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In Defence of Idiosyncratic Learning Experiences

Designing a Tertiary Ideation Institution that responds to the idisyncratic learning space needs and preferences of a variety of individual students

By: Carla Rademan

Declaration

Accordance with Regulation 4(c) of the General Regulations (G.57) for dissertations and theses, I declare that this dissertation, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

I further state that no part of my dissertation has already been, or is currently being, submitted for any such degree, diploma or other qualification.

I further declare that this dissertation is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

Student name and signature

In Defence of Idiosyncratic Learning Experiences

PROJECT SUMMARY

AUTHOR:
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STUDY LEADER:
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COURSE COORDINATORS:
Prof Arthur Barker

RESEARCH FIELD:
Inhabitation of Place -
Identity and meaning-making through space

CLIENTS:
The Makers Valley Collective
The Multiversity Initiative
(Spearheaded by Curro)
Private Individuals or a collective

PROGRAMME:
Alternative Tertiary Learning Institution for Design
Related Fields

STUDY AREA:
Bertrams, Johannesburg

PROJECT SITE:
54- 76 Sydney Rd, Bertrams
Johannesburg

SITE DESCRIPTION:
A currently open portion of land where residential
units had stood before being demolished.

COORDINATES:
-26° 11' 28.733'' S
(-26.191314645581702)
28° 4' 27.386'' E
(28.074274063110355)

ABSTRACT

Individuals are inherently different and so are their spatial needs related to learning. Unfortunately the current dominant learning space typology disregards this, opting for 'one size fits all' learning spaces that actually don't fit anyone while still expecting all students to perform to the best of their abilities.

This project thus investigates alternatives to the current dominant learning space typology in order to identify and develop an alternative that is more appropriate for the times in which we live as well as the diverse variety of students that are being accommodated in contemporary tertiary learning institutions. This is especially pertinent in 2021, since COVID-19 has caused educational spaces to be reconsidered in ways and to an extent that is unprecedented in recent decades, giving alternative approaches a valuable opportunity to enter into the general discussion.

Subsequently this project proposes a tertiary learning institution that enables idiosyncratic learning experiences by placing specific emphasis on creating spaces that celebrate individualism and equity by enabling students to learn in spaces that cater to their individual spatial needs and preferences.

Because every student deserves to learn in a space that complements and promotes their ideal learning experience.

KEY WORDS:
Learning Spaces, Educational Typology, Idiosyncrasy, Individual Spatial Needs, Alternative Learning Paradigm, [Sub]urban Adaptation, Biophilia
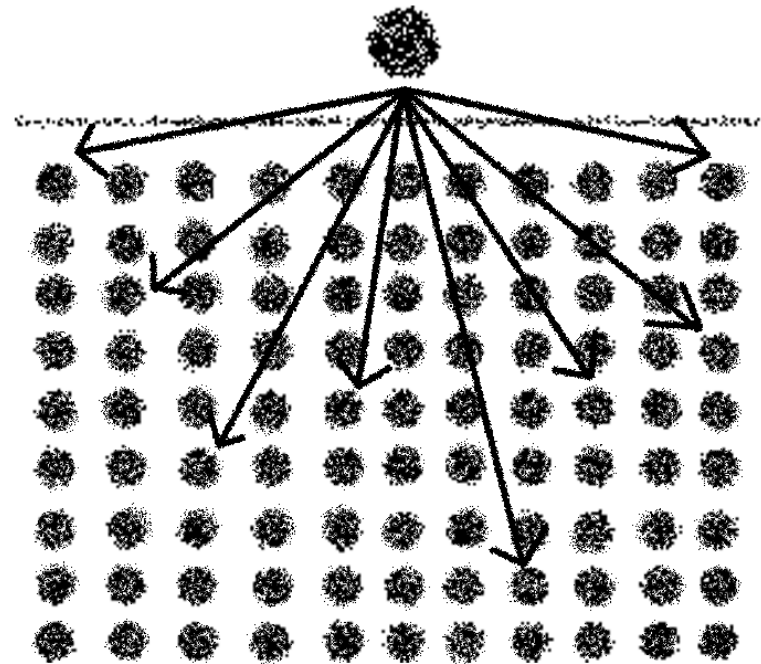
LINK FOR ANIMATIONS AND FULL SIZE DOCUMENTATION:
https://carlarademan1.wixsite.com/carla-rademan

Table of Content cont.

Chapter 1
The Problem with and the legacy of the Factory School model

our educational spaces look and function like this...
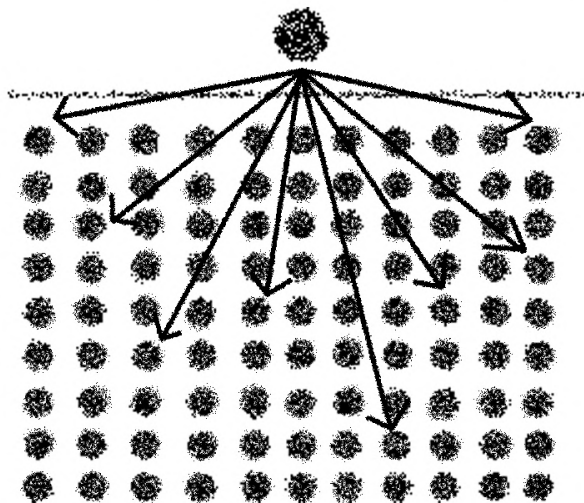
When Learning happens Like this
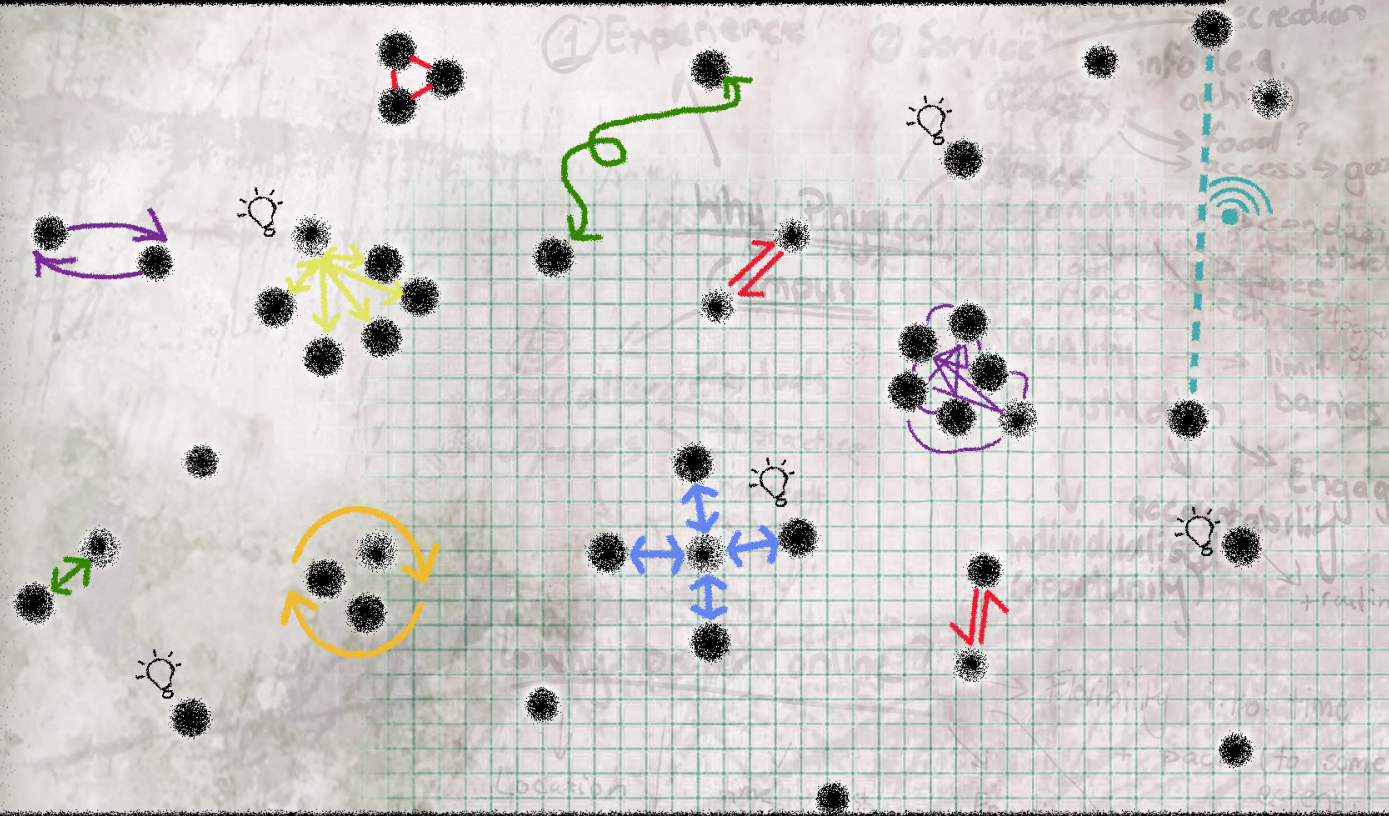
Figure 1: Representation of the Factory School Model as opposed to how learning occurs

Individuals are inherently different and so are their spatial needs related to learning, unfortunately the current dominant learning space typology disregards this, opting for 'one size fits all' learning spaces that actually don't fit anyone while expecting students to perform to the best of their abilities.

This project thus investigates alternative ways in which higher learning spaces can be designed to more appropriately cater to a variety of students' individual spatial needs or preferences and the ways learning occurs in a contemporary South African context.

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Architectural focus

Individual orientated learning spaces for ideation students

← Role of a campus →

Urban focus

Positioned within a (sub)urban context in JHB

← Role of a city →

Ecological focus

Constrained by critical environmental and climatic considerations

The Instructivist learning paradigm and its 'one-size-fits-all' approach is the most dominant learning space typology globally, yet it isn't appropriate for the ways in which we learn, nor does it accommodate the variety of spatial preferences and needs one invariably finds in a healthy, diverse student body. Thus many students find themselves learning in spaces that are far from ideal for their unique spatial preferences, needs, discipline and way of learning.

How can this typology change to be more appropriate and appropriateable?

(Sub)urban areas are an integral part of our cities and will become even more so as Johannesburg's 2040 compact polycentric urban development framework is implemented. Thus we should not summarily condemn (sub)urban areas to be forgotten, ignored or replaced, but they should strategically be adapted to become valuable constituents in the city without changing the inherent character that lends them resilience and relevance.

How can a campus catalyse (sub)urban adaptation and development?

Our world is in crisis and it is no longer optional to take the environment into consideration. Thus it is an ethical imperative for resource efficiency, passive design and biophilic design principles to be integrated into every design in order to not only decrease society's climate vulnerability but also reinforce humans' innate connection with our environments

How can environmentalism be integrated into a building for tertiary learning?

What:
To investigate this question this project proposes a tertiary ideation institution with ideation being used as a blanket term to cover a variety of design related fields to be accommodated in a de-siloed way within this educational precinct.

Where:
The project is located in Bertrams, Johannesburg, a dynamic suburb located just east of the CBD.

Who:
The Makers Valley Collective along with other private investors form the client base as well as the primary stakeholders for the project.

Learning Paradigms

Instructavist Approach
Transition of new knowledge from a source (lecturer) to a student

Socratic Approach
Questioning knowledge through conversation

Dominant learning space typologies in use

1st ≈1780s -

2nd Industrial Revolution ≈1870s - 1960s

(Ancient) Grecian Model

Factory School Model

Formalised [tertiary] Education in SA becomes more common

BSc · BCom · BA

Birth of universities

Medieval/Monastic Model

& Apprenticeship One-Room Model

(Herie 2013)
(Oblinger 2006)
(OED 2021)

Figure 2.1: Timeline Illustrating the history of educational space typology (part 1)

'One size fits all' learning spaces

Learning is one of the most intrinsically personal and valuable experiences a person can engage with, but if the space within which learning occurs does not accommodate an individual's spatial needs and preferences it severely limits the richness of the learning experience. This is exactly what the current predominant typology for higher learning spaces is guilty of (Conti & McNeil 2011) as the individual spatial preferences of students are not taken into consideration to the extent that they could and should be when learning spaces are designed (Hunley & Schaller 2009). This unfortunately results in many students finding themselves in spaces that are far from ideally suited to them as individuals and learners.

Alternatively phrased:
If every student is inherently different and has different spatial needs and preferences, why are all students of a given class, year or field placed in the exact same situation/environment,
  with the exact same surroundings,
    being taught in the exact same way,
      as if they have the same pre-existing frame of reference
on an assumption that they have the same interests and abilities.

The Origin of the problem

To understand this phenomenon, we first need to turn our attention to the origin of the problem, namely the proliferation of Instructivist Learning Paradigm and the Factory School Model that it has become synonymous with. This model (hereafter referred to as FSM) emerged in the late 1800s and early 1900s after a surge in industrialisation resulted in an massive increase of white collar workers needing to be trained (Vadeboncoeur & Padilla-Petry 2017:2). Concurrently, a mentality that prioritised efficiency, rationality and industriousness was becoming increasingly common and thus permeated the rationale that underpinned the FSM. Subsequently the primary aim of the FSM was to transfer information from a source (lecturer) to a recipient (student) as efficiently, economically and easily as possible (Novoa 2015:159) regardless of the potential expense to higher-order skills (Ellis & Goodyear 2016) and the experiences individual students.

To this day, this model remains the most widely used learning model in the world, with its fundamental tenets permeating the designs of many learning spaces from lecture halls to studio spaces (Cain, et al. 2016). This model has however experienced little more than cosmetic spatial evolution over the last 100 years, with even

the 4th industrial revolution (IR) failing to make the model itself healthier for learners, even though it has enriched the learning experience in a myriad of other ways.

It should be noted that there was a number of alternatives that were investigated during the 1960s - 1970s (e.g. the Open Classroom and Learning Communities) but none managed to break the proverbial glass ceiling and become actual opposition to the FSM. This is arguably because they failed to address the fundamental issues of the FSM (Fisher 2005) and instead focused on secondary problems such as increasing the visual connection with nature (which is not to say it isn't a valid improvement) while still using the basic FSM layout, thus limiting its potential impact and relevance.

This however begs the question:
If the FSM is so enduring, is it really that problematic and does it really need to be challenged?

In response the following three fundamental reasons are provided for why the FSM is problematic and in urgent need of an overhaul.

Instructavist Approach
Transition of new knowledge from a source (lecturer) to a student

Constructavist Approach
Construction of new knowledge by student

Critical Approach
Contextual knowledge interrogation by student

3rd Industrial Revolution
≈1960s - 2000s

4th Industrial Revolution
≈2000 - ongoing

Reactions against the FSM

Open Air Model

Open Classroom Model

Learning Community Model

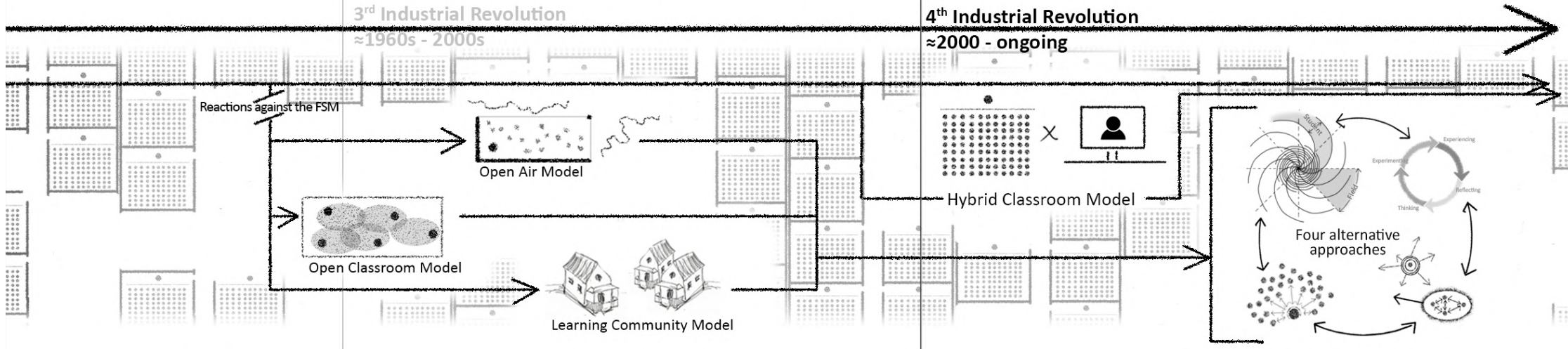Hybrid Classroom Model

Four alternative approaches

Figure 2.2: Timeline Illustrating the history of educational space typology (part 2)

1

Systematic homogenisation of learners

Homogenisation of learners here refers to the process of systematically disregarding students' individual preference and characteristics as a way to make them easier to process into the desired 'product' (graduate) as one would have done with any other raw material.
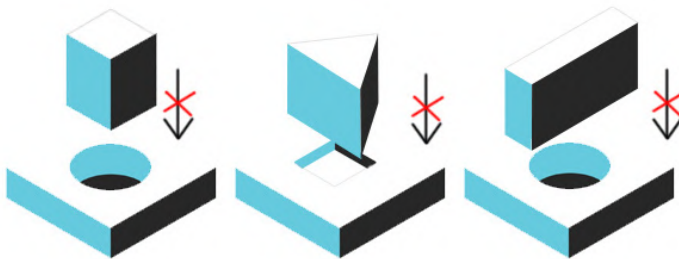

Figure 3: Illustration of the homogenisation of learners

Unfortunately, the design of learning spaces is very much complicit in this homogenisation, and has become somewhat infamous for actively facilitating or even enforcing 'correct', 'desirable' or even just 'expected' learning behaviour, regardless of how it might affect individual students.

Desirable traits and behaviours include factors such as sociability, agreeableness, humility and compliance while undesirable ones included reservation, analytical, autonomy and persistence. Upon closer consideration of learning environments, it isn't difficult to see how the former is encouraged while the latter is discouraged through the physical characteristics of learning spaces, even in contemporary educational building. Some examples of these characteristics include the 'sage on a stage' layout that can be seen in the vast majority of lecture halls, double loaded corridors, literal (spatial) and metaphorical (academic) silos between departments and even the type of layout, such as open plan study spaces that promote collaborative learning (sociability) while giving comparatively little credence to solitary processes (autonomy) (Carbone 2019).

Today it is generally accepted (Novikova 2013) that students being equal is not the same as students being the same and that there is no such construct as an undesirable personality trait, as all traits are necessary to form balanced communities. This is especially true in learning communities where differences should be celebrated and utilised to further enrich the learning experience. This way

of thinking is also found in emerging teaching approaches (Fisher 2005) which postulates that different students learn and produce work differently and that pedagogy, and by extension the spaces in which learning happens, should acknowledge and celebrate this (Marcela 2015).
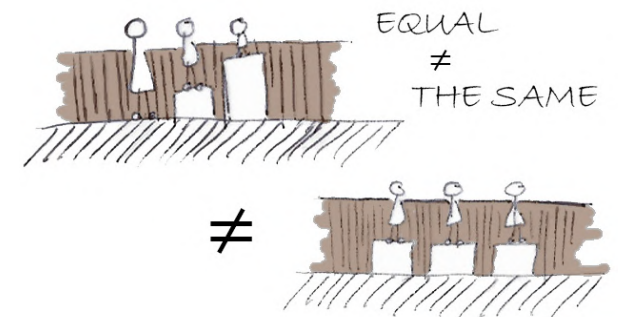

EQUAL
≠
THE SAME

≠

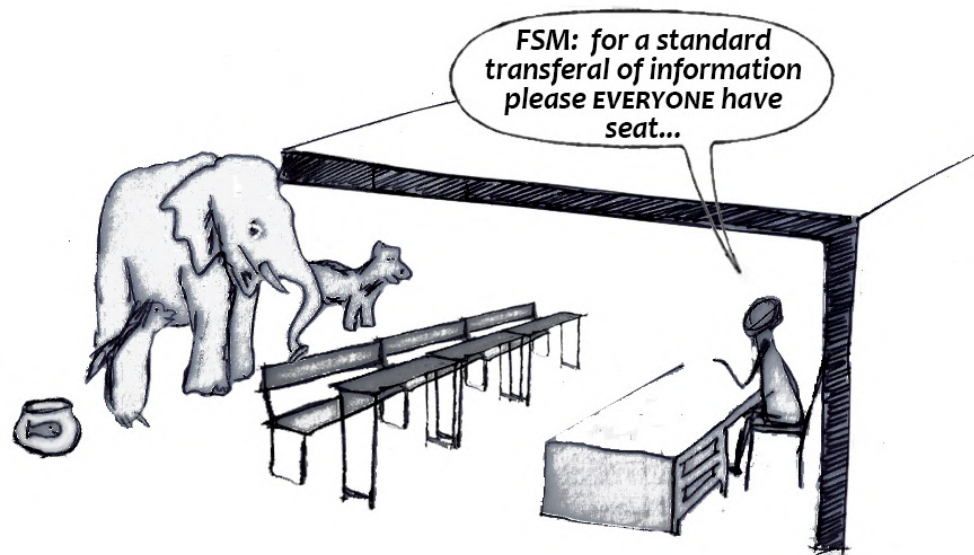Figure 4: Equal ≠ the same

Figure 5: FSM illustration

be part of a conveyor belt, in a system where critical thought was not required and where the social hierarchy inferred by the FSM was often needed for optimal efficiency. Thus the FSM, while being inhumane for the reasons discussed above, at least had a reason for looking and working the way it did.

But our world does not work like that anymore and we are no longer training people to simply be cogs in a bigger machine. Especially in the midst of the 4th IR, it has become imperative for students to be able to engage in critical, autonomous thought, while possessing a general resilience and adaptability in the ever changing context of the 21st century.

Unfortunately, neither of these characteristics are cultivated by the FSM and it is thus increasingly being considered as ill-equipped to deal with evolving demands on learning spaces. This is largely due to the standardisation already discussed (resilience in part relies of diversity and homogenisation roots out diversity) along with the FSM's tendency for propagating and even glorifying lower order thinking skills (especially rote learning etc.) that is no longer sufficient in preparing students for their professional lives.

Confucius postulated:
"Tell me and I will forget; teach me and I may remember, involve me and I will learn".

But in the contemporary learning context it is necessary to add: Give me tools and I will act.

Technology, tools and industries are constantly changing and the spaces within which learning takes place ought to assist in increasing the adaptive capacity of students.
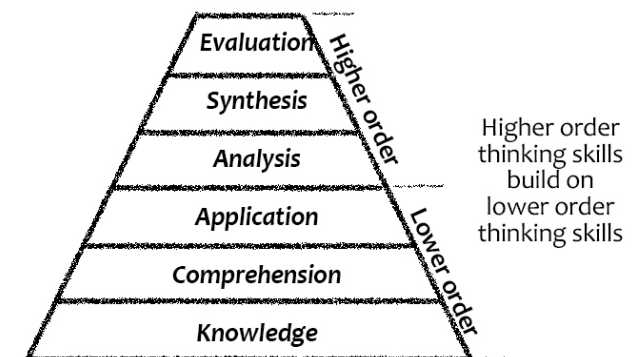
2
We experience spaces differently

It is well documented that the physical spaces within which we learn have a major impact on the process of learning itself (Ellis & Goodyear 2016), with existing studies focussing on a range of variables from the impact of lighting or volume to the different ways a learning space might be configured. Underlying to many of these studies however, is an Instructivist assumption that there are learning space characteristics that are universally ideal (Fisher 2005).

There is, however, a more contemporary and growing body of research arguing that different people experience, use and respond to spaces differently (Munro & Sugden 2003), meaning that a learning space will not evoke the same reactions in all students and thus will not be equally conducive for all who use it. Proulx (2016), for example, concluded that the degree to which our brains use sensory heuristics (mental short cuts used to process the millions of stimuli we receive every second), can differ greatly from person to person. This means that the exact same space can be overstimulating (too bright, too noisy, too much movement etc.) for one individual, while being rather boring for another. This is but one study putting forth a possible reason for differences in preference, but their logic is echoed by many other studies which have also concluded that there is no universal ideal learning space.

This in conjunction with the FSM (where all student are placed in the same spaces) means that many students will consistently find themselves in learning spaces that are not ideally suited to them as individuals.

As a result there is a growing emphasis on idiosyncrasy within the discourse around how individual spatial preferences should be accommodated in learning (Conti & McNeil 2011). How this is to be physically actioned in learning spaces is, however, still very much in flux and this is specifically the part of the conversation that this project is intended to participate in since all students deserve to learn in a space that enables them to learn to the best of their abilities.

3
The FSM has not changed in over 100 years

Regardless of one's opinion on increasing idiosyncrasy in learning spaces, the fact that the FSM has not changed in over a century is troubling.

It should be noted that within the context of 2nd IR at the end of the 19th century, the use of the FSM made sense. Even homogenisation was understandable to an extent (if not agreeable even then). Ultimately, people were often literally being trained to

Higher order thinking skills build on lower order thinking skills
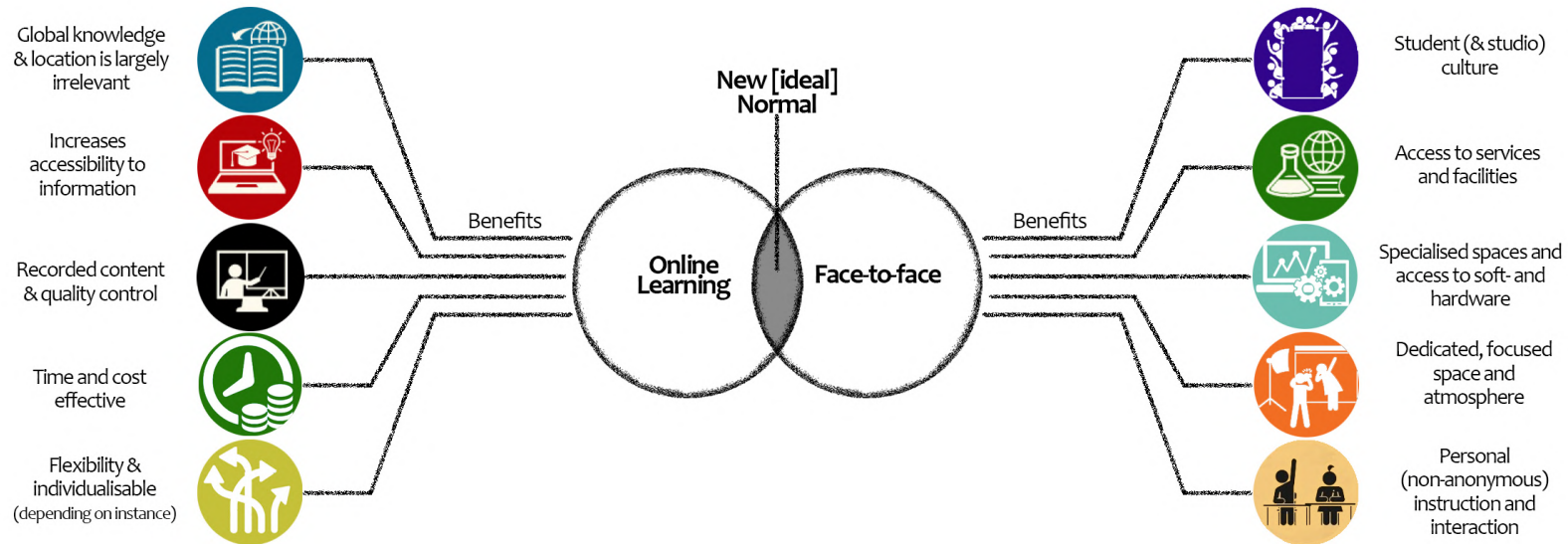
Figure 6: Learning order hierarchy

Figure 7: Benefits of Online Learning versus face-to-face learning

Changing the game via a global pandemic

Despite the problems highlighted previously, the FSM has remained dominant for more than 100 years with alternatives struggling to break through the typological glass ceiling.

Yet in early 2020 the game changed when the COVID-19 pandemic suddenly and insistently forced a massive overhaul of not just the way we think about learning but also about what our expectations and needs are of the spaces within which learning occurs (Mhlanga & Moloi 2020). This opened the door for emerging learning space alternatives to competitively enter the arena since most tertiary learning institutions have had to largely abandon traditional teaching environments and find alternatives in order to make continued learning possible.

While some may still yearn to return to the pre-COVID-19 learning environments, the pandemic has had the serendipitous effect of disproving a number of assumptions that had maintained the FSM's dominance (specifically within the realm of tertiary education). Above all else it has proven than we no longer need a 'sage on a stage' as in the FSM, since we have the option of a 'sage on a screen'. As such the race is now on to determine what the "new normal" is going to be where learning spaces are concerned.

Why do we still need physical learning spaces though?

Core to most tertiary learning institution's strategies to cope with COVID-19, was a notable shift to online learning. This has in turn led many to understandably question whether we still need physical learning spaces at all and whether we should instead be aiming for a fully digital learning experience.

While online learning has a number of distinct benefits that makes it valuable in any future learning environment, there remains a number of disadvantages to a fully digital learning experience as well as many advantages to physical learning spaces that remain relevant and necessary.

In South Africa the most pressing of these remain the limited access to the services, hardware and software that are often required in order to study, even more so when studying online. In a country where access to even basic services (such as electricity) and fundamental learning hardware (such as a PC or laptop) is not guaranteed, a fully digital learning environment will have the unfortunate side effect of excluding many students who are not in a position to access these learning environments outside the walls of a physical learning institution. This in turn stands at odds with the ideal social mandate of tertiary learning institutions, which would include promoting diversity in a student body, while providing students who might have been excluded for socio-economic reasons, with the opportunity to study in their chosen field.

Many students, furthermore, do not have a physical space (at home or otherwise) that provide the privacy and/or other environmental conditions needed to effectively engage with online learning.

The last of these points in favour of physical learning spaces, pertains to the inherent enriching benefits of peer-to-peer engagement, which can simply not be matched by current digital platforms. While solitary learning is sorely under represented in the current model, interactions between peers, camaraderie and other social aspects of physical learning spaces are some of the most valuable learning opportunities that students experience and there is no way to adequately simulate these in a digital environment.

Subsequently one can conclude that while we might not need 'a sage on a stage' anymore, we still need spaces that facilitate learning, and in the "new normal" learning spaces might just have the opportunity to perform alternative functions from what was traditionally expected of them.
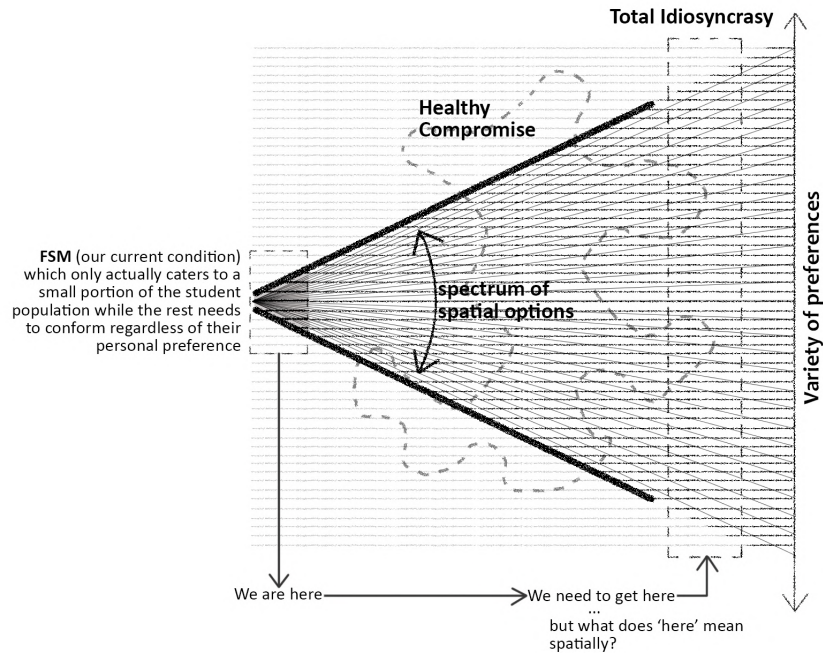
Graphic summary of problem:

Figure 8: Summary of problem
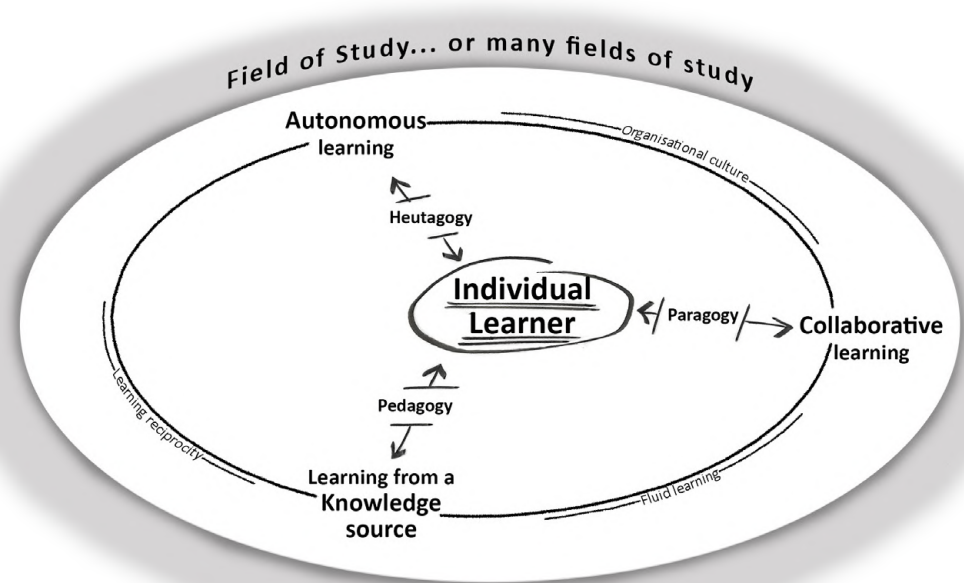
Graphic summary of hypothesis:

Figure 9: Hypothesis

In response to the specific problematic characteristics identified within the FSM as well as the evolving role of learning spaces as a result of COVID-19, this project speculates that a good learning space should first and foremost be informed by the individual students themselves, followed closely by the way in which learning occurs and thereafter be framed by the specific field of study that is to be accommodated. This hypothesis fundamentally stands at odds with the idea of 'one-size-fits-all' learning spaces and is what will be investigated for the remained of the document.

There are three underlying intentions being catered for through this hypothesis:

- To shift from a condition where the student is at the behest of the space to one where the space is at the behest of the student, in order to facilitate the development of learning spaces that are optimal for a larger portion of students
- Enabling universality through both variety (choosing what works for you) and flexibility (adapting and customising the option you have chosen until it works for you) .
- Allowing for personal preferences as a means of unlocking all that the learning experience can be, while remaining cognisant of the fact that total idiosyncrasy in tertiary learning institutions is simply not feasible, thus a healthy compromise is necessary and advantageous.

This lead to two specific lines of enquiry being identified:

1. What would spatial idiosyncrasy be through the eyes of students and what would it imply for physical learning spaces?
This will be investigated through participant based fieldwork

What are the appropriate approaches to learning that ought to be accommodated and what would they imply for learning spaces?
This will be investigated through a literature review and precedent studies
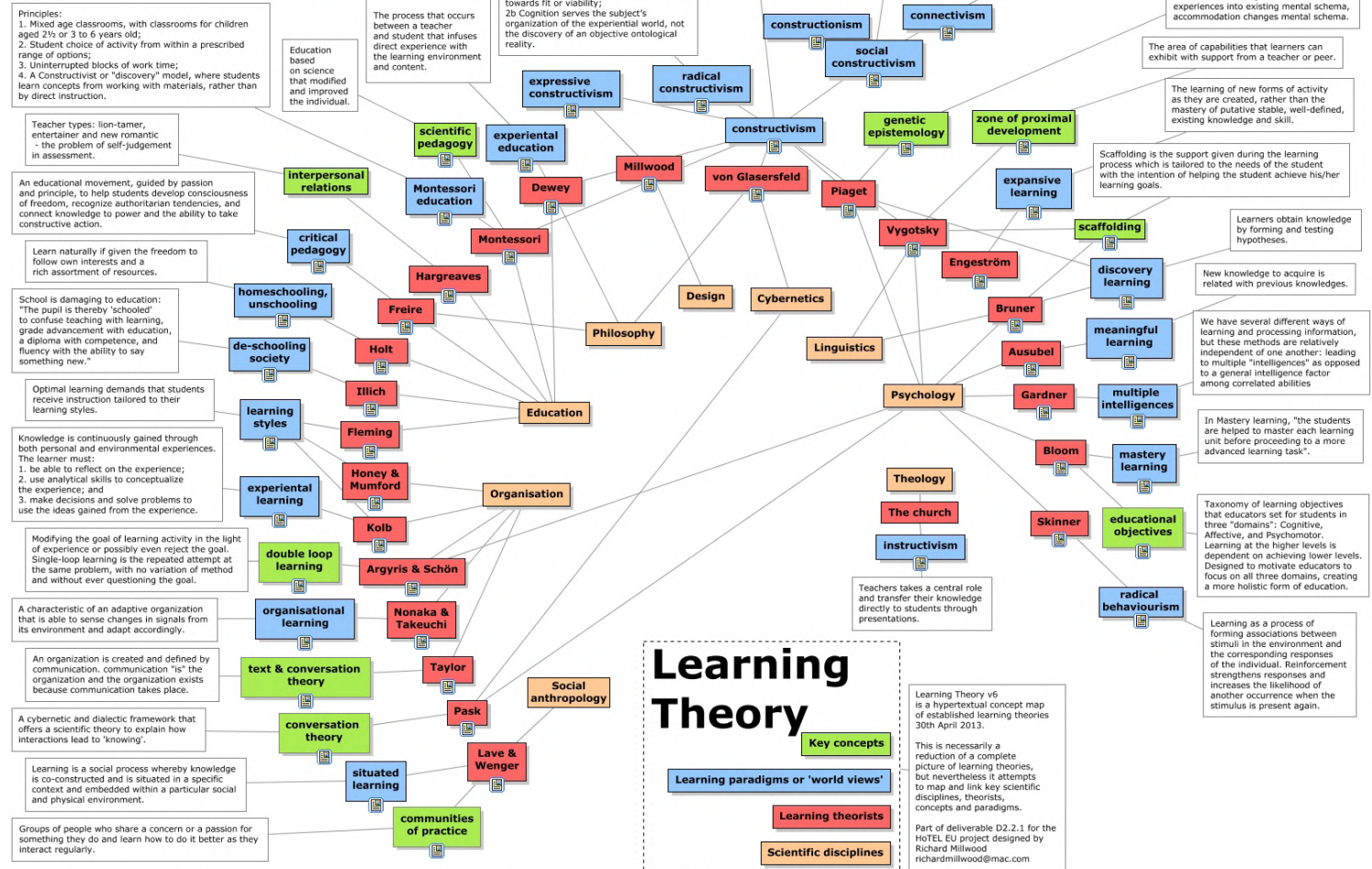
Chapter 2
Finding the right student-centered alternative

What are the appropriate approaches to learning that ought to be accommodated and what would they imply for learning spaces?

Over the last 20 years there has been a resurgence of interest in alternatives to the Instructivist learning largely brought on by the increasing availability of accurate, diverse and up-to date information as a result of the internet. This has lead to the development of a number of theories and approaches to learning and teaching that both converge and diverge in a myriad of ways.

A Map of Learning Theory Concepts, Theorists, Paradigms and Disciplines, by Robert Millwood

Knowledge as mental representation:
1a. Knowledge is not passively received either through the senses or by way of communication;
1b. Knowledge is actively built up by the cognising subject;
2a. The function of cognition is adaptive, in the biological sense of the term, tending towards fit or viability;
2b Cognition serves the subject's organization of the experiential world, not the discovery of an objective ontological reality.

The learner is not a passive recipient of knowledge but that knowledge is 'constructed' by the learner.

groups construct knowledge for one another, collaboratively creating a small culture of shared artifacts with shared meanings

knowledge is distributed across a network of connections to people and information - learning consists of the ability to construct and traverse those networks

A human being develops cognitively from birth throughout his or her life through four primary stages of development: sensorimotor (0-2), preoperational (2-7), concrete operational (7-11), and formal operational (11-). Assimilition is incorporation of new experiences into existing mental schema, accommodation changes mental schema.

The process that occurs between a teacher and student that infuses direct experience with the learning environment and content.

Education based on science that modified and improved the individual.

The area of capabilities that learners can exhibit with support from a teacher or peer.

The learning of new forms of activity as they are created, rather than the mastery of putative stable, well-defined, existing knowledge and skill.

Principles:
1. Mixed age classrooms, with classrooms for children aged 2½ or 3 to 6 years old;
2. Student choice of activity from within a prescribed range of options;
3. Uninterrupted blocks of work time;
4. A Constructivist or "discovery" model, where students learn concepts from working with materials, rather than by direct instruction.

Teacher types: lion-tamer, entertainer and new romantic - the problem of self-judgement in assessment.

Scaffolding is the support given during the learning process which is tailored to the needs of the student with the intention of helping the student achieve his/her learning goals.

An educational movement, guided by passion and principle, to help students develop consciousness of freedom, recognize authoritarian tendencies, and connect knowledge to power and the ability to take constructive action.

Learn naturally if given the freedom to follow own interests and a rich assortment of resources.

Learners obtain knowledge by forming and testing hypotheses.

New knowledge to acquire is related with previous knowledges.

School is damaging to education: "The pupil is thereby 'schooled' to confuse teaching with learning, grade advancement with education, a diploma with competence, and fluency with the ability to say something new."

We have several different ways of learning and processing information, but these methods are relatively independent of one another: leading to multiple "intelligences" as opposed to a general intelligence factor among correlated abilities

Optimal learning demands that students receive instruction tailored to their learning styles.

Knowledge is continuously gained through both personal and environmental experiences. The learner must:
1. be able to reflect on the experience;
2. use analytical skills to conceptualize the experience; and
3. make decisions and solve problems to use the ideas gained from the experience.

In Mastery learning, "the students are helped to master each learning unit before proceeding to a more advanced learning task".

Taxonomy of learning objectives that educators set for students in three "domains": Cognitive, Affective, and Psychomotor. Learning at the higher levels is dependent on achieving lower levels. Designed to motivate educators to focus on all three domains, creating a more holistic form of education.

Modifying the goal of learning activity in the light of experience or possibly even reject the goal. Single-loop learning is the repeated attempt at the same problem, with no variation of method and without ever questioning the goal.

A characteristic of an adaptive organization that is able to sense changes in signals from its environment and adapt accordingly.

An organization is created and defined by communication. communication "is" the organization and the organization exists because communication takes place.

A cybernetic and dialectic framework that offers a scientific theory to explain how interactions lead to 'knowing'.

Teachers takes a central role and transfer their knowledge directly to students through presentations.

Learning is a social process whereby knowledge is co-constructed and is situated in a specific context and embedded within a particular social and physical environment.

Learning as a process of forming associations between stimuli in the environment and the corresponding responses of the individual. Reinforcement strengthens responses and increases the likelihood of another occurrence when the stimulus is present again.

Groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.

Learning Theory

Learning Theory v6 is a hypertextual concept map of established learning theories 30th April 2013.

This is necessarily a reduction of a complete picture of learning theories, but nevertheless it attempts to map and link key scientific disciplines, theorists, concepts and paradigms.

Part of deliverable D2.2.1 for the HoTEL EU project designed by Richard Millwood richardmillwood@mac.com

Key concepts

Learning paradigms or 'world views'

Learning theorists

Scientific disciplines

Figure 10: Overview of contemporary alternative learning approaches and theories

Instructivist
Knowledge is installed as opposed to evoked

Constructivist Paradigm
Learning is a process rather than an event, in which learners construct (versus acquire) new knowledge and skills

Critical Pedagogy
learning is understood as context-dependent, and different ways of knowing are acknowledged and valued

Global Classroom
It is whatever you want it to be

Figure 11: Four overarching paradigms

Four contemporary approaches stand out however, as being both widely respected by both the academic and teaching communities while also specifically focussing on the potential ways in which learning can be an idiosyncratic experience for students.

Goethe Institute in Santiago, Chile (Temporary Premises) - FAR frohn&rojas

Both space and time is limited, so we need to be strategic with how we use both

The temporary (but not so temporary) premises was geared towards making the most of a small space while still delivering on all the services it needed to

Does a function need space? → *can it have a different space*

1 Space does many thing = functions need to happen in parallel

services → flexible

furniture → flexible

Figure 12: Methodological precedent - Goethe Institute in Santiago, Chile

This is a cyclical approach that relies on having students interact with new content (specifically facts or other rote information) on their own prior to engaging about it collectively either through discussion or experimentation, before once again providing the student with the opportunity to internalise what has been learnt on their own (Letrán 2020).

Core to this is **strategic hybridity**, meaning this approach utilises the strengths inherent to online learning (self-pacing, recorded content, flexibility, remoteness etc.) while utilising face-to-face learning when it can really make a difference (active participation and discussions) (Kolb & Kolb 2006:47-48).

What gives this model resilience is that it does not dismiss or devalue lower order skills, but rather argues that face-to-face time will just yield greater rewards if it is spent engaging with the topic through critical discussion or even physically testing the concepts being investigated. This is the opposite of the traditional classroom where the contact time is spent conveying information (i.e. the 'sage on a stage') and students are expected to engage critically on their own afterwards. It also implies that students can and should take responsibility of managing various aspects of their own education such as managing their time and their inputs as a means of increasing accountability and agency.
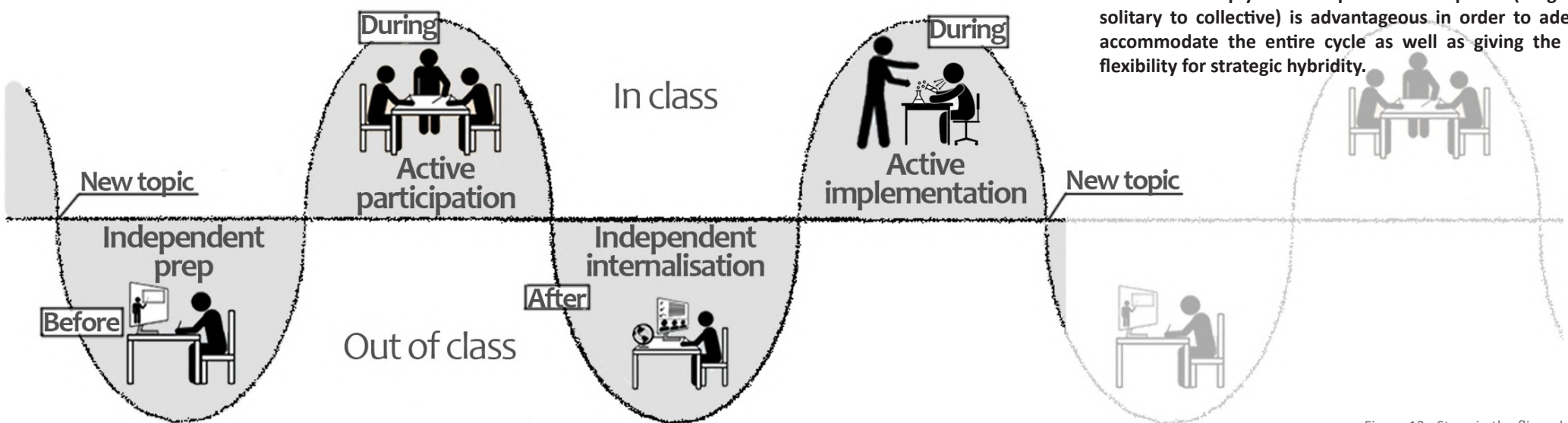
This would imply that a spectrum of spaces (ranging from solitary to collective) is advantageous in order to adequately accommodate the entire cycle as well as giving the needed flexibility for strategic hybridity.

In class

During — Active participation

During — Active implementation

New topic

New topic

Independent prep

Before

Out of class

Independent internalisation

After

Figure 13: Steps in the flipped classroom
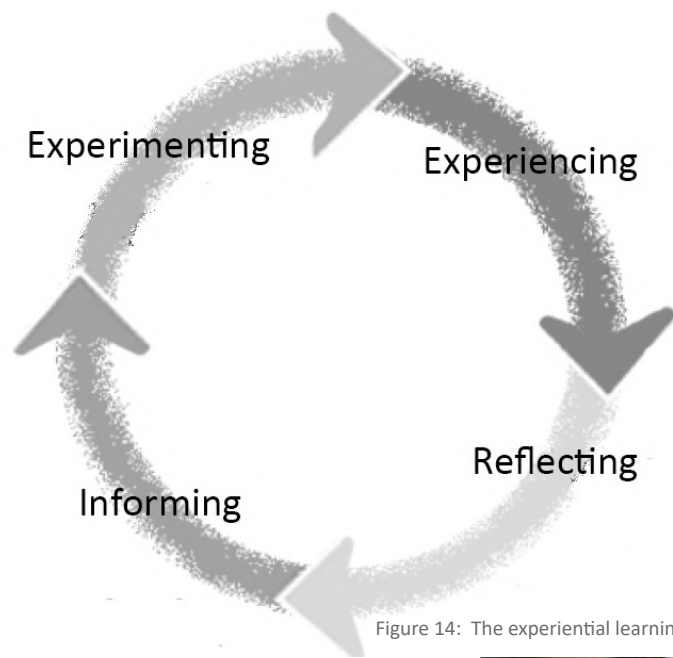
Figure 14: The experiential learning cycle

This approach finds its roots in Experiential Psychology which postulates that we retain knowledge better when it is bound in experiential memories, which in turn is predominantly created when we actively participate in activities (Ellis & Goodyear 2016) before critically reflecting on those activities. The latter being the primary difference between this approach and the hands-on-learning approach, since critical reflection implies consciously questioning the activity, why and how you did it, thus increasing the likelihood of the knowledge being retained. Subsequently this approach places notable emphasis on learning from one's own personal experiences, industry simulations and other 'real world' tasks in conjunction with critical reflection.

A distinct benefit of this approach, is that students are far more likely to be industry ready (or as close as one can be after tertiary learning) as they have developed a layering of physical and mental skills over a longer period of time.

This approach is once again cyclical, suggesting that each student should be able to oscillate between thinking, doing and reflecting as they require. This approach also highlights the value of having makers' spaces and other areas where students can physically be hands-on and actively learning.

TU Delft - Faculteit Bouwkunde
You do not know what you do not know and the only way to know is to experiment

Within the design fields as taught at TU Delft there is a follow through from thinking to testing and implementing.

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Figure 15: Methodological precedent - TU Delft

The Student-Determined approach
Paragogy (peer-to-peer) & Heutagogy (self-determine)

This approach is based on the tenants of two learning models that both place specific emphasis on giving full control of the learning process to the student, namely paragogy (peer-to-peer) or heutagogy (self-determined).   This model is characterised as being decentralised, non-linear and highly individualisable since every student will go about their education in a slightly different way.

At its core this approach celebrates the fact that learning is completely volitional, meaning that while an instructor can control what is being taught the student is in control of what is being learnt (Herie 2013). Subsequently this approach argues that students are ideally suited to determine how their own learning should proceed since they know where they come from and what their destination is while the instructor is ideally suited to guide the process as students don't know what they don't know.

This model also takes full advantage of the dynamic nature of peer networks in order to enrich both the learning experience and potential feedback.

Subsequently one might argue that in order to fully accommodate this approach, the students themselves should be able to determine what an ideal space would be for their learning and thus they should be able to change spaces as they deem necessary in order to suit their process. This implies that spaces need to be adaptable and dynamic in nature while also being able to accommodate a wide range of possible applications and occupations.

Figure 16: Student directed learning

Figure 17: Methodological precedent - Ruin Academy

Taitung Ruin Academy - Marco Casagrande
Workshop, Research Center and Living Laboratory

A flexible space that inhabitants (students) can use as they see fit to investigate the third generation city

Additional considerations:
1. Students' mental wellbeing is actively catered for while giving them extensive freedom to utilise spaces and plan their own activities as they see fit.
2. There is a mediation between what the plants need to be happy and how they contribute to the user experience.
3. The project considers how industrial buildings can be adapted when they are no longer used for their intended purpose, which is highly relevant in Bertrams.

Abandoned Centre
Disciplinary Curriculum

Soft Centre
Multidisciplinary Curriculum

Hard Centre
Traditional Core Curriculum

Universals

Student

Field

Liquid core approach
De-siloed learning

Figure 18: Fundamental curriculum structures

The last approach finds its origin in a curriculum structure rather than an approach to learning and it proposes three things:

1

There are core fundamental skills and knowledge that transcend any specific field of study and all students stand to benefit from having this shared foundation before branching off and specialising. (This is especially true in design related disciplines as will become more relevant in latter parts of the project).

2

Working in silos is counterproductive as work becomes increasingly self-referential, whereas there is a wealth of untapped opportunities in actively pursuing cross-pollination and continuing to do so even after the initial foundation course.

3

After the initial foundation course, a student should be in full control of their learning going forward in order to make the eventual options and opportunities as open ended as possible. Because they have the shared foundation however, a student can combine different fields, use knowledge from one field in another, engage in discussion with students from other fields and in general straddle industry lines that would have otherwise divided the students. (Novoa 2015)

These principles support the idea of having no spatial differentiation between fields or even years of study, meaning that it would be perfectly possible for two students from completely different disciplines and even from different years to land next to each other and cross-pollinate their ideas and perspectives, thus enriching the learning experience tremendously.

organised chaos

Institutional Str
anti-silos
no hierarchy
social

Figure 19: Methodological precedent - Quest University

Quest University - David Helvand
A university as a place where you get an education not a degree

Quest is an experimental university founded on the question of what would happen if you put two people from two different fields together and let them interact.

Curriculum
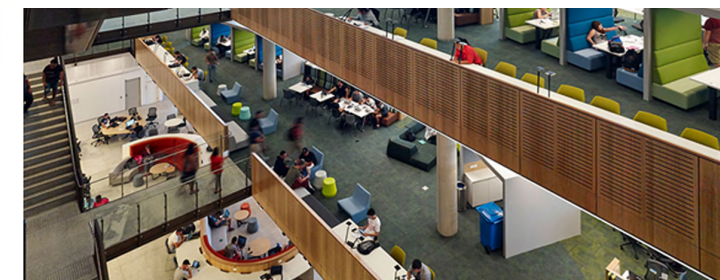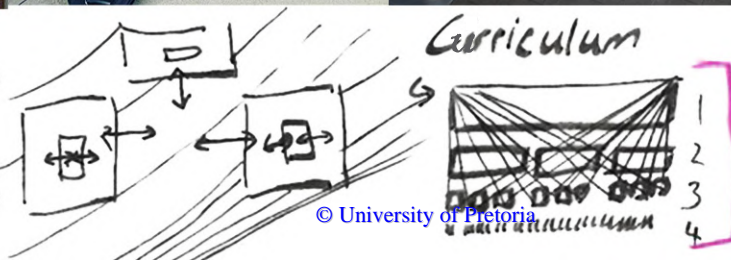
The Flipped Classroom Approach
Blended learning

With lecturer

Informal with peers

Structured

Individual

Collective

Formal with peers

Relaxed
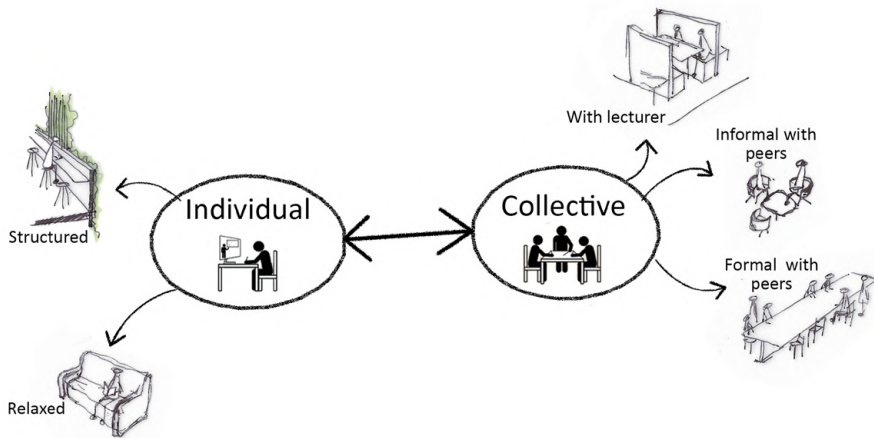
The Student-Determined approach
Paragogy (peer-to-peer) & Heutagogy (self-determine)
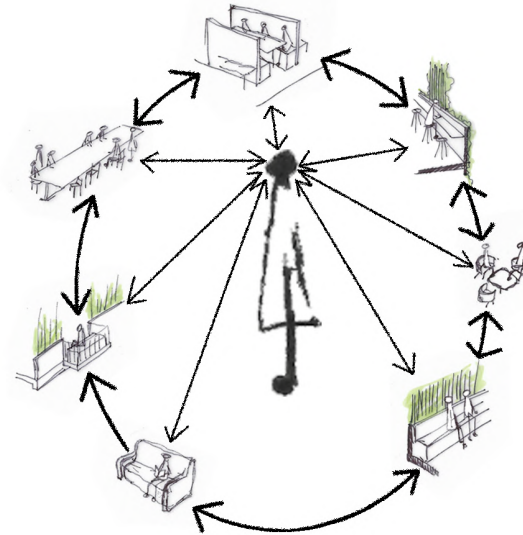
The Experiential Learning approach
Learn by doing (and then reflecting)

The Liquid Core approach
De-siloed learning

Interface Design, 3rd Y

Graphic Design, 2nd Y

Craftsman, 1st Y

Fashion, 3rd Y

Film, 1st Y

Animation, 2nd Y

Industrial Design, 3rd Y

Figure 20: Why a design institution?

Designers are often **early adapters** of new approaches

Studio culture is vital in many design related fields making physical spaces vital by extension

Design related fields often need **specialised spaces** hardware and software
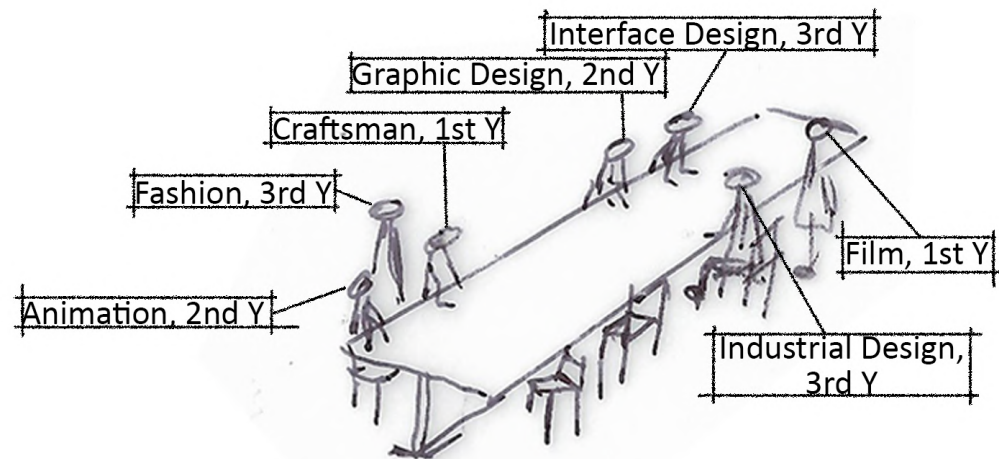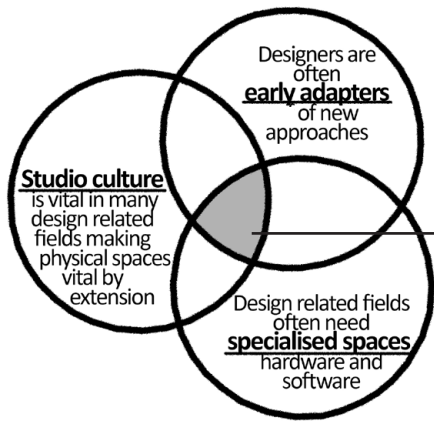
These motivators make design, and more broadly ideation, the ideal field through which to investigate

In order to fully investigate the two fields of enquiry, it was elected that the programme for this project was to be a tertiary ideation institution with ideation being used as a blanket term to cover a variety of de-siloed design related fields.

