

Photography Arts Centre

An Architectural Exploration of Place and Identity in Bloemfontein

Kodzo Daniel Dzansi

Acknowledgements

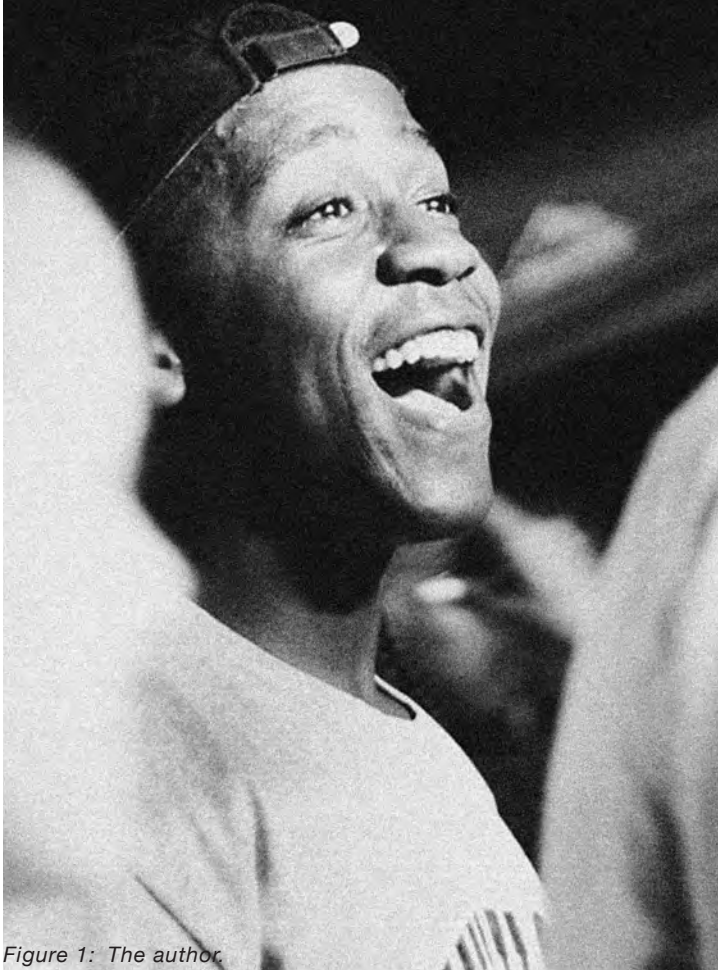


Figure 1: The author.

Signature:

Name:

Kodzo Daniel Dzansi

Student no.:

2012048068

My creator and source of strength, God, for blessing me with the will and gifts to overcome and conquer all adversities.

My Parents, Dennis and Lineo, for their sacrifice and support.

My sisters, Josephine and Mpho, for their love and encouragement.

Professor Jan Smit, Petra Smit, Zack Wessels, Anne-Marie Wagener, and all involved lecturers for their expert advice and guidance throughout the year.

The Masters class of 2019.

“Chance favours only the prepared mind.”

Louis Pasteur

A dissertation submitted as partial fulfilment of the requirements of the Master’s in Architecture, University of the Free State, 2019.

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1. I understand what plagiarism entails and am aware of the University’s policy in this regard.
2. I declare that this assignment is my own, original work. Where someone else’s work was used due acknowledgement was given and reference was made according to departmental requirements.
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Preamble

This dissertation explores the transformation of a non-place into a place by developing an identity in an architectural intervention with the aid of its context. It proposes a photography training centre in the central part of Bloemfontein rich in urban diversity. The aim of this photographic facility is to design a meaningful place of learning and activity by including and expanding upon the context's urban fabric and making it a part of the site's new identity.

The client is an emerging small business by the name of DYD and Sons Pty Limited. This company believes that it could leverage on a collaborative effort between it and the Central University of Technology's (CUT) Department of Design and Studio Art, Bloemfontein Camera Club and the College of Digital Photography to develop a non-linear model of learning the art of photography in the urban fabric of the centre of Bloemfontein.

The dissertation is split into four main parts. The study first recognises the problems and aims associated with the project in terms of typology, topology, morphology and building tectonics. The second part communicates the theoretical, conceptual and precedent framework that informs the design's development. The third part is the exploration of the design process leading up to the proposed design resolution. Part four concludes the dissertation with a reflection on the design's successes and comments on the design process.

Keywords + phrases:

non-place
identity
urban activation
public life
context

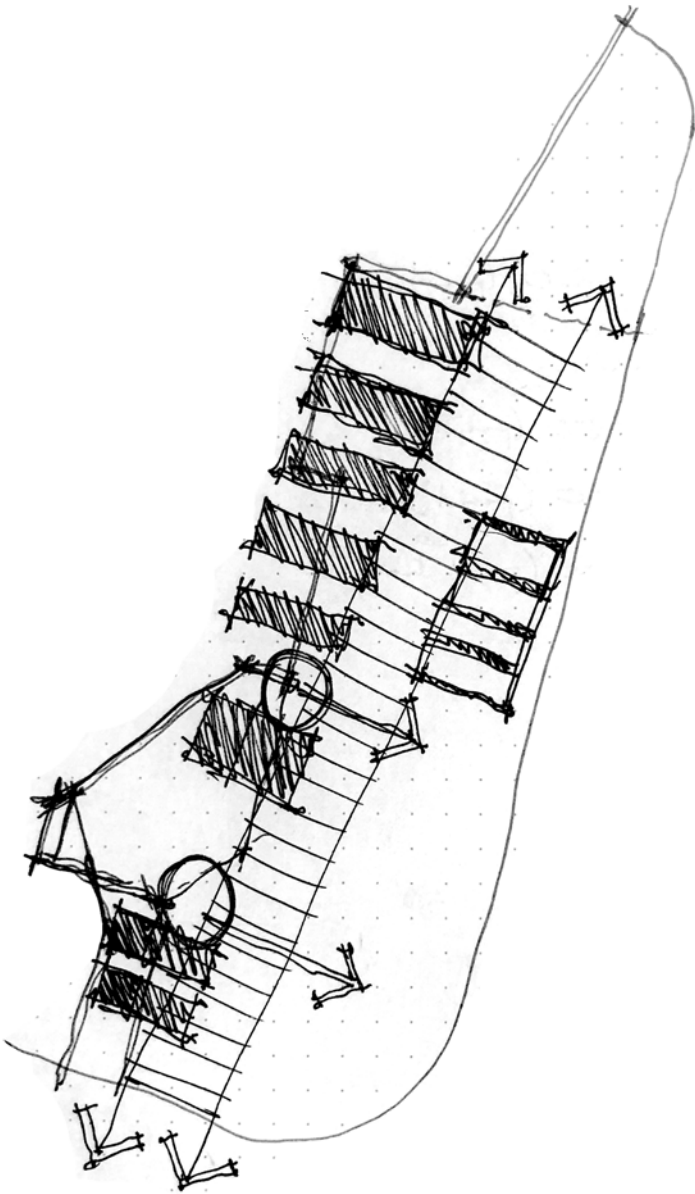


Figure 2: Conceptual sketch investigating spatial programming on the site.

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Introduction

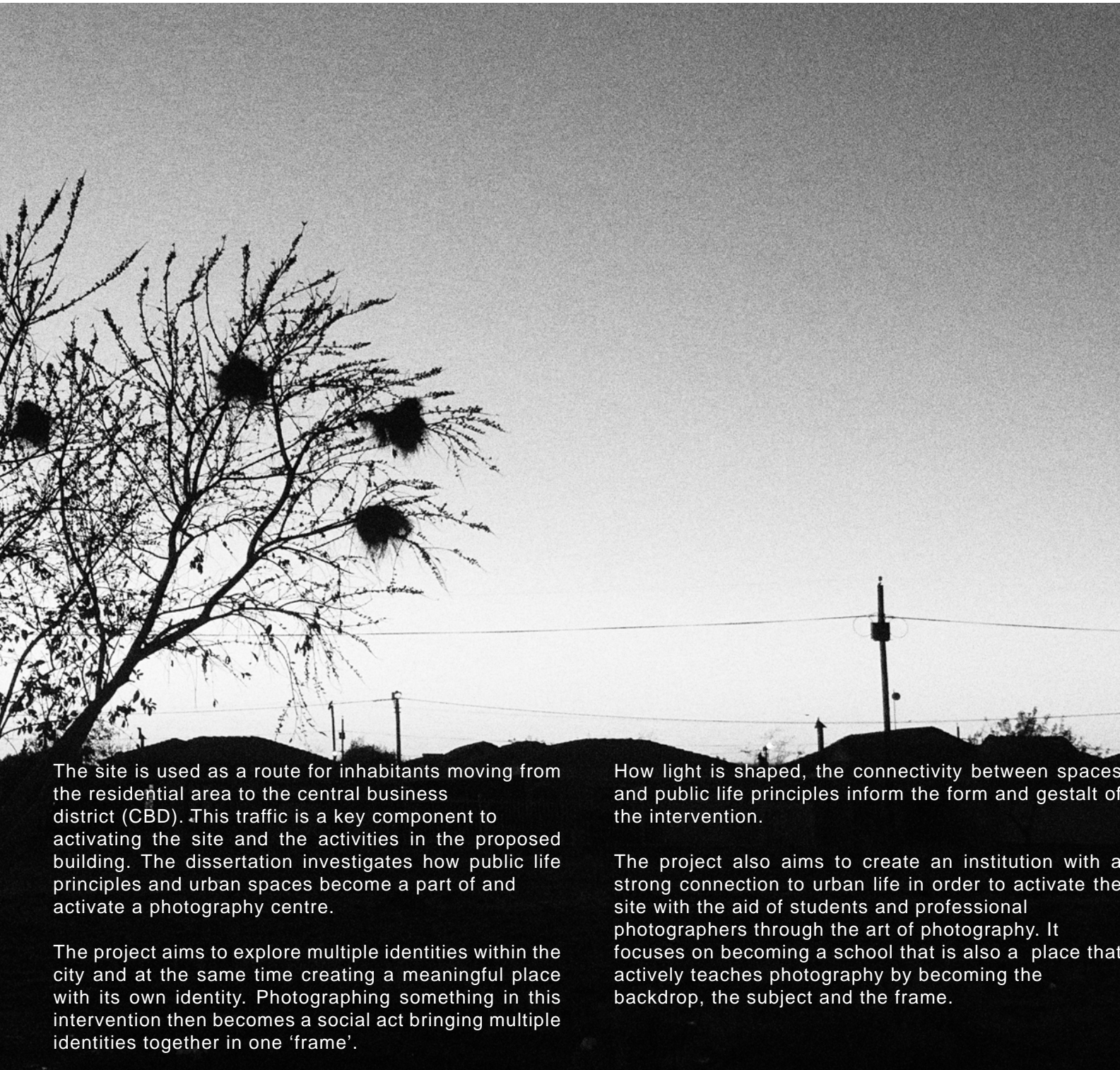
As Mehta, Scarborough and Armpriest (2017) allude to, while a site plays a major role in architectural design, the context informs how the architectural structure is situated, orientated and the ways in which it relates to and connects with the context.

The site for this architectural structure is located at the corner of Park Road and 1st Avenue in the central part of Bloemfontein. The context of the proposed site is home to a variety of place services - from liquor stores, to retail shops and internet cafe as well as residential units. The site is placeless and void of any recognizable service or identity. For any architectural piece to successfully become a part of the context it first needs to communicate an identity that fits into the context (Mehta, Scarborough and Armpriest 2017: 1). In other words, an architectural piece needs to be a structure that becomes a gathering point for the context's places by making them a part of it and it a part of the context. This intervention will make use of the existing identities in the context and combine them with the art of photography to respond to its specific context and the preferences of its owner, users, and occupants in accordance with Mehta, Scarborough and Armpriest (2017: 1).

It is important to first analyse the context and its identities in order to understand what they provide to the inhabitants (Boussaa, 2017). This analysis informs the type of space that would connect these identities to each other and the building. The site's lack of placeness and identity prompts the exploration of an institution like intervention without a linear model for skills development in the city.



Figure 3: The weaver bird's nest in a residential place.



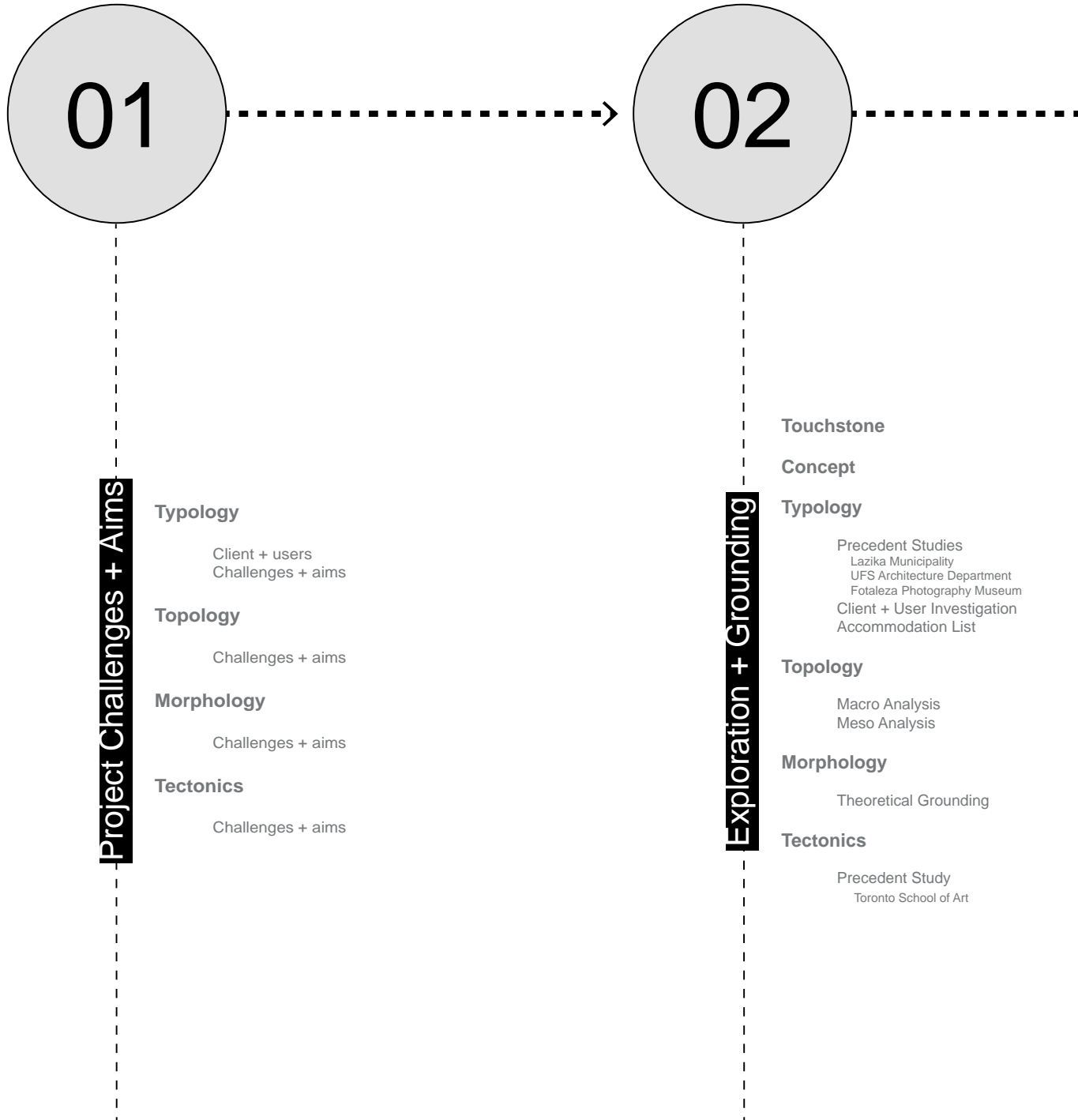
The site is used as a route for inhabitants moving from the residential area to the central business district (CBD). This traffic is a key component to activating the site and the activities in the proposed building. The dissertation investigates how public life principles and urban spaces become a part of and activate a photography centre.

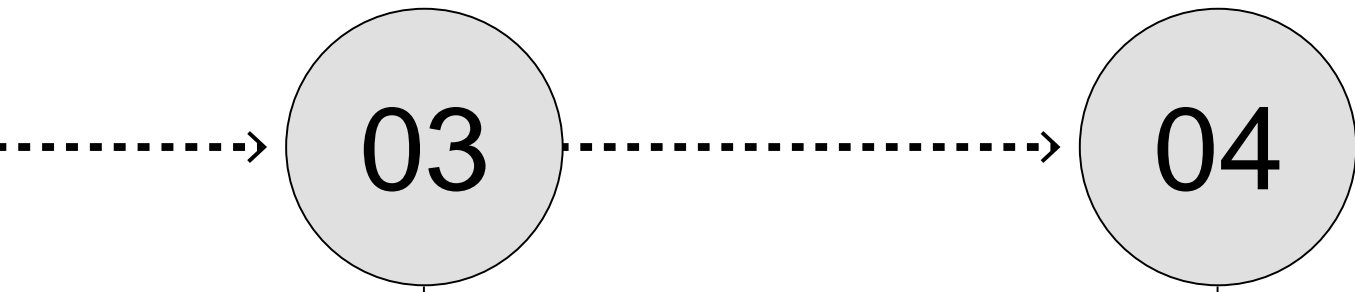
The project aims to explore multiple identities within the city and at the same time creating a meaningful place with its own identity. Photographing something in this intervention then becomes a social act bringing multiple identities together in one 'frame'.

How light is shaped, the connectivity between spaces and public life principles inform the form and gestalt of the intervention.

The project also aims to create an institution with a strong connection to urban life in order to activate the site with the aid of students and professional photographers through the art of photography. It focuses on becoming a school that is also a place that actively teaches photography by becoming the backdrop, the subject and the frame.

Document Framework





03

04

Design + Technical Thesis

- Design Development**
 - Design Development #
- Final Design**
- Technical Report**
- Tectological Precedent**
 - Precedent Study
 - Toronto School of Art

Reflection

- Reflection**
- Conclusion**
- References**
- Addendums**

Research Methodology

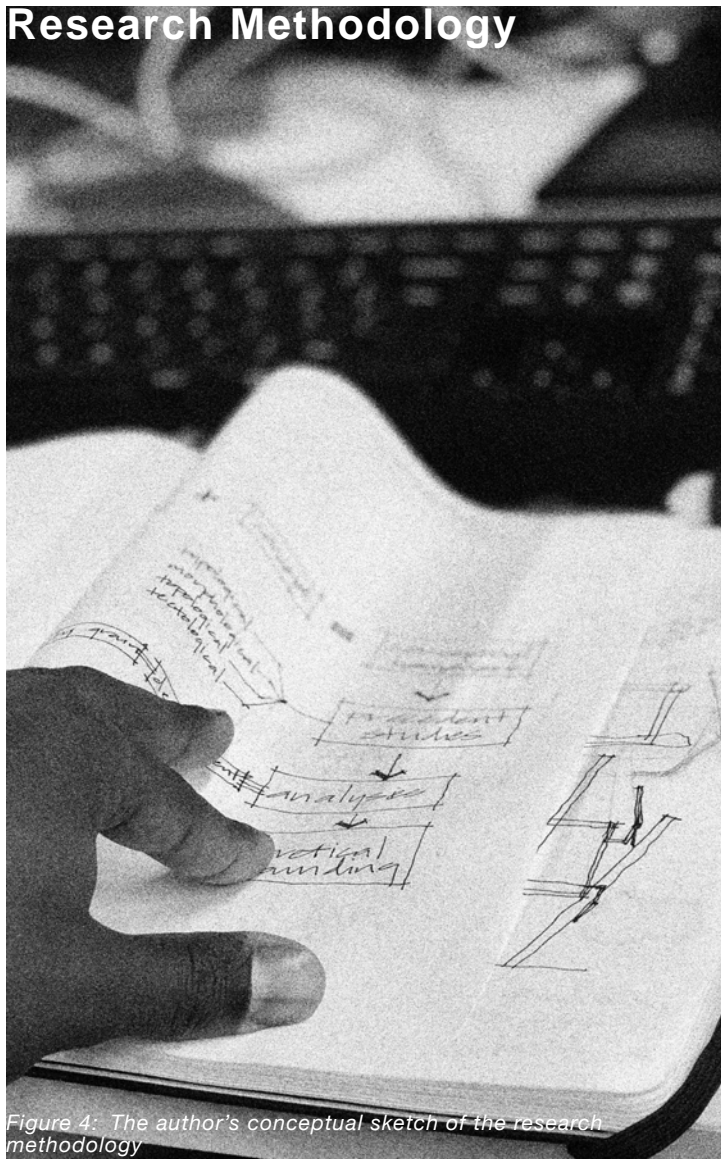


Figure 4: The author's conceptual sketch of the research methodology

The research methodology is informed by the exploration of the four core challenges of the design which are: (i) What is the design? (ii) Who is the design for? (iii) What is the context of the design like? And (iv) How will the design be put together? The location of the design is especially important as it relies on the influence of the context to generate an appropriate architectural response to the needs of the design.

The **touchstone** is an abstract representation of the essence of the design concept. It serves as a test for the design from the concept to the final design development.

The **concept** is the core element that critically influences every decision in the pursuit of the resolved design. The **conceptual framework** follows the exploration of the final conceptual approach developed from the touchstone with applicable precedent studies. The precedent studies also inform the supporting design tectonics.

The analysed precedent studies are as follows:

- Fortaleza Photography Museum - Marcus Novais Arquitetura
- MARCH & British - PANACOM
- Storefront for Art and Architecture - Steven Holl
- Ubuntu Centre - Field Architecture
- Ontario College of Art and Design - Morphosis Architects

The macro, meso and micro analyses compiles both quantitative and qualitative information to gather an acute sense of the **site and context**. These factors form critical parts of the design's decision making processes.

The **theoretical grounding** supports the design through the following writings:

- Edward Casey - The Fate of Place: A Philosophical History
- Åshild Hauge - Identity and Place: A Critical Comparison of Three Identity Theories
- Edward Relph - Place and Placelessness
- Gunnar Sandin - Dealing with Non-place in exploitation, belonging and drifting
- Zohreh Torabi & Sara Brahman - Effective Factors in Shaping the Identity of

01

Challenges & Aims

This chapter of the dissertation investigates the challenges involved with the typology of a photography facility. The challenges inform the solutions which the project aims to resolve.

The typological challenges address programmatic and functionality issues as well as the complexity of the clientele users. The connection of the intervention to the site is also investigated as it forms part of the functionality challenges.

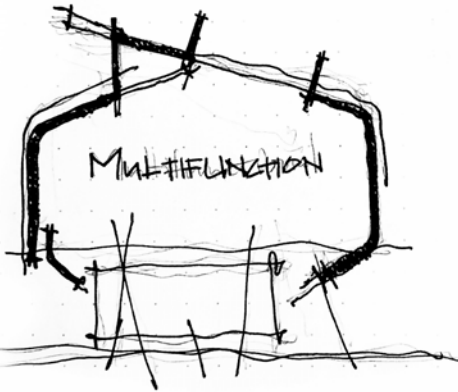
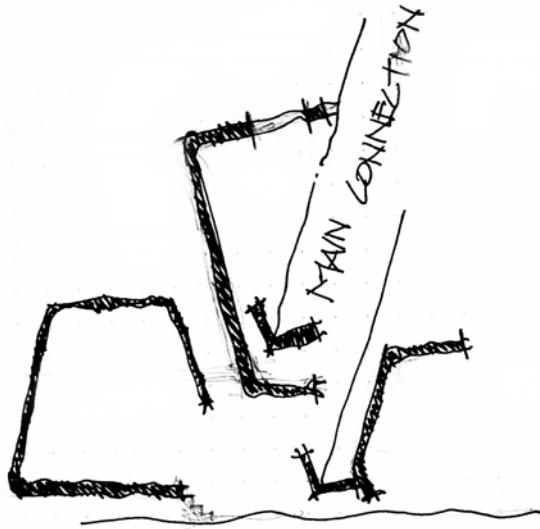
The topological challenges arise from the site conditions and characteristics. The aims then resolve any issues and take advantage of any special opportunities the site offers.

The morphology of the design bridges the functionality of the typological aims with the characteristics of the topological aims whilst staying true to the design concept.

The tectological challenges are, however, informed by the technical aims of the concept. The main challenge came from achieving the structure whilst maintaining the design integrity.

The investigation of the challenges and the fulfilment of the aims of the typology, topology, morphology and tectonics is what develops the intervention's complexity and whilst focusing on its core elements whilst undergoing development.

Typology



The typology of the photography facility is a hybrid of institutional architecture and public spaces. This then led to the proposed an eclectic collection of spaces required for the intervention.

Client

- DYD & Sons PTY LTD

Users

- Photographers
- Videographers
- Graphic designers
- Students
- Pedestrians

Challenges

- The typical institutional boundary formed by institutional typologies
- Safety and security of public spaces
- Involving and interactive urban spaces

Aims

- Photography and development studios
- Public spaces in the intervention
- Learning and lecturing spaces
- Porous and safe intervention boundary

Figure 6: Conceptual investigation of the project facilities.

Topology

The site for this architectural facility is located at the corner of Park Road and 1st Avenue, South of the Free State Stadium. The context is made up of residential sectors, retail, sporting and educational.

Challenges

- Maintaining the route usage of the site
- Parking and accessibility requirements according to SANS10400
- Connection between the intervention and Bloemfontein Swimming Pools

Aims

- Urban connection between the context and the intervention
- Activating the site's route in the intervention



Figure 7: Panorama of the project's site within its setting.

Morphology

The design proposes a new intervention to the site that contains characteristics of some of the functions on the site. Therefore, it is important that some of its aesthetic features convey the same message of “what’s current being a part of what’s new”.

Challenges

- Staying true to the context’s architectural language
- Unifying multiple typological spaces and their consequential aesthetics

Aims

- Juxtaposing Bloemfontein’s architectural language with aesthetic qualities not conventional to the context
- Connecting spaces segmented on a horizontal and vertical plane
- Accommodation of multiple services

Tectonics

Tectonics in architecture is the science or art of construction, both in relation to use and artistic design (Maulden, 1986: online). It is the exploration of how the technical response is influenced by the design’s aesthetic demands. The tectonics make sense of and resolve the intervention’s conceptual approach by the investigation of appropriate structural applications.

Challenges

- The use of slanted columns

Aims

- A economically and socially sustainable building, primarily making use of passive design principles
- Introducing a non-conventional tectological
- Approach to construction in the context

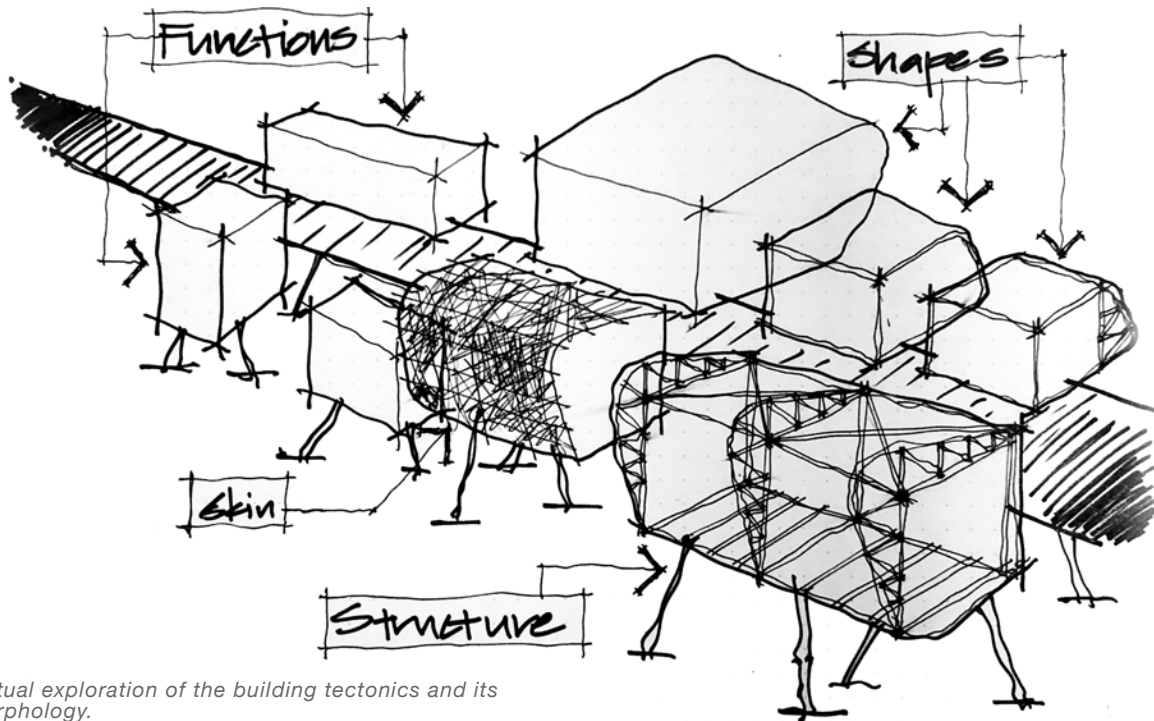


Figure 8: Conceptual exploration of the building tectonics and its relation to the morphology.

02

Investigation & Grounding

Part 02 | Investigation + Grounding

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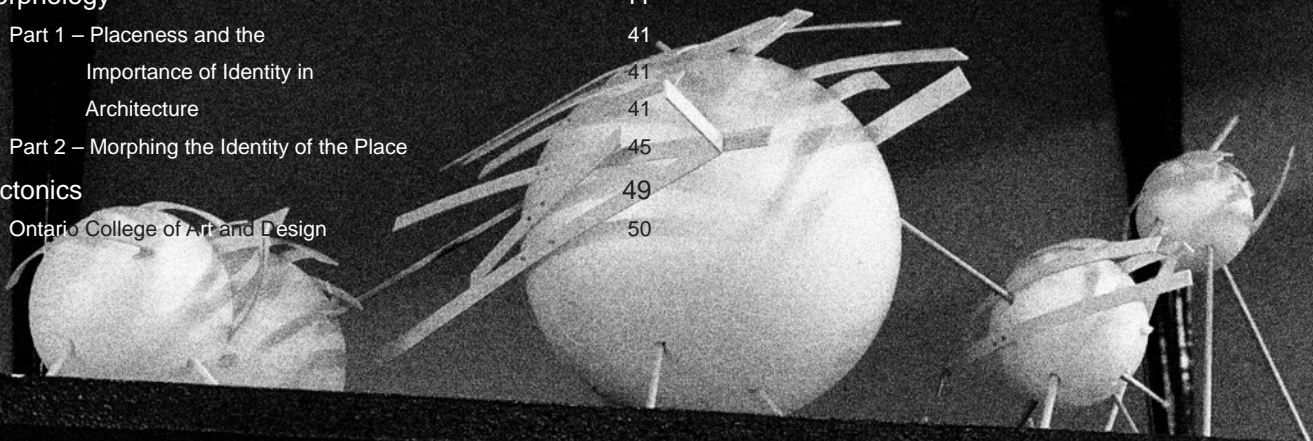


Figure 9: Alternate concept development model of the design.

The initial design stages of the design began with the development of conceptual and theoretical explorations of place and identity which informed the challenges and aims associated with the proposed building. The touchstone captures the essence and presents a phenomenological guiding tool for the design. It is the reference tool that will guide the success of the design.

The analysis of the site, users and clients informed the need of an intervention that used the context and the users to activate the spaces of the building in order to validate its place in the site. These factors informed multiple conceptual ideas and the development thereof based on the challenges and aims associated with this type of building. This developed a clear understanding of the typology, morphology and tectonics of the building.

Following the identification of the site, users and clients, and the types of spaces needed for this type of building is the investigation of the context. The cognitive and qualitative analysis investigates the direct implications of the site's features on the design of the project.

The morphology of the design is then concretized by the theoretical underpinning exploring the development of places and spaces in the urban context. All of the above investigations work together to refine the building throughout the design process to produce a successful photography school design in Bloemfontein.

Touchstone

The touchstone is the expressed intent of the phenomenological essence of the act practice of photography in the urban context. It embodies the challenges, aims and ideals of the project and renders a lens for further development of the design.

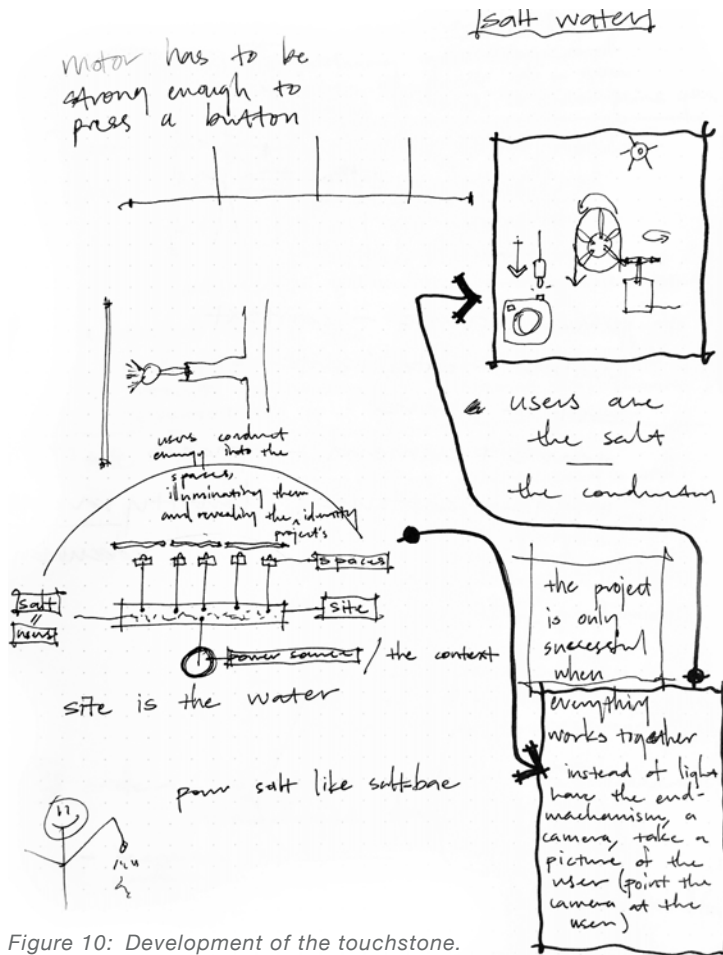


Figure 10: Development of the touchstone.

The concept sketches explore the thought process behind the different aspects of the project embodied in the idea of the touchstone. At heart the touchstone explores the idea of activating spaces using a

conductive route.

The still water represents the site as a barren and motionless thing. The user is represented by the salt that will be added to the water to form a complete conductor. The salt and the water conduct the electricity from the power source, which represents the site, to the gear motor. This connectivity and flow of energy activate the gears and cameras that represent the spaces of the building to finally capture an image that reveals the user's involvement in forming the identity of the project.



Figure 11: Salt (the pedestrian) as the catalyst for activating the design.

Concept

Following the design of the touchstone and its phenomenological essence is the exploration of conceptual ideas that inform part of the building form's development. Three conceptual ideas are represented in sketch and physical models to capture the essence of the design and its place on the site.

Ultimately one concept is further developed by considering the functional and spatial mass implications of the project on the site, as well as its structural and aesthetic qualities.

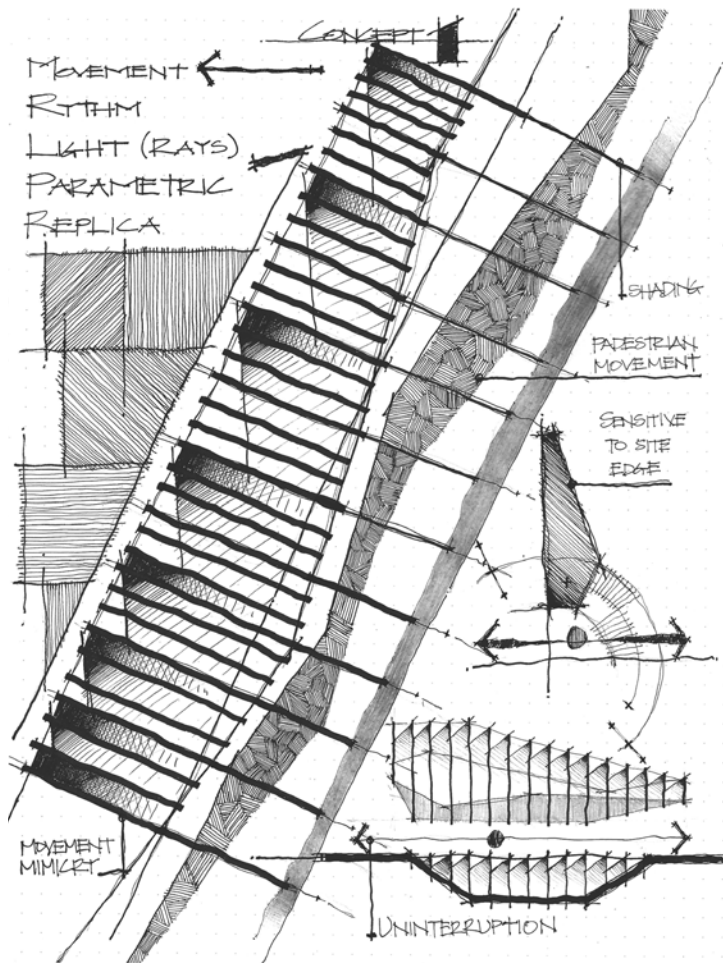


Figure 12: Capturing the essence of a being that moves in between spaces and potentially activating them.

Movement

Keywords:

rhythm, light, parametric, replica



This concept explores the concept of mimicking the movement of the pedestrian via rhythm and repetition in architectural expression. The light is manipulated in a way that forms fluid shadows - taking the expression of movement from linear and static to organic and free flowing.

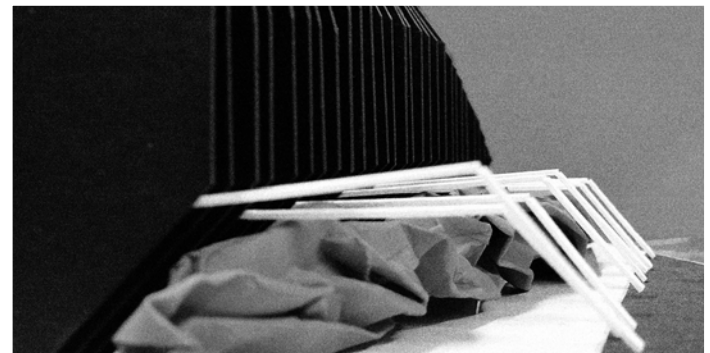
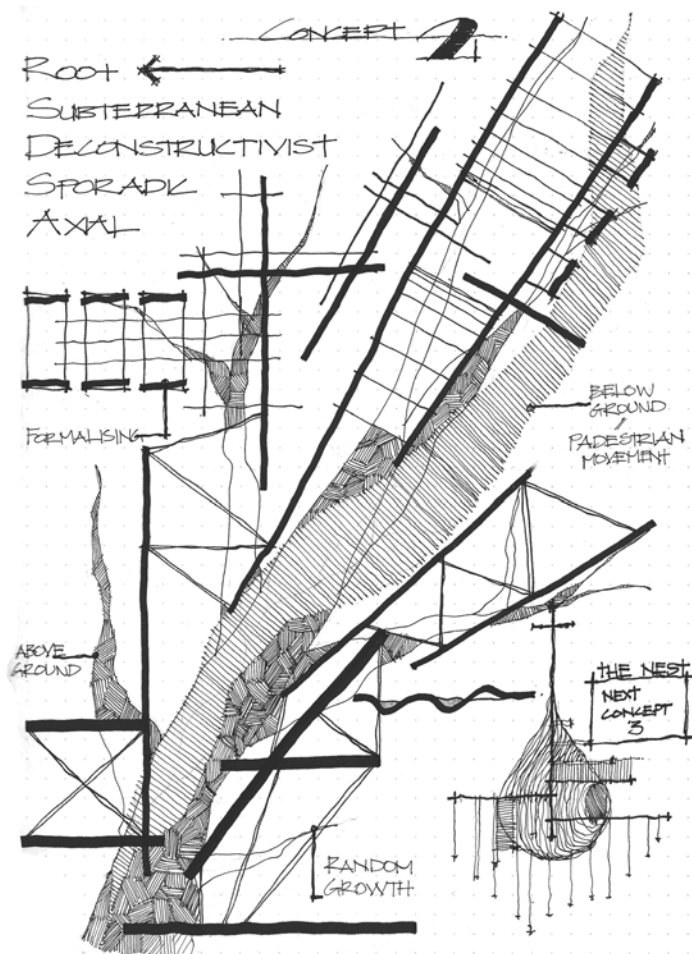


Figure 13: Diagrammatic sketch and concept model of the concept of light and movement activating a place.

Root

Keywords:

subterranean, deconstructivist, sporadic, axial



This concept explores a subterranean an approach to design, respecting the existing route with functions that are housed above and below ground. The idea is that the building is constructed around the pedestrian route like a funnel that channels water.

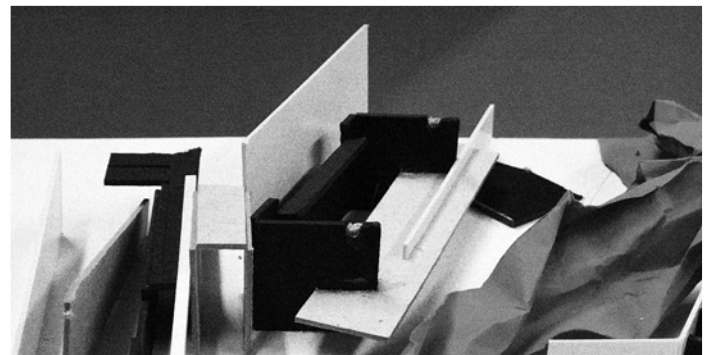
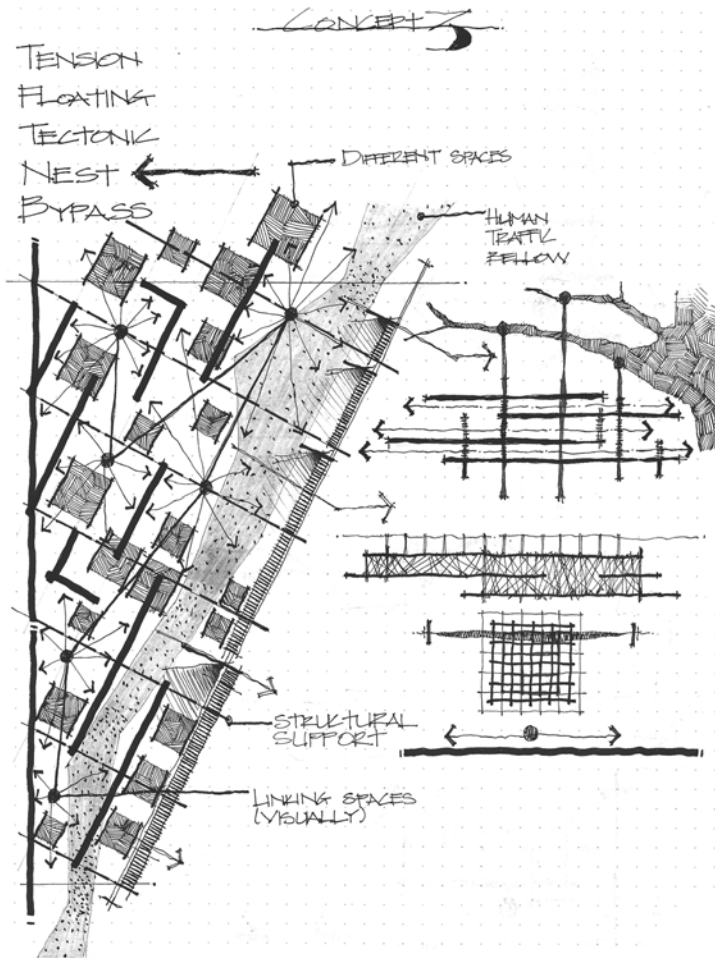


Figure 14: Diagrammatic sketch and concept model of spaces that become a part of the site by inhabiting the earth and the sky.

Nest

Keywords:

tension, floating, tectonic, bypass



This concept mimics the social weaver's nest's idea, separate nests that are built around each other to form a collective thing. The concept explores the housing of different functions in a suspended structure.

