BLACK, GREY, WHITE: To PiMP a butterfly

(A regionalist study in the design of township campus architecture specific to the University of Pretoria's Mamelodi campus)

By: **Katlego David Waleng (2019)**

This document is submitted in fulfillment of part of the requirements for the degree Master of Architecture (Professional) in the Faculty of Engineering, Built Environment and Information Technology, University of Pretoria November 2019

Course coordinator: Dr. Arthur Barker

Study leader: Dr. Carin Combrinck

The Site: Pretoria, Mamelodi, Cnr Solomon Mahlangu, and Hinterland Avenue 318-Jr, Pretoria **25°43'15.8"S 28°23'57.6"E**

Programme: Micro-Bio-sports center

Clients: The University of Pretoria.

Research field: Human Settlements and Urbanism

Theoretical premise: Regionalism leading Spatial justice in terms of access

Keywords: **IDENTITY, SYMBOLISM, METAPHOR, PIMP, REGIONALISM, ACCESS**

BLACK

GREY

WHITE

TO PIMP A BUTTERFLY

The Poetic Narrative

"The caterpillar is a prisoner to the streets that conceived it
Its only job is to eat or consume everything around it, in order to protect itself from this mad city

While consuming its environment the caterpillar begins to notice ways to survive
One thing it noticed is how much the world shuns him, but praises the butterfly
The butterfly represents the talent, the thoughtfulness, and the beauty within the caterpillar
But having a harsh outlook on life the caterpillar sees the butterfly as weak and figures out a way to pimp it to his own benefits
Already surrounded by this mad city the caterpillar goes to work on the cocoon which institutionalizes him
He can no longer see past his own thoughts
He's trapped
When trapped inside these walls certain ideas take roots, such as going home and bringing back new concepts to this mad city
The result?
Wings begin to emerge, breaking the cycle of feeling stagnant
Finally free, the butterfly sheds light on situations that the caterpillar never considered, ending the internal struggle
Although the butterfly and caterpillar are completely different, they are one and the same."

-Kendrick Lamar (2015) To pimp a butterfly

Figure 1: Image of Kendrick Lamar, the author of the poem 'To pimp a butterfly'.(MTV News .2015).

Acknowledgment

I write this with a saddened heart, that on this day the words of Steven Bantu Biko (1978) “Black man, you are on your own” are applicable and relevant to the black child, especially the one residing in a 5 x 3 sqm corrugated metal sheet shack in the informal settlement.

The black child who is expected to thrive and make it, a child who is seeking inspiration outside his or her peripheries, this is a document meant for you. This document acknowledges the words of the black consciousness mandate, not as a movement but as an ideology clinging to a thought of inspiration, black child it is possible.

In the midst of democracy, the gates, doors, and windows are opened to the black child, to document, explore, unpack and re-establish Africa to its true sense, to its correct sense, to a continent for all but it starts here, at home, in our backyards, across the lengths of the Drakenberg and between the Indian and Pacific ocean, acknowledging the fisherman in the Cape and paying homage to my Sepedi upbringing in the North, by the grace of the almighty, you are acknowledged.

We reside in a country where we are constantly witnessing that it is the indigenous people who are poor, exploited and made inferior in their own land through the minimal documentation which reflects their culture, traditions or heritage in the academic sphere. This does not only create inferiority but increases of challenges of establishing an identity in a multi-disciplinary discourse for the black child.

So dear black child, your concerns are acknowledged, this document serves not only for academic research but as an attitude towards the way we think about the black child, towards the idea of constructing positivity into the environment which the black child is placed in, towards a celebratory thinking, imaginative building and a sense of pride in being black within the democratic South African context.

Black child, Steven Bantu Biko (1978) described consciousness as “a necessity of seeing the truth as it is”. For one to inspire the world, he needs to inspire him or herself, therefore the document acknowledges the work done which established a western approach to thinking in this country, an Idea semantically referred to as theory, without this the infusion of literature written by African American rapper /Poets like Kendrick Lamar could not be used to stitch the arguments presented.

Finally, I say: Black child, you are not alone. Your thoughts are supported through academic literature embodied in this document, they are infused with relevancy to the time which it is written, to inspire you into finding inspiration within your peripheries without the burden of the world you are yet to explore. Black child you are born to make it. Your ideas, confidence, and abilities are acknowledged, you are the true inspiration *to pimp a butterfly.*

Abstract

Barker (2015) argues that the making of architecture is a mediative approach to understanding the relationship between the strange and the familiar. He regards this processes as an act which gives an identity to the architecture made because it does not only focus on one aspect of creating an architecture nor does it focus on the creation of a completely new architecture but draws understanding from a narration of architectural interpretations to continue the continuum of thinking in the architectural discourse (Barker, 2012).

This document furthers Barker's (2015) argument by investigating the architecture which is considered familiar by its makers and the discipline but could be strange to the end-user or the social context, this is done to draw up principles of making familiar architecture within the South African context and using them to inform the making of an appropriate architecture which is assumed strange in its context.

To investigate this, a study of the formation of the South African architectural vernaculars is conducted through the scrutiny of the work done by Fisher(1998,2003), Barker (2012,2015) and Pienaar (2014). This is done to gather an understanding of what informed the architecture created in South Africa during apartheid so that a proposal of what could inform an architecture identifying in South African in democracy can be explored.

Secondly, the investigation is conducted in Mamelodi which according to De waal in Nice (2008) is a black township created by the apartheid government in 1945. The University of Pretoria's Mamelodi campus is the exact area of study as it is assumed in this document as a strange area to create an architecture that is identified as familiar to the Afrikaners (Barker,2015) in an all-black community.

The scrutiny of Fisher(1998,2003), Barker (2012,2015) and Pienaar (2014) work provides has with an investigative lens around the theory of Identity and architecture symbolizing narrative of the Great Trek, therefore encouraging the document to explore issues of Identity informing the making of architecture and the theory of symbolism and metaphors as carriers of a narrative through architecture.

Therefore this document will be investigating the making of architecture through the theories of identity, symbolism, and metaphor. It will outline a narrative as the driver of the design process and with propose and appropriate architectural response which can be considered as an approach to making public architecture in Mamelodi.

In accordance with regulation 4[e] of the general regulations [G.57] for dissertations and theses, I declare that this dissertation, which I hereby submit for the degree of Masters 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.

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Chapter 1

Introduction

Barker (2015) describes architecture as a relationship between the strange and familiar, whereby in most cases the creation of architecture begins with the search for the familiar rather than the strange.

In the case of the development of an Afrikaner identity in South Africa, Fisher (1998) illustrates how the formation of Pretoria regionalism was influenced by the establishment of the Cape Dutch architecture post-1652. Both the Cape Dutch and Pretoria regionalist architectural styles represent the dominance of a group of people residing within a region.

Although it was argued that no architecture is new architecture (Barker, 2015), the approach to a development of an architecture becomes innovative through its display of understanding the context or social conditions representing or symbolizing the region and its character.

In 2015, Lehloenya addresses the idea of identity as a phenomenological approach to making architecture. In his argument, he reiterates identity as an imagined act which is representative of the character of place but symbolic of the people or community within the space.

However Nice (2011) illustrates that in order to develop an understanding of the character of a place, you need to immerse yourself into that surrounding. This will not only make you socially aware, it will also enable you to respect the existing identity within the space such that you are able to appropriately develop on it.

As illustrated by Fisher (1998), Barker (2012), and Pienaar (2014) the establishment of an architectural identity is a continuous act of investigating the familiar in order to re-adapt, re-appropriate and apply the fundamentals which display a clear understanding of current and previous conditions relating to the context.

In this document, it is argued that to develop an illustration of an appropriate identity in a context, the past and current conditions need to be understood. However, since identity can be addressed as being both tangible and intangible a further understanding of context or relating to context needs to be illustrated in the process of that development.

This does not void the that the making of architecture as being symbolic of the familiar (as in the argued case of Pretoria regionalism by Barker, 2012), but suggests a manner in which investigating what has been identified as the familiar within context can establish the manner which informs the creation of the strange or what is identified as being strange architecture within the context.

In the case of understanding the context as a design informant, the investigative approach will focus on illustrating how the creation of “strange” architecture through the extraction of design principles used to develop the familiar architecture is possible. This approach was adopted because the timeline of the architectural movement in South Africa focused on documenting what was identified as being familiar to the settlers (Barker, 2012) which is assumed in this document to have been strange to the native dwellers.

The investigation is done to establish an idea of a relationship between the familiar and the strange as being inseparable, in terms of what may seem familiar to someone, could appear strange to another. Much like Lehloenya (2015), the relationship between what is strange and what is familiar is reactive to perspective, it is a matter of relating to the ability of understanding the two notions in terms of an establishment or continuation of an identity in context.

In light of the continuation of architectural identity, Lehloenya’s (2015) notion on how the familiar can be seen as strange and vise-versa by the receiver is challenged by focusing the area of study in Mamelodi, which was created as a black’s only township (Chiloane,1991). The allocation of the researcher will be assisting in determining how far the Afrikaner architectural identity migrated from Pretoria where the Afrikaners settled.

Since there is a University of Pretoria campus in Mamelodi which is 20km east of the CBD, the availability of the campus aided a platform to conduct this research.

As much as Pretoria regionalism is a reflection of Afrikaner identity in architecture (Fisher, 1998), its manifestation illustrated the dominance of the Afrikaner during apartheid. Its application to Mamelodi would be considered strange in an identity context because it is a continuation of Cape Dutch architecture which is symbolic of the Afrikaner-Dutch (Barker,2015) and not the Black South African who resides in the township.

The document, however, does not argue or state that there was no attempt in establishing an architectural identity that would appear familiar to the African dweller in the township. It does point out that there is a need to understand the past and current South African architectural identity in order to suggest the appropriate architectural response to the development and manifestation of architecture inspired by the context of townships.

In terms of a democratic approach that is reflective of new thinking in South Africa, the documents draw architectural inspiration from a poetic narrative as a symbolic dreaming tool. This narrative guides the architectural decisions and aids the making of architecture as being metaphoric and symbolic of an inspired approach of making appropriate architecture in the township.

The underlying idea of the document is to illustrate how architecture can be created to inform existing theories and philosophies through an understanding and extraction of principles and guidelines from appropriate academic writings. Regardless of the representation of the preceding informing writings, the architecture still portrays the power of inspiring theoretical writing which justifies the making of the appropriate architectural response

The aim of the document

This document focuses on the extraction of space making principles through the scrutiny of the works done by Fisher (1999,2003), Barker (2012,2015) and Pienaar (2014) on the history and manifestation of a South African architectural identity, although it is mainly reflective of dominance of the Afrikaner during the times of inception.

It also outlines the value of seeking understanding from those historical events and documentation, so that the principles extracted are appropriately applied in order to illustrate or develop the possibilities of a similar architectural development symbolizing the assumed future ambitions of the township dweller.

Thus the document investigates theories of identity, metaphor, and symbolism in architecture to link the development of Pretoria regionalism as an informant to the appropriate architectural response to the context.

Although the document investigates principles that were applied within a time of segregation in South Africa, the architecture proposed aims to suggest possible outcomes of dealing with segregational issues such as access to facilities, and the availability of resources in facilities (Nice,2008). These issues are not the main drivers of the investigations, but just informing portions of the architectural response.

Therefore the architecture proposed is not the absolute response to all townships with similar conditions but suggestive of an approach that is inclusive in the display of identity of the building and accessibility to facilities and resources to the township dweller.

Delimitations

The theoretical premise is focused primarily on extracting architectural (spatial) design principles which are linked to the South African architectural timeline as referred to in the works done by Fisher (1999,2003), Barker (2012,2015) and Pienaar (2014).

The investigation refrains from suggesting a new culture or architecture reflective of the Afrikaner dominance in Pretoria. It seeks to illustrate how an understanding of regional history can justify and inform the making of contextually appropriate and socially relevant architecture.

Furthermore the approach and suggested architectural response is not a blueprint to how township based campuses should be designed, it is but an illustration of an amalgamation of understating of the history with which the architecture was made and how a future vision for that history can be appropriated and adopted.

Limitations

The idea of Vista campuses in South Africa was to offer accessibility to education or upgrading of academic qualifications to the black South African in the 1980s (SAhistoryOnline). This meant that the architectural concept for these campuses was unrestrictive access to members of the township and long distant black scholars. Unfortunately, the high concrete palisade fence on the periphery of the campus, the zoning of publicly accessible spaces and the manner in which access is granted to the campus undermines those concepts.

Therefore the investigation limits itself from being in agreement with the security policies which were put in place to ensure the limitation of access is achieved.

It further limits itself from defining the existing architecture in the township, and analyses work done by urban planners such as Landman(2000) to argue that the design of an urban environment has an influence on the social behavior of the community that lives in it. The same holds true in architecture, the manner in which we design spaces has an influence on how we imagine and experience space, therefore, it is my social responsibility as a designer to suggest an architecture that represents the act of imagining.

Main questions

What is the language of the existing architecture on campus?

Sub questions

Can the principles of this language be adopted, re-appropriate or applied to inform an architectural response?

How can the identity of the existing language be metaphorically expressed in the suggested architectural response?

How does the suggested architecture link with the poetic narrative?

Hypothesis

According to Lamar(2015), poetry has the capability of sparking inspiration among the creative, If so, it is hypothesized that the poetic architectural response which offers accessibility to facilities would inspire an engaged use of the campus by the township residents.

The adoption of Barker's (2015) argument on the making of architecture is a relationship between the strange and familiar, further allows to hypothesize that an investigation and understanding of what is seen as familiar architecture can be stranger to the other and vise-versa, thus solidifying Lehloenya's(2015) statement on what seems familiar to one, maybe strange to another.