The institution is to house individual learning pockets, makers' spaces and interaction spaces that all have a reciprocal relationship, allowing students to customise their experience, both on a day-to-day basis as well as holistically. Additionally, students will start with a shared foundational course before specialising in subsequent years. All students will however remain fully interspersed throughout all years, leaving room for random interactions and cross pollination

Individual learning 'offices' or pockets

Shared fundamental course

Progressive Idiosyncratic specialisation

Industrial & product design
Sound Engineering
Artisans
Spatial design
Fashion
Film Arts
Performing Arts
Production design
Animation
Visual communication
Interaction design

Autonomous learning
Heutagogy
Organisational culture
Individual Learner
Paragogy
Collaborative learning
Learning reciprocity
Pedagogy
Fluid learning
Learning from a Knowledge source

Planned and serendipitous interaction opportunities

Opportunities to apply what has been learnt specifically through making

All students share the same studio to enable creative cross-pollination

Every student can elect where and how they learn with changes occurring at their discretion within the overarching structure of the building and the institution

Experiencing
Experimenting
Reflecting
Thinking

Learning includes the full creative process from theory and inception to prototyping and testing

During
In class
Active participation
New topic
Independent prep
Before
Independent internalisation
After
Out of class

Active, face-to-face interaction is reserved for when it will be the most valuable

Figure 21: Illustration of programme

= Producer = Create = **Applied Arts** = **Craft** = **Ideation** = **Design** = **Practical Arts** = creative entrepreneur =

Users

Occasional visitor

Lecturers

Administration staff

Part time students

Maintenance staff

Full time Students

Alumni

Students

Community members

General public

Staff members

Community members

General public

Makers Valley Agents

Programme

| Educational facilities | Public creativity | Social infrastructure |

Core Functions

Spaces for autonomous learning

Spaces for learning by doing

Spaces for ad hoc services

Spaces for collaborative learning

Creativity infrastructure

Student 'offices' or individual learning pockets

Gathering spaces and other social amenities

Event spaces

Businesses and economic infrastructure

Makerspaces

Planned and serendipitous interaction opportunities

Public amenities

Figure 22: Diagram of how the programme, users and functions relate

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YUNIBESITHI YA PRETORIA

Motivation for fieldwork

The emerging learning alternatives and their subsequent spatial manifestations discussed previously, place great value on the inherent differences of users as well as the importance of giving students choices, but this leads to the question of what students' spatial preferences and needs actually are?

As previously noted, findings regarding this question vary greatly depending on the unique field of enquiry as well as the approaches used, with the findings from different studies even standing at odds with one another in some instances. Subsequently the following fieldwork was actioned in order to develop a filter through which other literature could be reviewed, to aid in the identification of relevant informants, to development principles for designing the learning spaces of this project and to improve the understanding of what students actually want.

Methodology

The fieldwork conducted was designed to generally fall within the parameters of the Constructivist research paradigm, since it argues that reality is a social construct and that individuals have different perceptions that they are entitled to (Mertens 2010:16). This was crucial in designing research methods that suited the idiosyncratic intentions and predominantly qualitative nature of this project.

Several cues were however also taken from the Pragmatic paradigm, specifically pertaining to intersubjectivity (individual interpretation can coexist with a shared 'real world' without conflict), an emphasis on plurality and mixed research methods (Mertens 2010:35).

Method/design

Photo-elicitation along with either an interview (semi-structured) or a survey (long form questions) was used to identify spatial characteristics that students find beneficial or detrimental as well as the reasons behind these spatial preferences and needs.

Participants

Tertiary learning institutions that offered design related courses were identified* and participants were selected to represent a balanced cross section of relevant fields and years.

Guba and Lincoln (1989) criteria for ethical practice was also used with the intention of increasing the value that the fieldwork might have for the participants. These criteria include ontological, educative, catalytic and tactical authenticity (Mertens 2010) and are all geared towards increasing participants' self-awareness (e.g. their own spatial needs) and enabling them to act on their own behalf (e.g. change their learning spaces) (Lincoln & Guba 1989).

Instruments and procedures:

Primary data collection was split into two broad categories, namely interviews and surveys, the latter being used in instances when institutions were still exclusively operating online due to lockdown restrictions. The content and intention were consistent across both categories however.

In both cases participants were asked a series of questions** geared towards understanding their preferences and needs related to learning spaces, as well as why they thought they had these opinions and how they would change their spaces if they could.

In addition to either the interview or survey, participants were also asked to respond to a series of images showing a variety of learning spaces. This method was chosen in order to trigger reactions and opinions that may not have been obtained with verbal participation alone and as a means of overcoming discrepancies in vocabulary ,since participants were not architectural students. By responding to images, participants were able to more accurately articulate their preferences and since there was a shared point of reference (the images) potential for misunderstandings notably decreased. Participants were also far more comfortable responding to images than speaking in general abstract terms, resulting in findings being far richer than the interviews/surveys on their own.

122 Participants

8 Lecturers

70 Survey Participants   **52 Interview Participants**

114 Students

Sound Engineering — Visual communication — Animation — Interaction design — Drafting — Fashion — Interior design

Honours — 1st Years — 3rd Years — 2nd Years

*See Addendum A for Ethical Clearance and institutional consent forms
**See Addendum B for the full instruments.

Figure 23: Snapshot of fieldwork participants

Instruments and procedures cont.

Images for the Photo-Elicitation were selected to represent a wide variety of spatial characteristics (across the respective spectrums) that are commonly found in learning spaces in order to receive as rich and varied responses as possible. Spatial characteristics that were specifically taken into consideration included:

- Different types of learning activities
- Solitary and group activities
- Various occupancy levels and spatial configurations
- Levels of sensory stimulation and lighting levels
- Different material and colour palettes
- Degrees of connectivity between distinct entities
- Internal and external spaces

Subsequently the fieldwork was intended to find answers to the following three questions:

1

What spatial characteristics do participants prefer/ prefer to go without and how do these spatial characteristics impact their learning experience

2

What would they change about their learning spaces if they could?

3

What do participants think cause them to have the spatial preference or needs that they have expressed

Results:

The results from the fieldwork have been divided into three parts that loosely correlate to the above three questions.

Figure 24: Images used in photo elicitation

Three preference tiers were identified based on how often they were noted:

1. Near unanimous preferences

As noted by the majority of participants (75% or more)

Figure 25: Illustration of near unanimous preferences

1. Connection to Nature

"I would love to work outside, but it is not practical with our work." Participant 12.

Biophilia is often considered to be the exception not the rule, but the frequency with which the above sentiment was noted by participants opposes this quite vehemently, suggesting that students are very well aware of the inherent value of being connected with nature and natural elements while learning and that they yearn to have that connection.

The great impediment however is the lack of infrastructure outside (working surfaces, electricity etc.) and exposure to the elements (specifically sun, glare and wind).

Participants also noted that even just a hint of nature, whether it be a view, a potted plant or even a material choice had the potential to improve the atmosphere of a learning space.
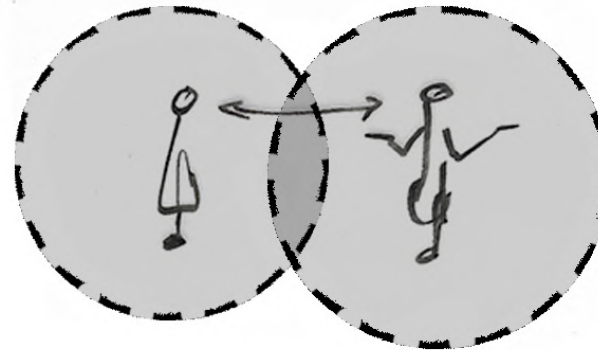
2. Ownership and Customisability

"It is awesome when I can use my surroundings as part of the design process, but I can't really do that in a space like this [their studio equivalent] *where we don't even have assigned seats never mind an area that is just mine."*
Participant 19.

For many participants, learning would be improved by having a designated space for the following reasons:

1
Limit interruptions and reduce reliance on scheduled studio sessions that don't necessarily align with peak productivity hours
2
Provide an opportunity to individualise and actively use spaces, thus improving work flow and a sense of ownership
3
An impression of privacy and safety that comes from having a dedicated 'personal bubble'
4
Limit COVID-19 risks related to sharing spaces and tools
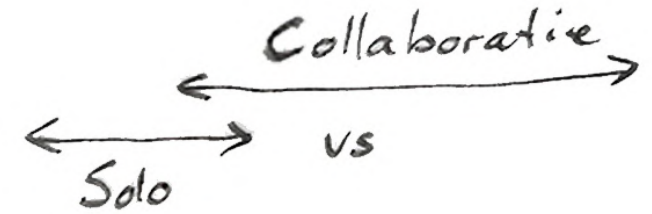
3. Interaction Spectrums

"I'm a people-person, but sometimes I just need to forget about them and focus." Participant 26.

vs
"I prefer working alone, but good ideas often come about after talking to someone."
Participant 31

One of the most intrinsic preferences students exhibited was positioning themselves somewhere on the solitary/collaborative working spectrum. However, the vast majority of students also noted that it was sometimes necessary to work on the other side of the spectrum in order to achieve a good design. Meaning that no matter individual preference, participants generally noted that a healthy design process spans the entire spectrum.

Figure 26: Illustration of secondary preferences
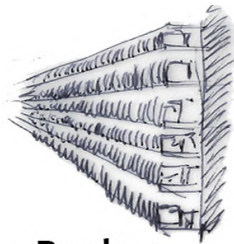
Books are comforting

Books and libraries are often considered to be somewhat archaic, but even in instances where the participants acknowledged that they don't use books for learning often, they still noted that they enjoy learning while being surrounded by books.

Libraries or bookshops are also considered calming and a collection of books were noted as making spaces interesting without being distracting.
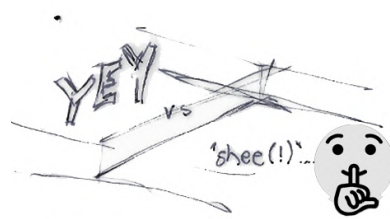
Spaces should have rules

As much as students valued flexibility and the ability to personalise their spaces, many noted a preference for spaces that had socially accepted 'rules', the classic example being that one should be somewhat quiet in a library.

This often went hand in hand with a preference for being able to intuitively 'read' how a space was to be navigated, used and how one is to behave within it without blatant signage.
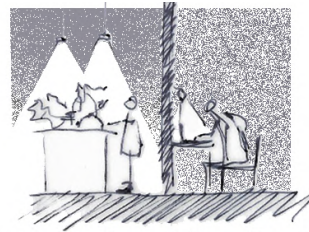
Lighting should reflect the type of learning

Lighting is a rather divisive factor (see part 3 below), however many participants noted that the lighting (both quantity and type) found in a space should be dictated by the type of learning or work that will be done within the space.

"Bright light and computer screens just don't mix well," Survey Participant 32.
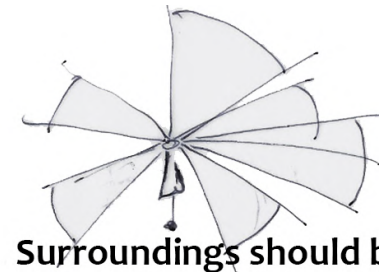
Surroundings should be observable

As one might expect from students studying in Johannesburg, many emphasised safety and the need to always be aware of one's surroundings, even while one is working or learning.

Subsequently many noted a preference for visually permeable barriers, floors that make sounds when you walk on them and other such mechanisms that would alert them to other individuals approaching.

Sound should be controlled

Sound was noted as having the power to hinder learning more often than any other stimuli and jarring or unwelcome sounds were noted as a deal-breakers more often than any other factor.

Sound however, was also consistently noted as a factor in making a space feel welcoming and calm, with only a thin line separating these impressions.

Functional precedent:

Hyde Park Corner Exclusive Books

Figure 27: Functional precedent - Hyde Park Corner Exclusive Books

The bookshop is used by a wide variety of users as a study, work and relaxation space, with the tables and lounge chairs (or bean bags) being consistently occupied and effectively used as hot desking opportunities, all while being surrounded by books.
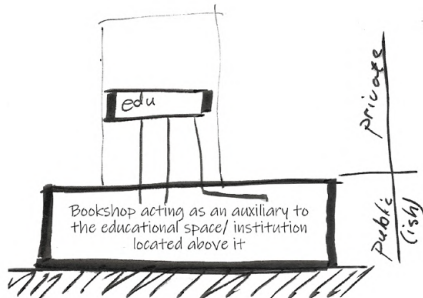
3. Spectrum Preferences

For the majority of spatial characteristics no clear consensus or pattern could be identified and the frequency tables below indicate the variety of preferences that were noted by participants.
This diversity supports the initial presupposition of this document that individual students' preferences are so divergent that a 'one-size-fits-all' learning space is not a viable goal.

Lighting

Frequency:
- Bright
- Natural light
- Cold light
- No fluorescents
- Diffused
- No overhead lights
- Spot lights
- Warm light
- Cosy light
- Dark

Decoration

Frequency:
- Big patterns
- Inspirational content
- Other students' work
- Fine grained pattern
- Visual noise
- Process work
- Plants
- A view
- Minimalistic
- Nothing

Colour

Frequency:
- Black & White
- Just one or two muted colours
- Earth tones
- Single pop of colour
- Pastels
- Dark colours
- Lots of different colours
- Bright colours

Comfort

Frequency:
- Extremely comfortable
- Supportive but relaxed
- Not upright
- Good posture
- Not a couch
- Rigid
- Hard

Occupancy

Frequency:
- Lots of people and activity
- Lots of people but focused
- Group with similar intentions
- Selected group
- Few friends
- One or two friends
- Alone

Size

Frequency:
- Open
- Big
- High ceiling
- Stepped ceiling
- Big windows
- Not narrow
- Everyone should have a personal bubble
- Space to move around
- Intimate
- Small

Layout

Frequency:
- Have contact with everyone
- High interactivity
- Share space
- Cubicle
- Dedicated space
- Closed off
- Protected & private
- Focused

Materials

Frequency:
- Natural
- Soft
- Warm
- Interesting
- Textured
- Tough
- Cleanable
- Sleek
- Transparent
- Hard
- Structural
- Cold

Figure 28: Illustration of spectrum preferences

TOP PICKS

MOST DISLIKED

What secondary spaces are required on a campus?

Gender Neutral Spaces · Counseling Office · Silent Spaces / Emotional Recuperation · Recreational Spaces · Libraries · Physical Activity & Gyms · Nice Smoking Areas · Cafeterias · Recharge Zones · Gardens
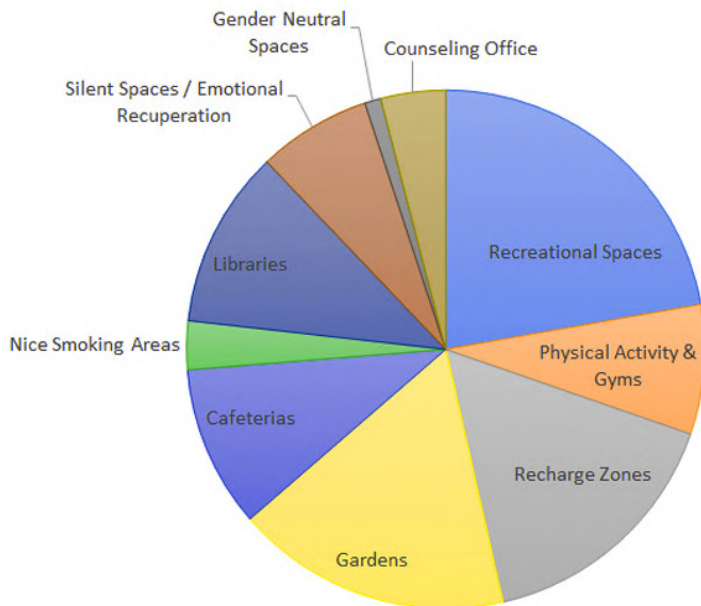
Do you prefer digital of physical tertiary learning?

Digital · Physical Campus
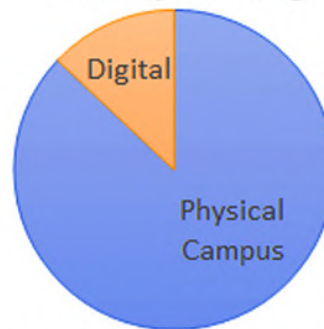
Should the public be allowed onto a campus?

Yes · No · With Restriction
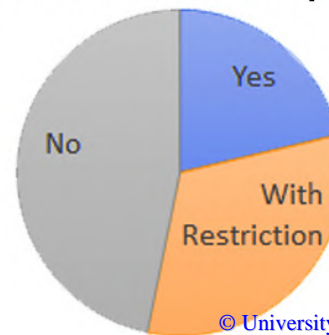
What makes a learning space a good space for you?

Colourful · Dark space · Organised · Big Space · Many other people around · Control of Temperature · Ventilation · Physical Comfort · Garden View · Privacy · Access to Equipment · Quiet · It is not my room · Natural light · No other people · COVID-19 concerns · Minimal Distractions · Intimate
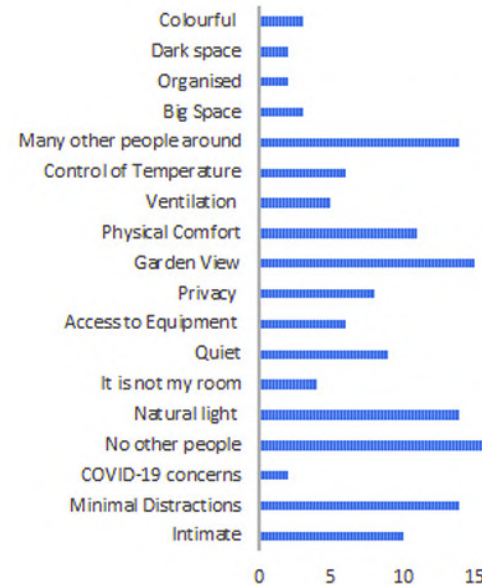
What makes a learning space a bad space for you?

Cold · Being Outside · No Colour · Too Much Colour · No Privacy · Clutter · Noise · Confined Spaces · Too Much Stimuli · Too Dark · Seclusion from Others · Lack of Ventilation · Too Few Windows · Bright Rooms · Too Many People · Insufficient Space

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Figure 29: Preference statistics
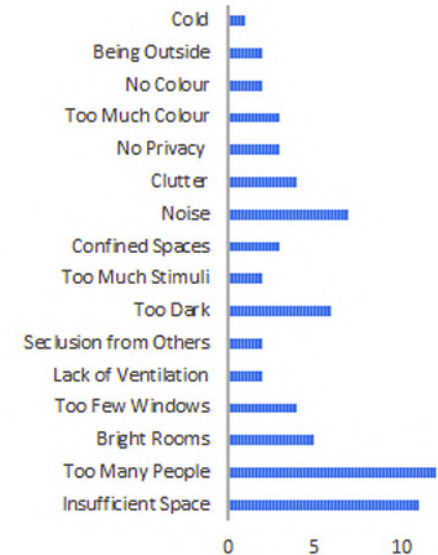
The following are the 6 types of reasons that participants provided to motivate why they think they have the spatial preferences and needs that they expressed during their participation

Neurodivergence
(Including dyslexia, ADHD or Aspergers)

Neurodivergence uniquely exemplify why students should be able to adjust their learning environment. Amongst other factors, students highlighted a tendency towards extreme overstimulation as well as understimulation. Some also noted various specific preferences pertaining to furniture configuration and type that can aid or hinder their ability to feel comfortable in a space.

Mental health
(Including social anxiety and depression)

Participants who noted mental health as a factor, most often noted a need to be able to control the amount and intensity of social interaction that they experience. They consistently also highlighted the need for break away or emotional recuperation spaces.

Disability & Health
(Including visual impairments, injuries and asthma)

Participants who sighted this reason often noted challenges with navigability and usability of spaces, partially due to the general tendency for buildings to be somewhat inaccessible to persons with disability, but they often also noted colour or material choices making it more challenging to use a space than it needed to be.
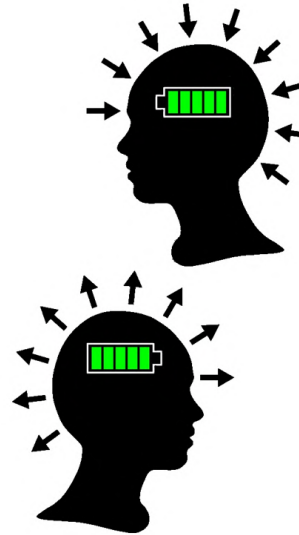
Personality
(Including introversion / extroversion and shyness)

This reason was noted more than any other as being the primary reason for spatial preference with almost all students noting a preference for either more solitary environments or more collaborative environments. Similarly a large number of students noted that feelings of shyness notably impact their willingness to participate in some spaces, causing them to seek out less challenging spaces to work in instead.
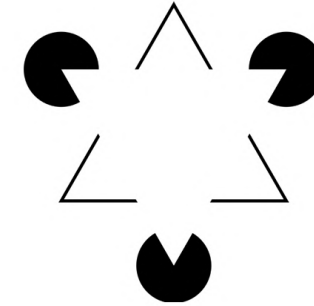
Past experience
(Including traumatic past events and previous fields of study)

Several students noted unpleasant past experiences as the reason for preferring high visibility spaces and other such preferences. Many also noted previous learning experiences as influencing what their current preferences, this was especially prevalent in students who had previously studied something else.
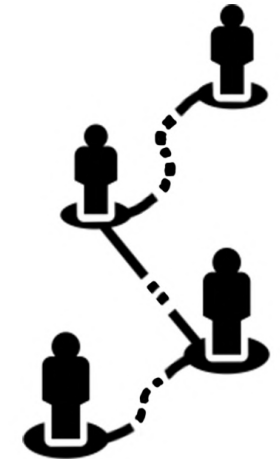
Demographic
(Including culture, religion and social expectations)

While this was not a common reason expressly stated by participants, they would often motivate their answers with phrases such as 'It would be rude if...' (e.g. it would be rude to sit with your back to someone). Additionally, cultural practices were noted a number of times as affecting how a participant would use a space, for example a preference or custom of sitting on the ground.

It should however be noted that even participants who provided very similar reasons often had marginally or majorly different preferences. As an example, one student with a visual impairment noted a dislike for bright or white walls as it made it difficult to differentiate between planes, while another student with a visual impairment noted that the brighter a space the better it was. This reinforces the idea that it is unreasonable to make generalisations about what students would prefer or need, thus reiterating that 'one-size-fits-all' learning spaces could never actually fit all, especially in the contemporary learning environment where a student body is likely to include students across all spectrums.

The overarching conclusion from this investigation is that in order to accommodate as many individual students as possible a learning space needs to provide a wide variety of options that students can choose from in order to get as good a fit as possible. These learning spaces should thereafter also enable personalisation as a means of 'tailoring' them to be even better suited to the individuals who are using them. Unfortunately, both the options to be provided and the degree of personalisation would invariably be constrained by what is viable within a space that has an annual user turnaround.

Chapter 3
The Site
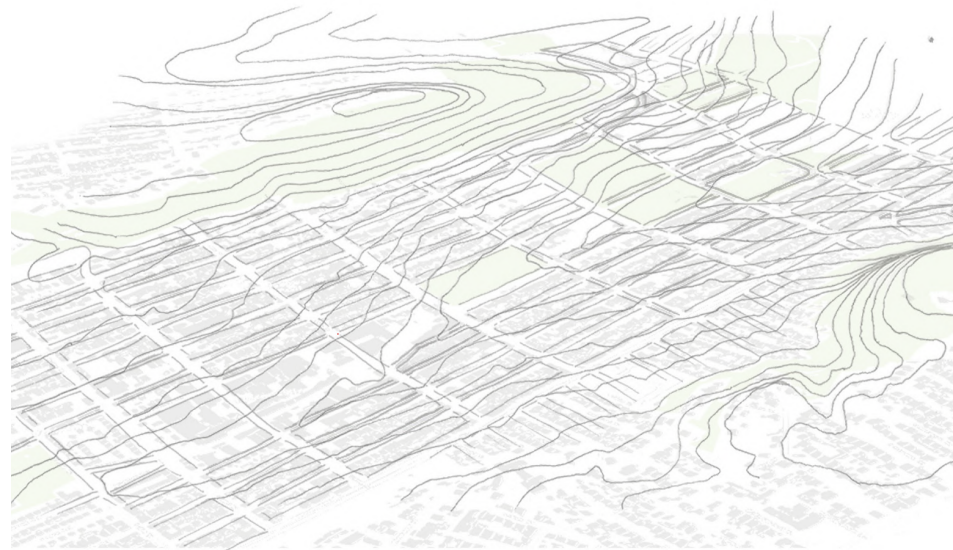
1. Saturation
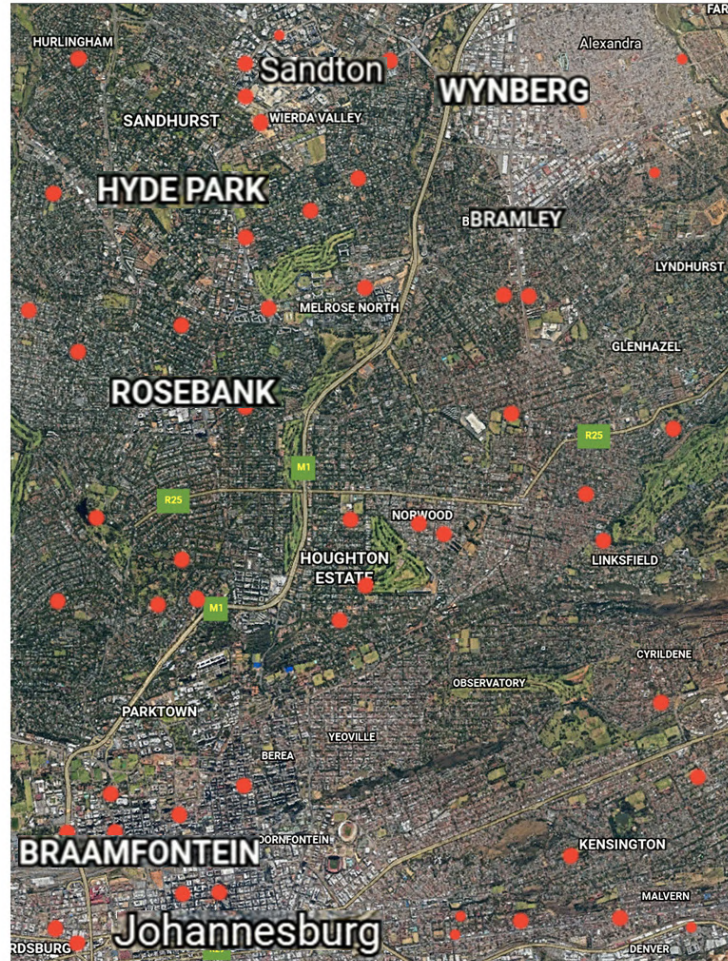
Figure 31: Existing additional learning spaces

The first criteria required the identification of areas that are comparatively less saturated in terms of tertiary educational institution while remaining close enough to benefit from any potential partnerships that may arise between institutions. Mapping of existing institutions suggested a number of areas, in particular the parts of Johannesburg located between the city centre and the eastern gateway which are notably empty of formalised institutions.

2. Catalytic potential
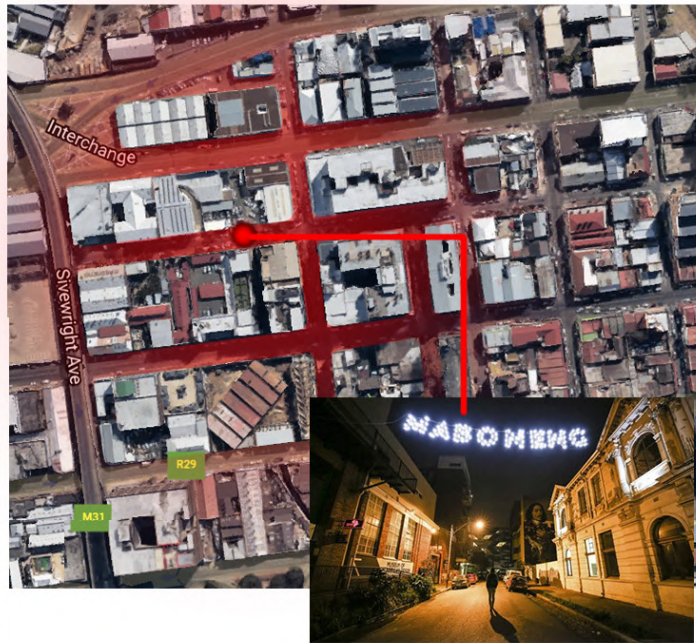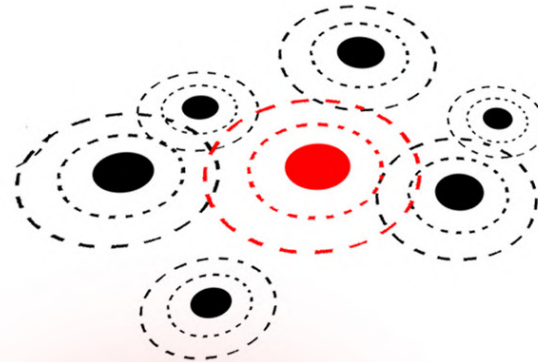
Figure 32: Illustration of catalytic potential

Campuses have the potential to have extensive positive catalytic effects. If the context of the site is not open to change, much of that catalytic potential is wasted (Raworth 2017). Subsequently it is vital to identify an area where the introduction of a campus will have the greatest chance of affecting positive change and ultimately having a positive reciprocal relationship.

3. Accessible

It's a public square... but can everyone really go there and use it?
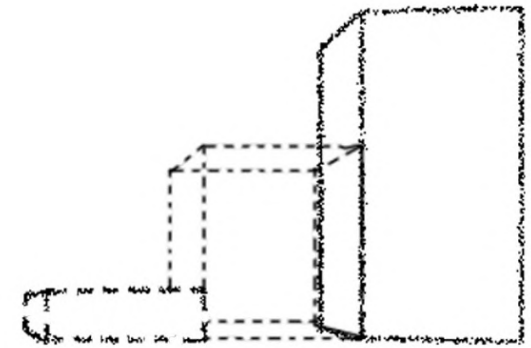
Figure 33: Illustration of passive exclusion

Tertiary education has an unfortunate legacy of being associated with exclusivity and gatekeeping that is in the process of being overhauled at many institutions worldwide and in SA. The location of a campus however, is often very complicit in this impression of exclusivity. As such it became vitally important for the site to be located in a context that was physically, economically and socially accessible to all students who would be inclined to study there.

Johannesburg's **current metropolitan structure** of inverted polycentricity (UMI, 2015)

High density suburban
Medium density suburban
Low density suburban
Very low density suburban

Metropolitan Core (high density)
Major inter-city road, commuter rail
Principal Metropolitan Sub-Center
Secondary Metropolitan Sub-Center

Johannesburg's planned **Future City Model:** Compact Polycentric Urban Form

Figure 34: Johannesburg's 2040 urban framework

Single (residential) use
Inactive edges
Vehicular orientated
Low density
Limited visibility
Surrounding nodes
Node
Node

Pedestrian friendly
Medium/low density
Comfortable & passive surveillance
Connectivity & semi-nodes
Green Infrastructure
Mixed use
Accessible
Active street edge
Spatial readability

Figure 35: Characteristics of suburbs versus [sub]urban areas

4. Future [Sub]urban Development
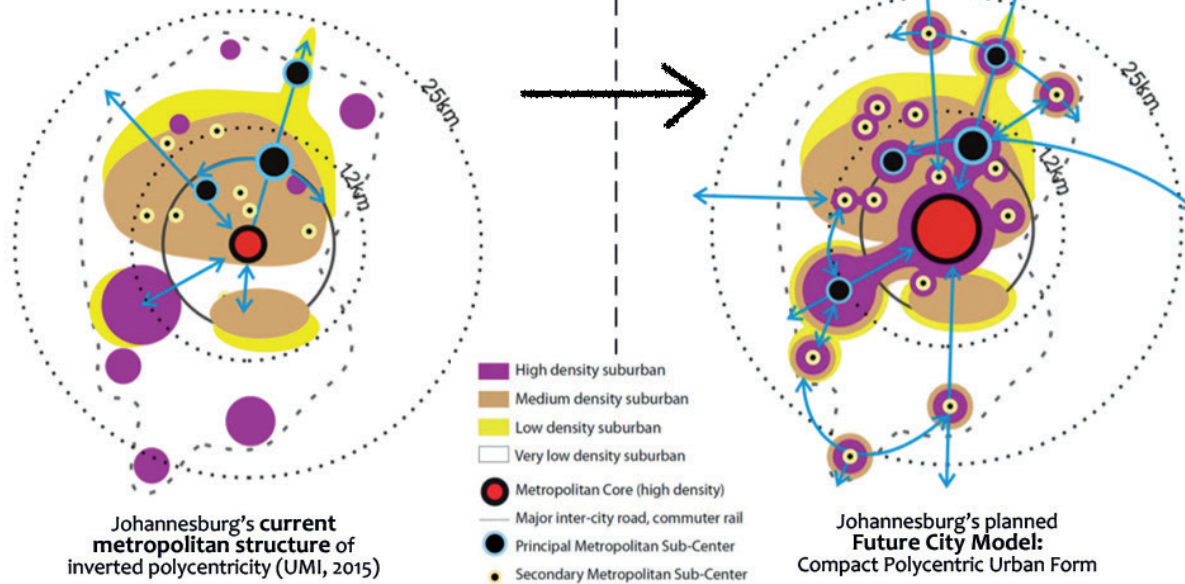
'Suburban sprawl' has, over the last couple of decades, become something of an umbrella term for everything deemed wrong with modern cities (from low density and service instability to limited passive surveillance and the death of the 'ballet of the street' (Jacobs 1961:50)) and often this accusation is justly levelled at suburbs (Kara 2014). But as much as contemporary designers would love to flatten suburbs and build good urban spaces instead, the truth is that it is not an option since there are simply too many of them in our cities and they are far too ingrained into too many people's worlds to just be eradicated.

Instead we need to consider ways in which we can work **_with_** suburbs and their inherent characteristics in order to improve them and create healthy [sub]urban areas in their places through the use of healthy appropriated urban principles.

This is fully in line with Johannesburg's 2040 spatial development framework as it is geared towards developing a compact polycentric urban form (City of Johannesburg 2016) which rely on having a network of urban nodes with healthy [sub]urban zones surrounding these nodes.

It was subsequently elected to locate the site within a suburban context with the intention of investigating [sub]urbanisation through the project.
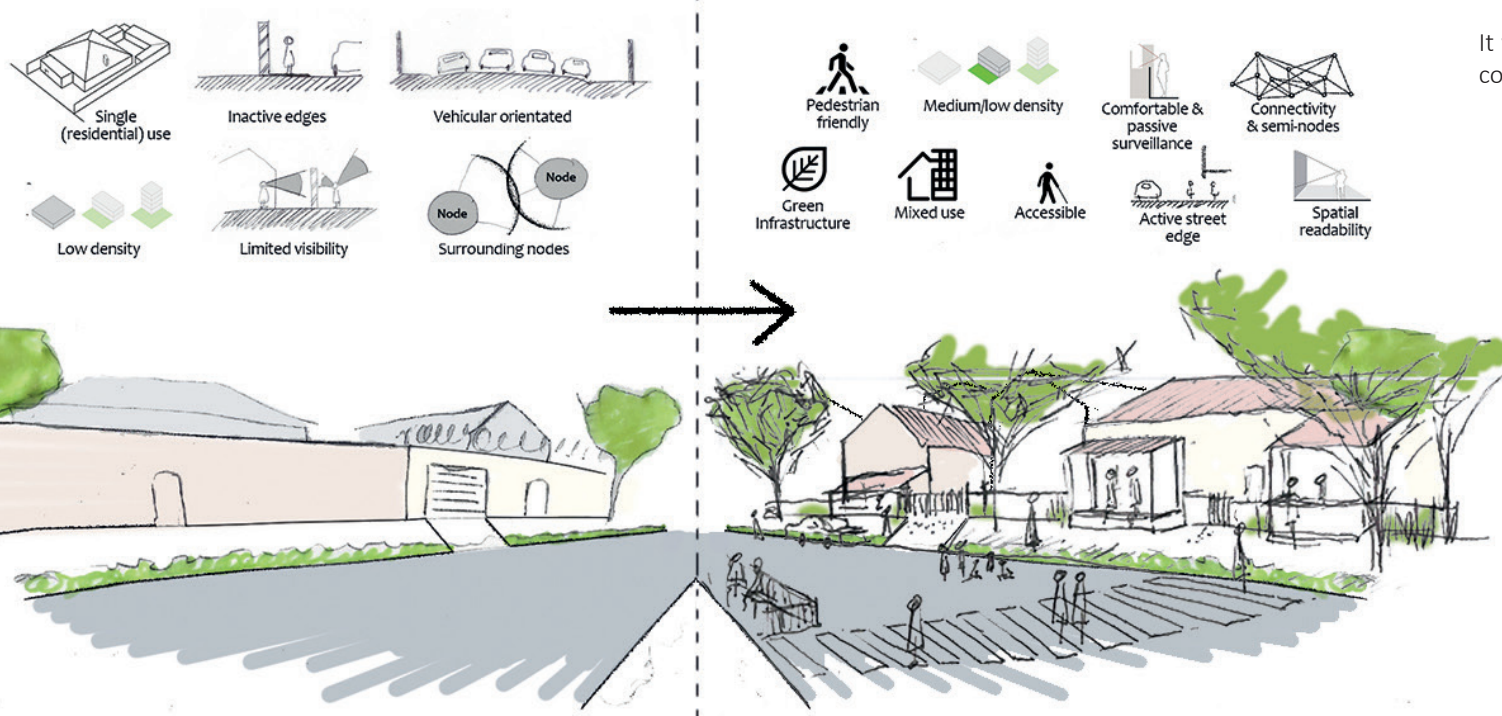
5. Reducing Climate Vulnerability

Exposure
magnitude of climate stress

Sensitivity
degree to which system is affected

We want it low

Potential impact
potential effects (positive or negative) of climate change

We want it low

Adaptive capacity
ability of system to adjust or cope

We want it HIGH

Vulnerability
the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change

We want it low
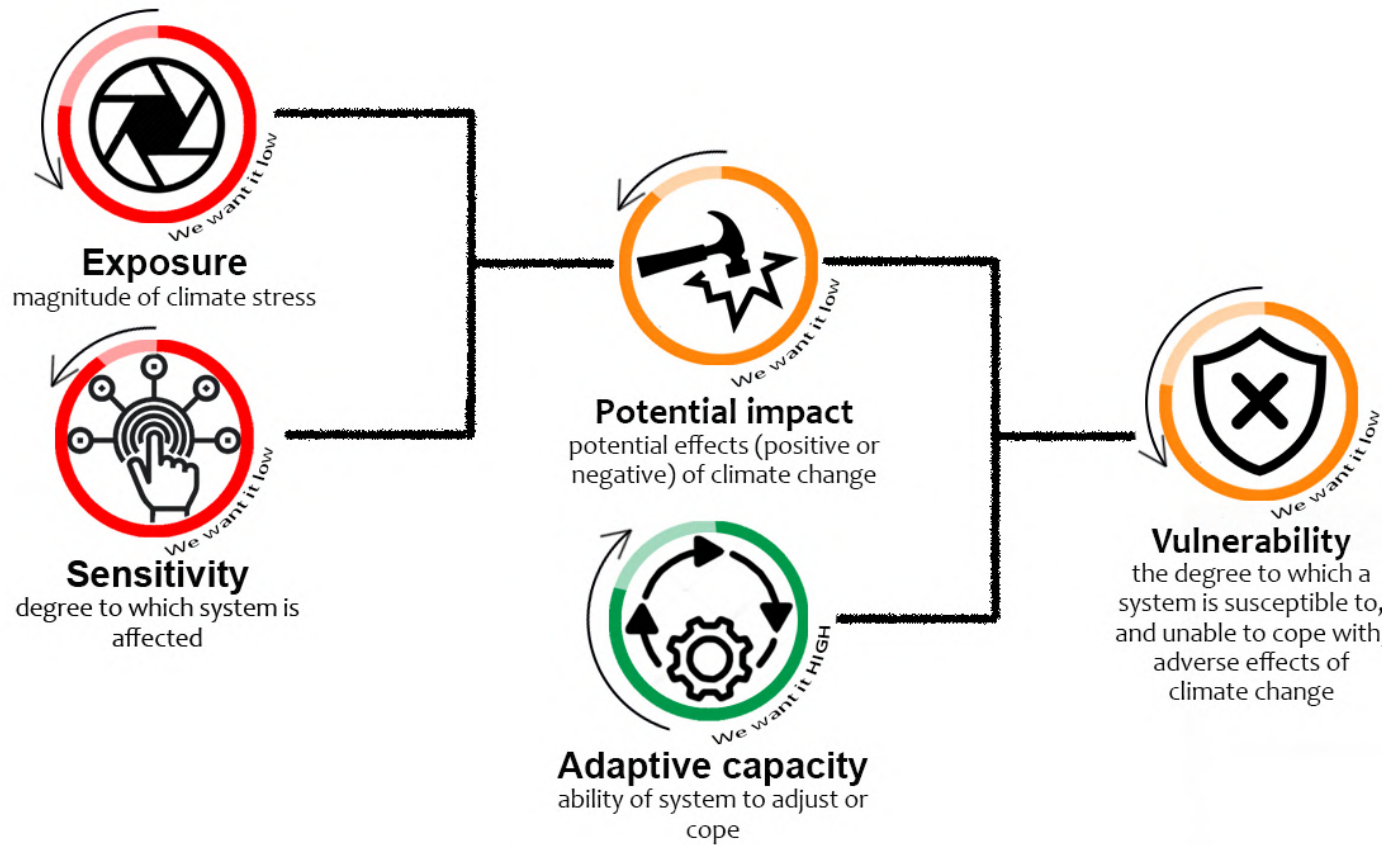
Figure 36: IPCC's Vulnerability assessment framework

Our world finds itself in the middle of an environmental crisis and it is no longer just optional to take this into consideration when designing. In truth both our societies and economies are nested subsidiaries of the environment and it is in our best interest to mitigate and adapt to the coming changes as best as we can.

Thus I believe it is an ethical imperative for environmental considerations to be integrated into every design even if it is not the primary focus of the project.

Consequently it was vital that this project be geared towards reducing climate vulnerability, using the metrics set out by the IPCC (2012)regardless of where it was located. Locating the project in a context that was more climatically vulnerable however, would facilitate deeper investigation into contextually appropriate climate adaptation and mitigation strategies (Benyus 1997).

To further reinforce these approaches was the intended use of biophilic design, with the intention to cultivate a relationship with nature, as it can be argued that a lack (or progressive loss) of connection, respect and reverence towards nature lies at the heart of our environmental crisis in the first place (Van der Ryn 1996).

Resource efficiency

Passive design

Biophilic Design Principles

Figure 37: Green design principles
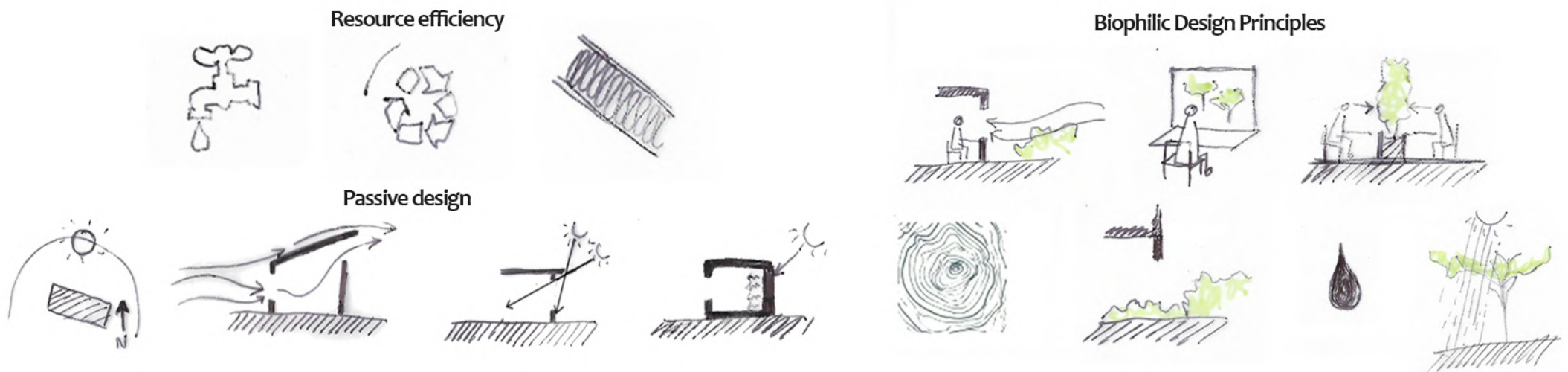
At an intersection of these criteria one finds Bertrams, alternatively known as Bezuidenhout (Bez) Valley, a suburb located just east of Johannesburg's CBD. Bertrams was established in 1889 in order to provide working class housing for the evolving metropolis and is characterised by 495m2 sites onto which comparatively modest houses were built during the turn of the century (Rule 1988) but has continued to be a thriving residential and industrial pocket nested between the two ridges.

Figure 38: Location of site

76-54 Sydney Rd
Bertrams
Johannesburg

-26.191172, 28.074479

Figure 39: Photograph of valley

Very cold 7°C	Cold 12°C	
Warm 32°C	Comfortable 25°C	Cool 18°C	Comfortable 23°C	Warm 32°C
	Very cold 7°C	Cold 12°C

Hours when the building is most likely to be in use

Summer   Autumn   Winter   Spring

50m

Site

● Existing green spaces and established trees

● Soweto Highveld Grassland

● Mesic Highveld Grasslands

Basic Assessment Report for the upgrade of the Bezuidenhout Valley Clinic was used as the backing for the sensitivity, impact and ecological feasability assumptions (Gumbi 2018).

Jukskei River

Site

0 50 100 150 200 250

Shale and sandstone deposits and bedrock is common with either a red sand or clay soil layer depending on the exact part of the valley.
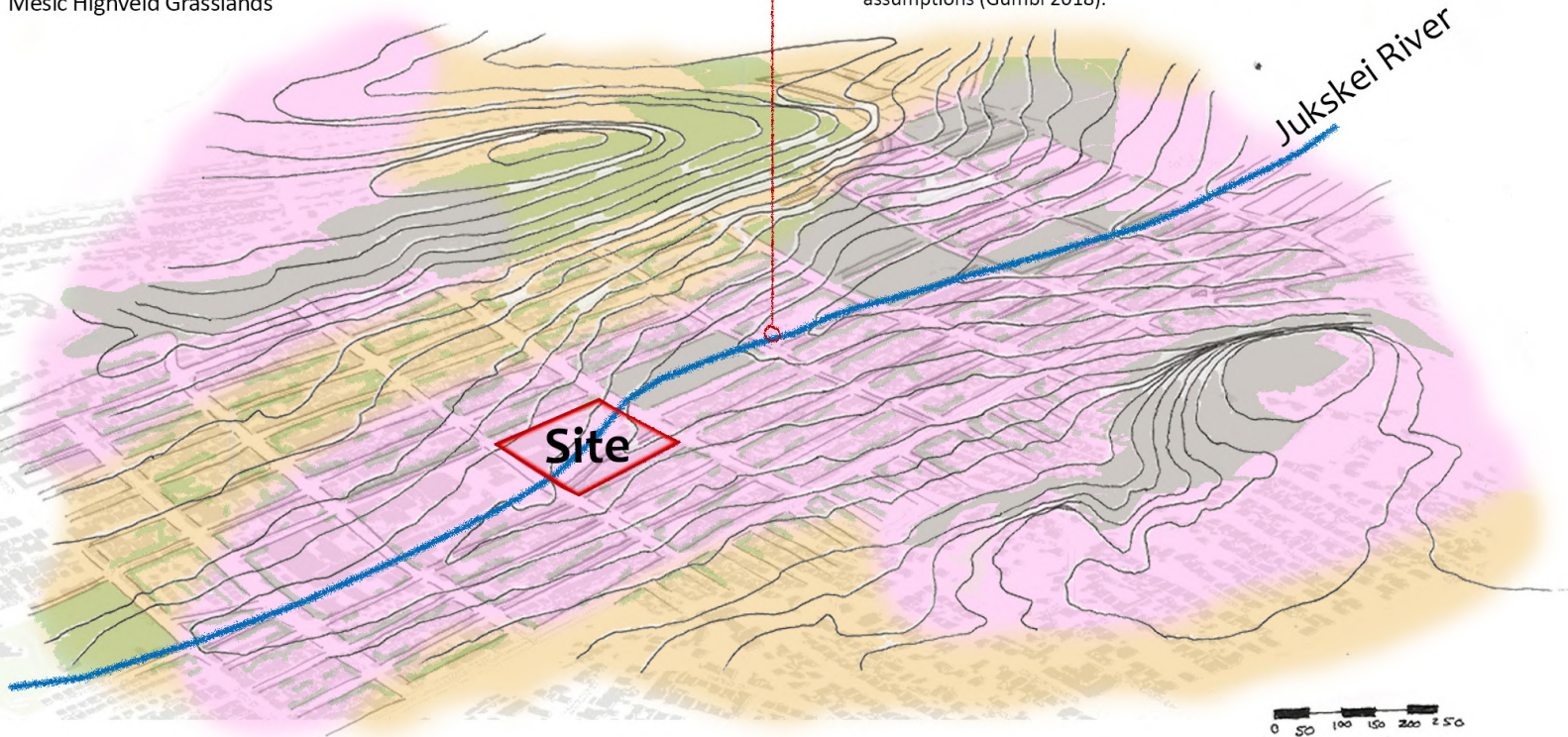
Combination of Soweto Highveld Grassland & Mesic Highveld Grasslands (respectively shown above) Has low sensitivity & conservation potential

Invasive Chinese Nettle vs Sweet-thorn
The valley is overrun by invasive species, thus limiting conservational potential

The Jukskei River has a fundamental impact on the area in terms of the spatial organisation, the micro climate as well as the climatic risks and opportunities

Figure 40: Environmental macro site analysis
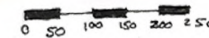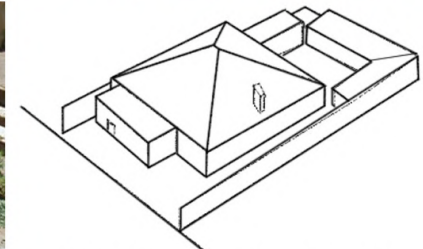
Bertrams contains a number of varying instances of Industrial Heritage buildings, most of which were built in the 1940s

Due to the prevalence of sandstone that was generally excavated, many features have been built out of this material, most notably the sandstone river channel (built in the 1910s) which is also considered to be a protected heritage feature (Gumbi 2018).

Bertrams was formalised from 1890s meaning most of the built elements hail from the first half of the 20th century, including stepped sidewalks and some water furrows

Most of the suburb is made up of single family residences, but many have been adapted in one way or another including backyard infill

Jukskei River
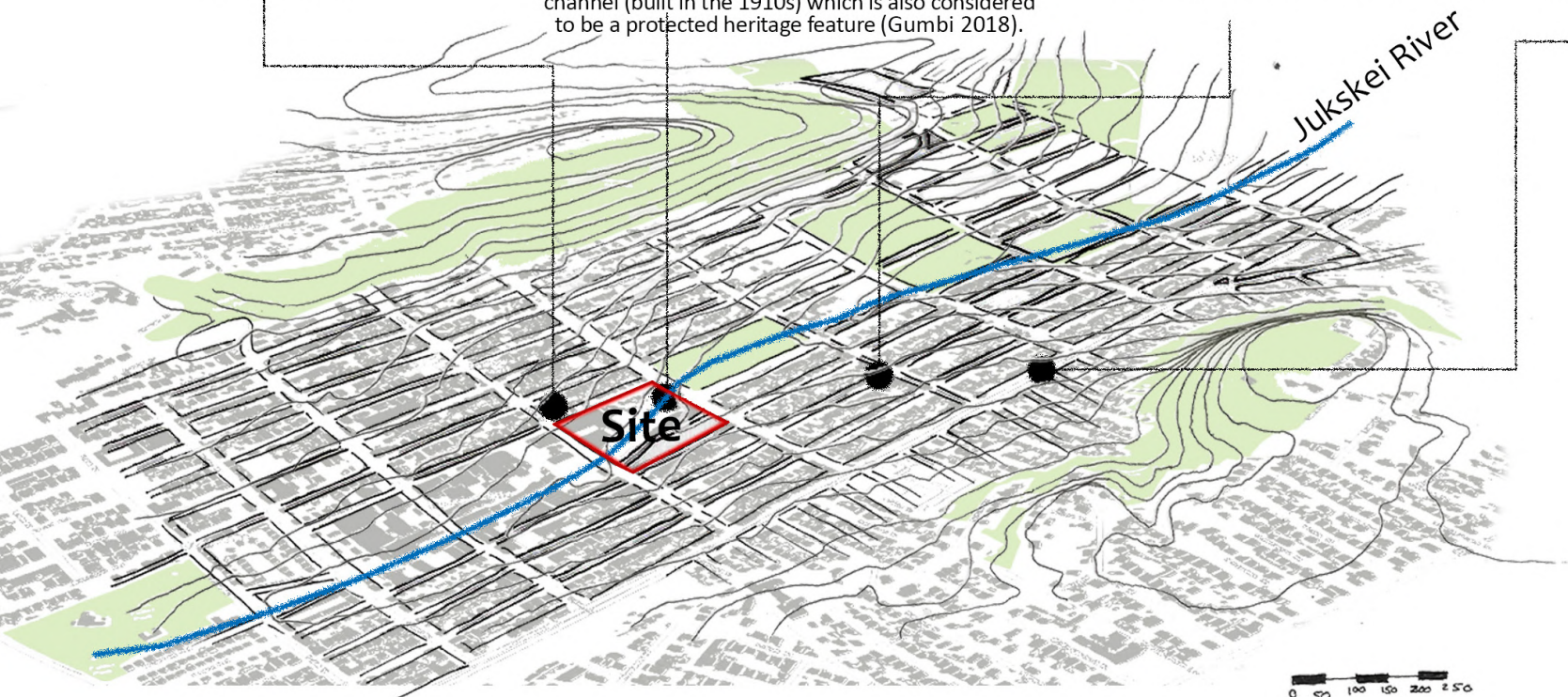
Site

There are however, numerous instances of heritage elements in the process of deterioration and dereliction, largely due to neglect

0 50 100 150 200 250

Figure 41: Historical macro site analysis

The Makers Valley Collective

Bertrams is also the home of the Makers Valley Collective, a collection of businesses, NGOs and other interest groups that have banded together to share and capitalise on resources while finding strength in numbers (Victoria Yards 2019). The collective includes Nandos's head office, Victoria Yards and Skills Village, to name but a few of the 20+ members (Makers Valley 2019). What they have in common is that they value social and creative enterprise which they try to cultivate by giving makers and creative entrepreneurs the resources and networks they need in order to succeed and to collectively contribute to a holistic wellbeing economy in the Bertrams area, which they have been steadily making progress towards since their establishment in 2018.

The members of the collective are all loosely located around The Makers Way (Makers Valley 2019) which is a movement spine that stretches from Ellis House (next to Ellis Park Stadium) to a public park in the heart of the valley which straddles the Jukskei River. This spine serves as an anchor for the social, creative and economic activities that form part of the collective. Unfortunately, this spine is currently woefully underutilised and underdeveloped, existing in name but not in practice, where it could be an incredibly valuable tool for both the collective and the community.