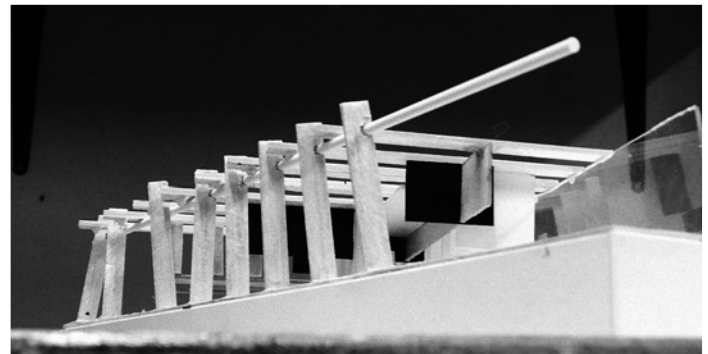
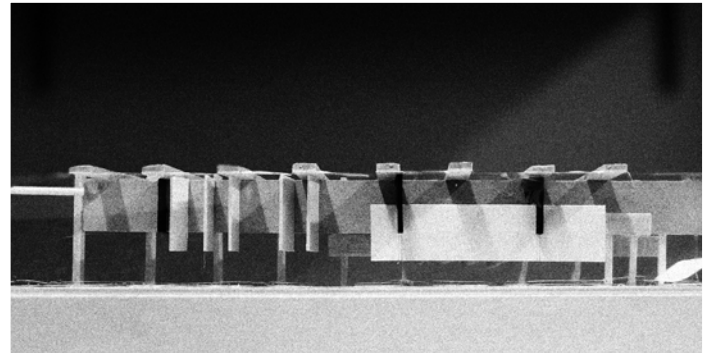
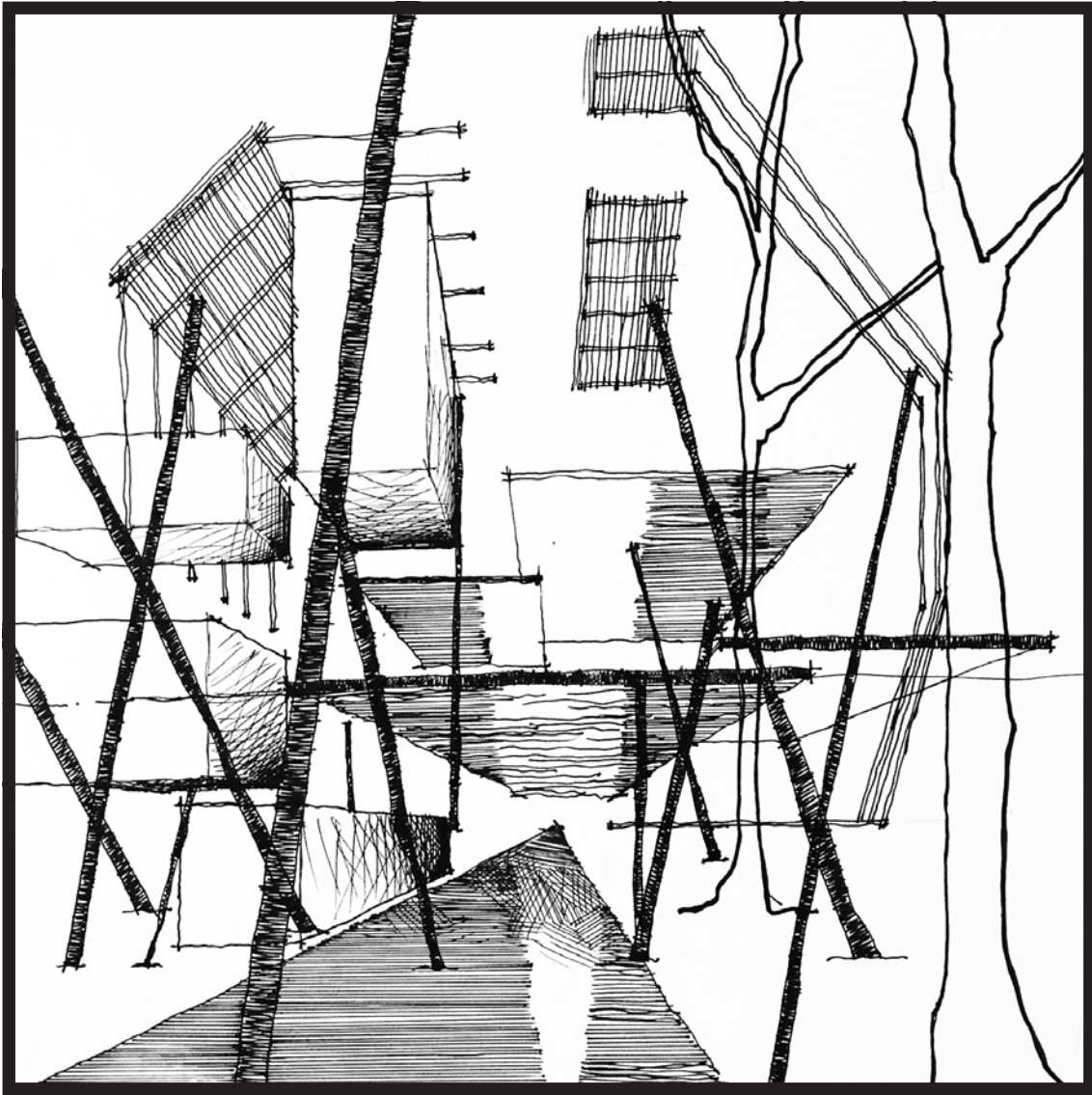


Figure 15: Diagrammatic sketch and concept model of the intervention making its place above and around a pedestrian route.



This sketch is an amalgamation of the best parts of the discussed concepts. The pedestrian route plays a very prominent role on multiple levels of the concept, connecting the different functions and services of the proposed design. The sketch also provides hints to the type of structural investigation the design explores with further development. This sketch aids in tracking the identity and aesthetics of the design from start to finish.

Figure 16: Diagrammatic sketch of multiple planes on different levels being activated by a single route.

Typology

The photography training centre is a place made of a typology that is a hybrid of institutional, public and urban. This prompts an investigation that forms an eclectic mix of buildings, interventions and spaces that inform the types of functions and spaces needed for the final project.

The following stills capture key elements and features forming the identity of the design's development.



Figure 17: The artist and his tool.

Fortaleza Photography Museum



Figure 18: The Fortaleza Photography Museum (Oliveira & Ribeiro, 2017: online).



Figure 19: Lecture space (Oliveira & Ribeiro, 2017: online).



Figure 20: Library space (Oliveira & Ribeiro, 2017: online).



Figure 21: Temporary exhibition space (Oliveira & Ribeiro, 2017: online).



Figure 22: Graffiti and mural wall (Oliveira & Ribeiro, 2017: online).

MARCH & British



Figure 23: The MARCH & British (Archdaily, 2013: online).



Figure 24: Lobby bar (Archdaily, 2013: online).



Figure 25: Kitchen loing (Archdaily, 2013: online).

Storefront for Art and Architecture

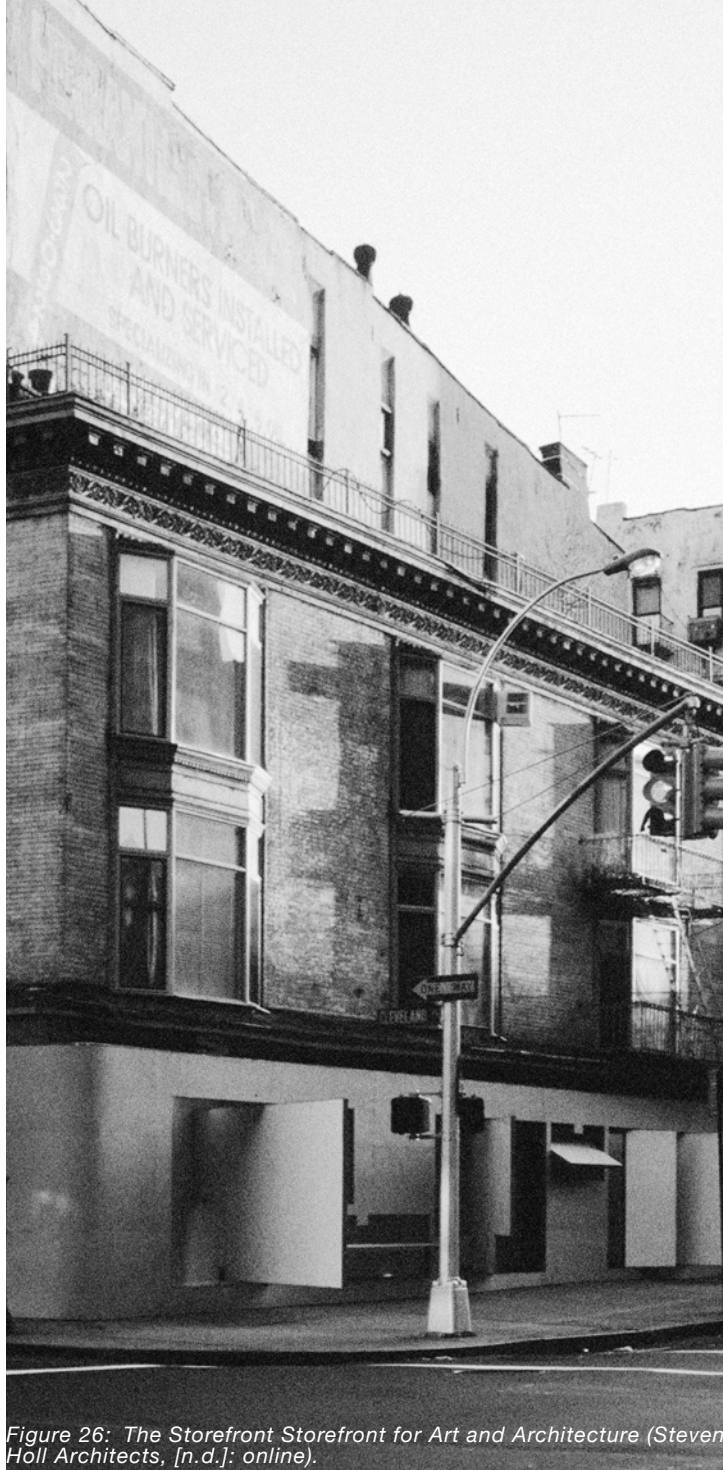


Figure 26: The Storefront Storefront for Art and Architecture (Steven Holl Architects, [n.d.]: online).



Figure 27: Open rotating panels at night (Steven Holl Architects [n.d.]: online).



Figure 28: Closed rotating panels during the day (Steven Holl Architects, [n.d.]: online).



Figure 29: Open rotating panels during the day (Steven Holl Architects, [n.d.]: online).

Marubi National Museum of Photography

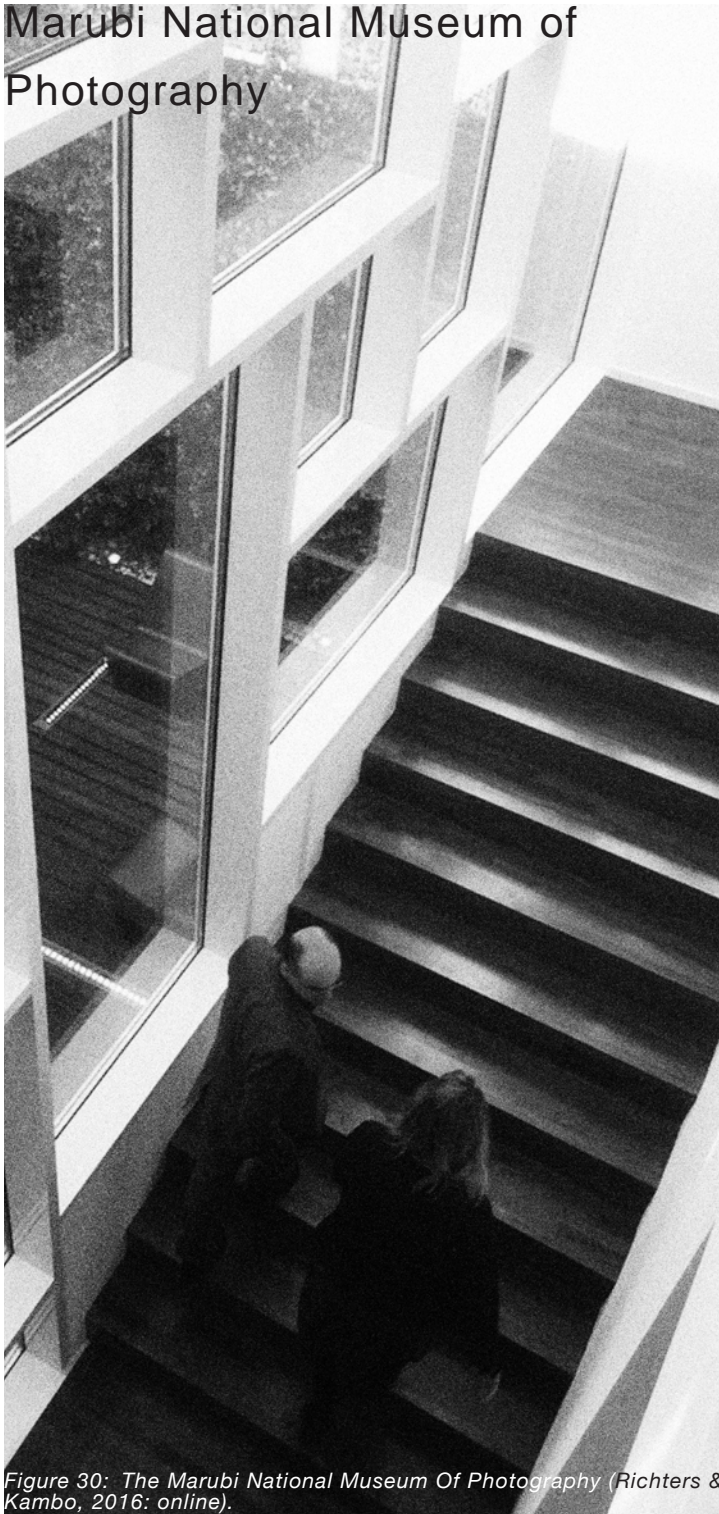


Figure 30: The Marubi National Museum Of Photography (Richters & Kambo, 2016: online).



Figure 31: Museum memory boxes exterior (Richters & Kambo, 2016: online).

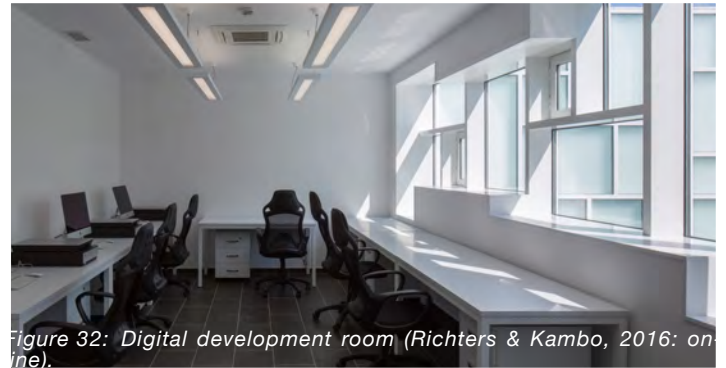


Figure 32: Digital development room (Richters & Kambo, 2016: online).

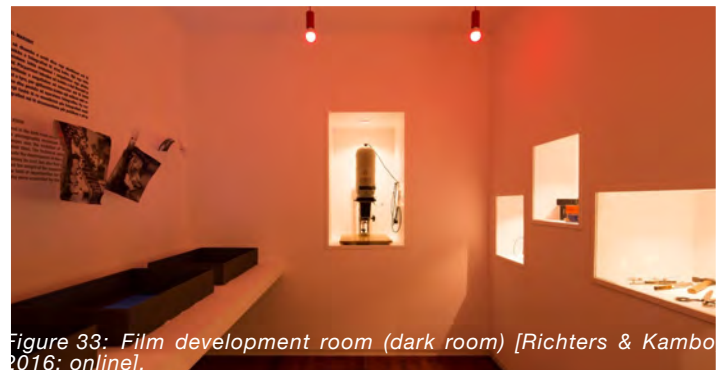


Figure 33: Film development room (dark room) [Richters & Kambo, 2016: online].



Figure 34: Museum artefacts (Richters & Kambo, 2016: online).

Topology

The proposed site was chosen based on the need to introduce an institutional setup that makes use of a public network connected to an eclectic mix of typologies in the city of Bloemfontein.

The site is in the student hub of the city, South of the Free State Stadium, where it is used as a pedestrian transport route for people walking from the primarily residential area of the context towards the CBD. The context comprises of residential, institutional, civic and entertainment places, making the site suitable for achieving the aims of the project.

The topology is analysed on a macro, meso and micro level, collecting relevant cognitive and qualitative information in relation to the site and context.

Macro site analysis

The map below is the layout of the prominent macro systems in Bloemfontein in relation to the city centre where the proposed building is situated.

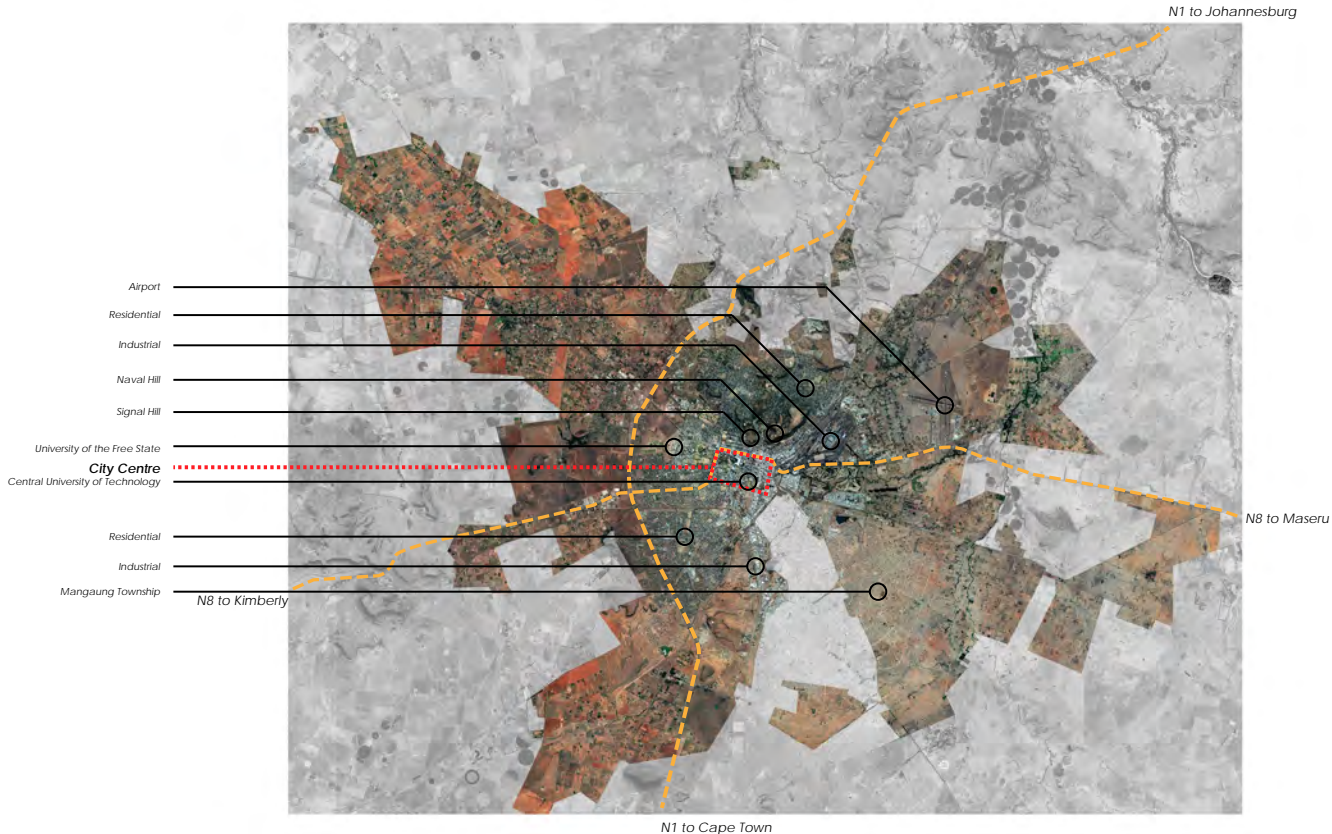
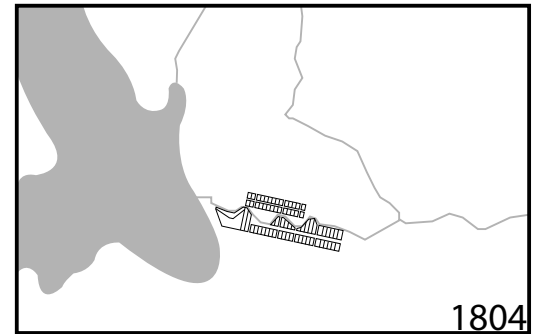


Figure 35: Macro systems map of Bloemfontein.



Historical development of the city

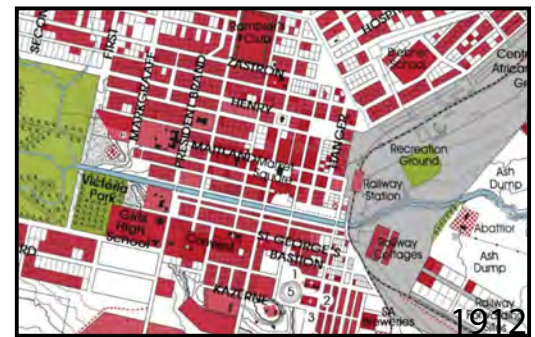
Bloemfontein, founded by Major Henry Douglas Warden in 1806, was chosen for its sustained water source with some of the best farms in the area (van der Westhuizen: 94). The town formed along the canal from west to east, with Bloemfontein becoming the inside.



In 1842 Captain H. D. Warden was ordered by the British government to find a suitable settlement area from which the English could govern the Transgariëp area (now called the Free State) [van der Westhuizen: 93]. Markgraaf formed in 1880, stopping at the canal. Park Road formed in 1904.



From 1902 to 1912 Bloemfontein witnessed a rapid growth in large land uses that served as catalysts for residential expansion: Tempe, Grey College, the horse racing course, King's Park, the asylum, the agricultural showgrounds, the National Women's Memorial site, Queen's Fort and the railway grounds to the east. Naval Hill and Signal Hill towards the north completed the new enclosure (Auret: 203-204).



1912 also saw the development of 1st Avenue (formerly Markgraaf), leading to the development Victoria Park and King's Park with the canal following a more linear path. By 2015 Victoria Park became the Park Road South African Police Services, with King's Park accommodating places such as the park itself, the Waterfront Mall and Bloemfontein Swimming Pools.



Figure 36: Historical development of the city maps traced by the author from Auret (2017: 197-209).



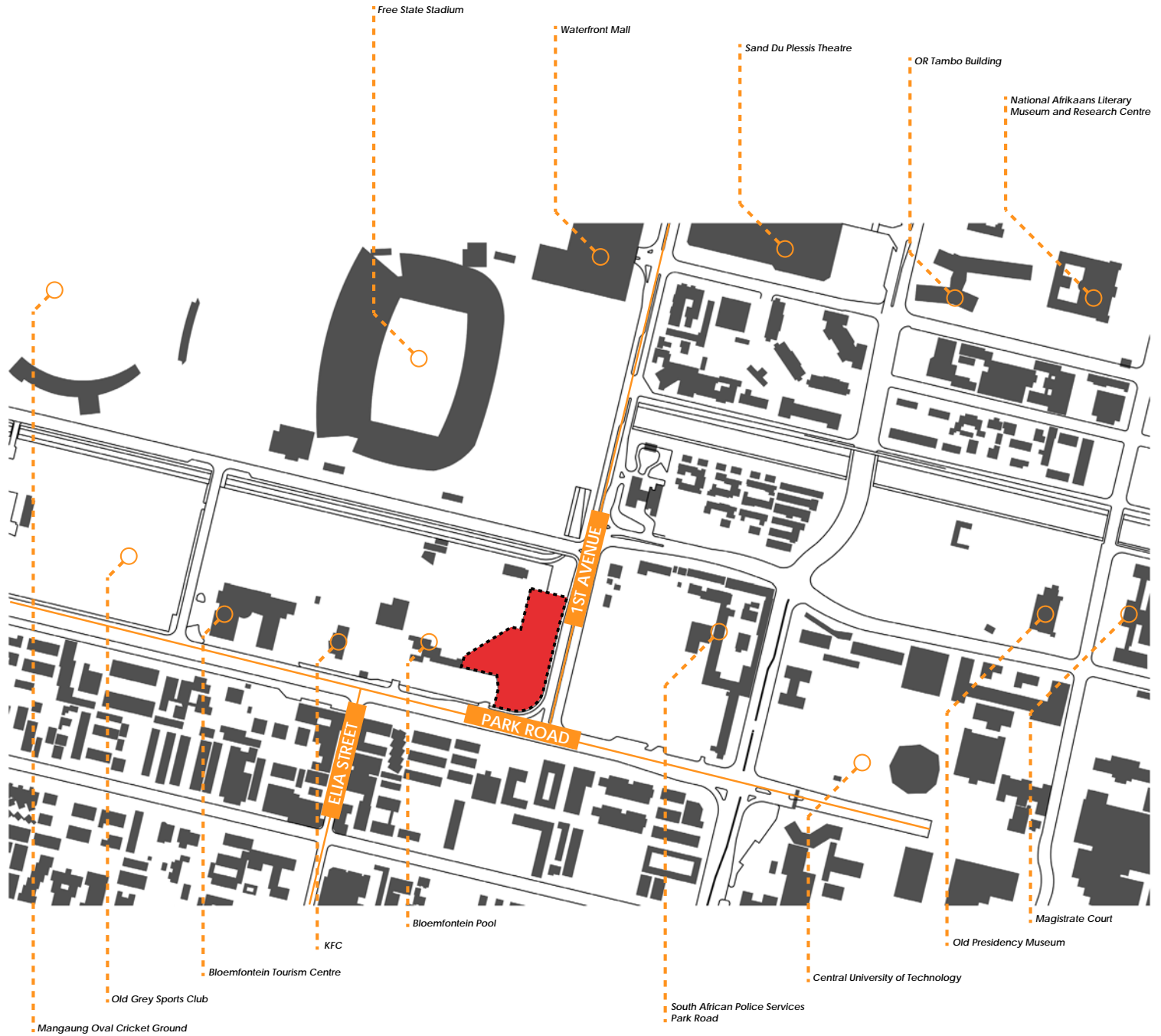


Figure 37: City grain of the context in relation to the site.



Meso site analysis

Officially, the site has no function or purpose. It is used as informal parking on days when the Free State Stadium has big home games. The existing places on the context are primarily residential and educational with the Central University of Technology to the east of the site. This results in a site that creates an ideal opportunity for the creation of public spaces, but because of

1. Public transport routes

Vehicles travel within the context's grid pattern with the public transport services following dedicated routes. Each type of public transport travels on a different path.

2. Pedestrian traffic

Most of the pedestrian traffic, informed by the location of the prominent residential and retail buildings, occurs in a grid pattern - however the flow over the site cuts diagonally and becomes more informal. This is mainly due to the influx of pedestrians going to and coming from the CBD.

3. Zones

The map groups the types of land use zones in the context, indicating the types of places and characteristics connecting to the proposed site and intervention. As stated earlier, residential zones feature the most.

its dense pedestrian traffic, it also creates unmonitored unsafe zones. The site needs to address these issues to create a controlled and safe experience for the inhabitants of the area. The analysis of the context investigates the most prominent characteristics of the site that factor into the project's connection to the context.

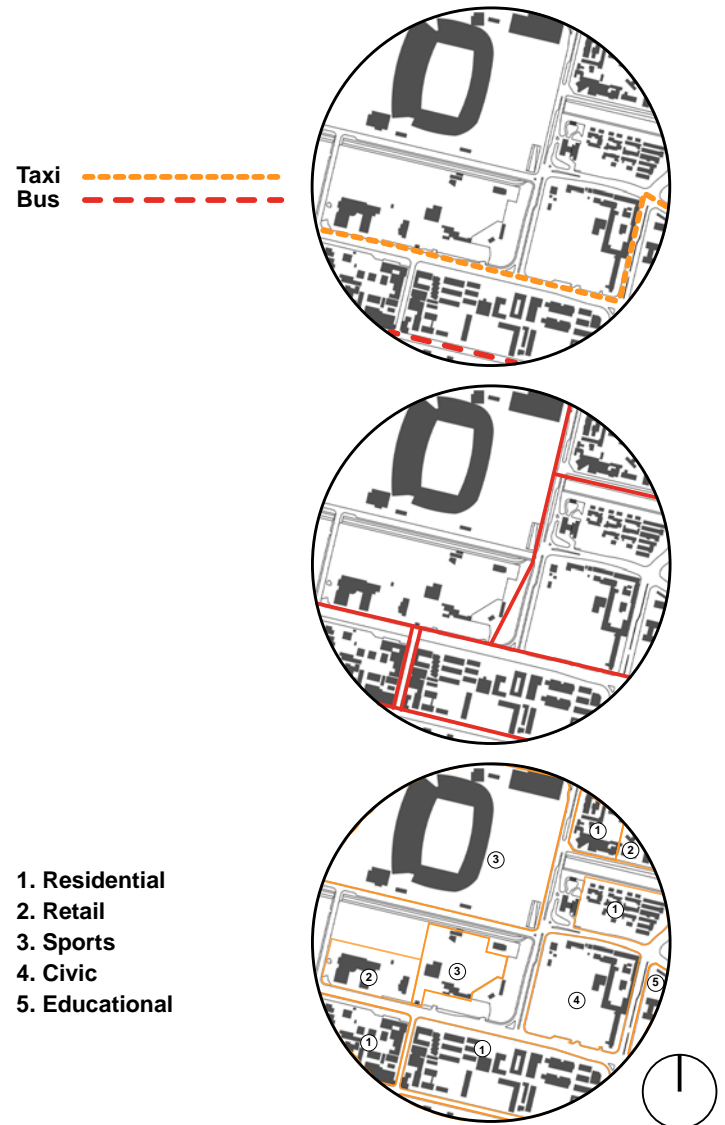


Figure 38: Meso analysis. Map 1-3.

4. Informal trade areas

The informal trade areas indicate their placement over time as informal traders don't stay on one spot, but they do have a general area they occupy. The informal trade areas are situated along the routes the pedestrians make the most use of.

5. Natural features

Indication of the site's connection to the city's oldest historical and natural feature, The Bloemspruit. The Site is also surrounded by trees providing shading to the western edge of the site.

6. Activity hubs

The clusters indicate activated hubs in the context in relation to the proposed site. This is ideal for the activation of the proposed intervention along the highlighted pedestrian route.

7. Population density

The map gives a relative indication of the current density and activity in the context's fabric. The most activity is found along Elia Street with daily trading and entertainment activities. The proposed site aims to activate the proposed design via the pedestrian route that cuts through it and the dense population on Elia Street.

Bloemspruit
Trees

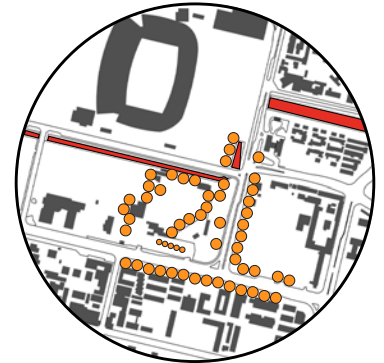


Figure 39: Meso analysis. Map 4-7.

Micro site analysis

The macro site analysis looks at the features of the site that the pedestrians are exposed to and interact with when transitioning through the site's main pedestrian route.



Figure 40: Meso analysis of the context from the north to south the south (1).



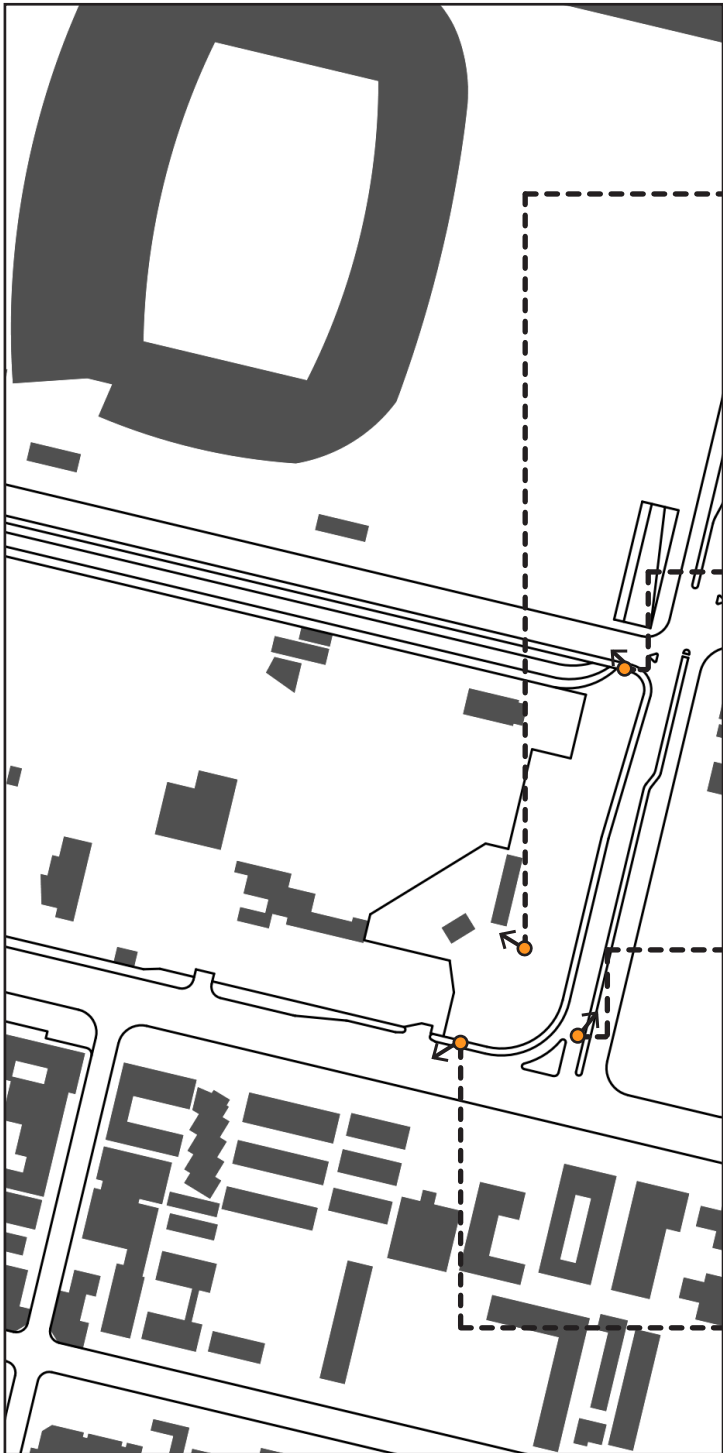


Figure 41: Meso analysis of the context from the north to south the south (2).



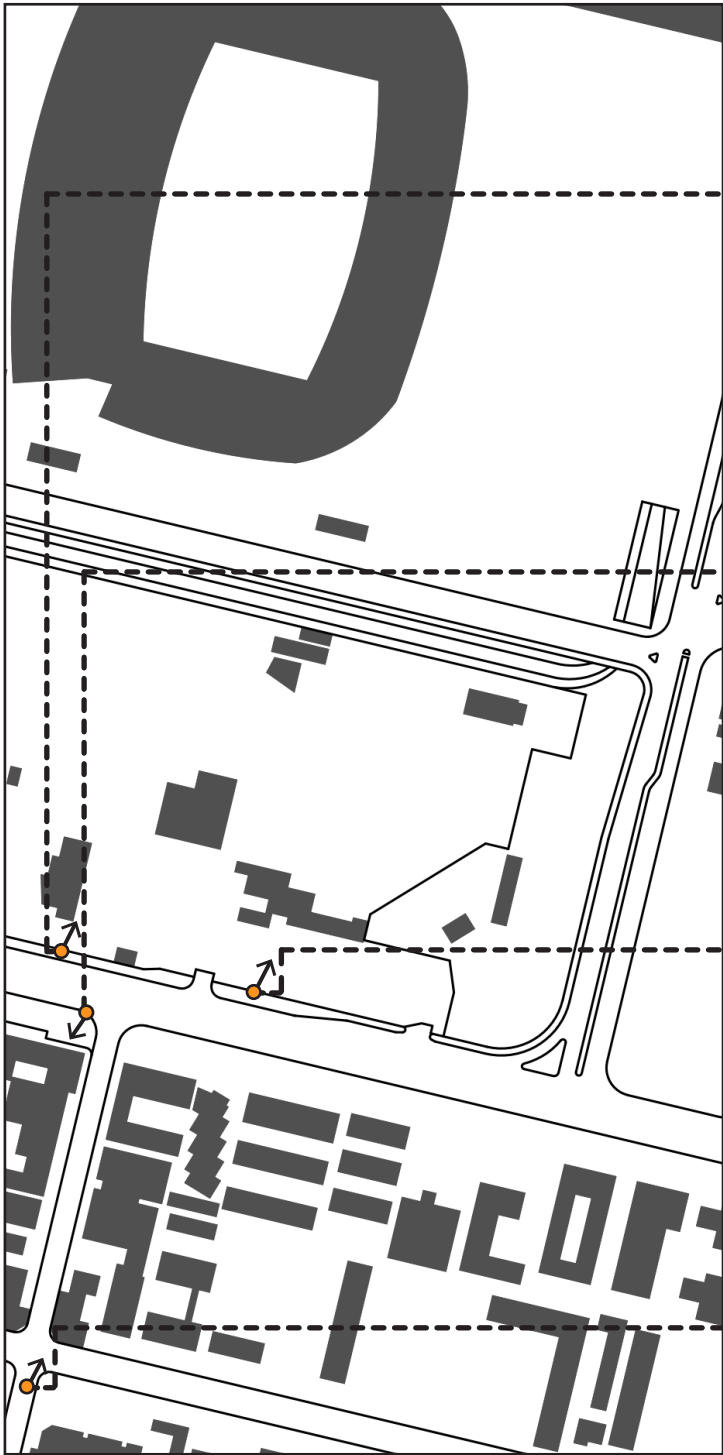


Figure 42: Meso analysis of the context from the north to south the south (3).



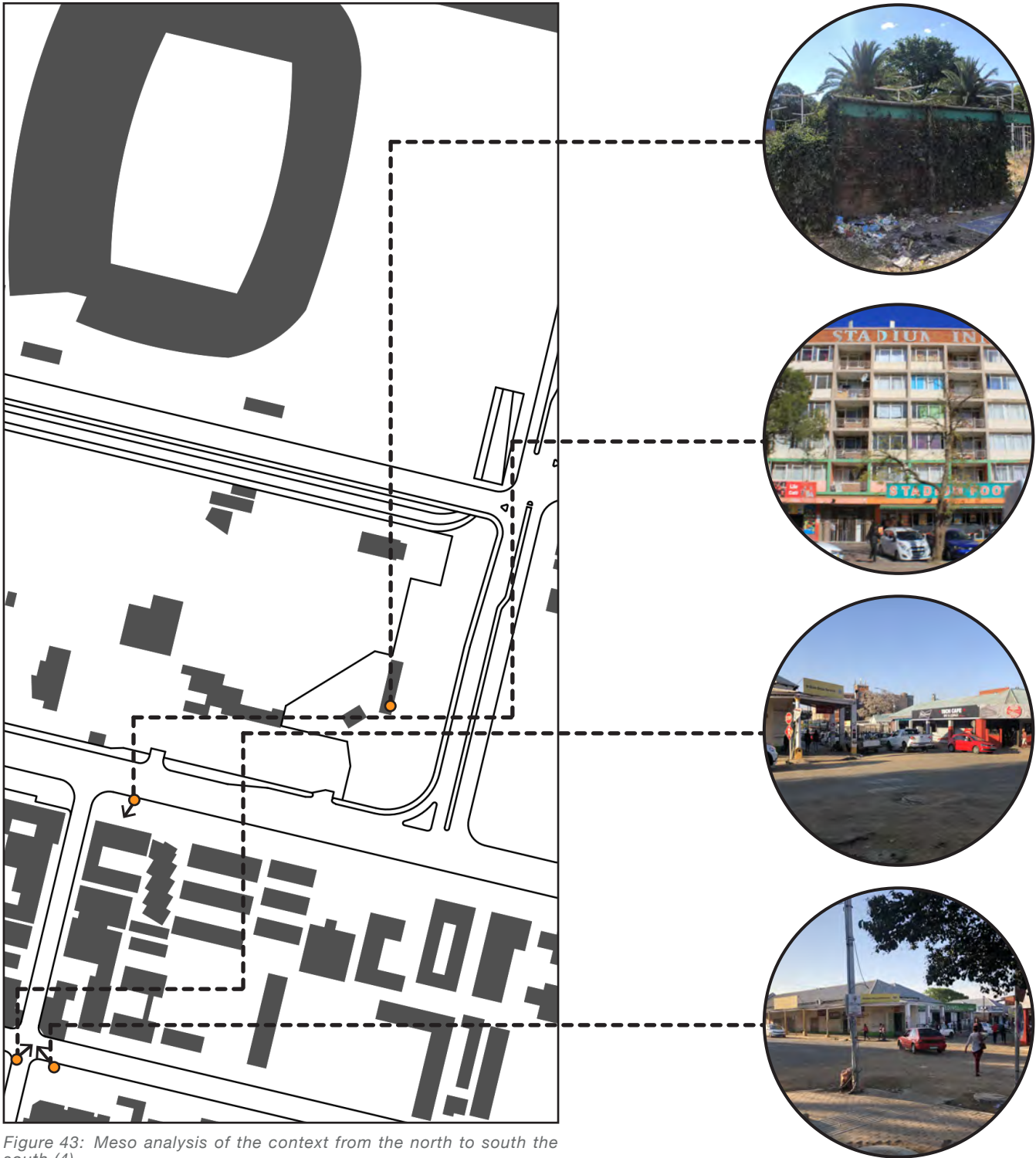


Figure 43: Meso analysis of the context from the north to south the south (4).



Morphology

In this dissertation, the theoretical investigation is split into two parts that concretize the intervention's conceptual approach. Part 1 discusses and explores concepts of site, non-place, place-making and identity. This chapter focuses on the place of the design in the context and how it will make an identity of its own by drawing from its surroundings and the needs of building's program. Part 2 explores public space and public life concepts and how the design creates its identity in the physical realm. The purpose of morphology is to create a connection between the design and the context via urban design principles and concepts.

Part 1 – Placeness and the Importance of Identity in Architecture

Introduction I

This section of the study presents a theoretical perspective of the site and its immediate context to comprehend the nature of the site. The goal is to understand how the site can utilize the identities of the places in its vicinity and the design's clientele to develop an identity of its own. This was done by firstly investigating what 'place' and a 'non-place' are and how a person can distinguish one from the other. Secondly, this chapter discusses the link between a site and a place and how one becomes the other. Following that, the chapter discusses the connection between a place and meaningful architecture. Lastly, this chapter discusses the importance of 'placial' and social identity. These investigations resulted in a framework for how the intervention develops its own meaningful identity in the placeless part of a diverse context.

Placing the non-place

Canizaro (2000) posed two critical questions when architecture is conceptualized as place. These are, what is a place and what kind of entity is it? These ontological questions can be answered by exploring the extant definitions some of which are examined now.

A place can be conceived as a definitive or solid feature that is inhabited, or which one passes or goes through or to. It is a concept based on the principles of feature adjacency and feature connectivity which is used to define spatial relationships (Buckey, 1997). Engelbrecht (2006: 2) defined the same concept as "a fluid and dynamic environment interacting with those who occupy it". For Canizaro (2000), in architecture,

“place” refers to a building or environment from a particular point of view. According to Sandin (2003: 67), the theoretical determination of a place or what one may label as ‘placial’, involves a distinction between ‘place’ and some other part of the geographical location that is under consideration. By implication therefore, in order to refer to a geographical location as a place, there needs to be an area demarcated by some characteristics which indicate a transition from one identity to another. These characteristics could be anything from a change in site’s features like paving, vegetation or an empty plot of land (Sandin, 2003: 67; Engelbrecht, 2006: 2).

When interpreting the concept of place in the architectural practice, other factors of come into play. For instance, a place can be defined by its aesthetic features and characteristics, functions, or the type of social interactions at play. For Sandin (2003: 67), a place then becomes recognized by the phenomena it excludes; becomes defined by its expected features, limiting its presence and relevance by underrating its value and range; and any intervention doesn’t identify itself by what is expected of it in its context, but rather by the sum of its parts that were influenced by the context (Sandin, 2003: 67).