Methodology

This document proposes an architecture informing theory approach with the investigative methodology carried out in two phases

The first phase is a practical site walk investigative approach

This refers to numerous site visits to collect data such as topological conditions, urban site activity, relative time of levels of activity, social and economic activity and surrounding architectural conditions such as housing topology, conditions of walkways, stormwater reticulation and harvesting, urban sprawl and location of public institution.

The visits to the site informed the knowledge of what conditions exist on-site and visually accessing the existing building and its surroundings but to assume which intangible aspects such as an understanding of the existing architectural language, a theoretical premise will be required to develop

- A lens of the investigating in theories of Identity, History, architectural language, and symbolism is developed. The selection of the theory was informed by the political significance of the area of study within the South African context.
- The aim of understanding these theories is illustrated through deriving the principles which guided the existing architecture in the township.

Since it been established that Mamelodi was developed during the apartheid regime, it is assumed that the making of public architecture such as social housing, and service facilities must be spatially reflective of an Afrikaner dominance emanating from Pretoria. According to Fisher (1998), the architecture should either be cape-dutch or Pretoria regionalism.

Recalculating the time which the University of Pretoria's campus in Mamelodi was erected(which was in 1981-82), and through physical observation (Refer to image7 and 11) the campus did not illustrate any key elements or aesthetic resembling it as being cape-dutch architecture.

This eliminated investigating the campus as a cape-dutch design and focused the spatial and functional investigation on finding principles within the campus building reflecting fragments of Pretoria regionalism.

Through the scrutiny of Fisher (1998) and Pienaar's(2014) work, it was possible to extract the focal principles which could be used as investigative measures

Using Identity as a theory and substantiating it with Fisher (1998), and Barker (2012,2015)arguments, the analysis should be adequate to inform the making of an appropriate architectural response in relation to the hypothesis, however as stated by Fagen in Barker (2015) the making of regionalist architecture is more of a responsive action balanced with an understanding of context, thus the response is still open to the designer interpretation exemplary of the acquired body of knowledge.

As hypothesized, the making of architecture is aimed at being a representative of narrative, in turn, this is used to state that architecture has the possibility of being used to narrate a story. However, this narrative can only be achieved by seeking an appropriate theory that guides how the making of architecture can be driven.

Barringten and Hart (2012) introduced the phenomenological approach to making architecture through metaphors and symbols. Their work is not heavily grounded in phenomenology but it unpacks principles relating to elemental metaphors and symbols which portray an architecture. This theory of metaphor and symbolism is used to establish the link between the architecture and the poetic narrative.

Much like the Regionalists, Barringten, and Hart (2012) illustrated the making of metaphoric and symbolic architecture as being pragmatic. This approach attached meaning to elements used in the architecture, an approach used to aid identity and elements such as symbolic attachments to the architecture.

Terminology

- **Pimp**: An American slang term used in this document to refer to the process of understanding what is existing so that you can reappropriate it into current relevancy or social functionality.
- **Youngin':** Refers to a young black person living in a township with his perspective blocked by his/her environmental condition.
- **Caterpillar: 1-**Refers to the young man in the narrative looking for inspiration. **2-**Refers to the young man in the township who is looking for inspiration.
- **Butterfly: 1-** Refers to the young man in the narrative who has made it out of the ghetto. **2-**Refers to the graduate who serves as inspiration to the young man in the ghetto.
- **Pupa: 1-** Refers to the context in the narrative where the caterpillar investigates its existence. **2-** Refers to the university campus in Mamelodi, where the young man in the township develops his thirst for inspiration.
- **Identity:** A symbolic representation of an act of classing self or group of selves in a structure with social responsibility of representing or symbolizing an existence influenced by familiarity, pride, and behavior, which symbolic represents a grouping that is created as a result of understanding the context and condition of a region through existing architectural elements, objects or buildings (Fearson,1999, Fisher, 1998 and Barker, 2012).
- **Township:** A predominately black settlement created through the apartheid laws in South Africa which is characterized by a mixture of formal and informal housing typologies.
- **Access:** The ability to be able to enter and use facilities to their maximum capacity without restrictions.
- **Context:** Refers to the specific area which is the study for the purpose of developing an architectural response.
- **Social Space:** A well-designed space with a variance of seating and lingering areas where a mixture of people gather to share ideas, communicate action or relax in company.
- **Strange:** Refers to a process of creating what is unusual to the social convention but still relatable and functional.
- **Bantu:** A derogatory term used in the apartheid era to refer to a South African who is rich in melanin.
- **Dweller:** The native South African who resided in the townships during apartheid due to the enforced laws.
- **Regional Climatic context:** Specific climate conditions of the area of study as illustrated in the SANS 10400 edition 1 of 2011 document.
- **Pragmatic:** Referring to a practical and functional approach in the making of architecture
- **Cape-Dutch:** The first documented residential architectural language established by the Dutch settlers in the Cape region of South Africa(Fisher, 1998).
- **Pretoria Regionalism:** An illustration of an understanding of spatial design principles reflected in the Cape Dutch and South African Modernism architectural principles which are identified with how the Afrikaners made architecture in Pretoria(Fisher, 1998).

The site

The investigated site is the University of Pretoria's Mamelodi campus in Mamelodi at the western corner of Solomon Mahlangu drive and Hinterland street. Mamelodi is located 20km from the Pretoria CBD and was designed during the apartheid era as a blacks-only township (De waal in Mothowamodimo,2012).

The site was selected as it is part of the facilities under the curatorship of the University of Pretoria (Dipolelo, 2017, ed 1, 1). Since there is a departmental master plan (a masterplan of all theoretical architectural work done on the campus by students of the University of Pretoria's department of architecture), it presented the opportunity to add on my interpretation to this body of knowledge.

The campus is currently home to the extended program offered by the faculty of Natural and Agricultural Science (NAS) and the faculty of Economics and Management Science(EMS) (Dipolelo, 2017, ed 1, 1). The security measures enforced portray a level of inaccessibility through the use of high concrete palisade fencing, thus segregating the building from its vibrant context

Figure 2: Image of Mamelodi Campus Concrete Palisade fence on street edge. (Author.2019).

Figure 3: Image of site in the Mamelodi context. Author.2019.

Figure 4: Image of Mamelodi campus. (Author.2019).

The Mamelodi they don't show on TV

Figure 5: Image of a collage of houses in Mamelodi. (Author.2019).

Context (Site)

Macro-scale

Mamelodi is a Black only township created in 1874 by the ruling government, it lays on the foot of the Magaliesberg mountain and Moreleta river 20km east of Pretoria CBD(Central Business District) Nice (2008).

The creation of the township resulted from the portioning of Mr. Jensen's vlakfontien farm into three plots through a series of three periods and then purchased by the City Council Pretoria (CCP) between 1874 ad 1945 Nice (2008. The final purchase of the third portion was made to accommodate the growth occurring towards the east of the township.

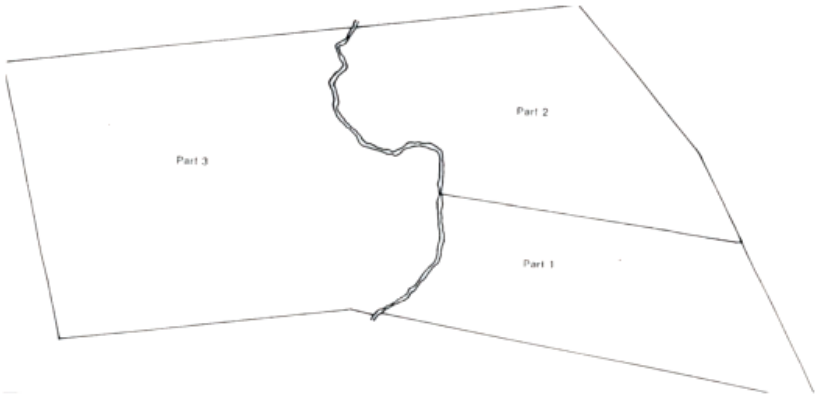
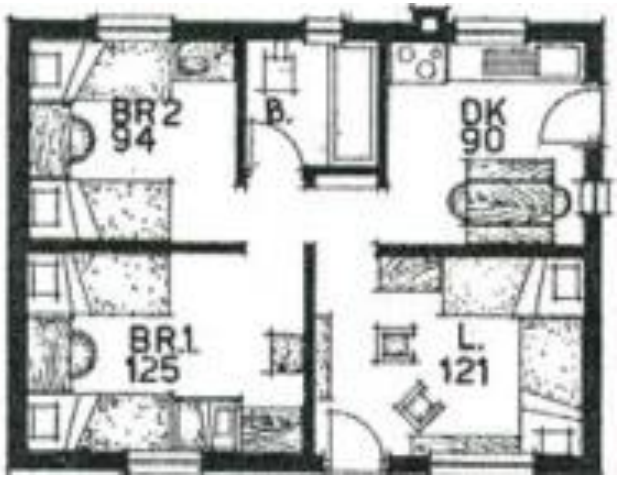


Figure 6: Image of Vlakfontien farm 1874. (Mothowamodimo, W.O.2012).

Nice (2008) illustrates how the first attempt of developing an architectural language was rejected by the native dwellers in the township, this proposed architecture is referred to as the Traditional Bantu village due to it comprised of a series of rondavels forming a courtyard (referred to as a Lapa) into the open space.

Figure 7: Image of the traditional Bantu village sketch. (Mothowamodimo, W.O.2012).

In 1954 the CSIR (Council for Scientific and Industrial Research) and the NBR (National Building Regulations) committee presented their proposed solution to social housing, It was known as the NE 51/9 housing typology (Non-European housing of 1951, drawing 9) which is a match-box like house divided into four rooms (Muthembi,2015).



According to Haaroff in Combrinck, Vosloo, and Osman (2017), the original purpose of the NE 51/9 housing typology was not intended to be built or used as a trademark for housing in townships. The idea was developed to design rationally in compact spaces. The acceptance of this typology by the national housing department led to the implementation of the housing typology across South African townships.

Figure 8: Image of the floor plan layout of NE 51/9 house. (Mothowamodimo, W.O.2012).

Now according to Barker (2015), the making of architecture does not present something completely new. It is however comprised of a series of attempts aimed at illustrating a continuum of thinking within the architectural community and discourse.

Barker's (2015) argument is reflected in Muthembi's (2015) formulation of the build-up of a policy-driven social architecture which illustrates how the implementation of the NE 51/9 housing by the apartheid government influenced the manner in which architects thought of social architecture post-apartheid. In essence, the idea of NE 51/9 housing is heavily reflected in the RDP (Reconstruction and Development Programme) implemented in social housing development across newly accepted townships in South Africa (Department of housing 2004 in Burgoyne, 2008).

According to the department of housing in Burgoyne(2008), this typology grew and influenced how compact spaces in terms of social housing are addressed in South African, thus in this document, thus strengthening Barker's (2015) argument on the making of architecture as a result of a continuum of thinking.

Although social housing is not the focus of this document, its approach and mass implementation strategy offered an understanding and background on the development of public facilities in Mamelodi. It also introduces the idea of what influenced the form of the existing urban context, which elements or conditions are worth analyzing to understand which information is appropriate for this study, and can inform the making of an architectural response.

According to a digital analysis of Mamelodi, it is comprised of public facilities such as lower education campuses, Public health care facilities, a transport hub and higher education campuses, which are assumed to have been influenced the dominance of how architecture was made as a result the Afrikaner dominance in Pretoria during the time of design and erection.

The assumption is based on the argument introduced by Barker (2015), the making of the public architecture in Mamelodi cannot be completely new. If his notion is correction, the focus of the study on the University of Pretoria's Mamelodi campus (previously known as Vista campus) should illustrate a paradigm in which the identity of the campus can be placed, thus enabling the ability to extract principles which would inform an architectural approach to the campus.

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Figure 9: Image of Mamelodi campus's iconic Pedestrian entrance. (Author.2019

Figure 10: Image of Mamelodi campus's main Pedestrian entrance.(Author.2019).

Figure 11: Image of Mamelodi campus's vehicle entrance. (Author.2019).

Meso-scale

On an urban scale, Mamelodi has three public health care facilities, two tertiary education campuses, twentyone primary, and secondary education facilities, and one transport hub (train station) (Mapable, 2019). This document focuses on extrapolating architectural principles and identity through analyzing the University of Pretoria's Mamelodi campus which is one of two tertiary education campuses in the township.

Churchhill (1945) Paraphrased Santanyana (1905) by reiterating that, those who do not learn from history are condemned to repeat it. The failure to illustrate some understanding of the historical context of Mamelodi as a black township is very detrimental to the making of an appropriate architecture supporting this document.

Therefore Nice (2008) suggests that the sprawling of Mamelodi becomes key in investigating the identity enforced in the township. It is found that in its original context, Mamelodi was zoned ethnically (Chiloane,1991). This means that due to the multitude of black residents from different cultures and traditional backgrounds, it is ill-advised to attempt to develop an architecture symbolic or representative of one or all. However, it is suitable to attain an understanding of how this zoning manifested to accompany a neutral public architectural identity.

Figure 12: Image of Stationary private vehicular transport on hinterland Ave. (Author.2019).

Form an urban pictorial analysis, Mamelodi is composed of an existing, vehicular and Pedestrian movement around the area of study (see images 11 and 12). This illustrates the township's reliance on continuous pedestrian and vehicular activity in a form of movement, however, Wolmarans(2017) argues that this indicates a pattern of pendulum migration existing in the township, thus both observations makes movement prominent to the appropriate design approach and research.

Form urban images, Mamelodi is composed of an existing, timely vehicular and Pedestrian movement around the area of study (see image). This illustrates the township's reliance on continuous pedestrian and vehicular activity in a form of movement, however, Wolmarans(2017) argued that this indicates a pattern of pendulum migration existing in the township, thus both observations makes movement prominent to the appropriate design approach and research.