Some members of the Makers Valley Collective

Social initiatives in addition to Making

Jukskei river clean-up project

The Swop Shop - Community needs reaction

Growing Community - food security initiative

Placemaking & Community Connect initiative
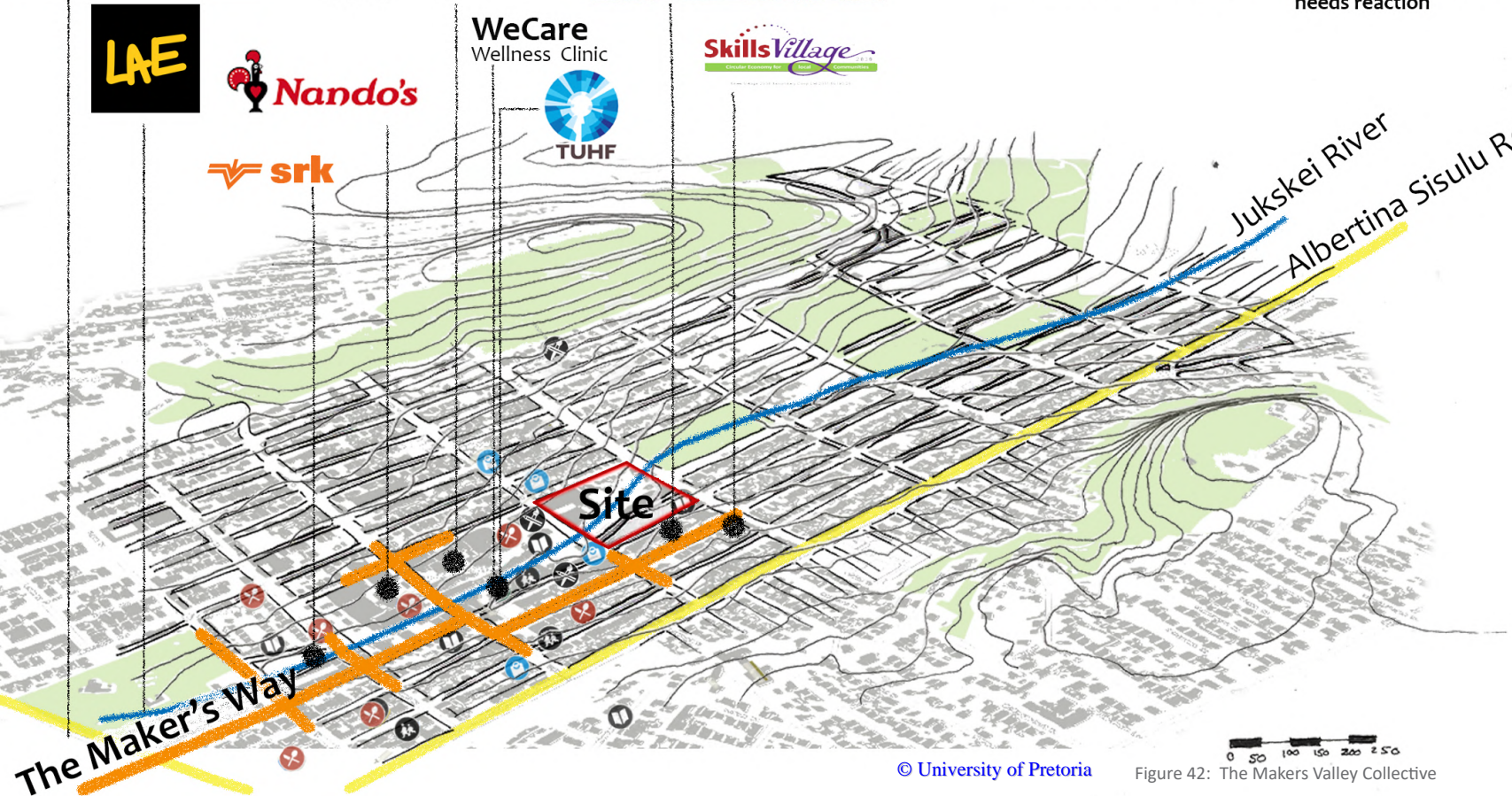
Stakeholders

1. **Makers Valley Collective**
   SRK engineers
   US Consulate
   British Council
   Summit Educational Trust (SET)
   Engineers Without Borders
   Victoria Yards
   Nando's
   Rand Merchant Bank (RMB)
   Giant Films
   Green Business College
   Ellis House
   Skills Village
   BOXA
   UrbanWorks
   Time Anchor Paint
   Whippet Cycles
   Food I Love You 7
   City of Johannesburg (CoJ)
   Jhb Inner City Partnership (JICP)
   Jhb Development Agency (JDA)
   Pikitup
   TUHF

2. **Community of Bertrams**

3. **Students & Institution staff**

Site

Jukskei River

Albertina Sisulu Rd

The Maker's Way

Figure 42: The Makers Valley Collective

Strengths

Physical location

Green spaces

Mixed use

Relaxed atmosphere

Density (fringe)

Weaknesses

People live there but work elsewhere

Inactive street edges

Polulation is mostly lower income resulting in limited buying power

The valley causes temperature fluctuations
Service interruptions

Underutilisation of makers way, with one hardly ever even being able to tell the way is there from the outside

Opportunities

Many migrants and multi-generational occupants that result in a combination of stability and constant refreshing of the population

Wide age and demographic spread

The area has a history of making, trade and craft

Many old buildings & houses have remained largely authentic (with some minor alterations), giving area both distinct identity and value

Threats

Cyclical activity throughout both the day and the week

Introspective enclaves such as Victoria Yards that face inwards and give no hint that its there

Dereliction

Figure 43: Bertrams SWOT analysis
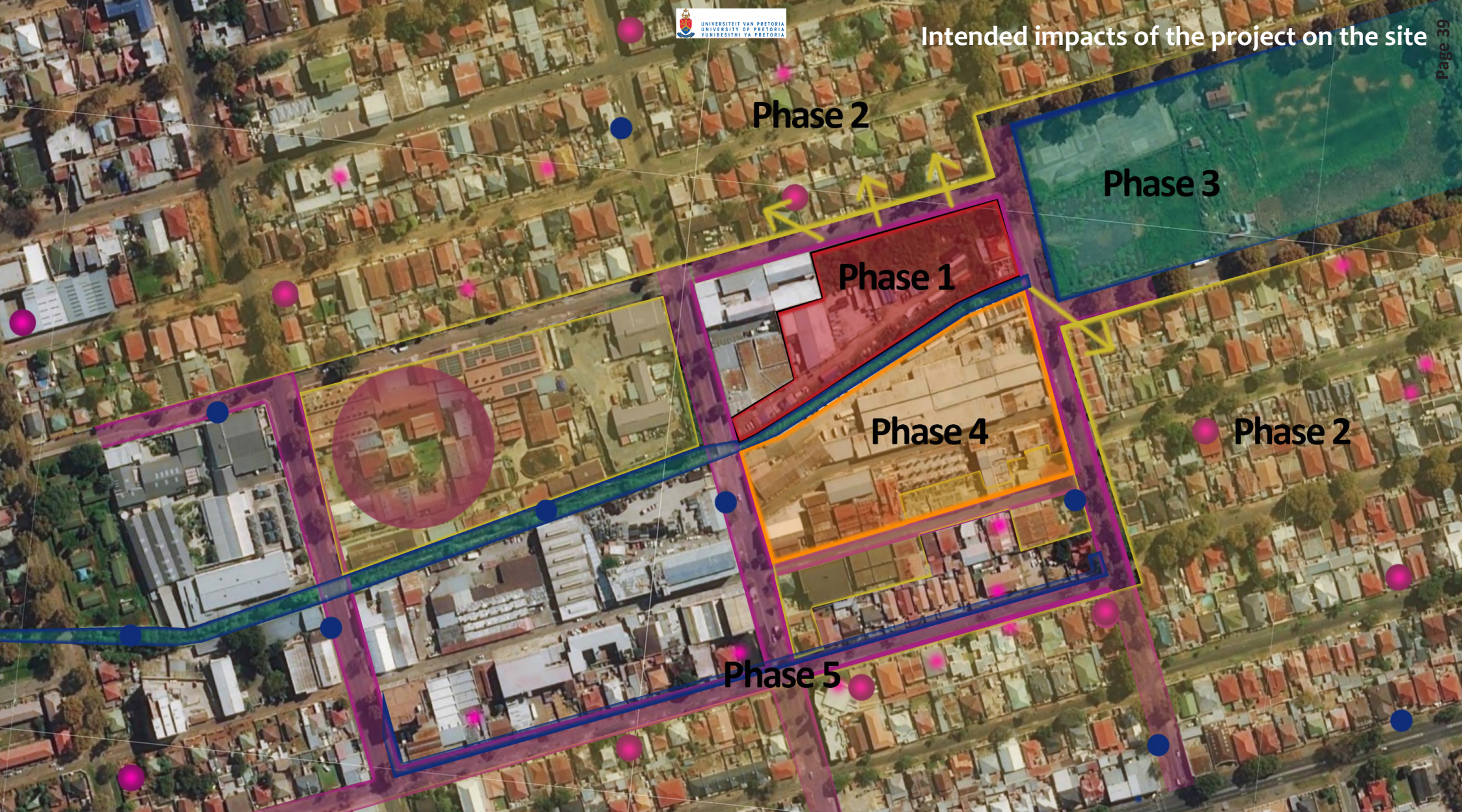
Figure 44: Overarching, phase impact on the area

Phase 1
Project as proposed in this document

Phase 2
Financial injection into the area, specifically relating to students living in the area as well as supporting local businesses

Phase 3
Social and socio-spatial improvements (park infrastructure and public facilities such as waiting spaces, water and electrical points)

Phase 4
Potential expansion of the campus to include other fields and to partner with the Skills Village

Phase 5
Partnerships with other members if the Makers Way as well as improving the street scape

Phase 6
Contributing to the general wellbeing economy of the area

© University of Pretoria

Micro site analysis

1690
1685

50m   100m   150m   200m

Northern edge of the site's elevation section

Existing heritage house to be maintained

Existing house that is mostly derelict but has an interesting presence and is thus to be maintained

Industrial, commercial and residential use of 'industrial windows'

Various applications of sheet metal as roof and wall cladding

Extensive use of brickwork, especially of a dark brown and red variety

Industrial forms, especially in the roof-scape

Sandstone commonly found when digging foundations

Park

12:00
12:00 12:00

Driving test practice area

06 July
06:56

21 December

N

E

S

Auto-repair shop

Temporary structures to be demolished

Existing buildings to remain as is

17:20

The Prop House

Skills Village

RAPAI ART GALLERY

BUCHMANN

Victoria Yards

Jukskei River

Makers' Way

Figure 45: Focused site analysis

Chapter 4
[Explorative] Design Development
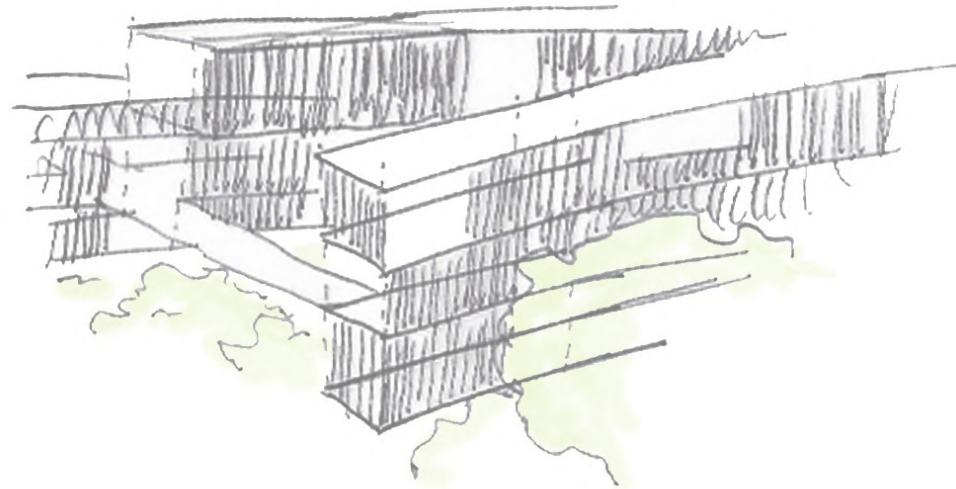
From the theory reviewed, the fieldwork and the site analysis the following were identified as non-negotiable requirements, principles or intentions that distinctly needed to be included and addressed within the project:

Approaches
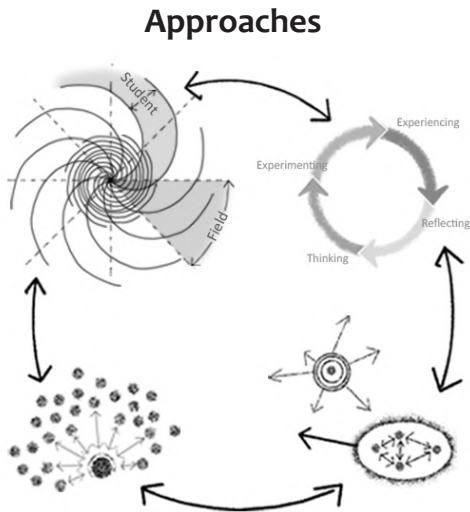
1
A variety of spaces

2
Active [work] spaces

3
Customisable spaces that facilitate ownership

4
De-siloed

Findings
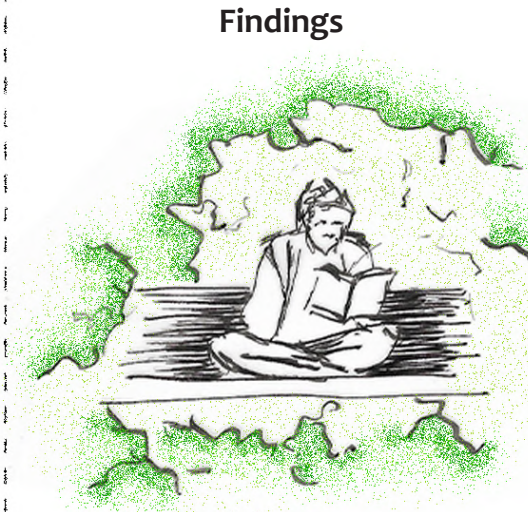
1
A variety of spaces

2
Biophilia

3
Customisable spaces that facilitate ownership

4
Different types, characteristics and features in spaces

5
Sensory sensitivity
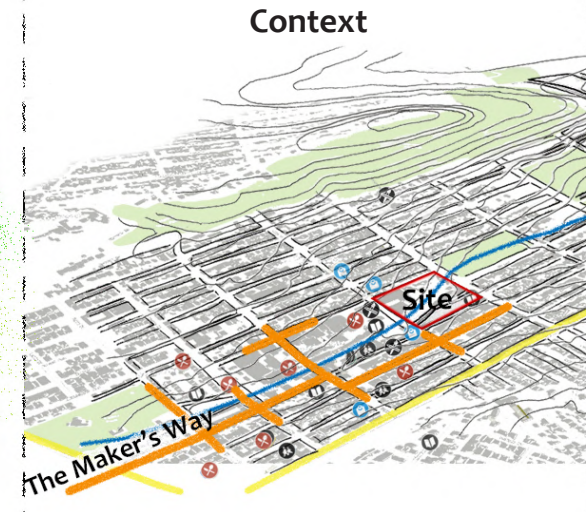
Context

1
Culture of making

2
Honour the valley morphology, especially regarding the river and slope

3
Project functions outwards and activate the edge

4
Remain true to the inherent [sub]urban characteristics of the context

Programme
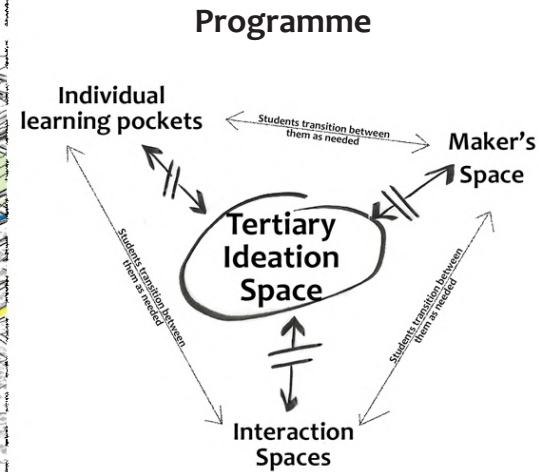
Figure 46: Project non-negotiables

1
The three core functions of solitary, interaction and making

2
Allow for user overlap

3
Induce feelings of safety and privacy

The intention with this initial exploration was to identify mutually beneficial opportunities, where the site could benefit from hosting a specific function while the function would benefit from being located on a specific part of the site. This lead to a number of relational diagrams that in turn we combined with the requirements set out on the previous page to start deriving potential massing responses.

Figure 48: Illustration and maquettes from step 1
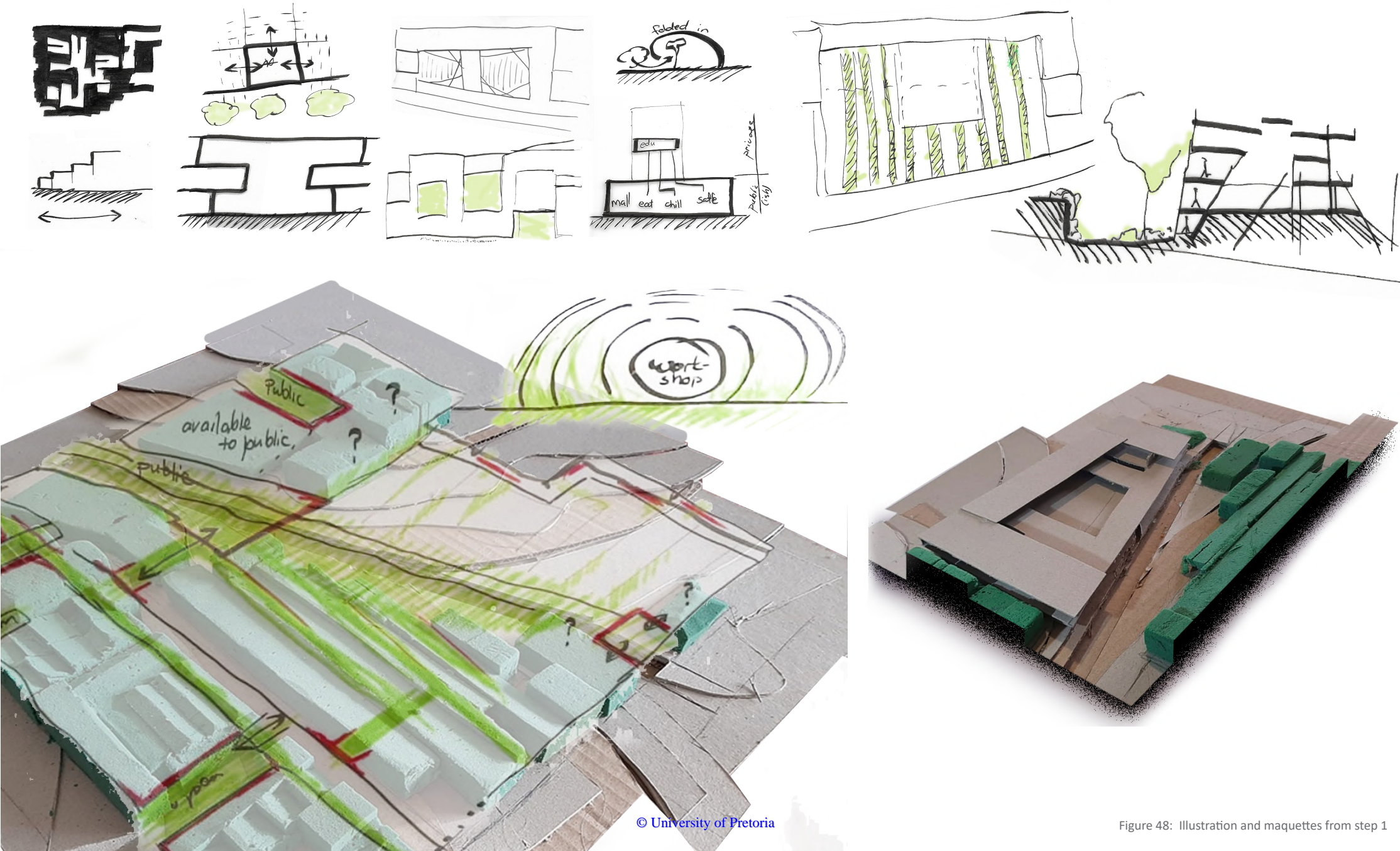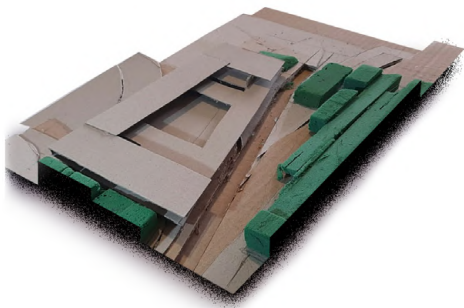
Reaction 1

Options tended to be extremely high mass, with more extensive open floor planes as would often be found in large open plan studio spaces and seas of cubicles. It was subsequently concluded that this would not be in line with the intentions of the project, since it would severely limit the students' abilities to customise their spaces and the way they use it.

Reaction 2

As much as the open floorplans would limit customisability, it would also notably inhibit the potential for providing every student with a sufficient connection with nature, while also ensuring that the plants can remain healthy and happy with little to no excessive maintenance as is often required with indoor gardens.
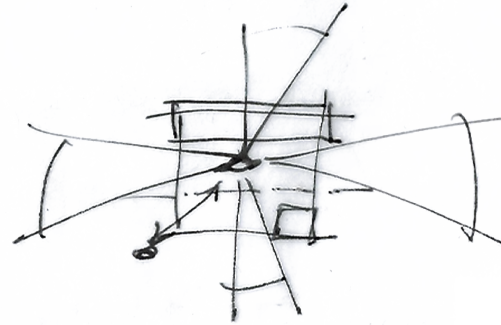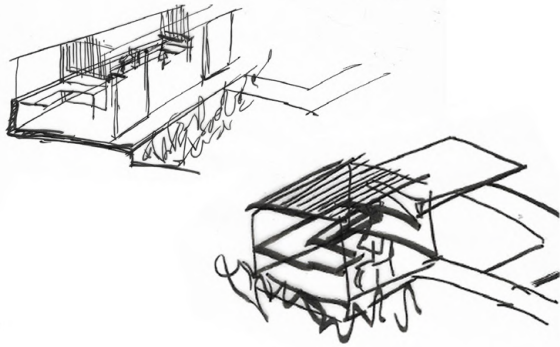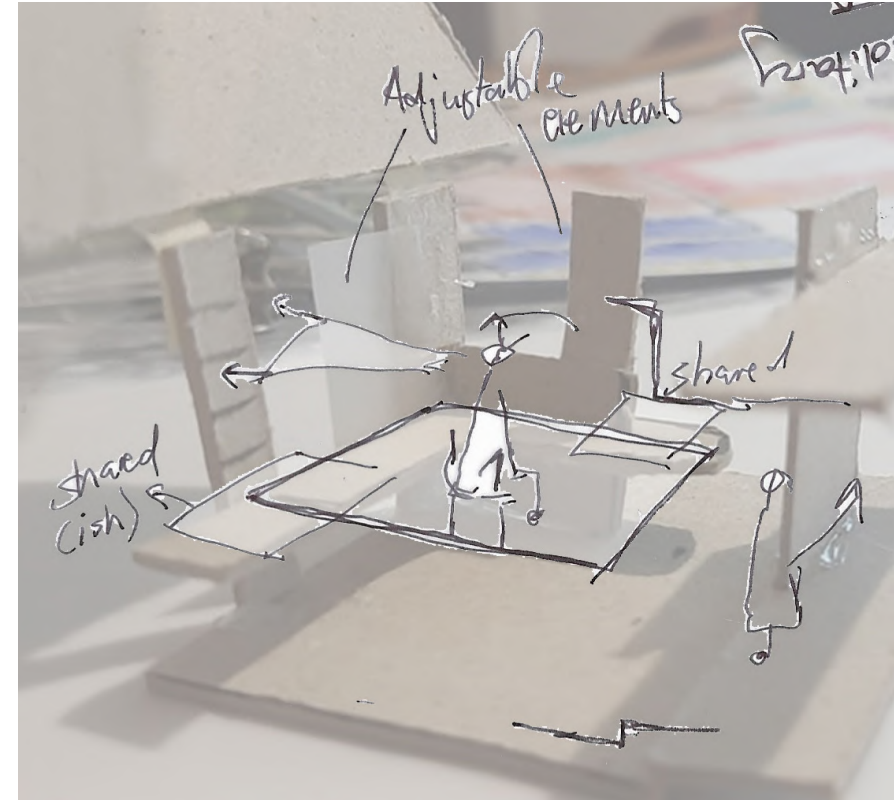
Figure 49: Illustration and maquettes from step 2

In response to the above reactions, the process of generating form was flipped in this iteration, starting with the requirements of an individual student's workspace and working backwards from there.

As discussed previously, equal ≠ the same, as such it is argued that the individual learning pods ought to have a set of core parameters (e.g. size, structure and basic material palette) that will remain consistent for all students. Over these base parameters however, a student would be able to personalise the space in terms of how it is decorated, how it is used, how open or closed it is to other students, the lighting quality and even comfort factors such as temperature.

The reasoning behind this response is to give every student the greatest possible freedom for individualisation while also enabling a yearly turnaround. Similarly the consistent parameters is intended to limit the risk of one individual student's preferences encroaching on or affecting another student's experience or ability to personalise their space. Lastly, by having a student individually take ownership of a small spatial pocket (rather than a shared ownership of an entire studio as is most often the case), it increases the chance of every student customising their space as it is infinitely less intimidating to make a spatial change that will only affect themselves than to make a change that might affect everyone (inadvertently feeding into the second motivation above).
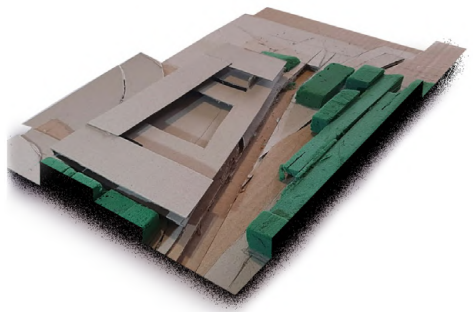
Reaction 3

There was an insufficient mediation between the pubic and private spheres, which was only reinforced by the high mass, blunt edge. This iteration would have also needed to rely heavily on active access control, where it would have been preferable to predominantly use passive access control as a means of making the building seem more accessible and friendly

Breezeblock Cafe & Local Studio Office upstairs
Dissuading people from entering where they shouldn't, rather than imposing hard barriers
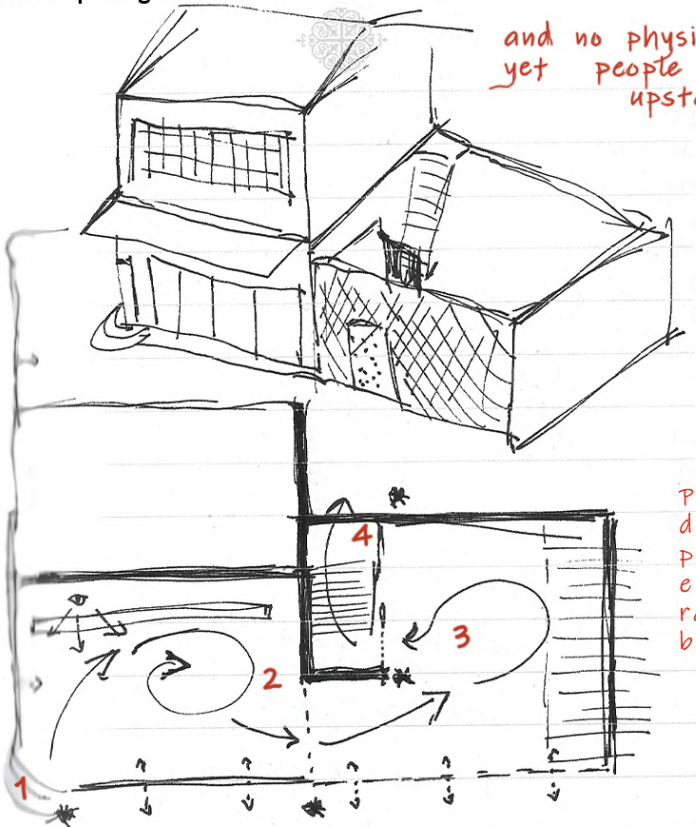
and no physical barriers yet people don't go upstairs

Power of dissuading people from entering rather than barring them

4 control points no visual access but active

Figure 50: Formal precedent - Breezeblock Cafe

7th Street Melville, Johannesburg
Passive access control by layering functions from most public to most private and having these layers act as filters
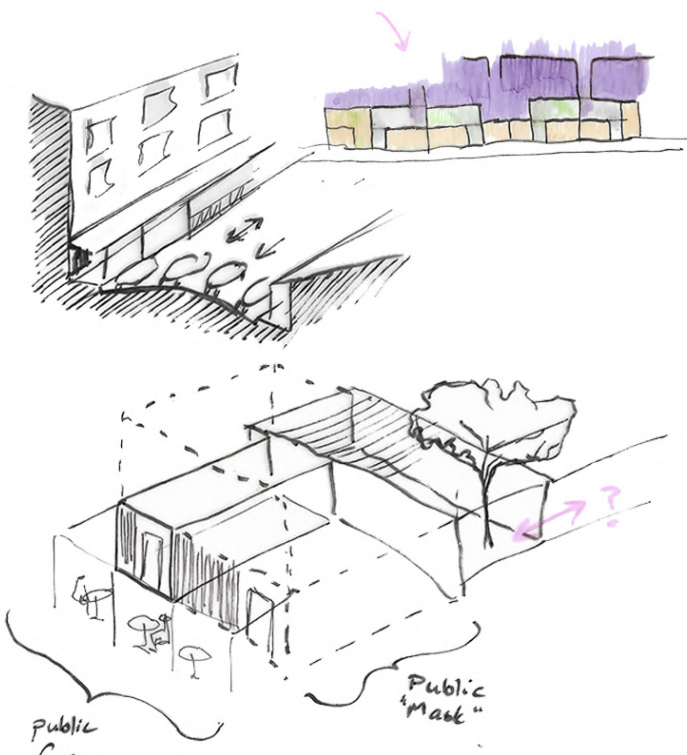
Additional observations:
- Diversity is densely packed along the street edge but shops go to varying depths
- Shop fronts are short but interesting and expressive
- Highly pedestrian orientated
- Perception of safety through passive surveillance
- Street as destination

The street has a kind of patina that has been acquired over time, isn't overly neat, making it feel lived in and as if one is allowed to live in it

public face

Public "Mask"

sidewalk = room w/ 4 planes
canopy
road side
Building wall
ground
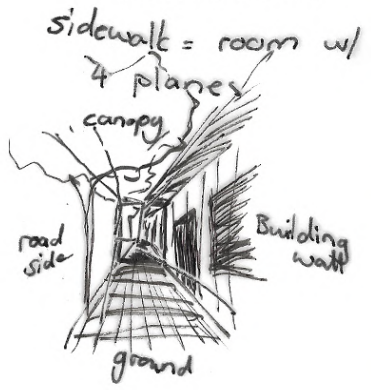
Figure 51: Formal precedent - 7th Street Melville, Johannesburg

In both precedents privacy and access thresholds are created by staggering access points and having different types of passive 'surveillance' at each point. The premise of this approach is to subtly dissuade entry by persons who do not have an actual reason for entering (whether innocently or malevolently) rather than having hard, defined barriers. Subsequently this approach cultivates a much healthier relationship and mediation between the public and private realm, where persons within a building or space can feel safe and secure, while those outside it do not feel like they are being forcefully kept out

Passive access control however, does not adequately address concerns regarding safety (both for students and their property as well as the building itself) during turbulent events such as riots, as occurred in the Bertrams area during this year. As a result it remains essential for the campus to be a means of cutting off access to the campus if it was required.

Reaction 1
In its current configuration the scattering of pods would either be highly exposed or would require extensive and likely overbearing enclosure in order to ensure the comfort of the users.

Reaction 2
The amount of space required to execute this option would have been extensive (likely even exceeding the available space) and would have run the likely risk of the pods 'sprawling' across the site, leaving little room for nature to breath.

Reaction 3
This iteration errs on the side of catering to those students who distinctly prefer solitary spaces while not leaving many options for those who are more extroverted.

Reaction 4
There is also a lack of synergy and sympathy between the individual pods and the more collaborative and public spaces (interaction spaces, workshops and public edge specifically).

Figure 52: Illustration and maquettes from step 4

1- pod string
The conclusion was reached that a string of pods would be the most effective way to deliver on the majority of these critiques levelled at the pod as an island iteration
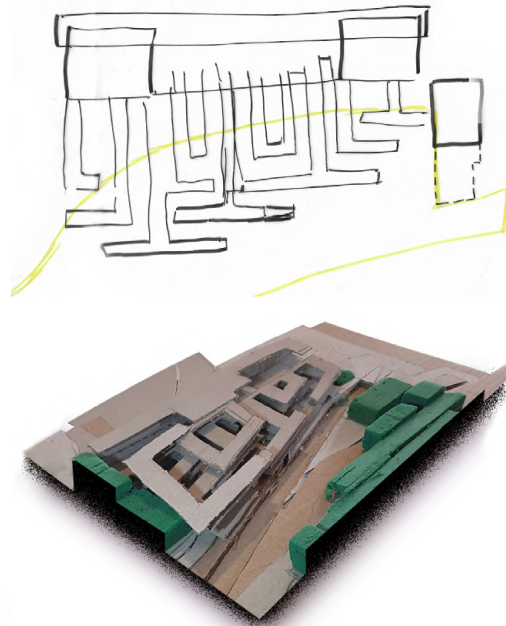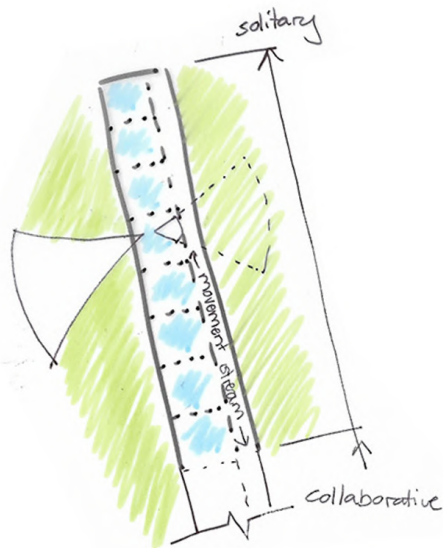
2- rectilinear iteration
The layout that was explored limited the potential for variation as the pattern was extremely regular and the inherent angularity imparted a feeling of rigidity (especially to the in-between spaces) which stood in contravention of the intentions of the pods and the intervention in general.

There was also a recurring concern that these in between spaces would not be comfortable due to both the scale and the degree of solar exposure.
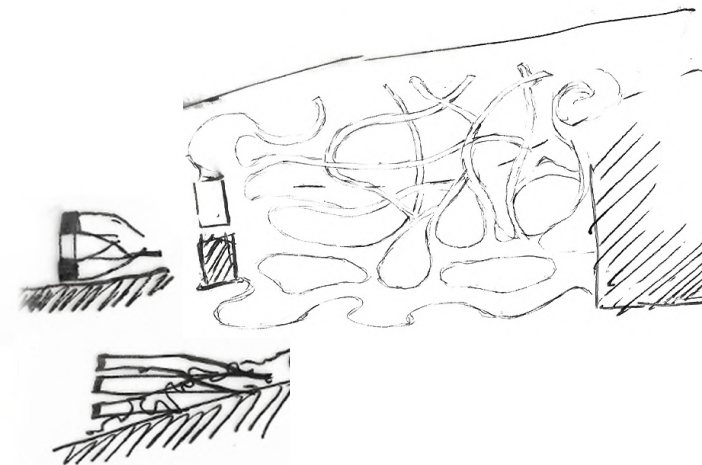
3- organic iteration
In order to alleviate this rigidity, several configurations were considered that introduced organic geometry.

The problem with the use of organic shapes in this instance was inconsistency in how room, furniture and even services would be shaped, meaning that nearly everything in the building would have needed to be custom made and would have required individual detailing in many cases. While several items in the previous and subsequent iterations would still need to be custom made, it was concluded that any benefit derived from organic shapes was not outweighed by how infeasible it would be.

Similarly, the use of organic shapes notably decreased the viability of ensuring that every student has an equal space as the quantification of usable and useful space would have become notably more complicated than in the straight counterparts.
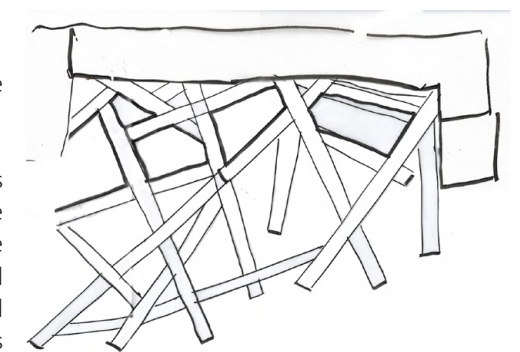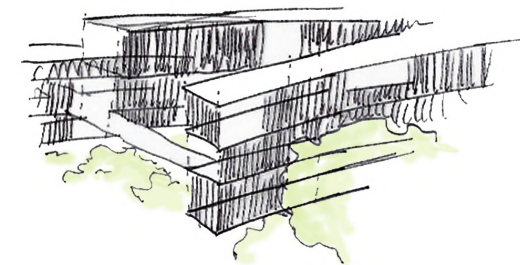
4- diagonal
As a mediation between iteration two and three diagonal angularity was investigated, where straight strings of pods were used but at odd angles.

Reaction 1
Diagonal strings of pods had the potential to deliver on all the requirements set out for the individual spaces, however there remained a disjunction between the individual spaces and the shared spaces.

Reaction 2
The diagonal strategy was strictly contained within the boundary of the building and the building was notably unsympathetic to the sidewalk and public sphere it implied.

Reaction 3
The diagonal strategy had not been investigated in section yet, nor how these pod strips might interact vertically.

Reaction 4
There was at this point no rationale as to why the strips were placed the way they were.

Figure 53: Illustration and maquettes from step 5
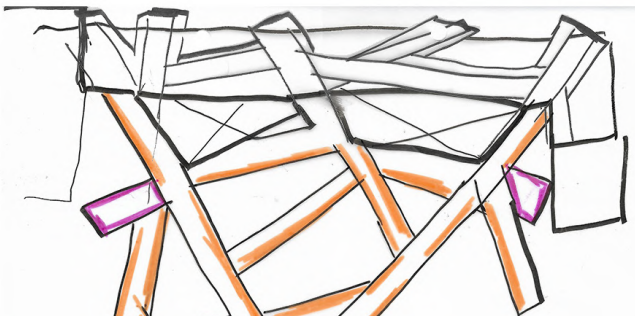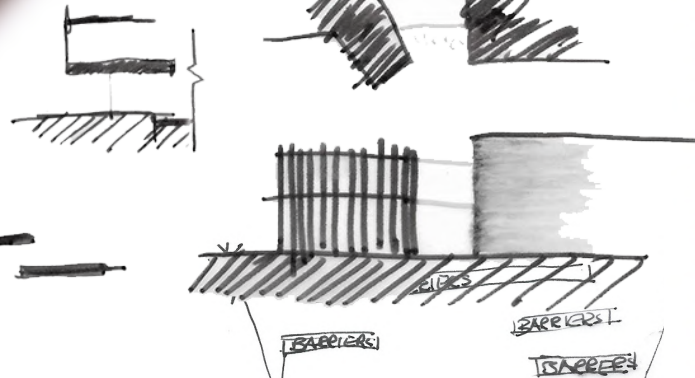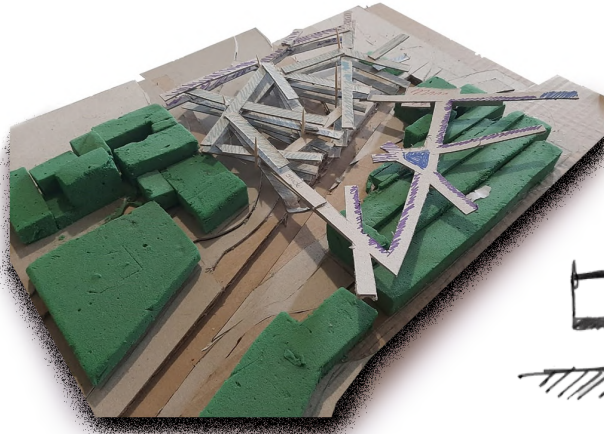
The Bertrams block size is quite notable, meaning that if the building edge was to be straight, with no undulation or interruption, it would likely feel too long and too intimidating, resulting in it being used less often and with limited positive effect, thus variations were investigated where the building edge steps out or recedes to create usable nooks, short stepped back promenades and other functional pockets.

Reaction 1
The building had become 'functionally diluted' with functions spread out over too much area and too far apart to have meaningful, mutually beneficial relationships between them.

Reaction 2
In an attempt to order the building, functions had inadvertently been placed into silos, such as placing interaction spaces in a completely separate building.

Reaction 3
In the latest iteration the river had become a private space in order to increase safety for the students moving between the two sides of the river, even though it has notably more social value as a public thoroughfare than as a private enclave.

Reaction 4
After subsequent iterations and discovering additional informants, there were a number of functions that were no longer located in the most mutually beneficial parts of the building.

quiet space | space that need sound insulation anyway e.g. a sound | noisy space
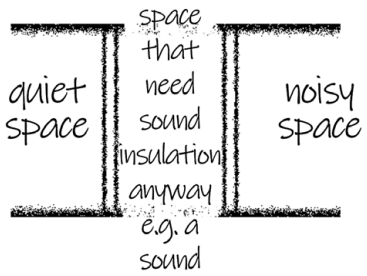
Opportunity for mutually beneficial relationships between functions

- Individual learning pockets
- Informal interaction spaces
- Formalised interaction spaces
- Niche functions (library, sound booths, computer labs etc.)
- Workshops/ Makers' spaces
- Commercial spaces (shops, cafe, information centre etc.)
- Service spaces (ablutions, storage, parking etc.)

Figure 56: Illustrations and maquettes from step 6
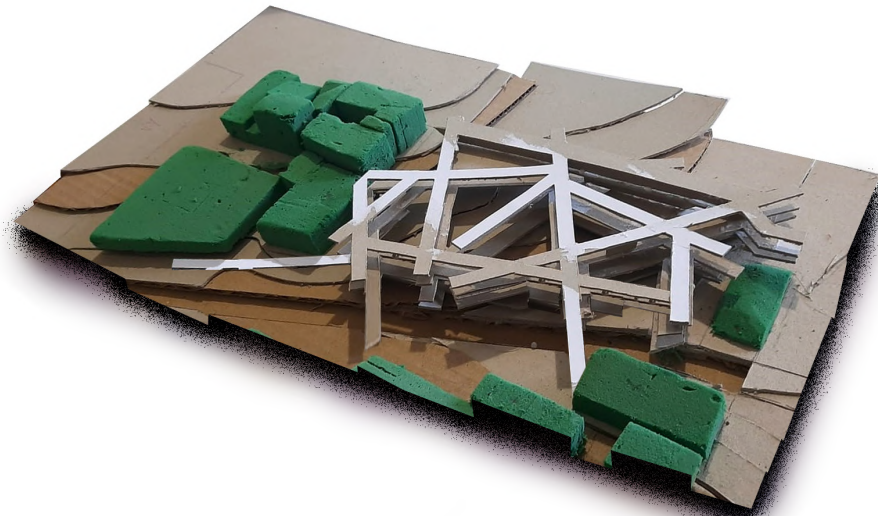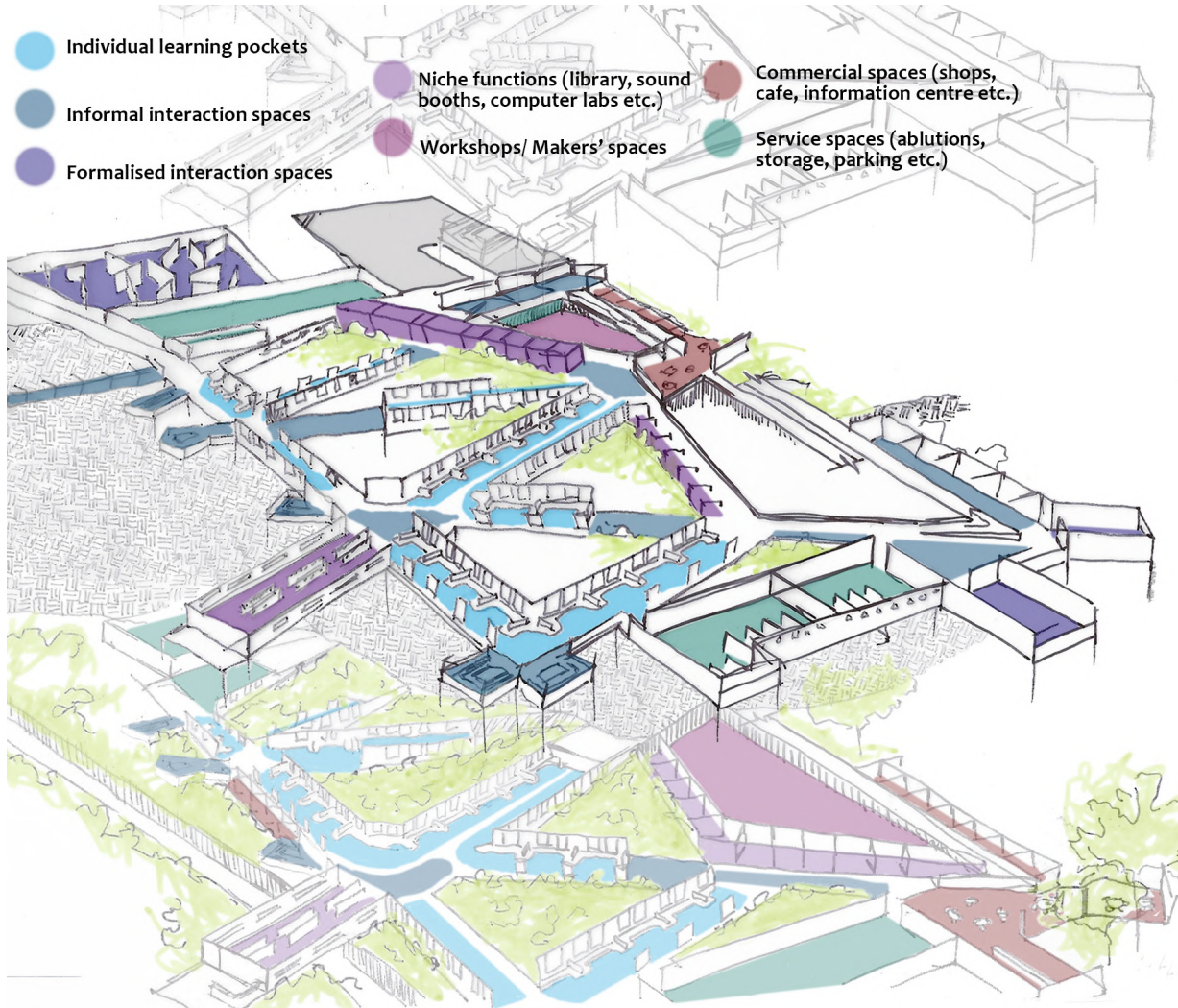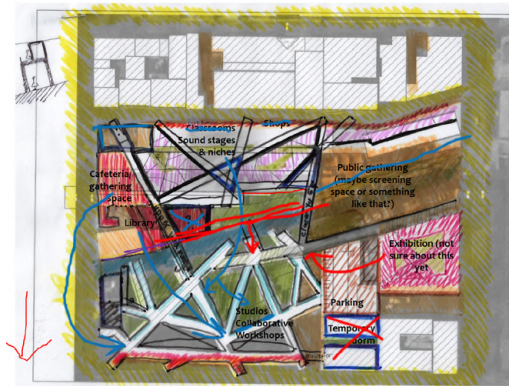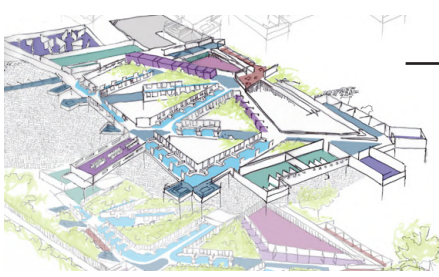
Speculate **Build** **Repeat**

Figure 57: Illustrations and maquettes from step 7.1
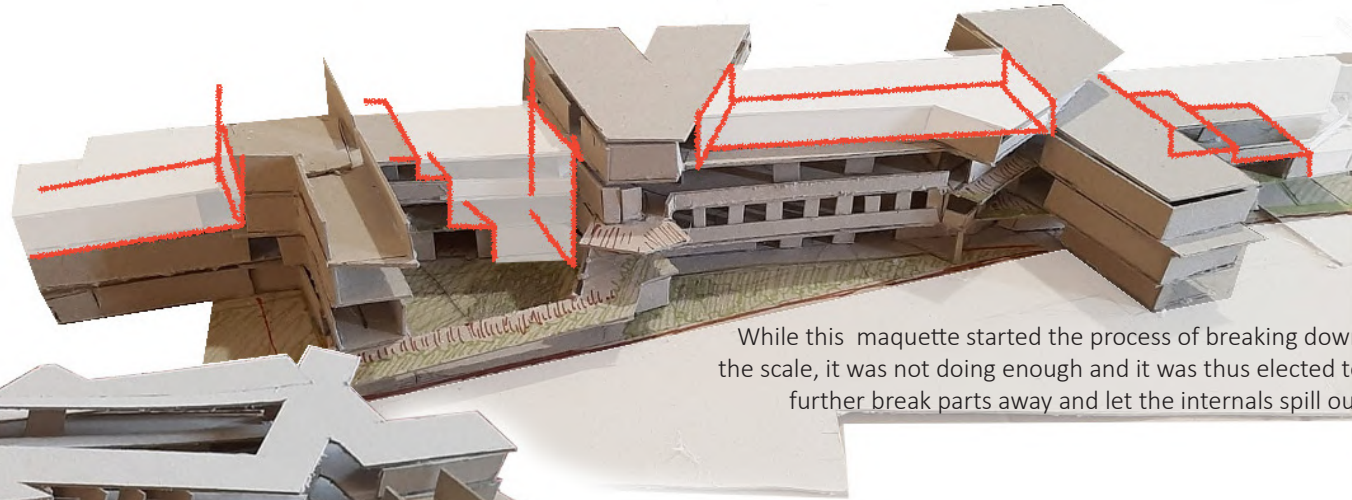
While this maquette started the process of breaking down the scale, it was not doing enough and it was thus elected to further break parts away and let the internals spill out
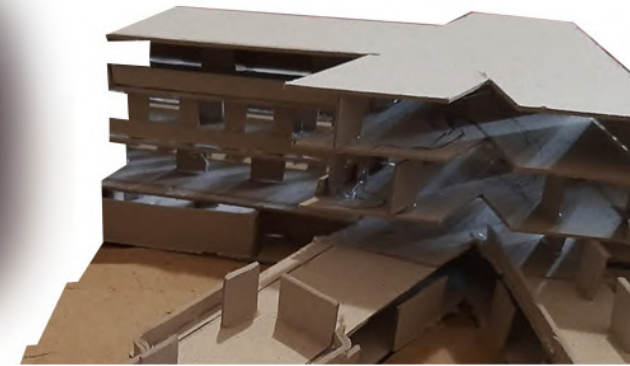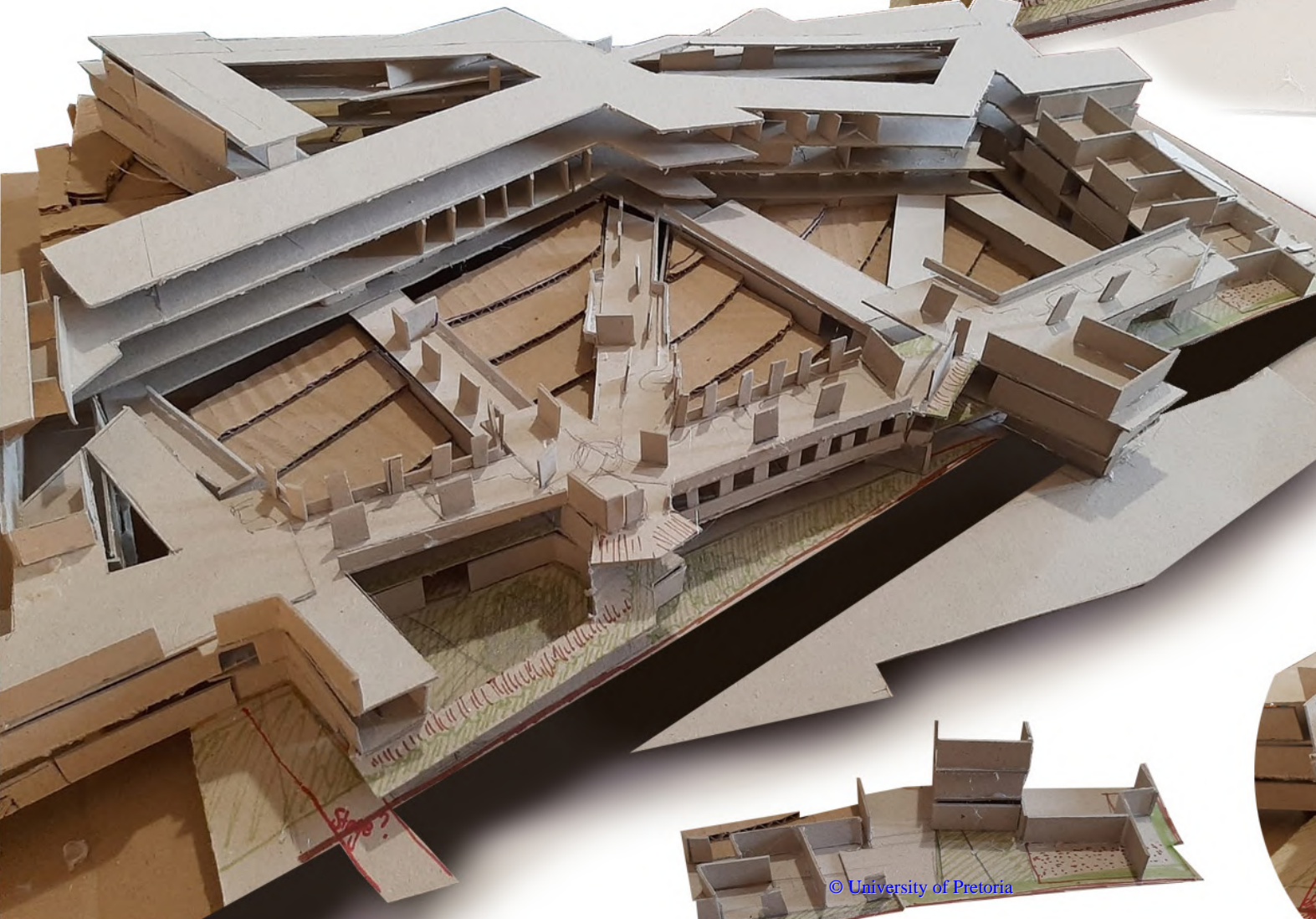
Reaction

There is no denying that having a fully idiosyncratic learning space would be ideal. One can also however, not deny that within a learning institution, such as the one being proposed, it is not viable for the spaces to be fully idiosyncratic since there is a yearly turnover of students. Students' preferences, furthermore, also fluctuate and depend on a multitude of informants, both within and outside of the learning experience. Not to mention that preferences could be different for different parts of a learning process and would thus change over the course of hours, days or weeks.
Based on these fluctuations it was determined that it would be better for students to be in control of how spaces change, but for there to be overarching parameters that remain consistent.

Subsequently there are three steps in the individualisation process of the individual pockets:
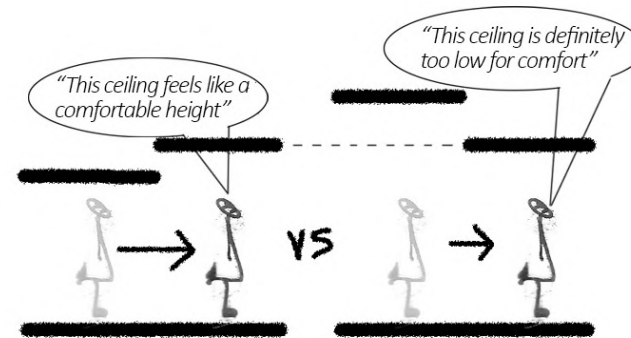
Figure 59: Sensory Heuristics

Sensory heuristics will be used to distort students' perspectives of the spaces. As noted previously there will invariably be some spatial characteristics (pertaining to the structure for example) that cannot be changed by individual students. By putting these characteristics in contrast or in combination with others however, students could be lead to experience them more favourably than they might have found them

Pockets that are located in different parts of the building will inherently have different properties. A student would thus be able to choose a pod that has the characteristics that in general suit their preferences better. These characteristics include level of solar exposure, sound, proximity to the ground or other functions and even the materials used.
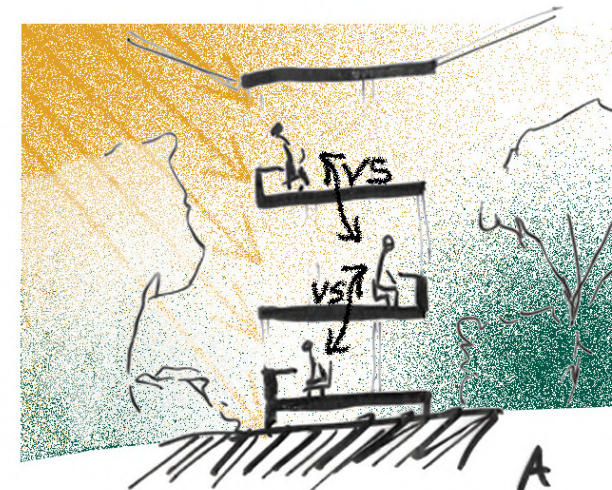
Figure 60: Variation by virtue of where a pocket is

Lastly, students would be able to cosmetically adapt the space to suit their needs. This specifically pertains to reconfiguring furniture items, sliding elements around and introducing decoration at their discretion. All of these changes ought to be extremely easy to achieve

Figure 58:
Illustrations and maquettes from step 7.2

Figure 61: Adaptability of pockets

It was noted that populating the entire edge would introduce a massive increase in small business in close proximity to each other (the proximity to Victoria Yards should also be kept in mind in addition to the many small business that populate the area). While this could have a number of benefits, it is speculated that there is a high likelihood that it would actually negatively affect the businesses in the surrounding area as Bertrams is not big enough to support that many small businesses on its own (even with an influx of students) and it would not be feasible to expect visitors to make up the difference. Thus it was elected to only populate some sections of the building's edge. This also introduced the secondary benefit of making it possible to have parts of the building (specifically the makers' spaces) visually accessible to the public and enabling a continuous visual interaction between the two spheres.

Figure 62: Maquette of Step 7.3
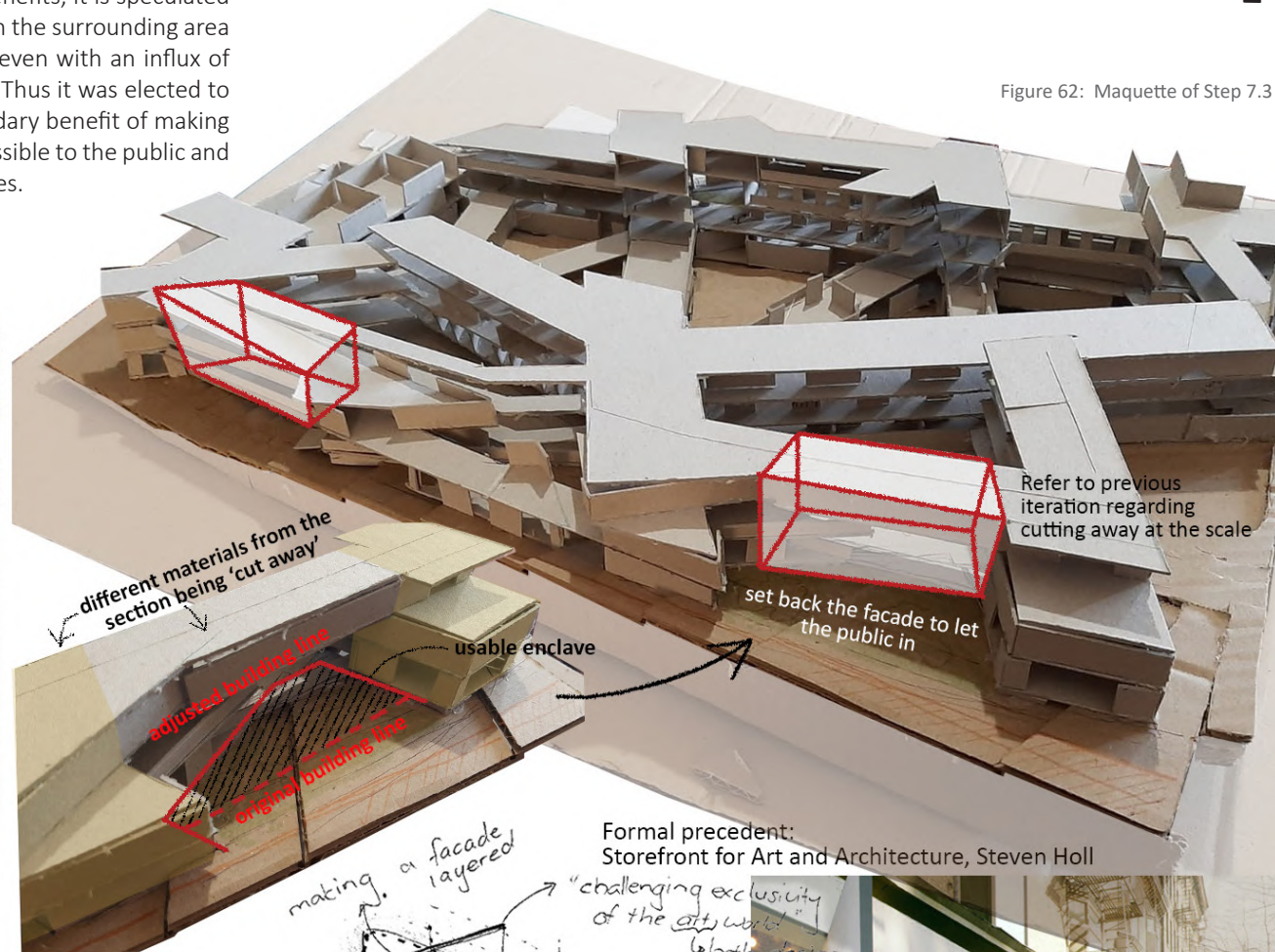
Strategic precedent: Safe-to-fail experiments, Jack Ahern (2011)

Healthy streets agenda   Green Alley project   Fine Young Urbanists

This approach employs many small changes all approaching shared goals from different angles to limit risks while increasing the chance of finding viable solutions. This approach has three distinct benefits:

1. It results in slow but steady improvement over time with fewer vulnerabilities. If the implementation is thus interrupted, progress made will not be undone as every change was done independently.
2. The small scale makes the approach dynamic, able to adapt quickly when new information arises or the situation changes.
3. It is comparatively easy and cost effective to implement, even retroactively.