The identified photography facility site is a non-place surrounded by places. It lacks a vibrant life that surrounds it and passes through it. It lacks any type of characteristic that would identify it with anything. The current project investigates the need to make something of the site by forming an identity that enforces its place in the non-place. In the article “Dealing with Non-Place in Exploitation, Belonging and Drifting”, Sandin (2003: 68) suggests that dichotomic notions of place are better serving reality when they are modalized. The intervention in this project is presented as practical realities, phenomena or situations that provide a better mode of understanding and

comparison when transitioning from any other place to itself offering an authentic and lived experience.

The purpose of place

The conceptualisations of place discussed earlier imply the physicality and abstract nature of what is meant by “place”. In other words, a place can be regarded as an experience that is created and reached for (a mental conception or an abstraction of spatial structure), and on the other hand, an objective physicality (Canizaro, 2000: 41) of a building. This makes it possible for the concept of place in architecture to be viewed from multiplicities namely realism and idealism perspectives.

In architectural design, the starting point would naturally be the design of the bigger place and then moving onto the finer details of the smaller spaces (Sandin, 2003: 70). This statement suggests that space would become something that precedes place even though, naturally, space is something that should follow the ‘place’ in an architectural development. Having established that place comes before space, one needs to know the thing that comes before place. In realist terms as opposed to idealism, a place requires a plane for it to inhabit the site or geographic location. In this study, site and geographic location are used interchangeably to mean the same thing.

According to Sederstrom (2016), the goals of architectural designs can vary greatly based on where a project is located. For Sandin (2003: 71) site is structurally different from a place or space. For example, site does not possess the same potential of place-value as place and space does, as sites are wishes rich of existential value place possessing the potential to concretize those wishes (Sandin, 2003: 72).

On another note, Sederstrom (2016) argues that a design is influenced by the physical attributes of a site (geographic location), like its climate, topography, site

features, and social attributes like its culture, industry, design style or history. Therefore, it is important to appreciate and incorporate all these aspects of a place into the design to create a sense of authenticity (Sederstrom, 2016).

The link between site and place

Having established that site depends on place, there is a possibility that this relationship might go either way. For example, Sandin (2003: 72) offers a semantic explanation for the distinction between the two concepts by suggesting that it is due to change over time (transitioning over time). In the words of Sandin (2003: 72), “the process of transitioning from site to place can be expressed as a process of habitational reordering, where such a temporal perspective, the ideal “place” could be seen as a final stage, a fulfilled habitat, whereas a site would be the initial locus for a wish of some kind.” In other words, the potential of a site can be exploited to become a place over a certain period, but this process lends itself to the possibility of moving ‘back’ to where it began.

Last but not the least, another important concept related to place in architectural design hence human habitation is exploitation, According to Sandin (2003: 72), exploitation when used in the architectural sense means turning the potential of a site into something that has more to offer to the environment than what it currently does. Based on this, Sandin developed a framework of consisting of what he termed possibilities, probabilities and likeliness, or in other words, some- thing that is open for adjustment Sandin (2003: 73).

Belonging to place

Having provided clarity that a place is a form of creation and site is a geographic location with potential when

both parts act upon each other, it becomes possible to adopt Sandin’s (2003: 74) proposal to address other types of modalisation in terms of identification. In *Place and Placelessness*, Relph (1976: 9) investigated placial experience in terms of identification with the place one is physically situated in. Relph (1976: 9) then developed a list of different types of insideness and outsideness for the research. This dichotomic list includes:

- existential insideness (a selfevident, close habitual relation to a place)
- empathetic insideness (a reflected, respectful and understanding relation)
- behavioural insideness (a navigating, utilitarian and pragmatic presence)
- vicarious insideness (a sense of knowing a place through mediation)
- incidental outsideness (a visitor’s attitude – place as occasional utility)
- objective outsideness (a deliberately distant and observing position of interest)
- existential outsideness (not feeling involved at all, even though being there)

Relph (1976: 9) opined that “there comes a point where a person can go from feeling outside to developing a sense of belonging and acceptance when moving into a space or place of inhabitancy”. According to Sandin (2003: 77) moving from outsideness to insideness is a choice often helped by the desire to take part in some level of engagement – be it with other people, structures, activities or spaces. For Sandin (2003: 77), a placial choice is about engaging with others.

To sum up the discussion so far, in the pursuit of a rich architectural experience on a social level, the envisaged photography facility is intended to house different functions and spaces beyond those akin to the normal educational institution typology. Instead, the project draws inspiration from its context and clientele

to offer a multiplicity of functions – from educational to recreational, and then urban. The implementation of the context's urban fabric provides the means of drawing the public user from the periphery and into the project. From there the user will form meaningful connections with the architectural facility by actively engaging with the spaces, learning and becoming a part of the culture of photography.

Place and identity

Place identity is another important concept in architectural design. This was carefully considered in designing the photography facility. Hauge (2007: 47), captures the importance of identity of a place eloquently as follows:

Identity is a “dynamic, social product of the interaction of the capacities for memory, consciousness and organized construal”. The importance of architectural identity lies in its ability to bring different entities and complexities together through one body. Social events, the forming of memories and connectivity can all happen through one building or place. People making connections and identifying with certain parts of places gives these places a sense of importance. According to Wooldward (2016:63), “there is no place without self, and no self without place”.

Hauge (2007: 46) speaks of two modes of identifying and their significance in the built environment. The first mode is “place identity,” which involves the individual's incorporation of place into the larger concept of the self (Proshansky, et al., 1983: 60). This incorporation involves memories and experiences, the association of feelings to the physical features and any ideas or concepts that result from interaction with the physical environment and the place. Social identity, the second mode of identifying, is aptly described by Wang (2013:14) as well as Qazimi (2014) as an individual's

knowledge of belonging to certain social groups, as well as the emotions and values this conveys to him or her. Therefore, social identity is dependent on other positive groups or entities such as race, age, sexuality, culture, nationality etc. Hauge (2007: 47) boils it down to place being a social entity or “membership group” providing identity.

In children, identity develops as they learn to differentiate themselves from the people around them. Place identity works the same way, the place sees itself as something different in relation to its surroundings, drawing from them but never becoming them. The photography facility draws its institutional influences from the Central University of Technology, its athletic influences from the Bloemfontein Swimming Pools as well as the Athletics Stadium, and it draws its recreational influences from Elia Street – the most significant social hub for tertiary students. All these influences are in the project's site's immediate context. In this way the design becomes its own thing by drawing its characteristics from the things around it.

Conclusion I

Having discussed the transition of non-place to place in the site, and how place allows for identification in different social groups, and how these ideas inform the concept of the design, the next part of this chapter involves the implementation of Effective Factors in Shaping the Identity of the facility in accordance with Torabi and Brahman (2013). The following topics discuss the different ways in which design takes hints from its environment in the placial and social context to identify with its environment and form a relationship of meaning with the users of the design on an aesthetic level.

Part 2 – Morphing the Identity of the Place

Introduction II

This part of the theoretical investigation introduces the design development of the photography facility, focusing on the factors shaping the identity of the design's physical characteristics and how they are drawn from the ideas of a learning environment in the city and its references to the art of photography. Torabi & Brahman (2013: 106) believed that architectural design involved two separate moments of a phenomenon: a cultural moment and a technological moment. The aesthetics (state of feeling regarding the beautify) of the envisaged photography facility combines the functional and cultural influences of the world of social media and photography today.

Traditionally, architectural design students are taught to follow and respect the aesthetics of the context, up to an appropriate degree, and to respond accordingly. However, in technologically competitive era driven by innovation where there is need to push boundaries, and make new things, it is easy to argue that, following this traditional mode is very limiting to innovation.

For Torabi & Brahman (2013: 106), avoiding or limiting innovation in by according too much respect for tradition is a disregard of architecture's main purpose of improving the human environment. Torabi & Brahman believed that the key to architectural brilliance is free thought. Instead, continuity, creativity and innovation can go together provided they are combined based on free thinking (Torabi & Brahman, 2013: 106). This approach to design improves the human environment, freeing us from sedation, immobility and possibly the death of architecture (Torabi & Brahman, 2013: 106).

Identity and Architecture

Architecture can be viewed as the concretization of a community and its values and the manifestation of the environment's characteristics and identity (Ayiram, 2011;82). Identity gives architecture of similar typologies the ability to distinguish themselves from one another and can be defined by ideas, concepts, external/internal factors and functions (Torabi & Brahman, 2013; Boussaa, 2017). The layout of buildings and their interior and exterior facades are among the obvious manifestations of civilization and culture of each tribe and nation (Torabi & Brahman, 2013; Ayiram, 2011;82). Another important factor in the establishment of architectural identity is historical presence in the development of the site. This view is consistent with the view that architectural inspiration not to overlook the power and significance of society's historical influences. This view is supported by Torabi and Brahman (2013) who suggest that stability and change or rest and motion are the two main characteristics of identity because they consider the past and historical features of society with the aim of realizing a new identity according to the needs of future societies. The photography facility project looks back at its contextual influences and fuses them with contemporary morphological and tectonic influences for the purpose of its enriching its identity.

The Main Characteristics of Architecture Identity

In terms of time, identity has both sustainable and dynamic aspects (Boussaa, 207; Torabi & Brahman, 2013) where on the one hand, one can be fixed to certain ideals but as time goes on, there is a tendency to become flexible. The fixed ideals remind us of where we come from and our inspiration or motives, whilst our flexibility allows us to assess and adapt to change. Architectural identity follows the same manner of development. When speaking of fixed and flexible

characteristics in architectural development, Torabi & Brahman (2013: 108-110) speak of 7 main characteristics of architectural identity, namely:

- Spatial organization
- Time organization
- Semantic organization
- General design principles
- Form and shape in the building
- Building materials
- Relationship with context

Spatial organization

Spatial organization determines the order and position of spaces, determining the frequency and communication between them.

The first-floor spaces of the design are mainly grouped as educational, administrative and photography. The more 'public' spaces are placed at the periphery of the site as the social connection to the context, from there they transition to the more private spaces as you move deeper into the project. This promotes connectivity to the design whilst offering security to the users.

Time organization

Architecture with identity represents the architecture of its time and preserve the physical and social structure and culture of its time (Torabi & Brahman, 2013: 109). The architecture develops this identity when it forms a connection with its context, be it through material or cultural reference to the environment. As time passes and cultures and society change, so does the environment's identity change, thus a change in architectural identity as well. Passage of time and changes in the type of construction in the long run lead to changes in the social and cultural structure (Torabi & Brahman, 2013: 109). For architecture to ensure its

survival and continuity on a temporal level, Torabi & Brahman (2013: 109) state that physical changes should occur considering the social and cultural structures of the environment.

In order to keep up with temporal cultural shifts, the design is composed of materials that don't demand permanence in construction and feel. Lightweight material use stems from the project's need to be able to adapt its spaces to fit any cultural shifts – not because it lacks any temporality and cultural relevance, but because it's identity and connectivity draws from its surroundings so it needs to be able to grow and adapt with them.

Semantic organization

Every society has a culture which represents its ideals, goals and ideologies (Torabi & Brahman, 2013: 109). Architectural concepts are meant to take these factors into consideration during development. Architecture with a strong sense of identity takes the programmatic needs of the building and combines that with a concept representative of the environment's social ideologies. This approach will result in a more informed and sensitive understanding of the materials, colours and building form appropriate to the environment.

The photography project's aesthetics are informed by its need to form a connection with the users from a public to private level. The concept of the social weaver's nest is indicative of just that. Nests or pods are very private structures, but a cluster of them, like in a social weaver's promote a sense of community in privacy. The nest's weaves subconsciously indicate the levels of privacy by the amount of light they let in.

General design principles

When resolving the morphology and program of a design, factors like orientation and sustainability etc. need to be considered. The same rules apply to buildings in the same environment, but it's important that architecture succeeds at using creative ideas that suit the needs of the building to achieve an architecture with identity (Torabi & Brahman, 2013: 109).

Form and shape in the building

The visible appearance of anything is the most important and immediate impression of the built or objective environment (Torabi & Brahman, 2013: 110). It is important that the morphology of a design is consistent and representative of the social culture. The use of culture in a design's aesthetics is only successful if the environment has an understandable language unique to itself. This language is a set of concepts that are derived from visual symptoms that represent a single culture (Torabi & Brahman, 2013: 110). If foreign concepts and elements are introduced, they run the risk of being rejected and failing in a design, it's important for the design to form a strong connection with the environment and that is possible through cultural identification with the society.

The appearance of an open building that is inviting and transparent on the periphery but becomes more private and secure via further exploration speaks of how, socially, the design is open to all walks of life coming in and becoming a part of it and forming their own meaningful connections with it as their interaction with it progresses. The modular pod-like systems at different levels inform that light-hearted feeling to the design.

Building materials

The materials used in architecture of different historical periods represent the faith, beliefs and culture of these periods (Torabi & Brahman, 2013: 110) and it's important to establish a connection between this and the idea that specific materials create different connections with different spaces. This creates a deeper connection with the identity of the architecture from a large scale to the minute details.

The tectonics of the design from ground to first floor level progress from heavily contextually influenced to not. This is representative of the proposed progression in time and construction and design in the project.

Relationship with context

The architecture is just like any living organism that interacts with the surrounding it inhabits. The environment influences the behaviour and characteristics of the organism and the same concept applies to architecture. Torabi & Brahman (2013: 110) state that the environment is important in understanding the architectural space. The influence of the environment on architectural identity is so important that Torabi & Brahman (2013: 110) believe that emphasis on solidarity and visual cohesion between the building and environment can have a strong role in creating architectural identity.

The strongest relationship between the photography school project and the context is the influence of the identities and buildings surrounding it. The architectural spaces reference the context in conjunction with the concept to inform warm, inviting and social spaces.

Conclusion II

The theoretical investigation chapter went over the ideas and concepts that informed the design strategies that went into the morphology and social connections in and outside of the design. The identity of the design is clearly informed by the context and connects to it without being a direct copy of any one system in its proximity, validating its place in the context. The ideas discussed also address the design's need to look and feel different to the buildings around it, not because it doesn't relate to them, which it does, but because it's something on its own from all these influences.

Tectonics

The photography training centre is a place made of a typology that is a hybrid of institutional, public and urban. This prompts an investigation that forms an eclectic mix of buildings, interventions and spaces that inform the types of functions and spaces needed for the final project.

The following stills capture key elements and features forming the identity of the design's development.



Figure 44: The means of capturing

Ontario College of Art and Design



Figure 45: Street level view of the Ontario College of Art and Design (Vågen: online).



Figure 46: Steel column to concrete footing (Vågen: online).



Figure 47: Steel column to steel base (Vågen: online).



Figure 48: Steel framework (Vågen: online).



Figure 49: Composite decking floor system (Vågen: online).



Figure 50: Light gauge steel work (Vågen: online).



Figure 51: Exterior decking (Vågen: online).



Figure 52: Insulation (Vågen: online).



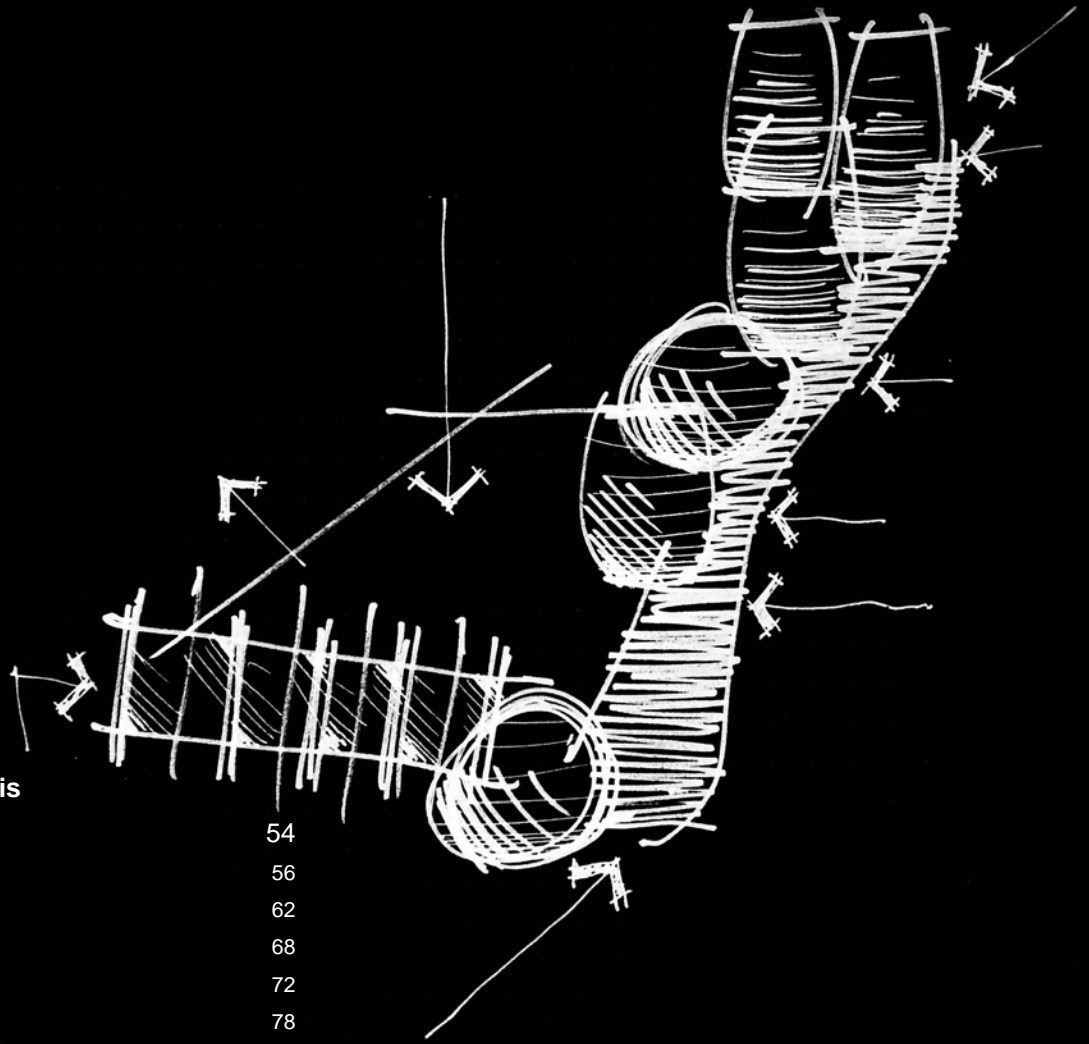
Figure 53: Exterior cladding (Vågen: online).



Figure 54: The Ontario College of Art and Design (Vågen: online).

03

Design & Technical Thesis



Part 03 | Design + Technical Thesis

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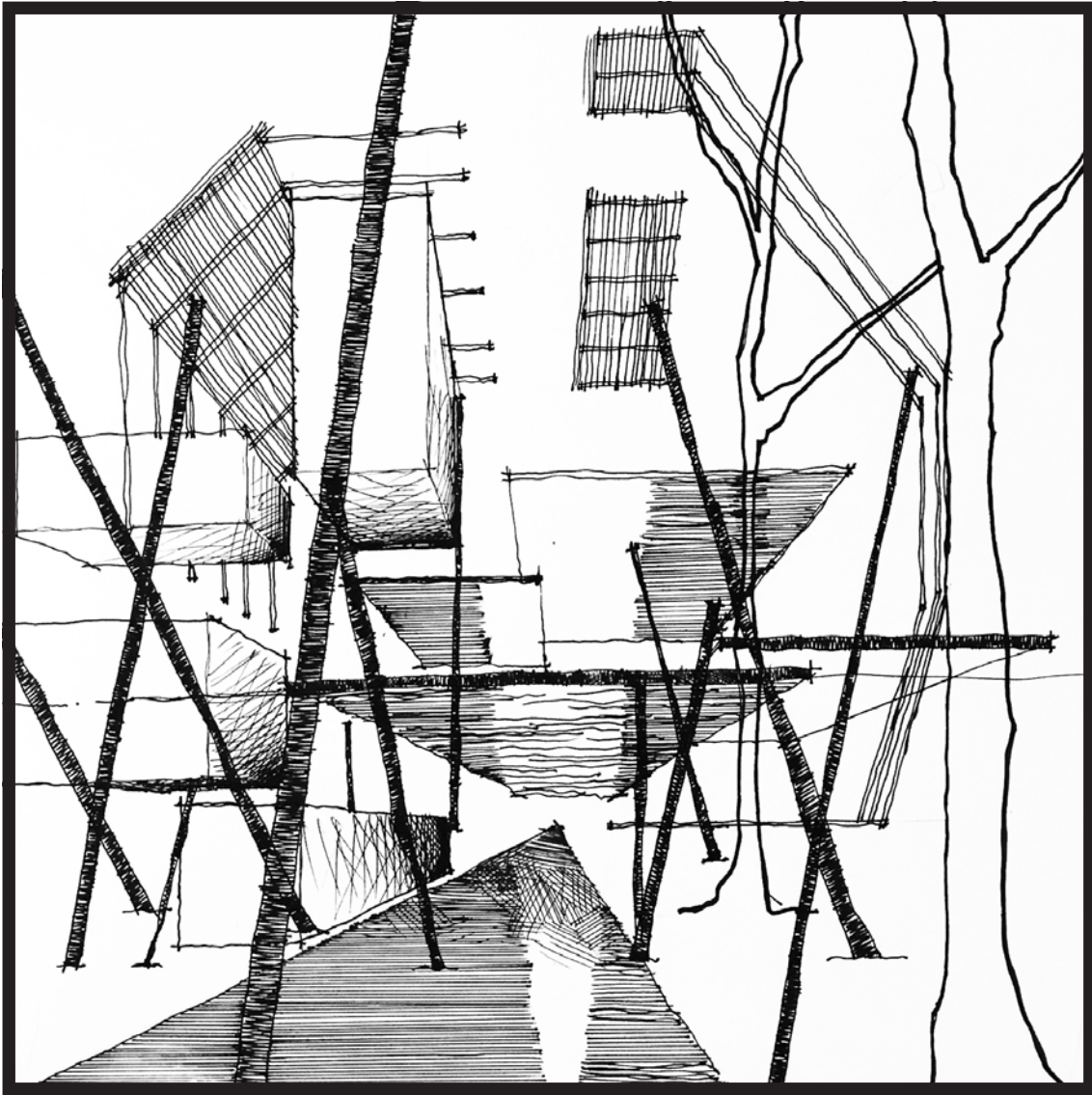
Figure 55: Early concept development sketch of the design.

Design Development

This part of the dissertation applies the discussion of the theoretical ideas and the conceptual approach to the proposed project. The documented work is an interpretation of the research generated in parts 1 and 2. This part illustrates the decision-making and reflection process of the design.



Figure 56: Author's rolls of design development drawings.



The final concept sketch serves as a graphic reminder of the design's typological, topological, morphological and tectological intent. The pedestrian route as the activator of the design with the aid of pedestrian movement, Meandering spaces connected on multiple planes via the slanted structure representing the connection of different functions and services in a very indirect manner. These components play their role in the development of the design and the decisions leading up to the final product.

Figure 57: Diagrammatic sketch of multiple planes on different levels being activated by a single route.

Development Stage 1

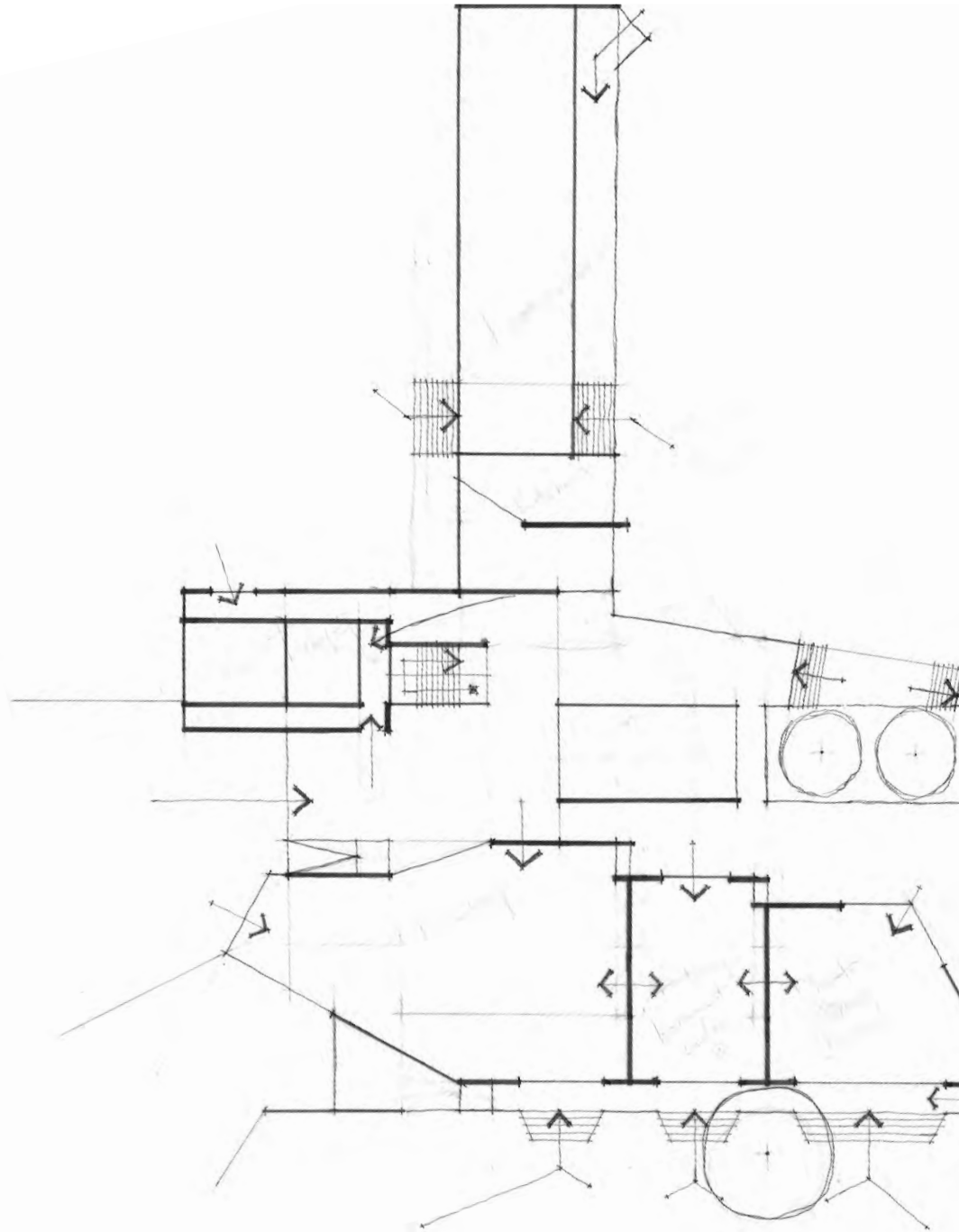
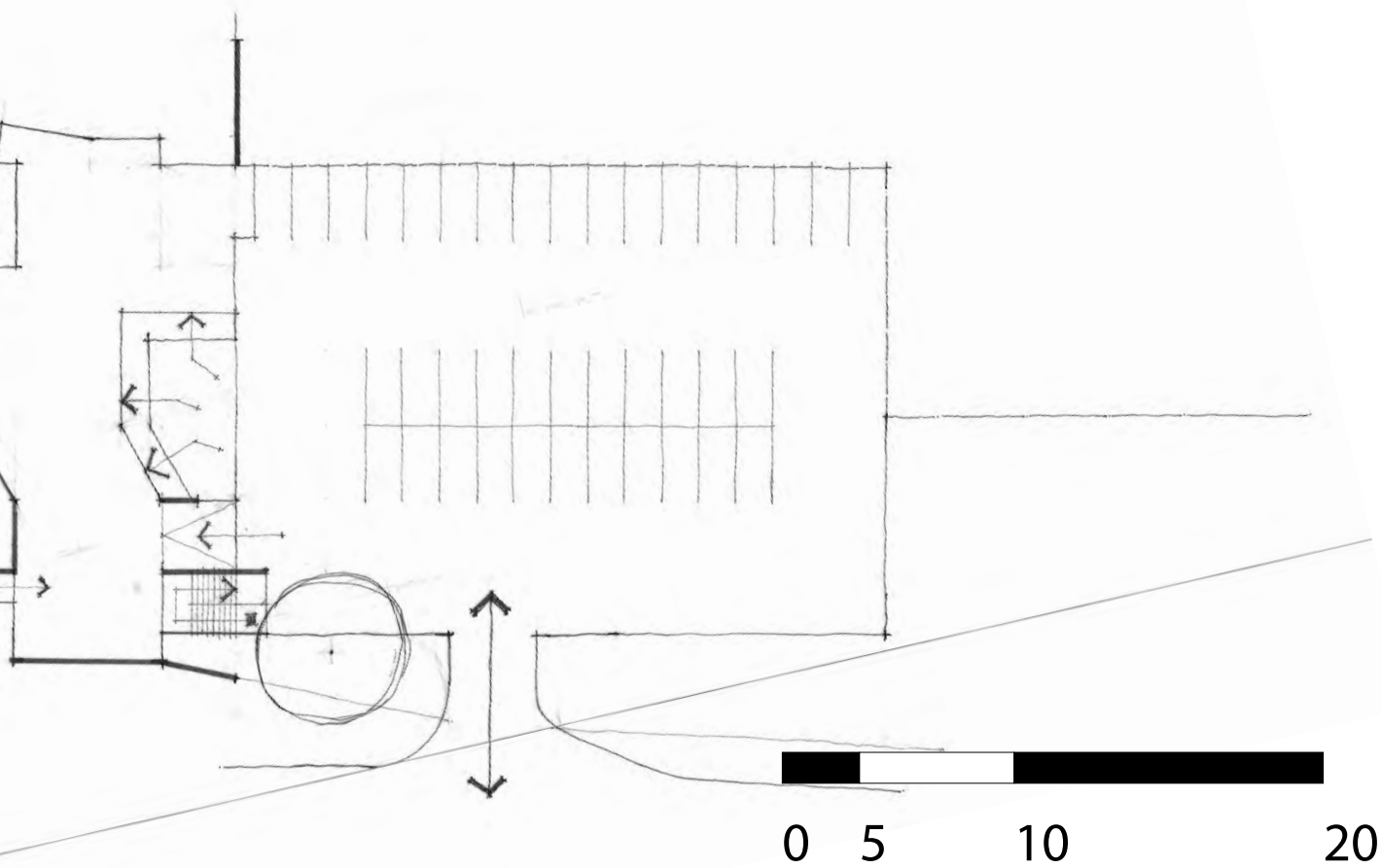


Figure 58: Ground floor plan.



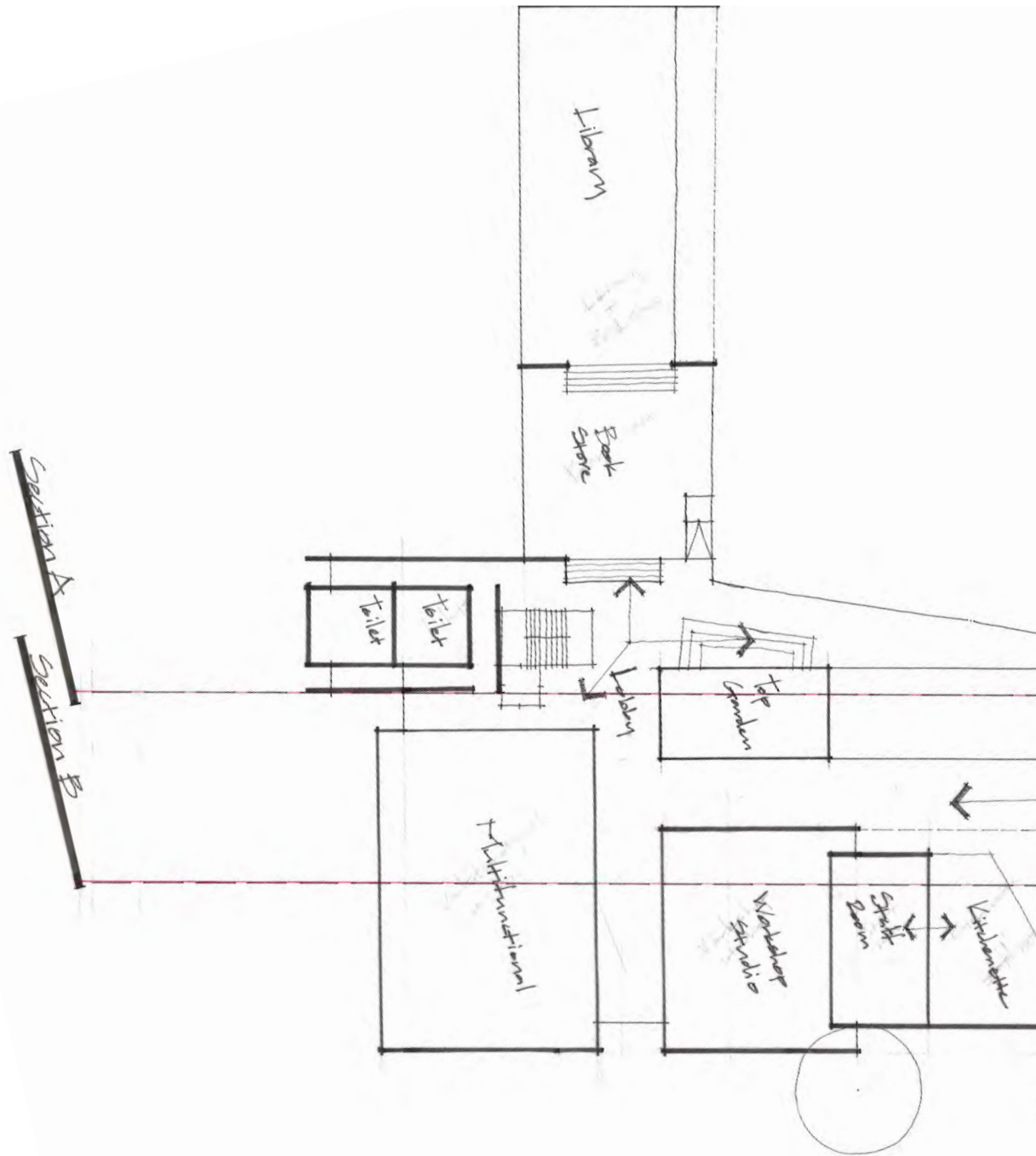
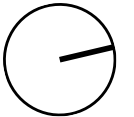
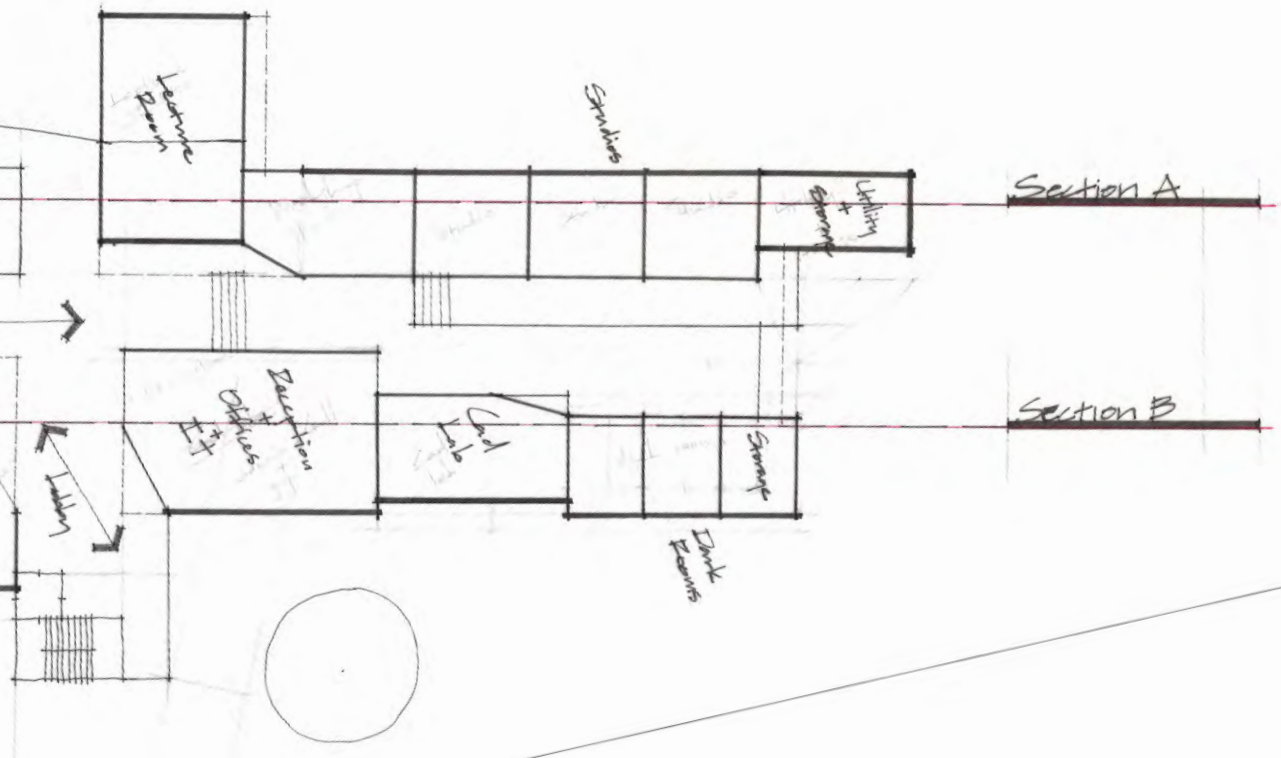


Figure 59: First floor plan.



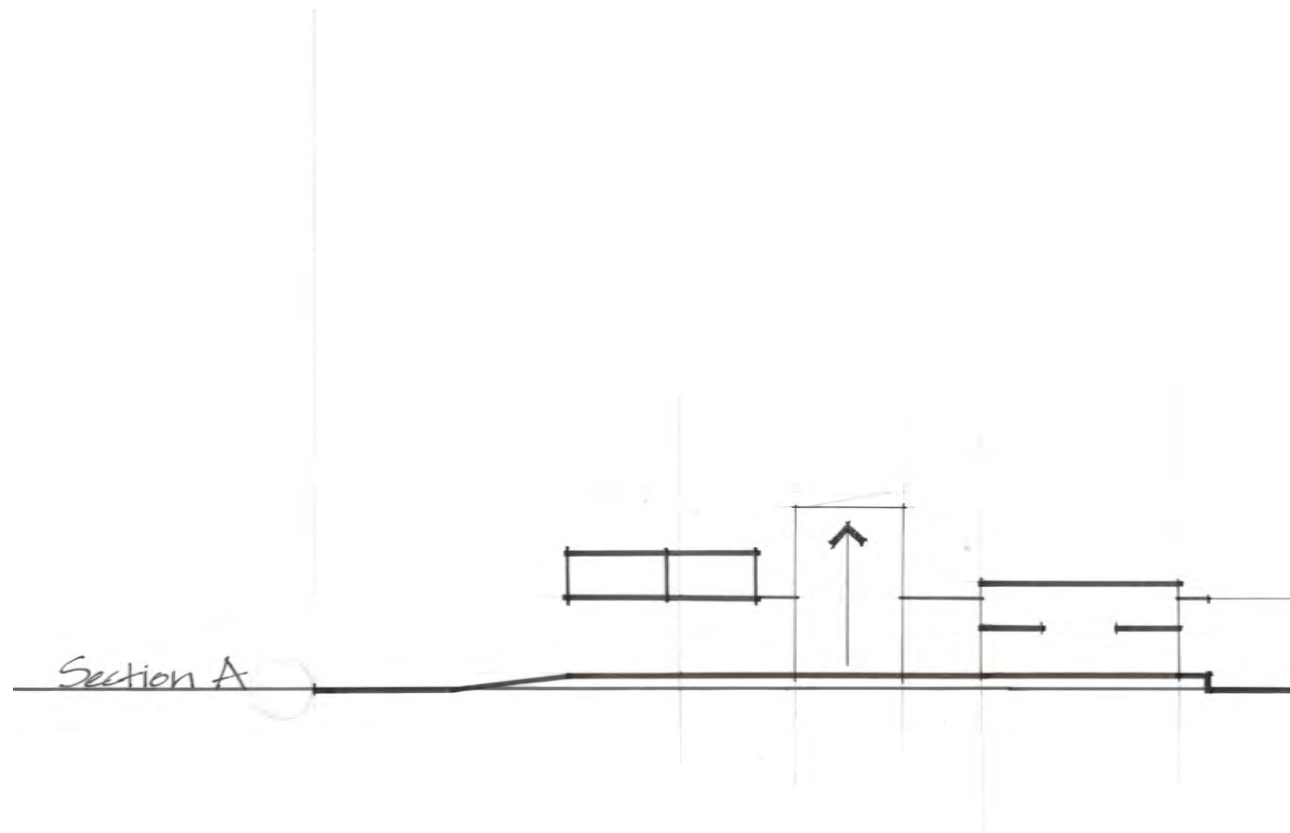
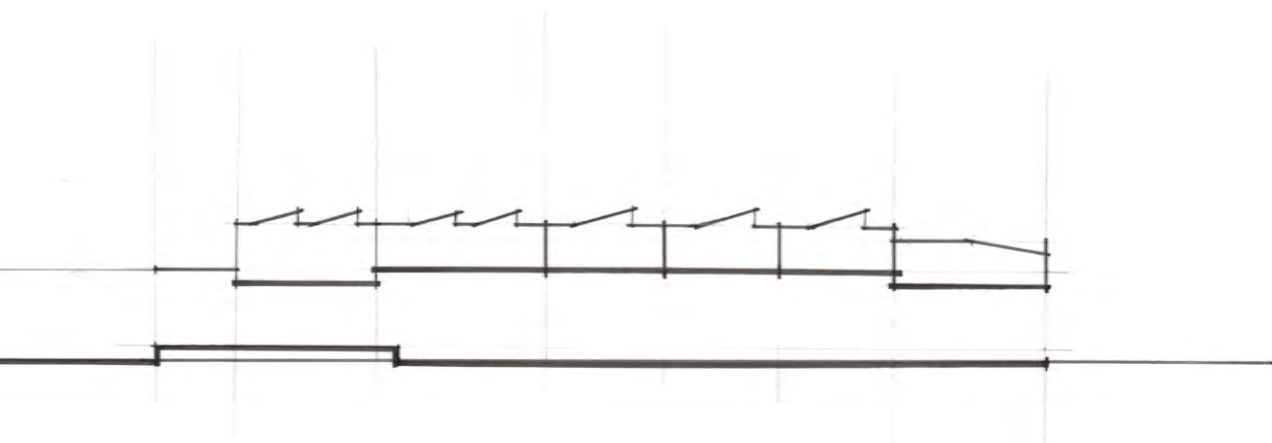


Figure 60: Building section A-A.