Figure 13: Image of Taxi protest at Cnr Solomon Mahlangu and hinterland Ave. (Author.2019)

The observed movement is extrapolated as being symbolic to the inaccessibility of facilities in close approximation for the residents thus resulting in long commutes to access those which are accessible.

It is also assumed that foot traffic can illustrate the presence of social activity existing in place, Whyte (1980) speaks of social activity of space being evident through the movement of people within a particular space. This assists in seeking ways in which the urban movement can inform architectural responses that aid in the social activity in space, as illustrated in Nice's (2008) community engagement proposal where the building became a hub for activities that encouraged the continuation of social activities.

Thus this allows the document to extract further understanding of the contexts through documents such as the GCRO report of Solomon Mahlangu Drive (2013), and CPTED reports Landman (2003)), to inform the appropriate urban condition suitable for the architectural response.

Background and History

History of Mamelodi

For the purpose of this research, Mamelodi is referred to as a township as described by Chiloane (1991)

Pretoria is situated north of Johannesburg and was established in 1855 by the trek Afrikaners (Nice,2008) around its peripheries were various cultures of black people who lived in kraals and had migrated to the city in search for job opportunities.

20Km east of the city (Pretoria CBD) a township was established to accommodate the black people who came to the city in search of work and better opportunities (Wolmarans, 2017). The township was developed strictly as a blacks-only area through the purchasing of Mr. Jansen's Vlakfontien farm between 1874 and 1949 (Nice,2008).

According to Dewar and Watson in Wolmarans (2017), the township was established during the apartheid era (1948-1990) as a settlement to facilitate the control of black South African.

In 1947 the first housing scheme known as the traditional Bantu village was piloted in Mamelodi. This scheme comprised of thatch roof rondawel housing typology for the township dwellers, which the dwellers found too familiar and rejected it. A later scheme referred to as the NE51/9 and NE51/6 house comparison of a matchbox four-roomed house was proposed, accepted and developed in 1954 by the CSIR and NBR council appointed by the government

(Muthambi.2015). Mamelodi began to expand towards the Silverton area which is west of the area of this study. It was only in 1960 when the purchase of the eastern portion of Mr. Jensen's plots was finalized that this area towards the east was used for further accommodation of the growing Black population(Nice,2008).

Taking into account the arguments made by Dewar and Watson in Wolmarans (2017) and Nice (2008) and considering these in terms of the general aerial overview map of Mamelodi's expansion from the west to the east, one can observe that the west is mostly dominated by the NE51/9 housing which was provided by the pre-1994 government. The eastern section is expanding with the combination of informal housing, RDP's (social housing post-1994), low income financed housing and recently provided government service entities such as primary schools and day clinics.

History of the campus

In 1978 the National Party commissioned an inquiry to investigate an appropriate manner in which an institution of higher learning could be established to facilitate black academics who wanted to upgrade their academic qualifications (SA History online)

As a result, in 1982, multi-disciplinary distant learning campuses were constructed in townships across South Africa, one of which is the University of Pretoria's Mamelodi Campus (Formerly known as Vista Campus). Due to the segregational policies under apartheid, these university campuses were under-resourced and only focused on the soft sciences such as education, sociology, and humanities (Kabamba in Nice,2008).

The main focus of the Vista campuses improved after the 1994 elections with the campuses expanding in terms of academic programs. In 2003 the original intention of long-distance learning changed, when the government amended the education act under minister Asmal, resulting in the merger of these small campuses with major universities across the country. In this way, the Vista campus in Mamelodi merged with the University of Pretoria and now performs as one of the satellite campuses responsible for the extended programs of various faculties (Dipolelo, 2017, ed 1,1)

Figure 14: Image of Aerial view of Mamelodi Campus. (Yiba.2018).

Figure 15: Image of the Mamelodi Campus arena building. (University of Pretoria.undated).

Program

Client

Upon site investigation it was noted that there are three different users presently in and around the selected site, they are

- The community members (School children, adults, youth, vendors, etc)
- The university's administrative and security staff
- The enrolled university students

The users access the campus and use it selectively. Surprisingly activities on-site illustrate that the community members have more potential of using the campus facilities beyond the daily academic period, but the restriction of access to other parts and facilities discourages the possible engagement from occurring.

If accessibility to the campus is achieved, this will create an opportunity for an open dialogue between the three users which is defined by architectural iterations. The space of engagement should identify a new engagement and definition of movement within a public space which is neither intimidating or viewed as undermining.

Programmatic response

The program aims to explore how the socio-cultural activity off campus can manifest into the core of the campus to aid in the creation of space which enables the three users to engage.

Rather than developing a new program that is different from the one existing on the campus, the approach is to adapt what is existing academically and contextually to add to the existing program which aims to invite the socio-cultural activity occurring on the peripheries of the campus.

The campus has various sports facilities such as a soccer pitch, a netball/basketball court, and a 7- A side pitch which was installed in 2011. Considering these facilities the proposed program serves to experiment in an appropriate manner in which the functions of the sports and academics can adopt the role of the drivers aiding the architecture around the created "enabling" space.

Therefore a Micro-Bio-sports center is proposed which combines the theoretical training of biotechnology(biomedical sciences) with the physical training embodied in sports with the facilities existing on-site.

Unlike the traditional Bio-sports centers, the proposed one does not focus only on efficient sports performance, the fusion with academia enables a development for a learning program around effective healthy living embedded in sports and biotechnology.

Theoretical Premise

This Section expands how theories of **identity** and, **metaphor** and **symbolism** respectively were scrutinized

The investigation and application of these theories is non-traditional in the sense that rather than accepting and adopting the statement of these theories as is, the researcher focused on synthesizing the fundamentals of the theories such that the research is reflective of an extraction of a particular understanding of the theories which can justify the creation of the architecture.

The premise of this section is to extrapolate the formation of an architecture informing a theoretical approach to research and a theory justifying architecture in-terms of design.

IDENTITY

The use of this theory was inspired by the manner in which Fisher(1998,2003), Barker (2012,2015) and Pienaar (2014) investigated how the formation of Pretoria Regionalism (also known as the third vernacular) catalyzed a standpoint for what came to be identified as Afrikaner architecture during the global modern movement in architecture and in apartheid South Africa.

Therefore this section will re-establish the definition of identity by scrutinizing the work done by the above-mentioned authors, such that it aids manner in which we can begin to understand the role of Pretoria regionalism in the making of the architecture at the university campus in Mamelodi. The purpose of

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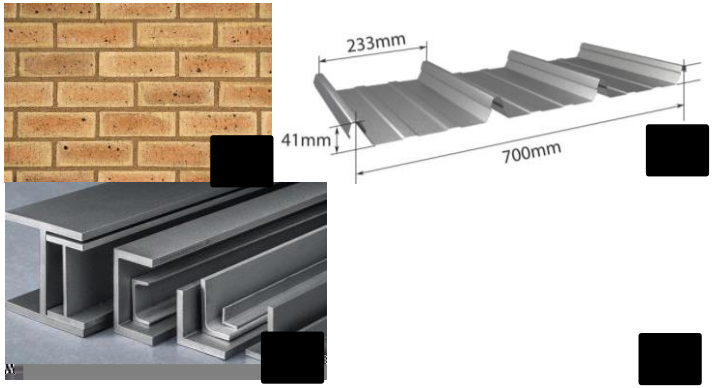
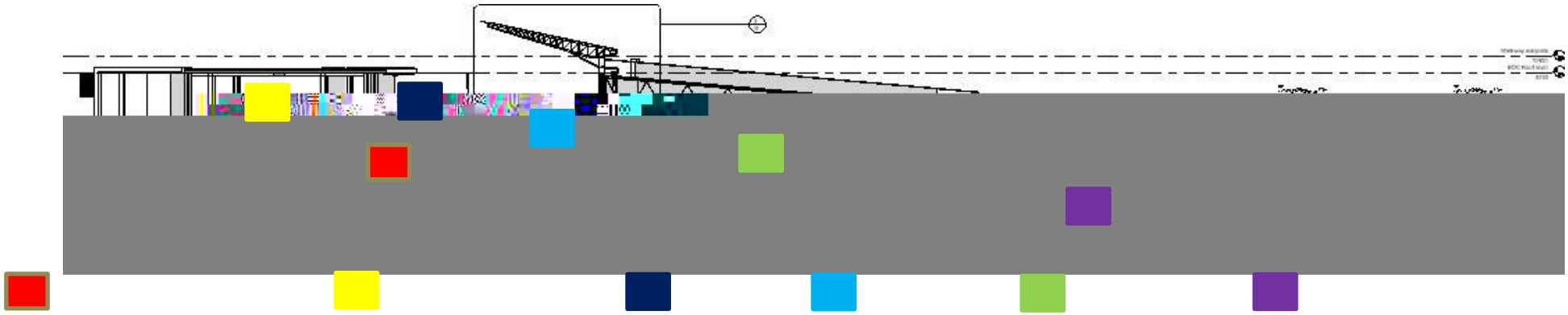
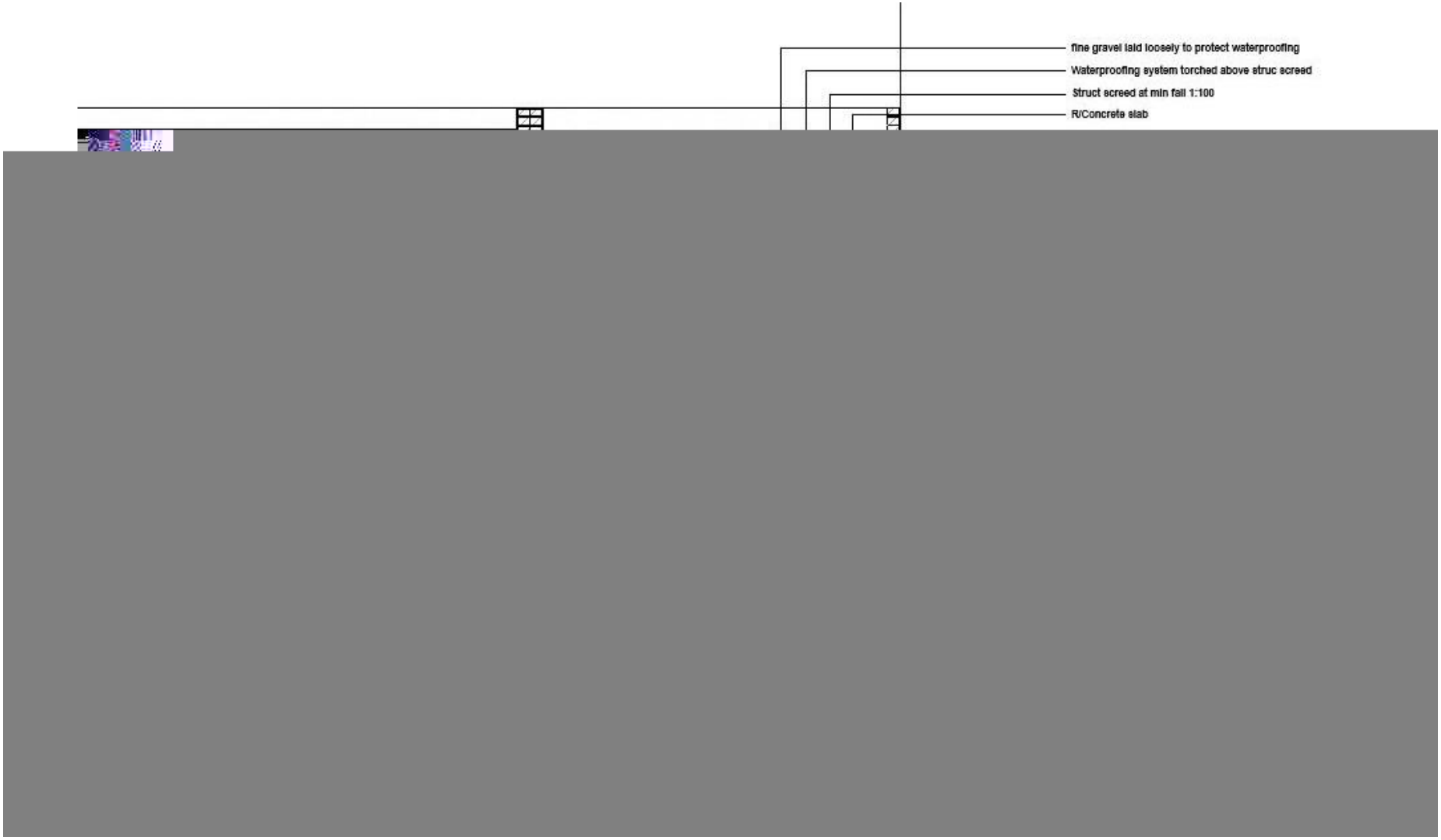


Construction Section and Water calculations



Details


fine gravel laid loosely to protect waterproofing
Waterproofing system torched above struc screed
Struct screed at min fall 1:100
R/Concrete slab

Annexure B: Water calculations (All according to SANS 204)

AREA CALCULATIONS

Catchment	Area, A (m²)	Runoff Coefficient,	
		C	C (weighted)
Roof	5130	0,85	0,85
Paving	0	0,8	0,00
TOTAL	5130		0,85