Figure 63: Strategic precedent - Safe-to-fail experiments

Refer to previous iteration regarding cutting away at the scale

different materials from the section being 'cut away'

set back the facade to let the public in

usable enclave

adjusted building line

original building line

Formal precedent:
Storefront for Art and Architecture, Steven Holl

making a facade layered

"challenging exclusivity of the art world both design and tertiary education have a similar stigma

contrast between inside and skin that is being pealed away

public private

But not

Figure 64: Formal precedent -Storefront for Art and Architecture
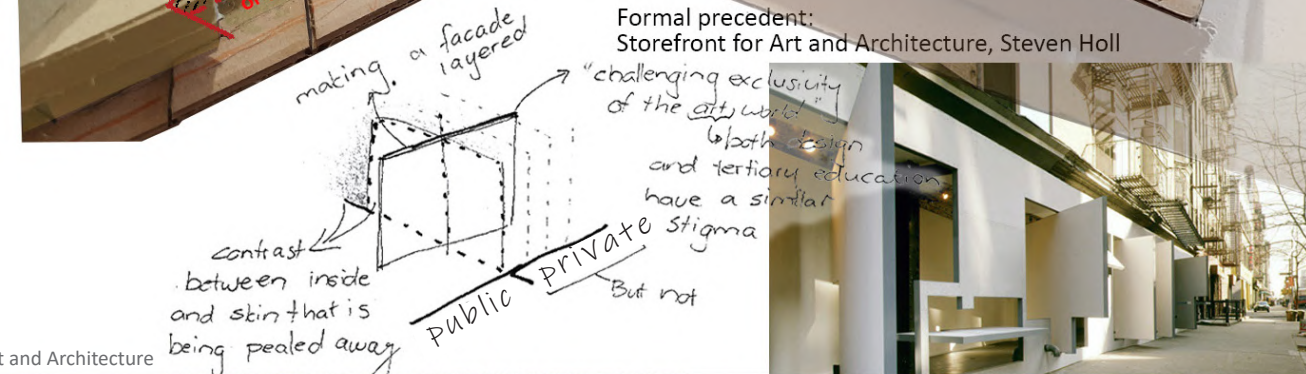
Reaction 1

Acoustic challenges and problems would remain a notable concern as long as the workshop atriums remained open to the surrounding areas as absorptive material on balustrades and other surfaces would be insufficient to kerb the impact of workshop sounds. This problem also applied to the extensive use of glazing elements to separate the spaces since glass is not a sufficient sound insulator at the extent that would have been required.

Reaction 2

In order for the workshop to be flexible and adaptable over time, services need to be both accessible and adjustable with ease. It was thus concluded that suspending services from the roof structure would be the most advantageous. This however would notably impede views from upper floors.

Reaction 3

Both workshops would be constantly producing fumes or odours as well as airborne particles such as sawdust. It was highly desirable for the rest of the building to remain free of these contaminants.

Subsequently it was elected to place a barrier between the workshop spaces and the interaction spaces with strategic glazed apertures to maintain visual connectivity even if it is not to the extent previously expected.

This however implied an opportunity to reconsider the vertical experience, with specific reference to the ramps as well as visual access from sidewalk.

Functional precedent: The Artist Asylum Makerspace
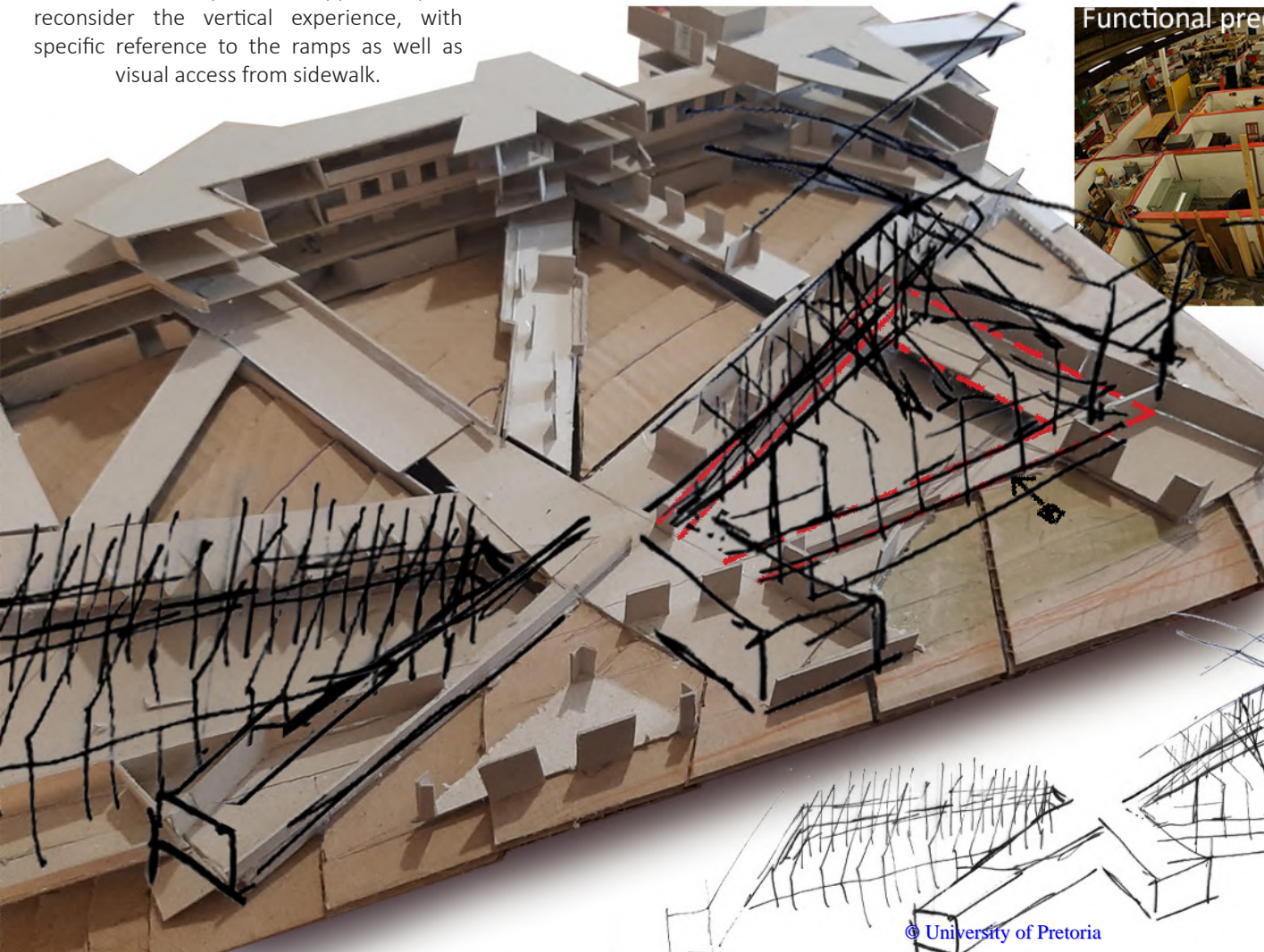
The Artist Asylum is a community fabrication centre that empowers individuals to give form to their ideas and to promote the teaching, learning and practice of fabrication. Strength in numbers.

Figure 65: Functional precedent - The Artist Asylum

Views and experience of students and observers are improved

Acoustics are no longer a problem
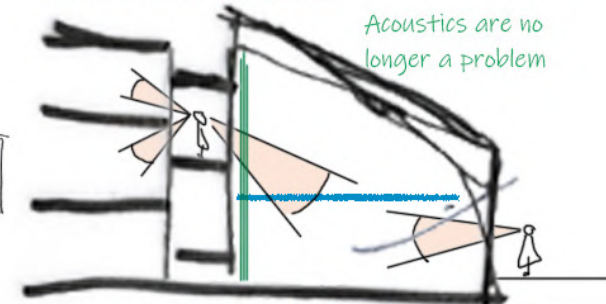
Suspended services can now work

Figure 66: Illustrations and maquettes of step 7.4
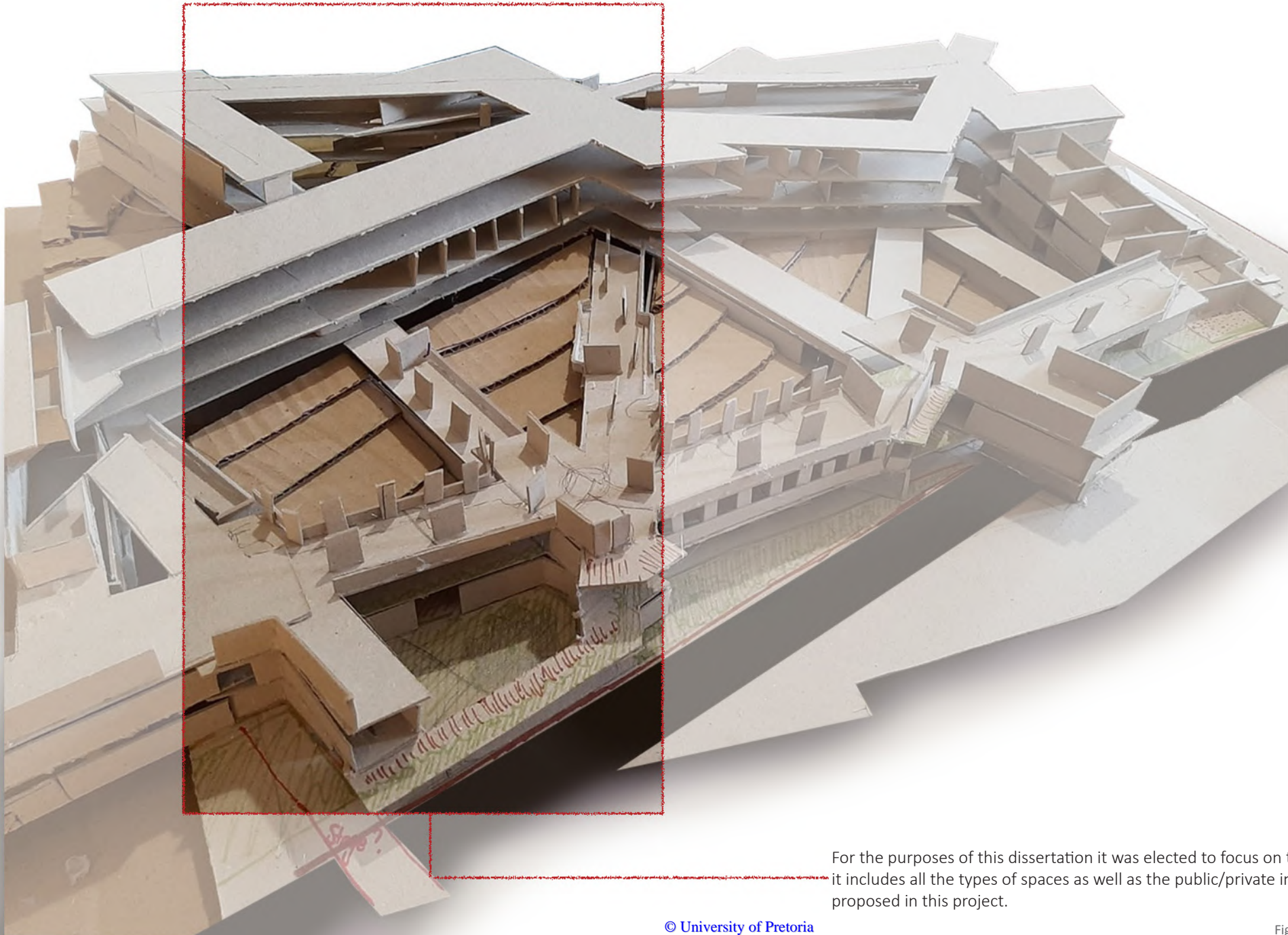
For the purposes of this dissertation it was elected to focus on the area indicated as it includes all the types of spaces as well as the public/private interface that is being proposed in this project.

Figure 67: Project focus area

Chapter 5
[Detail] Design Development
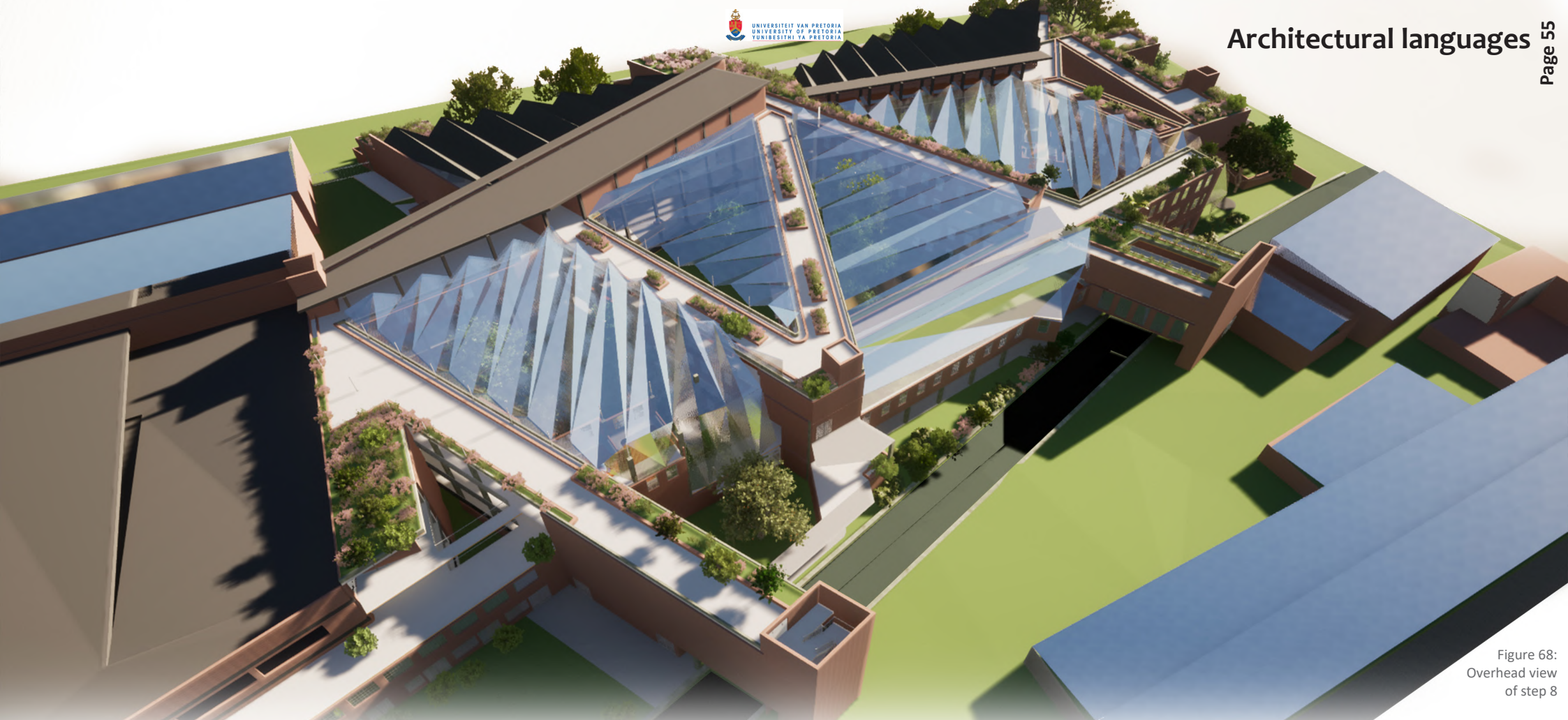
Courtyards:

Provide a connection with nature and aid in improving comfort within the building.
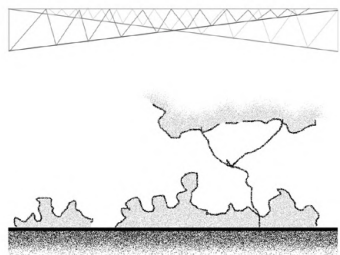
Strong vertical connection while being nested amongst the building and thus being amongst learning.

Makerspaces:

House workshops where students and community members can practically learn and make.
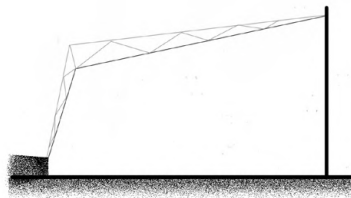
Enclosed but not encased to give the impression that the space is for, and open to, everyone. Consequently it is the intention for the space to feel light and open to facilitate this connectivity.

Interaction spaces:

House enclaves and infrastructure where students can meet and discuss, both formally and informally.
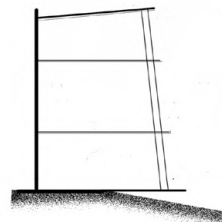
Highly active and energising to encourage interaction. Subsequently the architectural language of the spaces are a mediation between those of the individual and makerspaces.

Individual spaces:

Individual pockets where students can work in a solitary manner, or engage with theory.
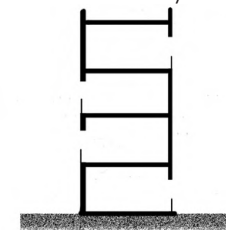
Provide a safe and private space for students to feel safe in. As such the individual spaces need to feel sturdy and secure while being nested in the earth to lend a feeling of stability.

Public spaces:

House economical, social and cultural functions that the public can enjoy and create overlap with students.
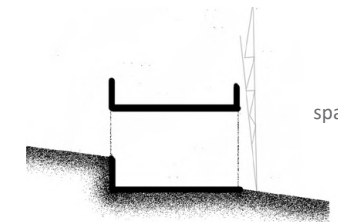
Invite public (especially community members) into the institution and encourage cross-pollination between the public and private spheres.
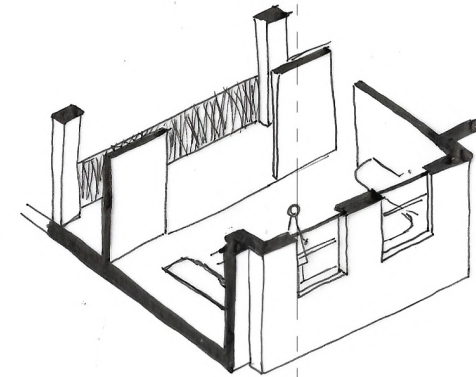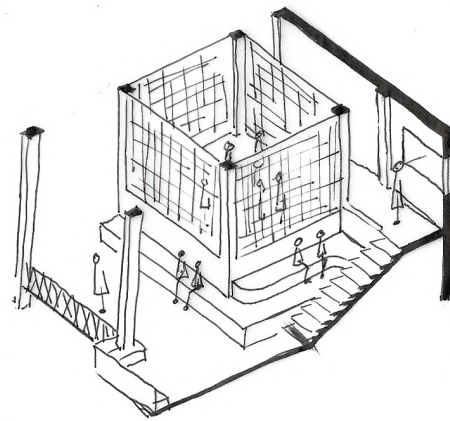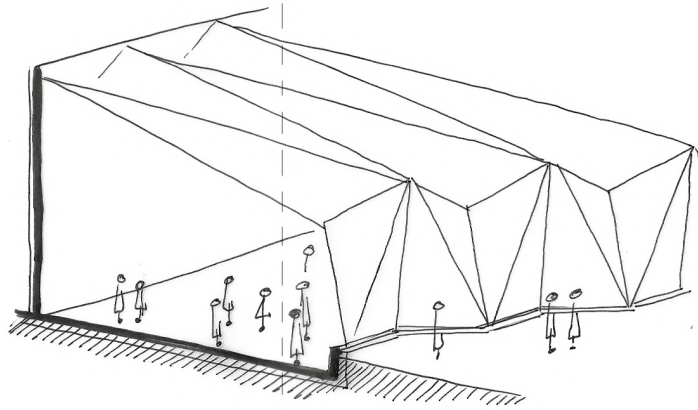
Tectonic — Stereotomic

Artificial materials — Natural materials

Structure is exposed — Structure is hidden

Colder — Warmer
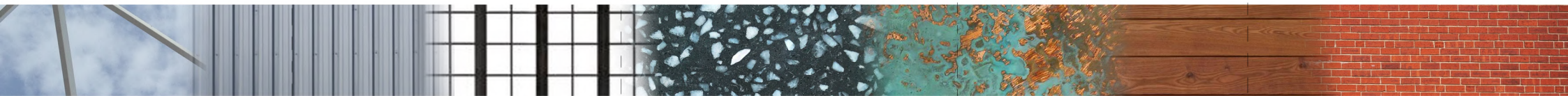
Figure 70: Material Spectrums

**Courtyards**   **Makerspaces**   **Interaction spaces**   **Individual spaces**   **Public spaces**

Figure 71: Experiential Spectrums
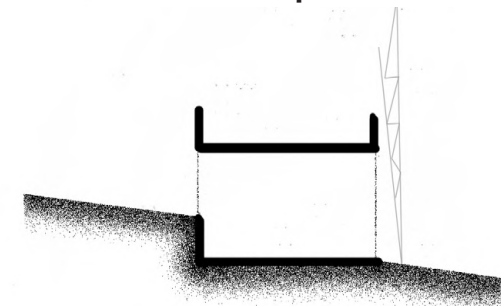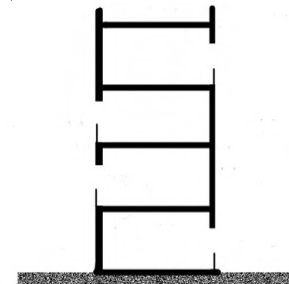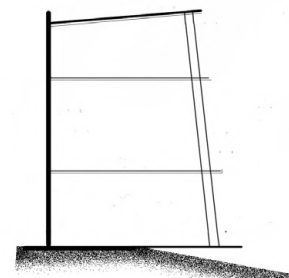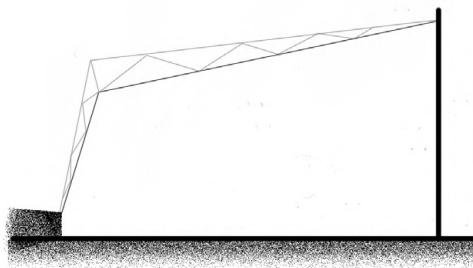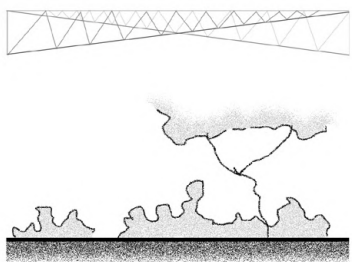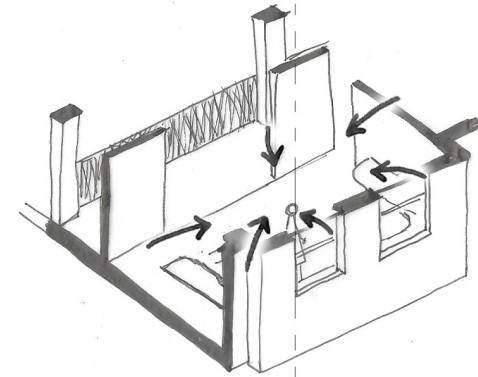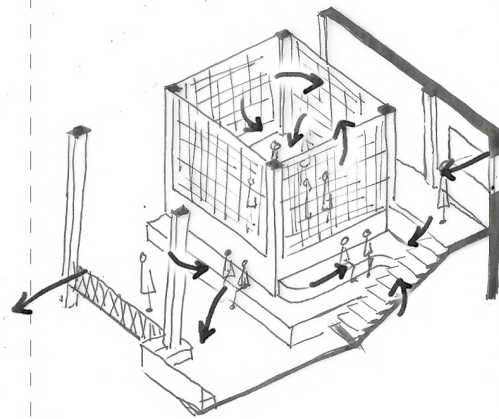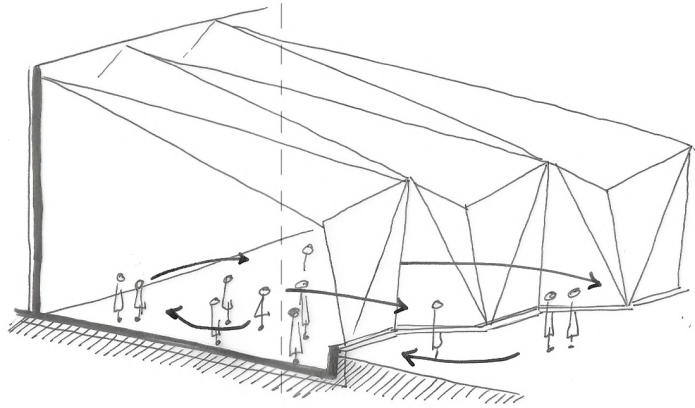
Visually permeable						Visually contained
Bigger volumes						Small volumes
'We' decide how things change						**'I'** decide how things change
Few but dramatic adaptations						Many small adaptations
Extroverted						Introverted

Courtyards
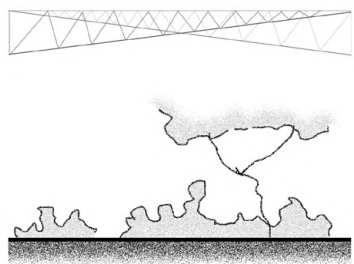
Makerspaces
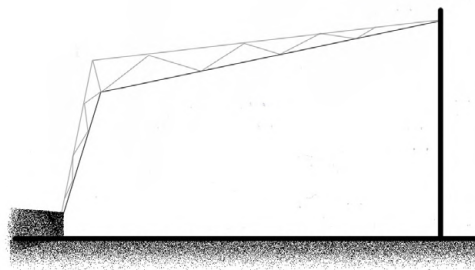
Interaction spaces
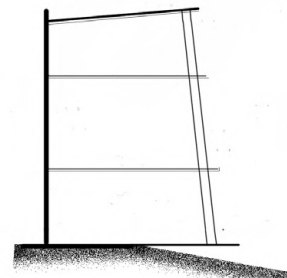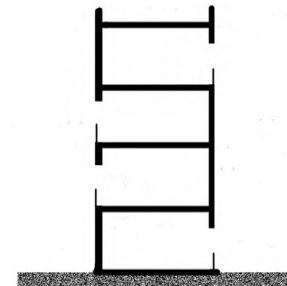
Individual spaces

Public spaces
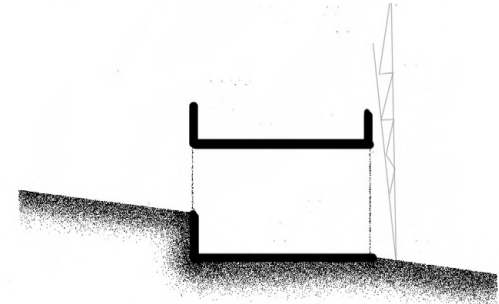
Big changes to the space **is possible,** but only by **consensus of the majority of users**

The amount of control an individual has over a space

The **individual** who's pocket it is, is the one **in control of the look and feel of that specific pocket** (over and above having chosen it in the first place

The space can be **changed and almost entirely reconfigured,** but it would be a **longer term commitment**

The scale/extent of changes that possible and catered for

The **pockets** have some **fixed parameters,** but and individual can make **many small, easy changes whenever they feel inclined to do so**

Courtyards
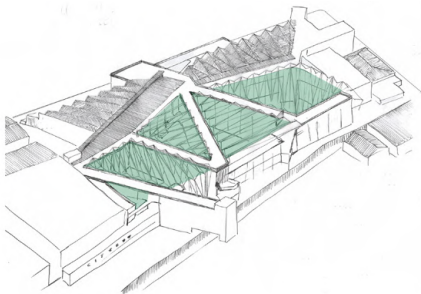
Makerspaces
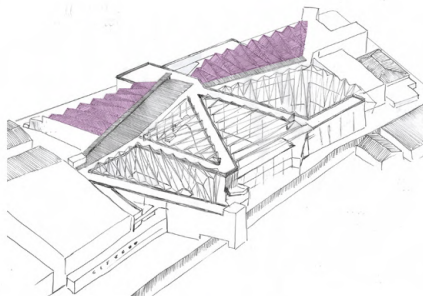
Interaction spaces
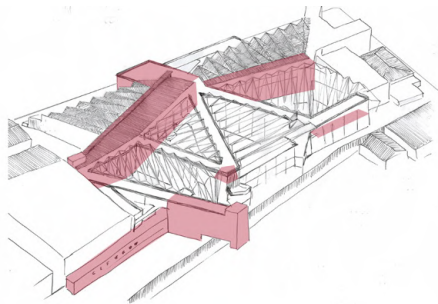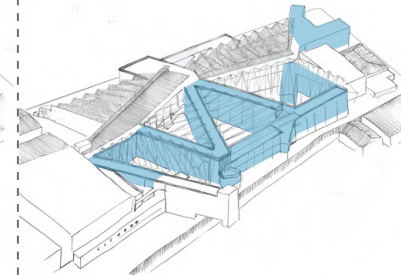
Individual spaces
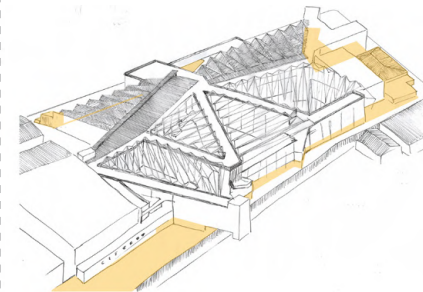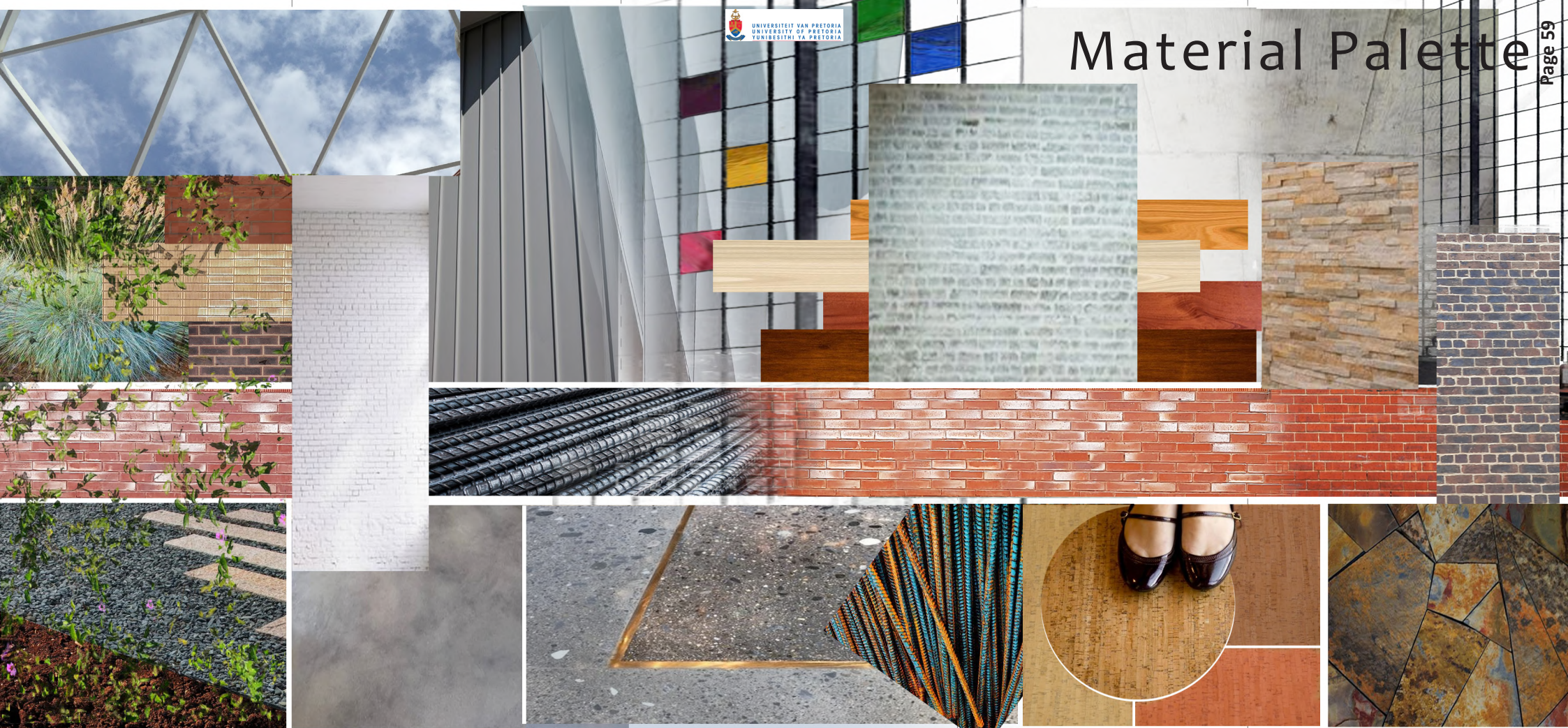
Public spaces

Figure 72: Material Palette

Courtyards
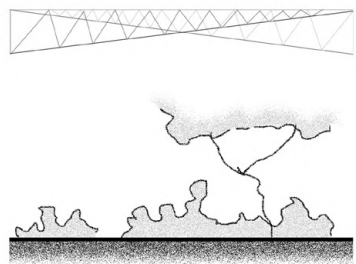
Makerspaces
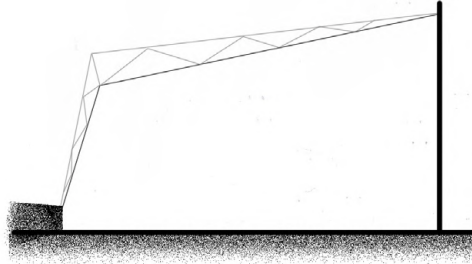
Interaction spaces
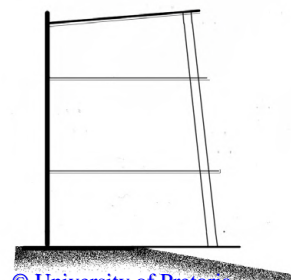
Individual spaces
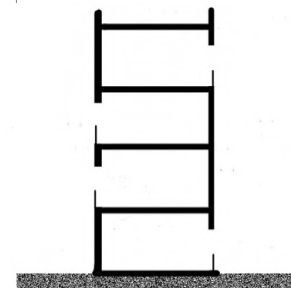
Public spaces
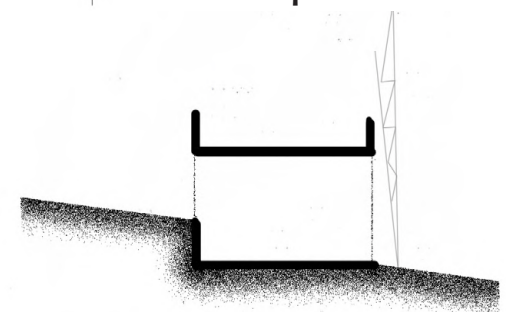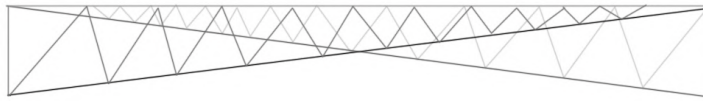
Throughout the design development the exposure or enclosure of the courtyards has been a recurring pivot point, as both a factor that has far reaching implications on the rest of the building as well as posing a unique technical challenge.
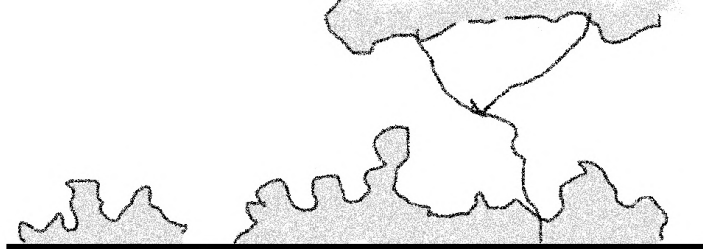
Ultimately it was elected to **cover** the courtyards in order to ensure that they are **usable all year** and to allow the individual pod strips to have **open walkways**, which would not have been viable if the courtyards had been exposed.

Subsequently it was determined that the method of enclosure
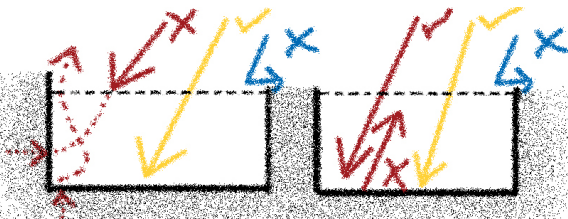
Enclosures needs to:
1. Keep heat out in summer while letting it in in winter
2. Allow light in
3. Provide protection from the elements
4. Span up to 25m
5. Navigate the triangular geometry
6. Be easily maintained
7. Be fully manually operable
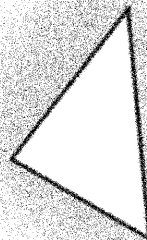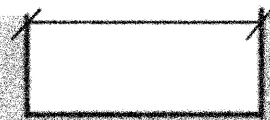
Figure 73: Courtyard enclosure requirements
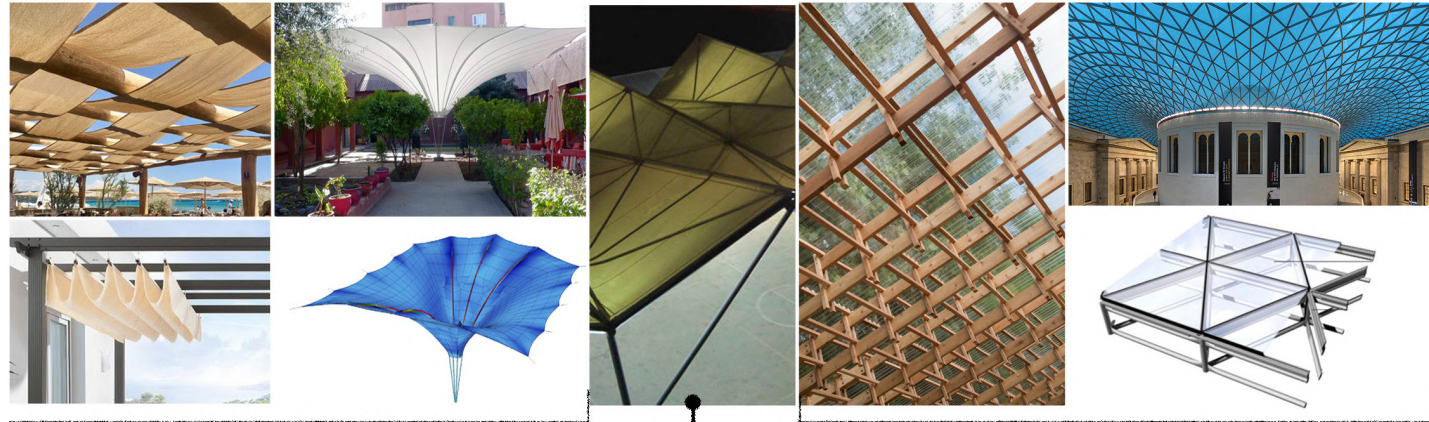
Objections to option:
Sealing the building
Transparency while maintaining comfort
Additional structures for span & geometry

4D truss however has potential, especially regarding load tracing

Objections to option:
Many complicated joints & parametrics
High (& expensive) material consumption
Ineloquent in relation to geometry

Passau State Library
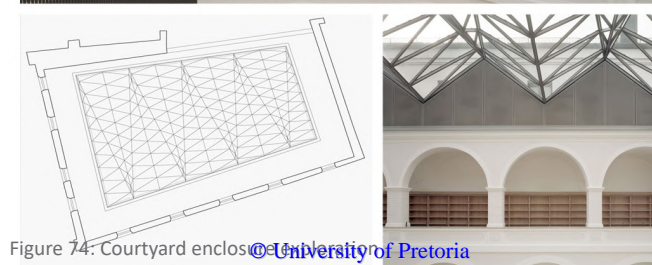
Figure 74: Courtyard enclosure
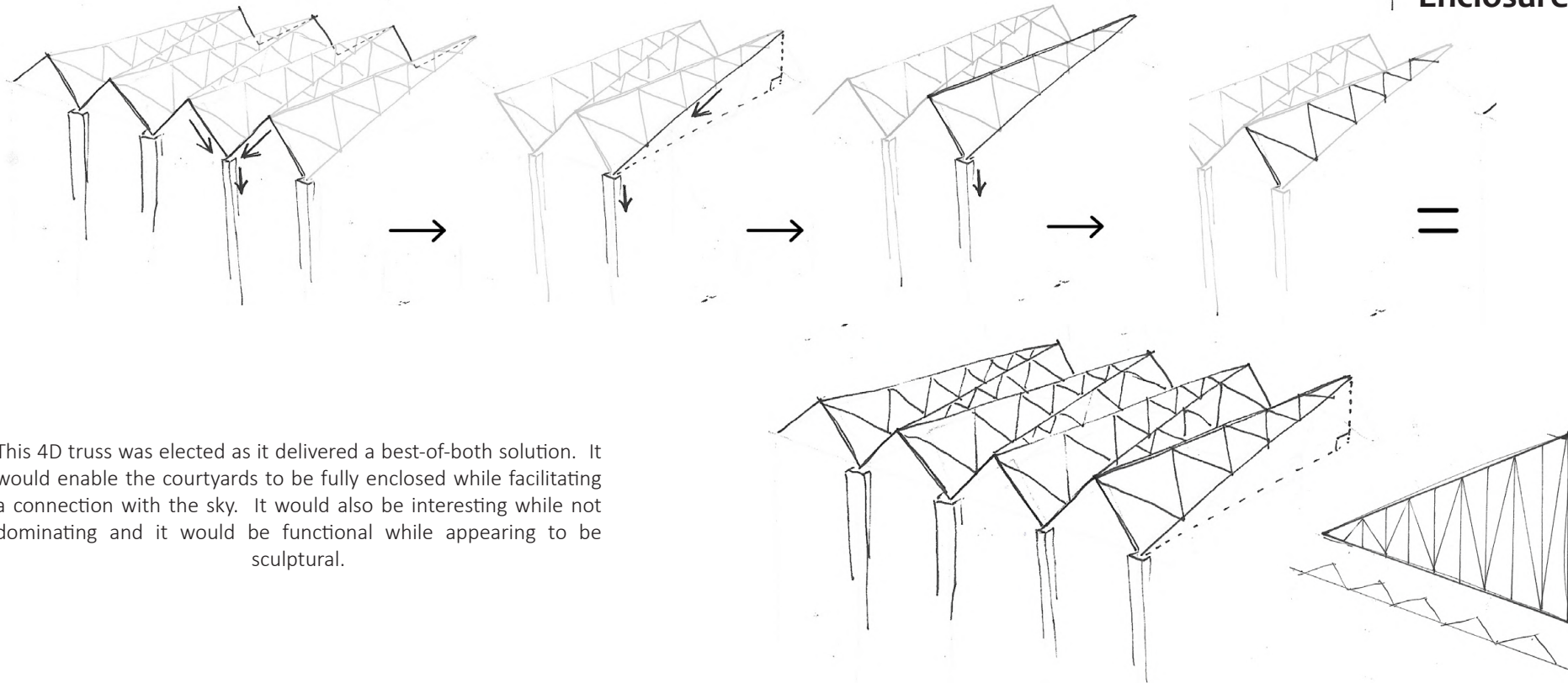
This 4D truss was elected as it delivered a best-of-both solution. It would enable the courtyards to be fully enclosed while facilitating a connection with the sky. It would also be interesting while not dominating and it would be functional while appearing to be sculptural.

Figure 75: Courtyard enclosure as a 4D truss

The roof sections that face North can be opened manually to allow solar ingress and ventilation as require by the building during various points of the day and year.

Three layers of transparent ETFE sheets with internal UV webbing (as illustrated above)as per the pattern indicated on the Northern Elevation

50x100 steel rectangular hollow section primed, painted with insulative foam paint before being painted matte black paint finish. These web members are welded to the 50x100 hollow section frame elements, to create a triangular truss structure. The angle between web members are not to exceed 60^0.

ETFE frame system as per manufacturer specification. The frame is to align with the SHS webbing when the roof section is in the closed position.

25x200mm steel hinges pop riveted to the RHS

Insulative polysulphide bead to be installed between the ETFE frame and the RHS

Figure 76: ETFE Internal structure

Detail 5.3 - Courtyard roof
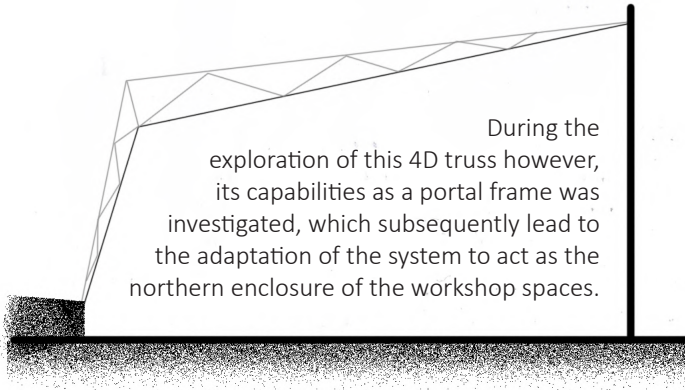
During the exploration of this 4D truss however, its capabilities as a portal frame was investigated, which subsequently lead to the adaptation of the system to act as the northern enclosure of the workshop spaces.

A secondary benefit of the 4D truss was a subtle similarity to the saw tooth, industrial roofs found in Bertrams, while maintaining its ideation identity

Figure 78: Saw tooth industrial roofs as found in Bertrams
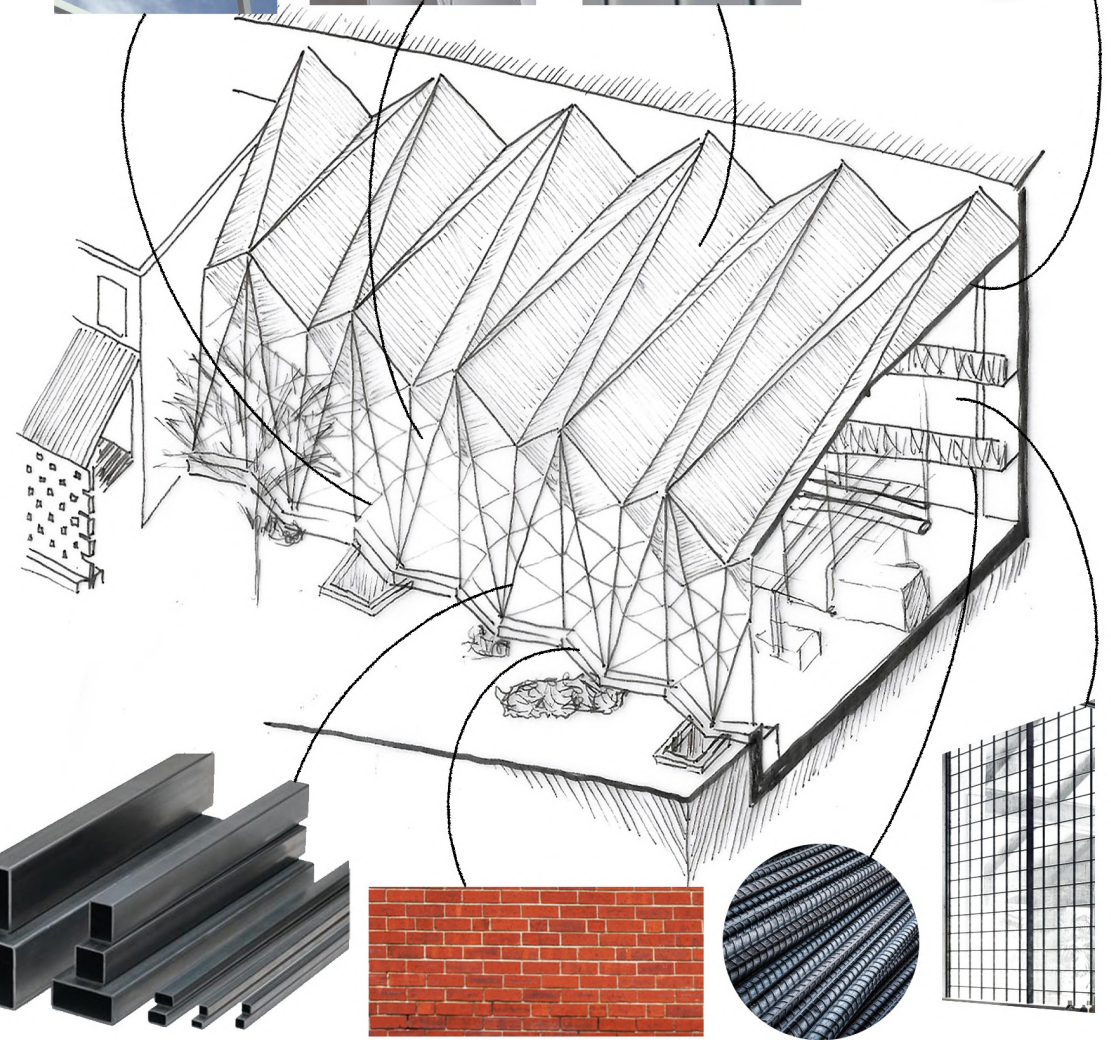
Figure 79: Maquette investigation of triangulation

Figure 80: Workshop material palette
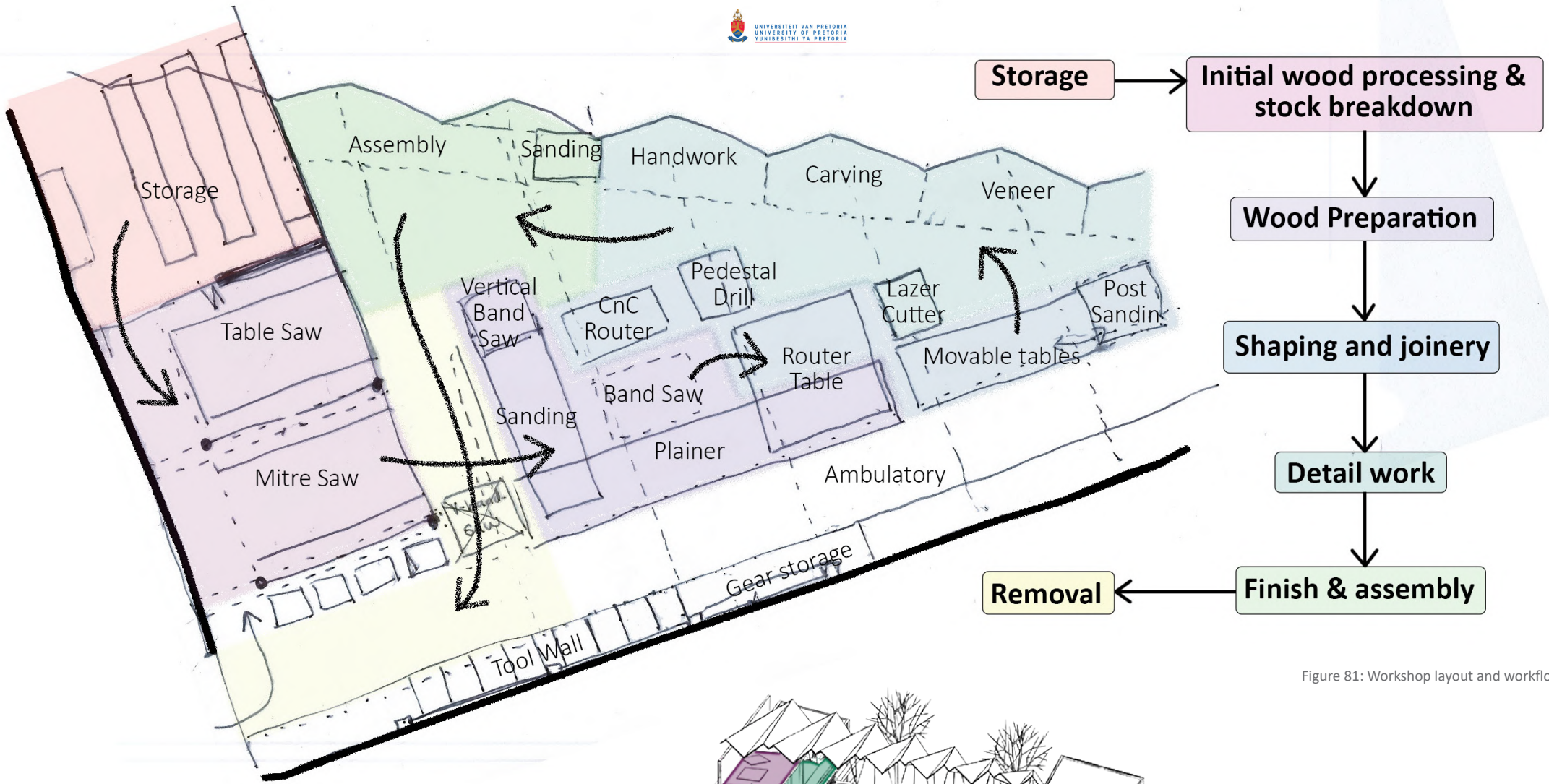
Figure 81: Workshop layout and workflow

Concurrently the Makerspace was being formalised to form the literal and figurative core of the building, being the one space that is shared and used by all students while also being the space that all movement passes through at some point, thus acting as a spindle point in relation to which the other functions are arranged.

These makerspaces are also the primary meeting point between the community and the student body, as the makerspaces will be open to the public and especially to the community, which is already in the process of cultivating a culture of making (as discussed in the section on the Maker's Valley Collective).

Under the canopy of "makerspaces", a number of more specialised workshops are proposed, each with their own distinct technical and spatial requirements. These include woodworking, steel and specialised artisan spaces such as pottery, CnC (e.g. 3D printing), painting and so forth.
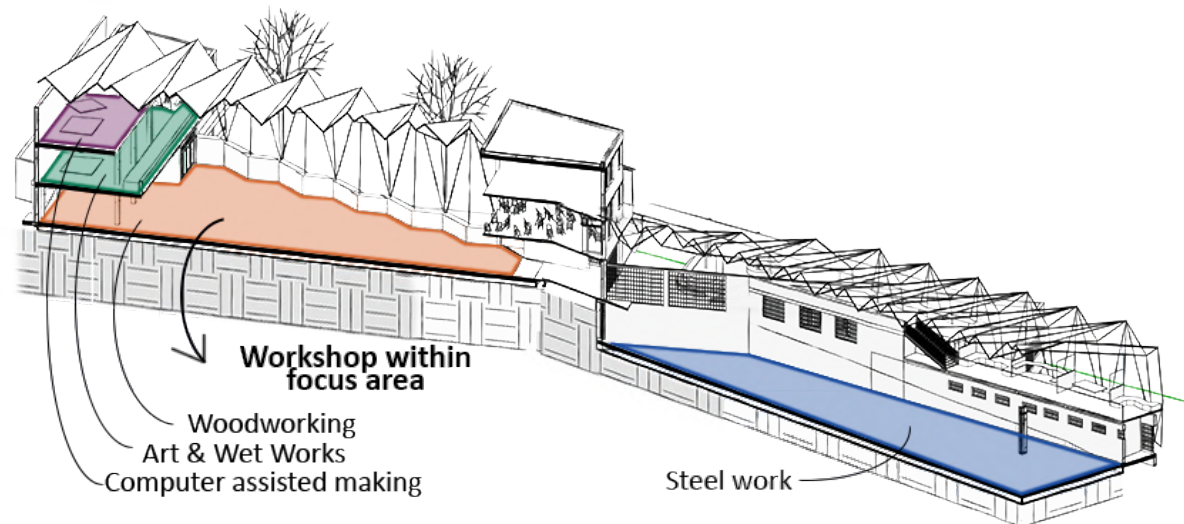
Figure 82: Variety of workshops within the building

Due to the variety of makers that would be using the space, as well as the constant development of technology, the workshops needed to be highly flexible and capable of changing quite extensively in a very short period of time.

Subsequently the services needed to be equally flexible. It was thus elected to suspend all the services from the portal frame structure to ensure that the services would never dictate the layout, use or the type of machinery that could be included in the workshop.