Development Stage 2

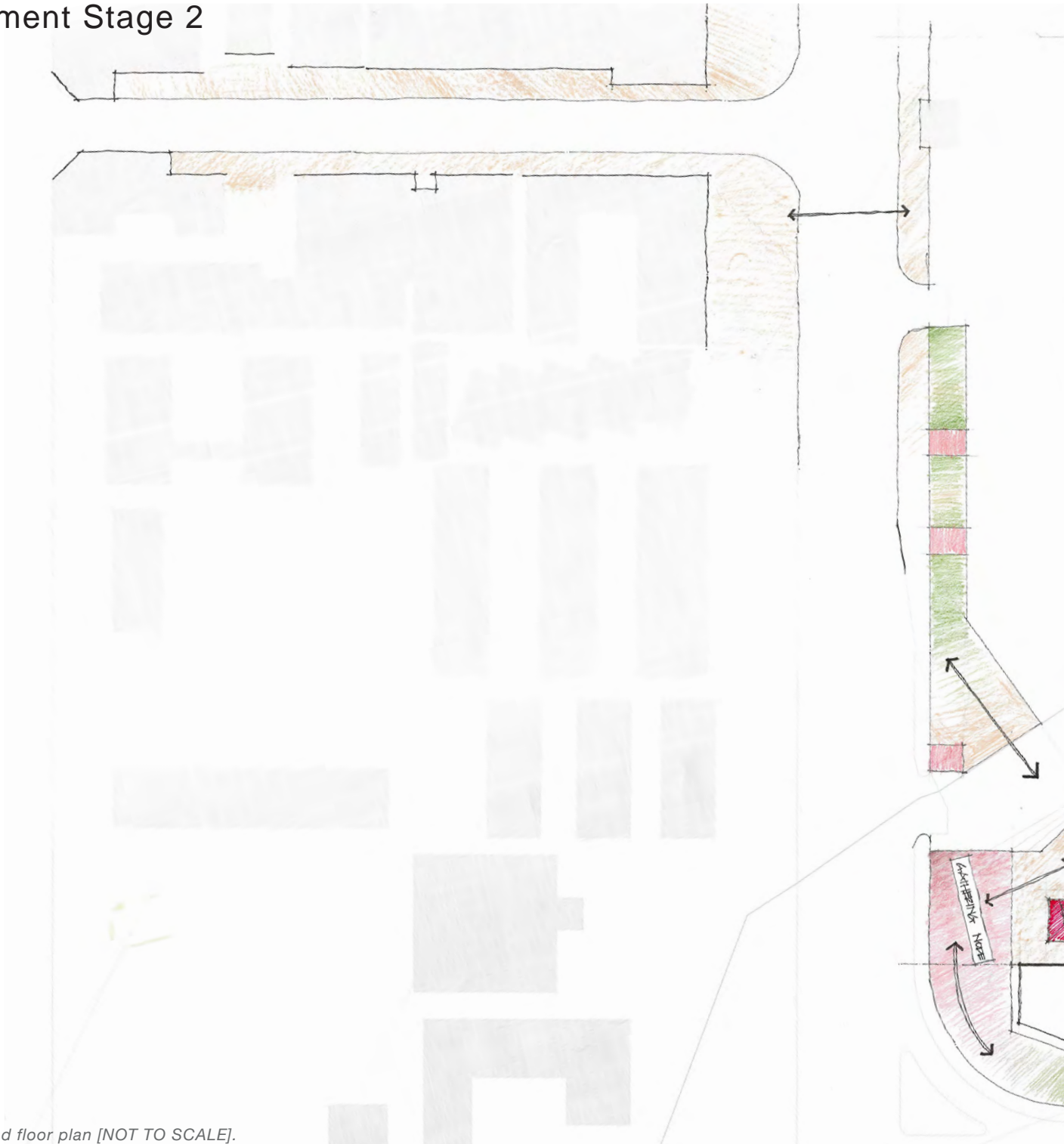
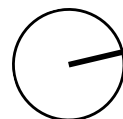


Figure 61: Ground floor plan [NOT TO SCALE].



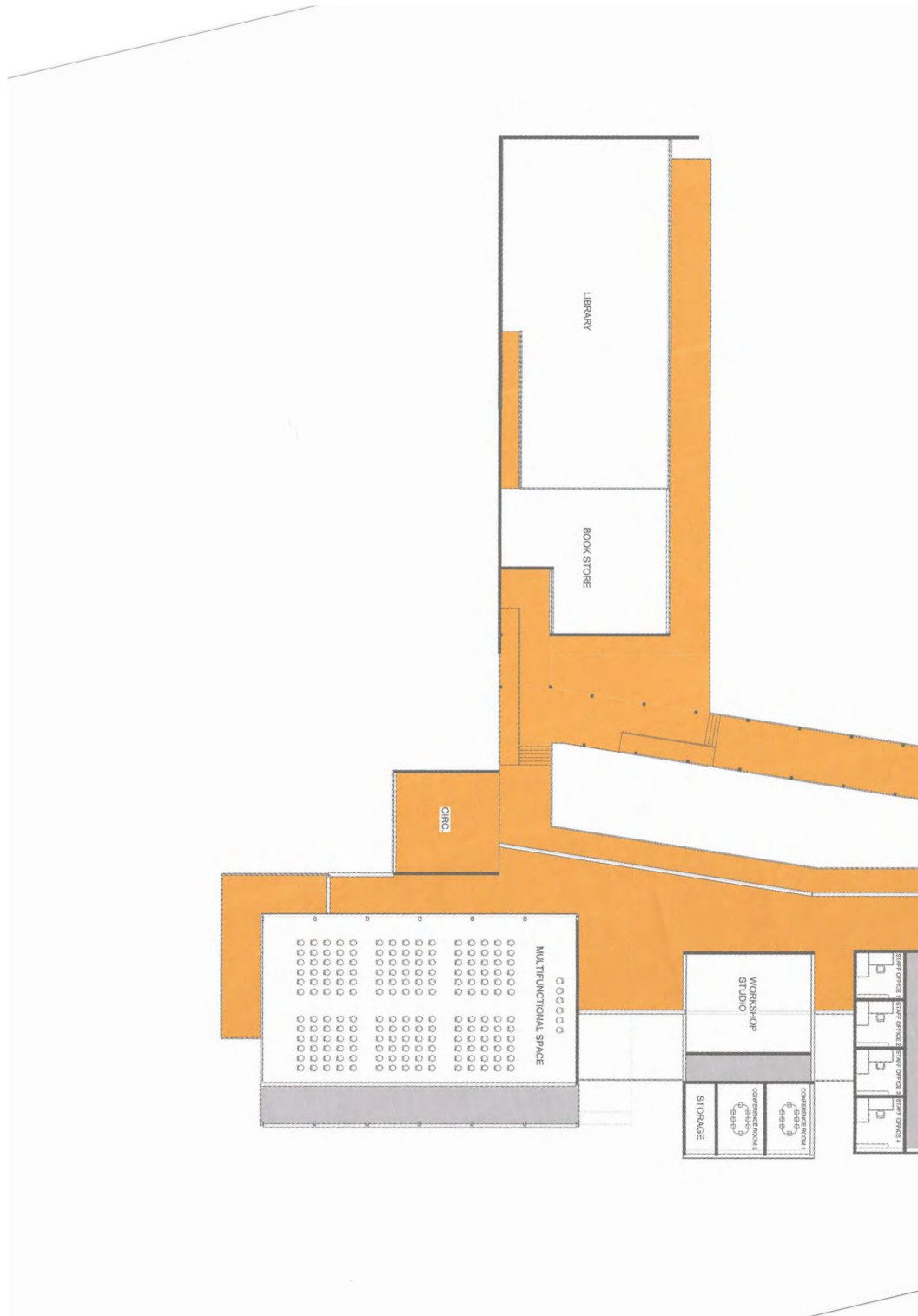
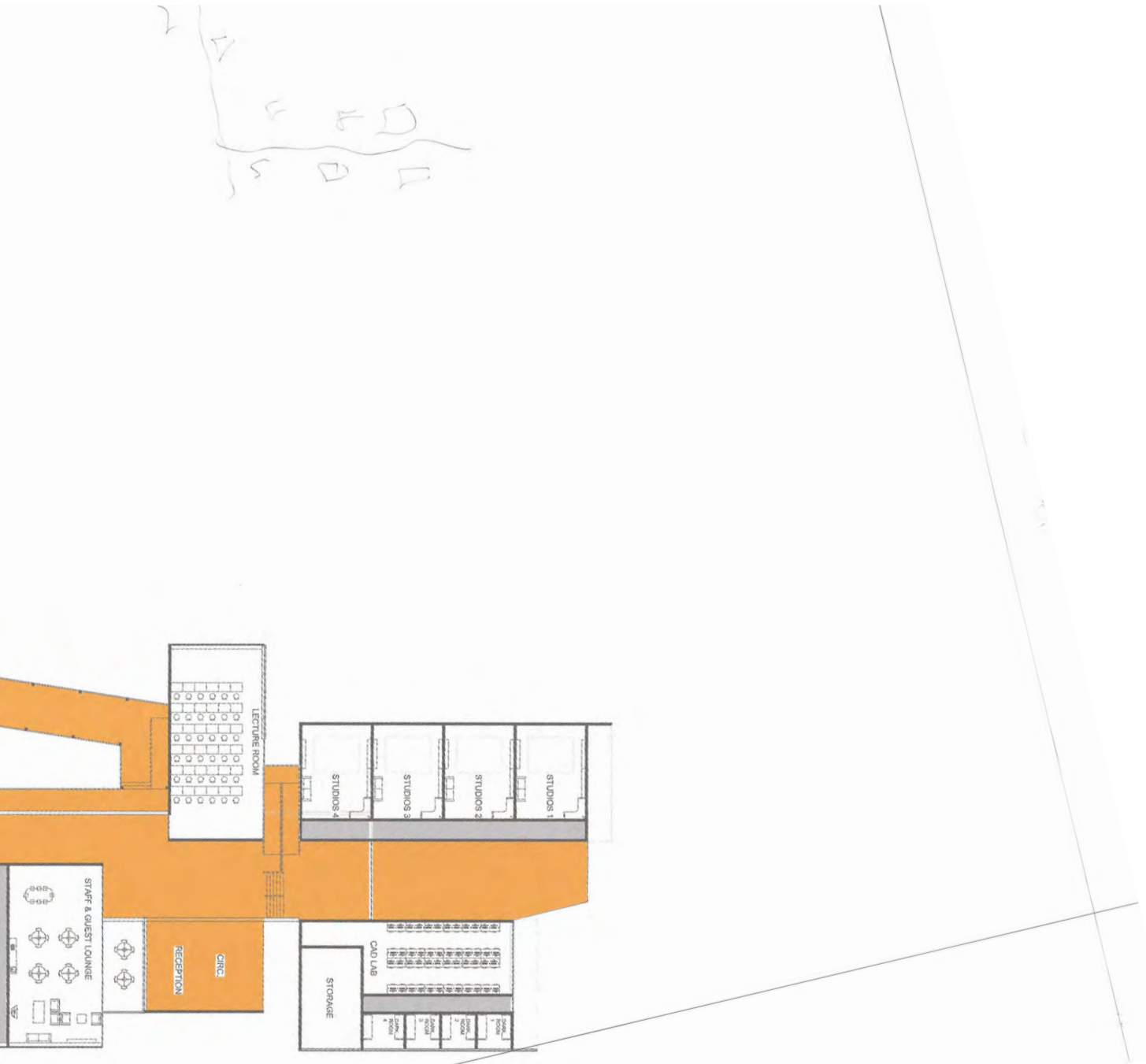


Figure 62: First floor plan.



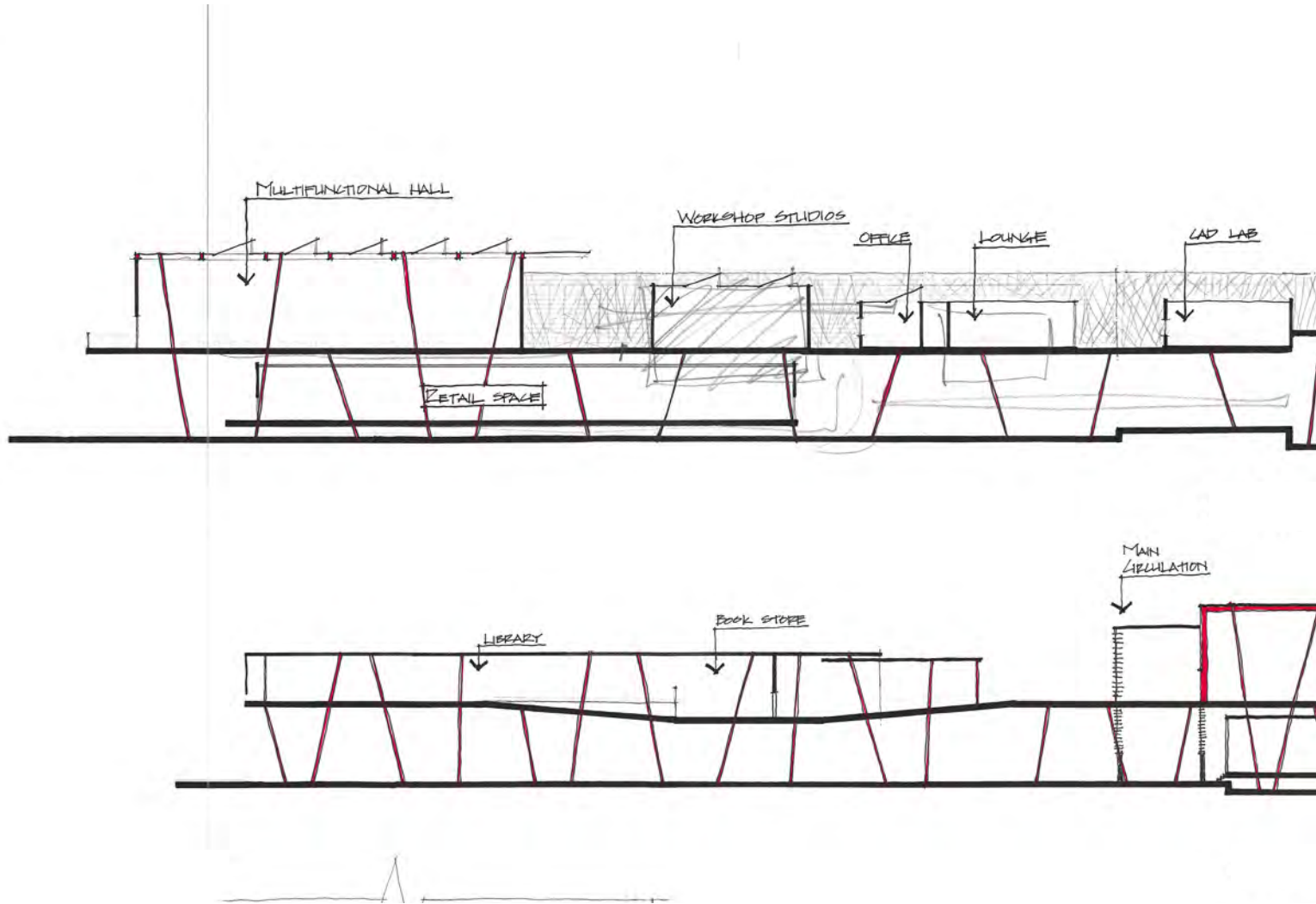


Figure 63: Sections [NOT TO SCALE].

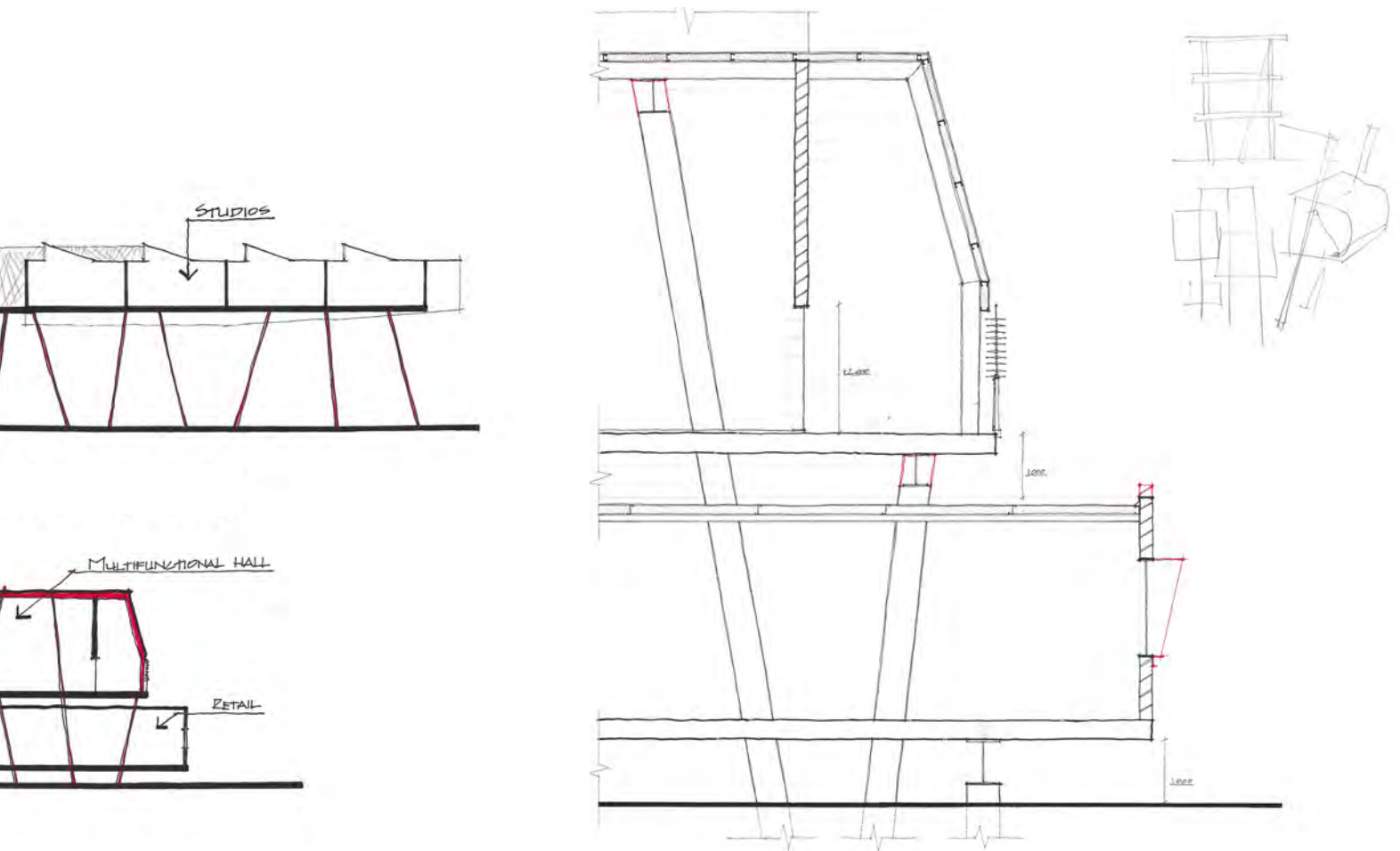


Figure 64: Wall section [NOT TO SCALE].

Development Stage 3

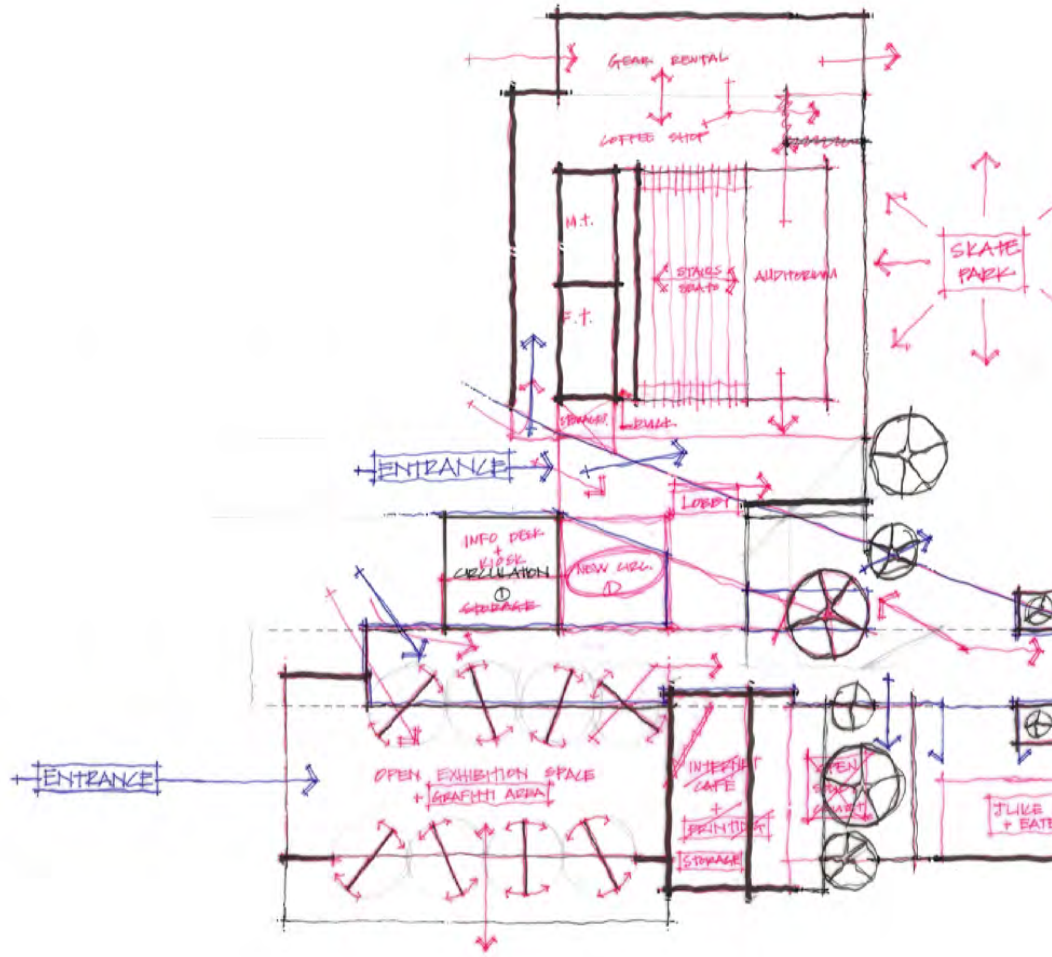
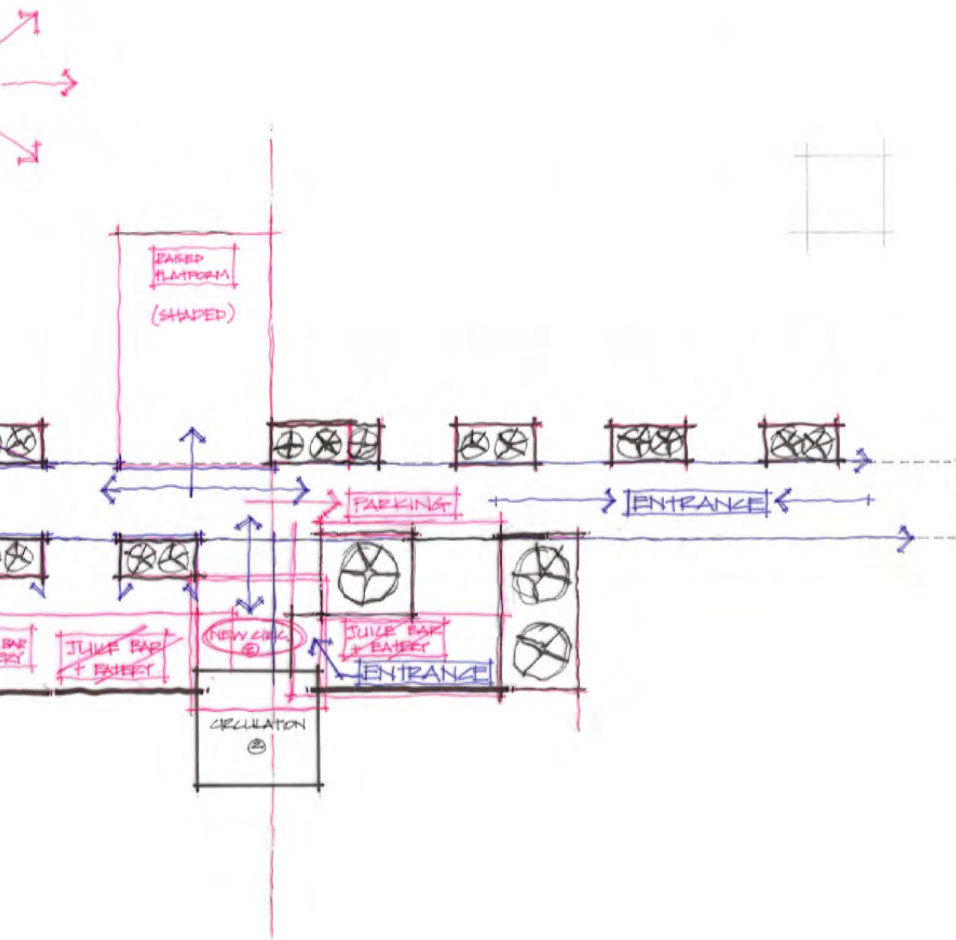
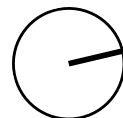


Figure 65: Ground floor plan.



0 5 10 20



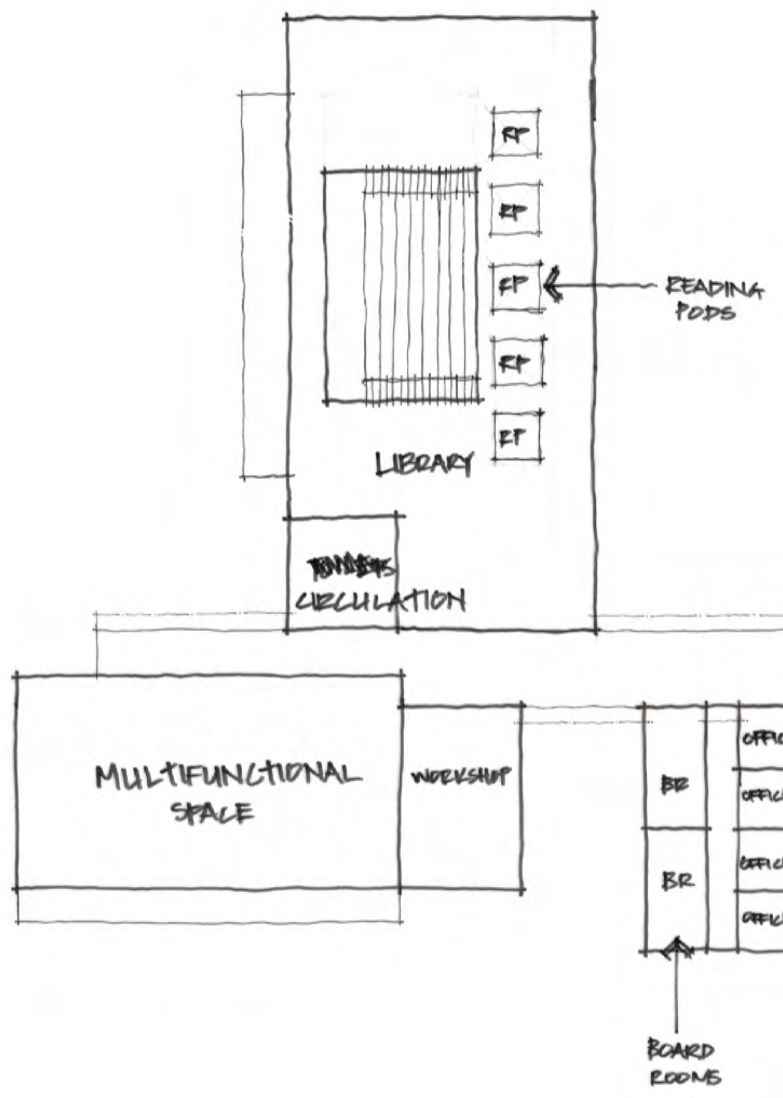
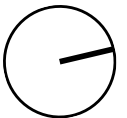
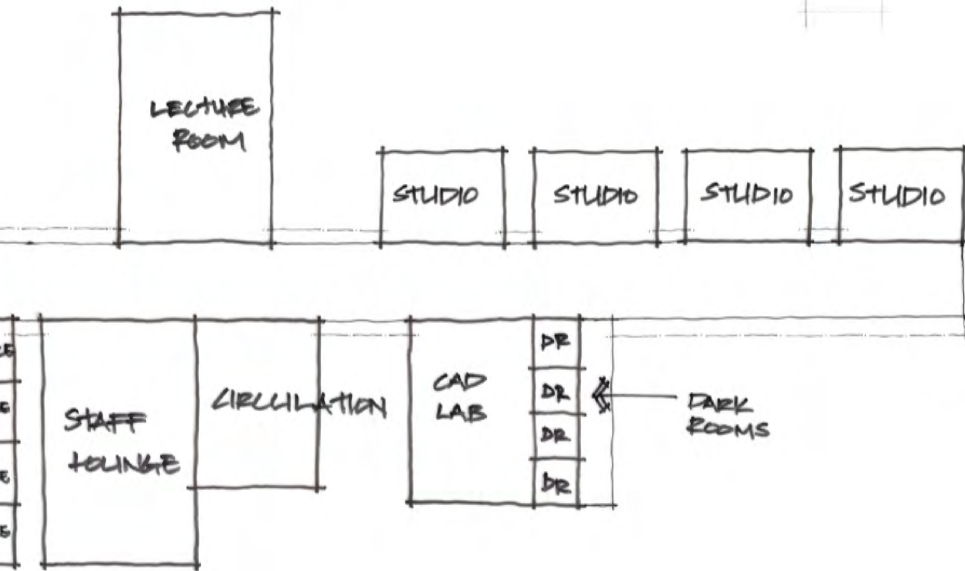


Figure 66: First floor plan.



Development Stage 4

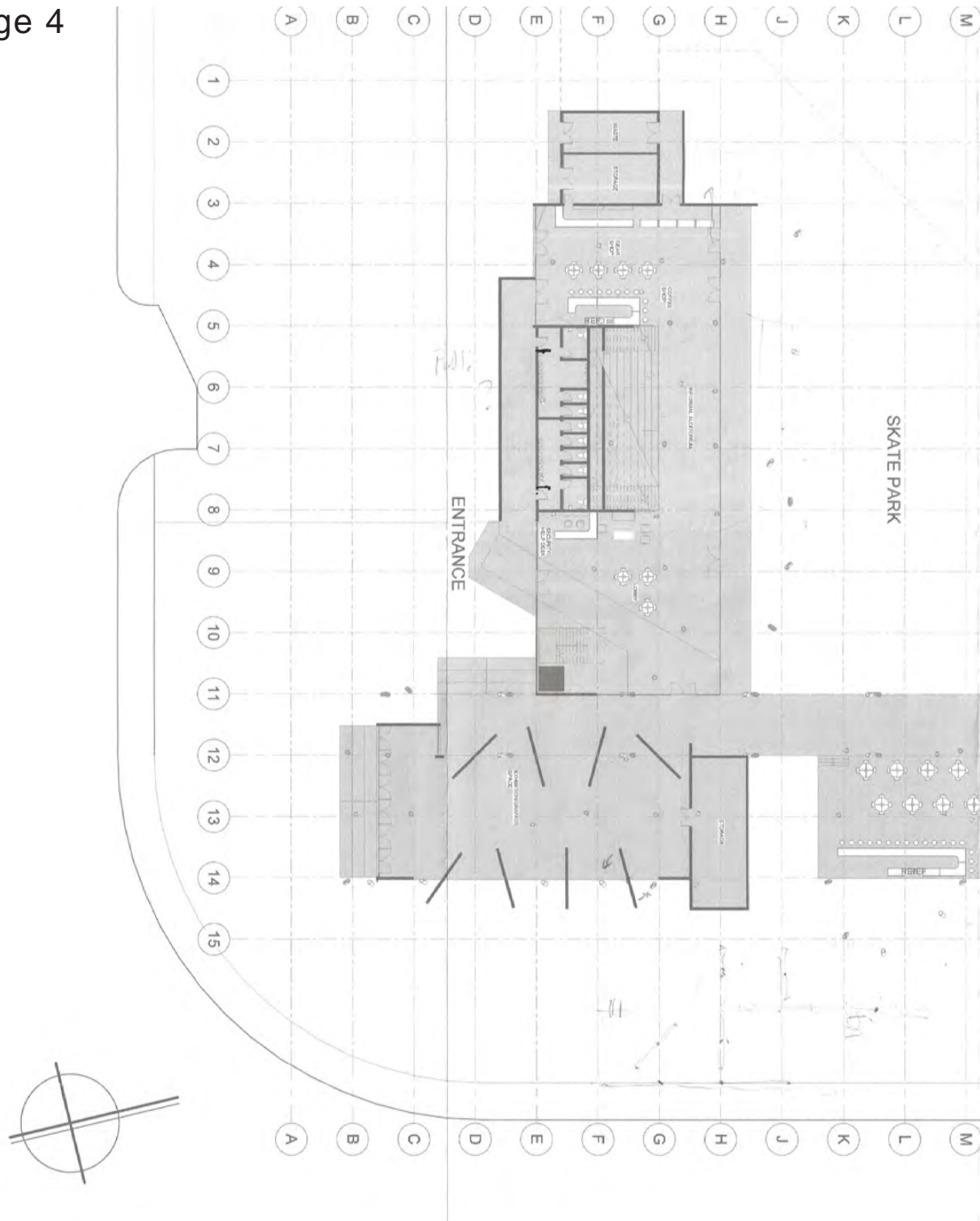
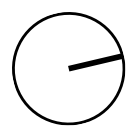
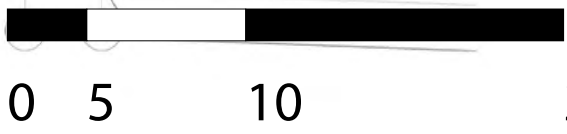
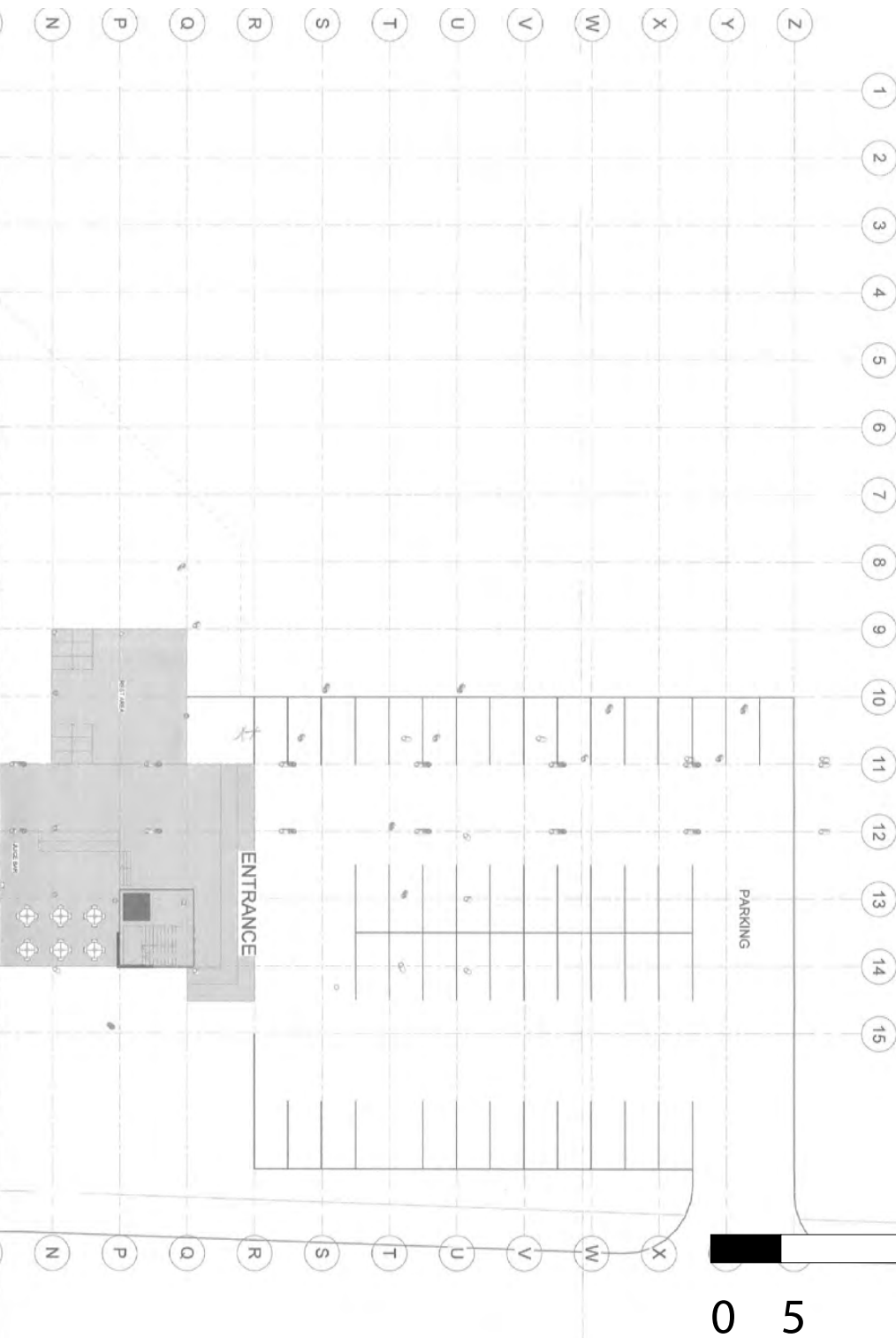


Figure 67: Ground floor p



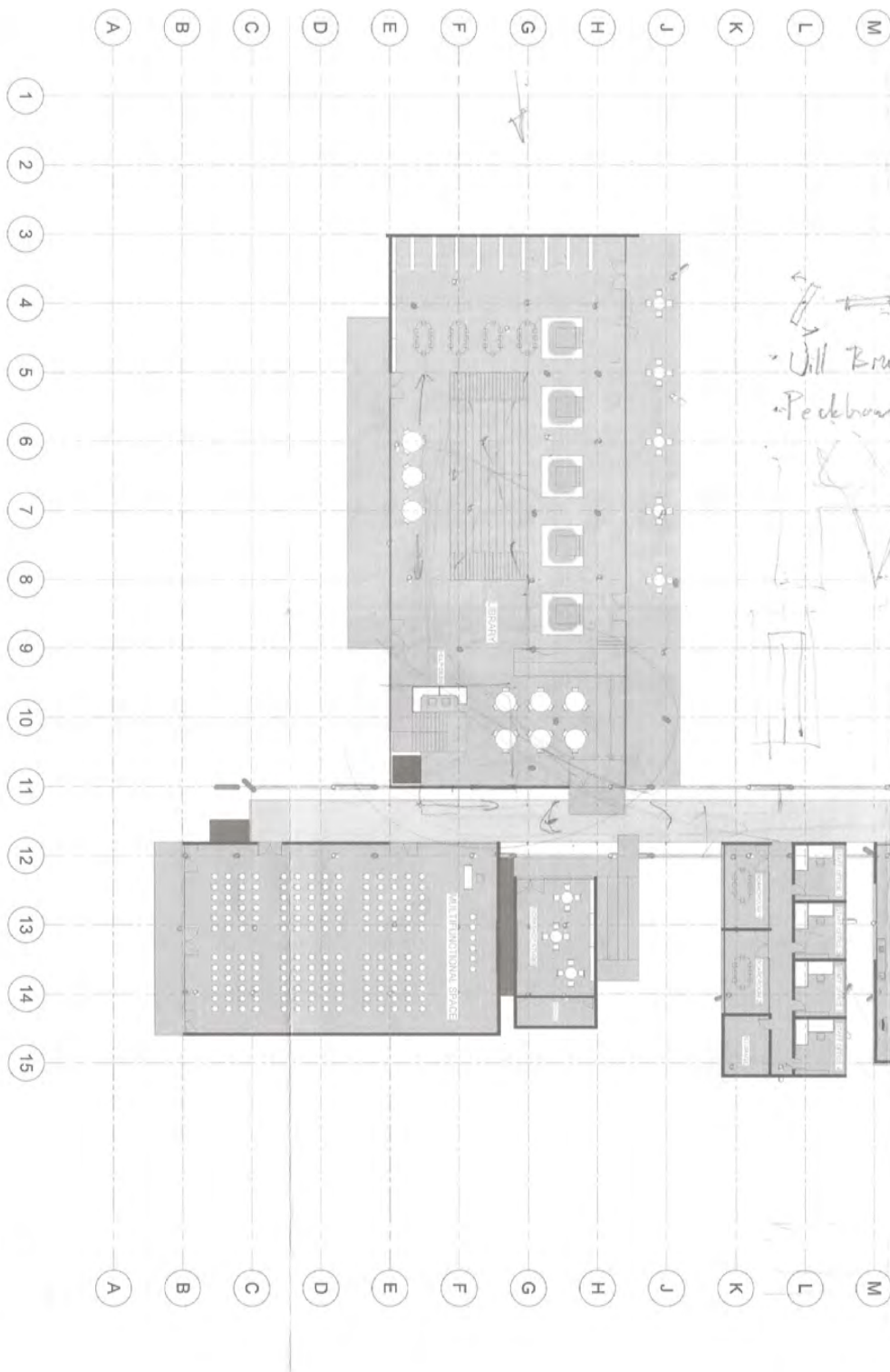
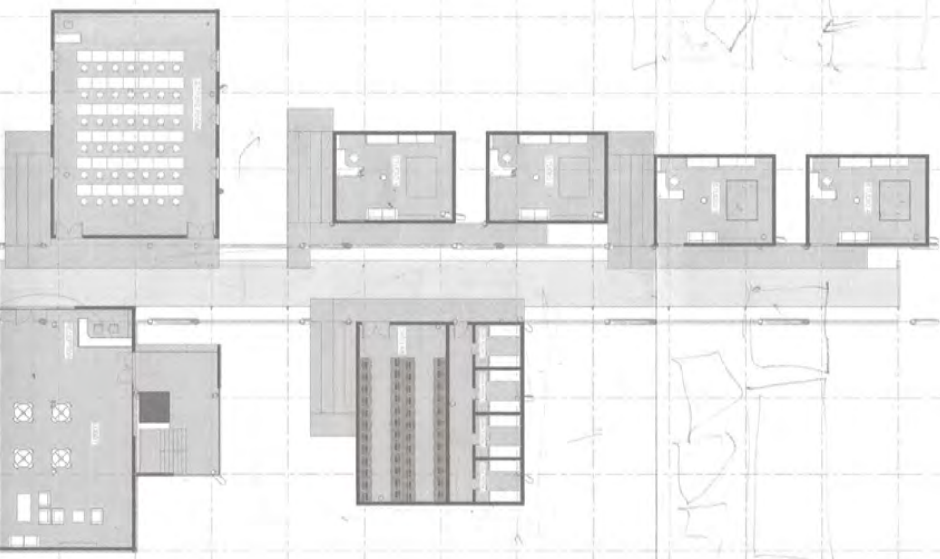


Figure 68: First floor plan

N P Q R S T U V W X Y Z

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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Library.