RAINWATER YIELD

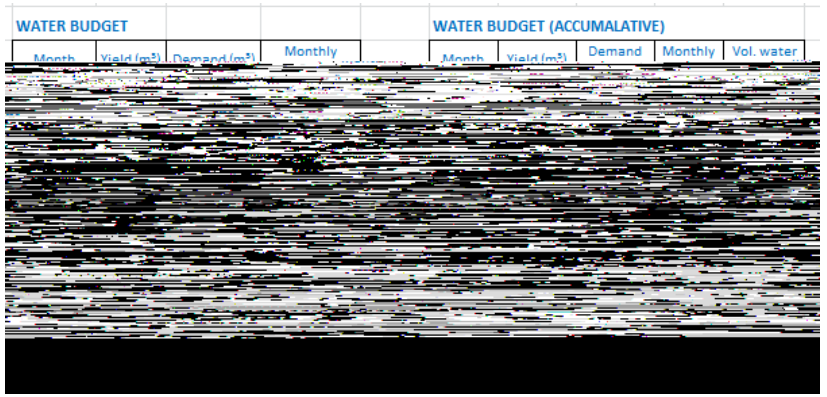
Month	Ave. rainfall, P (m)	Yield (m³) (Yield = PxAxC)
January	0,136	593,028
February	0,075	327,0375
March	0,082	357,561
April	0,051	222,3855
May	0,013	56,6865
June	0,007	30,5235
July	0,003	13,0815
August	0,006	26,163
er	0,022	95,931
October	0,071	309,5955
r	0,098	427,329
r	0,11	479,655
ANNUAL AVE.	0,674	2938,977

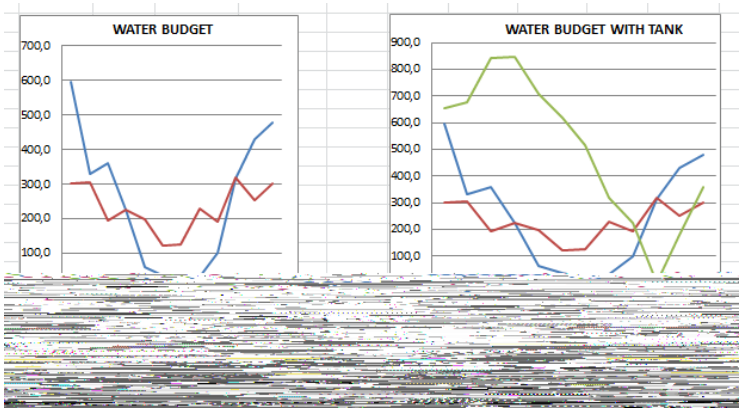
ALT SOURCE

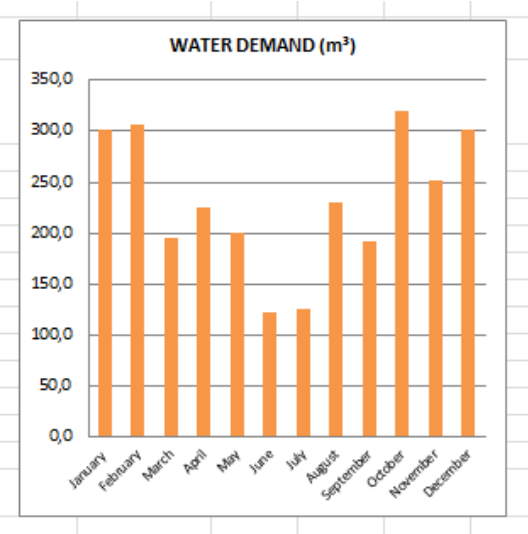
Month	Source 1 (m³/month)
January	3
February	4
March	3
April	4
May	5
June	6
July	6
August	6
September	4
October	5
November	3
December	0
ANNUAL AVE.	49

TOTAL YIELD

Month	Total Yield (m³/month)
January	596,028
February	331,0375
March	360,561
April	226,3855
May	61,6865
June	36,5235
July	19,0815
August	32,163
er	99,931
October	314,5955
r	430,329
r	479,655
ANNUAL TOTAL	2987,977







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Understanding the design of the University of Pretoria's Mamelodi Campus as through a regionalist lens.

David K Waleng

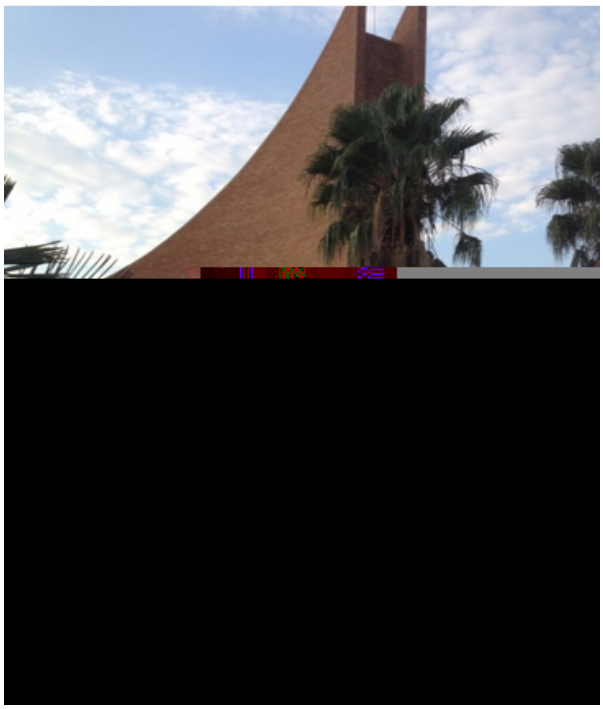

Fig. 01. Image of iconic pedestrian on Mamelodi campus (Author,2019)

Preface

The University of Pretoria's Mamelodi Campus is located on the western corner of Solomon Mahlangu drive and Hinterland Avenue in Mamelodi.
'The campus was designed and constructed in the 1980's as requested by the government in order to establish an academic institution in the township to accommodate black students seeking to further or better their DFDGHPLF WUDLQLQJ (S.A History online.2019).
'The campus was handed to the University of Pretoria in 2004 by the post-1994 government' under the amendment of the Transformation and reconstruction of the higher education system of 2002(Government Notice No 859.2002). The campus is currently home to the extended program R‡HUHG E\ WKH IDFXOWLHV and Agricultural Science (NAS) and the faculty of Economics and Management Science(EMS) (Dipolelo, 2017, ed 1, 1).

tThe aim of the article is to explore the design of the campus through the lens of Pretoria regionalist architecture. This is done to HVWDEOLVK WKH LQÀXHQFH WKDW WKH movement had on the making of architecture on the outskirts of Pretoria pre-1994.

Introduction

Barker (2015) suggests that no architecture will ever be truly new, due to its existence as being part of a continuum of thought and a development over time. When discussing Gawie Fagan's work. He illustrates how the discourse has contributed to the production of rooted solutions describing the relationship between the strange and the familiar, especially within a context or region (Barker .2015).

The idea of regionalism dates back to architects seeking to create what is familiar within an environment (Fisher .1998), Thus the description of regionalism links with Moerdjik's attitude of negating the imperialistic approach of making buildings as being the drive to the establishment of regionalism in South Africa(Fisher.2003)

Barker (2015) further describes regionalism as an illustration of an architecture that considers the relationships in its context.
This article focuses on Pretoria regionalist as the investigative lens of identifying which architectural principles used to inform the design of the University of Pretoria's in Mamelodi Campus. Since the campus now forms a part of the buildings within the University of Pretoria's infrastructure, the lens with which this campus is understood is valuable to the continuum of thinking about the Pretoria regionalism in the architectural discourse. The article will further illustrate which regionalist principle dominates WKH RYHUDOO LQÀXHQFH design of the campus.

Pretoria Regionalism.

7KLV VHFWLRQ ZLOO GH¿QH 3UHWRULD U
(1998,2003). Barker (2012), and Pienaar (2014).

Fisher (1998,2003)

Fisher (1998) describes Pretoria Regionalism as a variant within the modern movement informed by the re-appropriation of the Cape Dutch houses in Pretoria. The movement he coined as 'The third vernacular' was driven by Moerdjik's urges to establish an architecture representative of the Afrikaner in Pretoria (Fisher.2003)

Fisher (1998) illustrates that Eaton's DSSURDFK WR DUFKLWHFWXUH LQÀXHQFHG WKH HGXFDWLRQ R‡HUHG E\ WKH 8QLYHUVLW\ RI Pretoria's school of architecture since its establishment in 1943. According to Fisher (1998), the need for considering context as a design informant by regionalist perceived the movement as a rejection of the international style but it wasn't (Fisher,2003).

He further describes the works of Moerdjik, De Zwaan, McIntosh and Eaton as having a distinctive style that embraced an environmental appreciation of the architecture in Pretoria. Fisher(1998) argues that the restriction of export building material in Pretoria during the apartheid era forced Pretoria based architects to consider context as an informant to the making of architecture.

7KHUHIRUH ¿VKHU UHJLRQDOLVP DV D UHÀHFWLRQ RI DSDUWKHLG
response to nature and landscape by the economic use of naturally available and industrially manufactured materials in an empirical response to its surroundings, which tempered the evolving values of the modern.

Barker (2012)

Barker (2015) argues that regionalism VKRXOG EH GH¿QHG DV response to the environment surrounding the architecture, this means the architect is put in a position of selectively deciding which aspect or condition best suits the intended architecture without undermining or under-valuing the existing culture of place but continuing the expansion of thinking and addition of value within the architectural community.

He refers to Gawie Fagan and his interpretation of regionalism as being LQÀXHQFHG E\ WKH HG the University of Pretoria's school of architecture in the 1940s, the revolutionary introduction to the 'one-room-deep' house building typology referred to as &DSH 'XWFK DUFKLWHFW vernacular by Fisher in 1998) and the idea of functionality as the key aspect in modernism, being mediated to illustrate a pragmatic understanding of place wherein Fagan created his architecture.

Barker (2015) states that Fagan's work in regionalism illustrates a mediation between Cape Dutch architecture and the regionalist teaching he received from the University of Pretoria.
He relied on the practice of extracting symbolism (sometimes through chimneys) in his architecture not only as GH¿QHV 3UHWRULD an element within the design but as an extension of familiarity thus grounding domestic architecture within context.

This made Fagan's work the key example RI %DUNHU¶V GH¿QLWLF the regionalist is able to maintain balance between the polarities of universalization and revivalism through the mediative approach to contextual design.

Fig. 02. Mamelodi campus earth view.(Google maps, 2019)

Fig. 03. image of Mamelodi campus main entrance (Author, 2019)

Pienaar (2014)

Pienaar (2014) proves Fisher's (1998) definition of regionalism as the economical use of naturally available and industrially manufactured materials in an empirical response to its surroundings, which tempered the evolving values of the modern.

Through this endorsement, Pienaar(2014) is able to narrate Eaton's work as a legacy of domestic architectural oeuvre; she further describes Eaton as an architecture with the ability to translate key elements of what he has observed into architectural resolutions, this made him an attentive observer of the sense of nature and its culture(Pienaar,2004).

Eaton's translation portrayed a concern on simplicity and appropriation as observed in Cape Dutch architecture thus making his work less stylistic or aesthetic but more grounded in the search for appropriateness in architecture.

Eaton's many travels and associations with modernist architects had an influence in the manner in which he created form. However, unlike the international style, Eaton's work became regionalist through the indication of the importance in responding to place and tectonology as an articulation of site and appropriateness, thus validating Pienaar's adoption of Fisher's and making it applicable to the continuum of regionalist thinking.

Regionalism Principles

Fisher (1998)

In his writing on the Third vernacular, Fisher (1998), describes Regionalism as an economical response to nature and its landscape, he further articulates how the pragmatic approach to architecture practiced by Eaton, McIntosh, South, and Bowen formed the design manifesto of the school of architecture at the University of Pretoria in 1943. In his derivative, he refers to the following principles as the pragmatic understanding of a regionalist approach

•Sensitivity to the landscape
•Response to climate constraints
•Traditional plan forms
•Sun-shy windows
•Deep shaded eaves and verandas
•Low pitch iron roofs
•Rustic brick (direct or as whitewashed stock)

Fisher (1998).

Fisher (1998) argues that these principles were derived from a constraint by building control in the pragmatic understanding of the available technology and contextual constraints.

Barker (2012)

Barker (2012) argues for a critical regionalism through analyzing Gawie Fagan's work and describing it as a mediation between the love for Cape Dutch architecture and the functionalism of the University of Pretoria's school of architecture.

However, in his article on expanding architecture regionalism, Barker (2011) refers to regionalism as either meditative or radically responsive. He addresses regionalism as an intimate understanding of place which creates synergic spaces through responding appropriately to its context.

He outlines Pretoria regionalism at a more pragmatic level as the knowledge of

•Topography of place
•The climatic conditions of the area
•The prominent building tradition and technology and
•The availability of building materials

Barker (2011)

However, he goes on to state that what makes Pretoria regionalism is that the architect's ability to choose what he wants to respond to (Barker, 2011).

Pienaar (2017)

In 2017 Pienaar refers to Eaton as the patron of Pretoria architecture with an architecture inspired by Niemeyer. However, Eaton's architecture is a contextualized it, it is grounded in a regional response that is familiar to Pretoria in the 1940s.

She states that Eaton's meeting with Niemeyer in 1945 revolutionized how he viewed and understood architecture, however, what kept his work contextualized is his ability to translate architecture into a simplistic familiar artwork.

Through this, Eaton maintained architecture which embodied the following principles
•Responsive to climatic conditions
•Economical use of available material (especial brick)
•Sensitivity to the landscape
•Understanding of place (culture, tradition, its people)
•Functionality and simplicity
These principles earned him the title 'Patron of Pretoria Regionalism'.

Pienaar (2017)

History of Mamelodi

20Km east of the city (Pretoria CBD) a township was established to accommodate the black people who came to the city in search of work and better opportunities (Wolmarans, 2017). The township was developed strictly as a blacks-only area through the purchasing of Mr. Jansen's Vlakfontien farm between 1874 and 1949 (Nice,2008).

According to Dewar and Watson in Wolmarans (2017), the township was established during the apartheid era (1948-1990) as a settlement to facilitate the control of black South African.