Pulley systems were also incorporated into the suspension system for the same reason

Figure 83: Service matrix
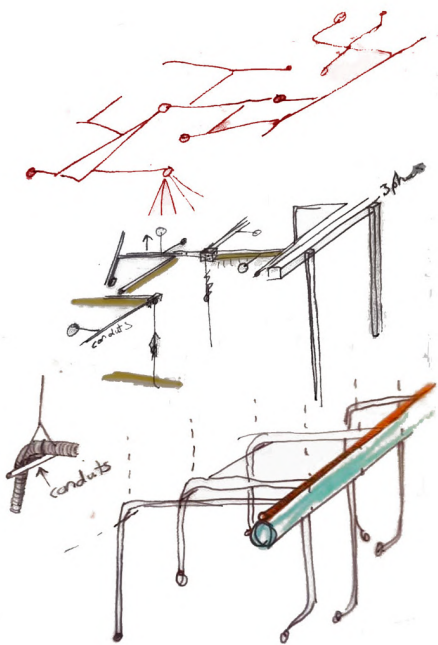
Acoustic panels

Project Suspension

Fire

Single phase power supply

Lighting

Three phase power supply

Fume Extractions

Sawdust Extraction

Figure 84: Layering of services

1:5 @ A4

A. Mountain detail
Specification as per Valley detail, with the valley flashing being replaced by a mountain flashing.
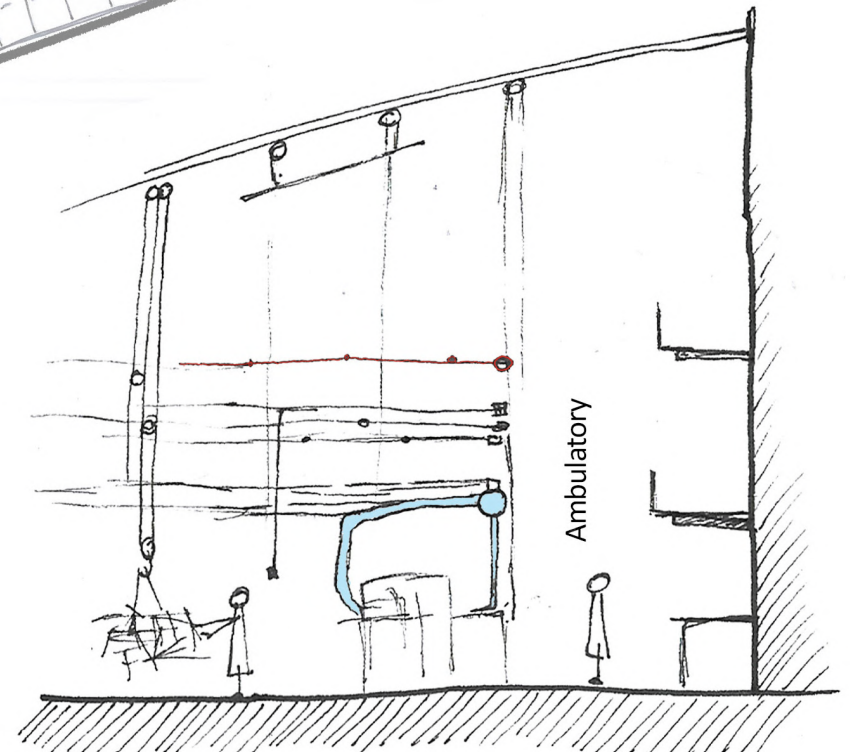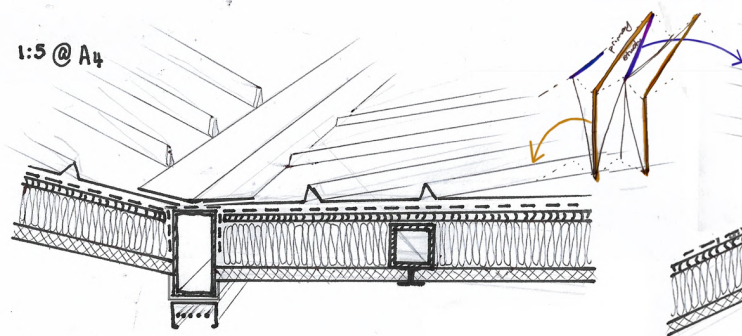
B. Valley detail
50x100 steel rectangular hollow section with 50x50 steel square hollow sections welded to it to create truss structure. Structure is painted with insulative paint before overlapping the insulation foil and installing a valley flashing.

Reflective, grey, widespread roof sheeting, installed over an insulation foil layed over a 20mm fiber board sheets fixed to the 50x50 hollow section. 50mm thermal insulation is sandwiched between the fiber board and a 35mm melamine acoustic board. Joints between melamine panels is to line up with the 50x50 hollow section.

50x50 cold rolled steel C-channel to be fixed to the bottom of the 50x100 hollow section and is to encase the service pulley system as illustrated below.

C. Vertical Structural Support
Specification as per Valley Detail, but running in the vertical plane to create the wall enclosure.

Reflective, grey, widespread roof sheeting to be installed with the flutes running parallel to the top most web member, which is a 50x100 steel rectangular hollow section, so that water runoff from the horisontal plan will still be directed towards the seam, while enabling a flush transition between the roof sheeting and the 40% translucent ETFE.
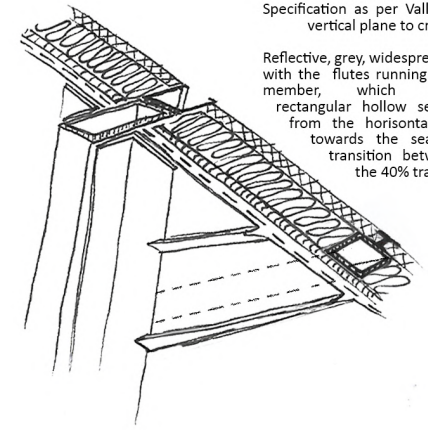
D. Web member detail
Specification as per Valley detail, but running in the vertical plane.

The top most web member is a 50x100 steel rectangular hollow section, painted with an insulative foam paint, before receiving a matte black pain finish. All the remaining web members are 50x50 steel square hollow sections, also painted with an insulative foam paint, before receiving a matte black pain finish. These web members are welded to the 50x100 hollow section frame elements, to create a triangular truss structure.

On the external edge of the RHS hollow sections (both rectangular and square) the frame for the ETFE system is to be mounted with an insulative polysulphide bead separating it from the webs as well as the flashing in the case of the top most web element.

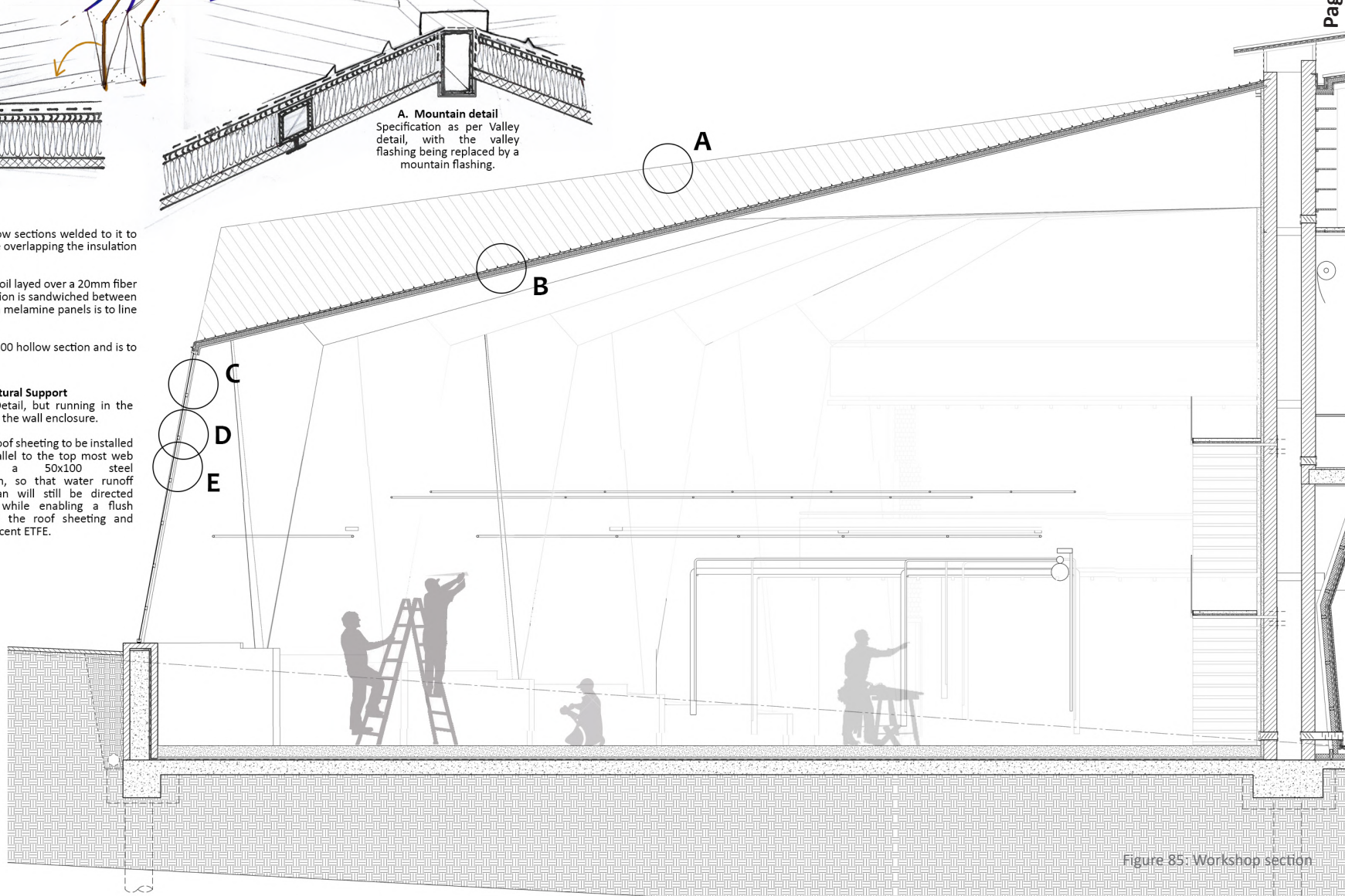**E. Web member detail**
50x50 steel square hollow section web members, painted with an insulative foam paint, before receiving a matte black pain finish. These web members are welded to the 50x100 hollow section frame elements, to create a triangular truss structure. The angle between web members are not to exceed 60⁰.

On the external edge of the SHS the frame for the ETFE system is to be mounted with an insulative polysulphide bead separating it from the SHS.

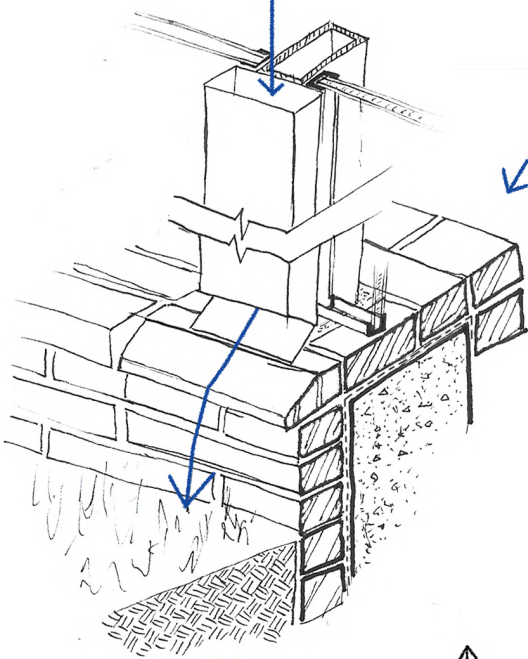Three layers of either 40% translucent or transparent ETFE sheets is to be used as per the pattern on the right.
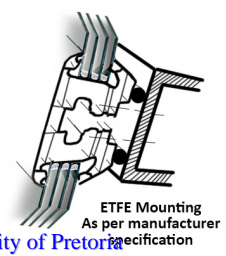
ETFE Mounting
As per manufacturer specification

Figure 85: Workshop section
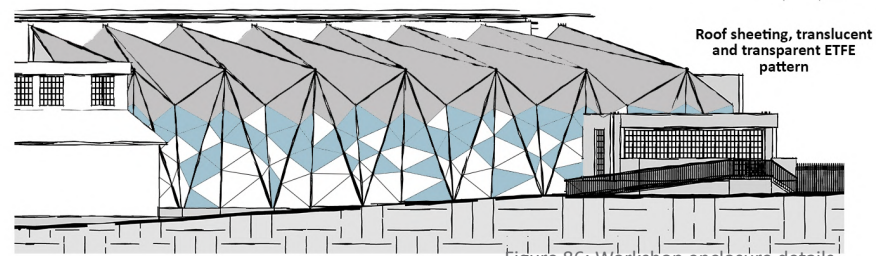
Roof sheeting, translucent and transparent ETFE pattern

Figure 86: Workshop enclosure details

A. Gutter termination detail

50x100 galvanised steel gutters are mounted to the vertical 50x100 RHSs after it had been painted to inhibit cathodic reactions. At the bottom this gutter terminates in a 45° angle with an additional flap folded down to ensure the water runs into the planter.
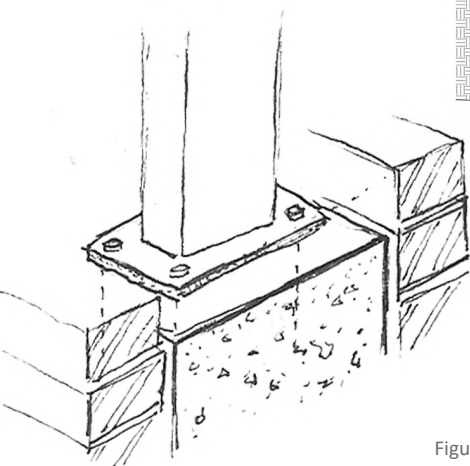
This flap aligns with a plinth stretcher brick that is installed where the seam (and thus gutter) meets the wall.

The frame for the ETFE system is to be mounted behind the gutter, with a polysulphide bead to separate them.

A

B

C

D

Figure 85: Workshop section
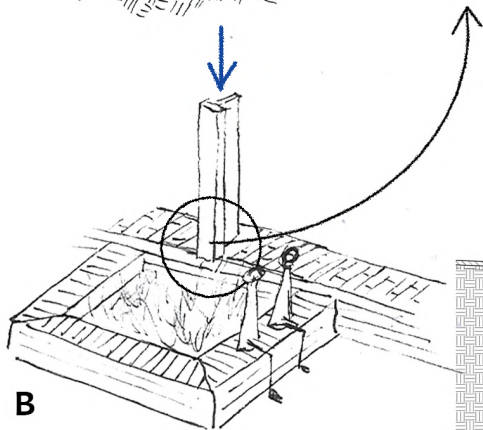
B

C. Rafter footing detail

50x100 steel rectangular hollow section is welded to a 300x150 steel foot plate that is in turn fixed to the concrete retaining wall with chemical anchors.

The top of the concrete retaining wall is to be covered with a single brick on edge layer and a DPM that is to extend below the fiber concrete floor finish layer.

The concrete retaining wall is tied into a 650x650 strip footing that also serves as ground beams for the piles.

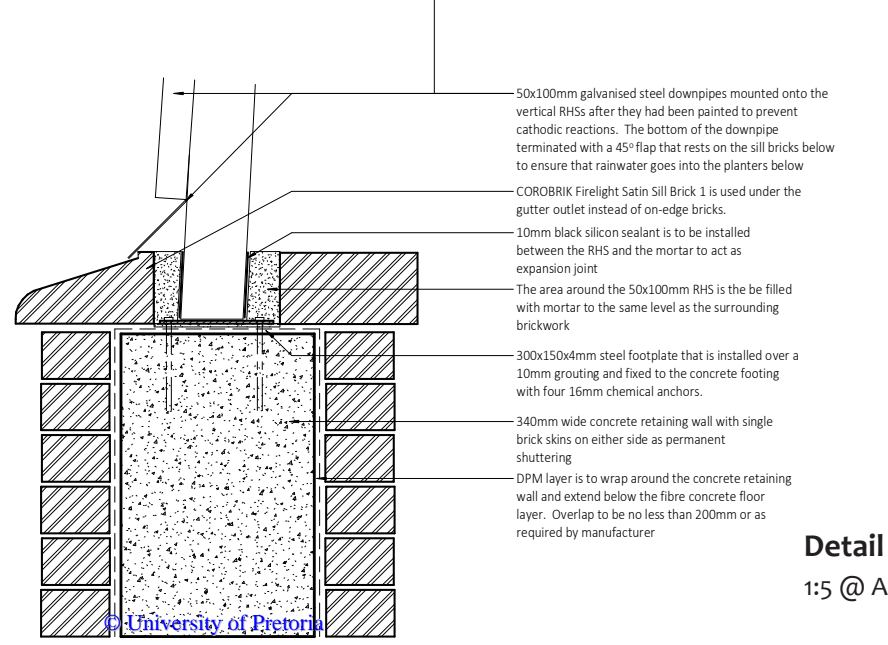A French drain is to be installed at the foot of the retaining wall
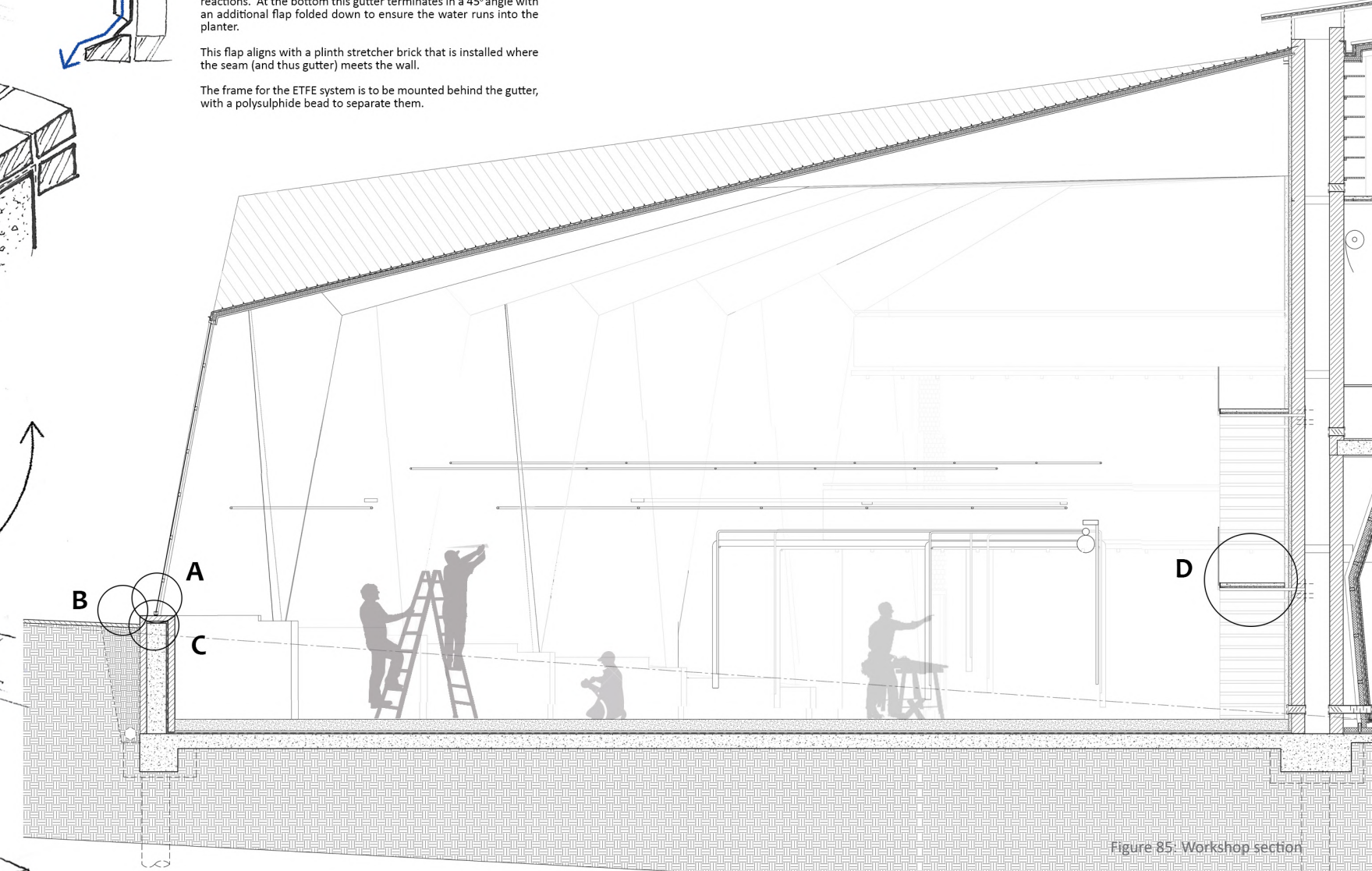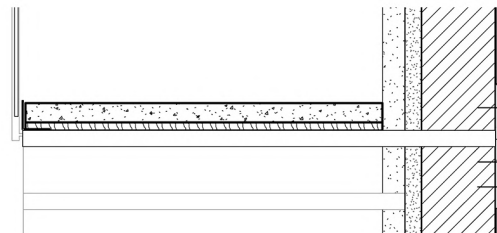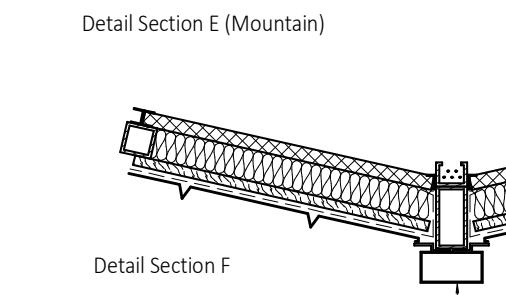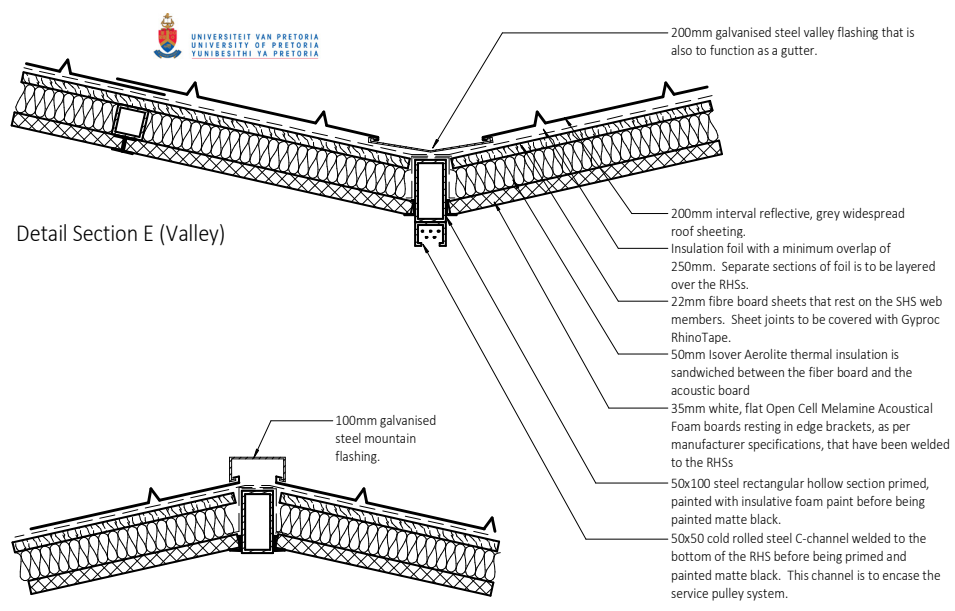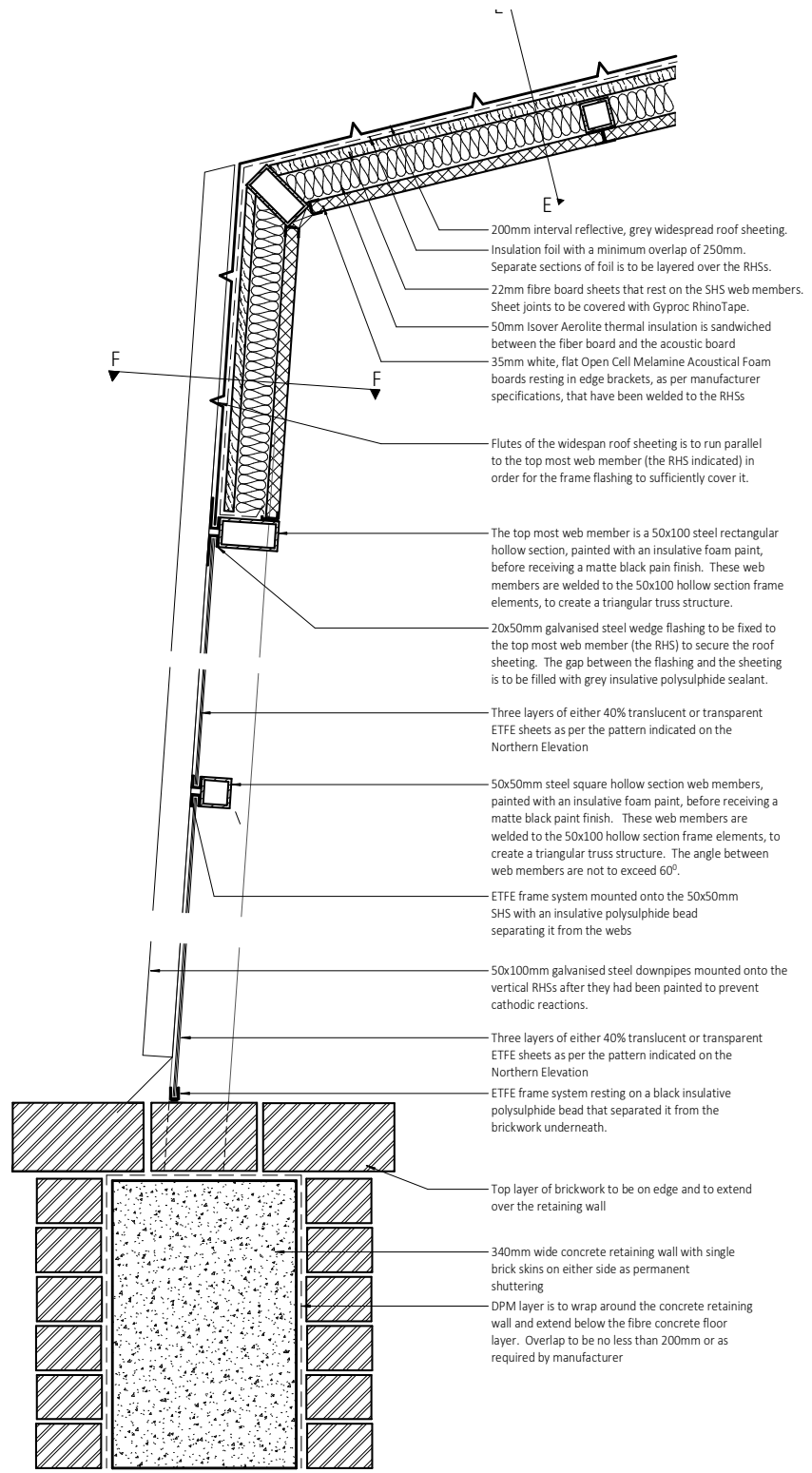
D. Cantilevering ramp detail

50x50 steel square hollow sections are welded to 200mm wide steel strip before being built into the brick wall, the steel strip is fixed to the internal side of the brick wall with chemical anchors.
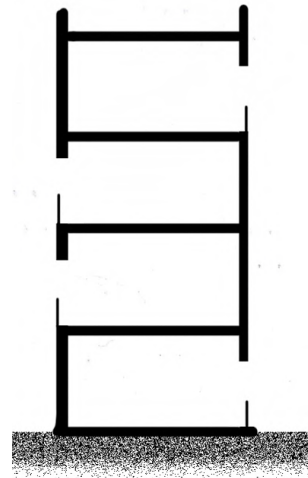
A 50x50 steel angle is welded to the outside edge of the square hollow section before 20mm fiber board is installed in it on top of the hollow section before a 30mm minimum thick screed is cast.

Figure 87: Workshop structure meeting the ground details

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Figure 88: Workshop ramp detail

200mm galvanised steel valley flashing that is also to function as a gutter.

Detail Section E (Valley)

200mm interval reflective, grey widespread roof sheeting.

200mm interval reflective, grey widespread roof sheeting.

Insulation foil with a minimum overlap of 250mm. Separate sections of foil is to be layered over the RHSs.

Insulation foil with a minimum overlap of 250mm. Separate sections of foil is to be layered over the RHSs.

22mm fibre board sheets that rest on the SHS web members. Sheet joints to be covered with Gyproc RhinoTape.

22mm fibre board sheets that rest on the SHS web members. Sheet joints to be covered with Gyproc RhinoTape.

50mm Isover Aerolite thermal insulation is sandwiched between the fiber board and the acoustic board

50mm Isover Aerolite thermal insulation is sandwiched between the fiber board and the acoustic board

35mm white, flat Open Cell Melamine Acoustical Foam boards resting in edge brackets, as per manufacturer specifications, that have been welded to the RHSs

35mm white, flat Open Cell Melamine Acoustical Foam boards resting in edge brackets, as per manufacturer specifications, that have been welded to the RHSs

100mm galvanised steel mountain flashing.

Flutes of the widespan roof sheeting is to run parallel to the top most web member (the RHS indicated) in order for the frame flashing to sufficiently cover it.

50x100 steel rectangular hollow section primed, painted with insulative foam paint before being painted matte black.

Detail Section E (Mountain)

50x50 cold rolled steel C-channel welded to the bottom of the RHS before being primed and painted matte black. This channel is to encase the service pulley system.

The top most web member is a 50x100 steel rectangular hollow section, painted with an insulative foam paint, before receiving a matte black pain finish. These web members are welded to the 50x100 hollow section frame elements, to create a triangular truss structure.

20x50mm galvanised steel wedge flashing to be fixed to the top most web member (the RHS) to secure the roof sheeting. The gap between the flashing and the sheeting is to be filled with grey insulative polysulphide sealant.

Three layers of either 40% translucent or transparent ETFE sheets as per the pattern indicated on the Northern Elevation

Detail Section F

50x50mm steel square hollow section web members, painted with an insulative foam paint, before receiving a matte black paint finish. These web members are welded to the 50x100 hollow section frame elements, to create a triangular truss structure. The angle between web members are not to exceed 60^0.

ETFE frame system mounted onto the 50x50mm SHS with an insulative polysulphide bead separating it from the webs

50x100mm galvanised steel downpipes mounted onto the vertical RHSs after they had been painted to prevent cathodic reactions.

50x100mm galvanised steel downpipes mounted onto the vertical RHSs after they had been painted to prevent cathodic reactions. The bottom of the downpipe terminated with a 45° flap that rests on the sill bricks below to ensure that rainwater goes into the planters below

Three layers of either 40% translucent or transparent ETFE sheets as per the pattern indicated on the Northern Elevation

COROBRIK Firelight Satin Sill Brick 1 is used under the gutter outlet instead of on-edge bricks.

ETFE frame system resting on a black insulative polysulphide bead that separated it from the brickwork underneath.

10mm black silicon sealant is to be installed between the RHS and the mortar to act as expansion joint

The area around the 50x100mm RHS is the be filled with mortar to the same level as the surrounding brickwork

Top layer of brickwork to be on edge and to extend over the retaining wall

300x150x4mm steel footplate that is installed over a 10mm grouting and fixed to the concrete footing with four 16mm chemical anchors.

340mm wide concrete retaining wall with single brick skins on either side as permanent shuttering

340mm wide concrete retaining wall with single brick skins on either side as permanent shuttering

DPM layer is to wrap around the concrete retaining wall and extend below the fibre concrete floor layer. Overlap to be no less than 200mm or as required by manufacturer

DPM layer is to wrap around the concrete retaining wall and extend below the fibre concrete floor layer. Overlap to be no less than 200mm or as required by manufacturer

Detail 1.1 -Workshop Perimeter

1:5 @ A0

Standing as the counterpoint for the makerspaces, which are active, bustling and interactive, are the individual learning pockets or 'student offices'. The pockets' fundamental purpose is to provide students with a spaces where they can learn on their own terms by being able to choose and subsequently adjust the pockets to suit their needs on an ongoing basis.

It should however be noted that all the pockets share the same basic parameters in terms of size (both the pocket itself and the built in elements) and amenities provided. While the argument can be made that students from different fields require different specialised features within their pockets, it was elected not to integrate these differences in order to leave as much room for flexible interaction as possible. With the liquid core approach in ...ised ...ould ...t to ...ntial ...ning

...ods

1. Pockets located in different parts of the building will inherently have different properties.

A student would thus be able to choose a pod that has the characteristics that in general suit their preferences better. These characteristics include level of solar exposure, sound, proximity to the ground or other functions and even the materials used.

2. Sensory heuristics can distort students' perspectives of the spaces

. As noted previously there will invariably be some spatial characteristics (pertaining to the structure for example) that cannot be changed by individual students. By putting these characteristics in contrast or in combination with others however, students could be lead to experience them more favourably than they might have found them otherwise.

Variation 3 -
Solo pockets with interaction spaces

various interaction spaces

Figure 89: Individual pocket neighbours

"This ceiling feels like a comfortable height"

"This ceiling is definitely too low for comfort"

VS

Cork on its own may feel hard, but in contrast with terrazzo it feels much softer

Figure 90: Individual pocket variations

Figure 92: Folding table

Figure 93: Sliding, tinted windows and sliding louvres

Figure 94: Sliding, acoustic dividing partitions

Figure 95: Movable suspension rails

Figure 96: Storage boxes functioning as partitions and seating

Figure 97: LED light strips, phone controlled with RGB capabilities

Figure 98: Sliding pin-boards that function as dividers

Figure 99: Individually controlled comfort settings

As a means of assisting in wayfinding, different floors' material palette is adjusted to reinforce the impression of the floors specifically in relation to the amount of light that would tend to enter that floors. As such the lower floors are to be furnished with darker tones of the materials used where higher floors will be lighter

Figure 91: Individual pocket material palette

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See Detail 3.3 for fall protection information

Geothermal air removal | Geothermal air supply | Electrical | Water | Fire

75x75x6mm continuous galvanised steel angle

400mm below the soffit, 2 layers Gyproc FireStop 15mm are fixed to Donn Steel Brandering which in turn is fixed to the wall and spans between the concrete columns installed at maximum 800mm centres along the length of the walkway. Fix Gyproc RhinoBoard using Gyproc RhinoBoard Sharp Point Screws 25mm (for first layer) and 42mm (for second layer) at maximum 150mm centres. All joints shall be staggered. Apply Gyproc RhinoTape to all joints and skim the surface using Gyproc RhinoLite. Install Donn Galvanised Steel Angle 25mm x 25mm at ceiling level to the wall running perpendicular to the direction of steel brandering.
1000x1000x20 Gyproc FireStop hatches, fixed to brandering as outlined above, is installed in front of every fourth individual pocket.
20mm compressed rockwool sheet is to be layed on top of the gypsum board.

Contained within this ceiling is five ducts with 15mm Isowall Wall Insulation and partitioning between them, fixed to the soffit. Each duct serves a separate service and in all cases except fire, the duct supplies the floor above to increase accessibility and adaptability.

Soffit mounted fire detection
16mm particle board carcass
16mm PG Bison Melawood panels to match the table and the floor where the pocket is found
38x38mm timber bracing

Floor to ceiling industrial windows, with 200x300mm glass panes. Mullions to be matte black. Colour panels to be random, however colours are to correspond with the floor on which it is found:
Lower ground floor: Greens, Blues and purples
Ground floor: Lighter greens and blues, with red
First floor: Red, Ochre and light green
Second floor: Ochre, yellow and light purple
Refer to Section B for illustration
Windows are only installed when a pocket is adjacent to an interaction space.

1365x630x16mm exposed/raw particle board with Melawood edging to be used as an adjustable pin board and divider between two pockets.

16mm PG Bison Melawood panels with matching edging
Lower ground floor: African Wedge
Ground floor: Etimo
First floor: Windsor Cherry
Second floor: Natural Oak

905x295x10.5mm sealed Wicander cork tile flooring fixed to floor with cork adhesives. Colour specification to correspond with the building floor:
Lower ground floor: Linea Chestnut
Ground floor: Fashionable Grafite
First floor: Personality Spice
Second floor: Linea Champagne
Screed to be no less than 25mm

Two 16mm exposed Melawood edging to insulation, while be
50x76mm sanced ar be used as the botto
Aluminium, corrosio wheels and track to be recessed into the screed

FFL 11185

Minimum 25mm polished and sealed Terrazzo floor finish to be applied to the walkway. Aggregate to consist of sandstone and slate found during the excavations for the foundations and cement mixture to be slightly darker on the lower floors than on the top floors.

CORO8RIK Firelight Satin plinth stretcher brick
35mm primed and painted with red oxide, steel top rail for the louvres
75x75x6mm continuous galvanised steel angle
Polysulphide sealant with backing rope
25x5mm timber louvre strips
Horisontal louvres are used on the North and South facing pockets, and vertical on the East and West facing pockets. Where a pocket is facing North/West horisontal louvres have been used, due to the way other built elements are placed in relation to the pocket strips, causing Western and Eastern light to be mostly blocked during the mornings and evenings.

20mm corner LED strip diffuser with remotely controlled RGB LEDs contained inside
35mm primed and painted with red oxide, steel bottom rail for the louvres
Two 16mm PG Bison Melawood panels with matching edging, colours to correspond to the table and floor as outlined for the other Melawood panels to the left.
60mm primed and painted matte black steel sheet encased the end of the top Melawood panel and is welded to a primed and painted matte black rod that is to act as the pivot point for the table, allowing it to fold up and slide behind the storage units
180° black hinges @ a maximum of 500mm cc to join the two panels
CORO8RIK Double bullnose brick stacked to for the support for the table. Brick type to correspond with the courtyard that is being faced
Brickwork Pattern as per Courtyard Details
80mm rigid foam seating, covered with removable material
16mm particle board carcass
16mm PG Bison Melawood panels to match the table.
38x38mm timber bracing

Pocket brickwork variation 1:
Brickwork extends down past the concrete slab and down to a 75x75x6mm continuous galvanised steel angle support
This variation is used where the pocket is not protruding.

2225

11160

SECTION B: DETAIL SECTION OF AN INDIVIDUAL POCKET

1:10 @ A3

Figure 100: Individual pocket section

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Acting as the literal and figurative intermediary between the makerspaces and the individual pockets are the interaction spaces.

These spaces are set to fulfil a myriad of purposes from providing break away spaces where students can work (or relax) if they are not finding their individual pockets conducive at a given time to formal presentations.

They are also intended to facilitate 'unanticipated interactions' between individuals while simultaneously providing spaces for planned group interactions and discussions at various scales of size and formality. As such the spectrum of interaction spaces are required to range from small and casual to comparatively large with a capacity for formality.

As much as the functions are an intermediary between the individual pockets and the makerspaces, so is the architectural language used with most if not all of the spatial characteristics also standing as a mediation between the other two.
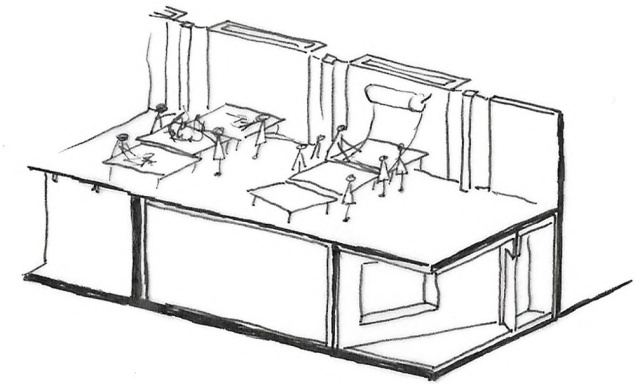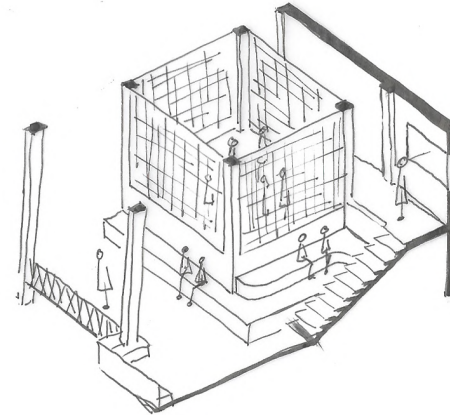
Figure 101: Examples of interaction opportunities

Library

Bigger gathering space (20 - 35 persons)

Recording studios and sound stages

Open plan, adaptable group spaces

Individual work with others around

Casual discussion

Focused collaboration or small seminars

Open group pods that can be contained
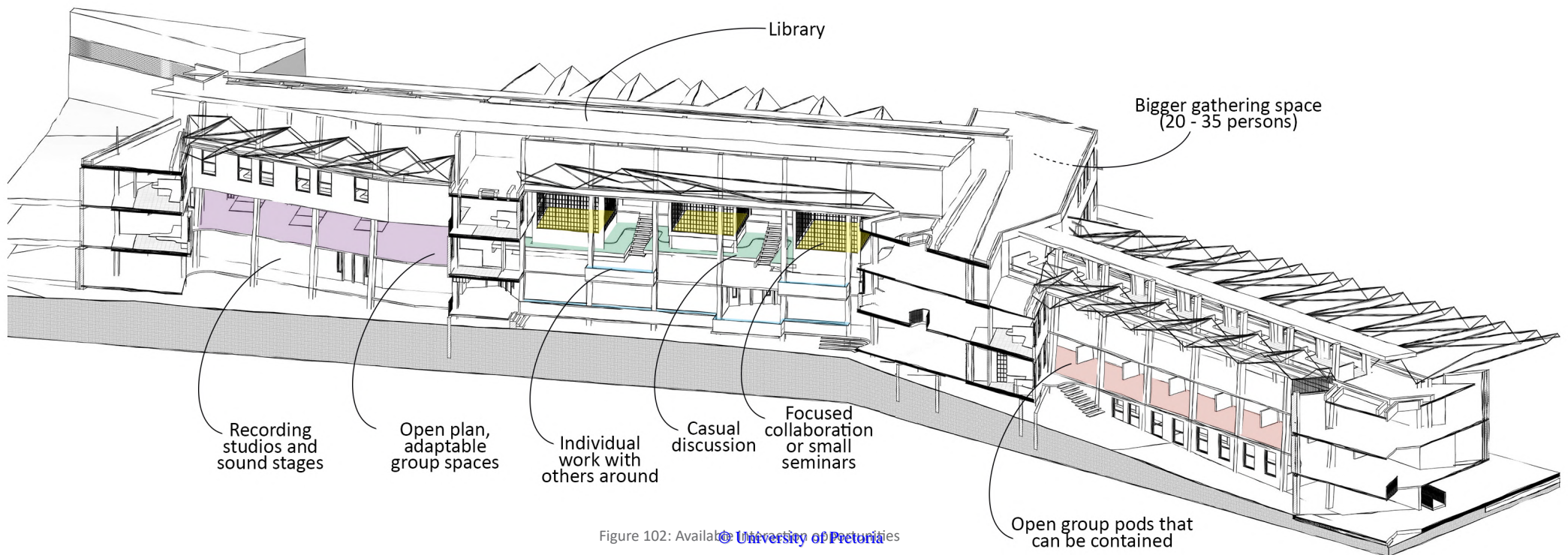
Figure 102: Available Interaction opportunities

Figure 103: Interaction section

Figure 104: Interaction material palette
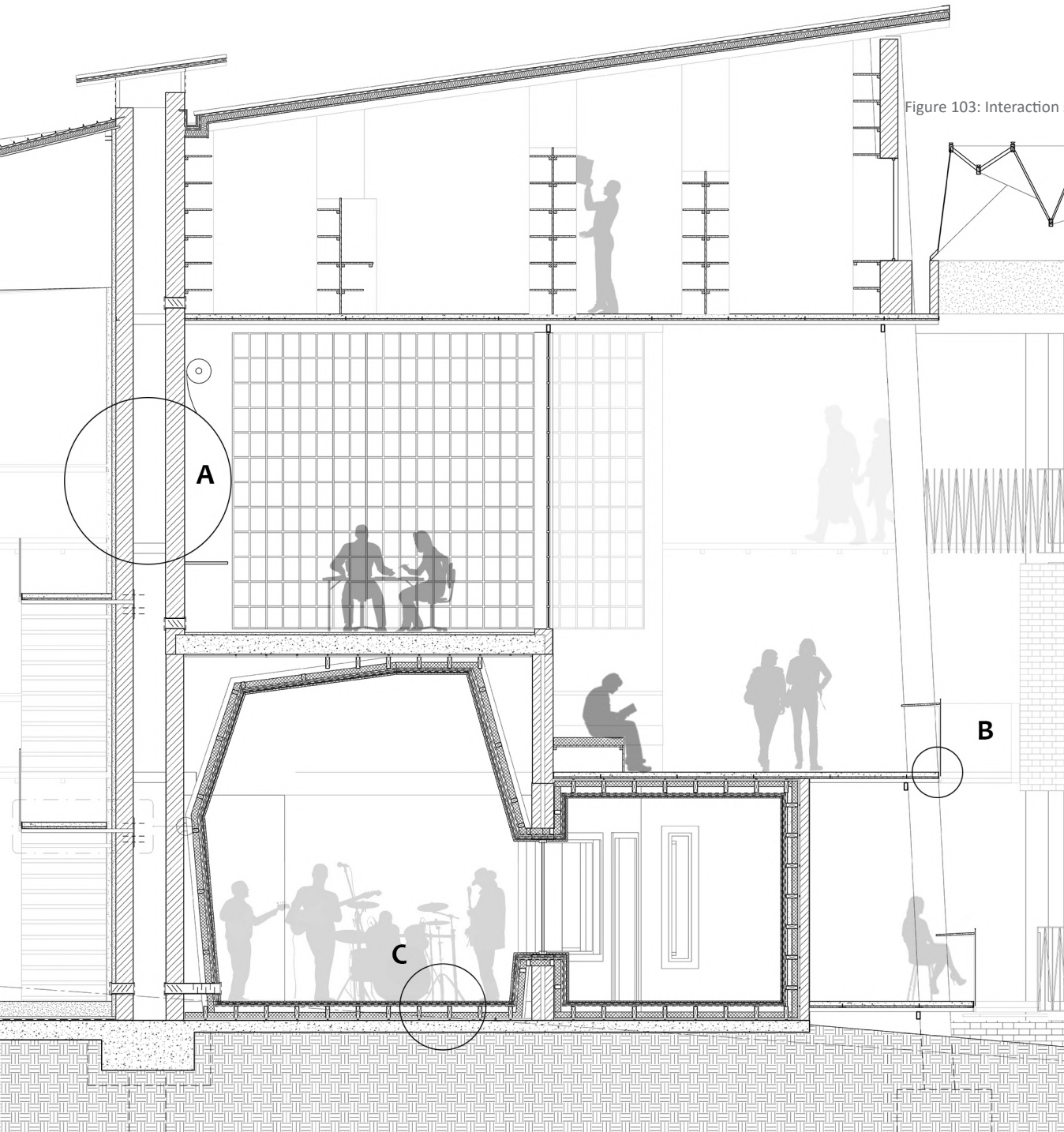
Figure 103: Interaction section
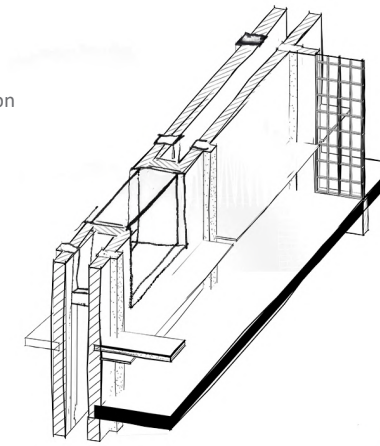
A. Cooling Tower

The structural spine between the workshop and the interaction spaces functions as an elongated cooling tower that stretches the entire length of the workshop. Warm air is pulled into the cavity using fans located at various levels throughout the spine. Once momentum in the flow of cool air is achieve the fans can be partially or fully turned off depending on the conditions.

The tower/spine consists of two double skin brick walls constructed between 300x400mm concrete columns. The columns are in turn tied to each other with short concrete beams at the building floor levels.

Apertures are also made through the spine to allow for a visual connection between the two sections. These windows are not openable and are sealed to maintain the sound barrier.

32mm sanded and sealed hardwood countertop, attached to the bracket with steel screws.

400x20x3mm steel bracket, primed and painted matte black, welded to the flat bars.

Stainless steel wire twilled pattern mesh, fitted between the flat bars with 20mm mesh clamps that in turn are welded to the flat bars.

20x3mm steel flat bar, primed and painted matte black, acting as vertical support for the fall protection, @600mm c/c (to correspond with the SHS below it)

40mm cast in place terrazzo using sandstone and slate that was excavated from the site as the aggregate.
Black oxide powder colouring is to be used as colourant for the cement mixture, where the Lower Ground floor is the darkest and the Second floor is the lightest

70x70x3mm steel angle, primed and painted matte black, is welded to the outside edge of the SHS to act as trim for both layers

22mm fibre board is installed over the SHS. The underside (soffit) surface is to maintain the fibre board finish and be sealed with Plascon Woodcare Water-Based Interior Varnish or similar

Two 30x30x3mm steel angles are to be installed back to back (forming an upside down T shape) where the fibre boards end and these are to run perpendicular to the SHS

50x50 steel square hollow sections, primed and painted matte black, welded to the RHS @ 600mm c/c. Ends to be closed off with a steel end cap

Silicon bead expansion joint, recessed on top of the SHS

100x50 steel rectangular hollow section, primed and painted matte black, welded to a 200x200 square steel plate that is fixed to the concrete column with ⌀16mm chemical anchors.
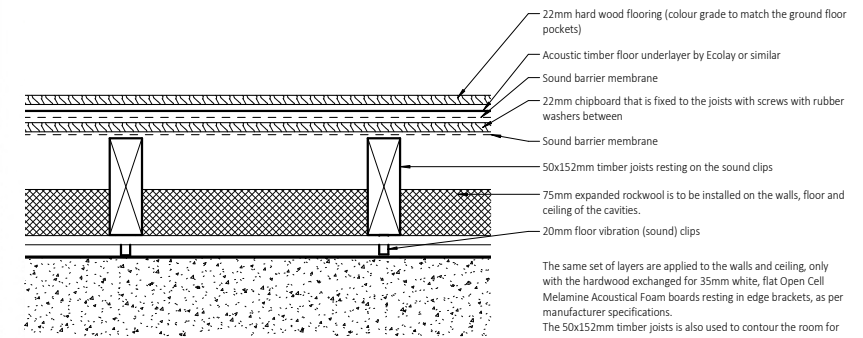
B. Interaction Floor Edge Detail

22mm hard wood flooring (colour grade to match the ground floor pockets)

Acoustic timber floor underlayer by Ecolay or similar

Sound barrier membrane

22mm chipboard that is fixed to the joists with screws with rubber washers between

Sound barrier membrane

50x152mm timber joists resting on the sound clips

75mm expanded rockwool is to be installed on the walls, floor and ceiling of the cavities.

20mm floor vibration (sound) clips

The same set of layers are applied to the walls and ceiling, only with the hardwood exchanged for 35mm white, flat Open Cell Melamine Acoustical Foam boards resting in edge brackets, as per manufacturer specifications.
The 50x152mm timber joists is also used to contour the room for optimal sound reflection, in order to avoid parallel planes whenever possible.

C. Sound Booth Detail

Figure 103: Interaction section   Figure 105: Interaction details

While the architectural languages of the interaction and individual spaces are distinctly and intentionally different, the boundary between the two is seldom starkly defined, as there should still always be a continuation between the two. As such the circulation routes throughout the building is treated consistently.

Detail 3.3 - Floor Transition from Interaction to Individual
1:5 @ A3

Interaction Spaces

Individual Pockets
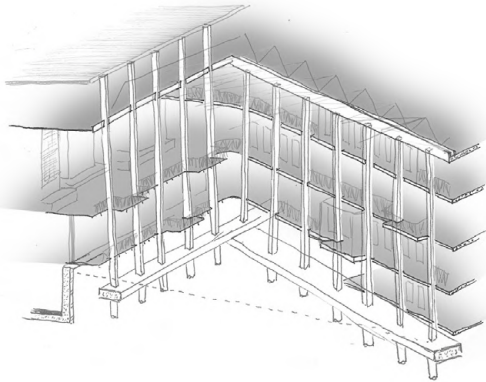
As such the strategy use in the circulation spaces is one where one characteristic stays the same while the rest changes. For example, when the walkway transitions from the individual to the interaction sections, the floor finish remains the same, but the ceiling height changes, the material of the fall protection changes and even the sound one's own foot makes on the floor changes. Yet the consistent element ties the two together.

40mm Brass straight edge trim that is fixed to the substructure prior to the terrazzo being cast

40mm cast in place terrazzo using sandstone and slate that was excavated from the site as the aggregate.
Black oxide powder colouring is to be used as colourant for the cement mixture, where the Lower Ground floor is the darkest and the Second floor is the lightest

22mm fibre board is installed over the SHS. The underside (soffit) surface is to maintain the fibre board finish and be sealed with Plascon Woodcare Water-Based Interior Varnish or similar
Silicon bead expansion joint, recessed on top of the SHS

50x50 steel square hollow sections welded to the RHS @ 600mm c/c. Ends to be closed off with a steel end cap

100x50 steel rectangular hollow section welded to a 200x200 square steel plate that is fixed to the concrete slab with ø16mm chemical anchors.

255mm concrete slab. When exposed the soffit is to be painted a white satin paint such as Plascon O4-A2-3, or similar

Interaction   Individual

Interaction   Individual

ire 106: Circulation spaces

Interaction Spaces | Individual Pockets

10mm rebar is spot welded to form a 4D triangulated pattern that is consistent with the roof. All 'valley' points are to be next to the walkway and the railing should be side fixed to the concrete at these junctions.
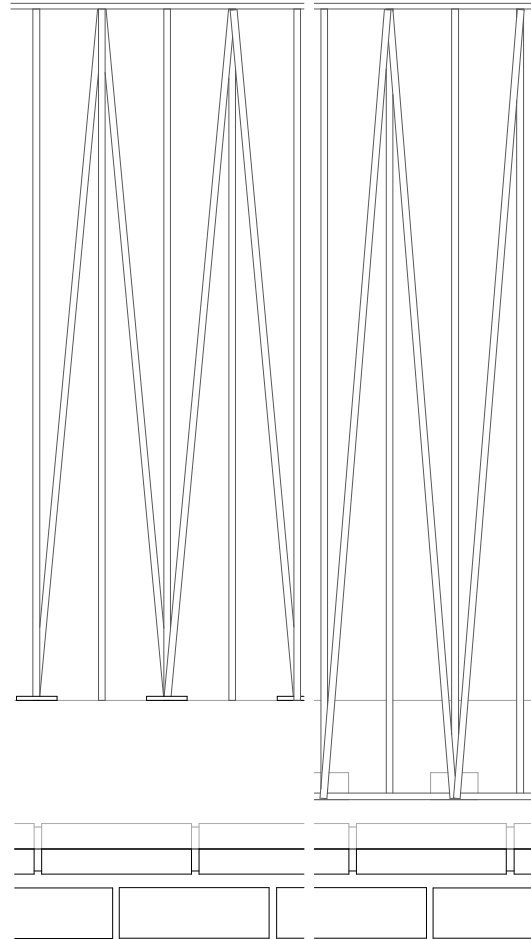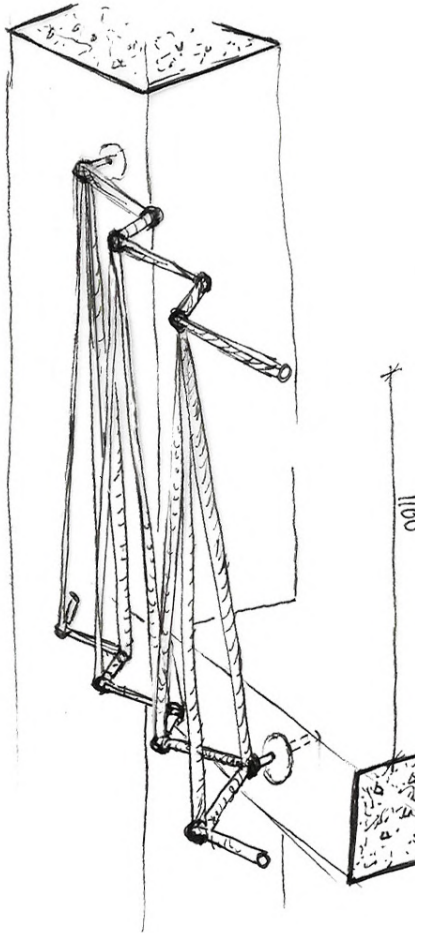
Where the railing is adjacent to interaction spaces the rebar is to be painted grey
Where the railing is adjacent to the individual pods the rebar is to be painted with a rust effect solution

Individual Pockets

50x70x6mm MS angle brackets

3mm mastik joint (under) between MS bracket and the concrete slab.

M16 chemical anchor fixing holes

M16 holes where the vertical rebar element can be inserter prior to welding it to the bracket and having the side elements welded to it in turn

Interaction Spaces

50x70x6mm MS plate

3mm mastik joint (under) between MS bracket and the concrete slab.

M16 chemical anchor fixing holes

M16 holes where the vertical rebar element can be inserter prior to welding it to the bracket and having the side elements welded to it in turn

Detail 5.4 -Fall Protection
1:5 @ A3

© University of Pretoria

Figure 107: Fall protection detail
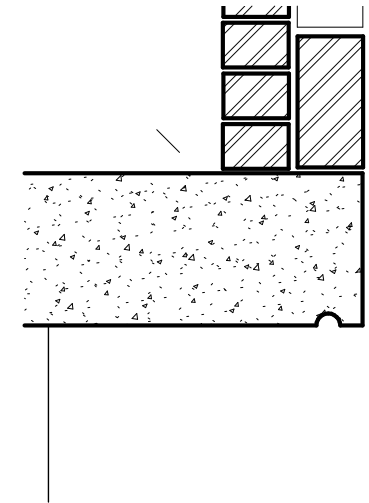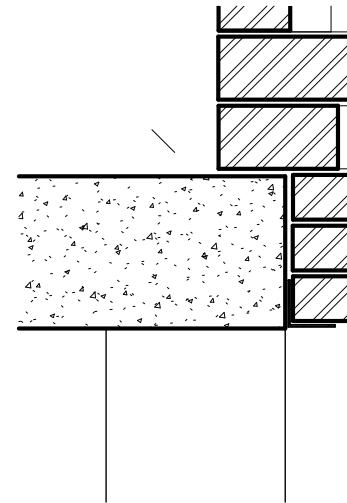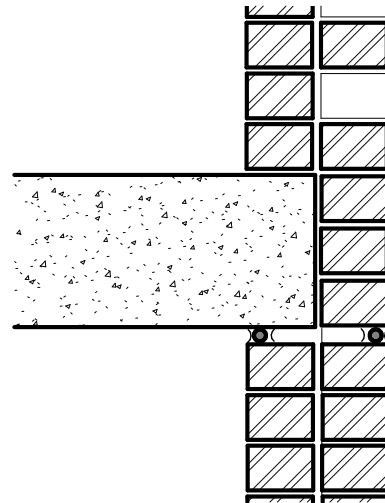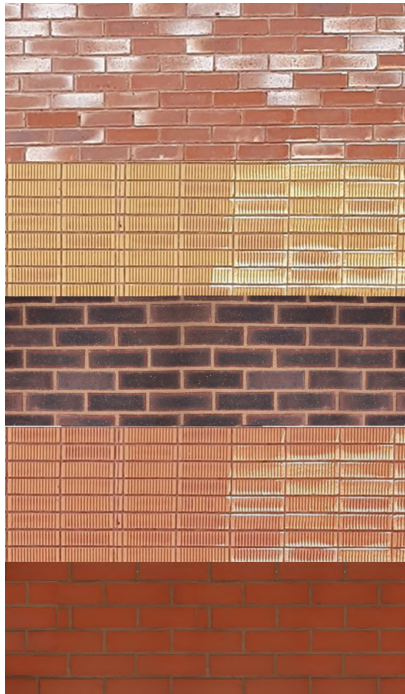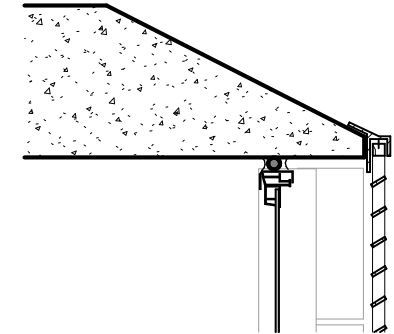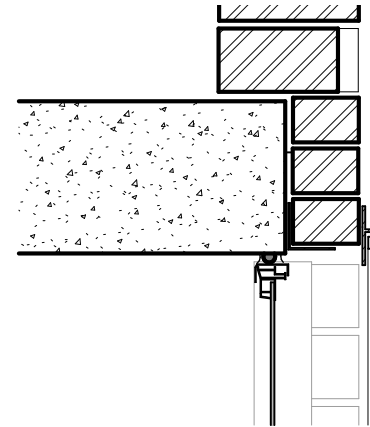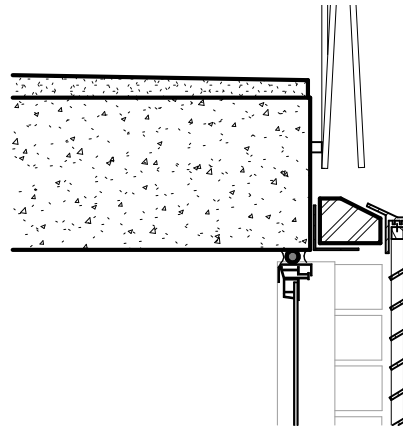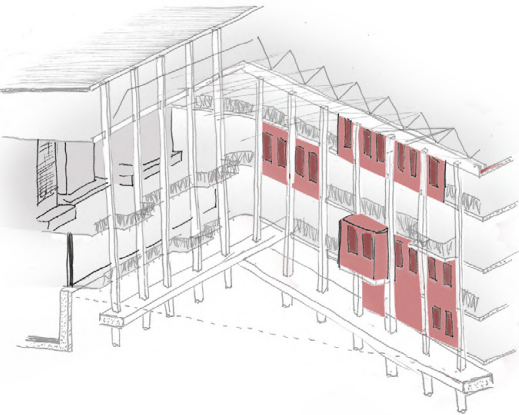
Brickwork Variation 1 - Concealing the Structure:
work extends down past the concrete slab and down to ocket below
variation is used where the pocket is not protruding and e another pocket is located below and a walkway above.