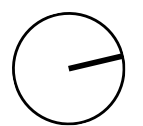


Edment

N P Q R S T U V W X



0 5 10 20



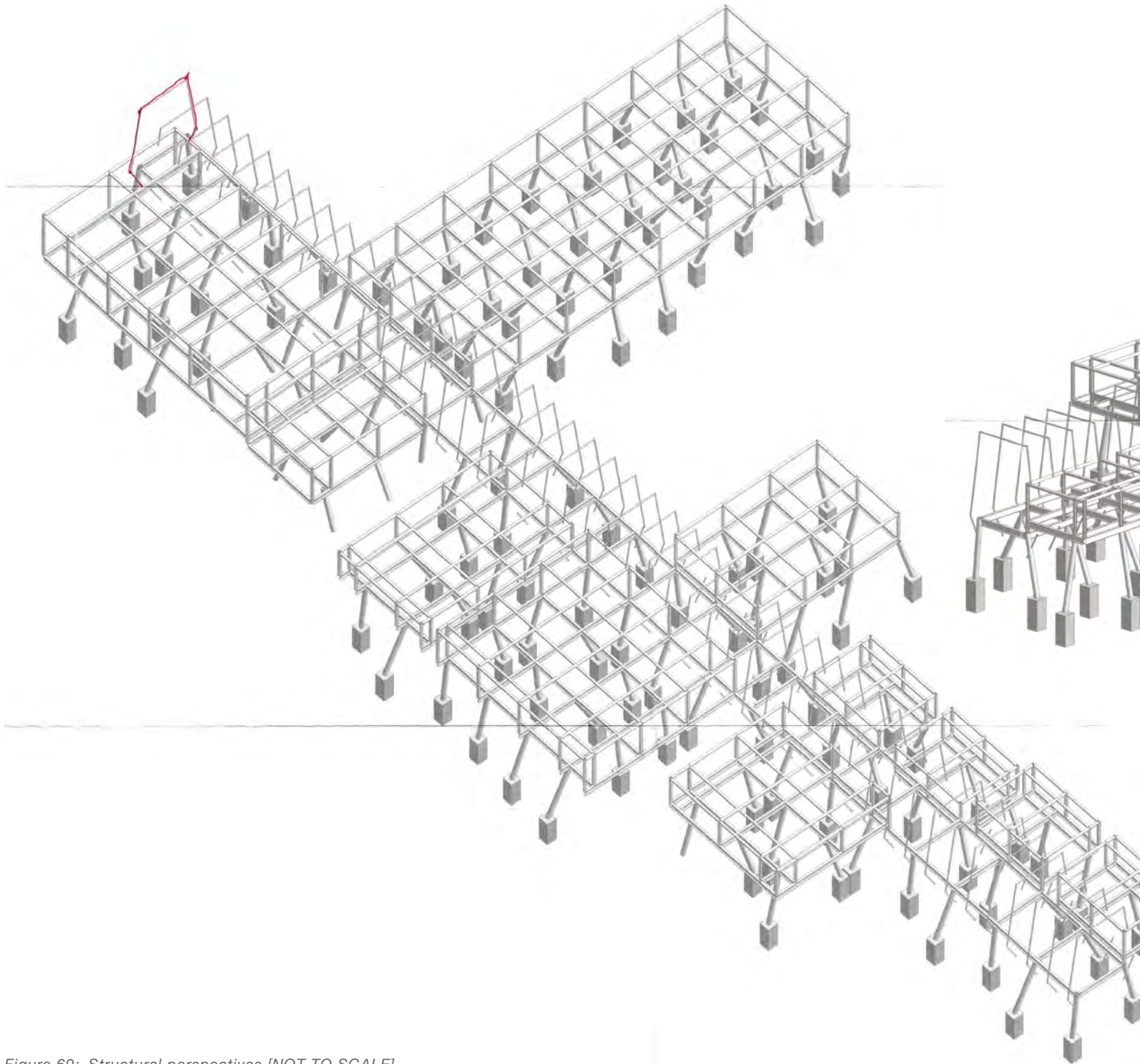
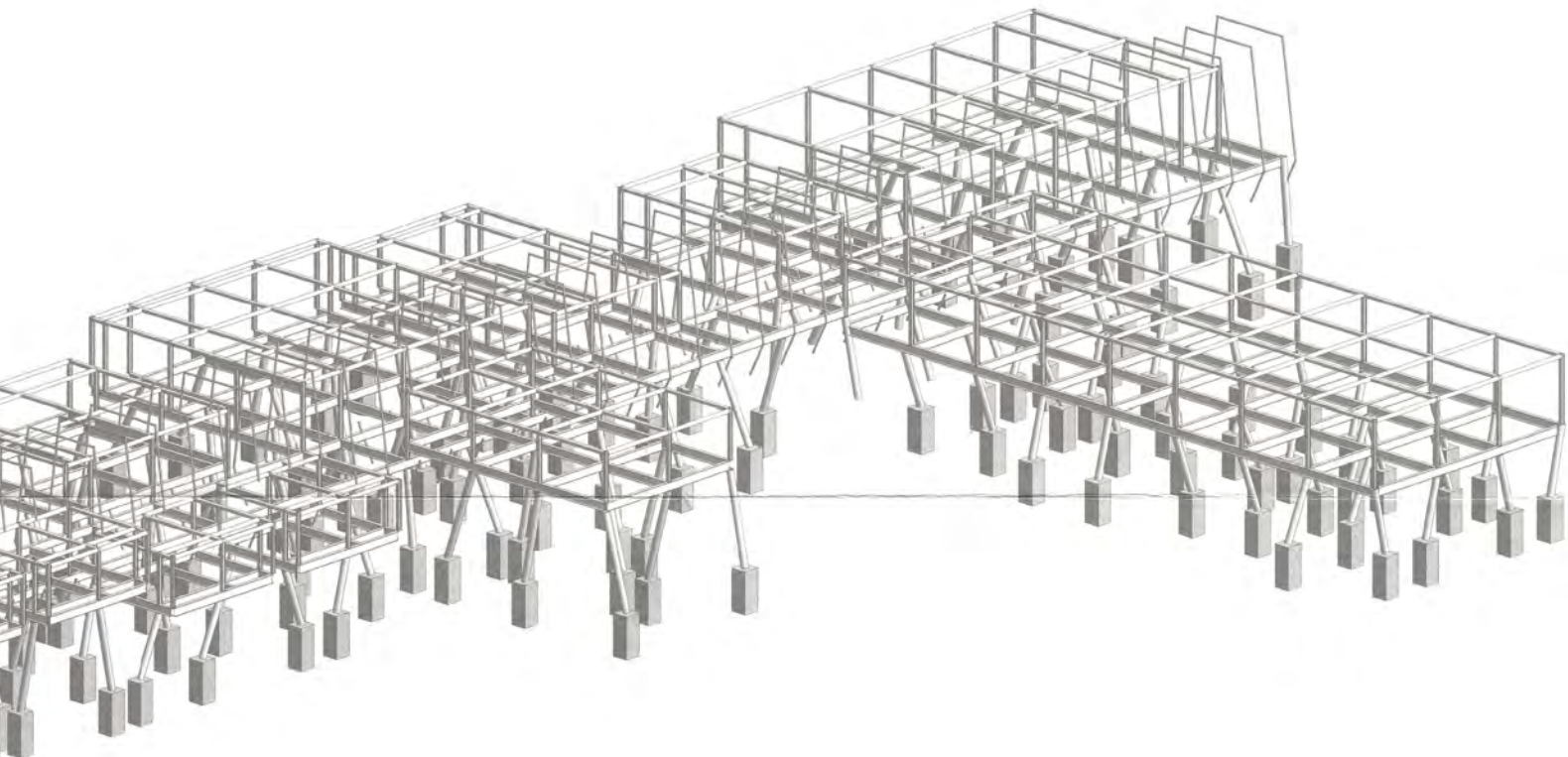


Figure 69: Structural perspectives [NOT TO SCALE].



Development Stage 5

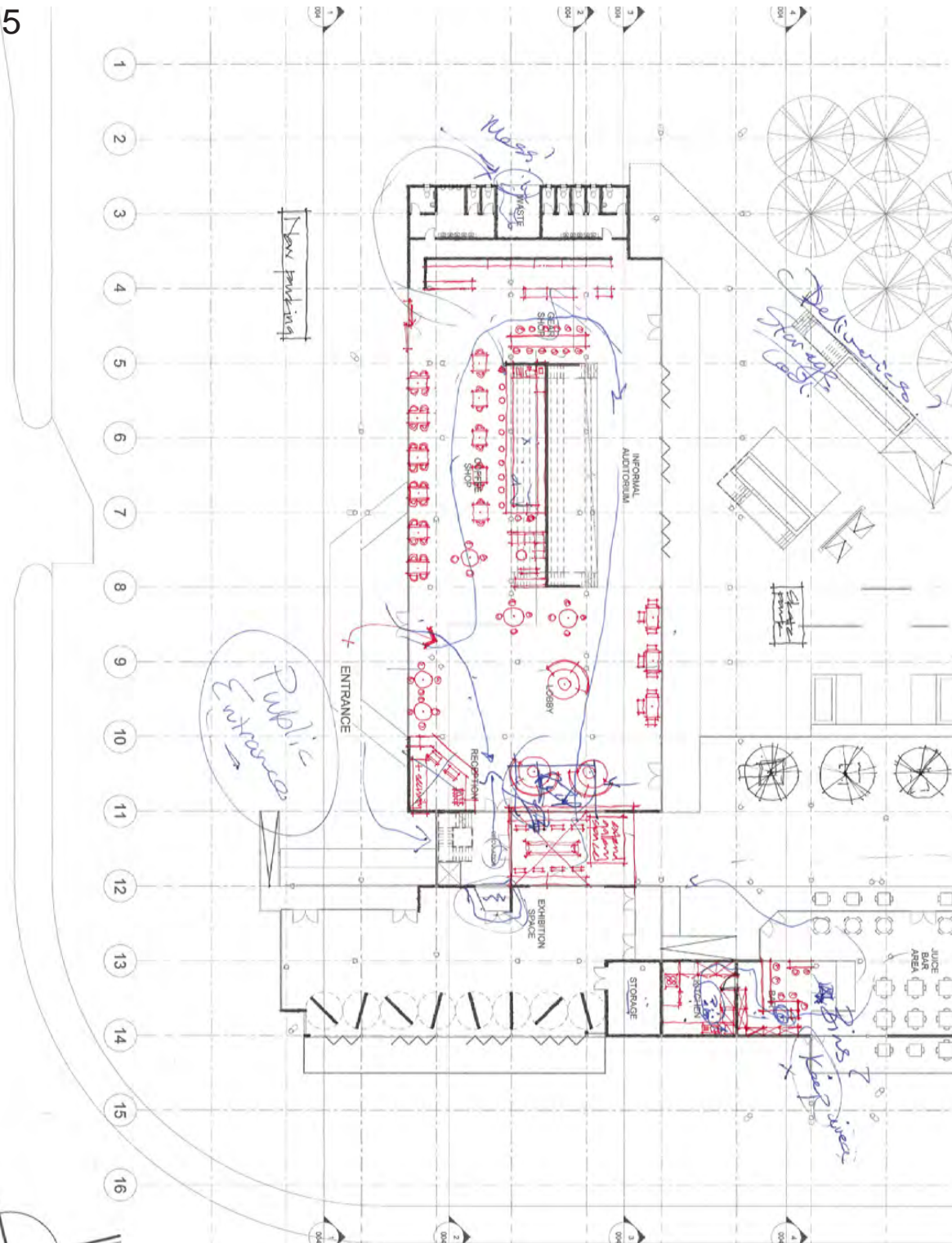
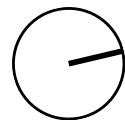
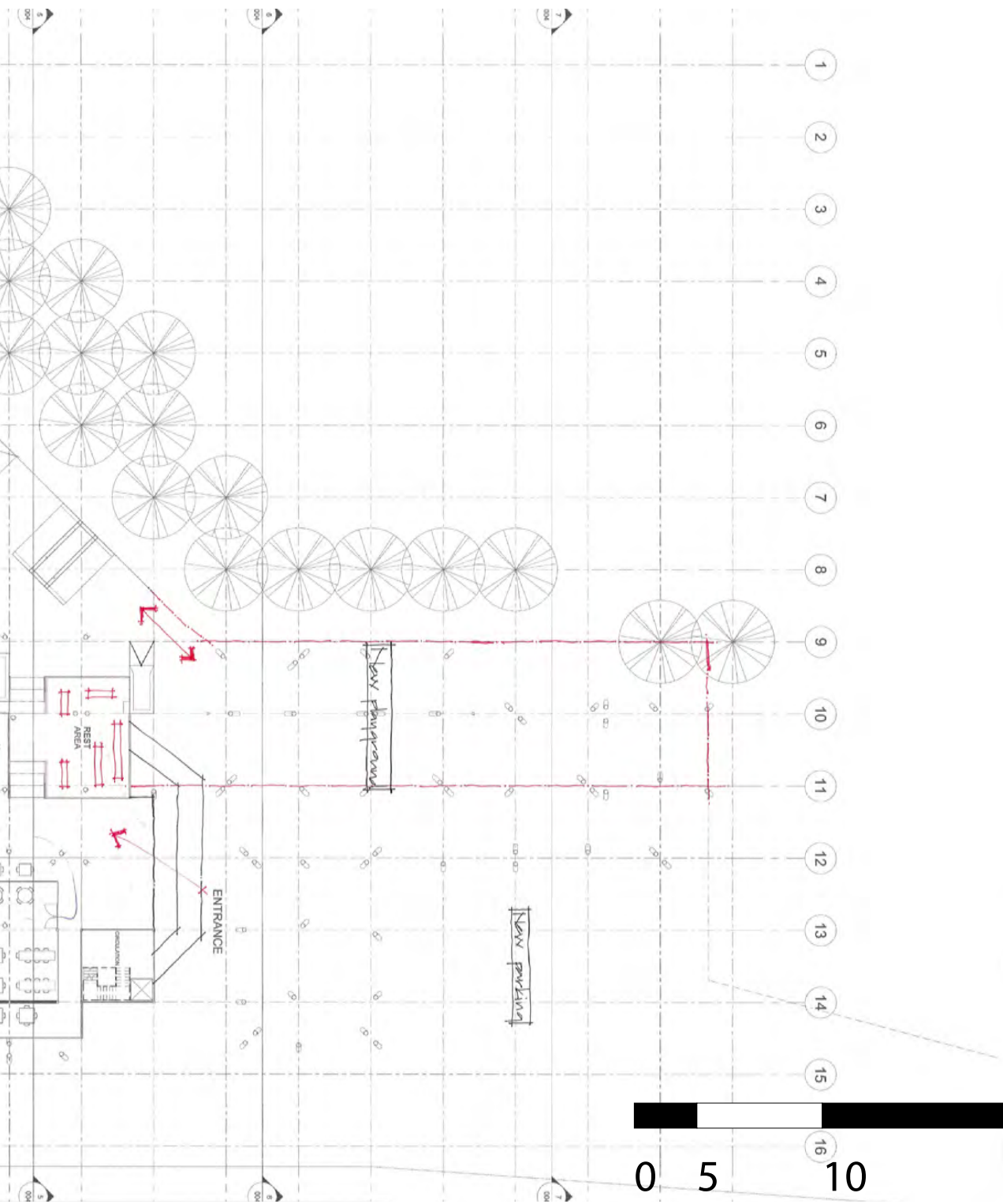
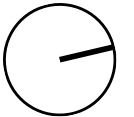
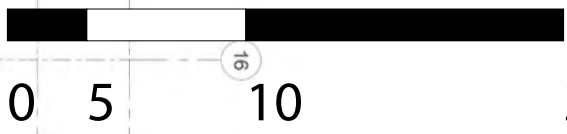
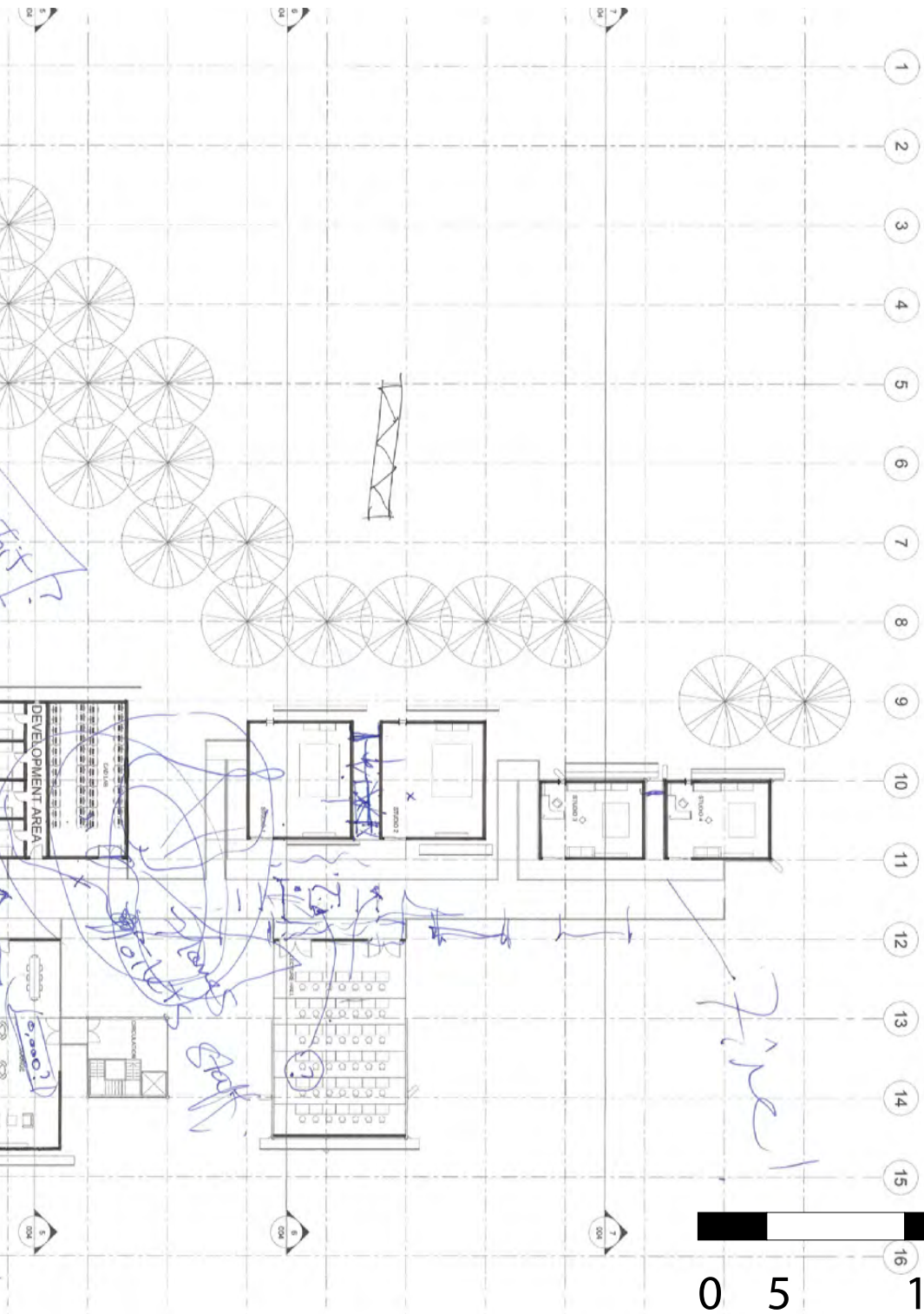


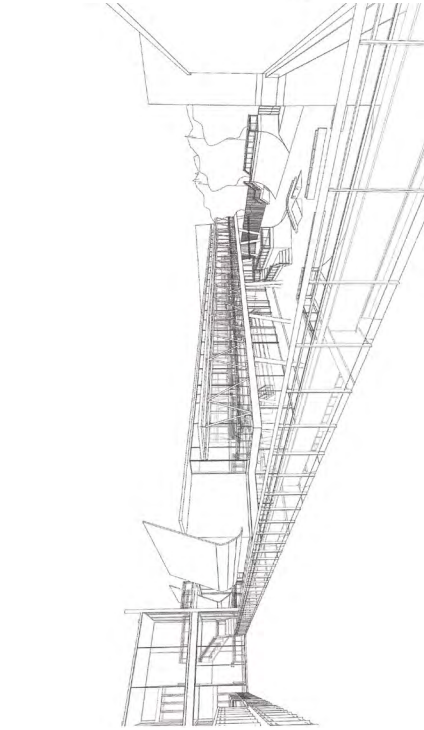
Figure 70: Ground floor plan.



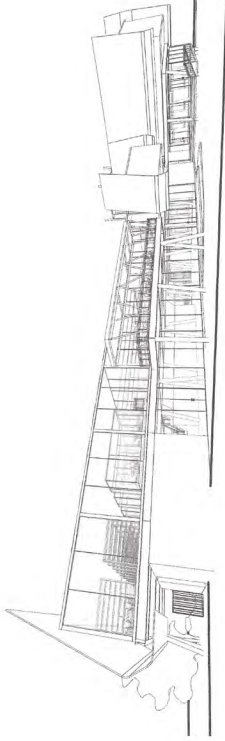




View 1

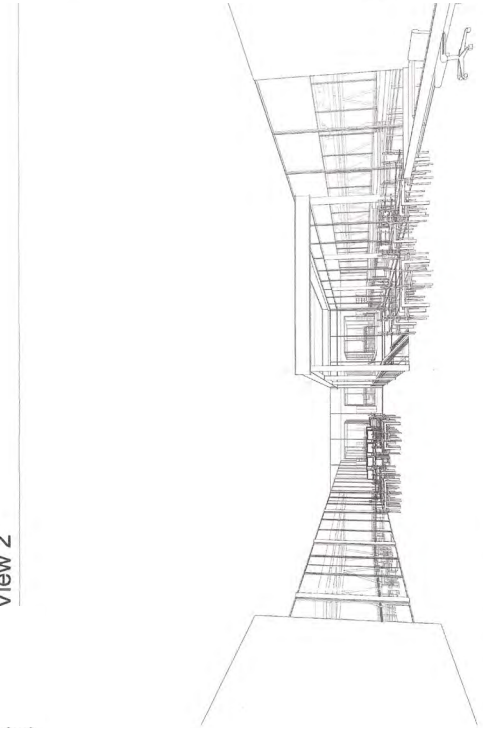


View 2

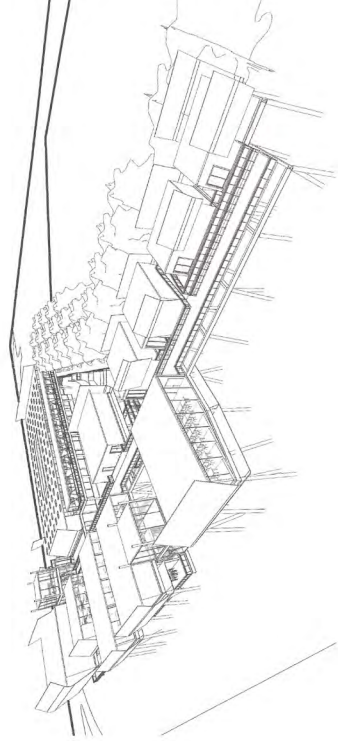


Enscape View 6

6

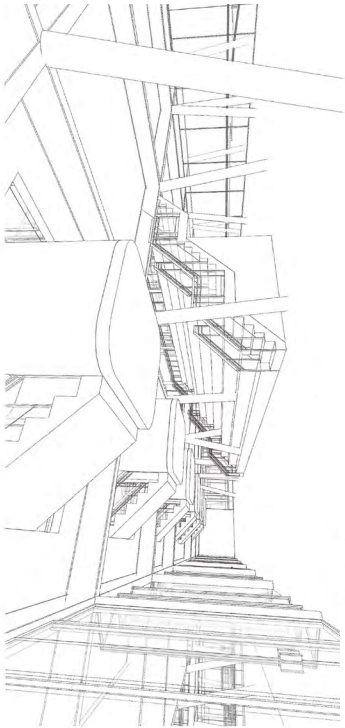


View 3

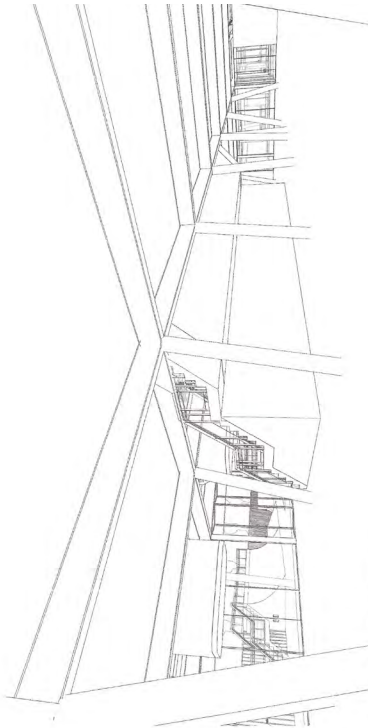


Enscape View 7

7



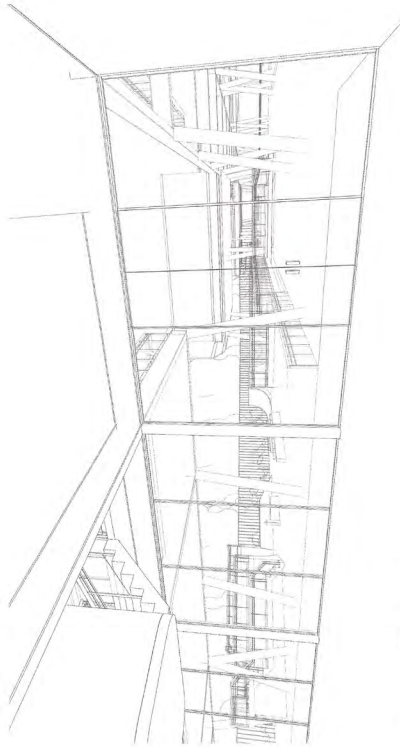
View 4



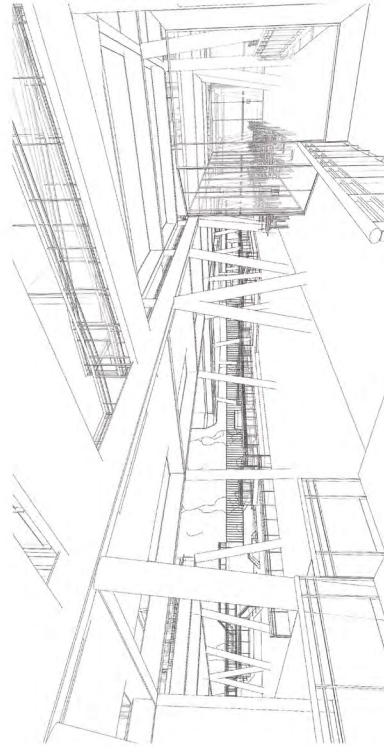
View 5



View 8



View 9



View 10

Figure 72: Building perspectives 1 to 10 [NOT TO SCALE].

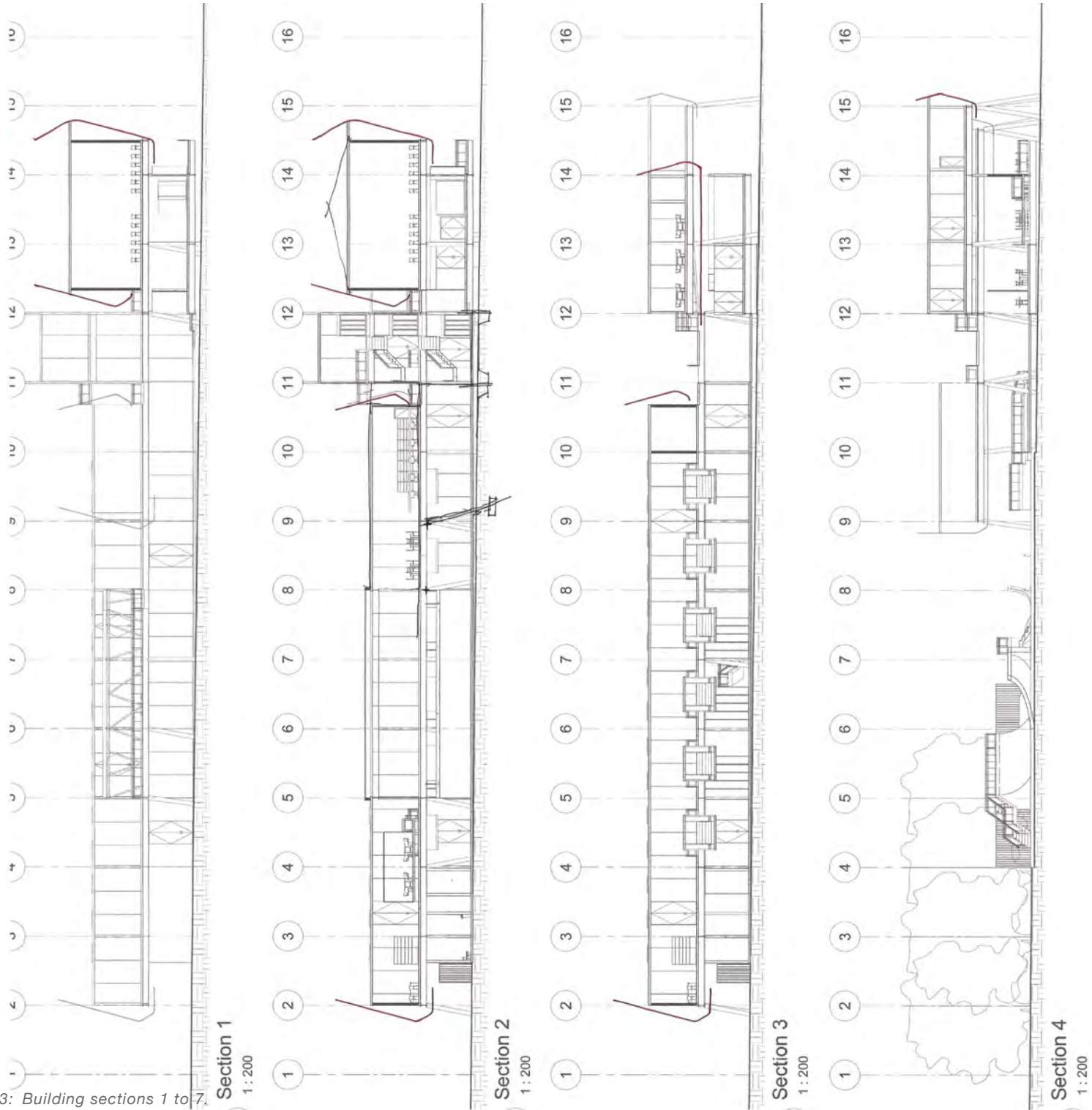
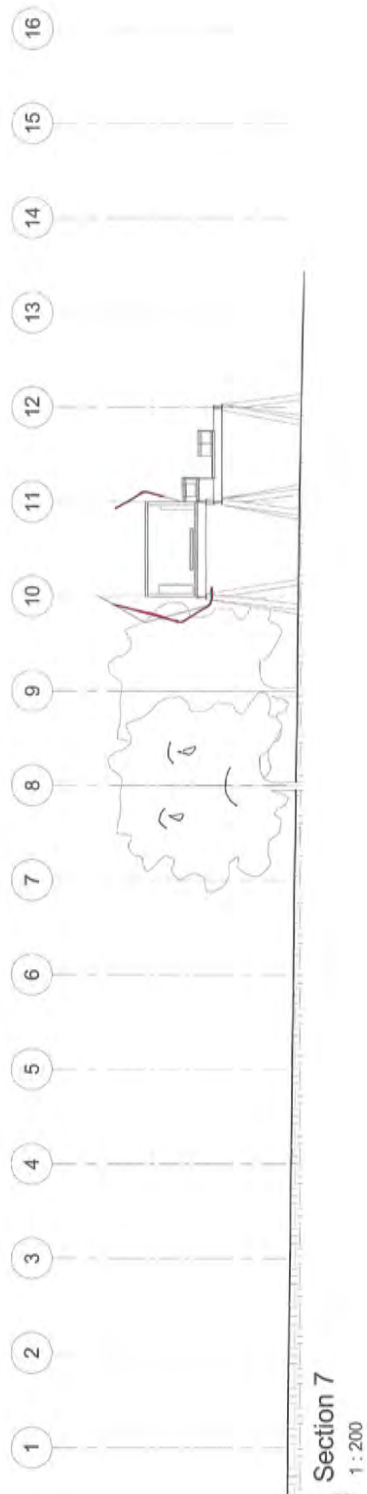
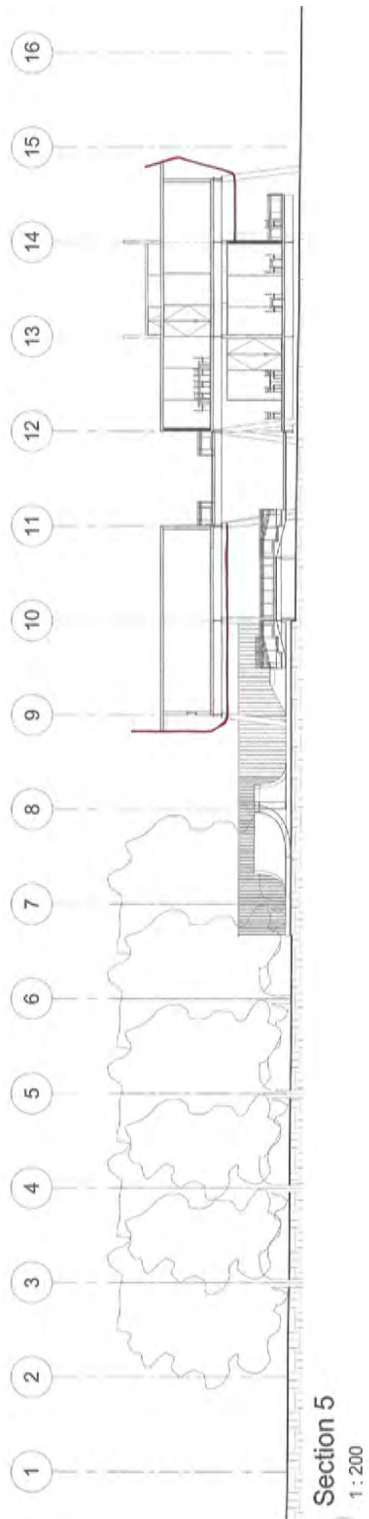


Figure 73: Building sections 1 to 4.



0 5 10 20

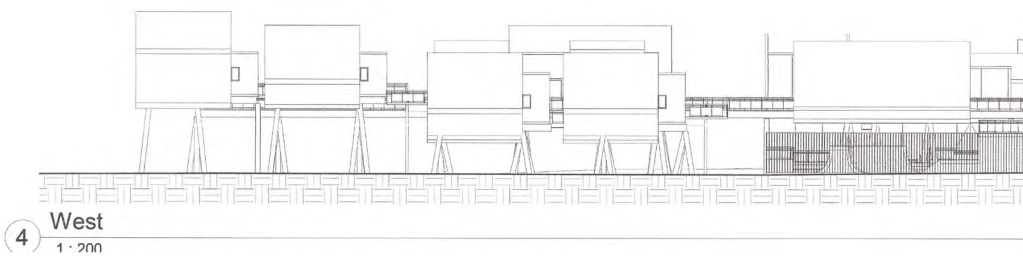
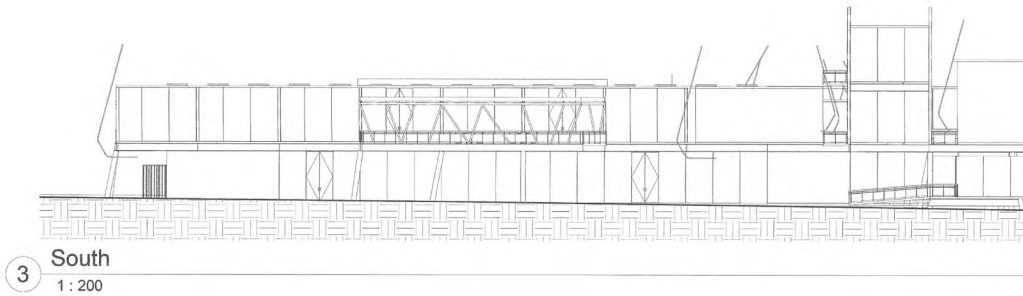
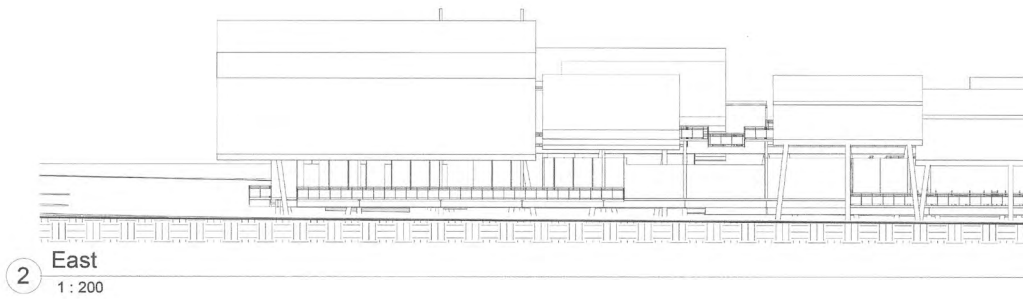
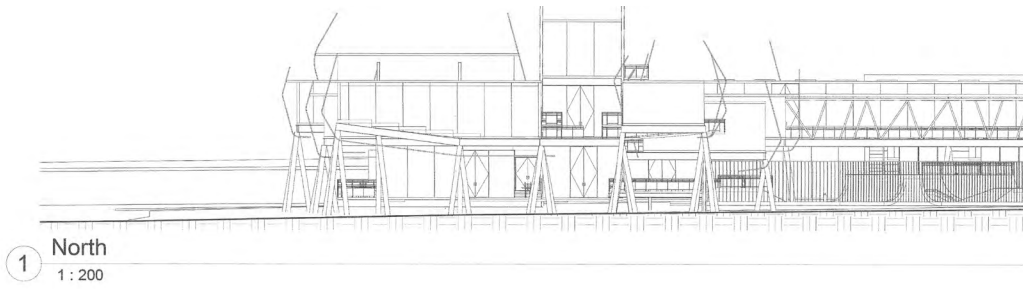
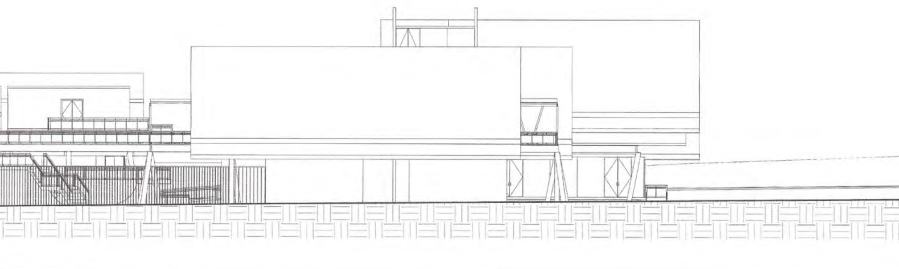
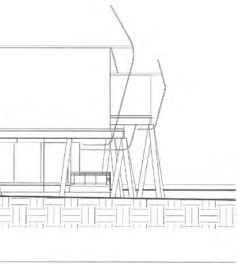
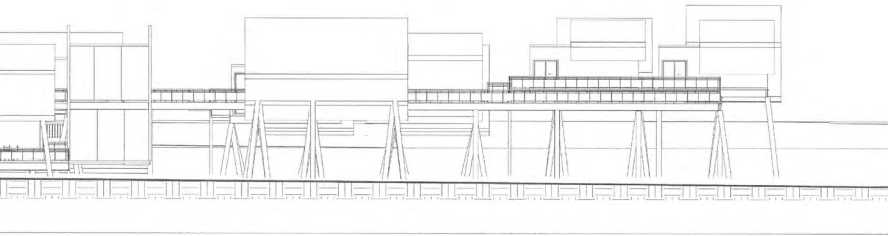
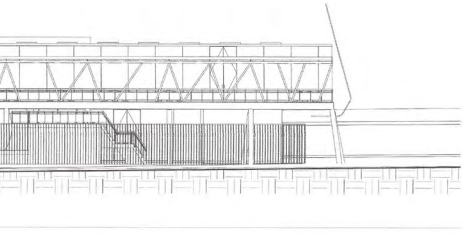


Figure 74: Building elevations.



Development Stage 6

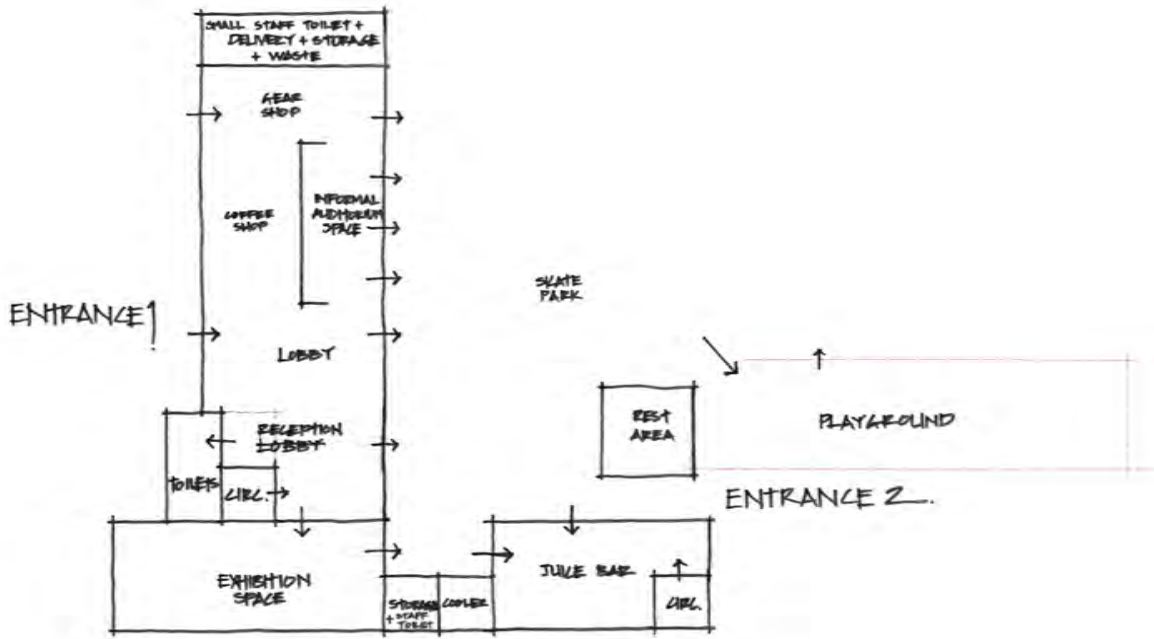
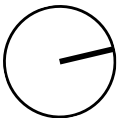
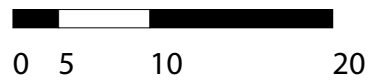


Figure 75: Ground floor plan.



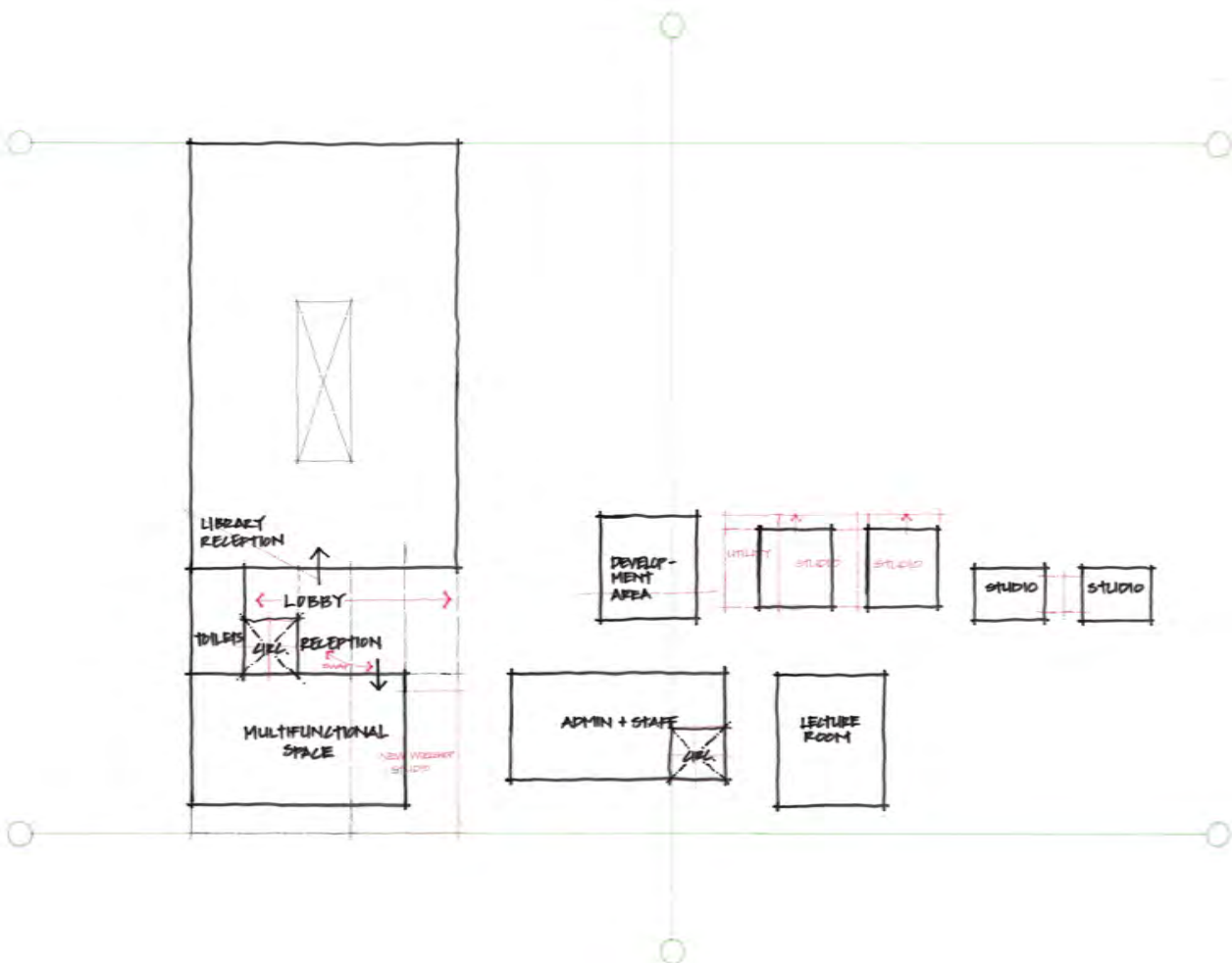
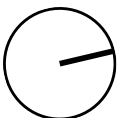
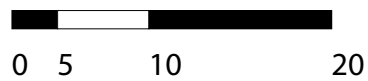


Figure 76: First floor plan.