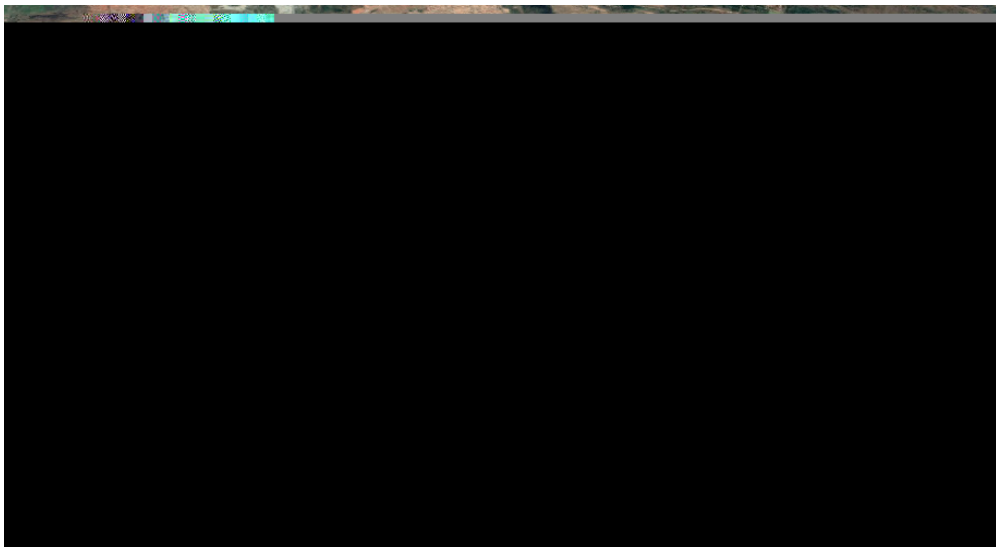

Fig. 04. Aerial view of Mamelodi (Google Maps, 2019)

, Q W K H ¿ U V W K R X V L Q J the known as the traditional Bantu village was piloted in Mamelodi. This scheme comprised of thatch roof rondawel housing typology for the township dwellers, which the dwellers found too familiar and rejected it. A later scheme referred to as the NE51/9 and NE51/6 house comparison of a matchbox four-roomed house was proposed, accepted and developed in 1954 by the CSIR and NBR council appointed by the government (Muthambi.2015).

Mamelodi began to expand towards the Silverton area which is west of the investigated campus. It was only in 1960 when the purchase of the eastern portion of Mr. Jensen's S O R W V Z D V ¿ Q D O L] H G W K D W W K L V D U H D towards the east was used for further accommodation of the growing Black population(Nice,2008).

Taking into account the arguments made by Dewar and Watson in Wolmarans (2017) and Nice (2008) and considering these in terms of the general aerial overview map of Mamelodi's expansion from the west to the east, one can observe that the west is mostly dominated by the NE51/9 housing which was provided by the pre-1994 government. The eastern section is expanding with the combination of informal housing, RDP's (social housing post-1994), low L Q F R P H ¿ Q D Q F H G K R X V L Q J D Q G provided government service entities such as primary schools and day clinics.

History of Mamelodi campus

In 1978 the National Party commissioned an inquiry to investigate an appropriate manner in which an institution of higher learning could be established to facilitate black academics who wanted to upgrade their academic T X D O L ¿ F D W L R Q V 6 $ online.2019)

The result was the erection of distant learning campuses strategically allocated in township across the country. The aim of these campuses was to accommodate the improvement of W U D L Q L Q J R U D F D G H P L (R L T X D O L ¿ F D W L R Q V of the black South African (SA History online.2019).

There are eight campuses erected in south African townships, one of them is the University of Pretoria Mamelodi campus through the amendment of the higher education act of 1997 by minister Asmal (Government Notice No 859.2002).

Regionalist movement in Pretoria illustrated a consideration of context as an informant to the making of an appropriate architecture, as much as it is the selective decision of the architect to respond to whatsoever embodies the understanding of place, it is also his or her duty to contribute on the discourse by addressing aspects of identity and culture of the region.

Discussion

This section will be focusing on breaking down the derived principles which will later be used to analyze the design of the University of Pretoria's campus in Mamelodi

As derived from the aforementioned literature by Fisher (1998), Barker 2011, 2012) and Pienaar (2014,2017) the following principles are used as the responses illustrating Pretoria regionalist practice in space making.

•Sensitivity to the landscape (knowledge of Topography of place, Orientation)
•Responding to climatic constrains (Rain, Sun, Orientation)
•Economic use of building material and technology
•Exposure of brickwork (Rustic or whitewashed)
‡ 6 L P S O L F L W \ D Q G I X Q F W L layout, walkways)

The above-mentioned principles will E H G H ¿ Q H G L Q W K H I R O O and used to investigate the aim of the article

1)Sensitivity to the landscape (knowledge of Topography of place

This will refer to how the building's layout responds to the site, site elements (trees, and footpath), natural F R Q G L W L R Q V V X F K D V Z D W orientation in terms of accessibility, views and how the architecture responds to the slope on section (showing relationship in terms of contextual scale of building.

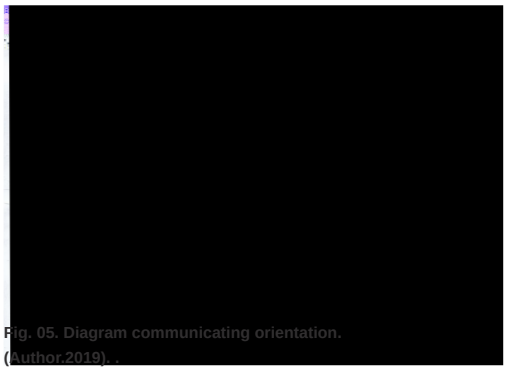

Fig. 05. Diagram communicating orientation. (Author.2019). .

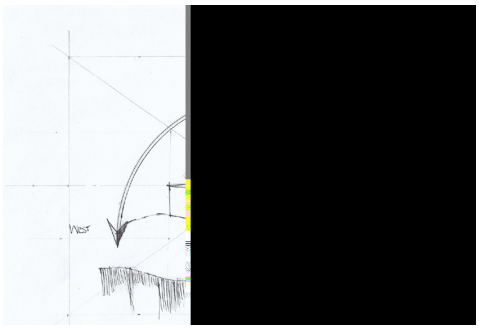

Fig. 06. Diagram illustrating sun movement in (Author.2019).

2)Responding to climatic constrains (Rain, Sun, Orientation)

Referring to the use of the typology of the roof overhang as shading devices and building edges, how openings address sun exposure and the manner in which the orientation of the building LV UHÀHFWLYH RI WKH RSWLPDO SHUIRUPDQFH of the building.

Fig. 07. Diagram illustrating Climatic response sun in context (Author,2019).

3)Economic use of building material and technology

Fisher(1998) states that the regionalists in Pretoria had a crafty approach to their use of materials on building skins and facades. This was done not only to stretch the use of available materials but to articulate the beauty of the building through an illustration of various detailing on building facades by simply using the combination of material (Fisher,1998)

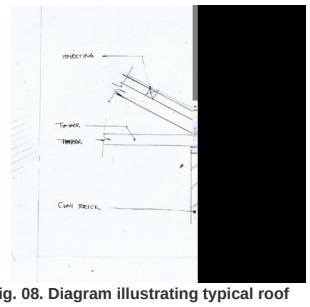

Fig. 08. Diagram illustrating typical roof detail.(Author,2019).

Fig. 09. Diagram illustrating mixed use of material.(Author,2019)

4)Exposure of brickwork (Rustic or whitewashed)

The manner in which the brickwork is exposed both externally and internally illustrates the continuity of craftsmanship in terms of construction and the attention to detaik in terms of design.

The exposure of rustic or white-washed brickwork is not only aethestic, Fisher(1998) elaborates that is also an economical way of maintaining the building over time as it requires no painting or varnishing after years of absorbing rainwater.

Fig. 10. Image of whitewashed wall (alamy.2019)

5)Simplicity and functionality

Responding to context through strategies such as orientation made aspects like roof design less complex for the Pretoria regionalist (Pienaar,2014). Fisher(1998) states that the mono-pitch roof used by regionalists in Pretoria is a good example of simple and functional architecture. This roof allowed of compact building massing and less complex way of setting the building in context, the detailing was well understood by the builders and its function stretched beyond just providing cover on the house to providing shade on the stoep (Fisher.1998)

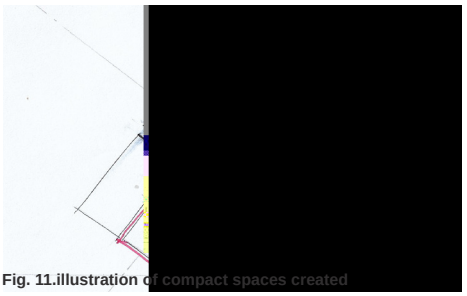

Fig. 11.illustration of compact spaces created using roofs.(Author,2019)

Fig. 12. Creation of by repeating mass (Author,2019)

Fig 19: The architects adopted the double skin system as a shading device for the harsh western sun. The high placement of the windows alls for natural light to enter the building. This detail is mostly found on the administration buildings and the buildings on the eastern side of the campus.
The skin allows for large fenestrations to be incorporated into the design, the use of OLUJH URRI RYHUKDQJV GL‡XVHV unwanted light from entering the building and aids in keeping the building warm during winter and by opening the windows, fresh air can enter the building and keep to passively cool it.

Economic use of building material and technology.

Fig 20: The design was limited to the use of face brick, sheet URR¿QJ DQG FRQFUHWH 7KH combination of these materials gives a pleasing visual aesthetic on the exterior of the campus buildings. From a site inception, materials such as face brick and VKHHW URR¿QJ LV UHDGLO\ DYDLODEOH and sold on some parts of the market on the eastern edge of the campus. This illustrates that the materials are locally sourced and due to the numbers of the markets selling these materials, they are in abundance thus could be perceived as being economical due to their local availability.

The mono-pitched walkway sloped to the grass area showing the consideration of the continuity of the natural stormwater movement on-site and since the walkway is west facing, it required depth and adequate shade so that it can be used, this informed the architects to use asbestos (at that time) because it is structurally capable of spanning longer distances with less support.

The practical nature of the campus prioritizes function over aesthetics but does not completely void the practice of craftsmanship through the external exposure of brickwork. The design addresses the issue by incorporating the ideas of identity expressed in the regionalist's design principles as described by Fisher (1998).

Overall, the campus is subtle in its environment, it is simple in its function (Fig 23) and it is practical in its design intention.

Fig. 22. Image of cafeteria.(University of Pretoria.undated).

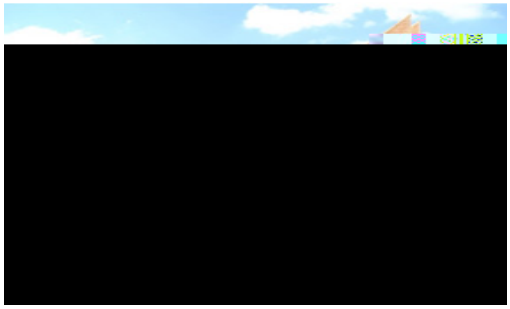

Fig. 23. Image of iconic pedestrian entrance. (University of Pretoria.undated).

Conclusion

In terms of the analysis, the University of Pretoria's campus in Mamelodi contains evidence illustrative of Pretoria regionalist thinking.
The façade is heavily dominated by exposed face brick and articulated LQ GL‡HUHQW FRQVWUXFWLRQ ERQGV WKLV illustrates the understanding of the contextual technology and economic XVH RI WKLV PDWHULDO UHFHFWLYH ERWK externally and internally (in the case of the Arena building).

Regardless of its size, the campus does not need to dominate its site, it respects the landscape and articulates it in terms of foot-movement while responding contextually to the natural conditions of the site i.e not disturbing the natural movement of stormwater circulation or growth of natural shading devices such as trees.
The University of Pretoria's Mamelodi campus contains elements resembling evidence of regionalist thinking according to the principles set-out by Fisher (1998), Barker(2012) and Pienaar (2014). There in the continuum of architectural thought, the campus design can be understood DV KDYLQJ EHHQ LQÀXHQFHG E\ WKH Pretoria regionalist approach to the making of architecture.

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/LVW RI ¿JXUHV

Fig. 01. Image of iconic pedestrian on Mamelodi campus (Author,2019)
Fig. 02. Mamelodi campus earth view.(Google maps, 2019)
Fig. 03. image of Mamelodi campus main entrance (Author, 2019)
Fig. 04. Aerial view of Mamelodi (Google Maps, 2019)
Fig. 05. Diagram communicating orientation. (Author.2019).
Fig. 06. Diagram illustrating sun movement in (Author.2019).
Fig. 07. Diagram illustrating Climatic response sun in context (Author,2019).
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Fig. 12. Creation of by repeating mass (Author,2019)
Fig. 13. Mamelodi Campus site condition. (Author,2019).
Fig. 14. Mamelodi Campus Building arrangement and zoning.(Author,2019).
Fig. 15. Mamelodi Campus site condition solar movement.(Author,2019).
Fig. 16.Diagram of Mamelodi campus library exterior wall detail.(Author,2019).
Fig. 17. Drawing of brick detail (Author,2019).
Fig. 18. Image of Mamelodi Campus arena building.(University of Pretoria.undated).
Fig. 19: Diagram of Double skin exterior wall system on campus library.(Author,2019).
)LJ LOOXVWUDWLRQ RI G technology on campus building.(Author,2019).
Fig. 21. Image of education building showing dominance of exposed facebrick.(Author.2018)
Fig. 22. Image of administration building showing dominance of exposed facebrick. (Author.2018)
Fig. 22. Image of cafeteria.(University of Pretoria.undated).
Fig. 23. Image of iconic pedestrian entrance. (University of Pretoria.undated).