Brickwork Variation 2 - Concealing the Structure:
Brickwork extends down past the concrete slab and to a 75x75x6mm continuous galvanised steel angle that is bolted to the slab
This variation is used where the pocket is not protruding and where another pocket is located above and a walkway below.

Brickwork Variation 3 - The Structure punches through:
Brickwork rests on top of the concrete slab and is capped by a cast-in-place concrete roof, cast to a Degree 1 accuracy
This variation is used whenever a pocket protrudes from the facade

Detail 5.3 -Revealing and Conceiling of the Structure
1:5 @ A3

The structure of the individual pocket strips are always hidden to reinforce the impression of safety and privacy. This is also due to the fieldwork finding that stipulated that students found exposed services and structures uncomfortable in spaes where they wanted to feel at ease (as would be the case in the pockets) where many students mentioned that exposed services and structures gave them the impression that the space was more industrious and purely functional (as would be the case in the workshops).

At their cores the internal courtyards / gardens function as extensions to the interaction and individual spaces, providing additional opportunities and environments wherein students can work depending on their preference and mood.

The primary constraint upon the ordering of the garden, however, was irrigation (and water retention) which would be handled in relation to the slopes. Subsequently it was elected to make extensive use of micro-swales that would be scattered throughout the courtyards.

In order to accommodate the swales discreetly, the gardens were consistently arranged into crescent shapes that would optimise the swales while giving the gardens a distinctly organic character that would stand at odds with and complement the more orthogonal (if diagonal) character of the building. Swale size, frequency and extent are dependent on the slope of a given courtyard
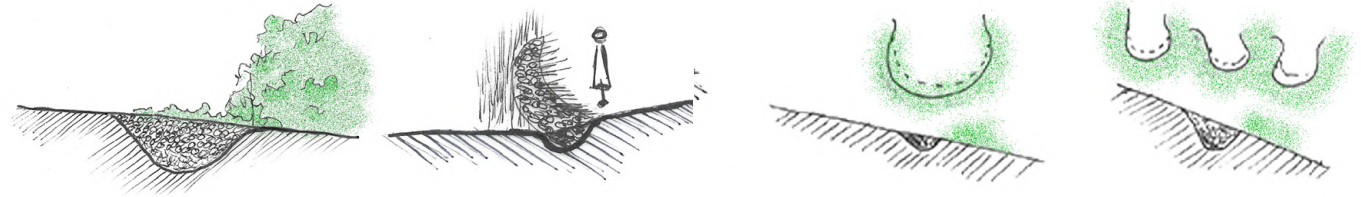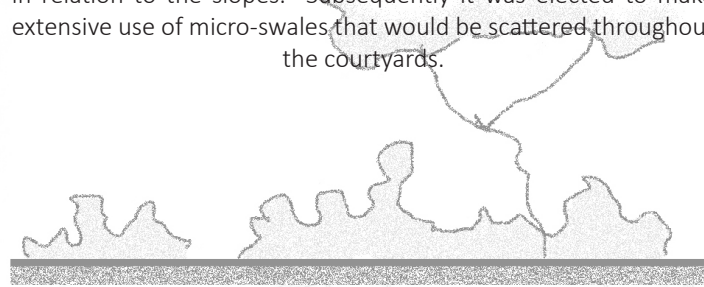
The swales are intended to increase water ingress and to stabilise the earth

Steeper slopes require more but smaller swales

Figure 108: Swales used

Medium activity level on edge

Summer solar profile

Winter solar profile

Public access point

High activity level on edge

Summer solar profile

Winter solar profile

Summer solar profile

Winter solar profile

Larger surface for thermal mass

Medium activity level on edge

Summer solar profile

Winter solar profile

Public access point
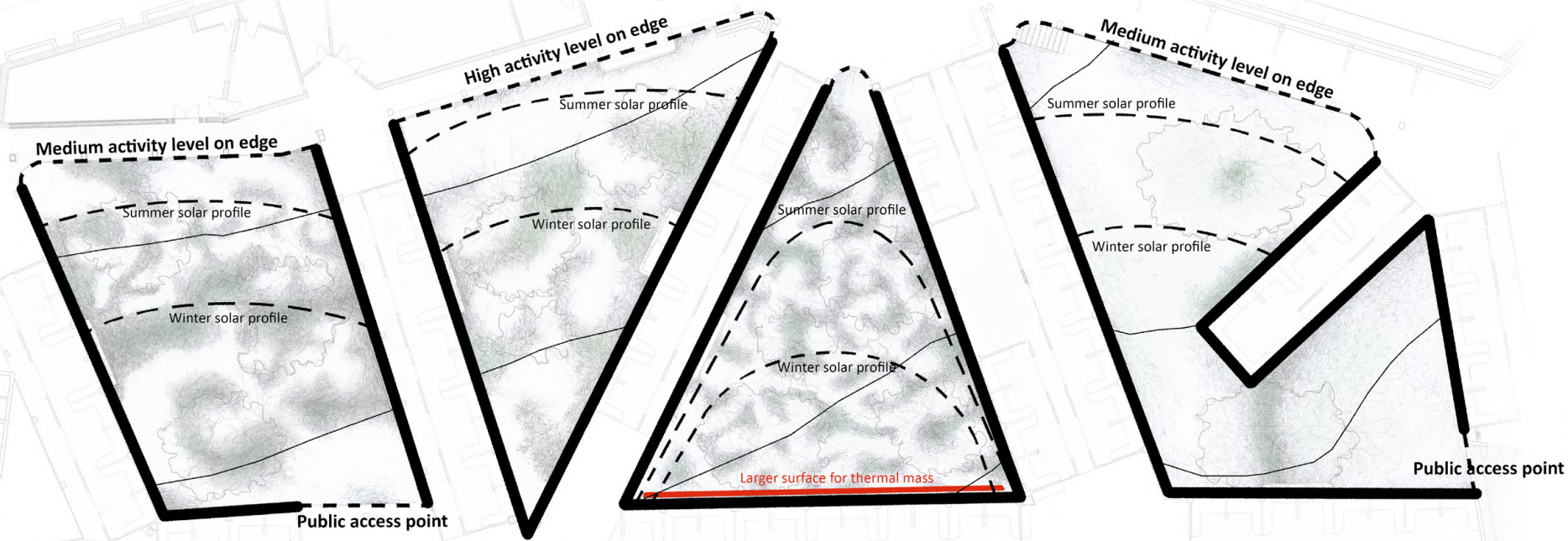
Figure 109: Overview of courtyards

Programming and layout of the courtyards were derived at through a combination of the activities directly adjacent to the courtyard, the slopes, the degree of solar exposure and the available surfaces for thermal mass. From these factors the type of spaces as well as the most advantageous plants were selected.
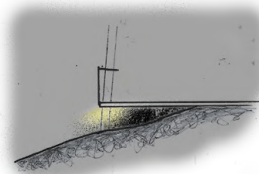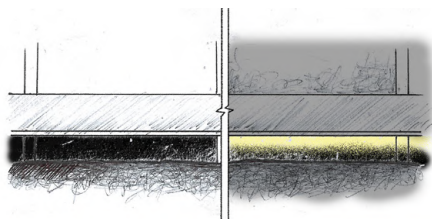
The interaction spaces are visually separated from the earth with a shadow line, to reinforce the tectonic nature of the interaction spaces

Where the building meets the courtyard it seems to float, reinforcing the impression of activity
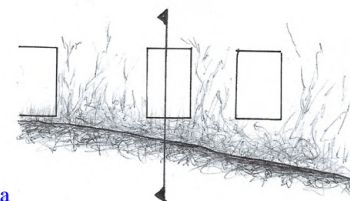
Where the individual pockets meet the earth there is a blurred boundary, creating the illusion that the pockets are of the earth, and thus a safe space

The learning pockets appear to be immersed in the earth and the planting reinforces this by blurring the line between the building and the courtyard

Figure 110: How the building meets the ground

"I'll meet you there"

"Hello World"

"Procrastination"

"Secret Garden"
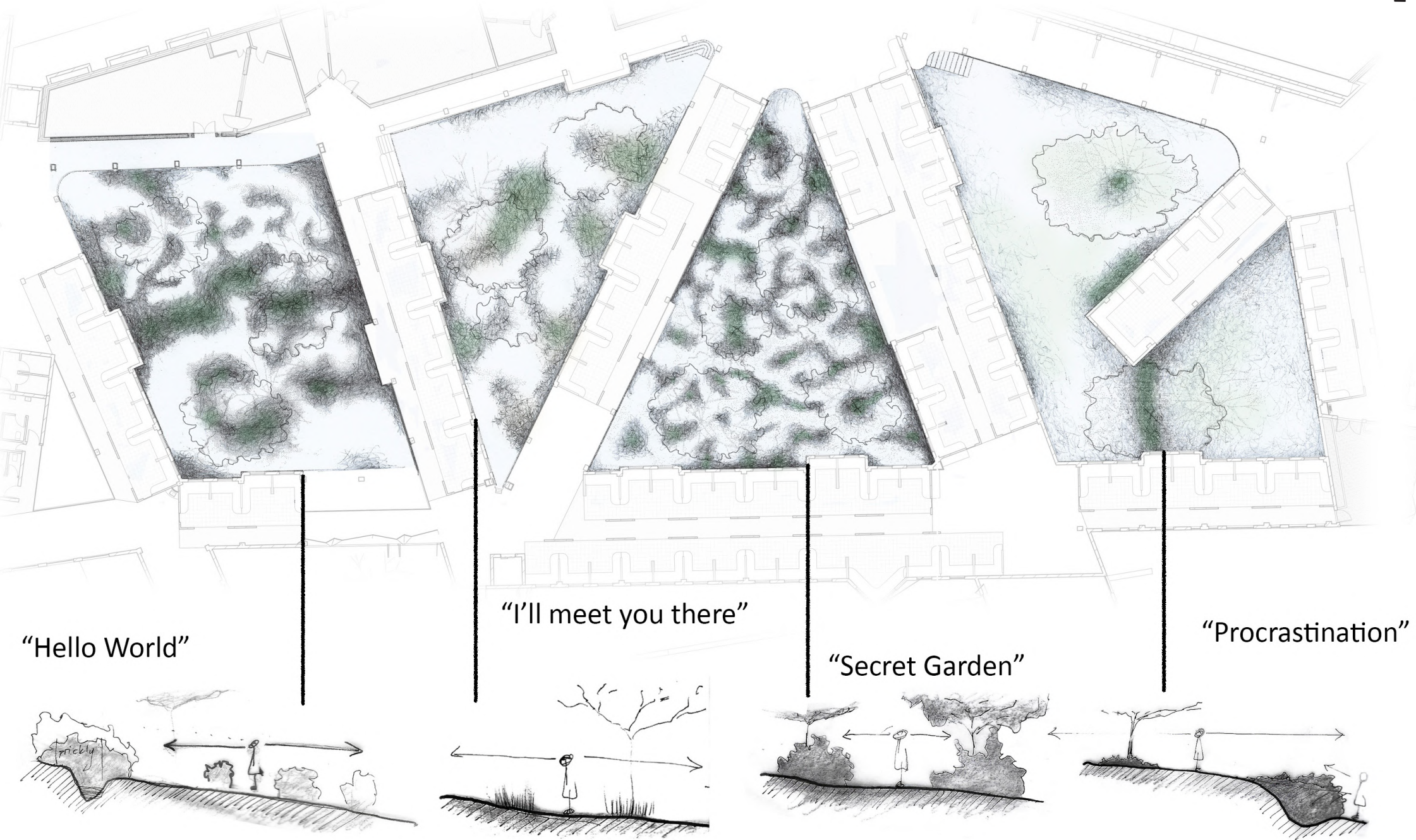
Due to the public nature of this courtyard, the
planting palette is intended to intrigue visitors and invite engagement with the natural
elements. Subsequently, all the plants in this courtyard are abnormal in some way.
Many of these plants also have very   distinct pleasant scents, stimulating visitors' memories more than if the scents were not there.

The brickwork is also intended to intrigue users through the colour and pattern since the purple Vineyard bricks are not
seen often.

As a means of passively controlling access to the building, a Ha Ha covertly separates the public
and private portions. The plants concealing the Ha Ha are also thorned to discourage crossing it.
In combination this provides a passive means of access control as visitors will nt be
able to enter the private spaces, yet they will not feel as if they are being excluded

Private / Public

Figure 111: "Hello World" Courtyard
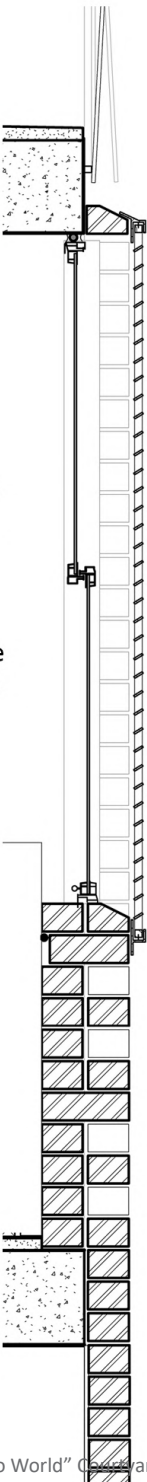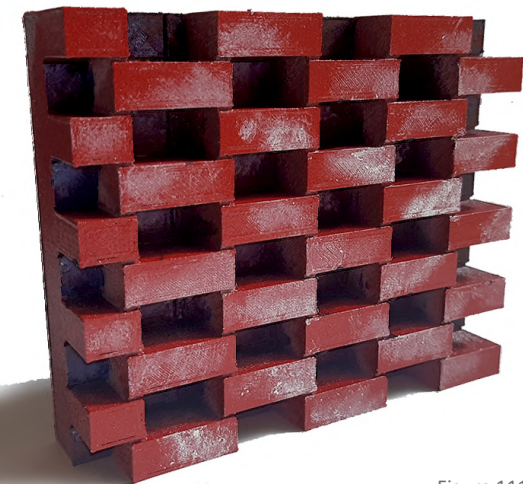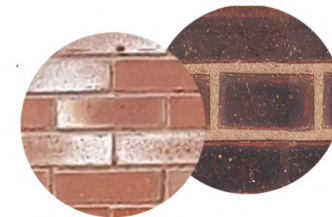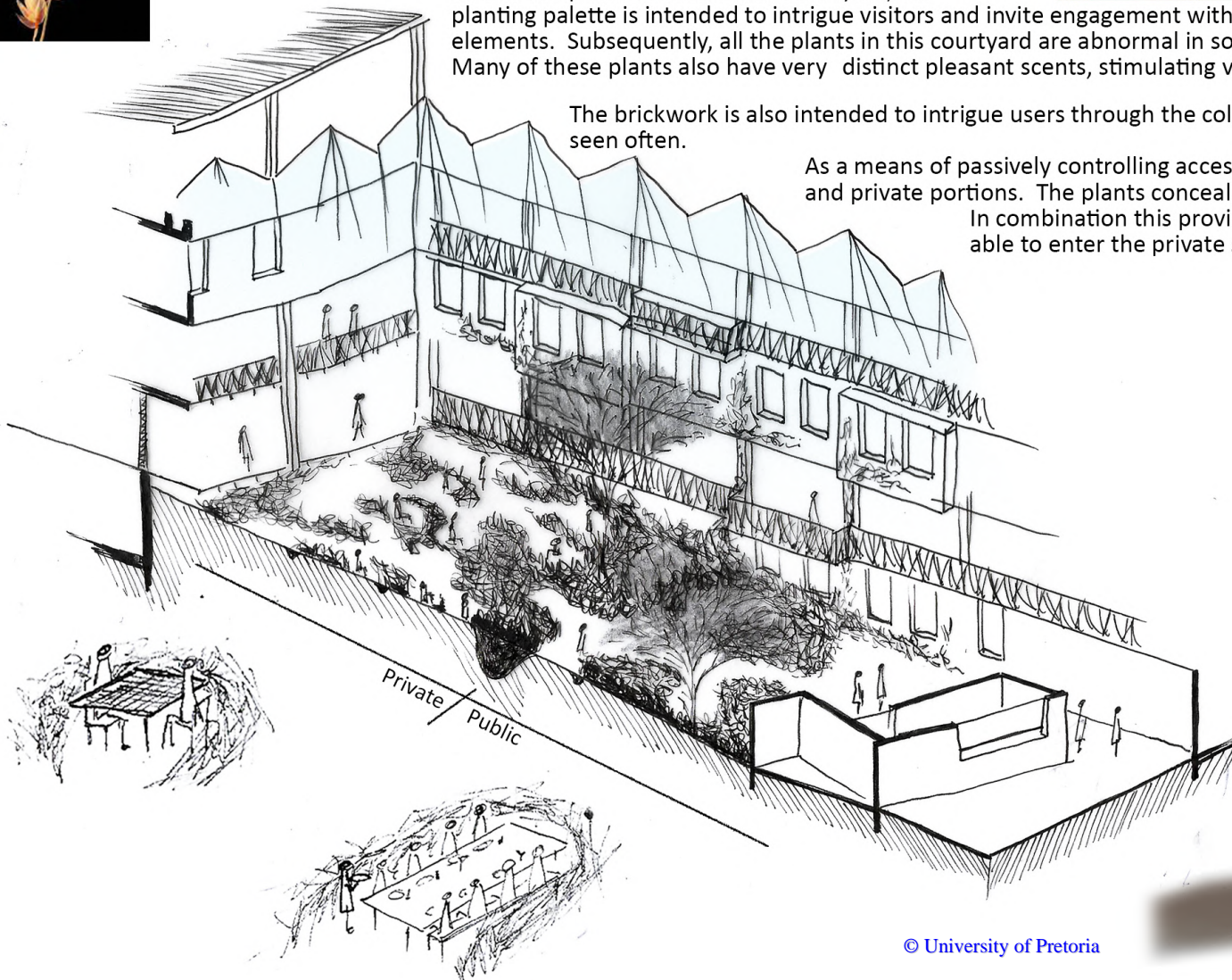
"I'll meet you there!"
Courtyard

This c........ably more exposed than the others while also being adjacent to the primary interaction space in the building, thus the courtyard caters to larger groups (which in turn is appropriate for larger as it has a comparatively low slope). The majority of the plants here are bladed, such as grass, to increase visibility and to create white noise and movement to complement the bustle of the students.

The brickwork is intended to complement the linearity inherent to bladed plants while also offsetting the horisontality of the courtyard.

Active Edge

Figure 112: "I'll Meet me there" Courtyard
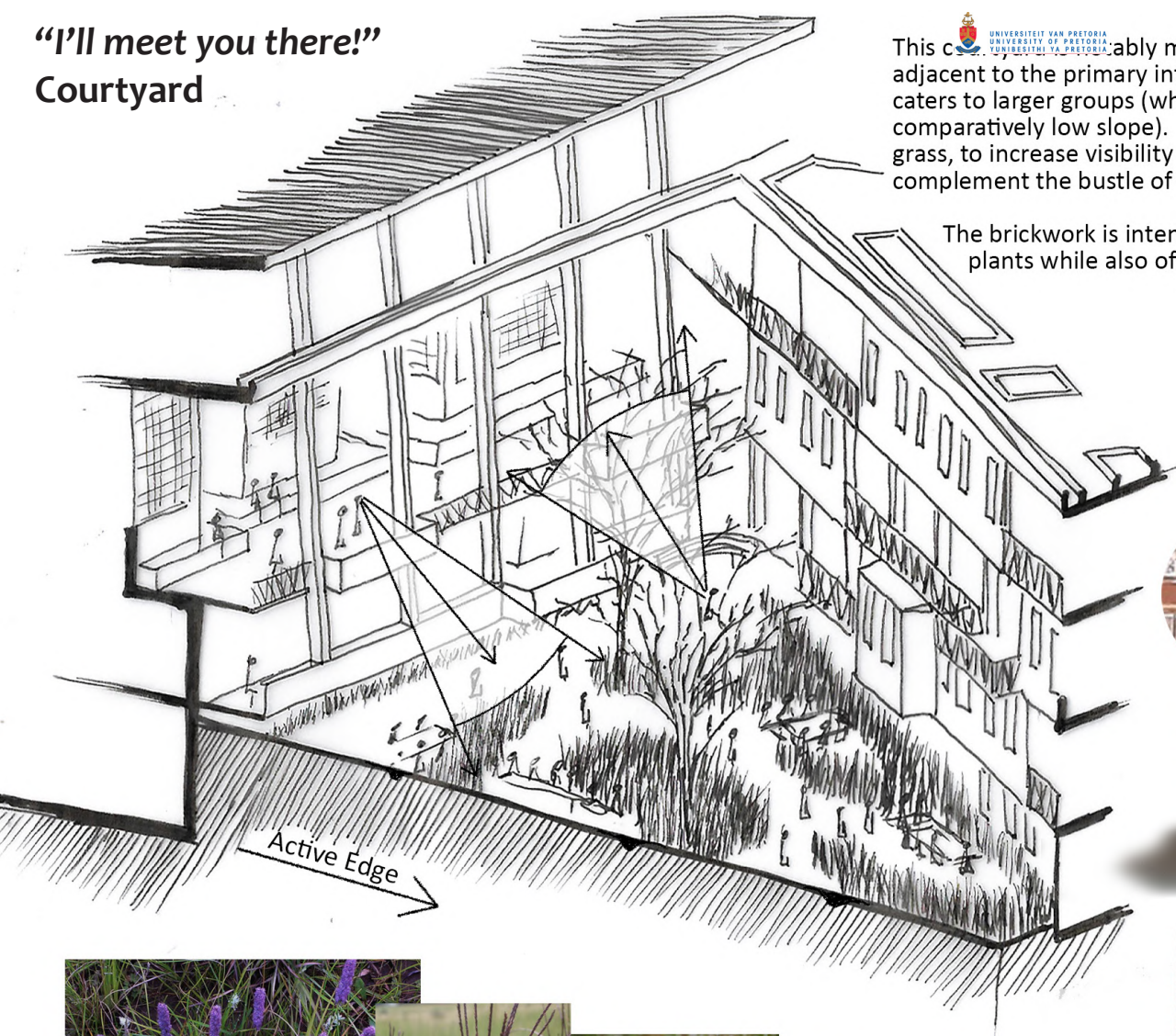
This courtyard is concealed from all sides and due to its distinct slope required small sv[...] this made this an ideal courtyard for solitary spaces. To facilitate privacy and improve acoustics the plants in this courtyard are more dense, taller and generally of a softer foliage variety. This also results in the courtyard feeling softer and intimate.

The brickwork emulates the dappledness of the plants and due to the density already present here. Subsequently, there is no additional colour introduced, with the surfaces undulations rather being the result of the bricks themselves.

While the courtyard is densely planted, limiting visibility on the ground, passive surveillance is still achieved since the individual pockets can look into the courtyard due to its slope.

Figure 113: "Secret garden" Courtyard
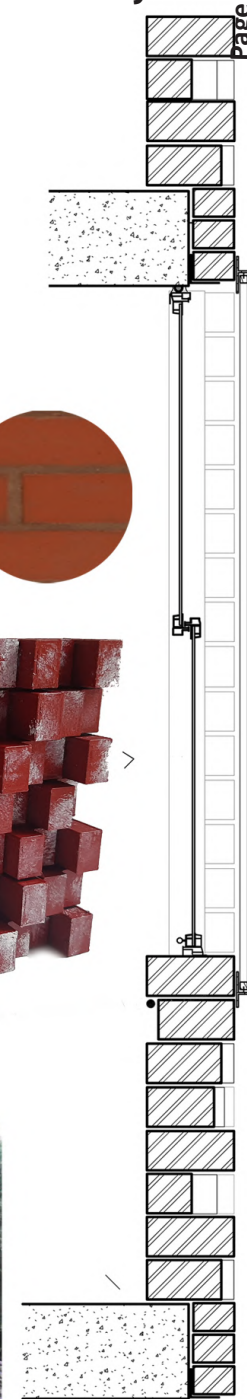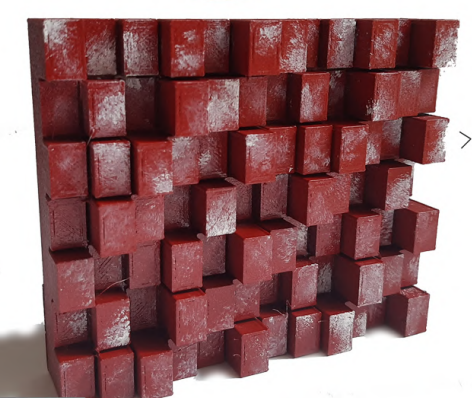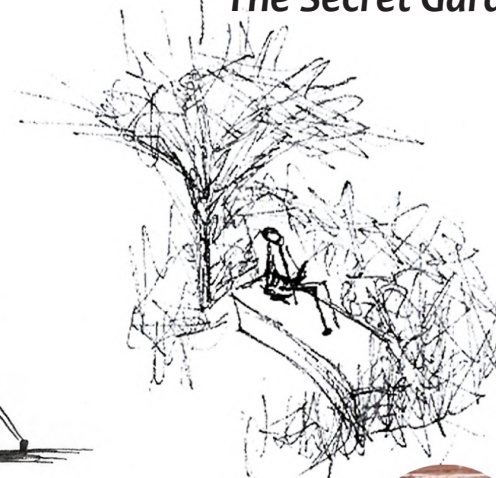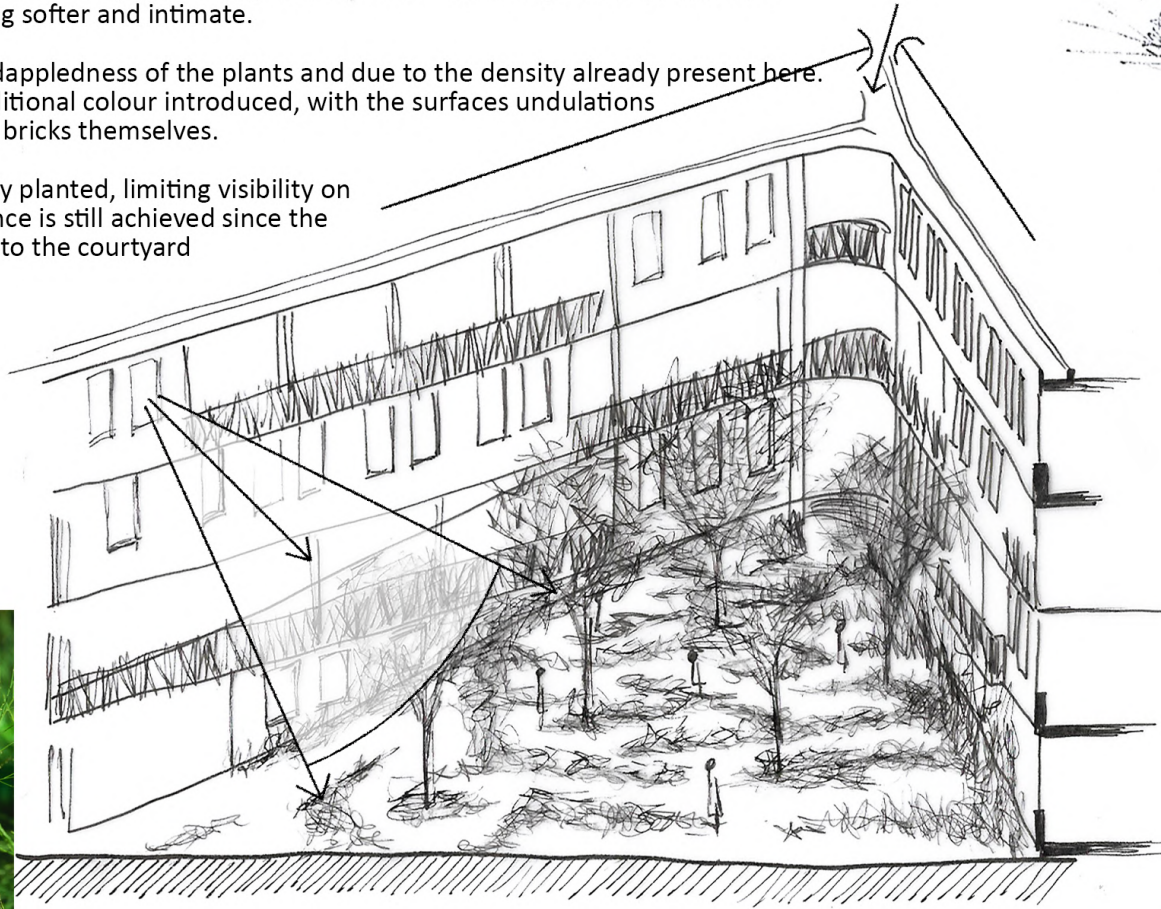
"Procrastination!" Courtyard

While this courtyard is adjacent to an interaction space, it is far less active than the other one, yet it is too exposed to be a private space resulting in it being something in between. It was also noted that an outside space dedicated to relaxation was also required.

The plants used are all intended to function in the place of lawn while also providing additional character such as colour and scent. Giving a space where students can just 'relax on the grass' as would be found on many existing campuses.

The brickwork is intended to appear woven, reinforcing the relaxed nature of the courtyard.

© University of Pretoria
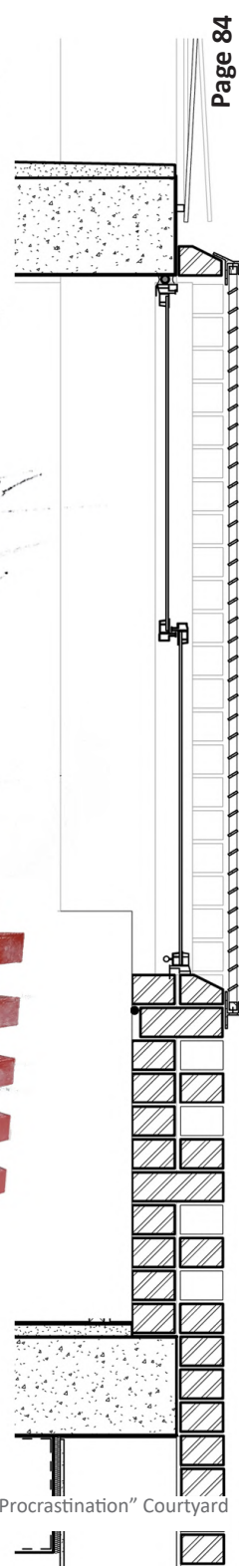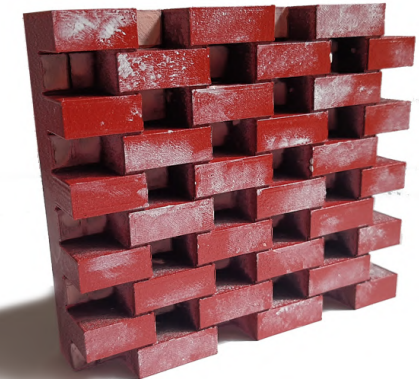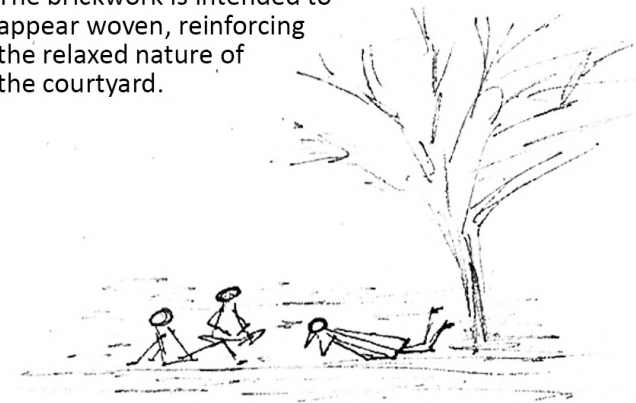
Figure 114: "Procrastination" Courtyard

The final type of space encountered in the building are the public spaces of which there are three broad types, all of which rely heavily on the principles of passive access control (discussed in chapter 4, step 3):

1.
Existing public space that has been programmed or made more usable
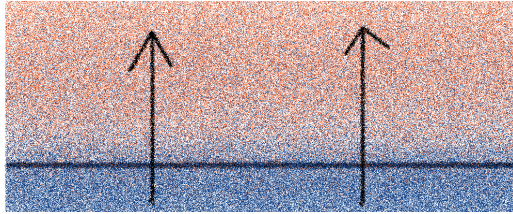
2.
Public functions that have been pulled into the building
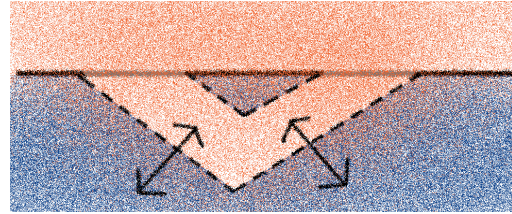
3.
Parts of the building that is accessible to the public
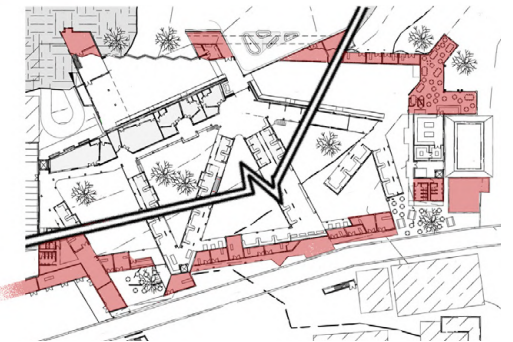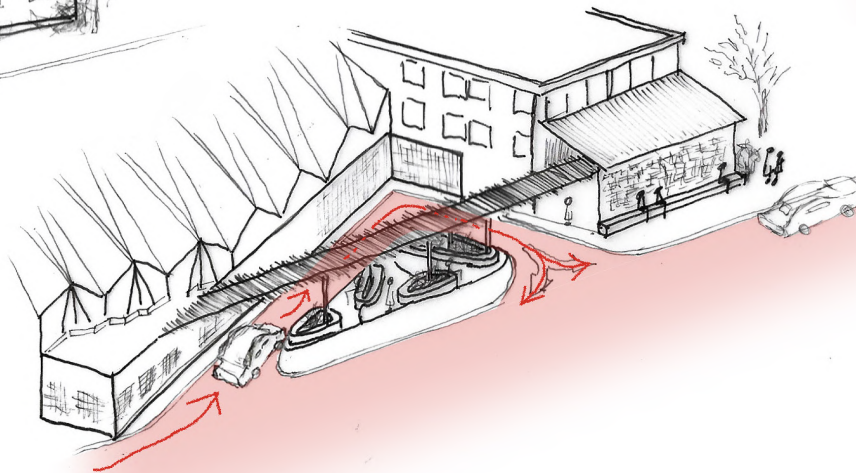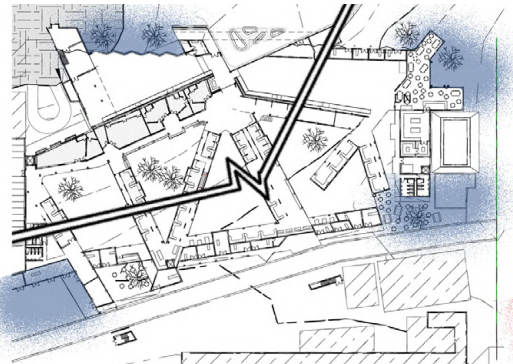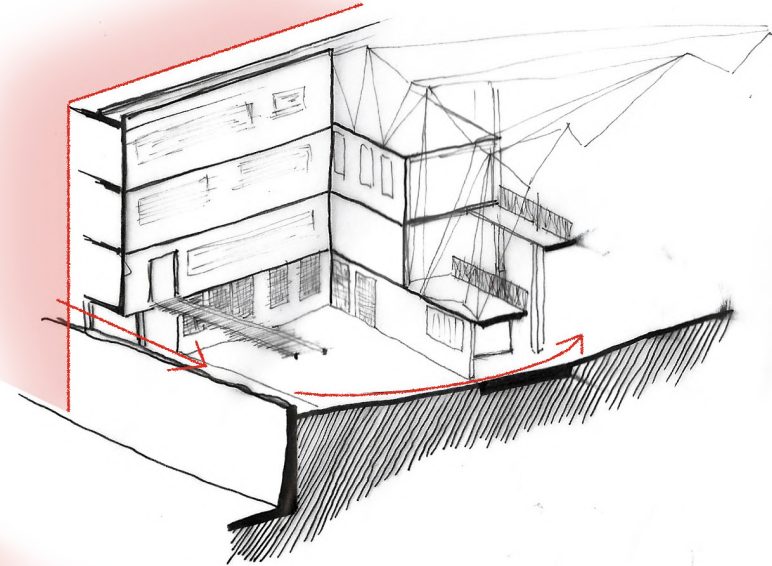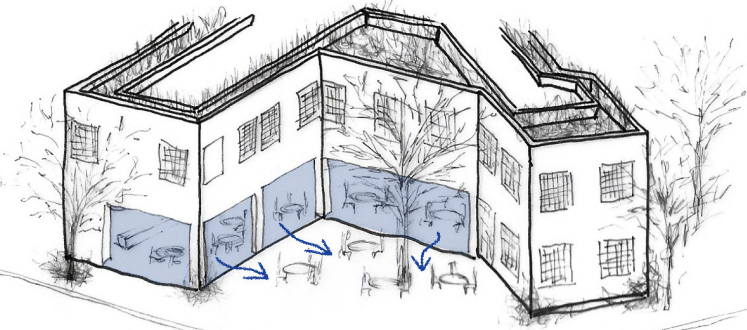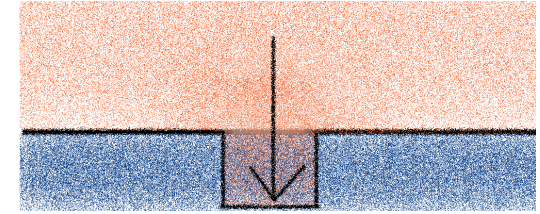
Figure 115: Types of public space in the building

Many of the public functions housed in these spaces also act as an extension to the creative act ce inside the building. This specifically refers to the southern edge that abuts the river where a number of creative and cultural activities and functions can be accommodated on an ongoing basis or in the event of a special occasions such as an art, design and performance festival.

Active promenade along the chanel

Water Walkway

Romantisised river chanel with planting on either side to frame it

A plain wall is available for film screenings, as a backdrop for performances or for displaying art or advertising

Open Day!
Join us on 12 December

Jazz Festival
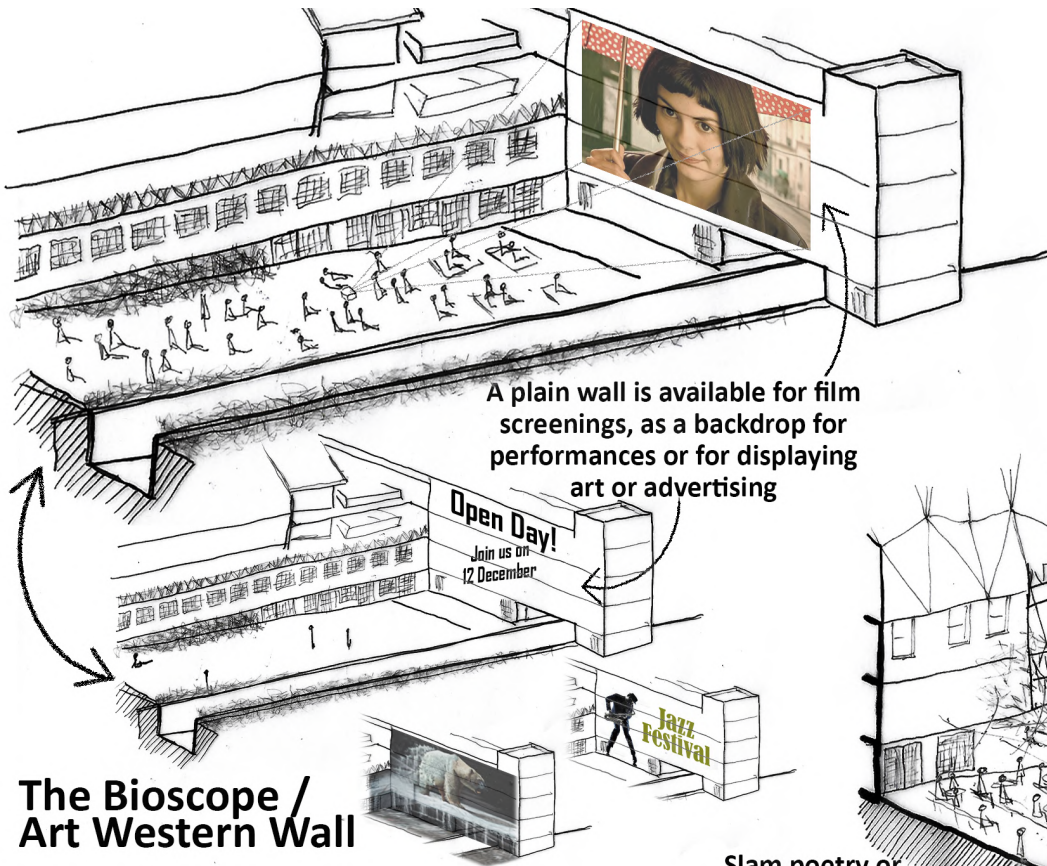
The Bioscope / Art Western Wall
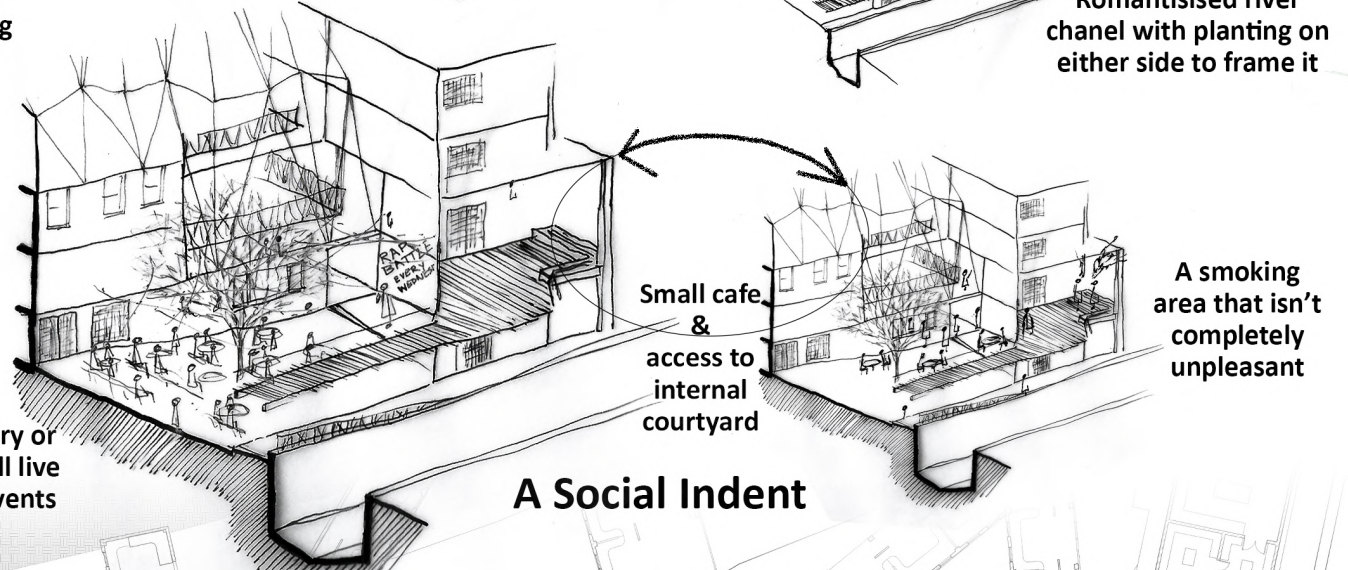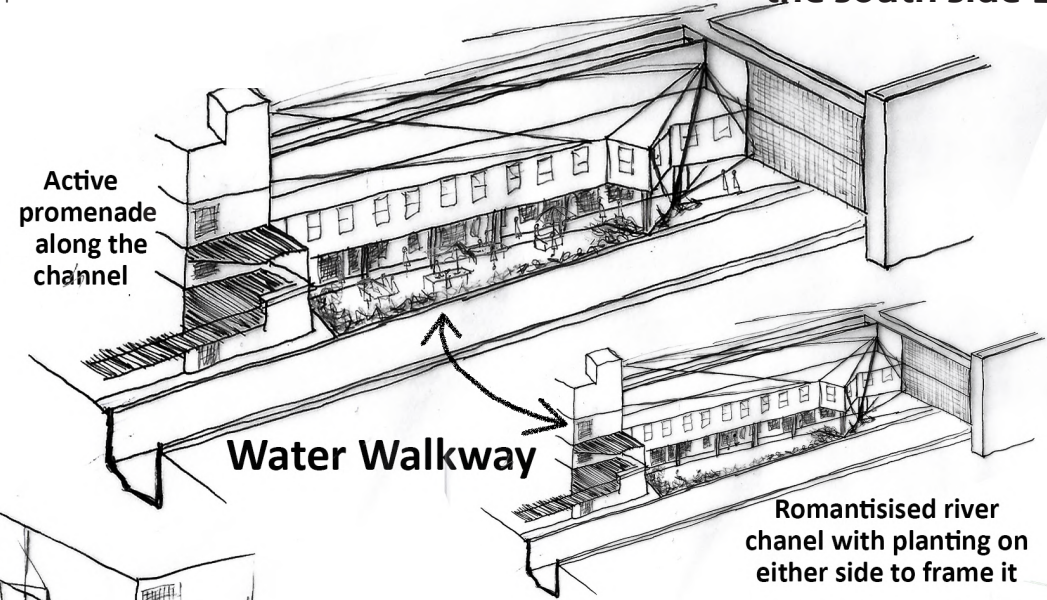
Slam poetry or other small live cultural events

Small cafe & access to internal courtyard

A Social Indent

A smoking area that isn't completely unpleasant

The Bioscope / Art Western Wall

A Social Indent

© University of Pretoria

Water Walkway

Figure 116: Social and cultural functions on the southern edge

Bar Without Roof

A bar located in a dilapidated 1910 house on the edge of the site

Wine tastings

Live music

Sidewalk dance floor

Spillout onto the sidewalk

Provide services to sport field and park across the road

The Corner Cafe[teria]

Link to the future south campus, if expansion occurs as proposed in the materplan

Exhibition space that is visibly open to any passerby

is it level!?

Exam pin-up space

The Corner Cafe[teria]

Figure 117: Social and cultural functions on the southern and eastern edges

Chapter 6
Building Systems
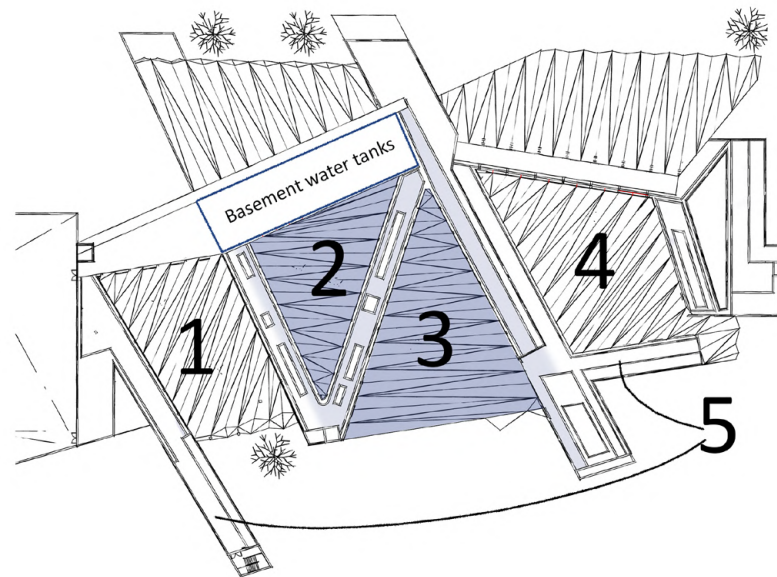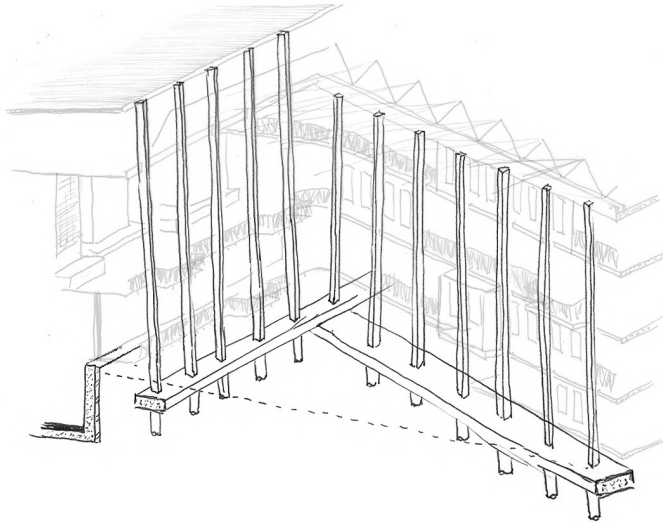
1. Pile foundation system with concrete columns
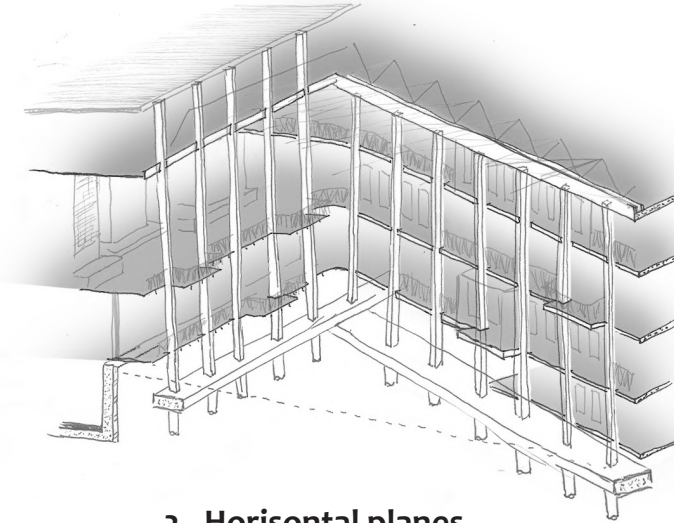
2. Horisontal planes concrete and suspended steel floors
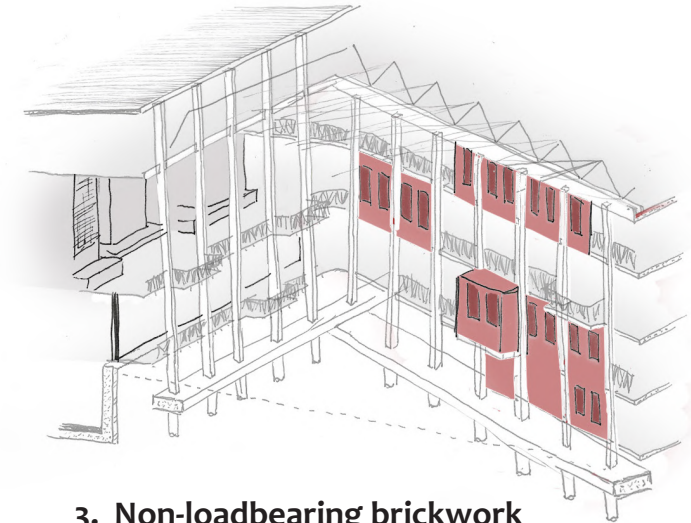
3. Non-loadbearing brickwork infill walls with glazing elements
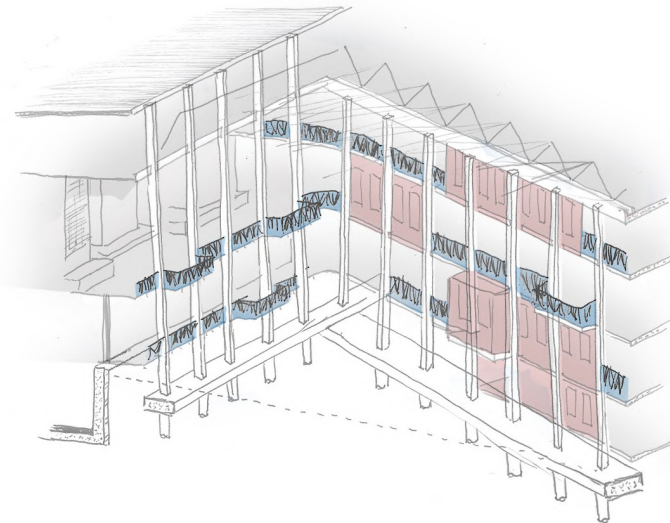
4. Fall protection
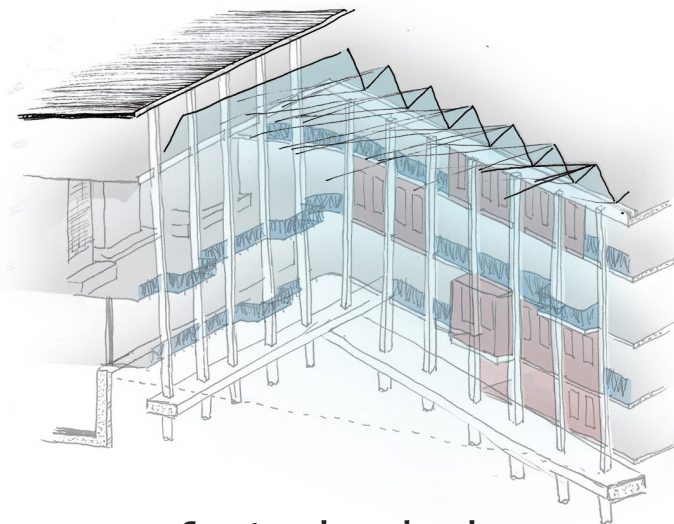
5. Courtyard overhead enclosure and roof sheeting system
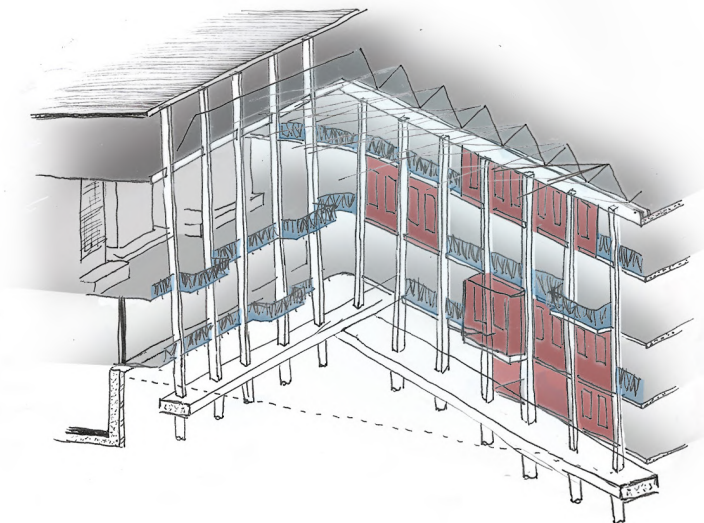
Figure 118: Sequence of structures

SEFAIRA Analysis 1:
Both the northern wall and roof cladding is single pane laminated glazing resulting in the workshop being entirely overlit and highly uncomfortable both in summer and winter.

SEFAIRA Analysis 1

234 kWh/m²/yr

HEATING DOMINATED

MOSTLY OVERLIT

Gains & Losses   Guidance

Impact on Heating   Impact on Cooling

North Solar
Wall Conduction
East Solar
West Solar
Floor Conduction
Glazing Conduction
Roof Conduction
South Solar
Infiltration
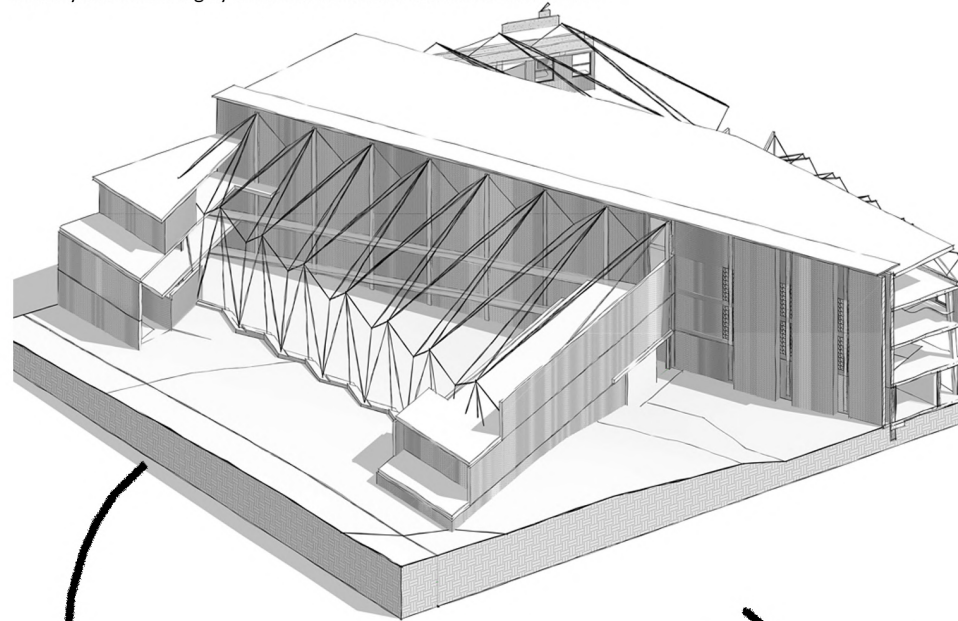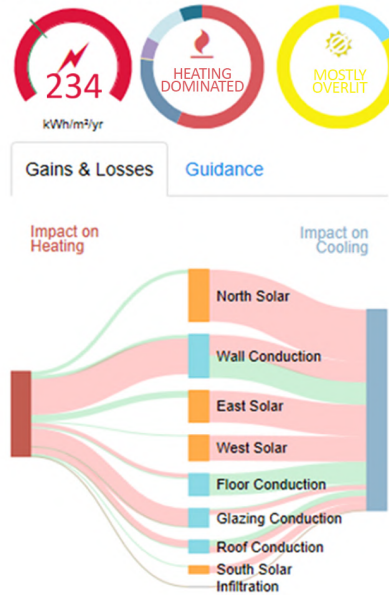
SEFAIRA Analysis 3:
In addition to the change made in Analysis 2, the roof was also replaced with roof sheeting and insulation assembly with a U-value of 0.15w/m²K. Additionally, the upper EFTE panels were 'frosted'. Jointly this improved the performance by a great margin.

