figures. [Sa]. [O] Available: http://www.phaeno.com/ Accessed 06.03.2008

PEARSON, C.A. 2006. *Architectural Record:* Zaha Hadid's Phaeno Centre in Wolfsburg, Germany. Vol.194, Issue 2, p. 70-81.

Previous Expos. [Sa]. [O]. Available: http://www.designindabaexpo.com/default.asp?cID=1&sID=14 Accessed 10.03.2008

RIEWOLDT, O. 1997. *Intelligent Spaces:* Architecture for the Information Age. Calmann & King; London. p. 7-11

SENEGALE, M. 2005. *Kinetic, responsive and adaptive:* A complex-adaptive approach to smart architecture. Proceedings of the SIGRADE 2005 International Conference, Lima: Peru. p.1-11

SCHUMACHER, P. 2002. The Autopoeisis of Architecture. In *Latent Utopia:* Experiments within Contemporary Architecture. Wien: New York. Available http://www.patrickschumacher.com/Autopoiesis.htm Accessed 19.03.2008

Science Awareness Platform, Johannesburg Observatory. [Sa]. [O]. Available: http://www.saasta.ac.za/scienceawareness/observatory.shtml Accessed 10.03.2008

SMITH, C. 2004. Inside-Out: Speculating on the interior. *Interior Architecture Educator Association.* Queensland University of Technology: Australia. p.93-102. Available: Internet: http://www.idea-edu.com/Journal/2004/inside-out-speculating-on-the-interior Accessed April 2008

South Africa. Department of Education. 2003. Higher Education Amendment Act, No. 38 of 2003. Available: http://www.education.gov.za/dynamic/dynamic.aspx?pageid=329&catid=12&category=Acts&legtype=1 Accessed 08.03.2008

The Strategic Plan of the University of Pretoria. [Sa]. [O]. Available:
http://web.up.ac.za/default.asp?ipkCategoryID=2995
Accessed 06.03.2008

Why is the expo unique. [Sa]. [O]. Available:
http://www.designindabaexpo.com/default.asp?cID=1
Accessed 10.03.2008

250 Experimental Stations and a diversity of programmes. [Sa]. [O]. Available:
http://www.phaeno.com/experimental.html
Accessed 06.03.2008