1 : Lecture Hall

2 : Seminar Hall

3 : Media center

4 : Physical rehab center

5 : Media service room

6 : Solar battery storage

7 : Public sitting booth

8 : Walkway

9 : Ablutions (Female)

10 : Ablutions (Male)

11 : Service duct

12 : Storage

13 : Fire fighting equipment duct

14 : Storage

15 : Public ablutions (Male)

16 : Public ablutions (Female)

17 : Service duct

18 : Eatery sitting area

19 : Eatery Service point

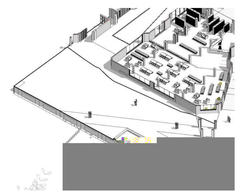
20 : Eatery prep kitchen

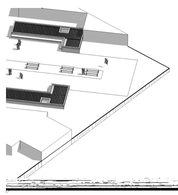
21 : Eatery storage

22 : Eatery cold room

23 : Entrance walkway

24 : Water storage tanks





Ground floor level

1 : 100

N

1 : Ventilation duct

2 : Walkway

3 : Consultation A

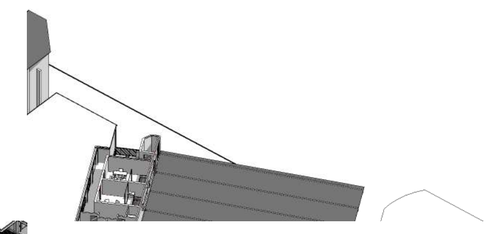
4 : Consultation B

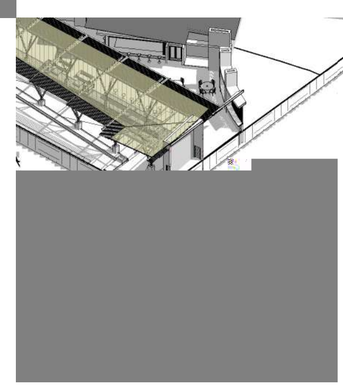
5 : Exam Media room

6 : Storage

7 : Exam room A

8 : Exam room B

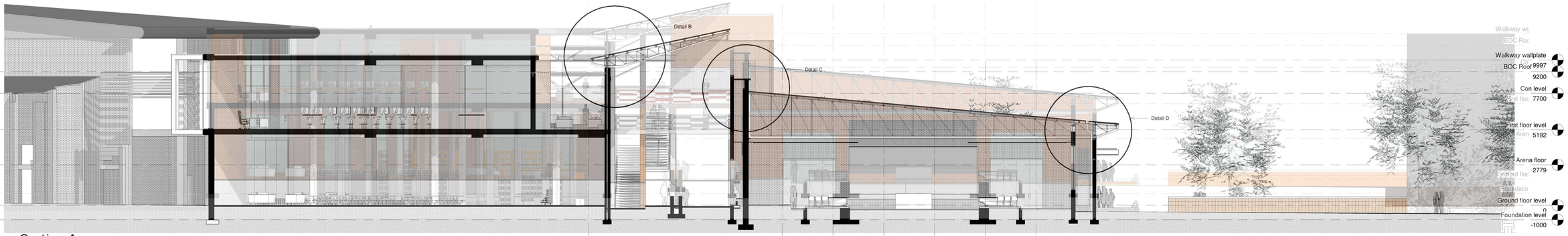




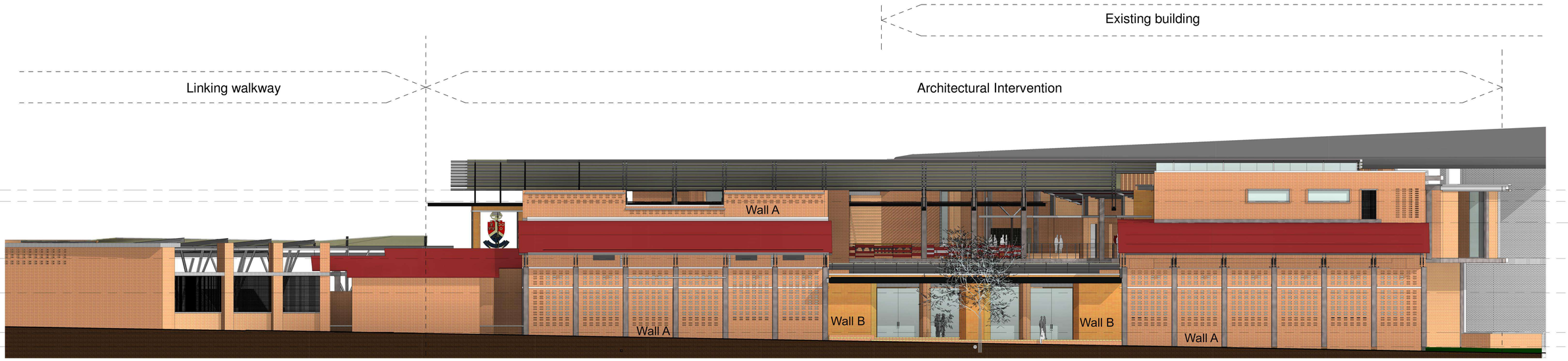
Con level

1 : 100

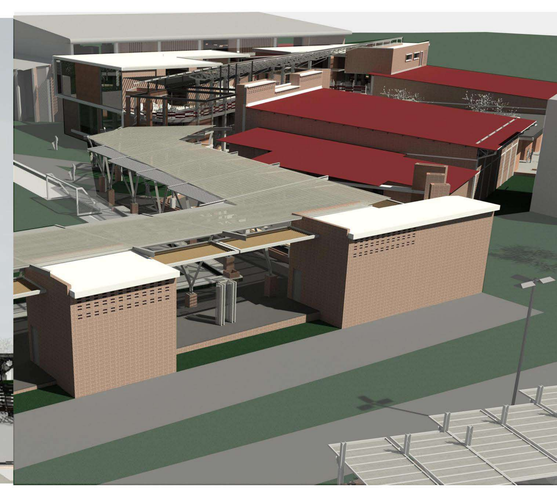
N

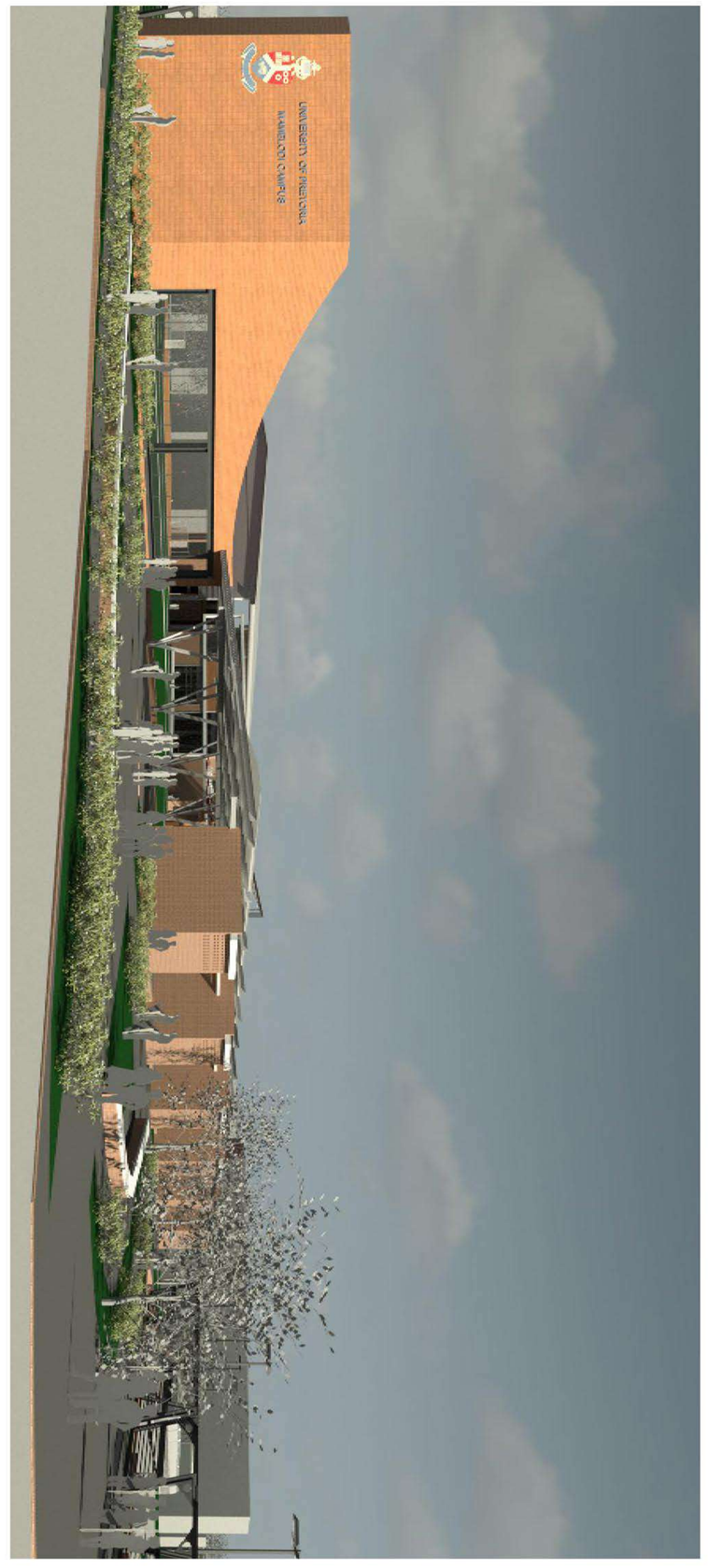


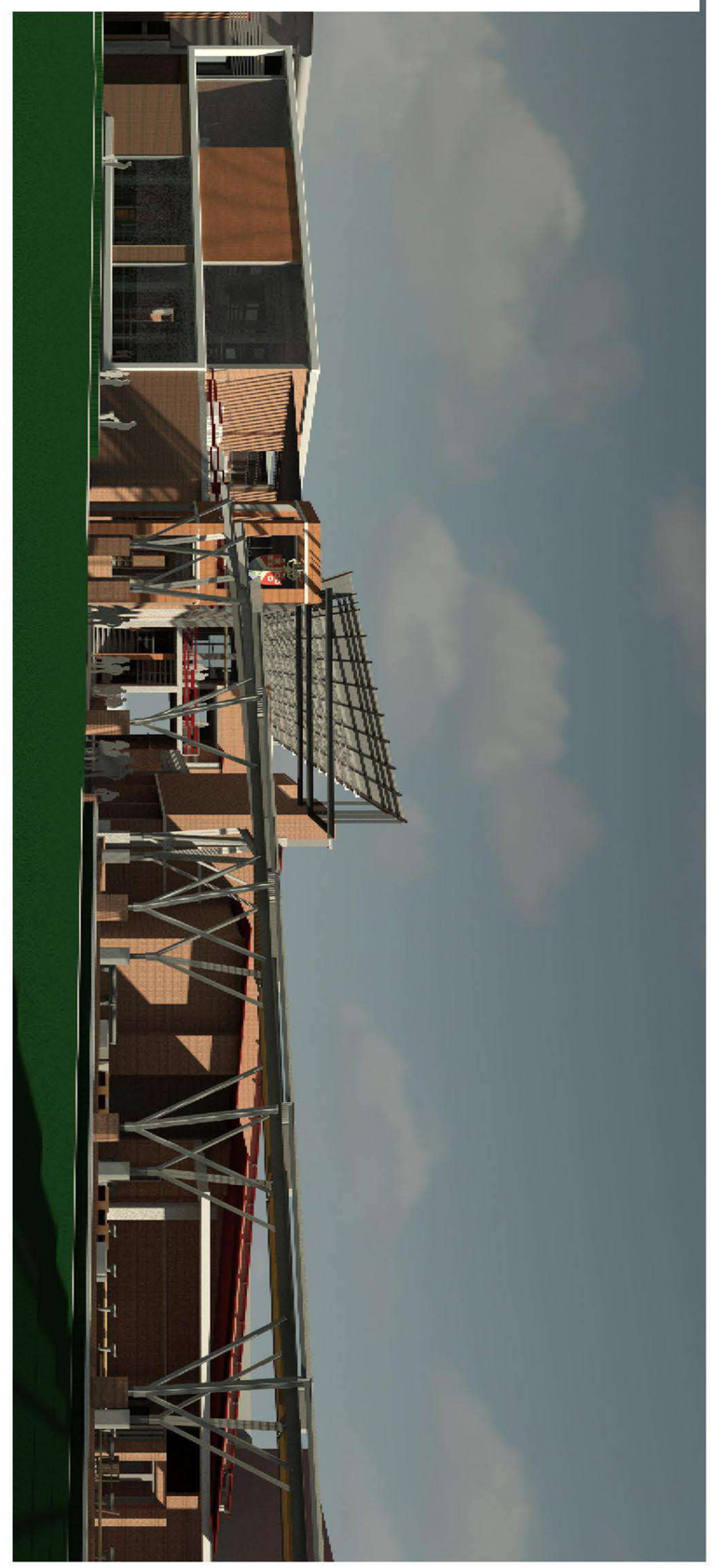
Section A
1 : 100



East elevation
1 : 100







RENDERS

Existing buildings on campus

Proposed architectural intervention for this presentation

Proposed architectural interventions on campus by university of Pretoria M(Prof) graduates

NB: All sports facilities are existing on site

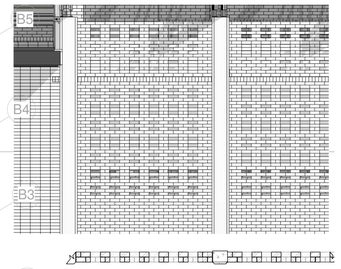
Figure 1 : Site plan indicating departmental contribution to Mamelodi campus (Combrink 2019)