SEFAIRA Analysis 2

148 kWh/m²/yr

HEATING DOMINATED

MOSTLY OVERLIT
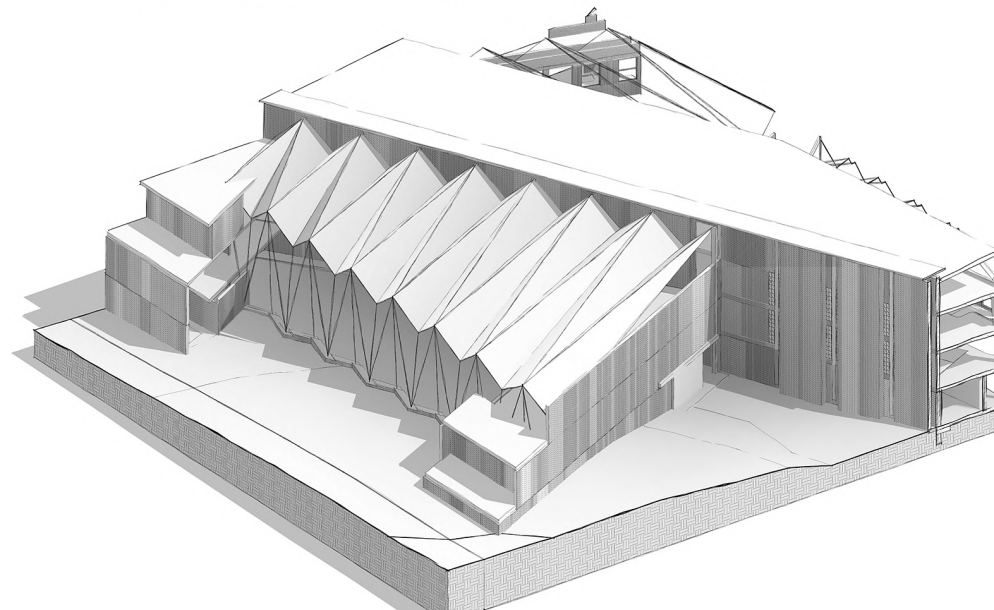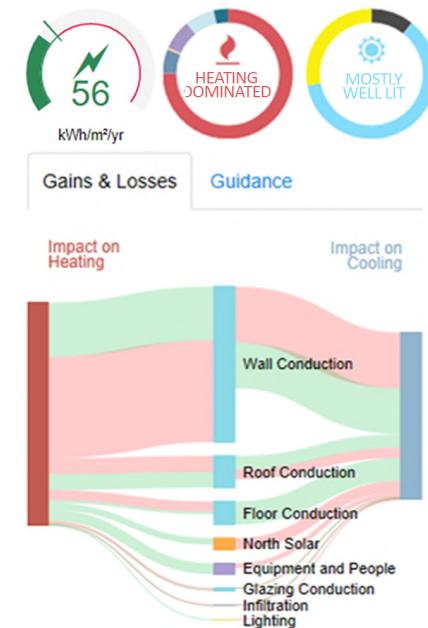
SEFAIRA Analysis 2:
All glazing the workshop is replaced with ETFE foil which has a U-value of 1.5w/m²K (or less). This significantly improved the performance of the space in terms of heating and cooling, however the space remained notably overlit

SEFAIRA Analysis 3

56 kWh/m²/yr

HEATING DOMINATED

MOSTLY WELL LIT

Gains & Losses   Guidance

Impact on Heating   Impact on Cooling

Wall Conduction
Roof Conduction
Floor Conduction
North Solar
Equipment and People
Glazing Conduction
Infiltration
Lighting

Energy consumption

Parking @ 4011m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
Day/night Lighting	0.1/m²	0.005	12	21.9	8784
Day/night Focused Lighting	0.05/m²	0.015	12	65.7	13176
Smoke detection	16	0.0004	24	3.504	56
Boom system	2	0.05	2	36.5	73

IT workspace @ 121m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General Lighting	0.5/m²	0.01	8	29.2	1766.6
Smoke detection	2	0.0004	24	3.504	7.008
PCs	6	0.1	25	912.5	5475

Library & Sound Studios @ 465m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General Lighting	0.5/m²	0.005	8	14.6	3394
Focused lights	0.5/m²	0.01	2	7.3	1697
Smoke detection	8	0.0004	24	3.504	28
Equipment	1	0.05	3	54.75	54
Equipment (specialised)	1	0.5	4	730	730

Workshops @ 1405m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General Lighting	0.5/m²	0.01	10	36.5	25641
Equipment (single phase)	1	10	24	87600	87600
Smoke detection	8	0.0004	24	3.504	28

Reception @ 105m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General Lighting	0.5/m²	0.005	12	21.9	1149
Focused lights	3	0.01	2	7.3	21
LED strip lighting	3	0.014	4	10.22	30
Smoke detection	2	0.0004	24	3.504	7
Laptops	2	0.05	8	146	292

Assembly areas @ 181m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General lighting	0.5/m²	0.005	5	9.125	825
Smoke detection	6	0.0004	24	3.504	21
Projector	3	0.08	2	58.4	175
Laptops	15	0.05	3	54.75	821

Plant rooms & Services @ 642m²
(incl. Water tanks & PVC infrastructure)

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General Lighting	0.1/m²	0.005	24	43.8	2811
Focused lights	10	0.01	0.5	1.825	18
Smoke detection	4	0.0004	24	3.504	14
Equipment	4	0.5	25	4562.5	18250

Dining area @ 275m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General lighting	0.5/m²	0.005	7	12.775	1756
External Lighting	10	0.02	12	87.6	876
LED strip lighting	35	0.014	12	61.32	2146
Smoke detection	5	0.0004	24	3.504	17
Additional equipment	1	2	2	1460	1460

Areas for food preparation @ 88m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General lighting	0.5/m²	0.01	18	65.7	2890
Smoke detection	6	0.0004	24	3.504	21
Appliances for food preparation	1	2.5	24	21900	21900

Pin-Up & Exhibition Spaces @ 220m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
Focused lights	40	0.01	2	7.3	292
Smoke detection	12	0.0004	24	3.504	42

Circulation @ 2014m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
Walkway lights	0.2/m²	0.005	12	21.9	8821.32
Smoke detection	0.1/m²	0.0004	24	3.504	705.7056

Individual Pockets @ 7.7m² each x 105 pockets

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
Pod strip lights	3.2	0.014	6	30.66	32867
Pod lights	1	0.005	6	10.95	3668
Smoke detection	0.5	0.0004	24	3.504	586
Laptops	1	0.05	8	146	48910
Cell phone charging	1	0.08	1.5	43.8	14673
Cell phone charger	1	0.003	24	26.28	8803
Equipment (frequent)	1	0.025	8	73	24455
Equipment (seldom)	0.5	0.1	2	73	12227

Courtyards

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General Lighting	0.5/m²	0.005	8	14.6	584
Power points	50	0.05	3	54.75	2737
LED strip lights	60	0.014	6	30.66	1839

Interaction Spaces @ 2639m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General Lighting	0.5/m²	0.005	8	14.6	19264
Focused lights	36	0.01	2	7.3	262
Smoke detection	12	0.0004	24	3.504	42
Laptops	50	0.05	3	54.75	2737

Storage Spaces @ 90m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
General Lighting	0.2/m²	0.005	5	9.125	162
Focused lights	0.5/m²	0.005	2	3.65	162
Smoke detection	5	0.0004	24	3.504	17

Bathrooms & Toilets @ 435m²

Fixture or Appliance	Frequency of fixtures	Fixture kW	Fixture h/day	Fixture kWh/year	Total kWh/year
Permanent General Lighting	0.1/m²	0.005	24	43.8	1905
Movement General Lighting	0.5/m²	0.005	2	3.65	793
Cosmetic appliances	10	0.8	5	1460	14600

Summary:

Total kWh per annum — 405 191kWh/year

Total kWh per annum that is essential to the building's day-to-day functioning*
(I.e. minimum to be generated on site) — 94 540 kWh/year

Total available PVC area: 550m²
PVC yield %: 15%
Solar radiation: 1700
Loss coefficient: 0.75

= Potential energy generated with PVC Panels: 105 187 kWh/year
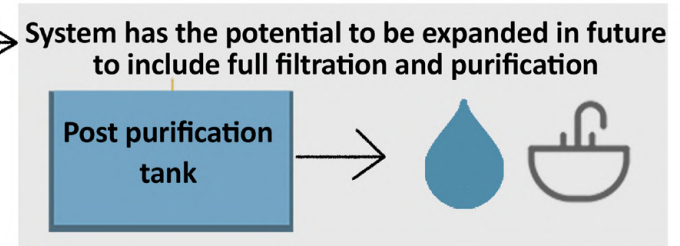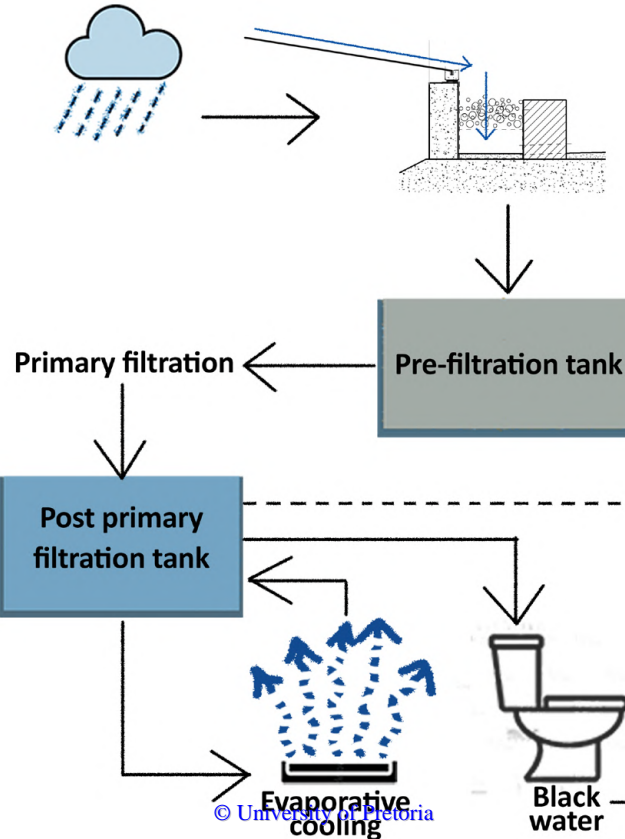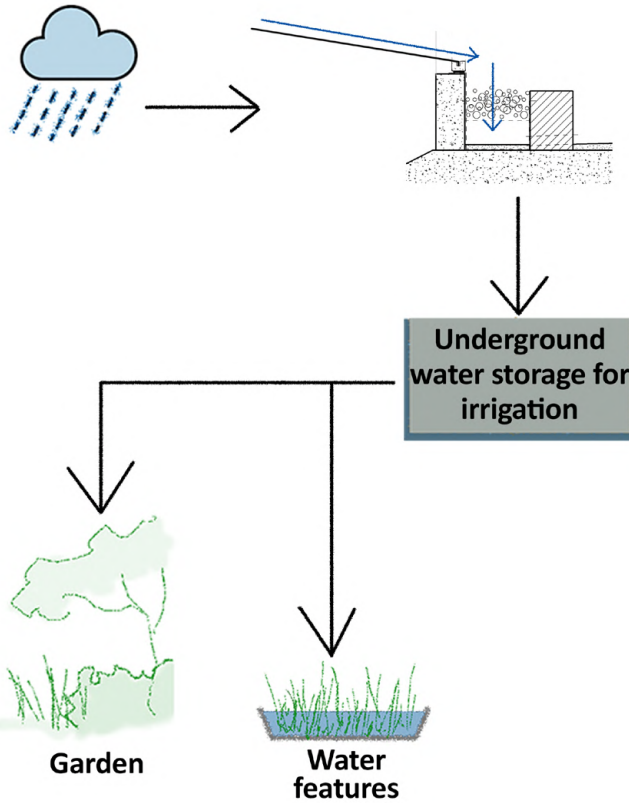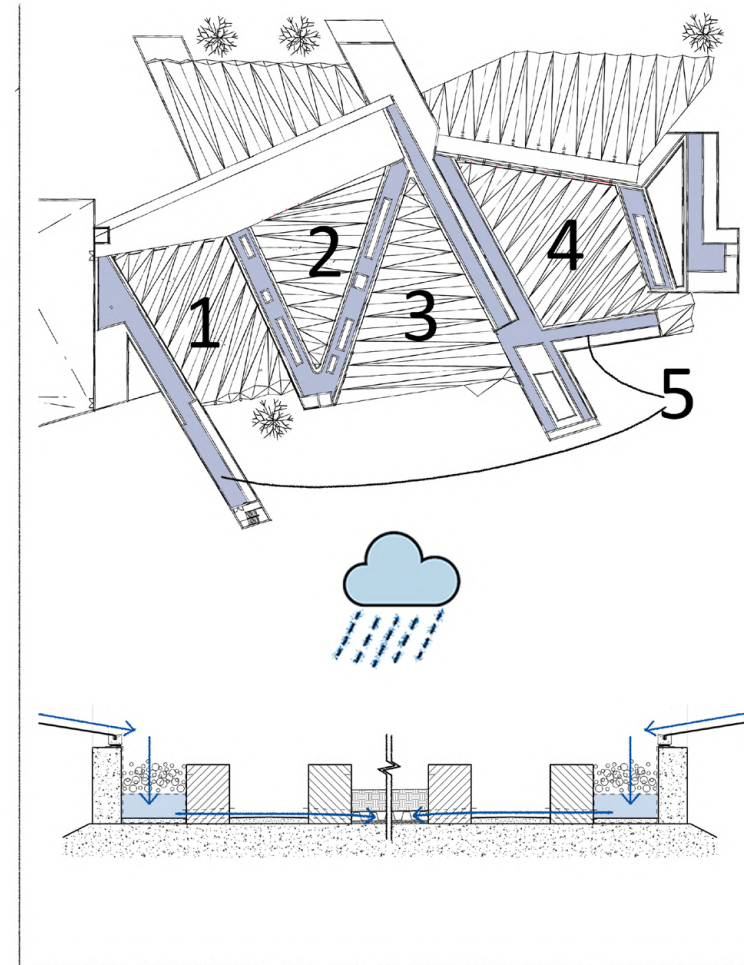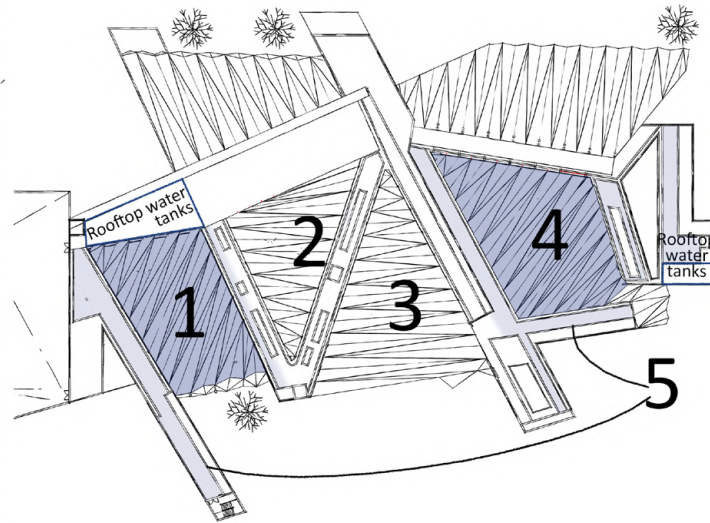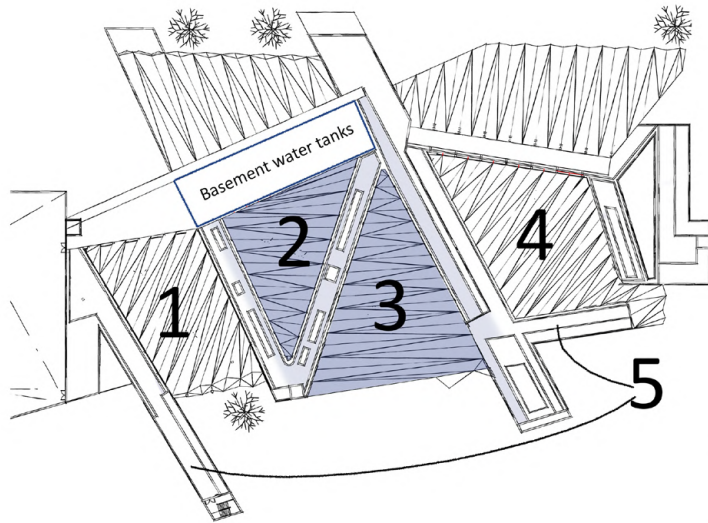= Minimum energy demand is met with approximately 10% contingency

● Items powered by the PVC Panels

◐ Items 50% powered by the PVC Panels
(i.e. if only PVC energy is available, only half of these appliances will function, e.g. only half the walkway lights will be on)

Thus the building will experience minimal functional disruptions in the event of loadshedding and extended power interruptions.
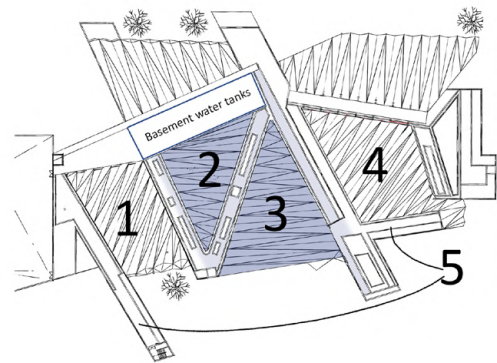
The only section that would be extensively affected is the workshops due to the high power demands of the machines.

Figure 121: Energy needs and potential PVC supply

Basement water tanks

1 2 3 4 5

Rooftop water tanks

Rooftop water tanks

1 2 3 4 5

1 2 3 4 5

Underground water storage for irrigation

Garden

Water features

Primary filtration ← **Pre-filtration tank**

Post primary filtration tank

System has the potential to be expanded in future to include full filtration and purification

Post purification tank

Evaporative cooling

Black water → **Remove off site**

Figure 122: Illustration of the three water catchment systems

Roof Area
Roof 2: 380m²
Roof 3: 650m²
Roof 5 (60%*): 1560m²

Runoff Coefficient: 0.9

Effective roof area:
Roof 2: 342m²
Roof 3: 585m²
Roof 5 (60%*): 1404m²
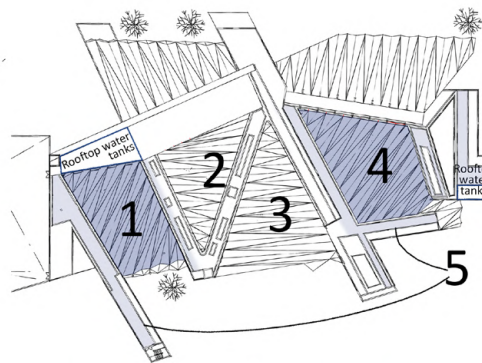
Roof Area
Roof 1: 550m²
Roof 4: 750m²

Runoff Coefficient: 0.9

Effective roof area:
Roof 2: 495m²
Roof 3: 675m²
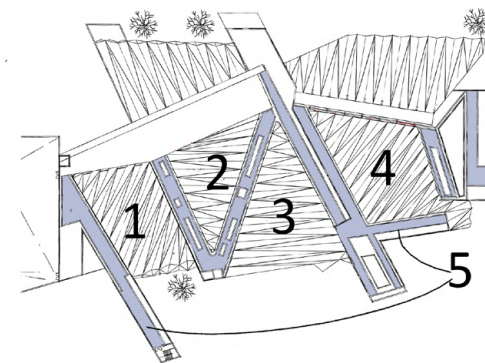
Roof Area
Roof 5 (40%*): 1040m²

Runoff Coefficient: 0.9

Effective roof area:
Roof 5 (40%*): 937m²

* It is assumed that 40% overflow will be required while the remaining 60% will feed into one of the other two systems

FIXED DAILY & MONTHLY IRRIGATION WATER DEMAND (SUMMER)

Amenity	Consumed per day (m³)	Consumption per 31 days (m³)
Courtyard 1 Irrigation (drip)	1.375	27.5
Courtyard 2 Irrigation (drip)	0.95	19
Courtyard 3 Irrigation (drip)	1.625	32.5
Courtyard 4 Irrigation (drip)	1.875	37.5
TOTALS	5.825	116.5

FIXED DAILY & MONTHLY BUILT IRRIGATION DEMAND (WINTER)

TOTALS	1.715	40.75

FIXED DAILY & MONTHLY BUILDING WATER DEMAND (SUMMER)

Amenity	Consumed per day (m³)	Consumption per 31 days (m³)
Evaporative cooling	0.25	7.75
Toilets	0.72	22.32
TOTALS	0.97	30.07
Reusable water	0.125	3.875

FIXED DAILY & MONTHLY BUILDING WATER DEMAND (WINTER)

Amenity		
Evaporative cooling	0.075	2.325
Toilets	0.72	22.32
TOTALS	1.123125	24.645
Reusable water	0.0525	1.6275

FIXED DAILY & MONTHLY ROOF OVERFLOW GARDEN WATER DEMAND (SUMMER)

Amenity	Consumed per day (m³)	Consumption per 31 days (m³)
Roof gardens	0.702	21.762

FIXED DAILY & MONTHLY ROOF OVERFLOW GARDEN WATER DEMAND (SUMMER)

Roof gardens	0.234	7.254

Year 1

Month	Ave. rainfall (m)	Yield (m³)	Loss	Consumption (Irrigation)	Tank Balance (Cumulative)	Yield (m³)	Loss	West consumption	Balance	Yield (m³)	Loss	East Consumption	Balance	Yield (m³)	Loss	Roof Garden Consumption	Balance
January	0.125	291.375	20	116.5	154.875	61.875	18	15.035	30.7775	84.375	18	15.035	53.2775	117	25	21.762	70.238
February	0.094	219.114	20	116.5	237.489	46.53	18	15.035	46.21	63.45	18	15.035	70	87.984	25	21.762	86
March	0.09	209.79	15	116.5	315.779	44.55	13	15.035	64.6625	60.75	13	15.035	70	84.24	20	21.762	86
April	0.054	125.874	15	116.5	310.153	26.73	13	15.035	65.295	36.45	13	15.035	70	50.544	20	21.762	86
May	0.013	30.303	10	40.75	289.706	6.435	8	12.3225	53.345	8.775	8	12.3225	60.39	12.168	15	21.762	61.406
June	0.007	16.317	10	40.75	255.273	3.465	5	12.3225	41.425	4.725	5	12.3225	49.73	6.552	10	7.254	50.704
July	0.003	6.993	10	40.75	211.516	1.485	5	12.3225	27.525	2.025	5	12.3225	36.37	2.808	10	7.254	36.258
August	0.006	13.986	10	116.5	99.002	2.97	8	15.035	9.3975	4.05	8	15.035	19.3225	5.616	15	7.254	19.62
September	0.026	60.606	15	116.5	28.108	12.87	13	15.035	-3.83	17.55	13	15.035	10.775	24.336	15	21.762	7.194
October	0.077	179.487	20	116.5	71.095	38.115	18	15.035	3.1875	51.975	18	15.035	31.6525	72.072	20	21.762	37.504
November	0.105	244.755	20	116.5	179.35	51.975	18	15.035	24.065	70.875	18	15.035	70	98.28	25	21.762	86
December	0.12	279.72	20	116.5	322.57	59.4	18	15.035	52.3675	81	18	30.07	70	112.32	25	21.762	86
ANNUAL TOTAL		**1678.32**		1355.75		**356.4**		327.2825						673.92		442.62	

Year 2

Month	Ave. rainfall (m)	Yield (m³)	Loss	Consumption (Irrigation)	Tank Balance (Cumulative)	Yield (m³)	Loss	West consumption	Balance
January	0.125	291.375	20	116.5	365	61.875	18	15.035	83.145
February	0.094	219.114	20	116.5	365	46.53	18	15.035	98.5775
March	0.09	209.79	15	116.5	365	44.55	13	15.035	117.03
April	0.054	125.874	15	116.5	359.374	26.73	13	15.035	117.6625
May	0.013	30.303	10	40.75	338.927	6.435	8	12.3225	105.7125
June	0.007	16.317	10	40.75	304.494	3.465	5	12.3225	93.7925
July	0.003	6.993	10	40.75	260.737	1.485	5	12.3225	79.8925
August	0.006	13.986	10	116.5	148.223	2.97	8	15.035	61.765
September	0.026	60.606	15	116.5	77.329	12.87	13	15.035	48.5375
October	0.077	179.487	20	116.5	120.316	38.115	18	15.035	55.555
November	0.105	244.755	20	116.5	228.571	51.975	18	15.035	76.4325
December	0.12	279.72	20	116.5	365	59.4	18	30.07	89.7

Max. Volume of Irrigation tanks

Max. Volume of Irrigation tanks

Max. Volume of Irrigation tanks
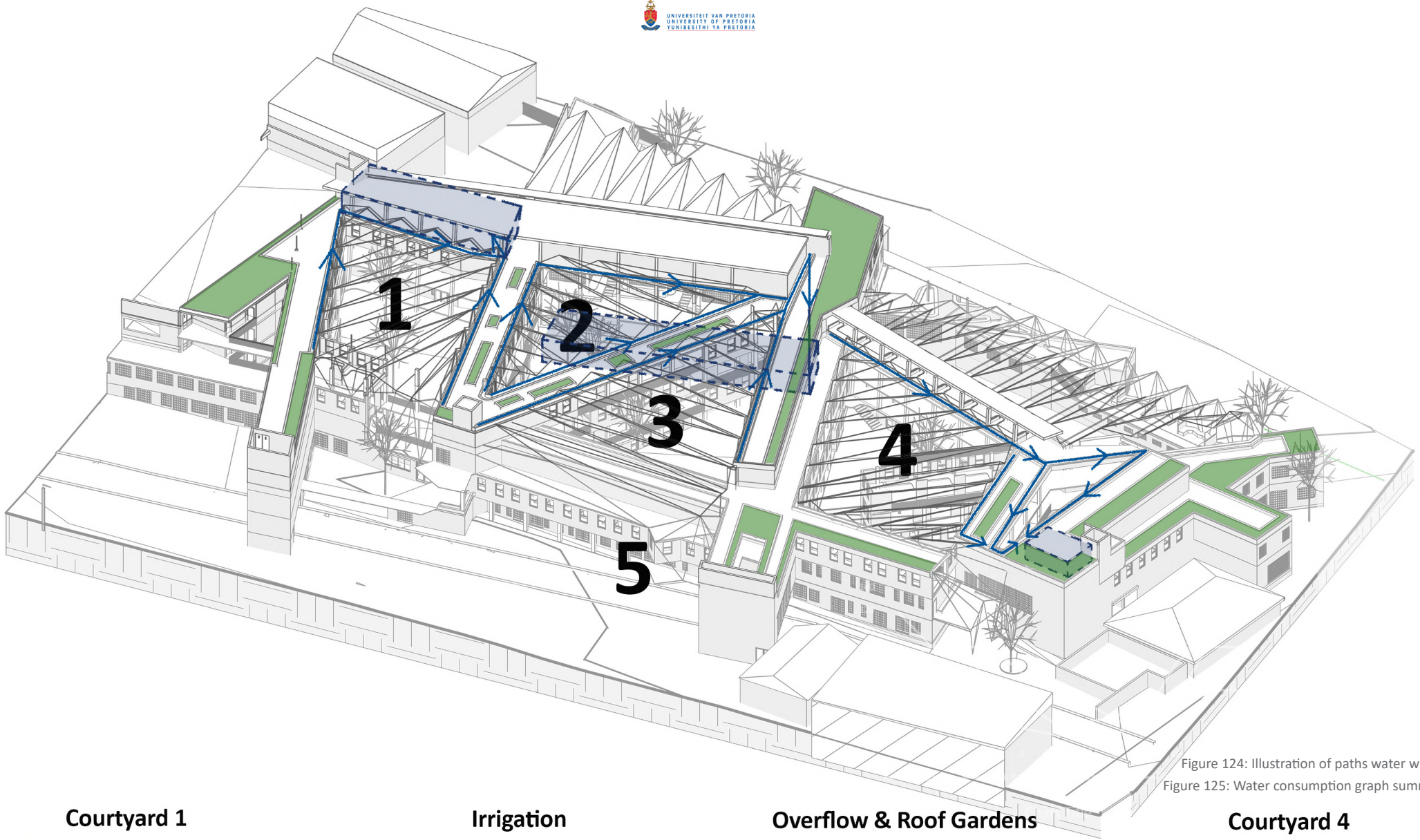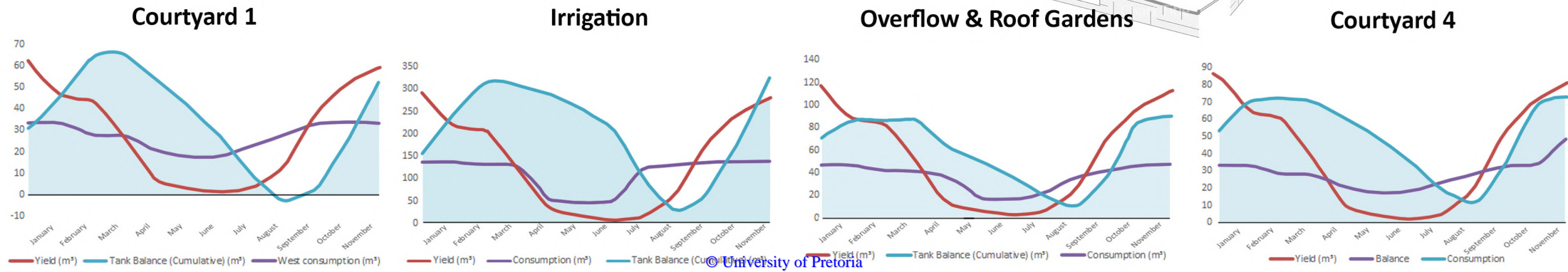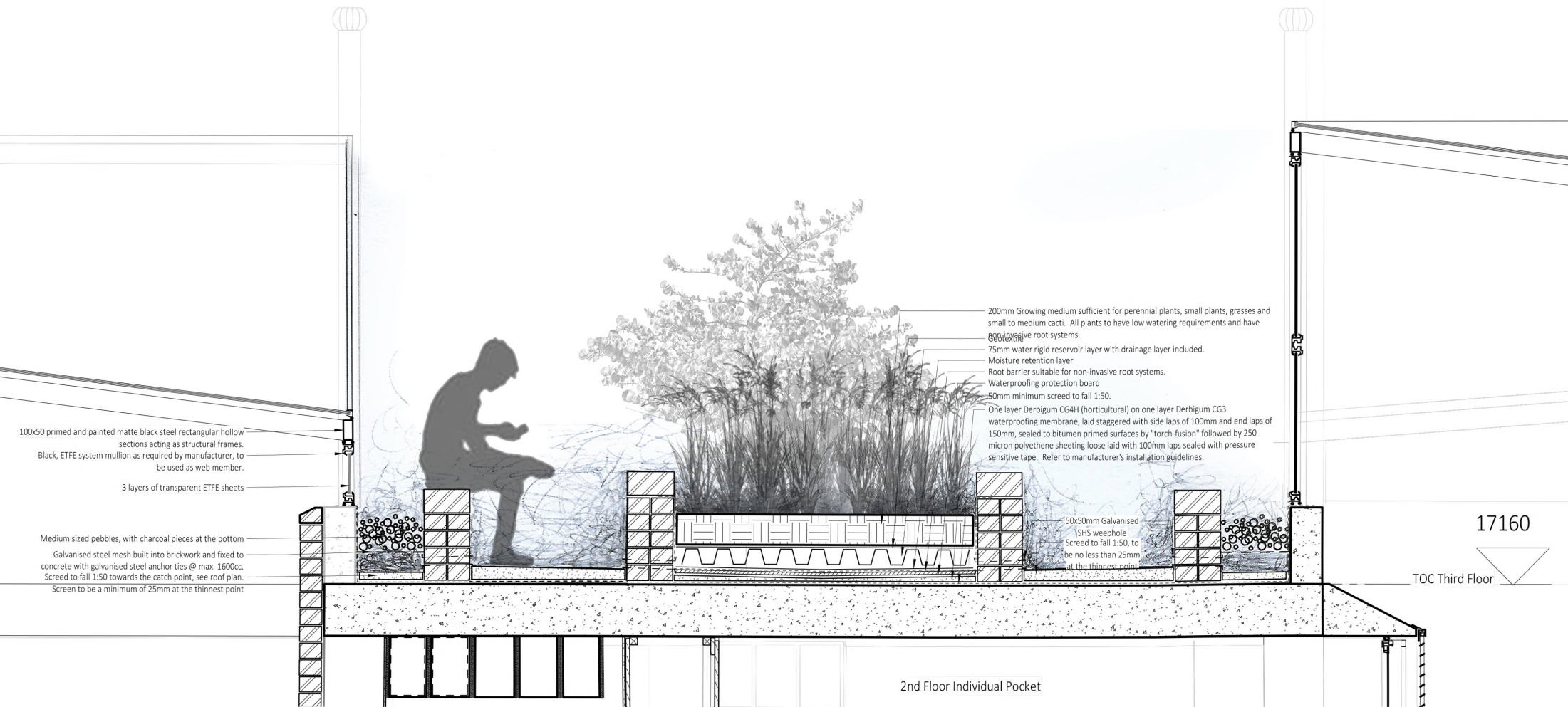
Figure 123: Water calculations

Figure 124: Illustration of paths water will take

Figure 125: Water consumption graph summaries

Courtyard 1

Irrigation

Overflow & Roof Gardens
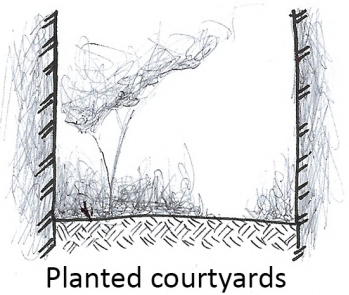
Courtyard 4

Yield (m³) Tank Balance (Cumulative) (m³) West consumption (m³)

Yield (m³) Consumption (m³) Tank Balance (Cumulative) (m³)

Yield (m³) Tank Balance (Cumulative) (m³) Consumption (m³)

Yield (m³) Balance Consumption

200mm Growing medium sufficient for perennial plants, small plants, grasses and small to medium cacti. All plants to have low watering requirements and have non-invasive root systems.

Geotextile

75mm water rigid reservoir layer with drainage layer included.

Moisture retention layer

Root barrier suitable for non-invasive root systems.

Waterproofing protection board

50mm minimum screed to fall 1:50.

One layer Derbigum CG4H (horticultural) on one layer Derbigum CG3 waterproofing membrane, laid staggered with side laps of 100mm and end laps of 150mm, sealed to bitumen primed surfaces by "torch-fusion" followed by 250 micron polyethene sheeting loose laid with 100mm laps sealed with pressure sensitive tape. Refer to manufacturer's installation guidelines.

100x50 primed and painted matte black steel rectangular hollow sections acting as structural frames.

Black, ETFE system mullion as required by manufacturer, to be used as web member.

3 layers of transparent ETFE sheets

Medium sized pebbles, with charcoal pieces at the bottom

Galvanised steel mesh built into brickwork and fixed to concrete with galvanised steel anchor ties @ max. 1600cc.

Screed to fall 1:50 towards the catch point, see roof plan.

Screen to be a minimum of 25mm at the thinnest point

50x50mm Galvanised SHS weephole

Screed to fall 1:50, to be no less than 25mm at the thinnest point

17160

TOC Third Floor

2nd Floor Individual Pocket

SECTION B: DETAIL SECTION OF THE ROOF WALKWAY

1:10 @ A3

Comfort & service reticulation

Photo-voltaic panels

Additional comfort systems:

Adjustable enclosure & thermal mass

Cooling tower/spine

Planted courtyards

Geothermal mass

Figure 126: Passive heating and cooling techniques employed

Street connection

A
C
B
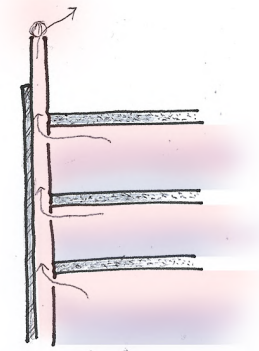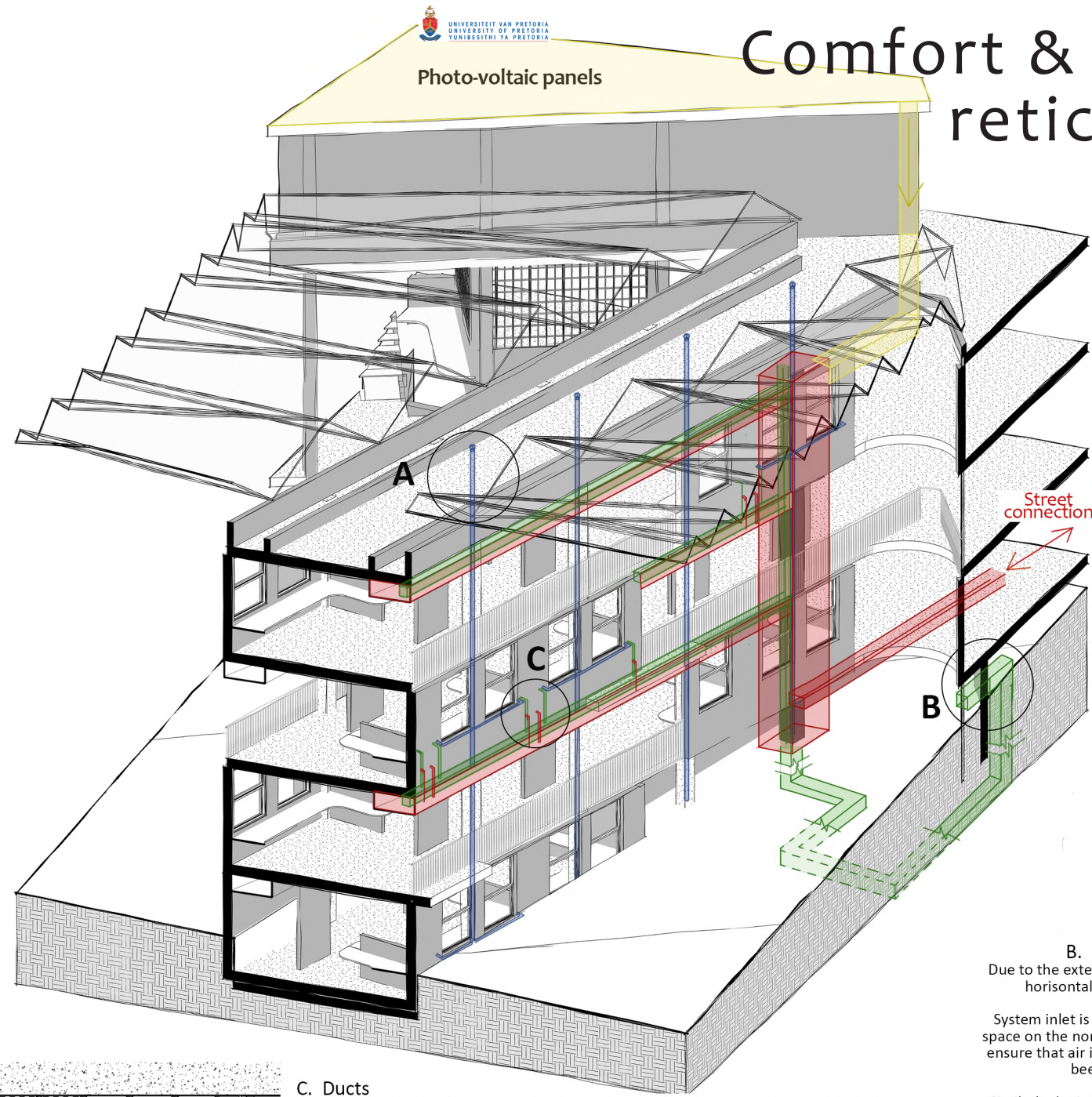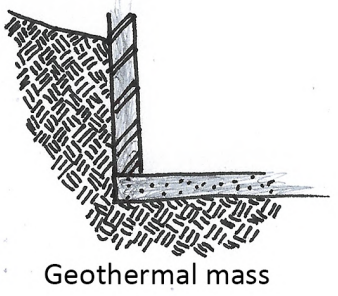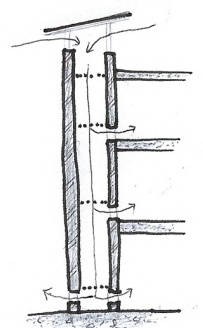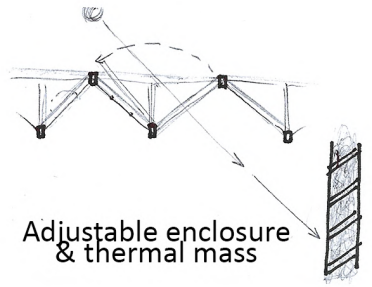
A. Heat extraction
Every individual student can control when and how their physical environment changes regarding comfort as each individual pocket has its own connection to the geothermal system and its own heat chimney that leads outside of the building and is capped by a small whirlybird. Thus the intake and extraction of air can be controlled as well as the rate of both.
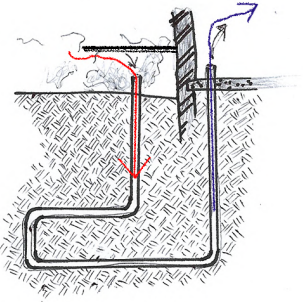
B. Geothermal System
Due to the extensive excavations already required, a horisontal collector system is to be used.

System inlet is located underneath the interaction space on the northern perimeter of the courtyards to ensure that air is already as cool as possible and has been filtered by the plants.

Similarly the intake filter and other infrastructure is also located on the northern perimeter, directly adjacent to either the east workshop and basement plant room.
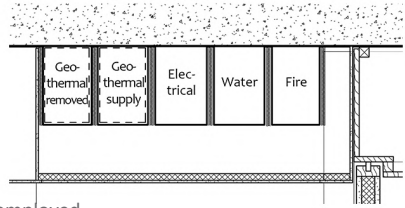
C. Ducts
Vertical ducts are located at the northern and southern most ends of the individual pockets strips to effectively reach every pocket.

From these vertical ducts horisontal ducts branch off to reach the individual pockets. These ducts are suspended from the soffits above the walkways and service the pocket above it (with the exception of fire that is soffit mounted). This results in services never being chased for more than 2m, further easing the future updates to the systems.

| Geo-thermal removed | Geo-thermal supply | Electrical | Water | Fire |

Figure 127: Hybrid heating and cooling techniques employed and service reticulation

SUSTAINABLE BUILDING ASSESSMENT TOOL RESIDENTIAL
1.04

		Achieved
SB	SBAT REPORT	4.1

SB1 Project

0

SB2 Address

0

SB3 SBAT Graph
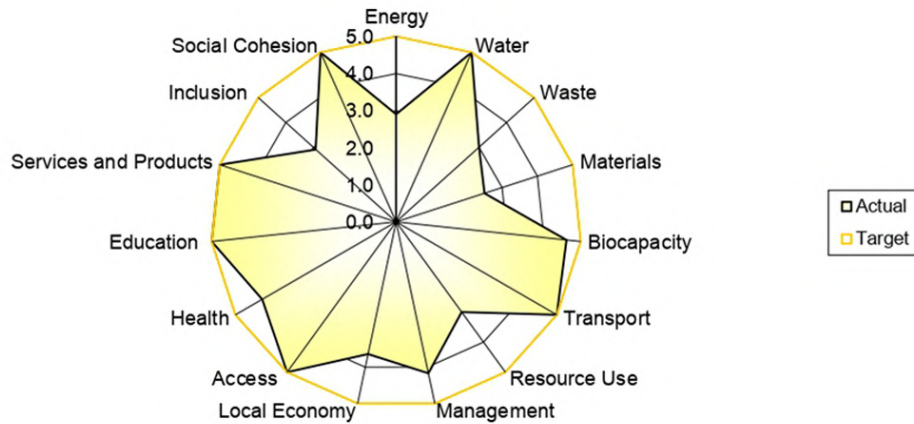
SB4 Environmental, Social and Economic Performance

	Score
Environmental	3.6
Economic	4.2
Social	4.4
SBAT Rating	4.1

SB5 EF and HDI Factors

	Score
EF Factor	3.7
HDI Factor	3.9

SB6 Targets

	Percentage
Environmental	72
Economic	83
Social	88

		Target	Achieved
BI	Building Information	5.0	4.1

BI 1 Building Targets

		Target	Achieved
EN	Energy	5.0	2.9
WA	Water	5.0	5.0
WE	Waste	5.0	3.0
MA	Materials	5.0	2.5
BI	Biocapacity	5.0	4.6
TR	Transport	5.0	5.0
LE	Local Economy	5.0	3.6
MN	Management	5.0	4.2
RE	Resources	5.0	3.0
SP	Services and Products	5.0	5.0
AC	Access	5.0	4.2
HE	Health	5.0	5.0
ED	Education	5.0	5.0
IN	Inclusion	5.0	2.9
SC	Social Cohesion	5.0	5.0

BI 2 Priority Key (Not Performance Key)

VH	Very High	5.0
HI	High	4.0
ME	Medium	3.0
LO	Low	2.0
VL	Very Low	1.0
NA	None / Not Applicable	0.0

BI 3 Project Name

Ideation Institution

BI 4 Address

54 - 76 Sydney Rd, Bertrams, Johannesburg

BI 5	Site Area	12779	m2
BI 6	Gross Floor Area (GFA)	15010	m2
BI 7	Gross Internal Area (GIA)	12512	m2

Figure 128: SBAT Rating

Chapter 7
Computer Generated Drawings
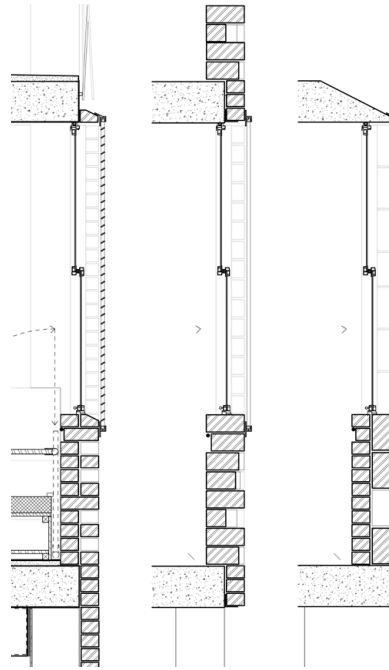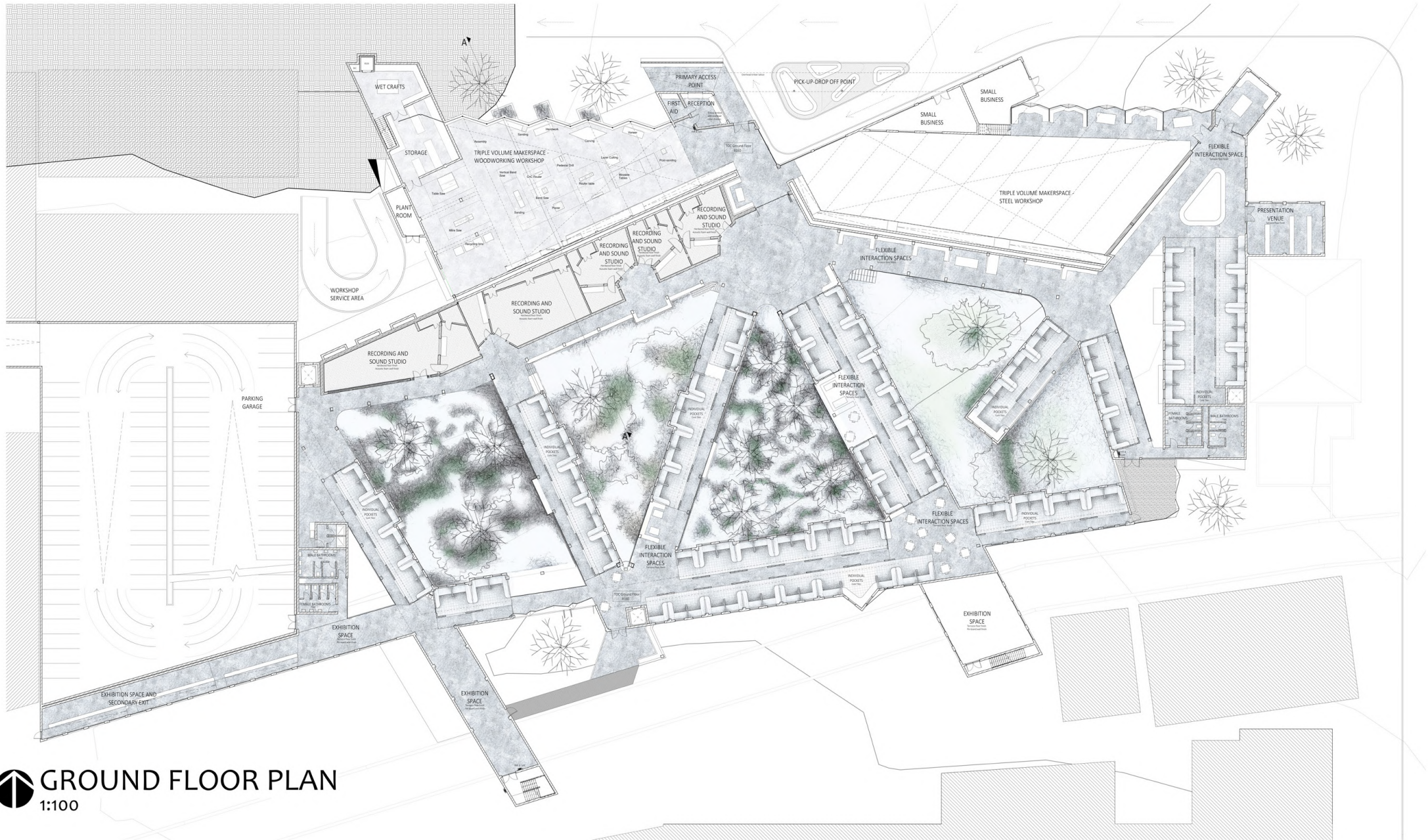
GROUND FLOOR PLAN

1:100
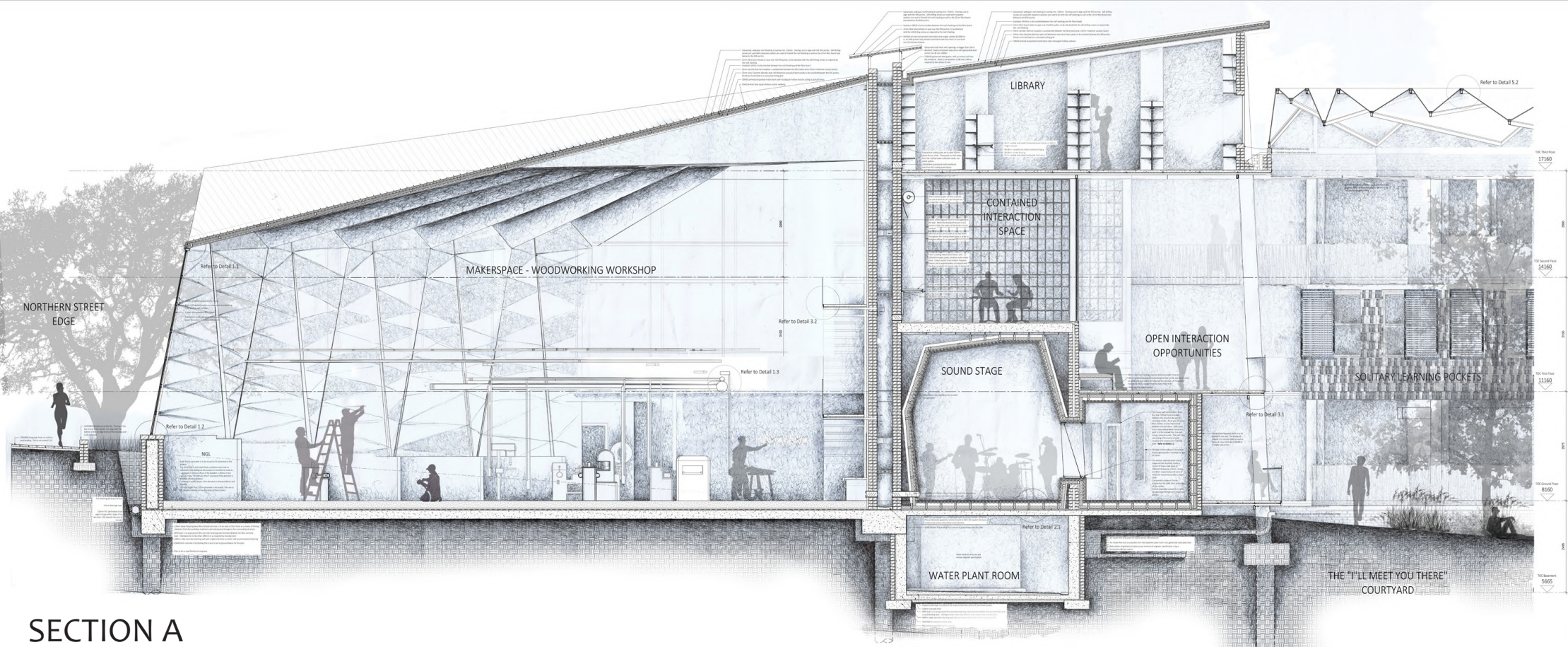
SECTION A

1:20 @ A0

Figure 133: Section A
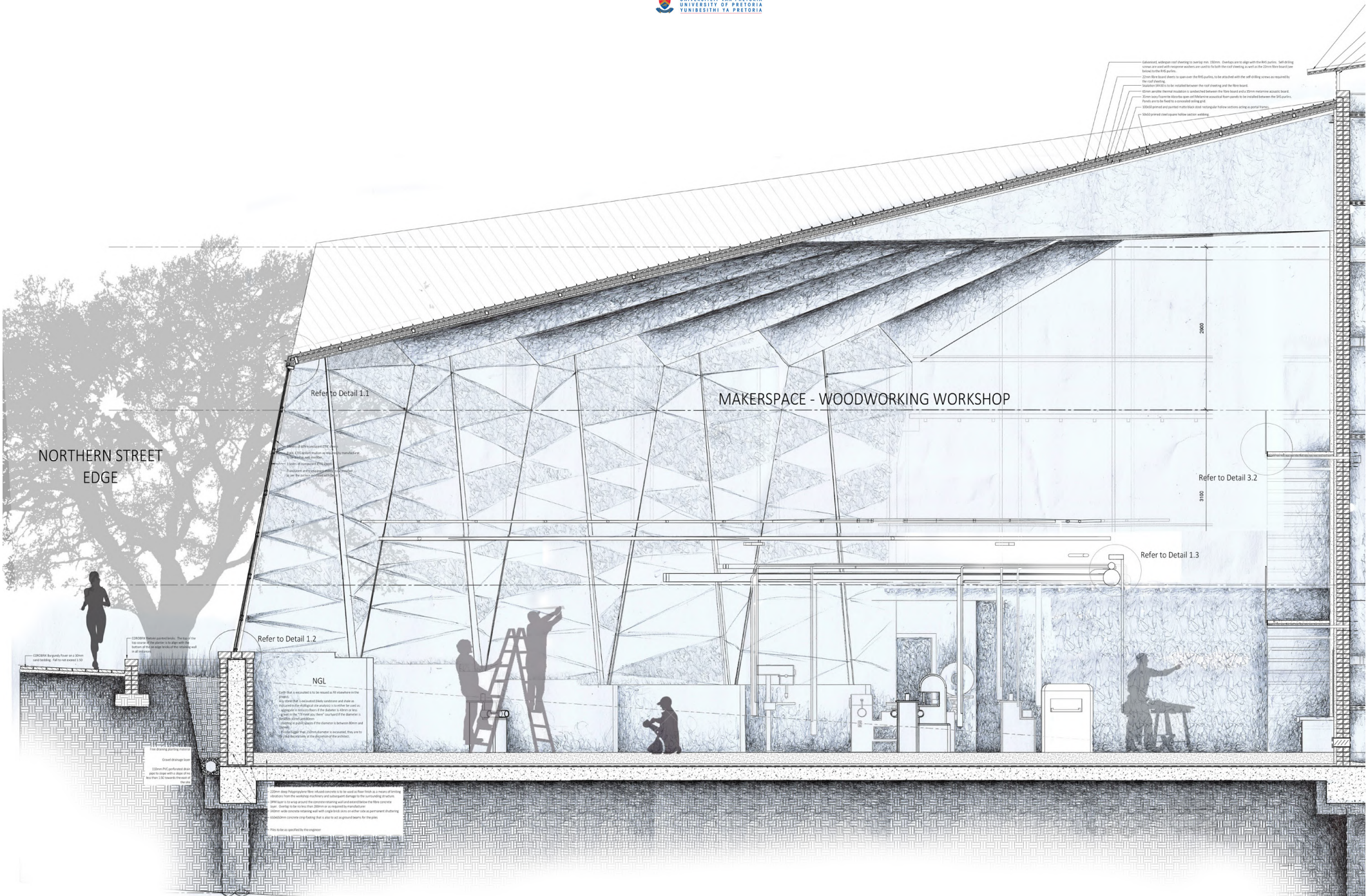
SECTION A: WORKSHOP PORTION