Development Stage 7

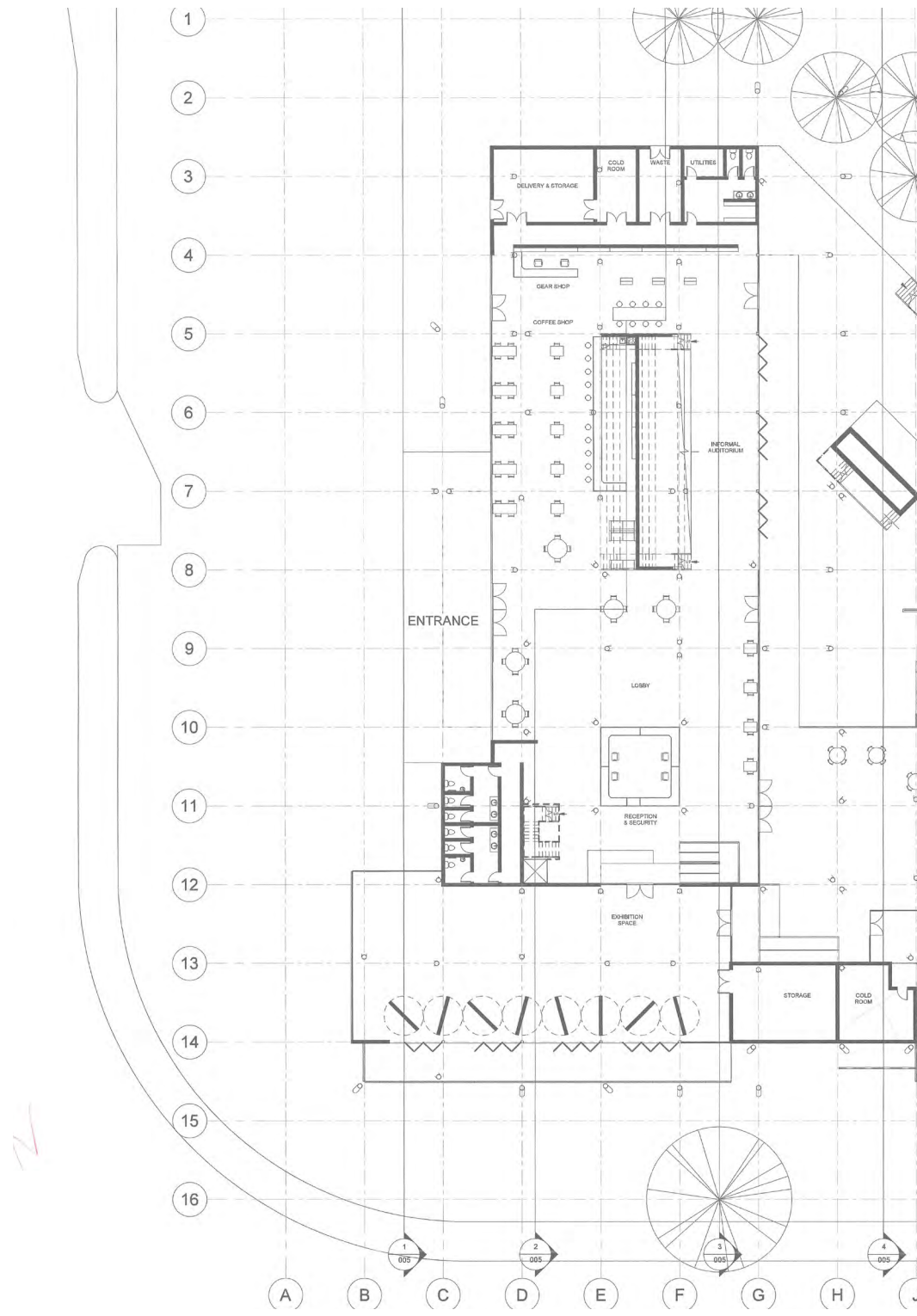
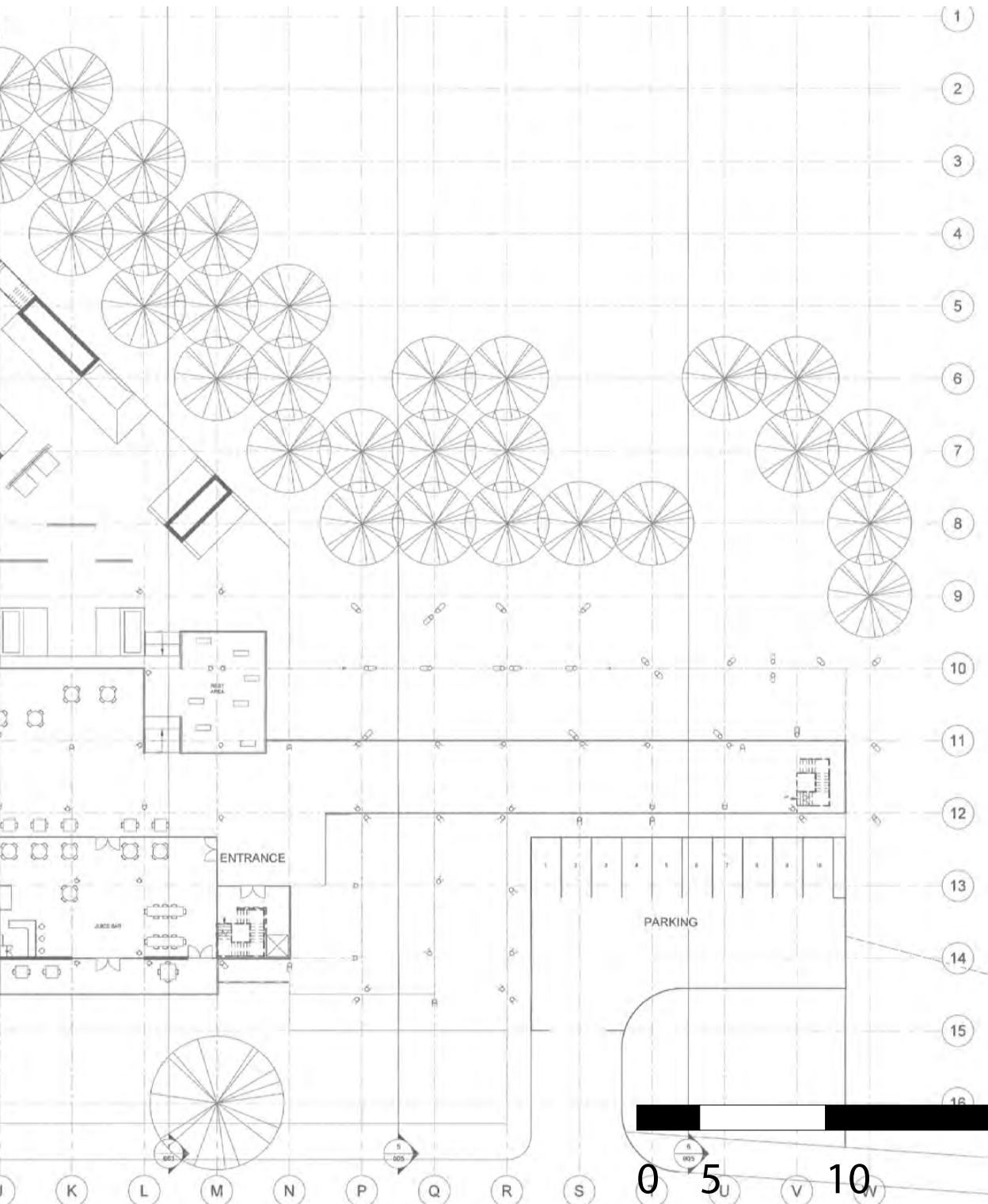


Figure 77: Ground floor plan.



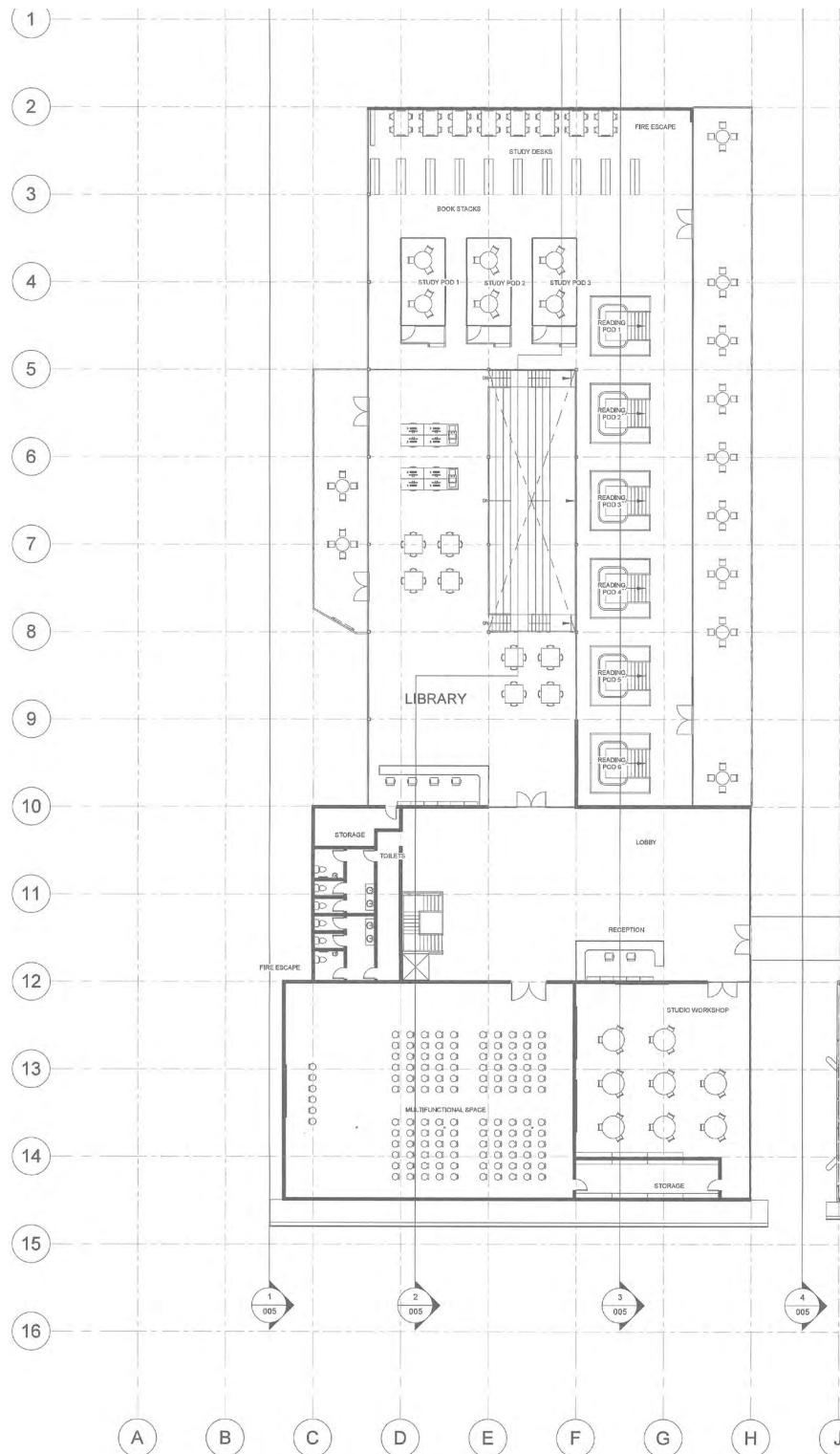
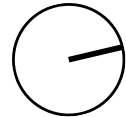
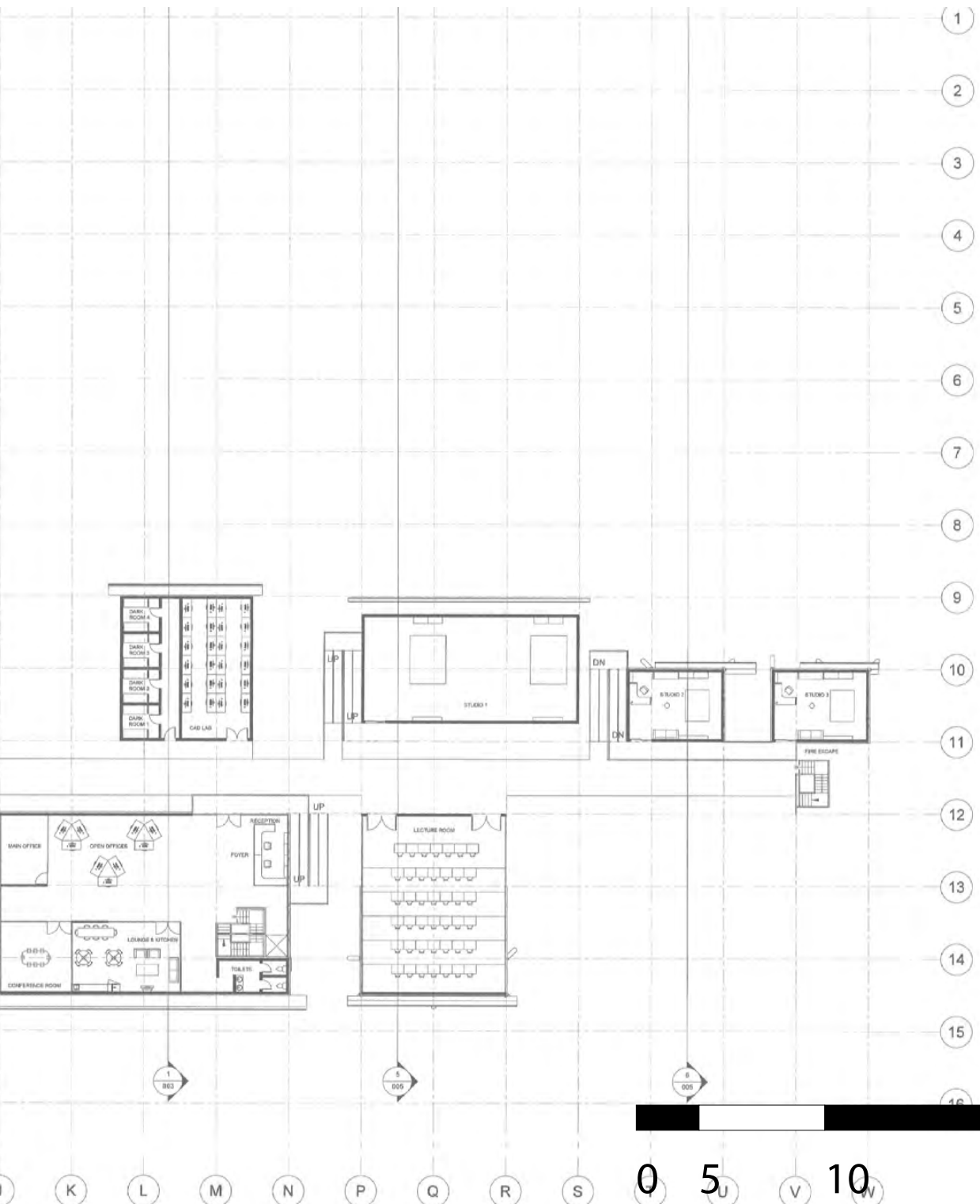


Figure 78: First floor plan.



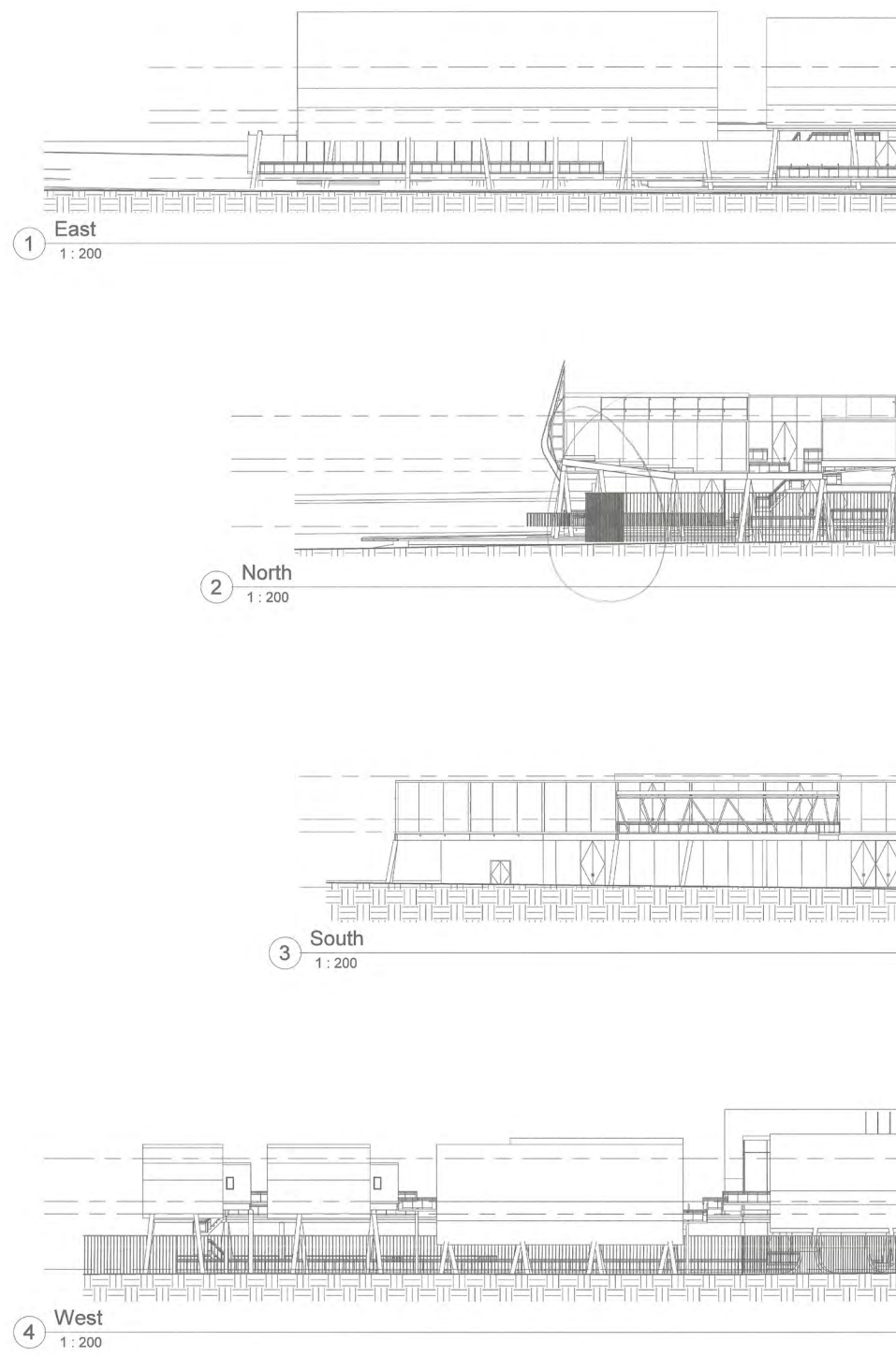
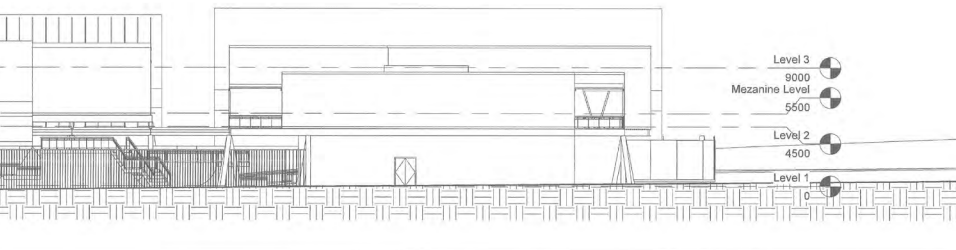
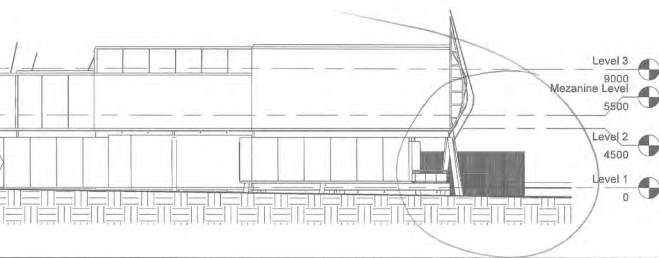
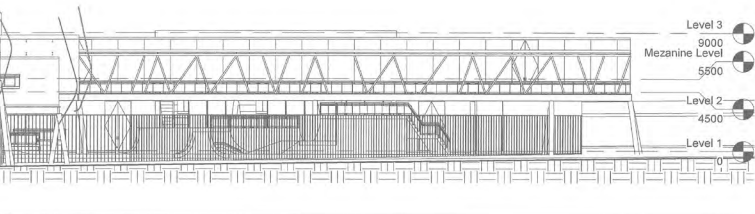
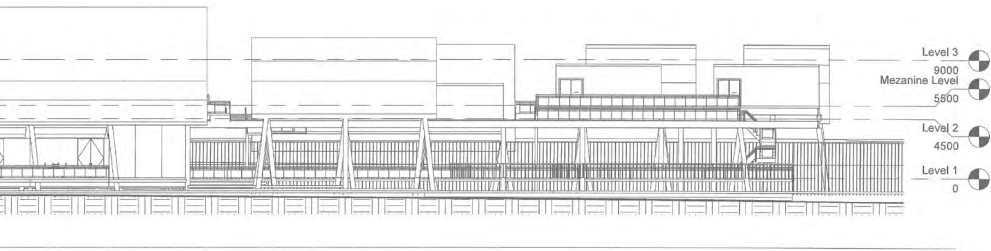


Figure 79: Building elevations.



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Figure 80: Exterior perspective of the proposed design.





Figure 81: Exterior perspective of the proposed design.





Figure 82: Interior perspective of the proposed design.





Figure 83: Interior perspective of the proposed design.



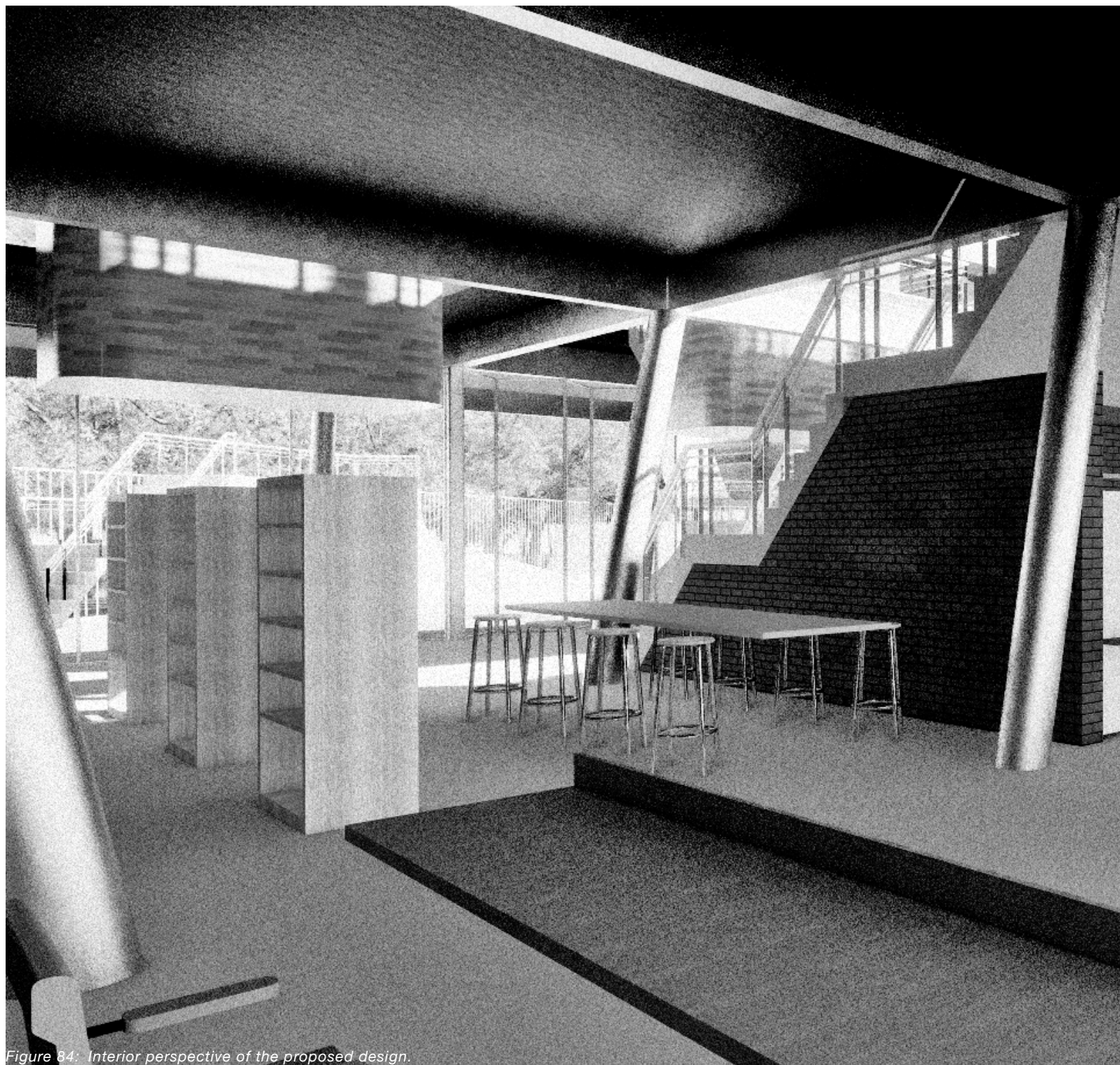


Figure 84: Interior perspective of the proposed design.

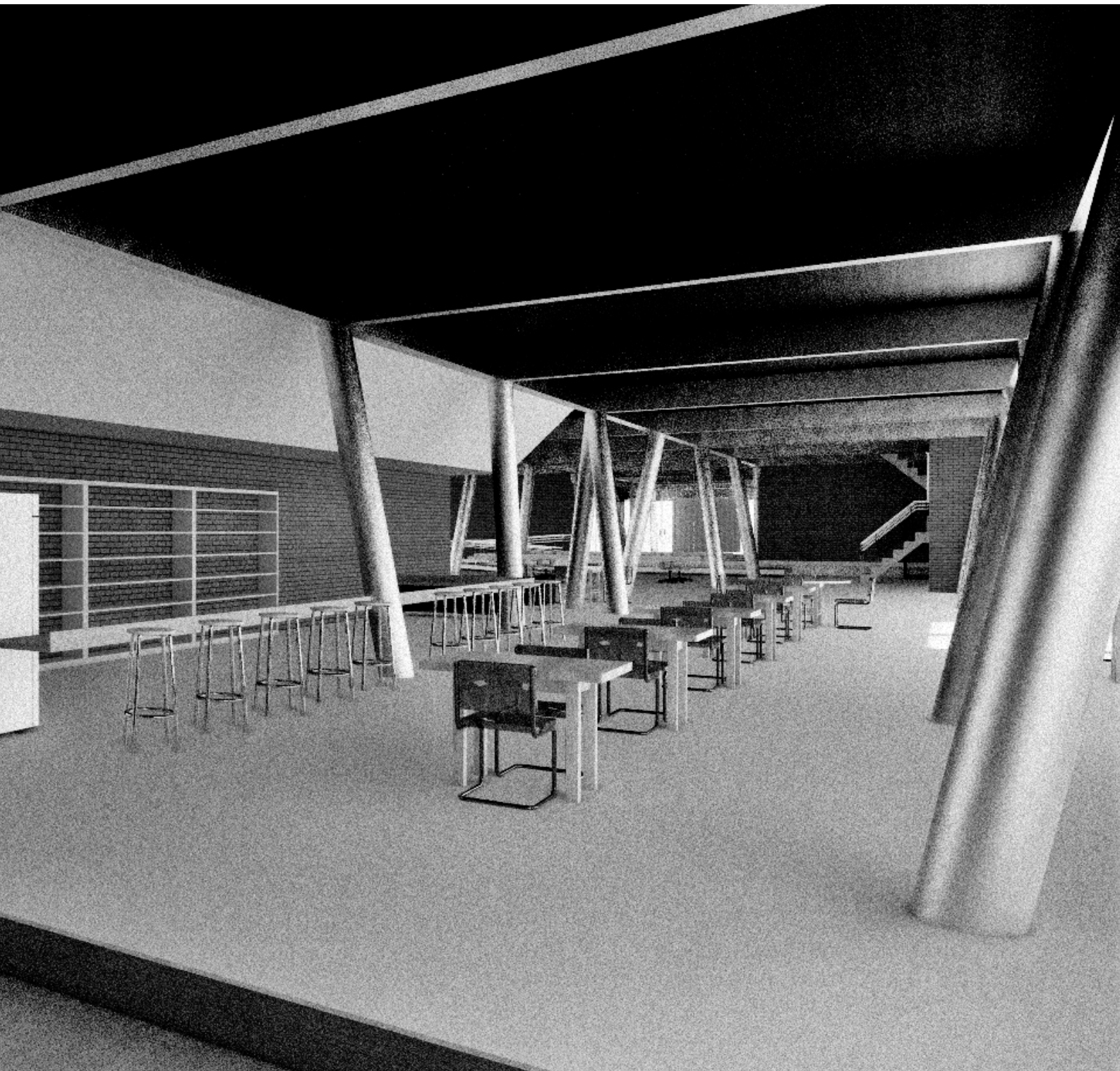




Figure 85: Exterior perspective of the proposed design.



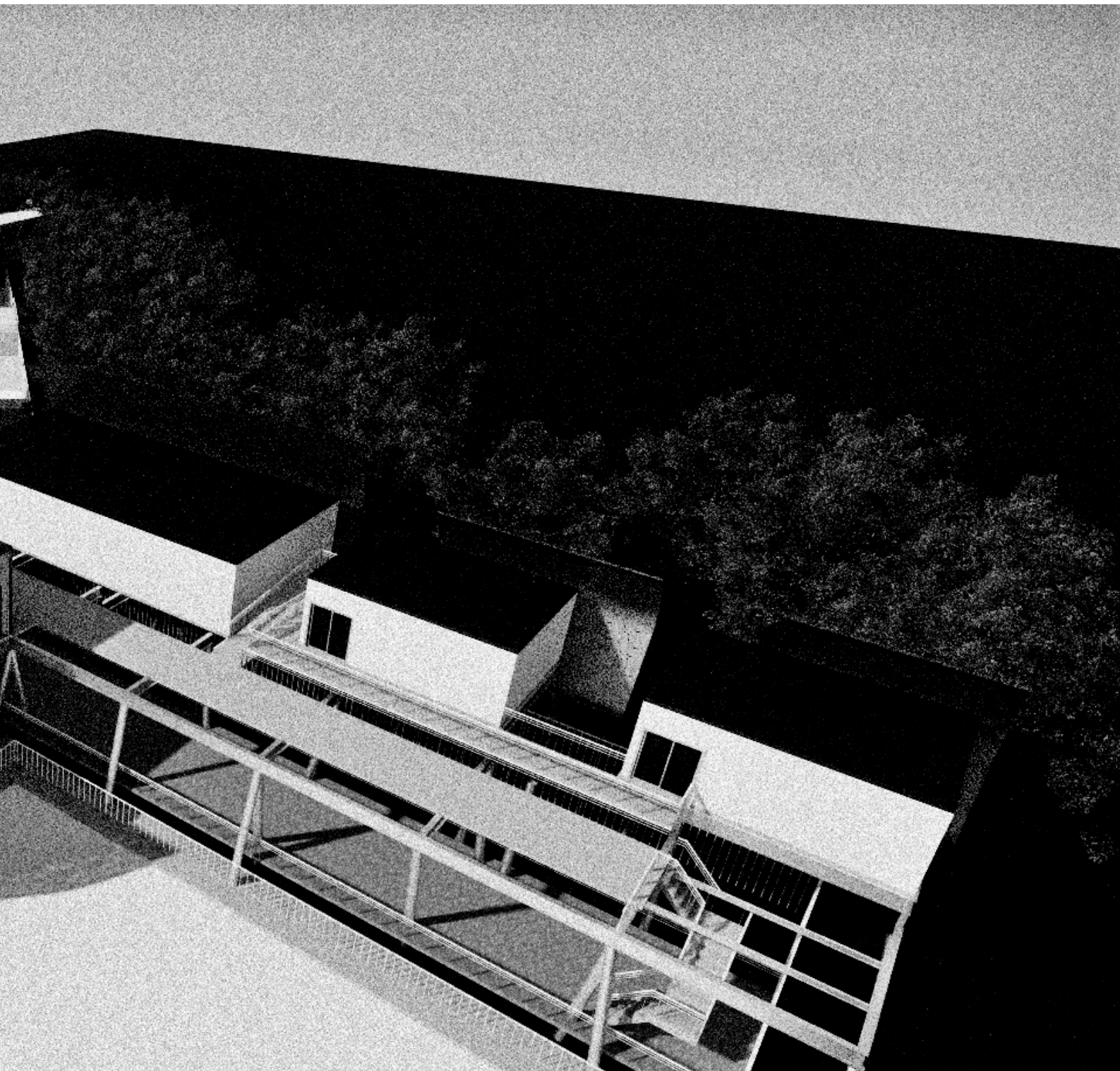


Figure 86: Exterior perspective of the proposed design.





Figure 87: Exterior perspective of the proposed design.



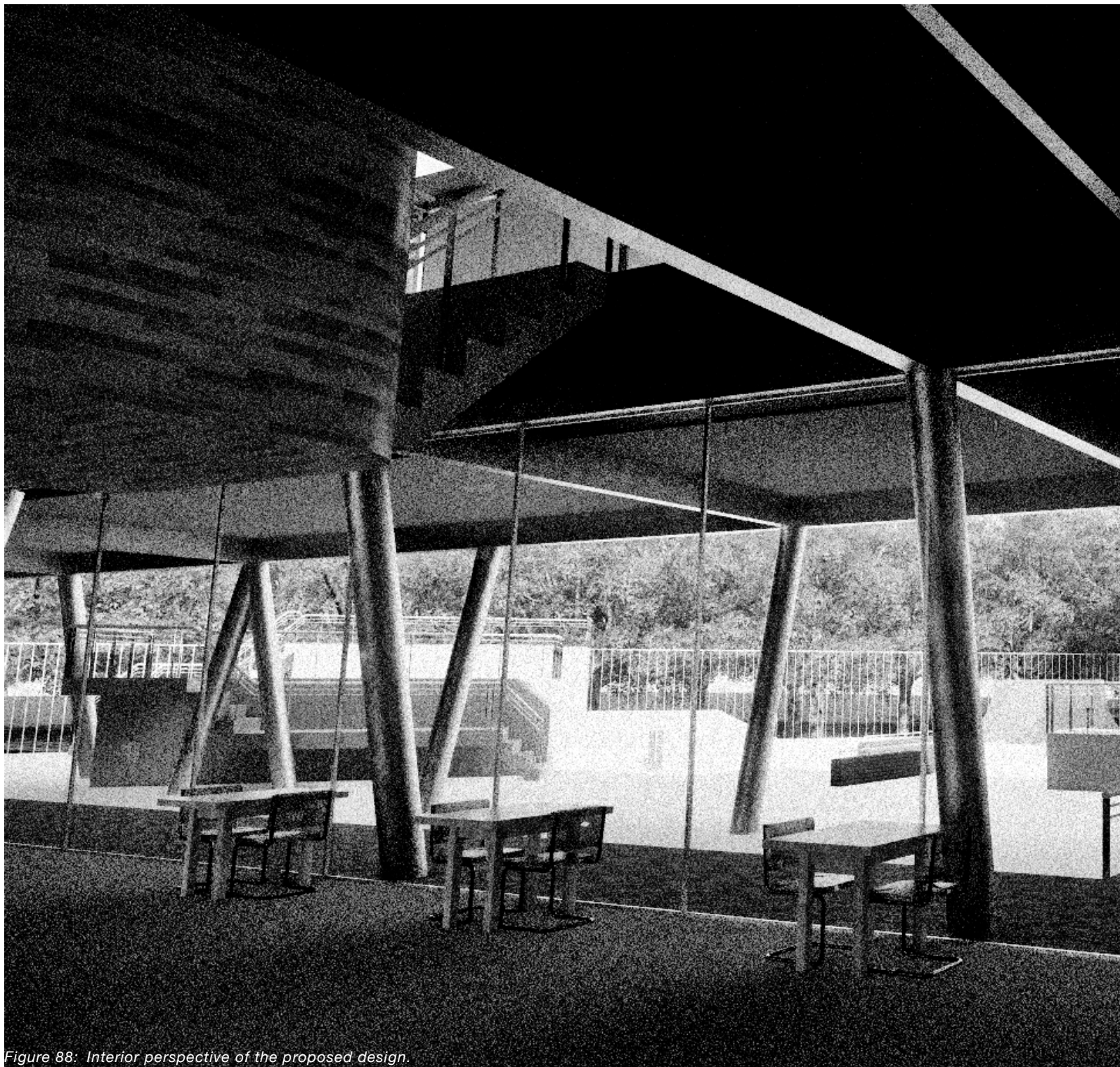


Figure 88: Interior perspective of the proposed design.





Figure 89: Interior perspective of the proposed design.



Final Design

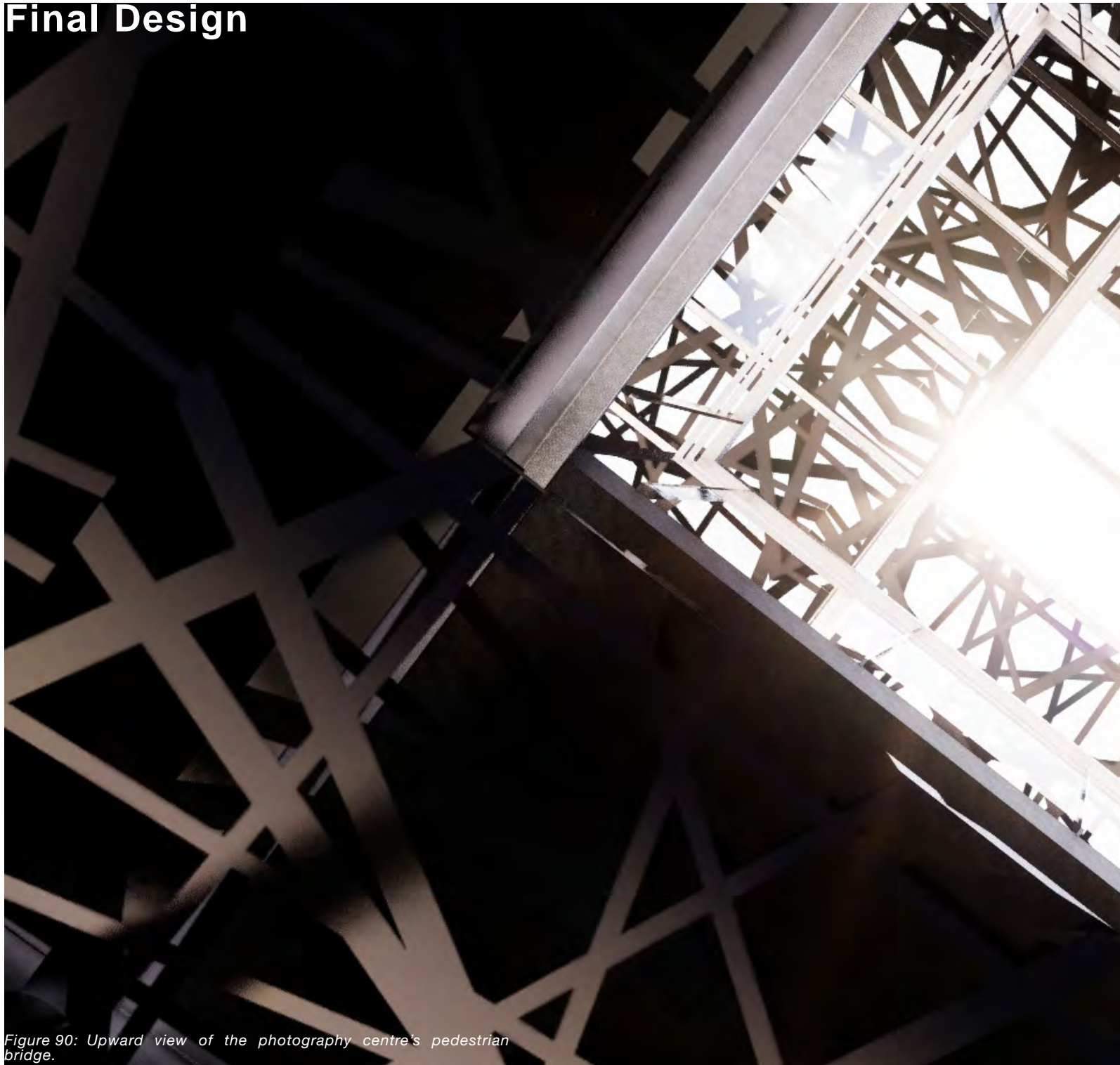


Figure 90: Upward view of the photography centre's pedestrian bridge.