Site
1 : 1000

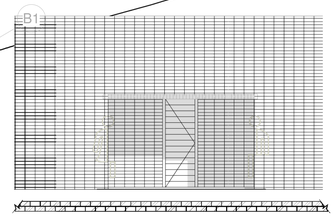
N

1 : Lecture Hall
2 : Seminar Hall
3 : Media center
4 : Physical rehab center
5 : Media service room
6 : Solar battery storage
7 : Public sitting booth
8 : Walkway
9 : Ablutions (Female)
10 : Ablutions (Male)
11 : Service duct
12 : Storage
13 : Fire fighting equipment duct
14 : Storage
15 : Public ablutions (Male)
16 : Public ablutions (Female)
17 : Service duct
18 : Eatery sitting area
19 : Eatery Service point
20 : Eatery prep kitchen
21 : Eatery storage
22 : Eatery cold room
23 : Entrance walkway
24 : Water storage tanks

KEYS
Structural beam above
Concrete Floor above
Steel work above
Roof sheeting above
Void
Rain water collection pipe and routes
Cool air collection points (passive strategy)



Wall A;230 x 115 x 85 mm thick wall in strecher bond construction technique, used as facade screen and ventilation system



Wall B ;230 x 115 x 85 mm thick wall in stacked bond construction technique, used as feature symbolizing the breaking of spatial use

C-Ground floor
1 : 100

N

1 : Robotics lab
2 : Server room
3 : Physical examination room
4 : Operating center
5 : Public study area
6 : Ablutions (Male)
7 : Ablutions (Female)
8 : Service duct
9 : Tutorial hall A
10: Tutorial hall B
11 : Admin waiting
12 : Kitchenette
13 : Admin
14 : Boardroom

KEYS

- Structural beam above
- Concrete Floor above
- Steel work above
- Roof sheeting above
- Void
- Rain water collection points
- Location of heat escape stacks/pipes (passive strategy)

Area of hot stack ventilation for remotest hall.Similar to detail C

Rain water drains to discharge into column cast gutter

Rain water outlet

Ventilation air tubes serving Physical rehab center below and tutorial room on first floor

Rain water gutter to sunken water pipe routed on ground floor.

Rain water drains to discharge into column cast gutter

Rain water outlet

rain water outlet cover

Rain water outlet

Rain water drains to discharge into column cast gutter

Area of hot stack ventilation for remotest wall. Refer to detail C

Ventilation air tubes serving media center below and robotics lab on first floor

Ventilation air tubes serving media center below and robotics lab on first floor

Ventilation air tubes serving media center below and robotics lab on first floor

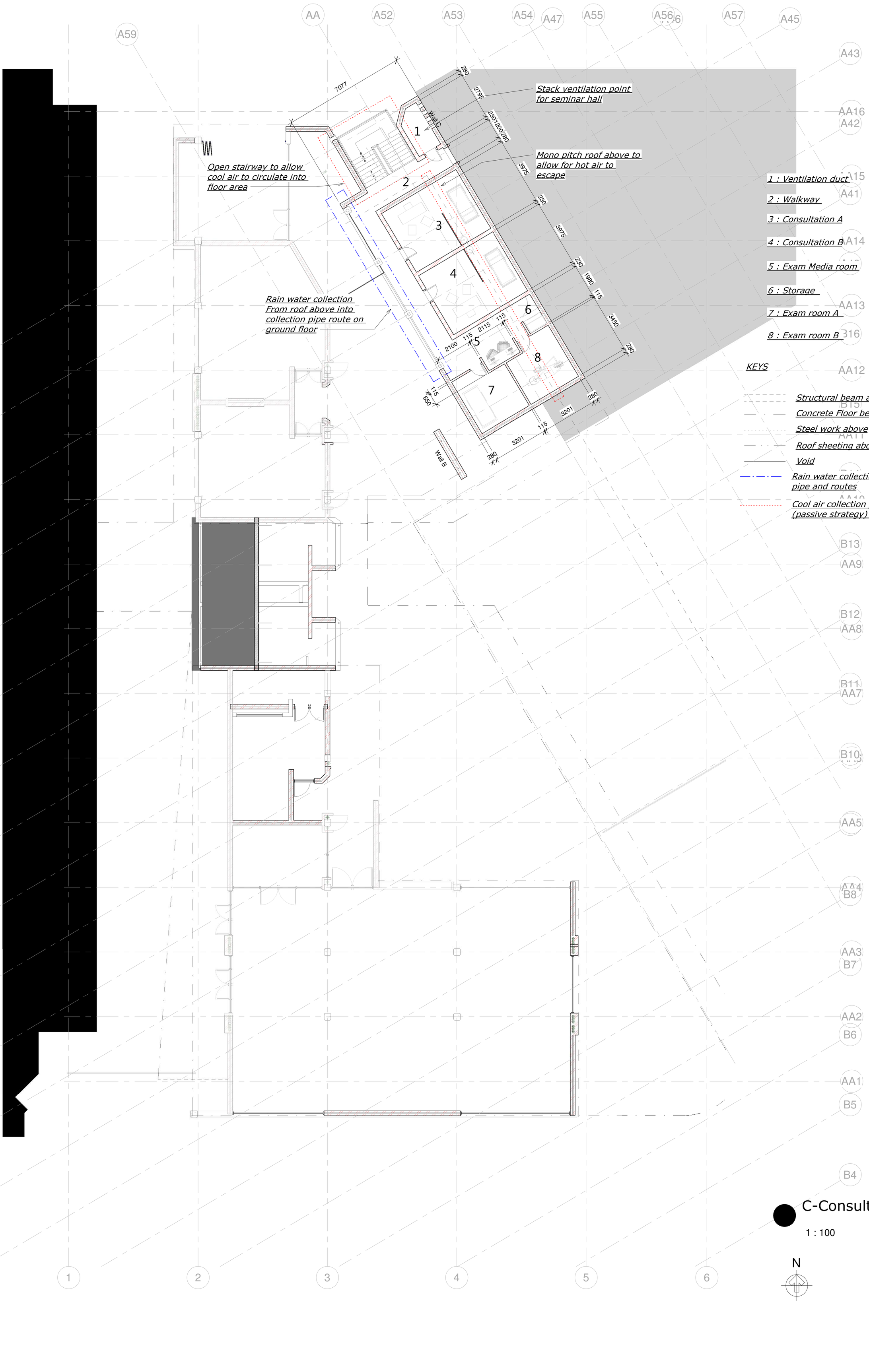
Ventilation air tubes serving media center below and robotics lab on first floor

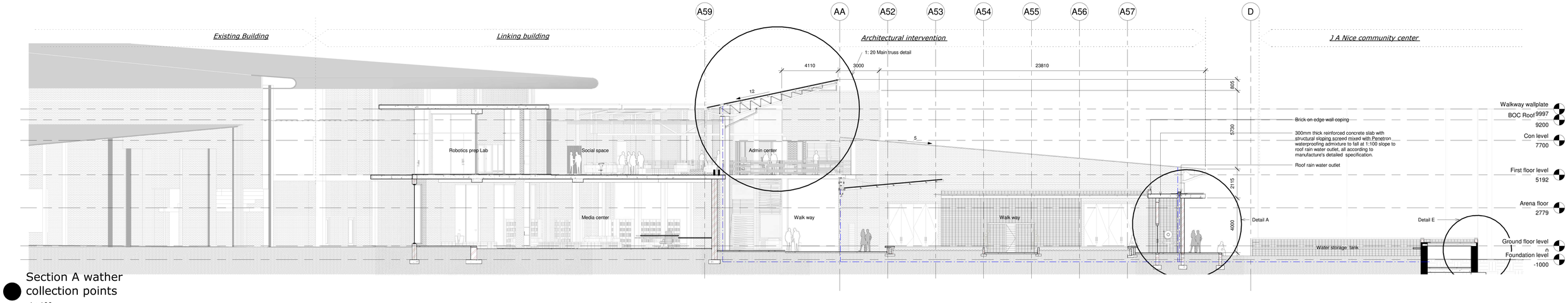
Wall B

C-First floor level

1 : 100

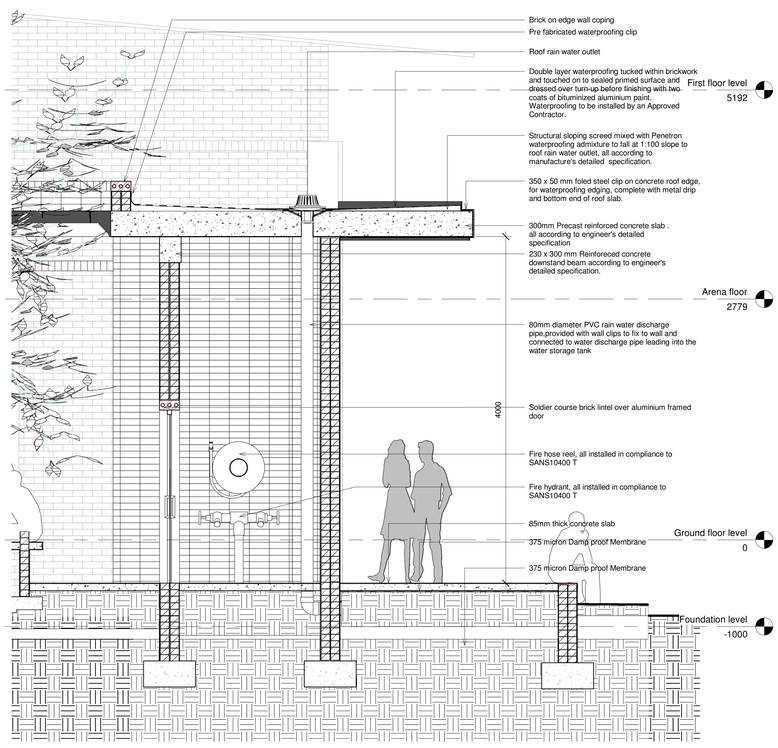
N


Stack ventilation point for seminar hall
Mono pitch roof above to allow for hot air to escape
Open stairway to allow cool air to circulate into floor area
Rain water collection From roof above into collection pipe route on ground floor
Wall C
Wall B
7077
280
2795
230
1200
280
3975
230
3975
230
1980
115
3450
280
115
2115
115
2100
115
650
280
3201
115
3201
280
1
2
3
4
5
6
7
8
1 : Ventilation duct
2 : Walkway
3 : Consultation A
4 : Consultation B
5 : Exam Media room
6 : Storage
7 : Exam room A
8 : Exam room B
KEYS
Structural beam above
Concrete Floor below
Steel work above
Roof sheeting above
Void
Rain water collection pipe and routes
Cool air collection points (passive strategy)
C-Consultation floor level
1 : 100
N



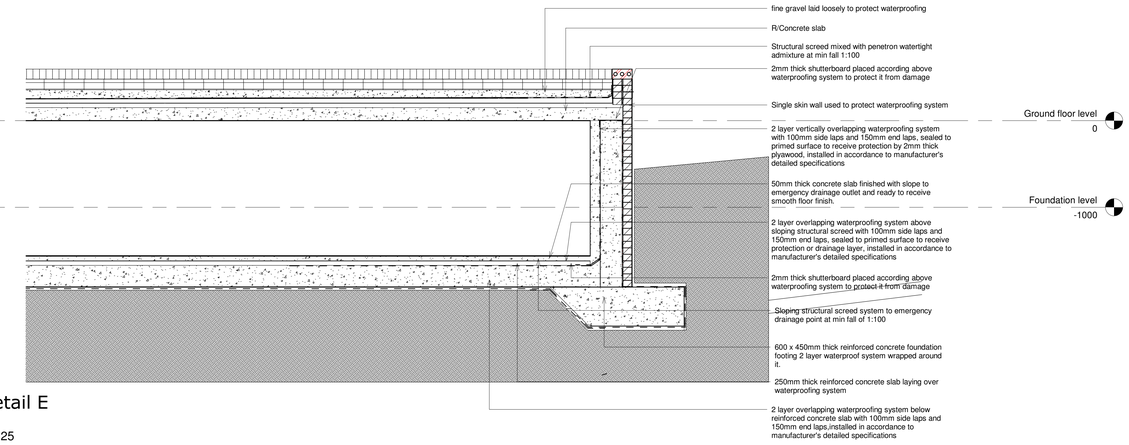
Section A wather collection points

1 : 100



Detail A

1 : 25



Detail E

1 : 25

AREA CALCULATIONS

Catchment	Area, A (m²)	Runoff Coefficient, C	Coverg(mixed)
Roof	1139	0,85	0,85
Paving	39	0,8	0,80
TOTAL	1178		0,85

RAINWATER YIELD

Month	Ave. rainfall, P (m)	Yield (m³) Yield = P*A*C	Yield (m³) Yield = P*A*C(mixed)
January	0,038	38,0164	38,0164
February	0,075	187,0375	187,0375
March	0,076	227,5545	227,5545
April	0,061	212,9815	212,9815
May	0,013	66,6865	66,6865
June	0,007	50,5155	50,5155
July	0,003	13,0815	13,0815
August	0,006	26,163	26,163
sr	0,022	95,931	95,931
October	0,071	309,5991	309,5991
r	0,096	417,329	417,329
r	0,11	479,856	479,856
ANNUAL AVE.	0,678	2938,977	2938,977

ALT SOURCE

Month	Source 1 (m³/month) 1
January	0
February	0
March	0
April	0
May	0
June	0
July	0
August	0
September	0
October	0
November	0
December	0
ANNUAL AVE.	49

TOTAL YIELD

Month	Total Yield (m³/month)
January	596,028
February	331,0375
March	360,6545
April	226,9815
May	61,6865
June	36,5155
July	19,0815
August	32,163
sr	99,931
October	314,5991
r	430,329
r	479,856
ANNUAL TOTAL	2987,977