1:20 @A0

MAKERSPACE - WOODWORKING WORKSHOP

NORTHERN STREET EDGE

Refer to Detail 1.1

Refer to Detail 1.2

Refer to Detail 1.3

Refer to Detail 3.2

NGL

Figure 130: Section A: workshop section
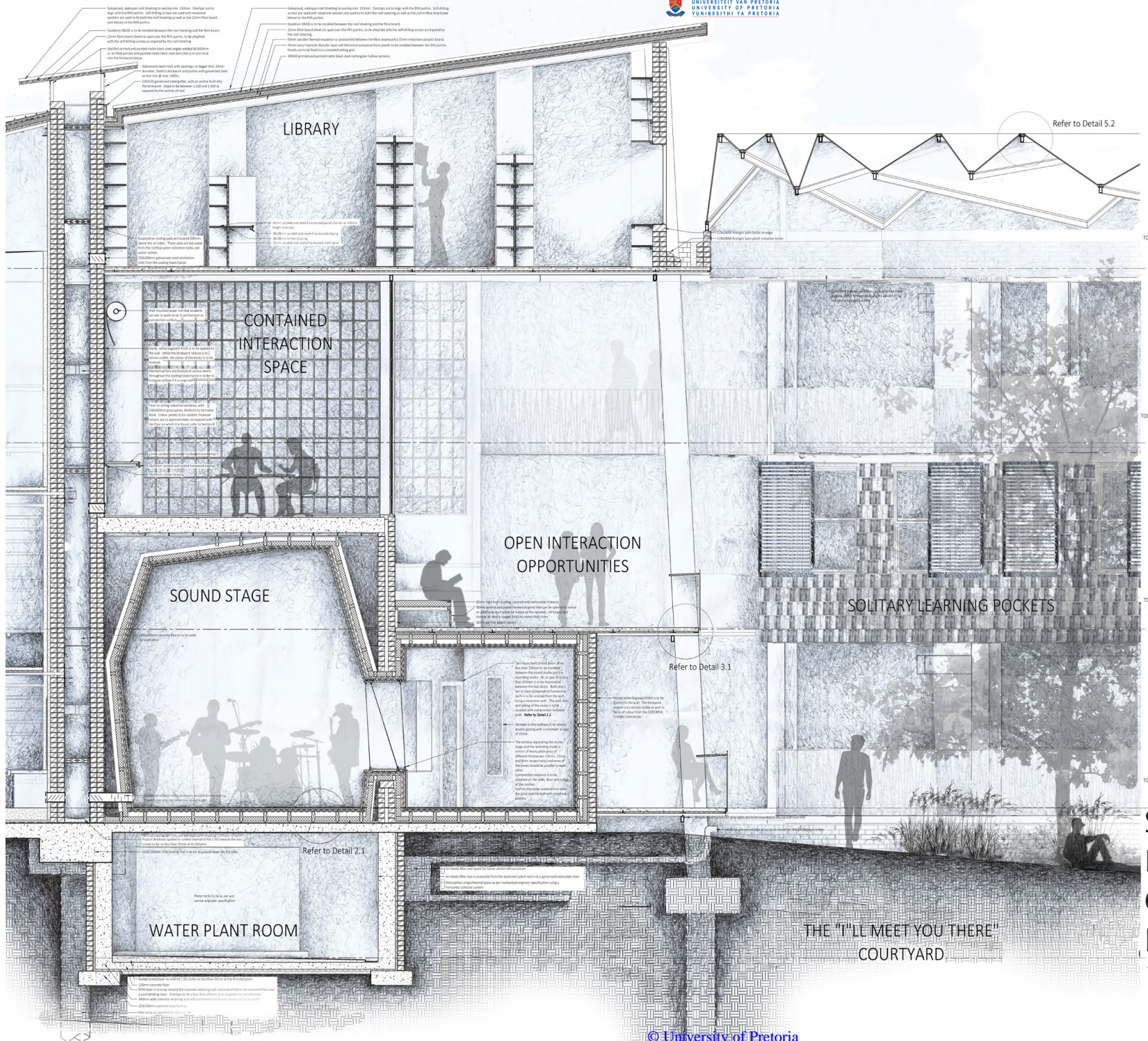
Figure 131: Section A: interaction section
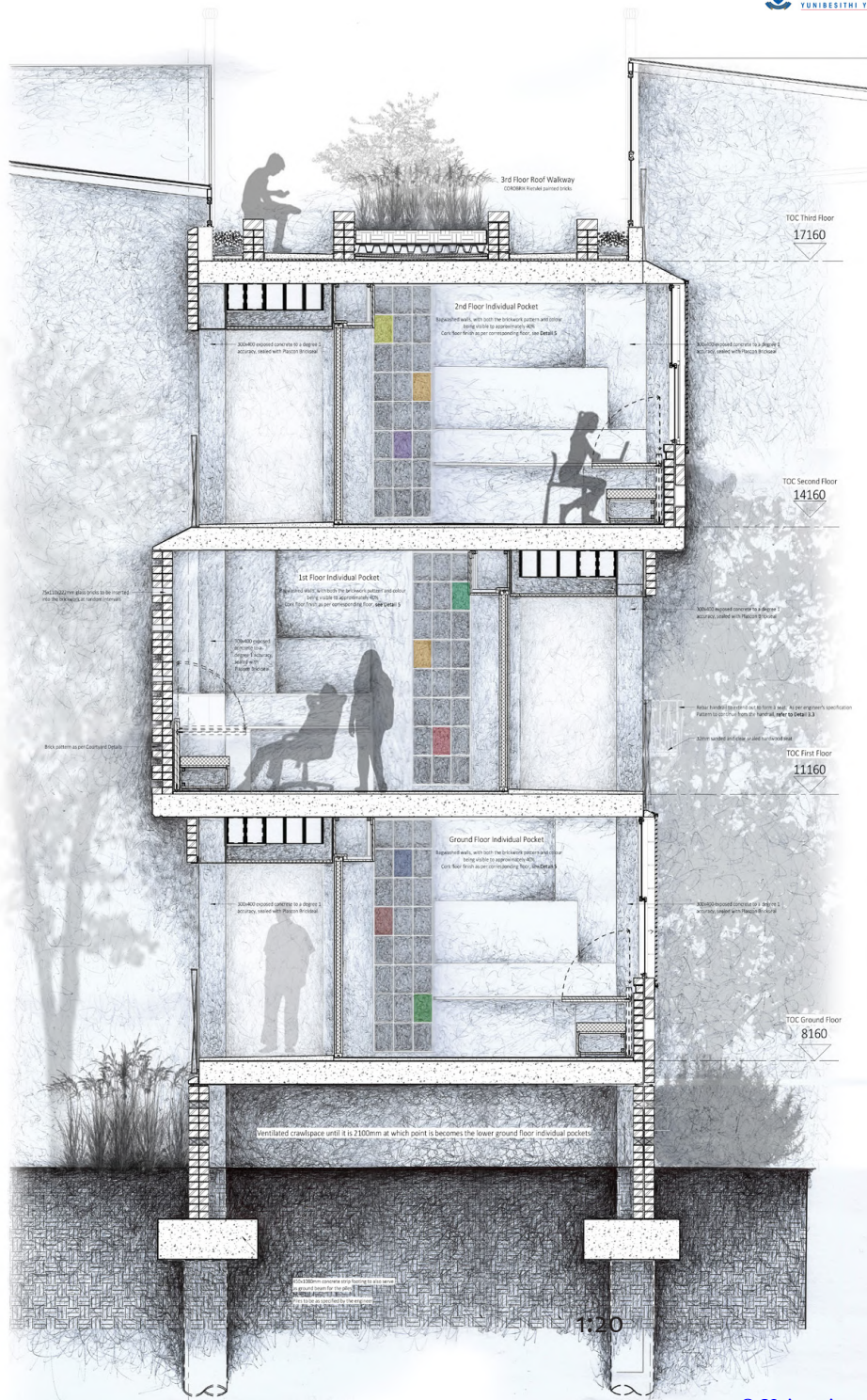
SECTION B: INDIVIDUAL POCKETS

1:20 @ A0

Figure 132: Section A: Individual pocket section

Park | **1st Street**

Proposed project

Existing buildings
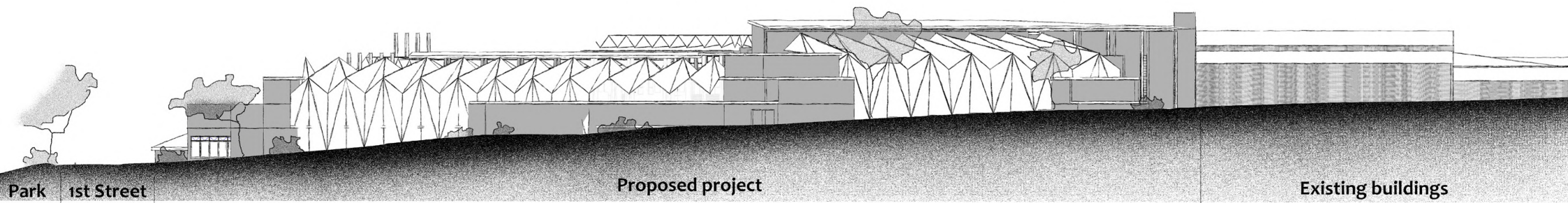
NORTHERN ELEVATION

1:500

Figure 134: North Elevation

Chapter 8
Models
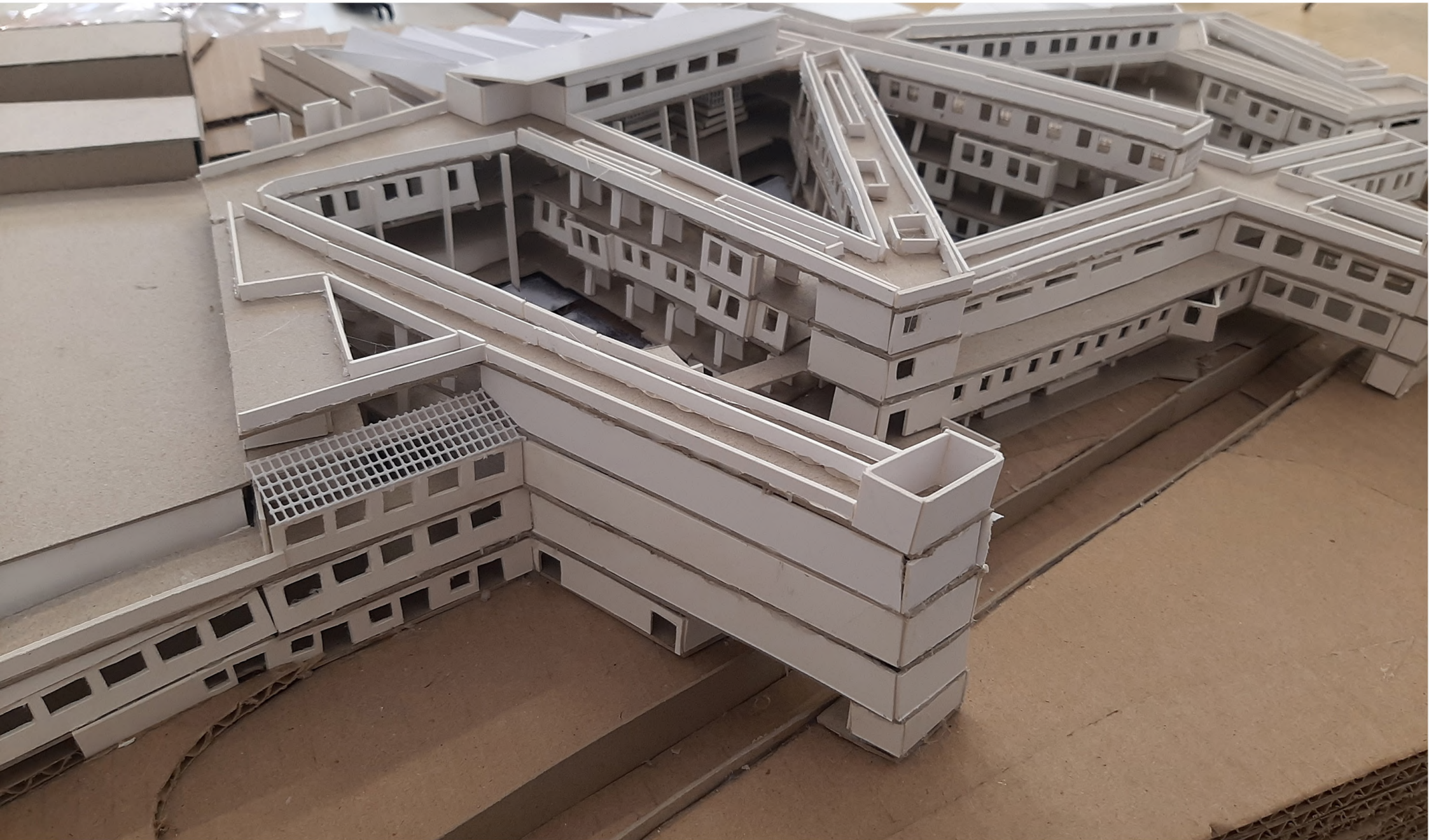
Chapter 9
Conclusion

Reflection

Education is one of the key tools at our disposal to facilitate meaningful and relevant positive change in most if not all facets of life. But education and learning is only as powerful as its constituents, and one of the most fundamental and far reaching of these are the spaces within which learning occurs.

Unfortunately, despite this impact it has on education and the learning process, the spaces within which learning occurs have remained largely the same for over a century with only minor and cosmetic changes even though the way we learn, what we learn and even the purpose of learning itself has fundamentally changed.

Through this dissertation, this aversion to typological change was investigated before identifying how it could change and articulating one possible alternative. This alternative was derived at by specifically considering what a learning space could be if the way individual students learn was not just taken into due consideration but celebrated as it should be.

Particular emphasis was also placed on the individual experience of learners, since every student has different spatial needs and preferences that should be accommodated in order for the full benefit of learning to be achieved.

Subsequently the following served as the five cornerstones for the project:

1

Current, and increasingly preferred, approaches to learning stipulate that learning requires the construction of knowledge.   This in turn requires active and proactive participation from students.

2

Equal ≠ the same

Which is especially evident in learning and learning spaces where unique differences need to be accommodated and celebrated, not homogenised.

3

There is not going to be just one single learning approach in the future, rather a variety that teachers and students can pick and choose from, so a space should be able to accommodate a spectrum of learning tactics, approaches and formats.

4

Biophilia and the environment has a fundamental role to play in how and where we learn going forward, not just because humans (despite what we sometimes think) have an innate connection with nature that can improve the learning experience, but because we urgently need to change the commodified way we see the environment.

5

There is no unanimous spatial ideal that all students will find perfectly conducive to their learning experience. Thus this project postulates that a better solution is to give students a range of options they can choose from, before also giving them the ability to alter these spaces as they see fit. This approach gives them the power to craft a learning space and methods that suits them as individuals.
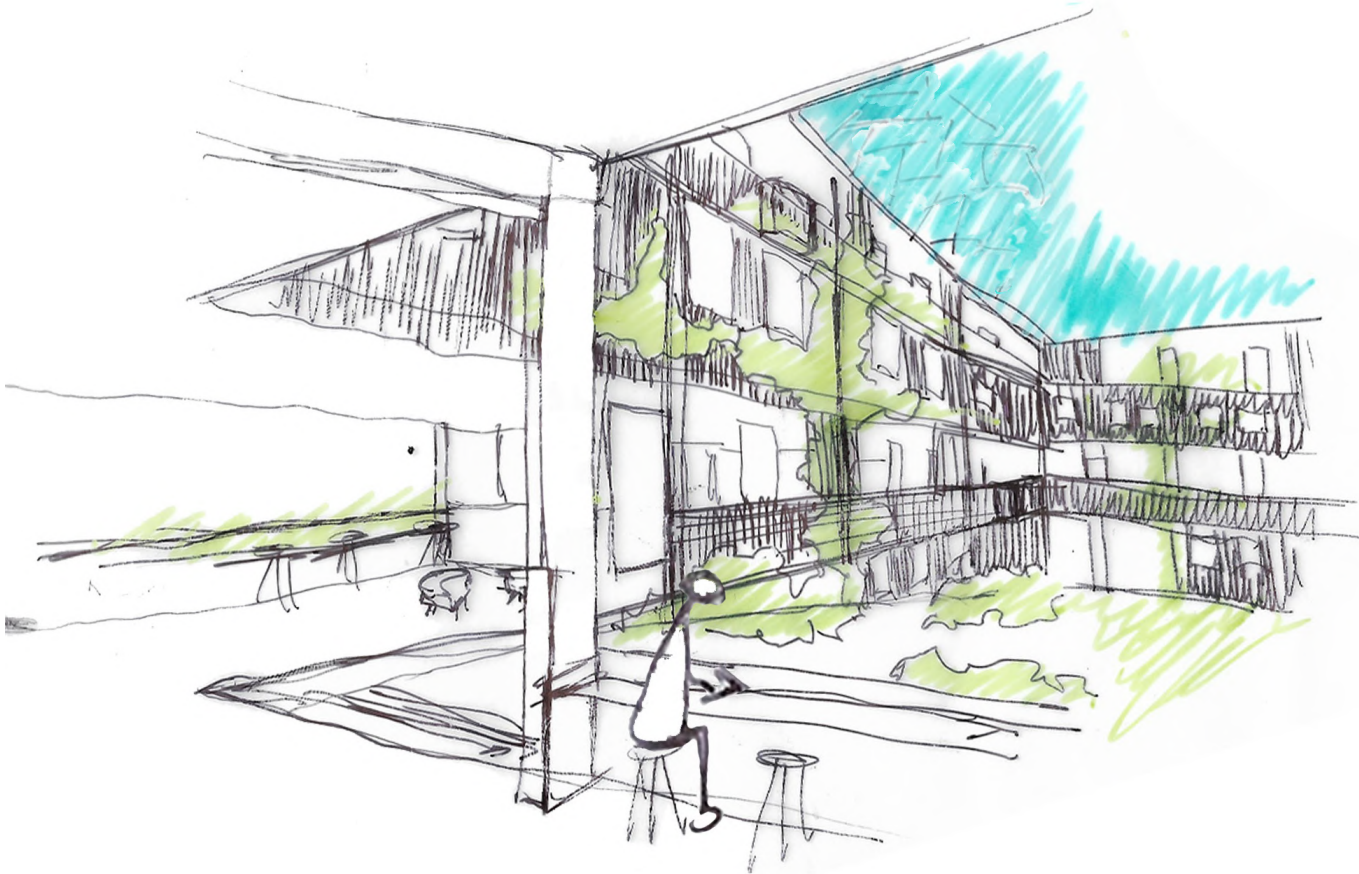
Figure 135: Perspective

These cornerstones were arrived at through the research investigations (both literary and fieldwork) and were thus the ideals against which every design choice was measured in order to ensure that all aspects of the project contributed to enhancing individual experiences of learners who would be occupying the space.

The ultimate intention of this dissertation was not to propose a new typology however, as that would have just been a perpetuation of the same problematic mentality that resulted in the factory school model in the first place.

Learning is not a one-size-fits-all experience and thus learning spaces or institutions should not be one-size-fits-all either.

The intention of this dissertation was thus rather to put forth but one possible alternative to the current learning space typology with the aim of showcasing some of the options that become possible when learning spaces are informed by the way learning occurs and the spatial needs and preferences of the learners. The goal of this investigation and proposal was thus to stimulate discussion and consideration around how learning spaces are designed and to hopefully contribute to a future condition where idiosyncrasy in learning spaces is the norm not the exception.

What the dissertation can mean for a career in architecture

Education has the potential to be a silver bullet and in South Africa education will remain largely, at least for the foreseeable future, mutually entwined with physical learning spaces. Thus this dissertation has the potential to open a door into educational space design out in the real world. Which is especially pertinent since South Africa's [spatial] education system urgently requires an increase in engagement from spatial practitioners if there is to be any hope of learning spaces ever improving on the scale and extent required to leverage general positive change.

The knowledge gained through the research and investigations of this dissertation is also invaluable in the context of being an educator (which will definitely be pursued in future). Especially since so much of the understanding accrued can be repurposed and utilised by an educator to improve the individual learning experience of their students.

At the intersection of these two pursuits there also lays the opportunity to actively instigate, facilitate and drive the improvement of learning spaces rather than simply encouraging a client to consider changes (as would be the case in the first pursuit) or to make changes within one's own teaching domain (as in the second pursuit).

Due to how idiosyncrasy was prioritised and incorporated into this project, the dissertation also included specific investigations into the unique spatial requirements of small, dedicated work/learn spaces in order to design appropriate individual learning pockets or 'student offices', as they might otherwise be called. The knowledge gained through these investigations can subsequently also be adapted and used in the context of individual working spaces such as remote offices, hot-desk spaces and other emerging working space alternatives that rely on and prioritises the individual user's experience. This is expected to become increasingly relevant as we continue into a post-2020 working world, and thus provide a wealth of opportunities going forward.

Conclusion

Learning is an amasingly personal and valuable experience that has the power to leverage incredible positive change for students and society, but if the spaces within which learning occurs do not accommodate an individual's spatial needs it severely limits the richness of the learning experience.

Individuals are inherently different and so are their spatial needs relating to learning, thus learning spaces should not be 'one-size-fits-all'.

This project proposes an alternative where students choose and customise how they learn and the space within which they learn. Thus providing students with learning spaces that actually work for them, because every student deserves to learn in a space that caters to and complements their individual spatial needs and preferences while promoting connectivity with themselves, each other and the environment.

Figure 25: Illustration of near unanimous preferences
Illustration by Author

Figure 26: Illustration of secondary preferences
Illustration by Author

Figure 27: Functional precedent - Hyde Park Corner Exclusive Books
Illustration by Author
Photographs:
EXCLUSIVE BOOKS. 2017. Exclusive Books Hyde Park Shortlisted for International Bookstore of the Year Award. Online: http://blog.exclusivebooks.co.za/exclusive-books-hyde-park-shortlisted-for-international-bookstore-of-the-year-award/ [Accessed 21 04 2021]
FAIRCLIFF, J. 2017. Exclusive Books and Open Book up for international awards. Online: https://www.sabooksellers.com/3580-2/ [Accessed 21 04 2021]

Figure 28: Illustration of spectrum preferences
Refer to Addemdum B for reference list

Figure 29: Preference statistics
Compiled by Author based on fieldwork

Figure 30: Reasons for preferences
Illustration by Author and adapted by Author from Neurodiversity Press (2019)

Chapter 3

Figure 31: Existing additional learning spaces
Illustration by Author and maps from Goodle Earth (2021)

Figure 32: Illustration of catalytic potential
Photograph:
Mathe, T. 2019. The heart of Maboneng beats on. Online: https://mg.co.za/article/2019-04-12-00-the-heart-of-maboneng-beats-on/ {accessed 03 07 2021]

Figure 33: Illustration of passive exclusion
Illustration by Author
Photograph:
SANDTON CITY. 2021. Nelson Mandela Square. Online: https://sandtoncity.com/nelson-mandela-square/ [Accessed 10 10 2021]

Figure 34: Johannesburg's 2040 urban framework
CITY OF JOHANNESBURG. 2016. The Spatial Development Framework 2040 (SDF) for Johannesburg. Johannesburg: City of Johannesburg.

Figure 35: Characteristics of suburbs versus [sub]urban areas
Illustrations by the Author, based on the writings of:
DAVIDSON, J. 2019. How the Suburbs Can Be Fixed? Online: https://nymag.com/intelligencer/2019/04/the-suburbs-can-be-fixed-no-really.html [Accessed: 30 03 2020].
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LYNCH, K. 1960. The Image of the City. Cambridge, Massachusetts: MIT Press.
WORLD RESOURCES INSTITUTE. 2015. Cities safer by design_ Guidance and Examples to Promote Traffic Safety. Washington, DC: WRI Ross Center for Sustainable Cities.

Figure 36: IPCC's Vulnerability assessment framework
Illustration by Author based on the framework outlined by the IPCC (2012)

Figure 37: Green design principles
Illustration by Author based on theories put forth by Van der Ryn (1996), Benyus (1997), Willard (2019) and Ambius (2021)

Figure 38: Location of site
Illustration by Author and maps from Goodle Earth (2021)

Figure 39: Photograph of valley
Hall, G. 2011. Views of Johannesburg from Langeman's Kop. Online: https://finepixtrix.wordpress.com/2011/08/23/views-of-johannesburg-from-langemans-kop/ [Accessed 09 08 2021]

Figure 40: Environmental macro site analysis
Illustrations by Author based on information from:
GUMBI, S. 2018. Draft Consultation Basic Assessment Report for the Upgrade of the Bezuidenhout Valley Clinic and Associated Infrastructure in Johannesburg, Gauteng Province, Johannesburg: Royal Haskoningdhv (PTY) LTD.

Figure 41: Historical macro site analysis
Illustrations by Author based on information from:
Hall, G. 2011. Views of Johannesburg from Langeman's Kop. Online: https://finepixtrix.wordpress.com/2011/08/23/views-of-johannesburg-from-langemans-kop/ [Accessed 09 08 2021]
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WIKIPEDIA. 2020. Bertrams, Gauteng. Online: https://en.wikipedia.org/wiki/Bertrams,_Gauteng [Accessed: 29 04 2020].

Figure 42: The Makers Valley Collective
Illustrations by Author
Photographs:
LORENTZ, S. 2021. SRK Engineers: Scientists Support Jukskei River Clean-Up Project. Online: https://infrastructurenews.co.za/2021/03/30/srk-engineers-scientists-support-the-jukskei-river-clean-up-project/ [Accessed 05 06 2021].
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Figure 43: Bertrams SWOT analysis
Observations by Author in conjunction with:
LORENTZ, S. 2021. SRK Engineers: Scientists Support Jukskei River Clean-Up Project. Online: https://infrastructurenews.co.za/2021/03/30/srk-engineers-scientists-support-the-jukskei-river-clean-up-project/ [Accessed 05 06 2021].
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Figure 77: Roof ETFE frame
Details by Author

Figure 78: Saw tooth industrial roofs as found in Bertrams
LACONTE, B. 2019. Sawtooth roofs. Online: https://za.pinterest.com/bryanlaconte/sawtooth-roof/ [Accessed 02 11 2021]

Figure 79: Maquette investigation of triangulation
Illustrations and maquettes by Author

Figure 80: Workshop material palette
Illustration by Author
Refer to figure 72 for further sources.

Figure 81: Workshop layout and workflow
Illustrations by Author

Figure 82: Variety of workshops within the building
Illustrations by Author

Figure 83: Service matrix
Illustrations by Author

Figure 84: Layering of services
Illustrations by Author

Figure 85: Workshop section
Drawing by Author

Figure 86: Workshop enclosrue details
Details by Author

Figure 87: Workshop structure meeting the ground details
Details by Author

Figure 88: Workshop ramp detail
Details by Author

Figure 89: Individual pocket neighbours
Illustrations by Author

Figure 90: Individual pocket variations
Illustrations by Author

Figure 91: Individual pocket material palette
Illustration by Author
Refer to figure 72 for further sources.

Figure 92: Folding table
Illustrations by Author

Figure 93: Sliding, tinted windows and sliding louvres
Illustrations by Author

Figure 94: Sliding, acoustic deviding partitions
Illustrations by Author

Figure 95: Movable suspension rails
Illustrations by Author

Figure 96: Storage boxes functioning as partitions and seating
Illustrations by Author

Figure 97: LED light strips, phone controlled with RGB capabilities
Illustrations by Author

Figure 98: Sliding pin-boards that function as deviders
Illustrations by Author

Figure 99: Individually controlled comfort settings
Illustrations by Author

Figure 100: Individual pocket section
Drawing by Author

Figure 101: Examples of interaction opportunites
Illustrations by Author

Figure 102: Available interaction opportunites
Illustrations by Author

Figure 103: Interaction section
Drawing by Author

Figure 104: Interaction material pallette
Illustration by Author
Refer to figure 72 for further sources.

Figure 105: Interaction details
Details by Author

Figure 106: Circulation spaces
Details by Author

Figure 107: Fall protection detail
Details by Author

Figure 108: Swales used
Details by Author

Figure 109: Overview of courtyards
Illustrations by Author

Figure 110: How the building meets the ground
Illustrations by Author

Figure 111: "Hello World" Courtyard
Illustrations by Author
All plant photographs were obtained from:
WILD FLOWER NURSERY. 2021. Wildflower Indigenous Plant Library. Online: https://wildflowernursery.co.za/indigenous-plant-database/page/3/?dosrch=1&q&wpbdp_view=search&listingfields%5B1%5D&listingfields%5B6%5D&listingfields%5B2%5D=14&listingfields%5B12%5D=Hardy&listingfields%5B7%5D=-1&listingfields%5B8%5D=-1&listingfields%5B13%5D=-1&listingfields%5B14%5D=-1&listingfields%5B15%5D=-1&listingfields%5B16%5D=-1&listingfields%5B17%5D=-1&listingfields%5B19%5D=-1&listingfields%5B20%5D=-1&listingfields%5B21%5D&listingfields%5B22%5D=Grassland&listingfields%5B23%5D=-1 [Accessed 18 10 2021]

Figure 112: "Meet me there" Courtyard
Illustrations by Author
All plant photographs were obtained from:
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Faculty of Engineering, Built Environment and Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en Inligtingtegnologie / Lefapha la Boetšenere, Tikologo ya Kago le Theknolotši ya Tshedimošo

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Reference number: EBIT/53/2020

Ms C Karusseit
Department: Architecture
University of Pretoria
Pretoria
0083

Dear Ms C Karusseit

FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY

Your recent application to the EBIT Research Ethics Committee refers.

<u>Conditional</u> approval is granted.

This means that the research project entitled "Masters Professional Dissertation in Architecture, Landscape and Interior Architecture" is approved under the strict conditions indicated below. If these conditions are not met, approval is withdrawn automatically.

Conditions for approval
Approved based on the summaries provided.
Applications from each student (including application forms and all necessary supporting documents such as questionnaire/interview questions, permission letters, informed consent form, etc) will need to be checked internally by the course coordinator/ supervisor. A checklist will need to be signed off after the checking.
All of the above will need to be archived in the department and at the end of the course a flash disc / CD clearly marked with the course code and the the protocol number of this application will be required to be provided to EBIT REC administrator.
No data to be collected without first obtaining permission letters. The permission letter from the organisation(s) must be signed by an authorized person and the name of the organisation(s) cannot be disclosed without consent.

This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Code of Ethics for Scholarly Activities of the University of Pretoria, or the Policy and Procedures for Responsible Research of the University of Pretoria. These documents are available on the website of the EBIT Ethics Committee.

If action is taken beyond the approved application, approval is withdrawn automatically.

According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of the EBIT Research Ethics Office.

The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.

Prof K.-Y. Chan
Chair: Faculty Committee for Research Ethics and Integrity
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

APPENDIX C

Informed consent form:
ACADEMIC INSTITUTE OF EXCELLENCE
MArch(Prof) Research project:
An investigation towards idiosyncratic learning spaces
Department of Architecture
EBIT Faculty
University of Pretoria

1. Project information

1.1 Title of research project:
Towards Idiosyncratic Learning Spaces: An investigation into how tertiary learning spaces can be designed differently to optimally cater to the users' individual spatial needs within the context of suburban based higher education

Researcher details:
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Supervisor details:
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Department of Architecture, University of Pretoria
nico.botes@up.ac.za

1.3 Research study description.
The aim with this research is to investigate which spatial (architectural) elements and characteristic cause different students (specifically those within design related disciplines) to consider some spaces as good learning environments and some as bad learning environments. The intention with this investigation is to enable the researcher to design learning spaces and learning infrastructure where a greater number of students are able to learn optimally because the spaces are more compatible with and complementary to their individual spatial preferences, spatial and social needs, the requirements of their field of study and the way in which they learn.

Participants in the study are asked a series of questions that relate to their preferred learning environments wherein they are asked to give their opinion on what makes a space good or bad for learning and some reasons why they say so. Participants will also be asked to rate and discuss images of learning spaces based on whether they think the spaces shown would be good learning spaces for them as individuals.

Note: Interviews will be recorded but all participants will remain fully anonymous.
Participation will generally not exceed 10 to 15 minutes

1. I, __Marina Hendricks__, performing the role of __Head of Department__ and representative for __Academic Institute of Excellence__ hereby voluntarily grant permission for students and employees of __Academic institute of Excellence__ to participate in the project as explained to me by **Carla Rademan**

2. The nature, objective, possible safety and health implications have been explained to me and I understand them.
3. I understand that students and employees of the company I represent have the right to choose whether to participate in the project and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for academic purposes and / or publication.
4. I understand that the respondents representing the above stated company will remain anonymous and that their comments may be used without giving any geographic or personal references (name, address, ID, occupation, age, income etc.) that may accidentally imply ouridentity.
5. Upon signature of this form, you will be provided with a copy.
6. I, as representative of the above stated company, agree that no specific data will be shared with the company. The company will have access to the final report.
7. This Informed consent form accompanies a letter from the above-mentioned company confirming permission to be granted. This letter is signed and states the company name (include the letterhead), date and role and identity of the person giving permission.

Signed: ___ Date: 16/04/2021
Witness: ___ Date: 16/04/2021
Researcher: ___ Date: 16/04/2021

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APPENDIX C

Informed consent form:
THE MARKET THEATRE LABORATORY APPROVAL
MArch(Prof) Research project:
An investigation towards idiosyncratic learning spaces
Department of Architecture
EBIT Faculty
University of Pretoria

1. Project information

1.1 Title of research project:
An investigation into how tertiary learning spaces can be designed differently to optimally cater to the users' individual spatial needs within the context of suburban based higher education

Researcher details:
Carla Rademan
Department of Architecture, University of Pretoria
carla.rademan@gmail.com / u15006868@tuks.co.za

Supervisor details:
Nico Botes
Department of Architecture, University of Pretoria
nico.botes@up.ac.za

1.3 Research study description.
The aim with this research is to investigate which spatial (architectural) elements and characteristic cause different students (specifically those within design related disciplines) to consider some spaces as good learning environments and some as bad learning environments. The intention with this investigation is to enable the researcher to design learning spaces and learning infrastructure where a greater number of students are able to learn optimally because the spaces are more compatible with and complementary to their individual spatial preferences, spatial and social needs, the requirements of their field of study and the way in which they learn.

Participants in the study are asked a series of questions that relate to their preferred learning environments wherein they are asked to give their opinion on what makes a space good or bad for learning and some reasons why they say so. Participants will also be asked to rate and discuss images of learning spaces based on whether they think the spaces shown would be good learning spaces for them as individuals.

Note: Interviews will be recorded but all participants will remain fully anonymous.
Participation will generally not exceed 10 to 15 minutes

1. I, __Thandeka Nheke__, performing the role of __Project Officer__ and representative for __The Market Theatre Laboratory__ hereby voluntarily grant permission for students and employees of __The Market Theatre Laboratory__ to participate in the project as explained to me by **Carla Rademan**

2. The nature, objective, possible safety and health implications have been explained to me and I understand them.
3. I understand that students and employees of the company I represent have the right to choose whether to participate in the project and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for academic purposes and / or publication.
4. I understand that the respondents representing the above stated company will remain anonymous and that their comments may be used without giving any geographic or personal references (name, address, ID, occupation, age, income etc.) that may accidentally imply ouridentity.
5. Upon signature of this form, you will be provided with a copy.
6. I, as representative of the above stated company, agree that no specific data will be shared with the company. The company will have access to the final report.
7. This Informed consent form accompanies a letter from the above-mentioned company confirming permission to be granted. This letter is signed and states the company name (include the letterhead), date and role and identity of the person giving permission.

Signed: _TF Nheke_ Date: 9 April 2021
Witness: _Motsasatsa_ Date: 9 April 2021
Researcher: _Radman_ Date: 9 April 2021

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VILLIOTI
FASHION INSTITUTE

FROM THE HEAD OF THE INSTITUTION

SPERO VILLIOTI

18 MAY 2021

To whom it may concern,

Carla Roos is appointed as the Head of Academic Programmes at the Villioti Fashion Institute.
The Head of Academic Programmes has the authority to allow Ms/Miss Carla Rademan access to our premises as well as permission to speak to our students.

Best wishes,

Spero Villioti

Head of the Institution

3rd Floor, South Wing, Hyde Park Shopping Centre, Corner William Nicol Drive
& Jan Smuts Ave, Hyde Park, Johannesburg, South Africa
Tel (011) 325 6088 **Fax** (011) 325 6079

@villiotifashion | www.villiotifashioninstitute.co.za

APPENDIX C

Informed consent form:
THE ANIMATION SCHOOL
MArch(Prof) Research project:
An investigation towards idiosyncratic learning spaces
Department of Architecture
EBIT Faculty
University of Pretoria

1. Project information

1.1 Title of research project:
Towards Idiosyncratic Learning Spaces: An investigation into how tertiary learning spaces can be designed differently to optimally cater to the users' individual spatial needs within the context of suburban based higher education

Researcher details:
Carla Rademan
Department of Architecture, University of Pretoria
carla.rademan@gmail.com / u15006868@tuks.co.za

Supervisor details:
Nico Botes
Department of Architecture, University of Pretoria
nico.botes@up.ac.za

1.3 Research study description.
The aim with this research is to investigate which spatial (architectural) elements and characteristic cause different students (specifically those within design related disciplines) to consider some spaces as good learning environments and some as bad learning environments. The intention with this investigation is to enable the researcher to design learning spaces and learning infrastructure where a greater number of students are able to learn optimally because the spaces are more compatible with and complementary to their individual spatial preferences, spatial and social needs, the requirements of their field of study and the way in which they learn.

Participants in the study are asked a series of questions that relate to their preferred learning environments wherein they are asked to give their opinion on what makes a space good or bad for learning and some reasons why they say so. Participants will also be asked to rate and discuss images of learning spaces based on whether they think the spaces shown would be good learning spaces for them as individuals.

Note: Participation will generally not exceed 10 to 15 minutes

1. I Bronwyn Horne, performing the role of Academic Head and representative for The Animation School hereby voluntarily grant permission for students and employees of The Animation School to participate in the project as explained to me by **Carla Rademan**
2. The nature, objective, possible safety and health implications have been explained to me and I understand them.
3. I understand that students and employees of the company I represent have the right to choose whether to participate in the project and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for academic purposes and / or publication.
4. I understand that the respondents representing the above stated company will remain anonymous and that their comments may be used without giving any geographic or personal references (name, address, ID, occupation, age, income etc.) that may accidentally imply ouridentity.
5. Upon signature of this form, you will be provided with a copy.
6. I, as representative of the above stated company, agree that no specific data will be shared with the company. The company will have access to the final report.
7. This Informed consent form accompanies a letter from the above-mentioned company confirming permission to be granted. This letter is signed and states the company name (include the letterhead), date and role and identity of the person giving permission.

Signed: ___ Date: 2021-04-14
Witness: ___ Date: 2021-04-14
Researcher: ___ Date: 2021-04-14

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APPENDIX C

Informed consent form:
VILLIOTI FASHION
MArch(Prof) Research project:
An investigation towards idiosyncratic learning spaces
Department of Architecture
EBIT Faculty
University of Pretoria

1. Project information

1.1 Title of research project:
Towards Idiosyncratic Learning Spaces: An investigation into how tertiary learning spaces can be designed differently to optimally cater to the users' individual spatial needs within the context of suburban based higher education

Researcher details:
Carla Rademan
Department of Architecture, University of Pretoria
carla.rademan@gmail.com / u15006868@tuks.co.za

Supervisor details:
Nico Botes
Department of Architecture, University of Pretoria
nico.botes@up.ac.za

1.3 Research study description.
The aim with this research is to investigate which spatial (architectural) elements and characteristic cause different students (specifically those within design related disciplines) to consider some spaces as good learning environments and some as bad learning environments. The intention with this investigation is to enable the researcher to design learning spaces and learning infrastructure where a greater number of students are able to learn optimally because the spaces are more compatible with and complementary to their individual spatial preferences, spatial and social needs, the requirements of their field of study and the way in which they learn.

Participants in the study are asked a series of questions that relate to their preferred learning environments wherein they are asked to give their opinion on what makes a space good or bad for learning and some reasons why they say so. Participants will also be asked to rate and discuss images of learning spaces based on whether they think the spaces shown would be good learning spaces for them as individuals.

Note: Interviews will be recorded but all participants will remain fully anonymous.
Participation will generally not exceed 10 to 15 minutes

1. I, Carla Roos , performing the role of Head of Academic Programmes and representative for Spero & Vanessa Villioti hereby voluntarily grant permission for students and employees of The Villioti Fashion Institute to participate in the project as explained to me by **Carla Rademan**

2. The nature, objective, possible safety and health implications have been explained to me and I understand them.
3. I understand that students and employees of the company I represent have the right to choose whether to participate in the project and that the information furnished will be handled confidentially. I am aware that the results of the investigation may be used for academic purposes and / or publication.
4. I understand that the respondents representing the above stated company will remain anonymous and that their comments may be used without giving any geographic or personal references (name, address, ID, occupation, age, income etc.) that may accidentally imply our identity.
5. Upon signature of this form, you will be provided with a copy.
6. I, as representative of the above stated company, agree that no specific data will be shared with the company. The company will have access to the final report.
7. This Informed consent form accompanies a letter from the above-mentioned company confirming permission to be granted. This letter is signed and states the company name (include the letterhead), date and role and identity of the person giving permission.

Signed: ___ Date: 18-05-21
Witness: ___ Date: 18-05-21
Researcher: ___ Date: 18-05-21

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the animation school

To whom it may concern,

This letter serves to confirm that I, Bronwyn Horne, am the Academic Head at The Animation School, Johannesburg Campus at:

Block 6, 110 Conrad,
110 Conrad Drive,
Craighall Park,
Randburg,
Johannesburg,
South Africa,
2196
Tel: 0118860624 Tel International: +27118860624
Website: www.theanimationschool.co.za

I hereby grant Carla Rademan carla.rademan1@gmail.com permission to contact our staff and students to request participation for her Research Project, should they consent.

Please don't hesitate to contact me if you require any further information or contact the Principal Nuno Martins nuno@uca.co.za to verify my employment.

Bronwyn Horne
Academic Head - Jhb Campus

The Animation School - Cape Town Campus - 42 Searle Street, Woodstock, Cape Town, South Africa, 7925
Tel: 0214610822 Tel International: +27214610822

The Animation School - Johannesburg Campus - 110 Conrad Drive, Block 6, Craighall Park, Randburg, Johannesburg,
South Africa, 2196
Tel: 0118860624 Tel International: +27118860624

Directors: NM Martins RS Reid

42 Searle Street, Woodstock, Cape Town, South Africa, 7925 Tel: 0214610822 Tel International: +27214610822
Block 6, 110 Conrad, 110 Conrad Drive, Craighall Park, Randburg, Johannesburg, South Africa, 2196 Tel: 0118860624 Tel International: +27118860624
Website: www.theanimationschool.co.za
Registered with the Department of Higher Education and Training until 31 December 2024 as a private higher education institution under the Higher Education Act, 1997.
Registration certificate no. 2009/HE07/013

Interview Questions

1. Which general field of study are you involved in?
2. How would you describe your approach to teaching? Does this stem from your field of study or your preference? Please elaborate?
   (Lecturer question)
3. Do you think the space within which you teach affects your approach? How so? (Lecturer question)
4. What kind of teaching activities do you engage with on a regular basis? (e.g. lectures, studio or seminars etc.)
5. Do you have a specific place(s) where you perform these activities?
   If an answer given to question 3 is a non-compulsory space:
   a. Why do you choose this space to perform the activity?
   b. Can you describe what stands out about the space?
   (Possible prompts: size, light level, occupancy level etc.)
   c. How would you change the space to make it a better learning space for you?
   If an answer given to question 3 is a compulsory space:
   a. Can you describe what stands out about the space?
   (Possible prompts: size, light level, occupancy level etc.)
   b. Are the characteristics of these spaces a result of the subject/ field of study?
   c. Do you think the space is appropriate for the activity?
   d. Are you comfortable teaching/learning within the space? Why do you think this is the case?
   e. How would you change the space to make it a better learning space for you?

6. Are there some learning activities that you generally prefer or dislike in terms of your approach to teaching? Why do you think that is the case? (Lecturer question)

The following questions are based on a series of images that will be presented to participants. These images were chosen to be representative of spatial tendencies that are commonly found in learning spaces (refer to Addendum B2):
7. Please consider the images and indicate the ones that you like most and least, please elaborate on your reasons for choosing them.
8. Which of these spaces do you think are good learning spaces and which do you think you will not be able to use comfortably (all the images do not need to be allocated)
Regarding the good teaching spaces:
   a. Please describe what you see in the images.
   b. What about these spaces makes you say they would be good learning spaces?
   c. How do you see yourself using these spaces? Do you see specific activities or habits manifesting in these spaces? Do these relate to why you consider them good learning spaces?
   d. What about these spaces would you change to make them even better suited to you?
   e. Which spatial (architectural) elements or characteristics do you think have the biggest impact (positively or negatively) on whether a space is a good teaching environment for you or not?
Regarding the bad learning spaces:
   a. What about these spaces, respectively, makes you say you will not be able to use comfortably?
   b. How do you see yourself using these spaces? Do you see specific activities or habits manifesting in these spaces? Does this relate to why you consider them less ideal?
   c. What about these images would you change to make them better for you?
   d. Are there characteristics about learning spaces that you consider 'deal-breakers'?

9. Are there any spatial elements or characteristics in particular that caused you to place the .... es in the middle?
10. Are there any elements or characteristics of good or bad learning spaces that have not been discussed yet or that you wish to iterate?
11. Based on the answers given thus far, why do you think you feel this way about different learning spaces? What, do you think, is it about you that makes you prefer some spaces over others? E.g. personality, strengths, nature of study field etc.
12. Based on your experience with students, which of these spaces do you think are good learning spaces and which do you think students will not be able to learn in (all the images do not need to be allocated) (Lecturer question)

Regarding the good learning spaces:
   a. What about these spaces makes you say they would be good learning spaces?
   b. How do you see these spaces being used? Do you see specific activities or habits manifesting in these spaces? Do these relate to why you consider them good learning spaces?
   c. What about these spaces would you change to make them better?

Regarding the bad learning spaces:
   a. What about these spaces makes you say they will not be good learning spaces?
   b. How do you see these spaces being used? Do you see specific activities or habits manifesting in these spaces? Does this relate to why you consider them bad learning spaces?
   c. What about these images would you change to make them better?

13. Would the context of the space affect whether you think it is a good learning space? (i.e. where it sits on a campus, other functions that are around it, or the spaces adjacent to it etc.)
14. What functions, aside from learning spaces, do you think a campus should provide to create a good learning environment collectively? Possible prompts: recreation or idle spaces, food services etc.
15. How do you think your answers have been affected by your study field?
16. Do you have any other comments or opinions regarding learning spaces that you believe might be relevant to this study?

Thank you for your time
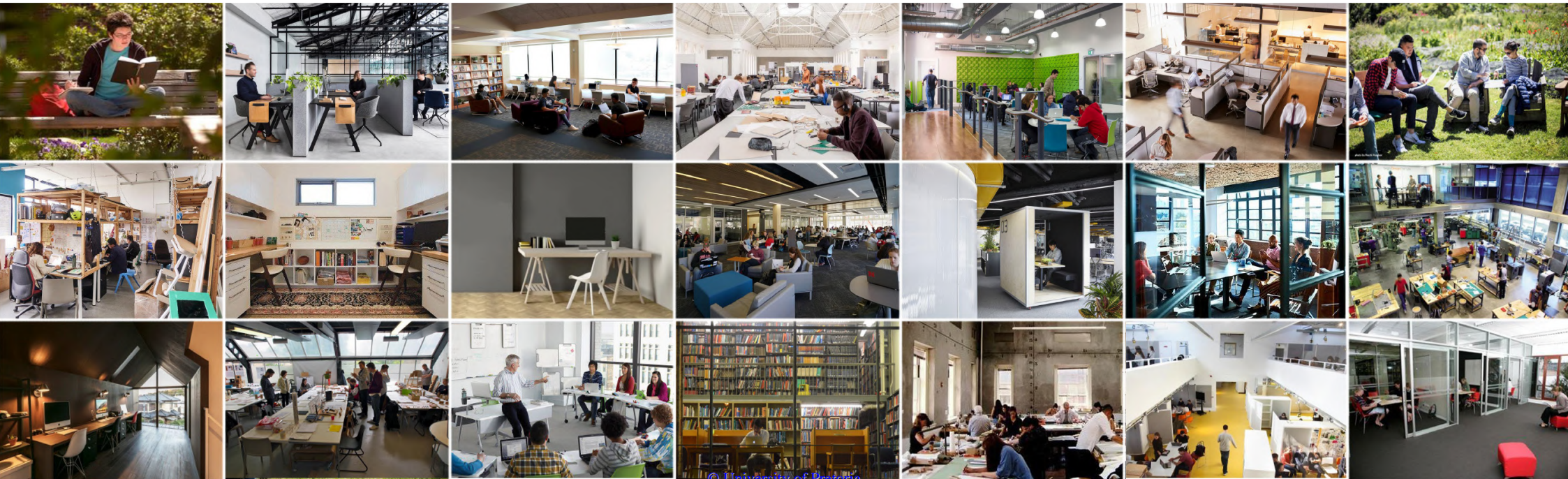
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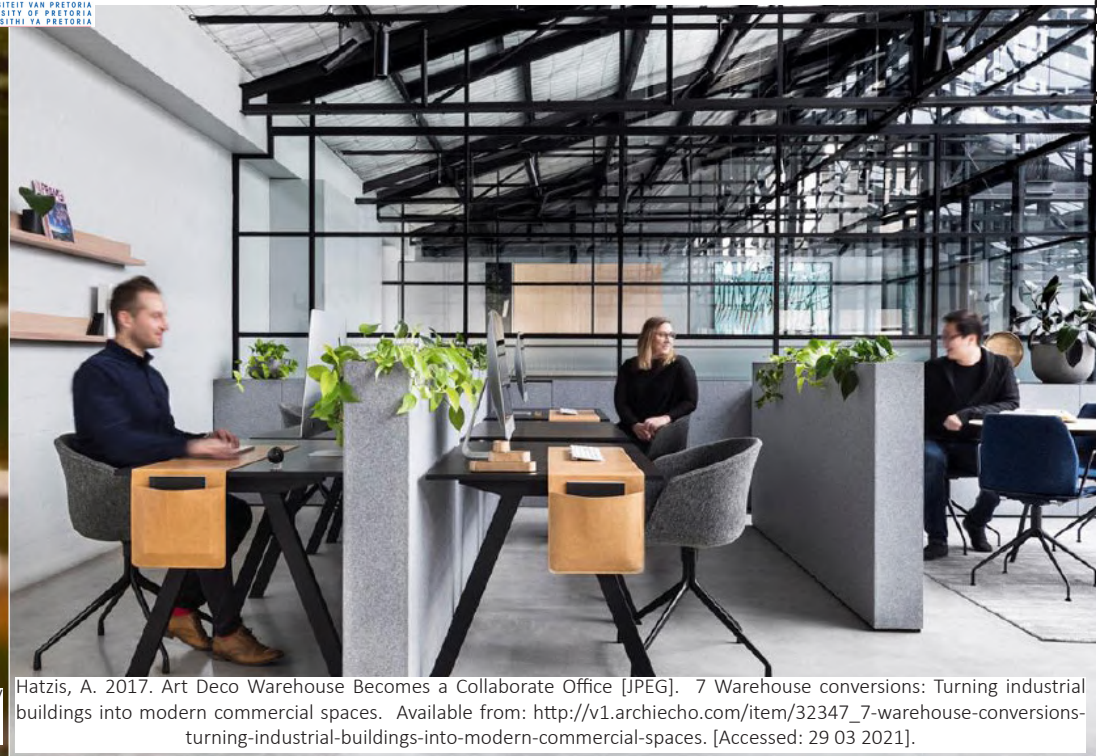
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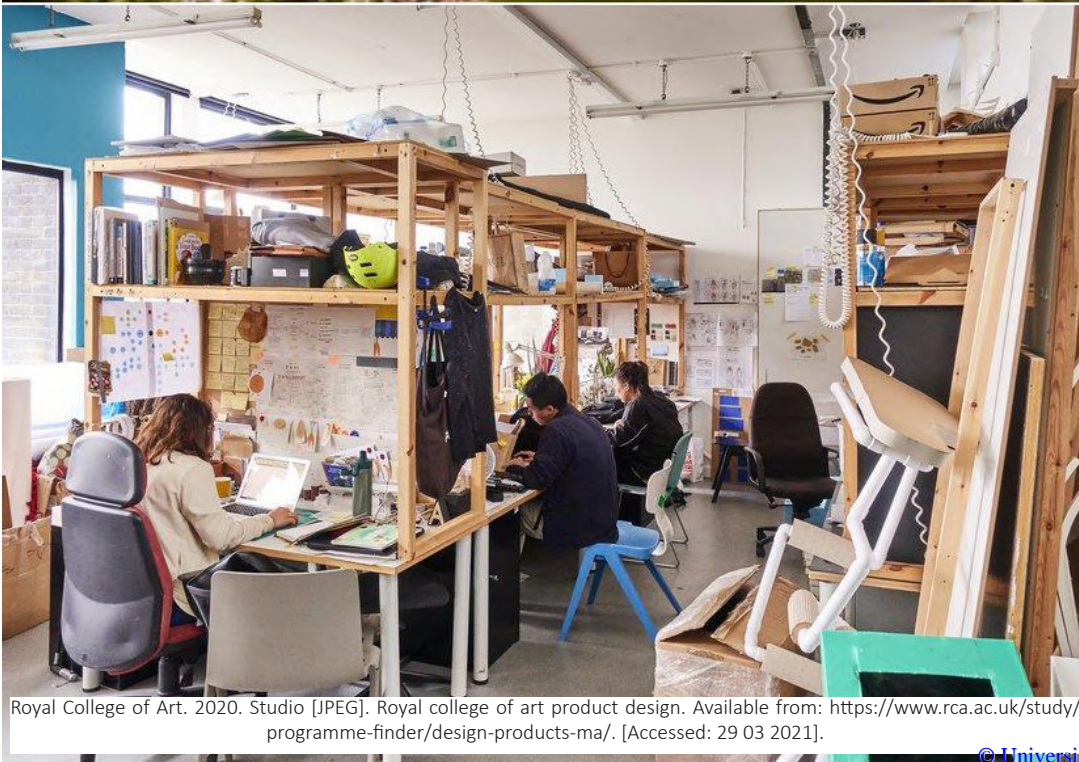
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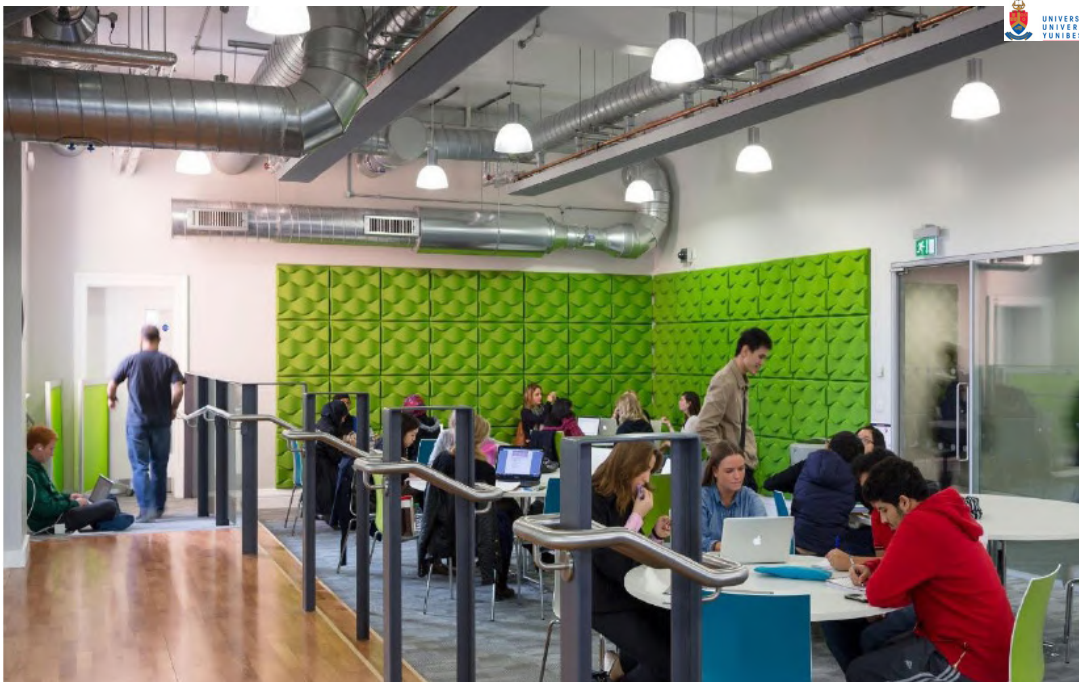
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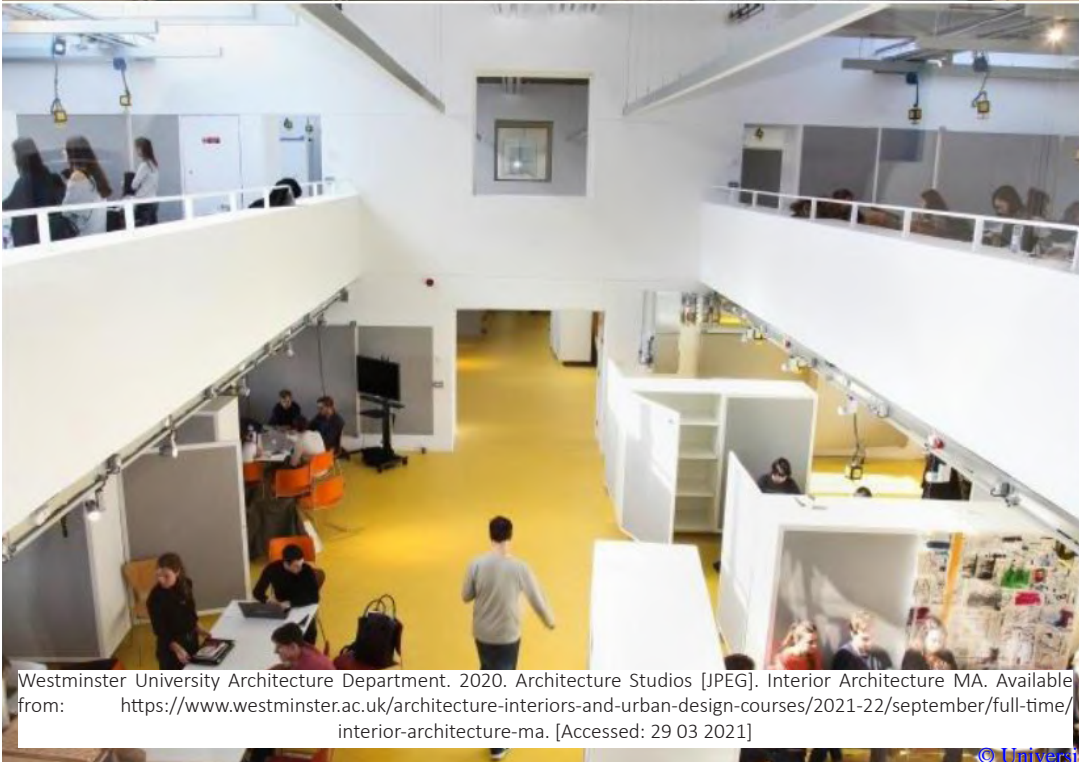
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