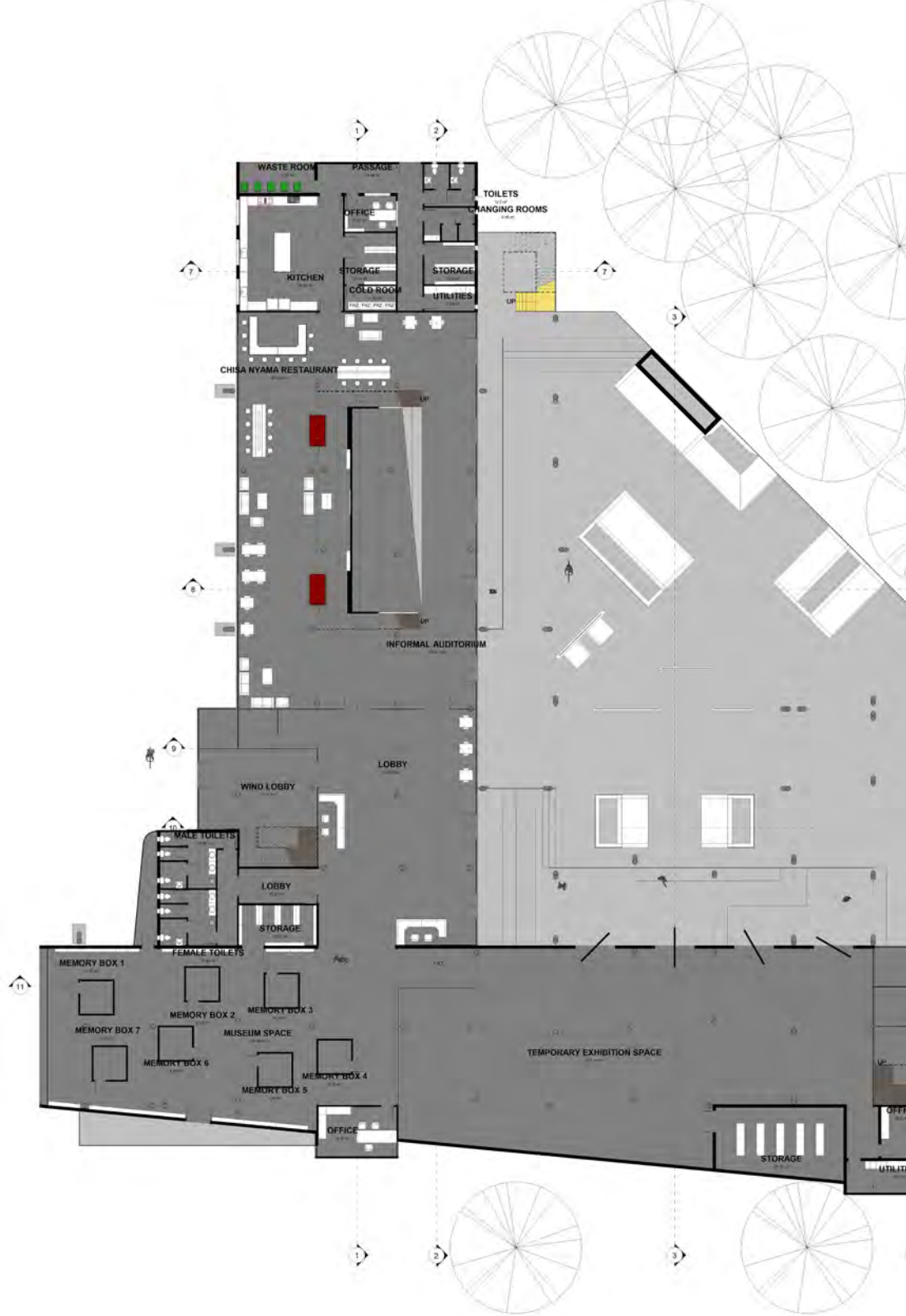


Figure 91: Ground floor plan

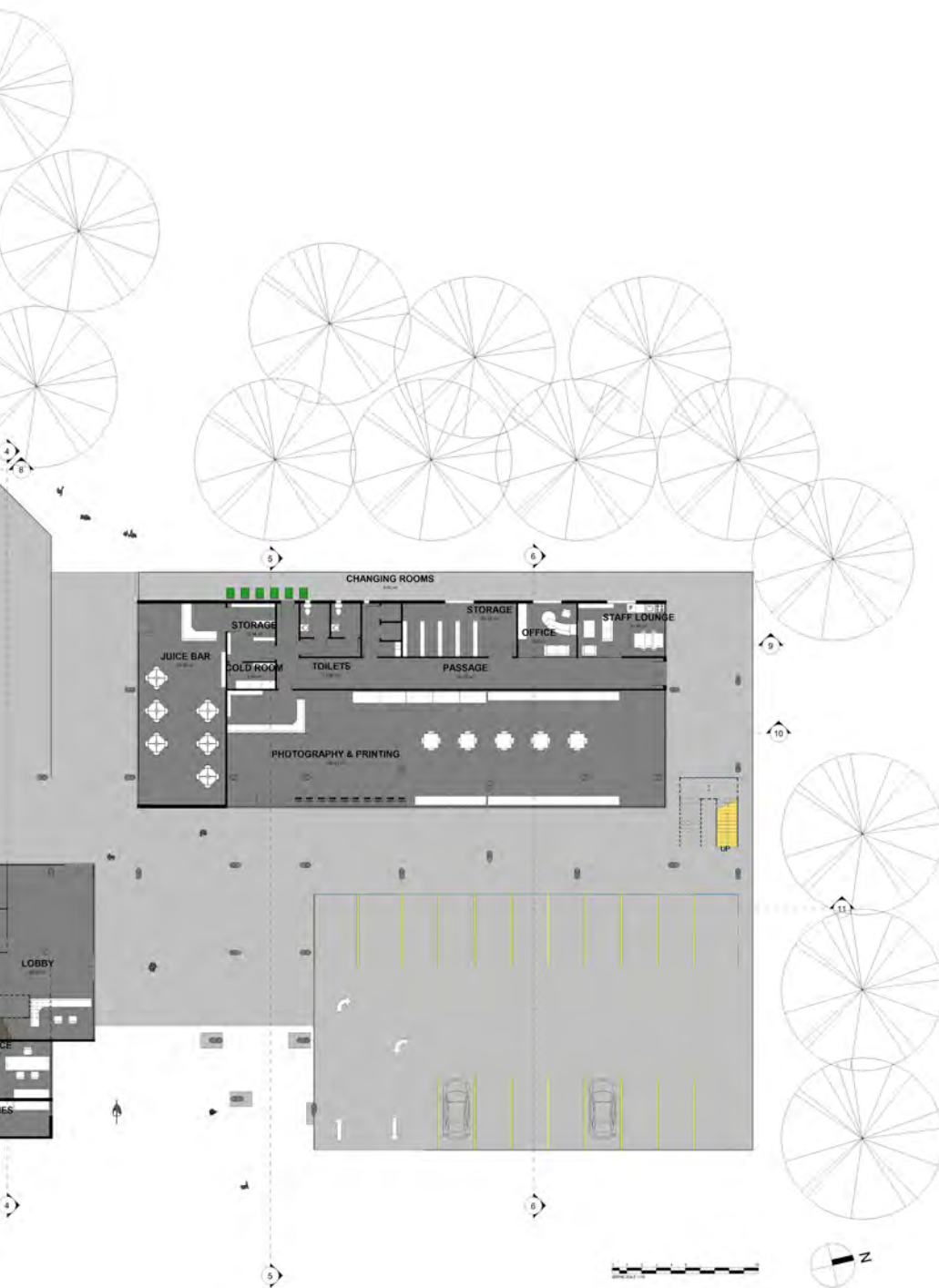
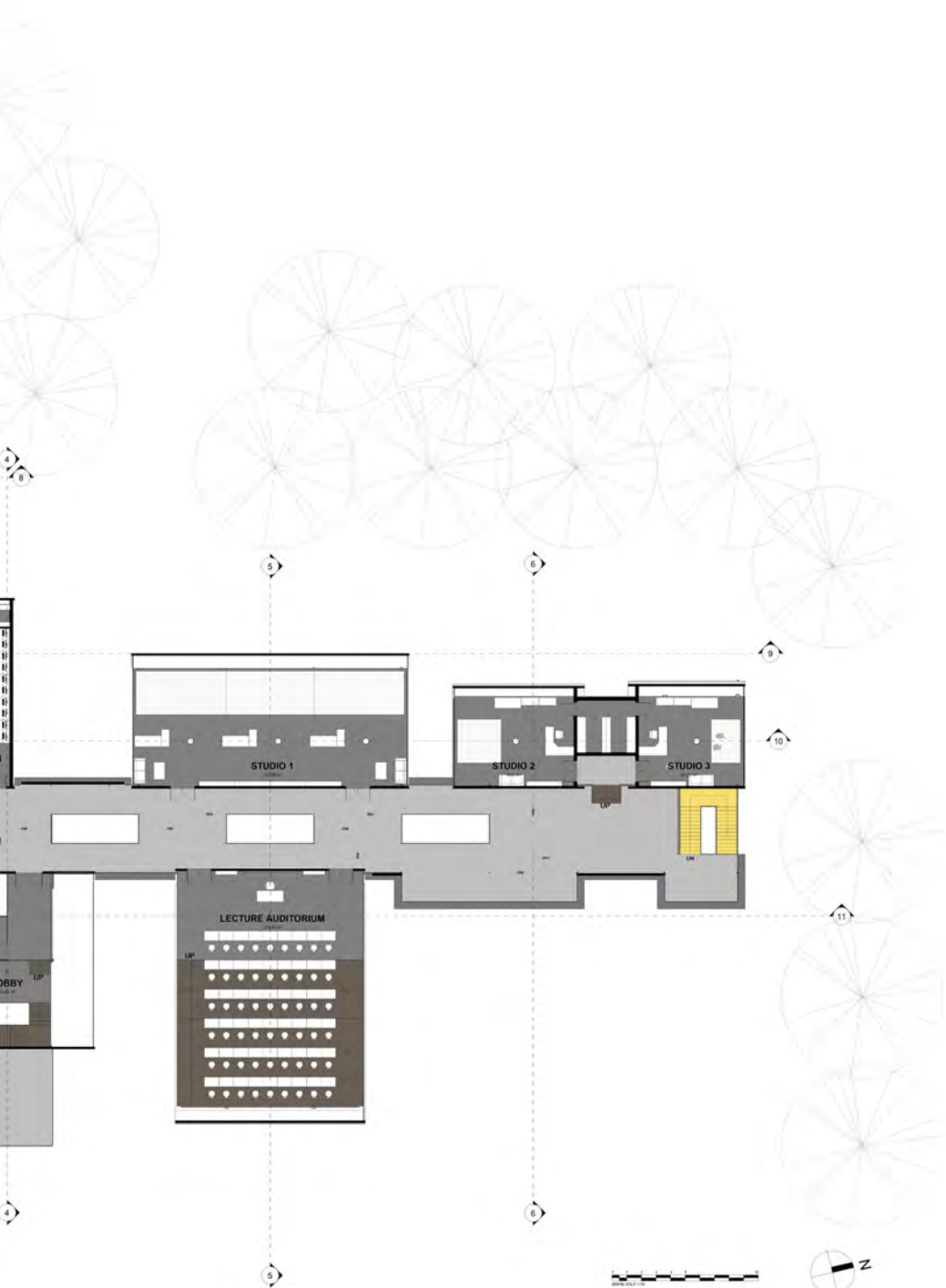




Figure 92: First floor plan



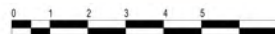
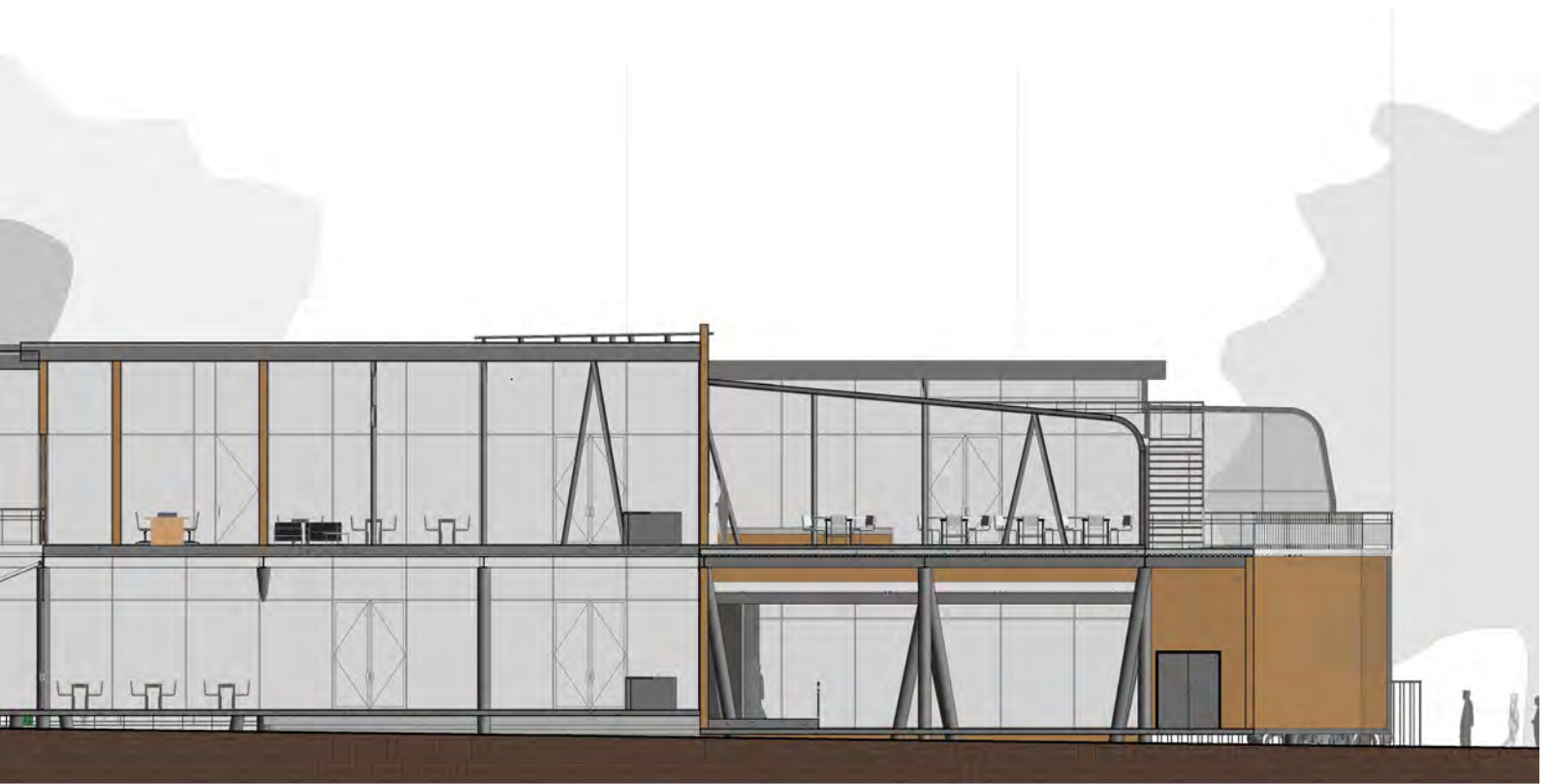


Figure 93: Section 1





Figure 94: Section 2



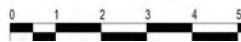
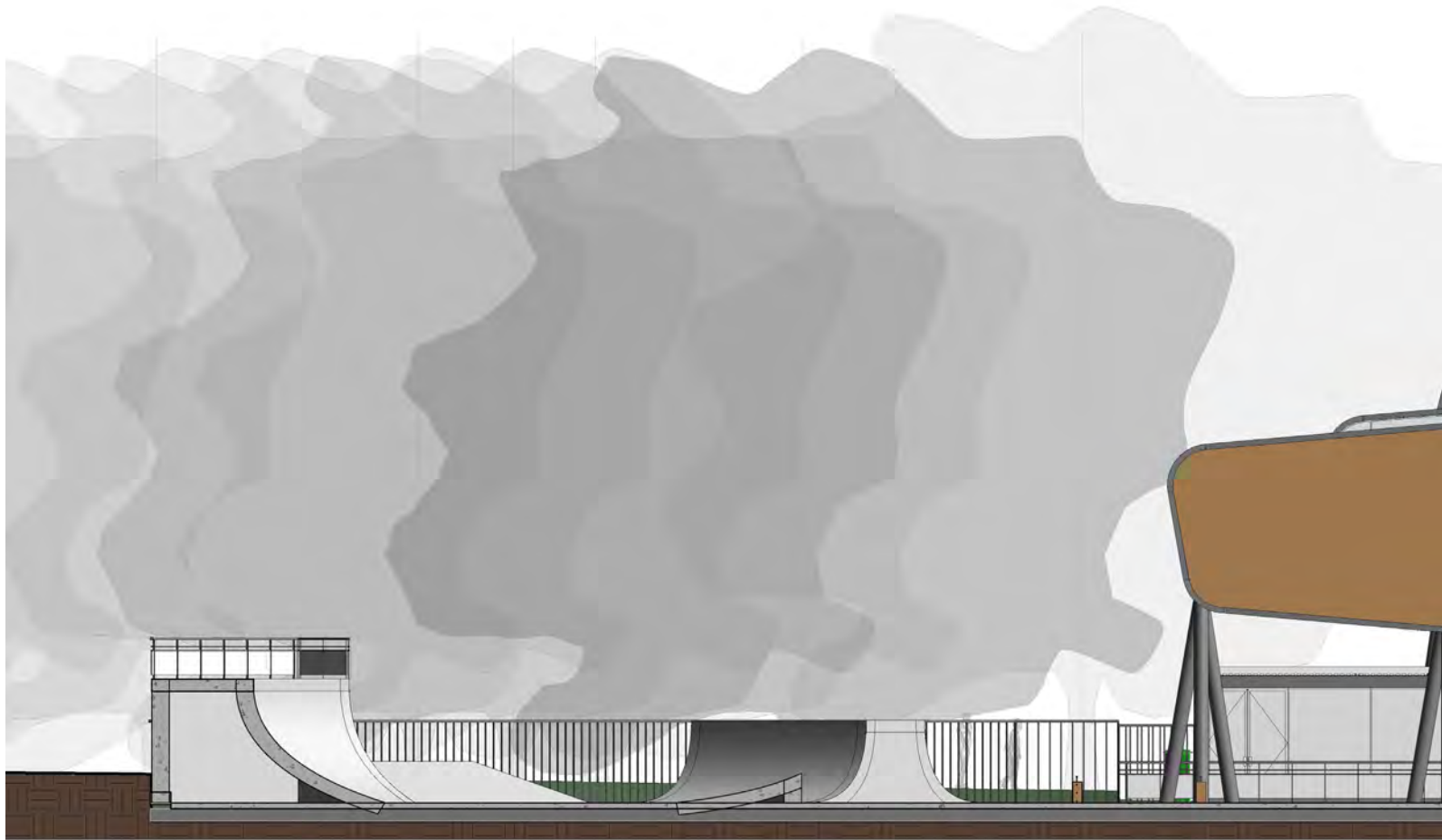


Figure 95: Section 3



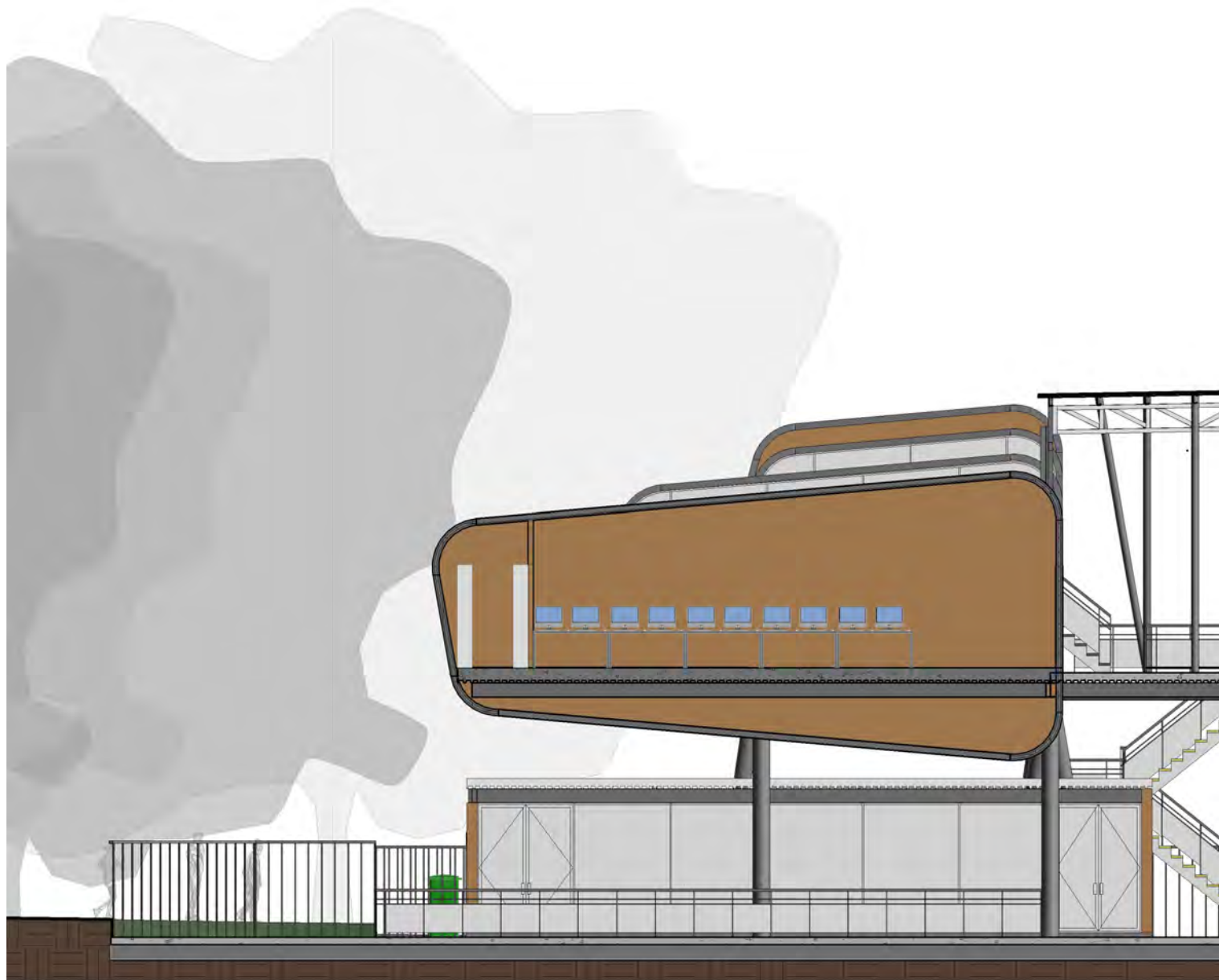
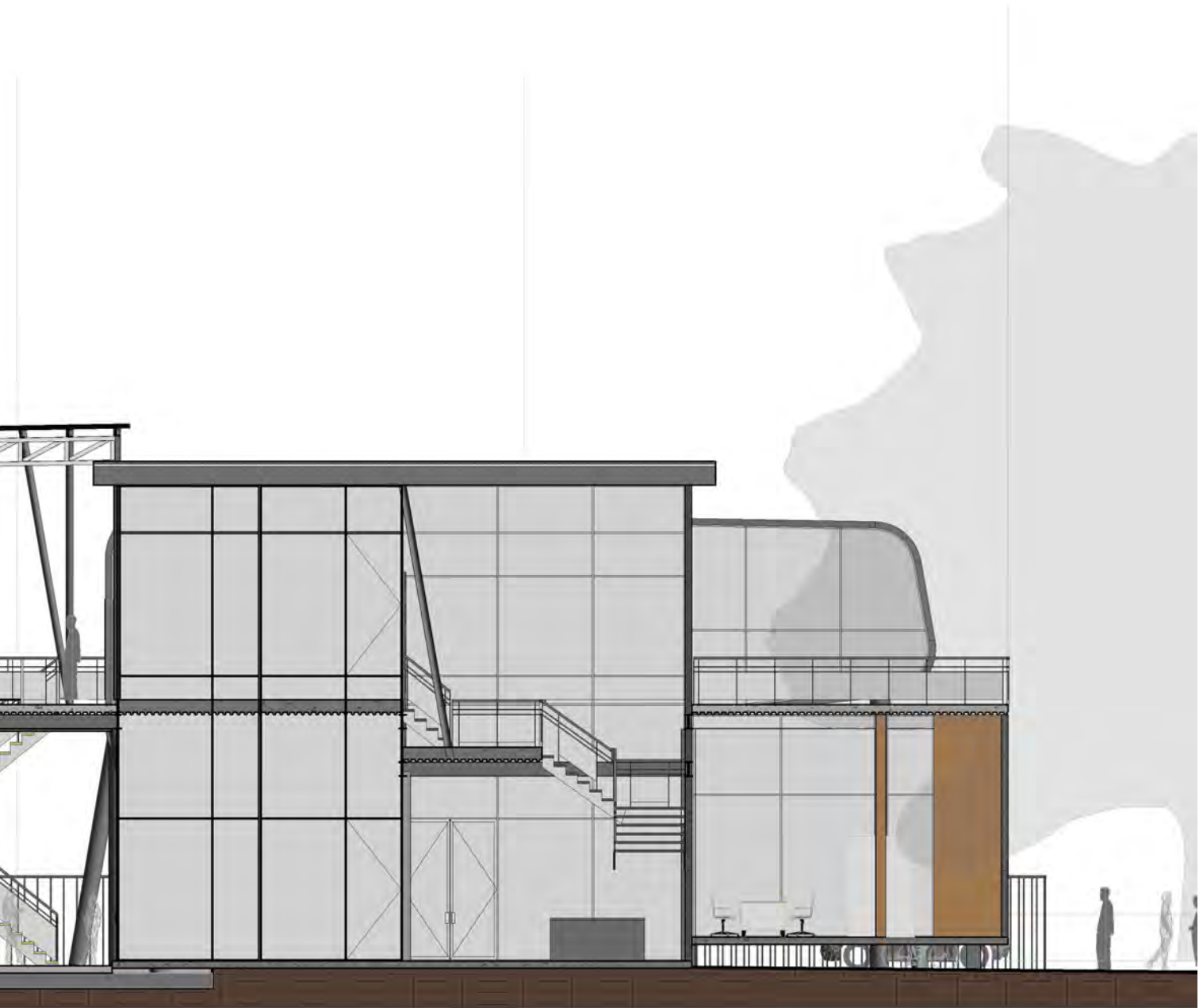


Figure 96: Section 4





10



Figure 97: Secti





Figure 98: Section 6

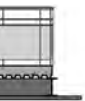




Figure 99: Section 7



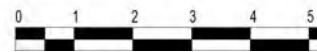


Figure 100: Section 8

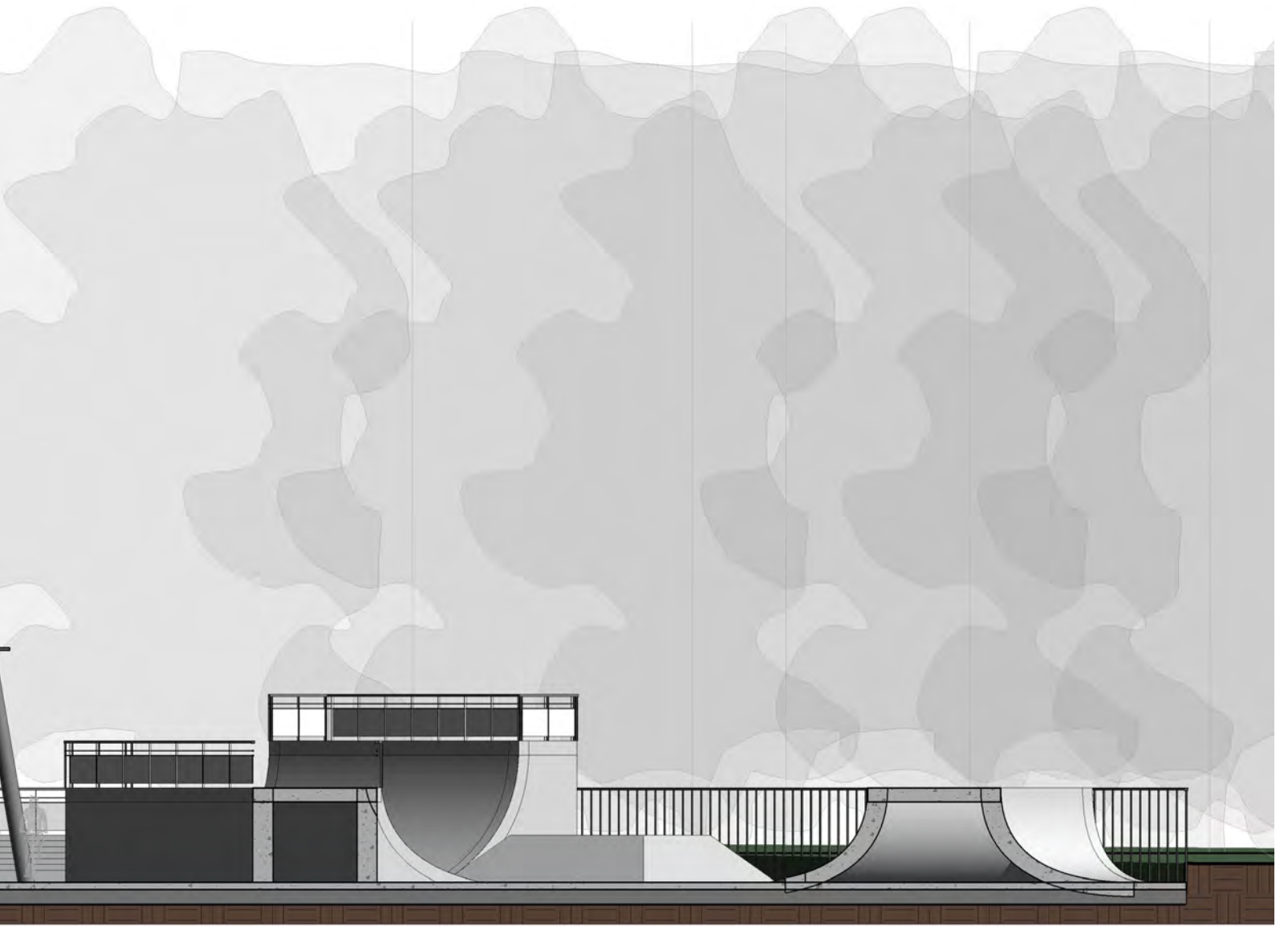




Figure 101: Section 9

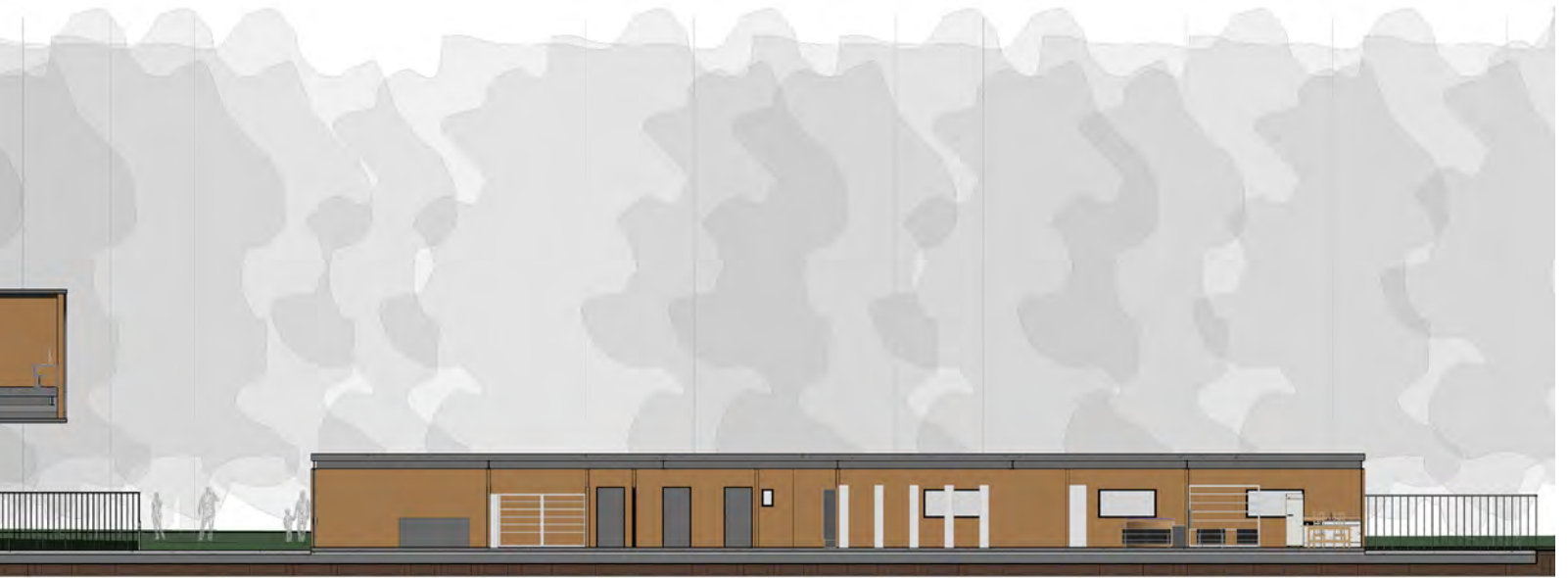




Figure 102: Section 10





Figure 103: Section 11



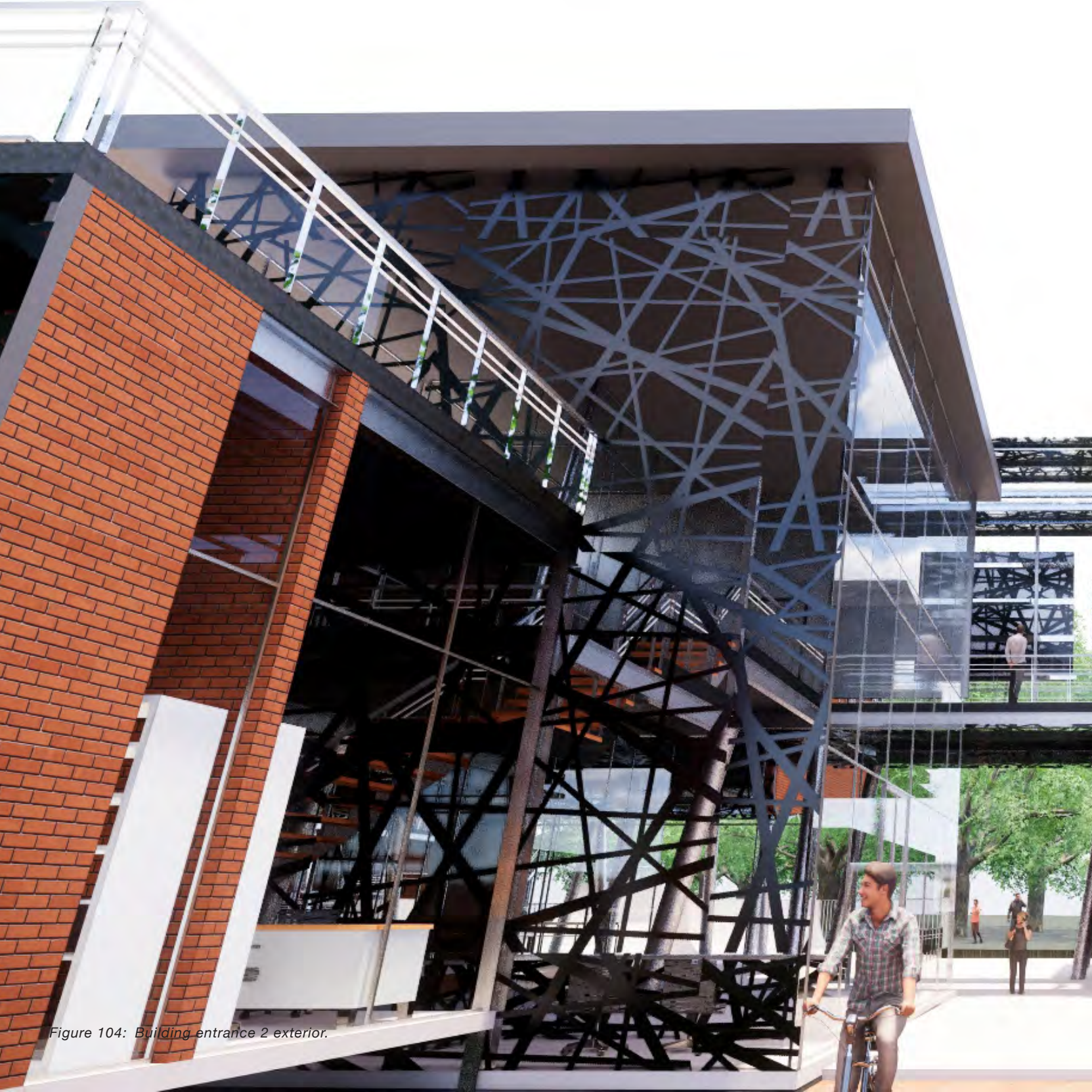


Figure 104: Building entrance 2 exterior.

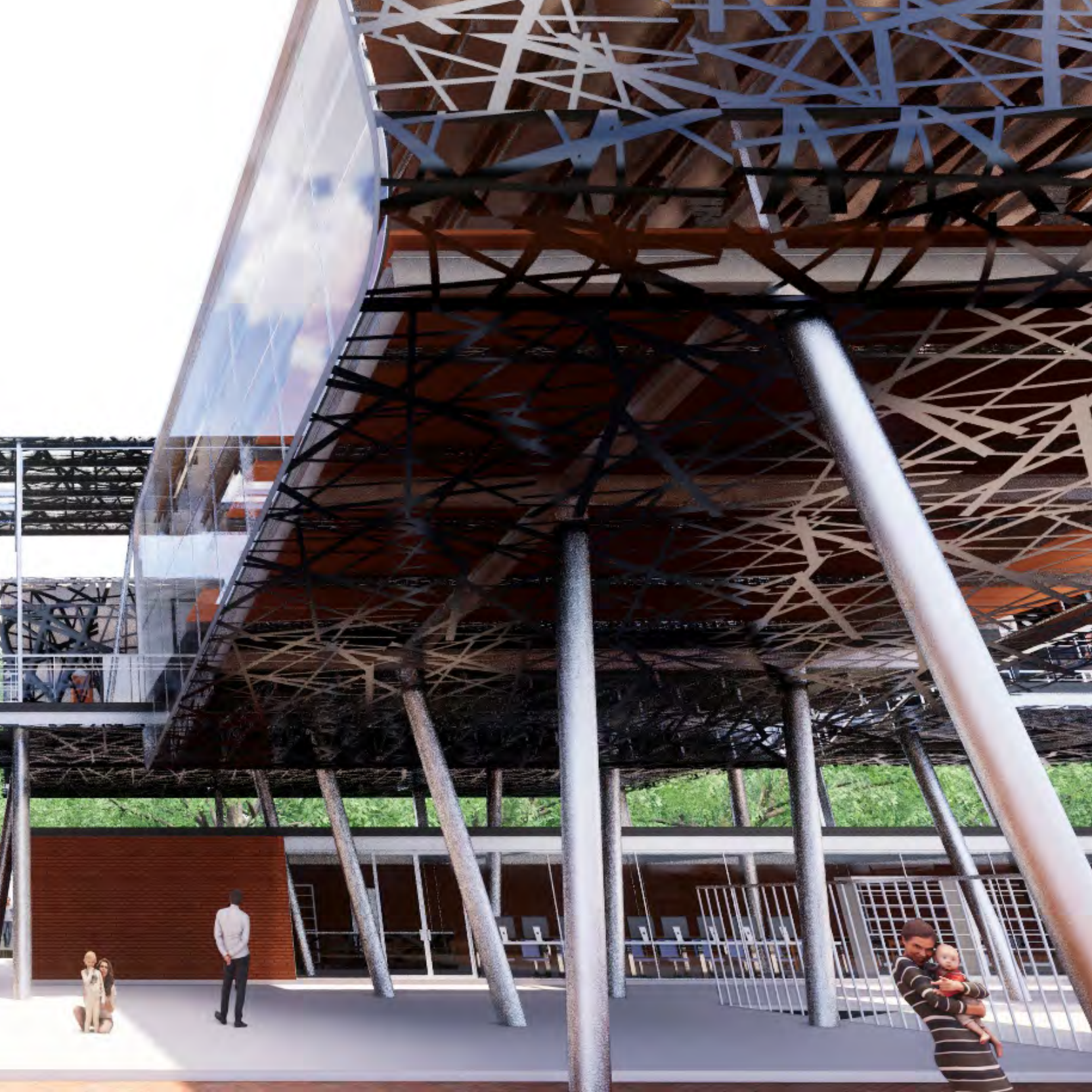




Figure 105: Chisa nyama interior.





Figure 106: Skatepark exterior.

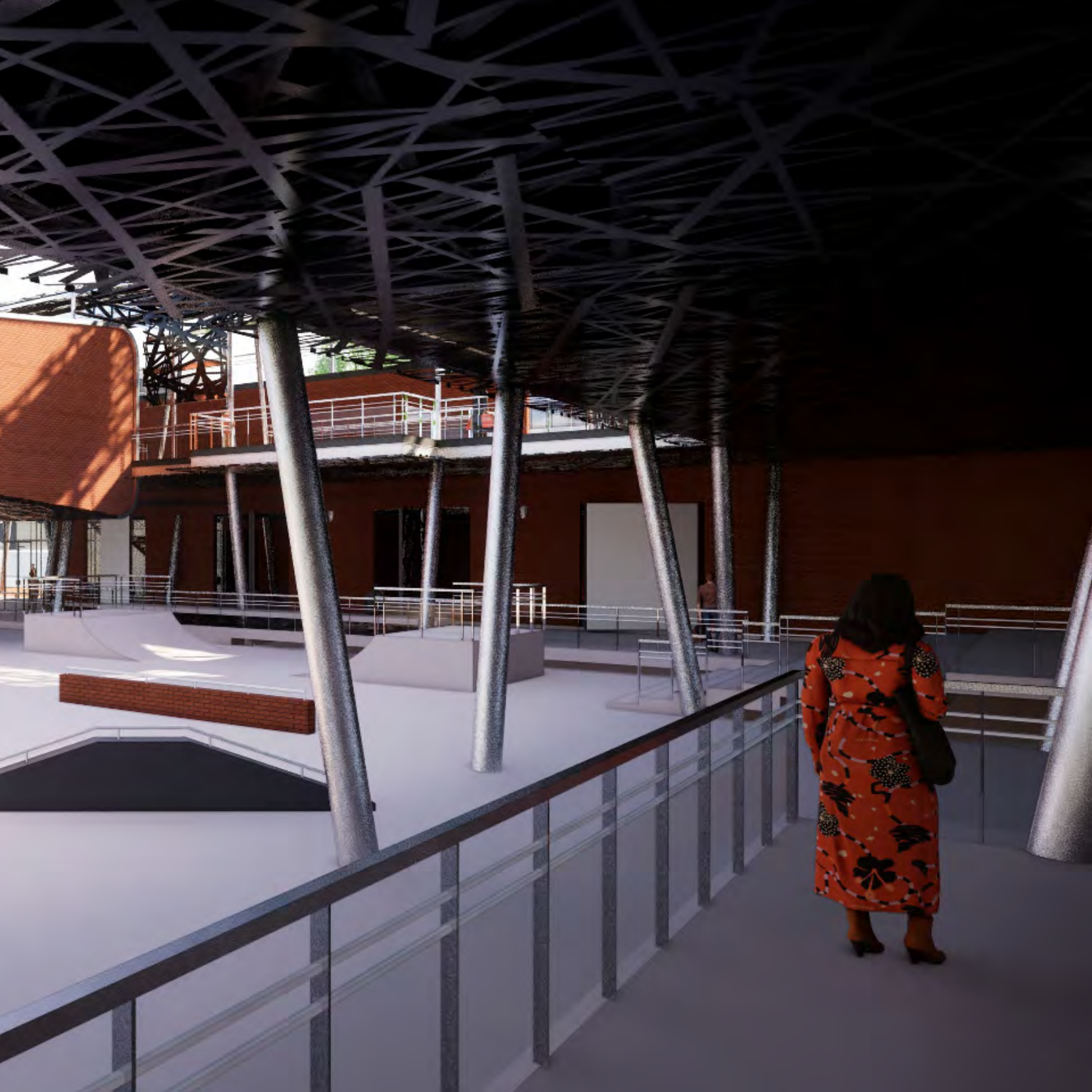




Figure 107: Informal auditorium interior.





Figure 108: Bridge on first floor





Figure 109: Building entrance 3 exterior.



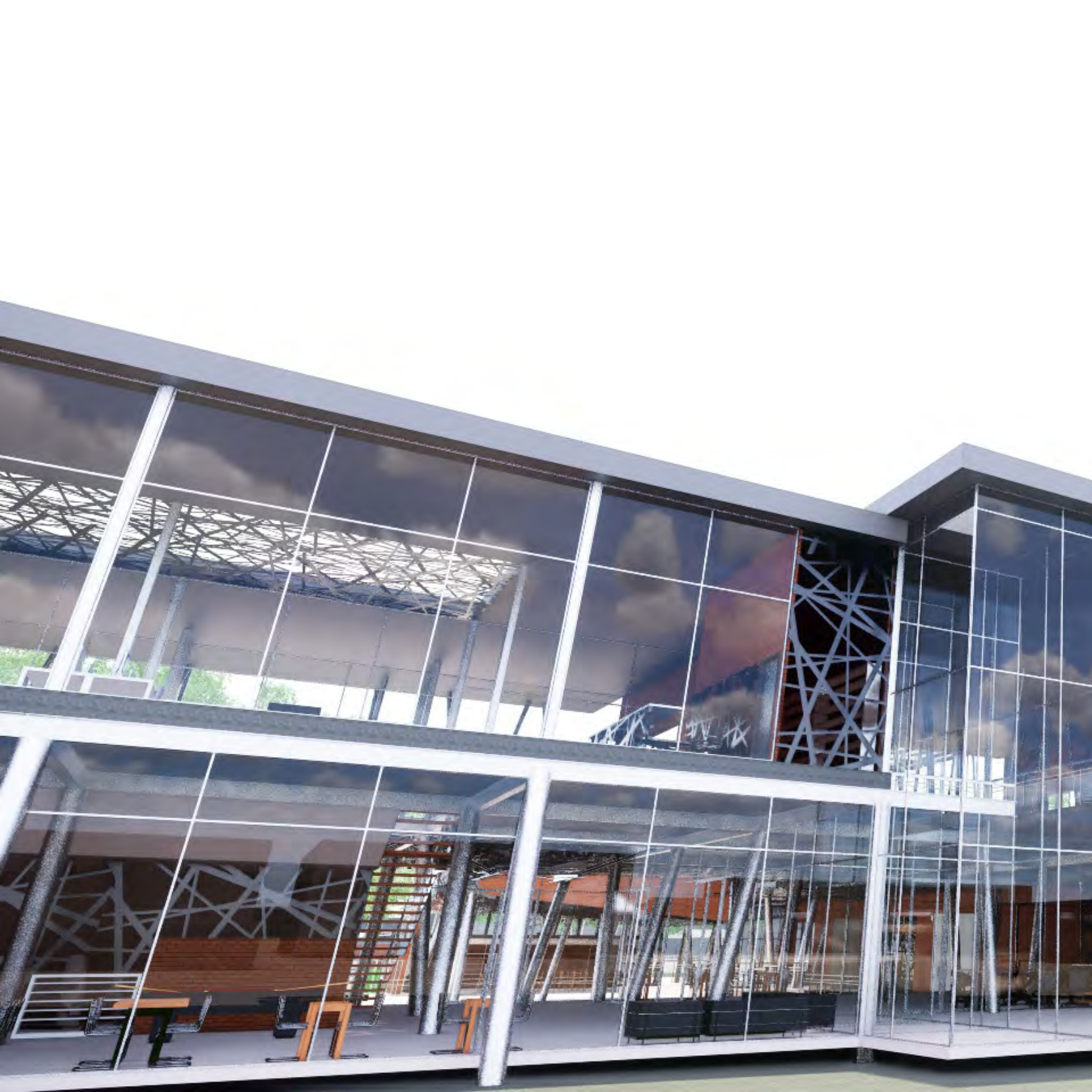




Figure 110: Building entrance 1.



Figure 111: Studio space interior.