IRRIGATION DEMAND

Month	Planting area (m²)	Irr. depth / week (m)	Irr. depth / month (m)	Irrigation demand (m³/month)
January	600	0,05	0,2	120
February	450	0,05	0,2	180
March	600	0,05	0,2	120
April	450	0,05	0,15	90
May	600	0,05	0,1	60
June	450	0,05	0,1	60
July	600	0,05	0,1	60
August	450	0,05	0,15	90
September	600	0,05	0,2	120
October	450	0,05	0,3	180
November	600	0,05	0,3	180
December	450	0,05	0,3	180
			ANNUAL TOTAL	1500

ALT DEMAND

Month	Entity (Persons?)	Entity (demand/ day?)	Alt demand (m³/month)
January	300	13	320,9
February	300	15	359
March	300	8	718
April	300	15	359
May	300	15	379,5
June	300	7	63
July	300	7	65,1
August	300	15	379,5
September	300	8	72
October	300	15	379,5
November	300	8	72
December	300	15	379,5
		ANNUAL TOTAL	1307,8

TOTAL DEMAND

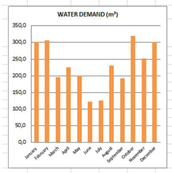
Month	Total demand (m³/month)
January	320,9
February	306,0
March	156,0
April	225,0
May	199,5
June	123,0
July	125,1
August	229,5
sr	192,0
October	319,5
r	252,0
r	300,9
ANNUAL TOTAL	2767,8

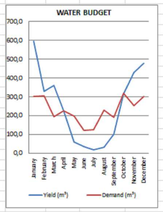
WATER BUDGET

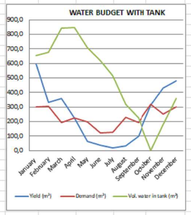
Month	Yield (m³)	Demand (m³)	Monthly balance
January	596,0	300,9	295,1
February	331,0	306,0	25,0
March	360,6	194,4	166,2
April	226,4	225,0	1,4
May	61,7	199,5	-137,8
June	36,5	123,0	-86,5
July	19,1	125,1	-106,0
August	32,2	229,5	-197,3
September	99,9	192,0	-92,1
October	314,6	319,5	-4,9
November	430,3	252,0	178,3
December	479,7	300,9	178,8
ANNUAL AVE.	2987,98	2767,8	

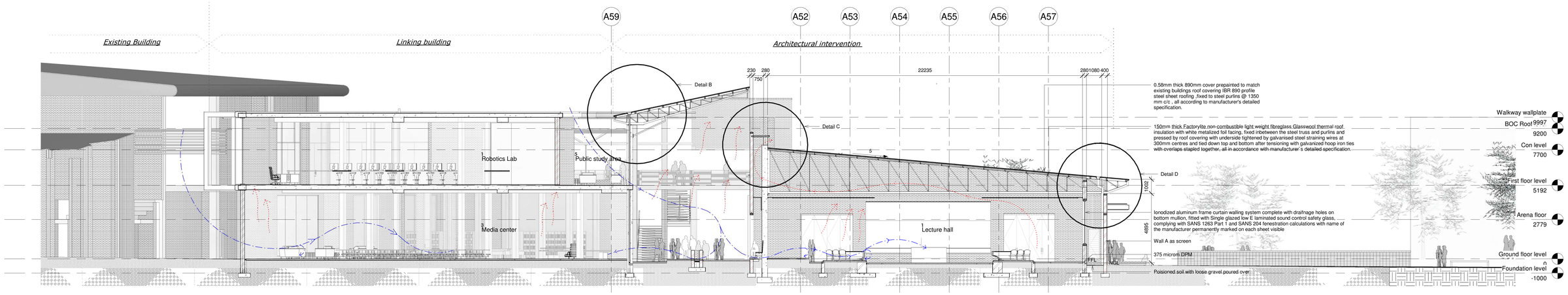
WATER BUDGET (ACCUMULATIVE)

Month	Yield (m³)	Demand (m³)	Monthly balance	Vol. water in tank (m³)
January	596,0	300,9	295,1	652,2
February	331,0	306,0	25,0	677,2
March	360,6	194,4	166,2	843,4
April	226,4	225,0	1,4	844,8
May	61,7	199,5	-137,8	707,0
June	36,5	123,0	-86,5	620,5
July	19,1	125,1	-106,0	514,5
August	32,2	229,5	-197,3	317,2
sr	99,9	192,0	-92,1	225,1
October	314,6	319,5	-4,9	0,0
r	430,3	252,0	178,3	178,3
r	479,7	300,9	178,8	357,1
ANNUAL AVE.	2987,977	2767,8		



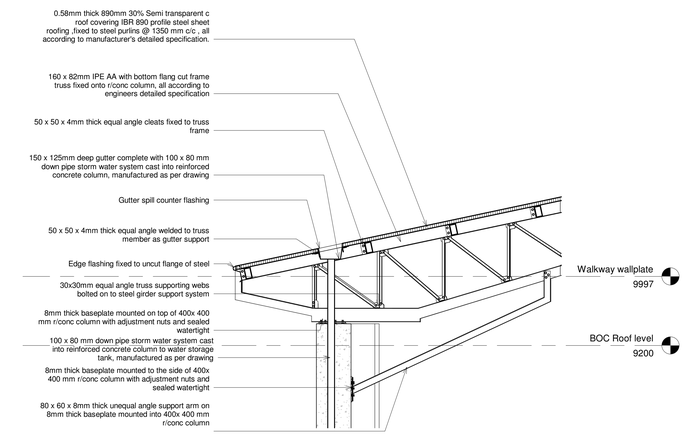






Section B Tech

1 : 100



Detail B

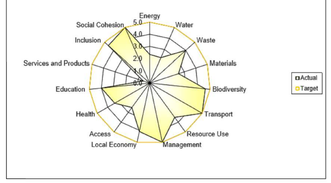
1 : 25

SUSTAINABLE BUILDING ASSESSMENT TOOL RESIDENTIAL

1.04

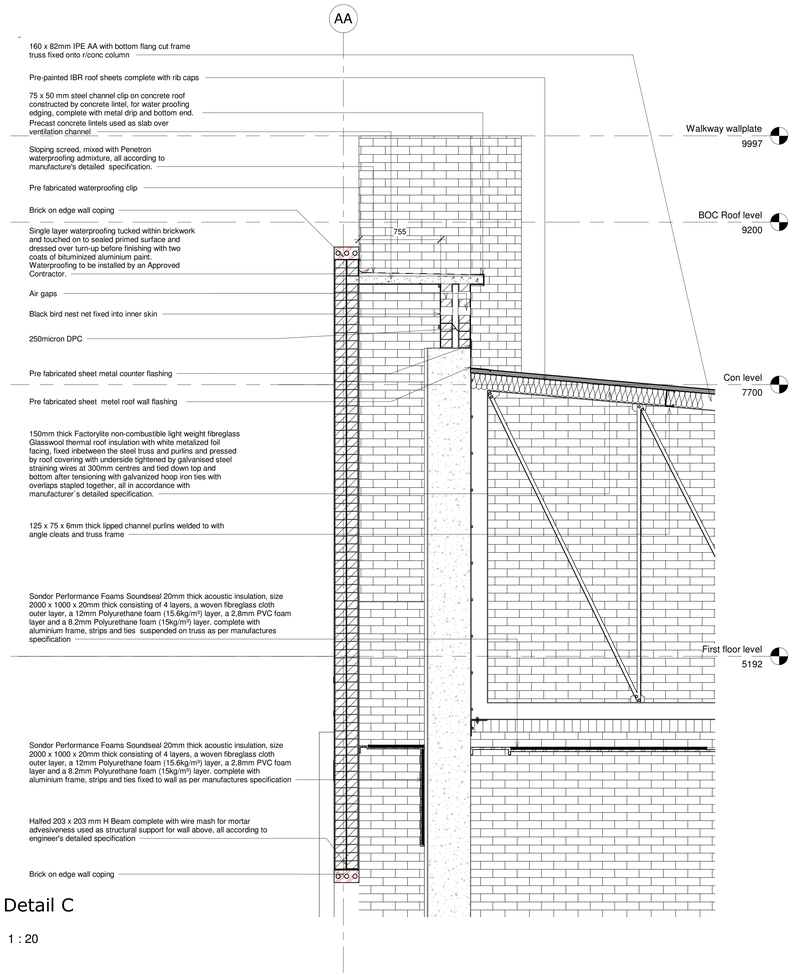
Achieved

SB SBAT REPORT	3.6
SB1 Project	
SB2 Address	0
SB3 SBAT Graph	0



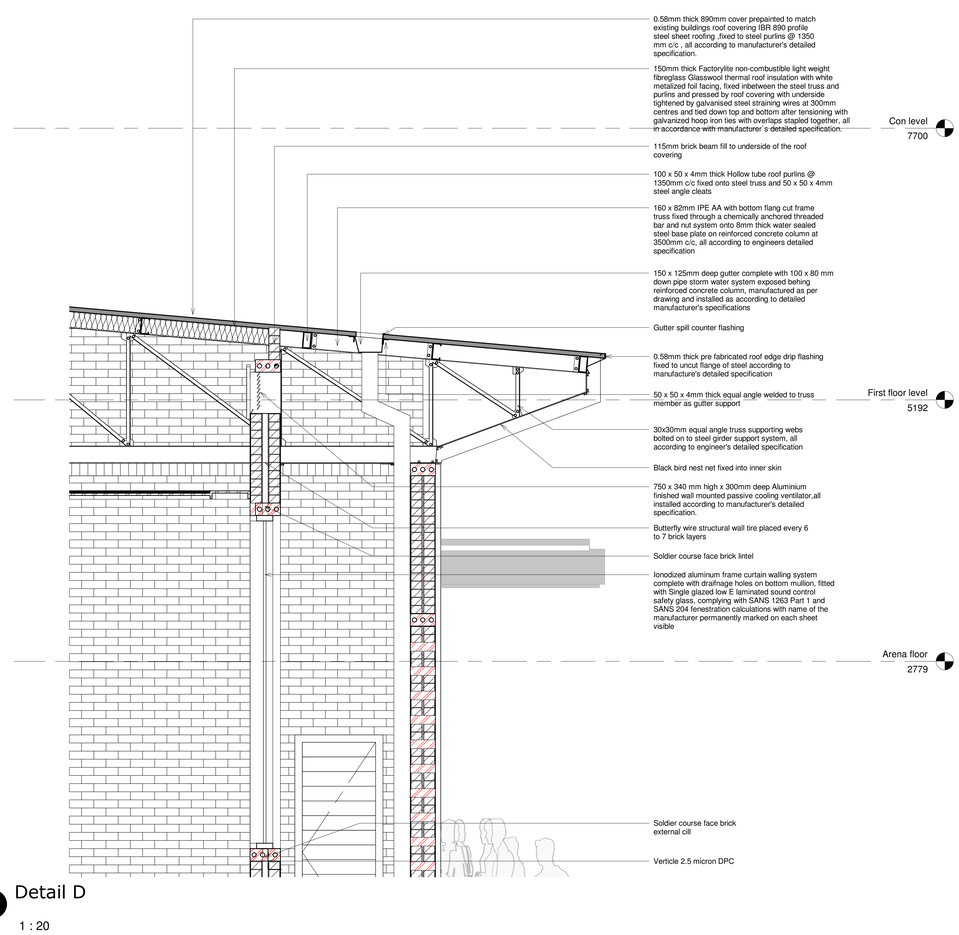
SB4 Environmental, Social and Economic Performance	Score
Environmental	3.1
Economic	4.0
Social	3.5
SBAT Rating	3.6

SB5 EF and HDI Factors	Score
EF Factor	3.2
HDI Factor	4.0



Detail C

1 : 20



Detail D

1 : 20

0.58mm thick 890mm 30% Semi transparent c roof covering IBR 890 profile steel sheet roofing ,fixed to steel purlins @ 1350 mm c/c , all according to manufacturer's detailed specification.

160 x 82mm IPE AA with bottom flang cut frame truss fixed onto r/conc column, all according to engineers detailed specification

50 x 50 x 4mm thick equal angle cleats fixed to truss frame

150 x 125mm deep gutter complete with 100 x 80 mm down pipe storm water system cast into reinforced concrete column, manufactured as per drawing

Gutter spill counter flashing

50 x 50 x 4mm thick equal angle welded to truss member as gutter support

Edge flashing fixed to uncut flange of steel

8mm thick baseplate mounted on top of 400x 400 mm r/conc column with adjustment nuts and sealed watertight

30x30mm equal angle truss supporting webs bolted on to steel girder support system

8mm thick baseplate mounted to the side of 400x 400 mm r/conc column with adjustment nuts and sealed watertight

100 x 80 mm down pipe storm water system cast into reinforced concrete column to water storage tank, manufactured as per drawing

80 x 60 x 8mm thick unequal angle support arm on 8mm thick baseplate mounted into 400x 400 mm r/conc column

300mm thick reinforced concrete roof with structural screed mixed with penetron waterproofing admixture, sloping to floor drain outlets at planter. top surface ready to recieve smooth floor finish, all according to engineer's detailed specification

300 x 400 mm deep reinforced concrete structural beam constructed into slab, all according to the engineer's detailed specification.

Construction joint between concrete floor and concrete column

250 micron damp proof membrane underneath slab

20MPA 85MM thick concrete slab on DPM, in accordance to engineer's detailed specification

93 % density mod aashto compected earth fill in layers not exceeding 150mm

9550

12

17.00°

2635

625

795

2300

Walkway wallplate
9997

BOC Roof level
9200

First floor level
5192

Arena floor
2779

Ground floor level
0

Foundation level
-1000

Main truss

1 : 20

SECTIONS
ELEVATIONS
VIEWS

SECTIONS
ELEVATIONS
VIEWS