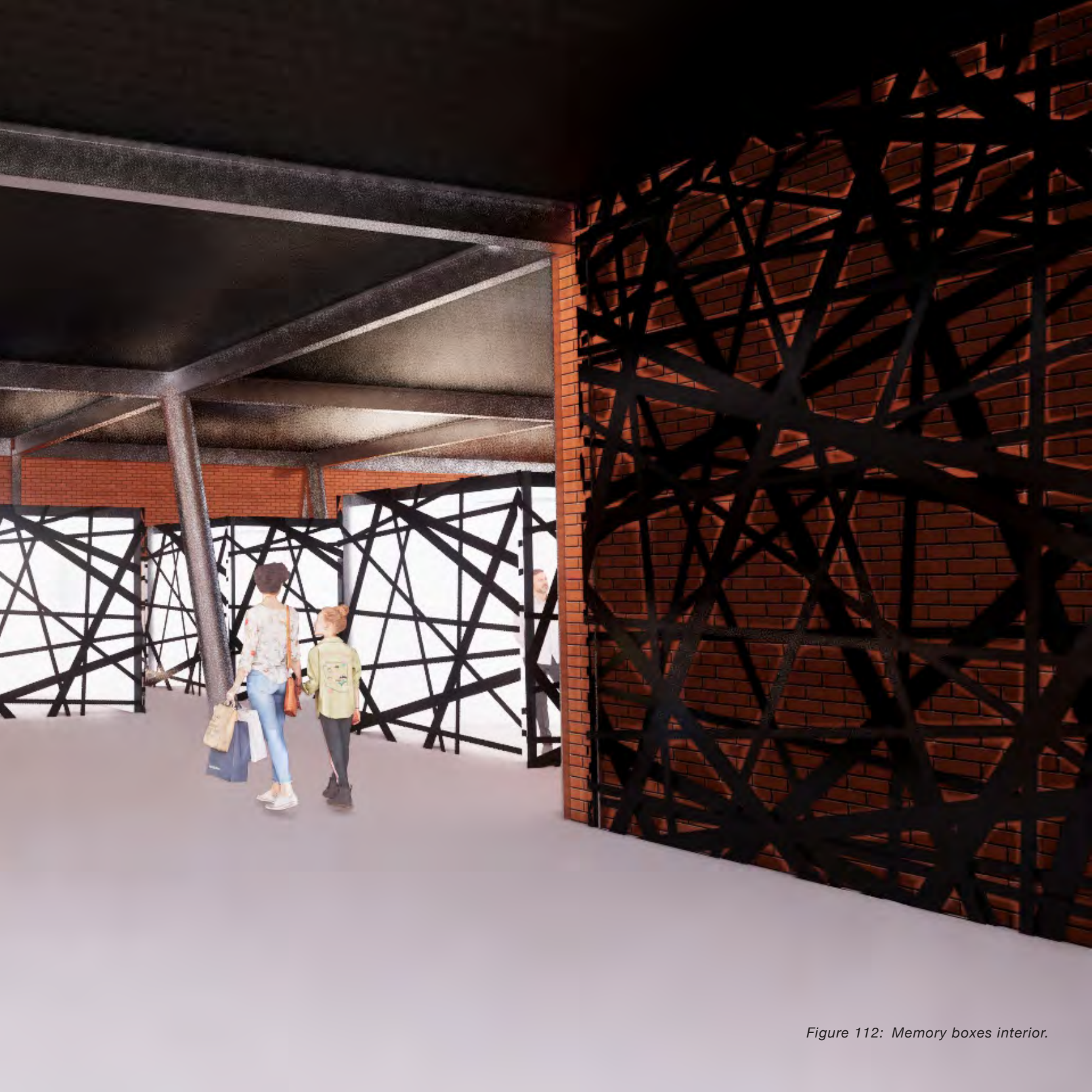


Figure 112: Memory boxes interior.





Figure 113: Learning commons interior.

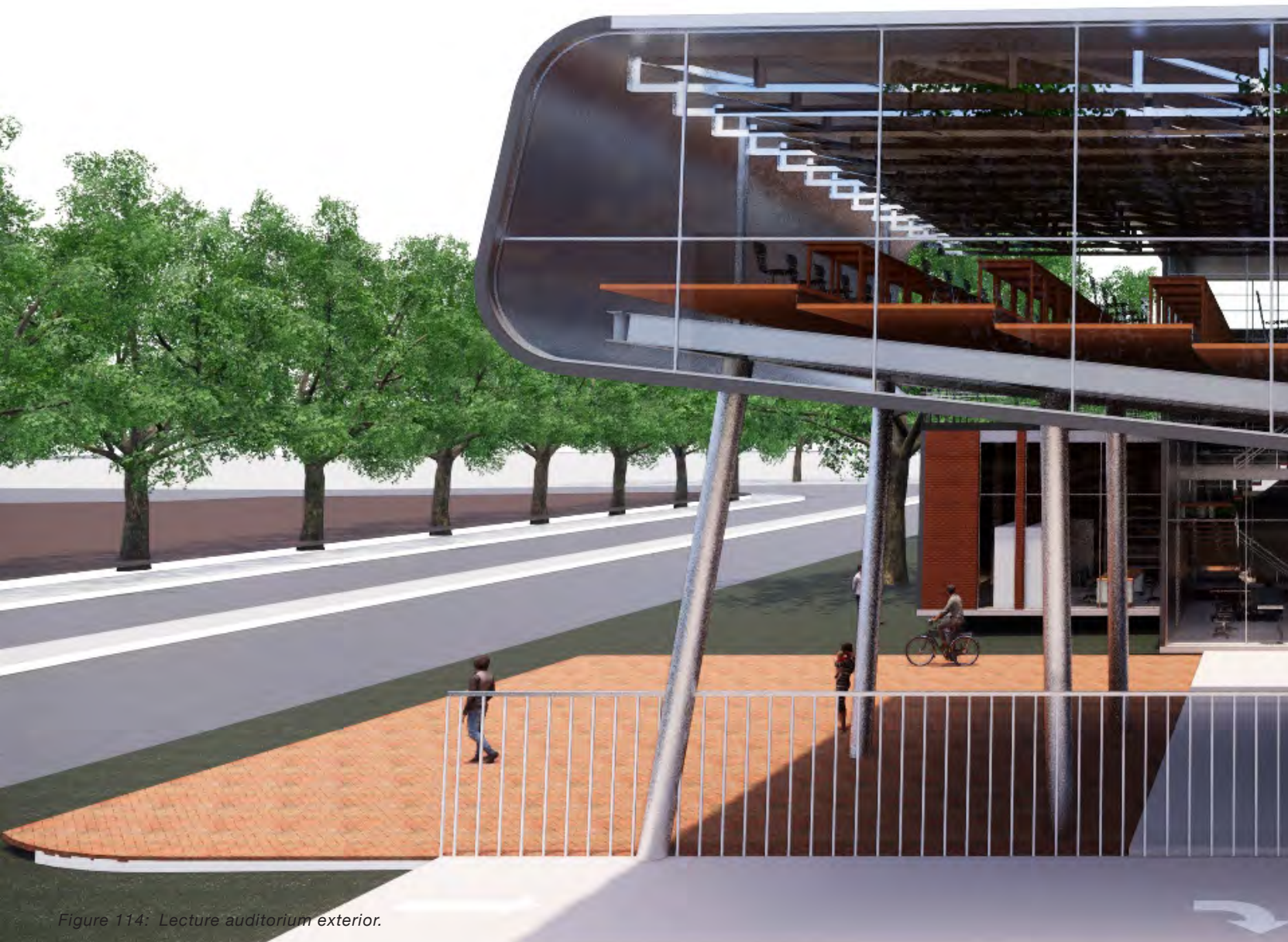


Figure 114: Lecture auditorium exterior.





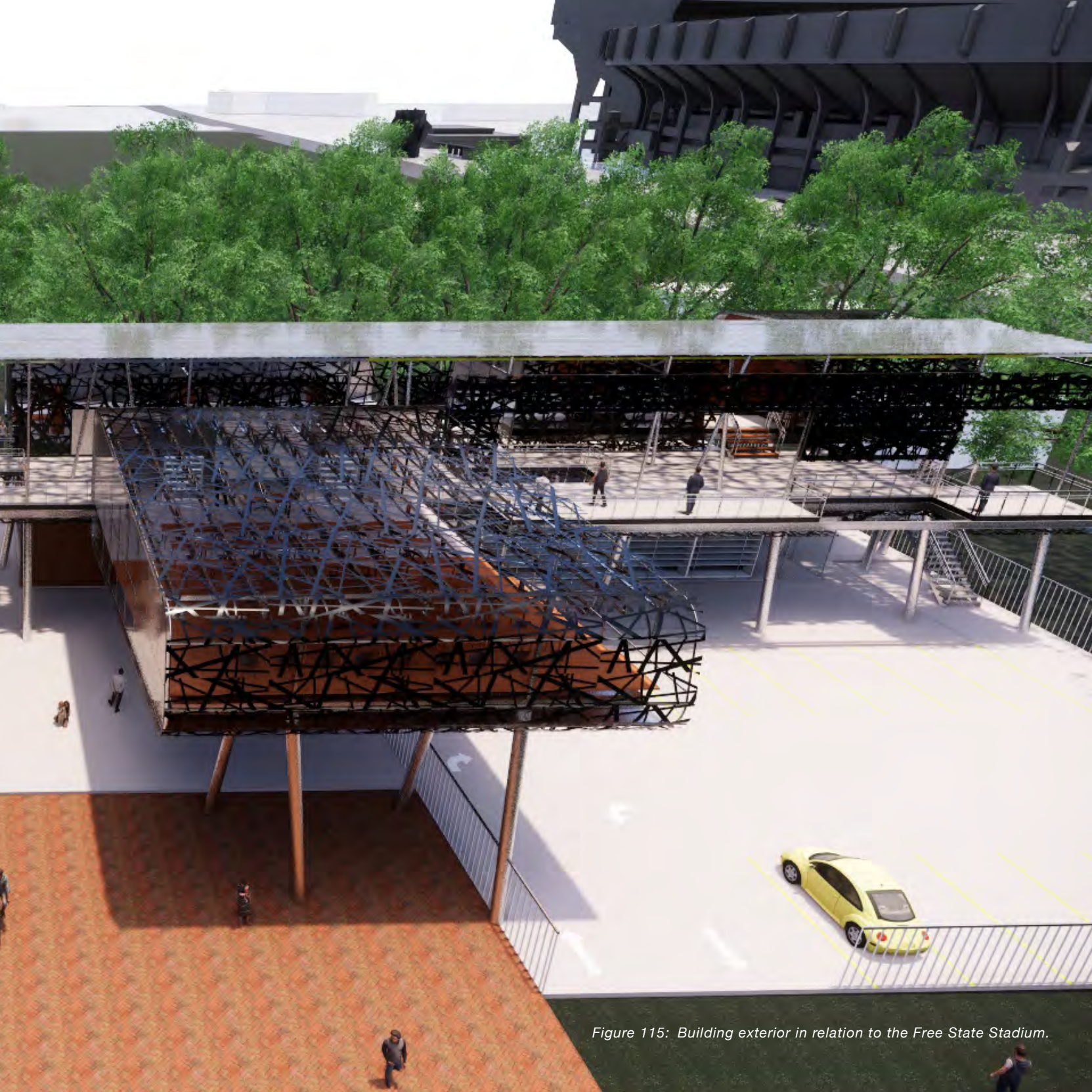
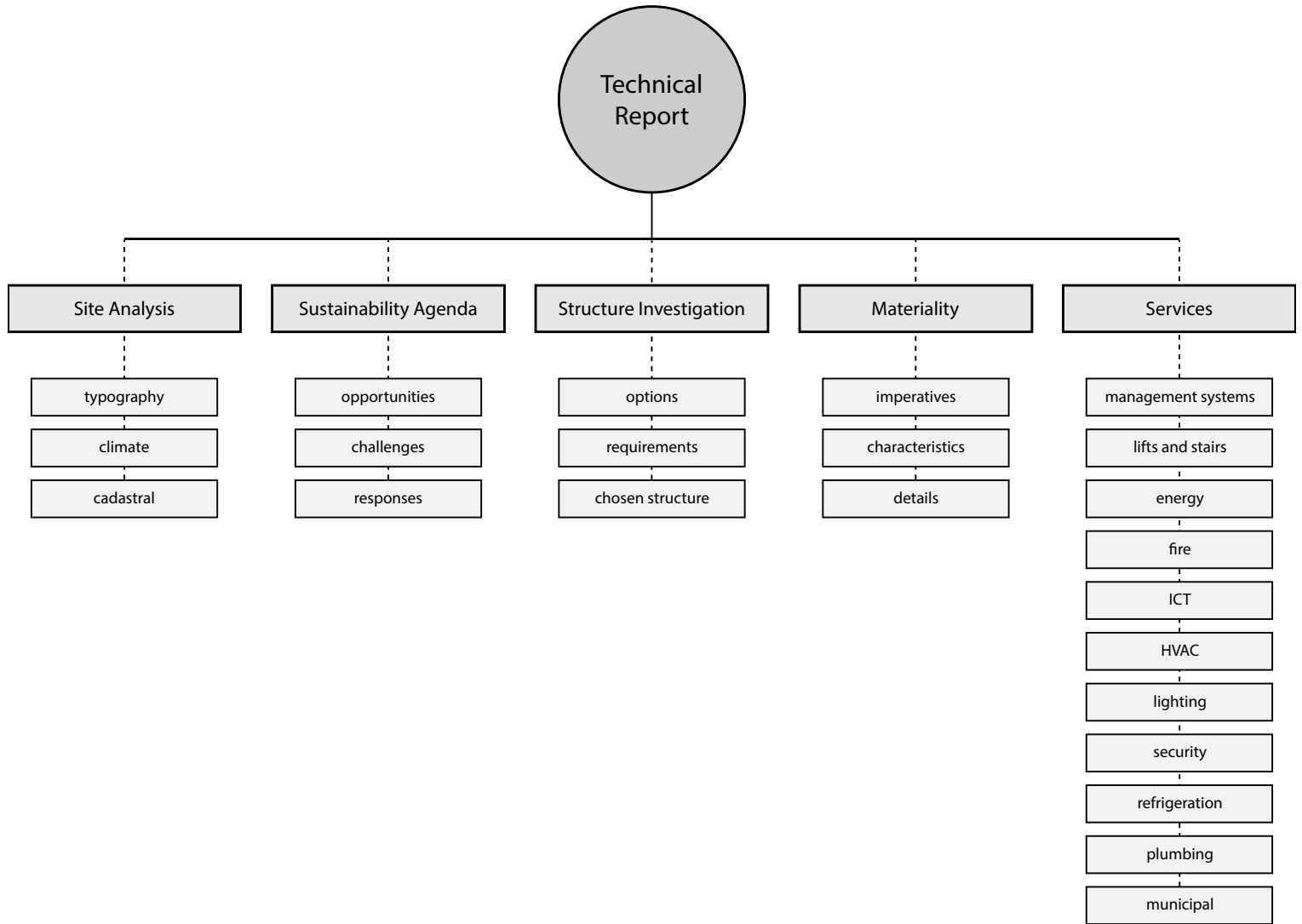


Figure 115: Building exterior in relation to the Free State Stadium.

Technical Report

The technical report is split into categories that discuss the different aspects that form the design rationale - the exploration of information and reasoning resulting in the final design development.



Site Analysis

The photography school intervention aims at achieving a place of learning the art of photography in the urban context. Students, enthusiasts and professional photographers will use this centre as a place to come together to share knowledge and skills related to photography. The proposed intervention is in the centre of Bloemfontein at the corner of Park Road and 1st Avenue, South of The Free State Stadium.

Topography



Figure 116: Locality plan [not to scale].

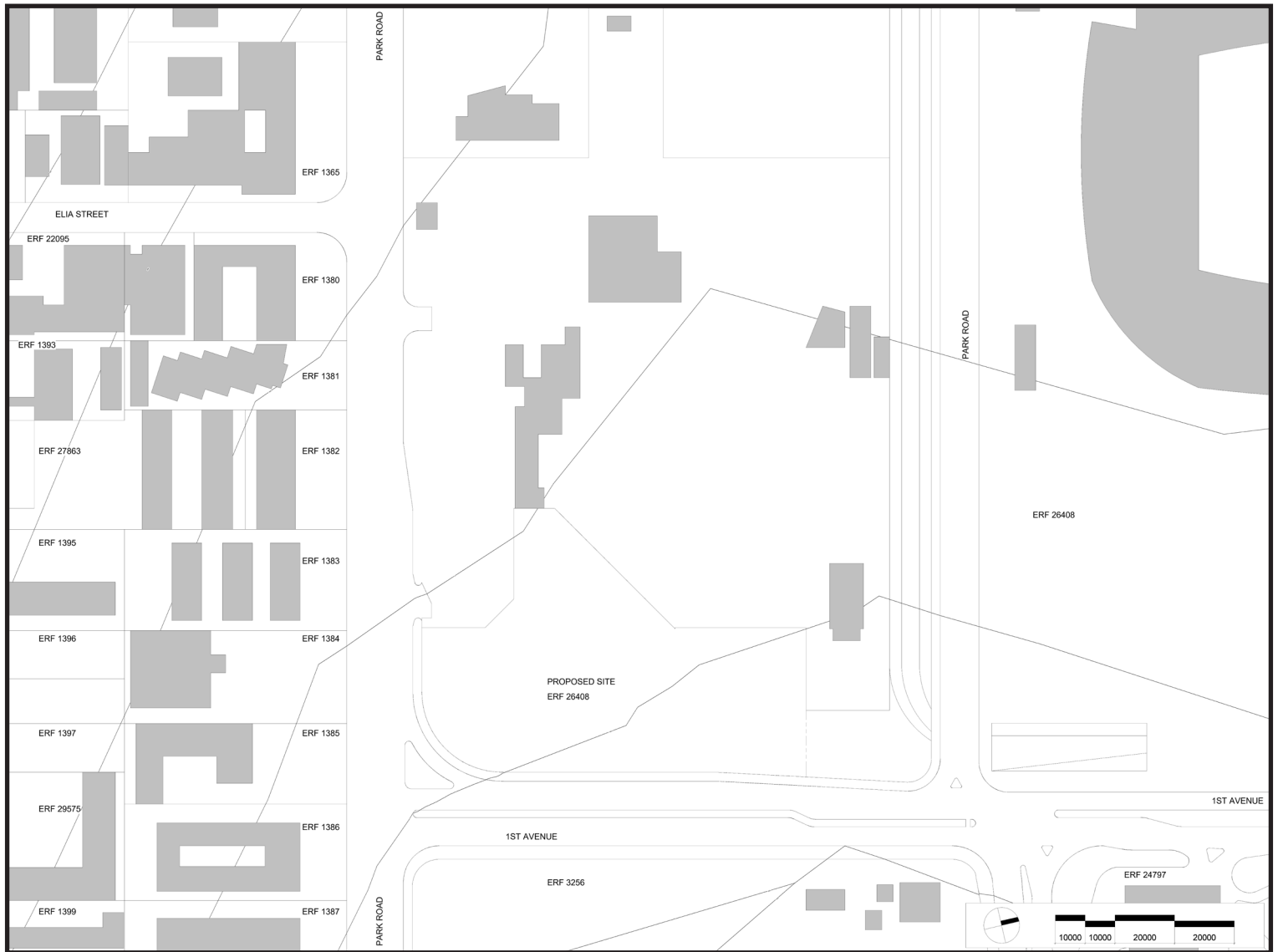


Figure 117: Locality plan [scale 1:500].

Climate

Table Indicating Quick Climate Information (Timaanddate.com, 2019: online)

Aspect	Value
Hottest month	January (23 °C avg)
Coldest Month	July (8 °C avg)
Wettest Month	February (39.9 mm avg)
Windiest Month	November (12 km/h avg)
Annual precipitation	182.2 mm (per year)

All Year Climate & Weather Averages in Bloemfontein (Timaanddate.com, 2019: online):

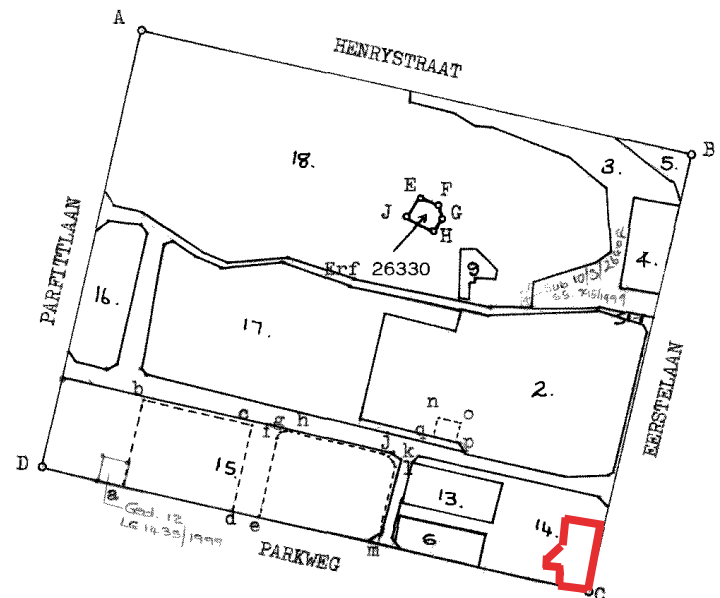
High Temp: 31 °C
 Low Temp: -2 °C
 Mean Temp: 16 °C
 Precipitation: 15.2 mm
 Humidity: 53%
 Dew Point: 5 °C
 Wind: 9 km/h
 Pressure: 1022 mbar
 Visibility: 22 km

Cadastral

In terms of the approved **Bloemfontein Town Planning Scheme** (B.T.P.S), the remainder of **ERF 26408** (Parfitt Avenue) Willows, Bloemfontein - the property is zoned "Business" **subzone "G"** and may be used for the development of an institution.

Table Indicating Development Restrictions for "Business" Subzone G (Business, General Business and General Commercial)

Site area	7 511m ²
Coverage	75%
Bulk	3,0
Street building line	7m
Height	17m
Parking	
Shops up to and including 1 000m ²	4 bays/100m ² GLA
Shops > 1 000m ² but = or < 15 000m ²	6 bays/100m ² GLA
Shops > 15 000m ²	5 bays/100m ² GLA
Office	2,5 bays/100m ² GLA



Sustainability Agenda

Sustainability defines the action of carrying out activities without bringing harm to the environment or depleting its natural resources, defined by the Brundtland Commission as meeting the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Commission, 1987: online).

Sustainability in architecture addresses the negative environmental and social impacts of buildings by utilizing design methods, materials, energy and development spaces that aren't detrimental to the surrounding ecosystem or communities (Build Abroad, [n.d.]: online). These factors are addressed when taking location, climate conditions and social and economic sustainability during the design phase of the intervention into consideration.

Opportunities

The following is a list of opportunities and advantages the site and context offer to the intervention.

Location

- Site is situated by two access routes - the transportation of services and material to and from site
- The site is brown and barren - allowing for the introduction of vegetation and greenery
- The ecology of the site offers natural shading by the tall trees on the eastern end of the site
- The social infrastructure of the context aids in the design becoming a part of the urban framework of the context

Challenges and responses

The climatic conditions of Bloemfontein affect the morphology and tectonics of the building; thus the responses need to address the aforementioned climatic influences. The following is a summary of how the building is designed to respond to them.

Design and technical responses

Architective (2013: 105) highlights Bloemfontein's climatic zone as part of the 'cold interior zone' and lists the following strategies as the best design responses to this zone:

- Passive solar heating - this is the harnessing of solar radiation and capturing the internal heat gains via high-performance windows, thermal mass, building orientation and high-performance insulation
- Insulation of thermal mass and floor slabs - this is done by increasing the mass of building elements like walls and floors to increase their heat gains
- Maximise the area of north facing walls and glazing - maximizing these areas contributes to their thermal massing. In specific instances increasing wall sizes also limits heat loss on the east and west facades of the building, whilst increasing the glazing size on the north face contributes to solar heat gain
- Cross ventilation - operable windows on adjacent or opposing walls draw air across the room without the need of active ventilation
- Vegetation - the positioning of the building in and around natural features also aids to passive means of climate control. In this instance the trees on the

east facade shade parts of the intervention during the warm seasons

Social and environmental sustainability

It is important to the sustainability agenda of the intervention that it satisfies the needs of the context it serves and that it doesn't deplete any natural resources or contaminate the environment. Skills development, social and economic involvement, and environmental sustainability then become a point of concern.

The intervention promotes the semi-informal development of photographic skills within the city with the help of novice and professional photographers. The library and skate park facilities promote a social connection with the context that not only serves the users of the learning spaces in the intervention.

The building methods and materials were chosen as to not be too difficult to construct that specialised contractors outside of Bloemfontein would be needed. These materials and methods are elucidated in the **Materiality** and **Structural Investigation** topics.

On the environmental front, rainwater harvesting reduces the use and waste of water by JoJo tanks, for use by the building and maintenance of the landscape. The above-mentioned passive design strategies aid in energy use reduction in terms of heating and ventilation.

Structural Investigation

Optional typologies

Structures can be classified in many ways according to their shape, their function and the materials from which they are made (Adriaenssens, Block, Veenendaal & Williams, 2014: 21). Following the investigation of the conceptual structural sketches for the photography school intervention, the following structural typologies are explored as options:

- Shell
- Portal frame
- Exoskeleton
- Diagrid
- Monocoque
- Triangular

Shell

The most identifiable feature of a shell is in the curved surface of its geometry. A shell is defined by a straight line or beam that is thin in the direction perpendicular to the surface and is curved in one or two directions (Williams, [n.d.]: online). The shell of a structure can either be solid and composed of masonry or concrete, or it can be frame-based with materials like timber and steel. Design Buildings (2019: online) states that timber and steel shells also act as reinforcement in solid shells, and form lattice or composite structures. Shells gain their strength and stiffness from relying on compression forces.

Types

- Framed - often composed of timber or steel.
- Solid - often composed of concrete or masonry units

Advantages

- Doesn't need intermediate wall or column support
- Structural efficiency
- High strength with respect to its weight
- Large space covered
- Lowers construction cost
- Aesthetic value (UKEssays, 2018: online).

Disadvantages

- Needs an edge beam to stop it from spreading
- Impossible to add floor above it
- With concrete being a porous material, seepage may become an issue (Design Buildings, 2019: online)

Portal frame

Portal frames are structures designed in such a way that no intermediate columns are necessary, allowing for large open spaces. Portal frames structures utilize a structural building method that involves connection of columns (vertical support) and horizontal beams or trusses (Pretorius Structures, [n.d.]: online). The vertical and horizontal beams are connected by rigid fixed joints, that are able to carry bending forces (moment resistant) [Ibid.].

Forms

- Pitched roof symmetric portal frame
- Portal frame with internal mezzanine floor
- Crane portal frame with column brackets
- Tied portal frame
- Mono-pitch portal frame
- Propped portal frame

- Mansard portal frame
- Curved rafter portal frame
- Cellular beam portal frame SteelConstruction.info ([n.d.]: online)

Advantages

- Time efficient construction
- Easy to assemble and construct
- Rapid and waste-free assembly
- More cost-effective than other types of structural frames
- Quick and easy to maintain (All About Sheds, 2017: online)

Disadvantages

- Subject to corrosion
- Poor resistance to fire

Monocoque

Monocoque structures are similar to shells, with their most notable feature being that the concept is to form a surface in which inner and outer layers act together as a unified, structural whole (Henn, [n.d.]: online).

Monocoque structures emulate the way nature designs - for example, weaver-bird nests and termite castles - which is a more efficient use of materials and energy (Kylee Swenson, 2015 : online).

Advantages

- Uses lighter material in comparison to other steel structures
- Uses less material for its strength

- Rigid
- Supports itself
- No interior support needed

Disadvantages

- Development time is long due to complexity
- The structural requirement limits the design

Triangular/Diagrids

The triangle is the strongest shape as it holds its shape and has a base which is very strong with a strong support (Kosmala & Kemmis, [n.d.]: online). Not only can triangles strengthen trusses, but wall and floor systems as well. Triangular and diagrid structural systems work on the same premise as triangles.

Advantages

- Mostly column free exterior and interior
- Free and clear, unique floor plans are possible
- Aesthetically dominate and expressive (Vijayaraja, 2013: online)

Disadvantages

- Construction crews have little or no experience creating a Diagrid
- It is hard to design windows that create a regular language from floor to floor
- The Diagrid is heavy-handed if not executed properly (Vijayaraja, 2013: online)

Structural requirements

In order to narrow down which structural typologies are most suitable and advantageous for the quick and sustainable construction of the design, the project demands the following requirements be met:

- Light weight secondary structure
- Relatively to assemble
- Inexpensive and cost effective
- Modular units for assembly
- Not affected by weather conditions during construction phase
- Time effective fabrication
- Fire resistant
- Modifiable assembly
- Allows for spacious floor area without internal support

Chosen structure

The final structure for the project is a hybrid combination primarily composed of the triangular and shell-based typologies. The intervention takes advantage of the combined strengths of the different typologies to satisfy its needs as opposed to committing to one typology and limiting its capabilities.

Materiality

Conceptual need and material characteristics

The materiality of the intervention is influenced by its structural and aesthetic needs. As mentioned in the Structural Investigation, the bulk of the structure of the building is composed of steel, with concrete and masonry elements. Steel also provides a good structural support system in relation to its weight. The exterior envelope of the intervention is made up of profile sheeting in a weave pattern representative of the aesthetic of the weaver bird's nest.

The advantages of using metal profiles as exterior cladding are listed as follows (4EverRoofing, [n.d.]: online):

- Heat and sun - metal roofing is impervious to drying out, becoming brittle, and cracking with age due to heat and UV rays
- Wind - wind gusts that can rip the shingles right off asphalt roofs don't affect metal roofs the same way
- Hail - due to its strength and durability, along with its ability to withstand different weather conditions, metal roofing has a high hail resistance compared to other roofs

The interior elements of the design have a more direct interaction with the user. Timber makes up the bulk of the interior aesthetic as it is a less harsh material to the touch than steel, concrete and masonry.

The rationale behind using steel on the exterior of the design is for its customizable profiles and durability. Metal fares better with temperature and humidity changes than wood.

Detailing

The following annotated sketches and renders indicate

the connection of materials from the exterior envelope to the interior.

Services

Building services are the systems in buildings that make them functional, efficient, safe and comfortable. They impact the safety and health of the users in and around the building.

The service categories the intervention addresses are listed as follows:

- Building management systems
- Lifts and stairs
- Energy generation, distribution and supply
- Fire safety, detection and protection
- Information and communications technology (ICT) networks
- Heating, ventilation and air-conditioning (HVAC)
- Lighting
- Security and alarm systems
- Refrigeration
- Water, drainage and plumbing
- Municipal services

Building management systems

The building management systems are the heart of any building, computer-based and are used to monitor and control the building's services. The major aim of the BMS is to guarantee the safety of facility operation, while also monitoring and optimizing the use and efficiency of its supervised subsystems to allow more efficient operation (Biopharmaceutical Processing, 2018: 977).

Lifts and stairs

Lifts in the building are essential for providing vertical circulation for the transportation of goods and for use by wheelchair and non-ambulant end-users. The intervention makes use of in-ground hydraulic lifts. These lifts raise and lower the lift via hydraulic pressure

and are generally only suitable in buildings of up to 8 storeys (Designing Buildings, 2019: online).

Alongside the lifts of the building are the stairs which act as the main vertical circulation. Emergency or fire escape stairs are also provided in accordance with SANS10400 Part M.

Energy generation, distribution and supply

Energy is generated from several different sources and delivered through a transmission system by distribution network operators to end user services and spaces (Designing Buildings, 2019: online). The main energy supply to the building is supplied by the local municipality energy network.

The secondary power supply is generated by solar thermal energy collection. The solar power supply is accompanied by a plant room that monitors and regulates the renewable power supply.

Fire safety, detection and protection

Building services present a high ignition hazard. To limit this hazard and the dangers of smoke and heat, buildings should be designed to give a sufficient degree of fire detection and protection.

The fire detection methods implemented in the intervention are heat and multi sensor alarms. Multi-sensor alarms detect more than one fire phenomena like optical and heat detection, and may also include other detection capabilities, such as carbon monoxide detection (Designing Buildings, 2019: online).

Once a fire is detected the sprinkler system is triggered to extinguish or contain small and growing fires until the fire rescue arrives. The sprinklers are installed in all

services on the ground and first floor level.

Information and communications technology (ICT) networks

In this intervention the ICT networks will be used to store, retrieve and communicate data inside any room or space with a network connection to a designated IT room.

Heating, ventilation and air-conditioning (HVAC)

HVAC systems in buildings are used to maintain and regulate internal air quality, temperatures and humidity. Internal air quality is maintained by air-conditioners by introducing fresh air and extracting stale air from spaces that won't receive an adequate supply of cross ventilation. In the intervention such spaces are:

- Dark rooms
- CAD labs

The heating of the internal spaces is supplied by natural light, wall panel heaters and the air-conditioning units.

Cross ventilation is used in all spaces that allow for it, both on ground and first floor level.

Lighting

The lighting of the building is provided by both passive and artificial means. The intervention opens itself up on the north and south facades to make use of as much comfortable natural light as possible to minimize the need of artificial means of lighting. On the occasions where that source of lighting is no longer efficient, artificial LED lights are used.

Artificial means of lighting are however different for different spaces. Designing Buildings (2019) lists the

types of artificial lighting as follows:

- General lighting
These types of light sources uniformly service a general space
- Ambient lighting
This is background or mood lighting that illuminates spaces without causing glare - upward facing wall lights are used in the building to achieve this effect
- Accent or feature lighting
This type of lighting brings focus to certain textures or features in spaces whilst dimming out the surrounding areas - in the photography school they are used in the gallery and exhibition spaces.
- Task lighting
This type of lighting is used to contrast work or task areas - they are used for highlighting reception desks and function as track lighting in the building
- Emergency or safety lighting
The main aim of emergency and safety lighting is to provide lighting when there is a power failure, allowing occupants to safely evacuate the building.

Types of emergency lighting used in the building include; emergency exit signs, recessed fluorescent lights, powerful halogen emergency spotlights for larger spaces, emergency ceiling lights and downlights, and so on (Designing Buildings, 2019: online)

Security and alarm systems

The security of a building protects not only equipment and services but also ensures the safety of the end users. Commercial security systems in the proposed intervention monitor the access, security and safety of the building in the following ways:

- Access control at all entrances and exits
- CCTV cameras to monitor all interior and exterior spaces
- Intruder alarm sensors
- Perimeter security personnel
- Fire detection systems

Refrigeration

Refrigeration in buildings provide cooling for normal refrigeration needs and industrial processes. In the intervention they are most applicable to the cooling and storage of consumable goods provided in the following spaces:

- Staff kitchen
- Juice bar
- Coffee shop

Water, drainage and plumbing

The plumbing and drainage systems in the intervention are used for:

- Waste removal in the toilets
- Hot and cold-water supply in the toilets, Juice bar, coffee shop and Dark Rooms
- Drainage of stormwater, surface and subsurface water

Municipal services

The municipal services provided to the building are:

- Waste removal
- Deliveries
- Landscaping
- Building maintenance

04

Reflection



Part 04 | Reflection

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Figure 118: "That's it."

Reflection

Developing a project for 9 months or so has been an eye-opening adventure for me. The highs and lows of going back and forth with a passion project such as this has made me appreciate the skills I acquired to get me to the result.

Whilst I feel there are aspects of the design I could have explored further in the conceptual stage; I am very

pleased with what the project became once all of its parts came together in the end.

This was a very challenging year, but one filled with fond memories and exciting new lessons to carry into my work in the future.





Figure 119: Building exterior

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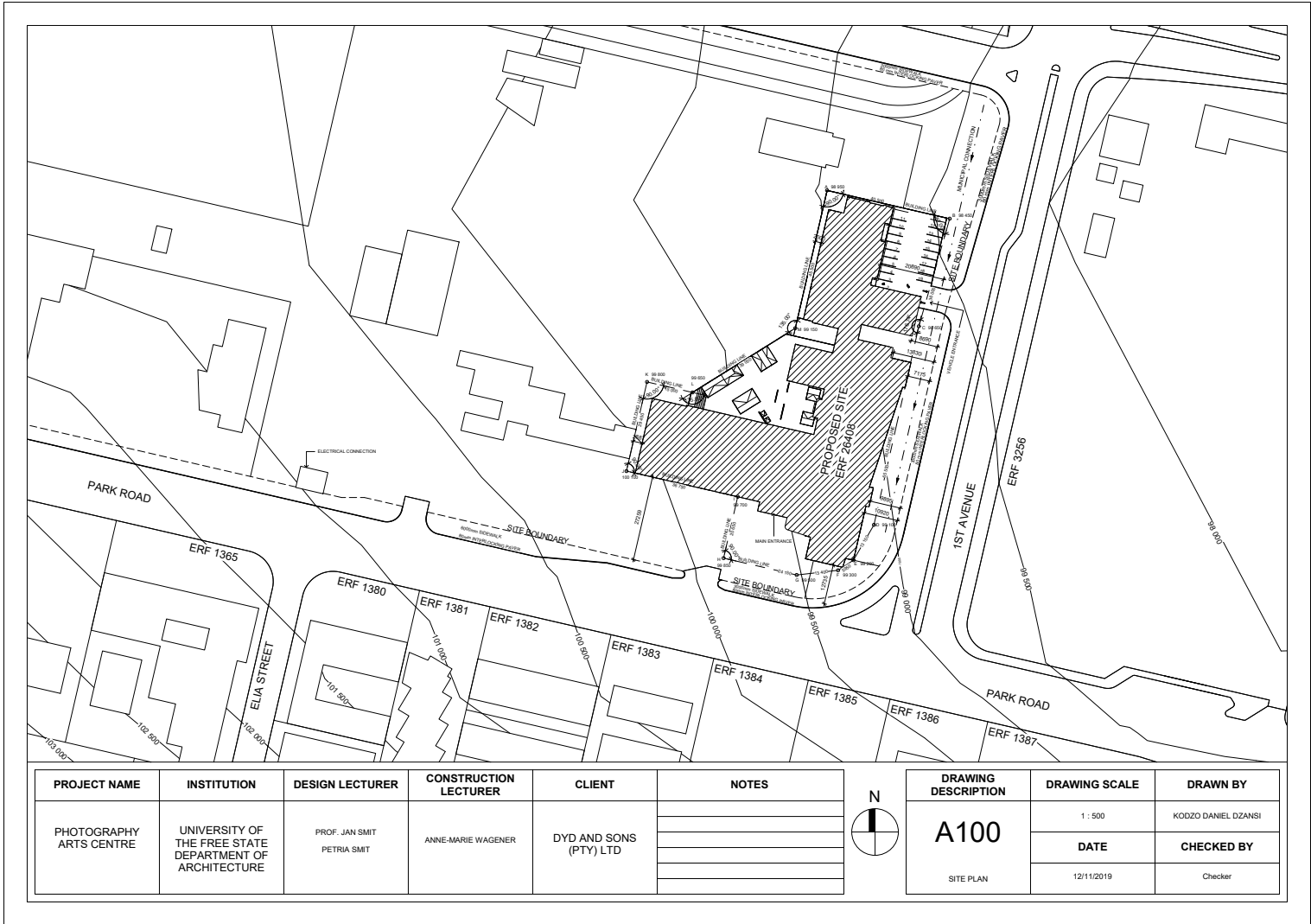
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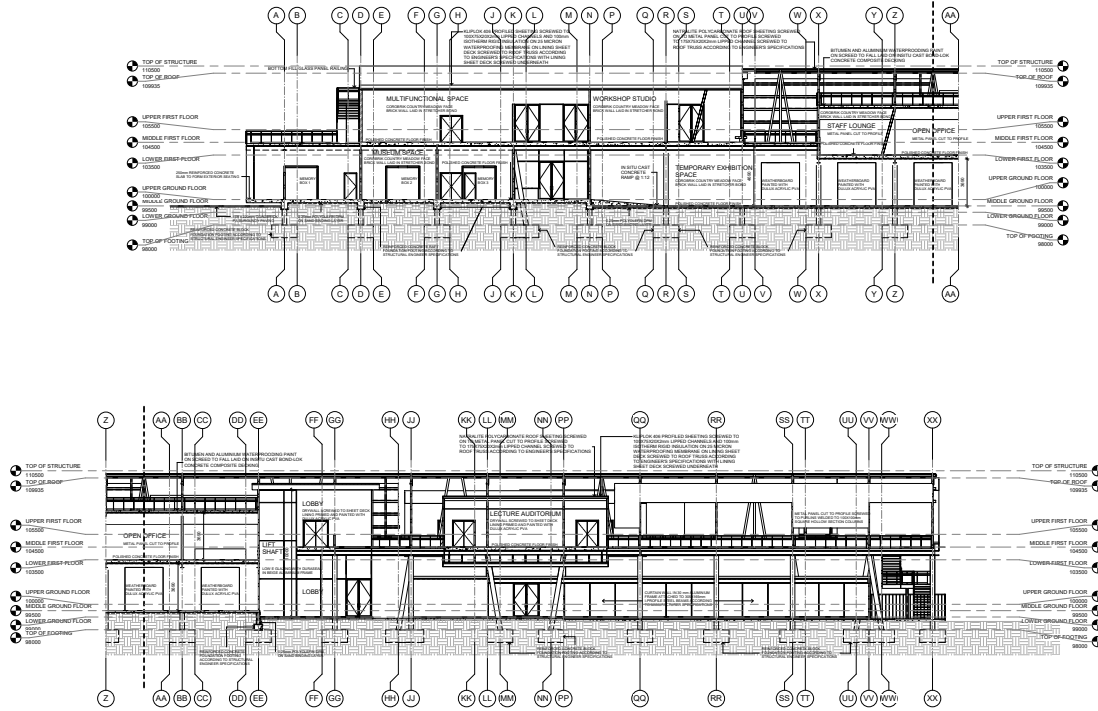
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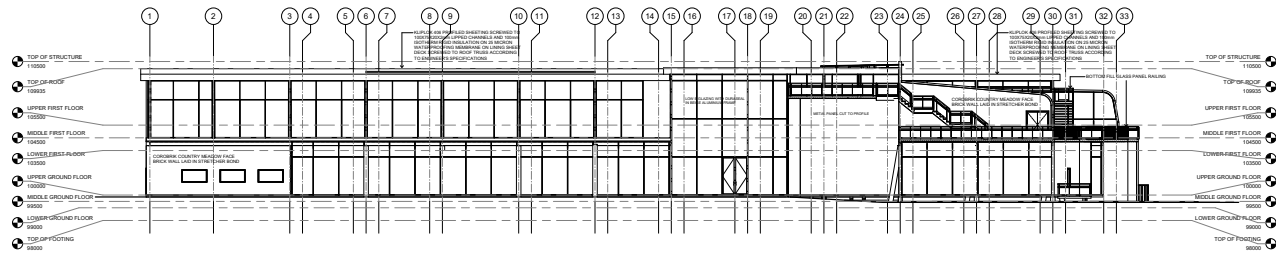


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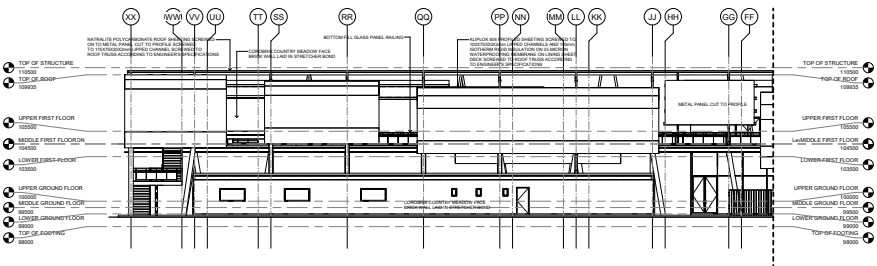


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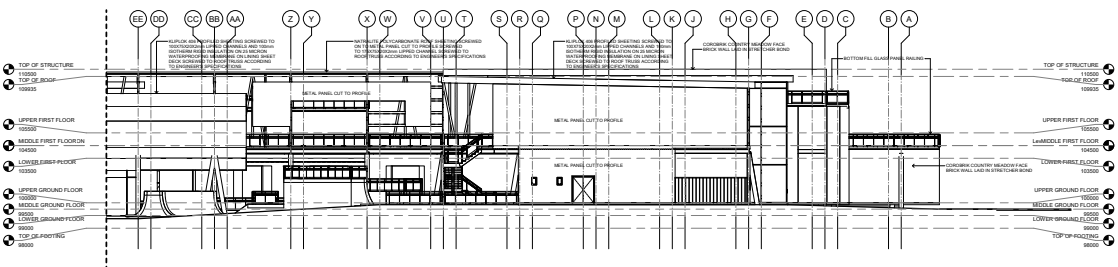
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