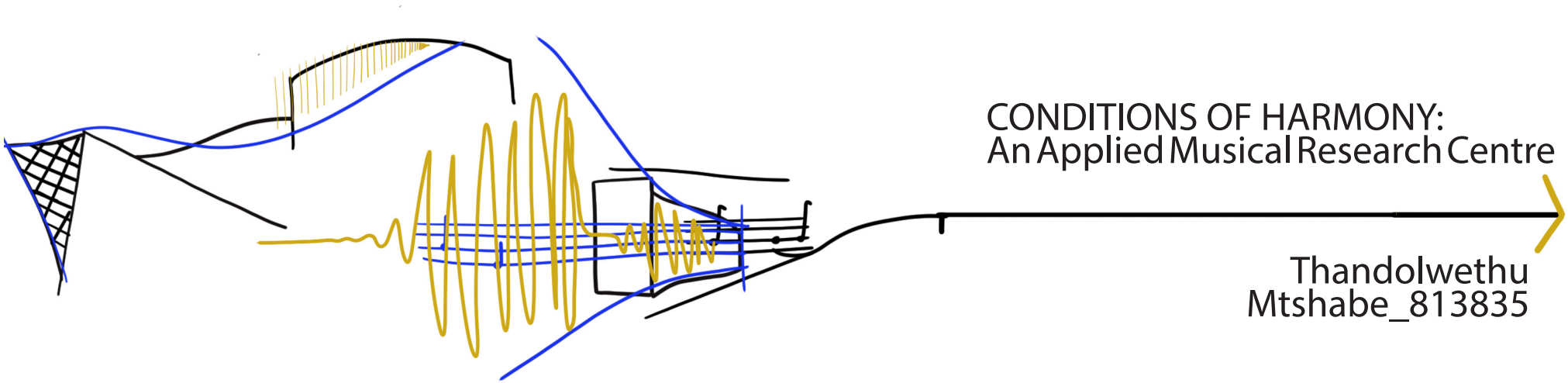


CONDITIONS OF HARMONY:
An Applied Musical Research Centre

Thandolwethu
Mtshabe_813835

Conditions of Harmony: An Applied Musical Research Centre

Thandolwethu Kanya Zenande Mtshabe
813835

Supervisor: Deborah Kikman

School of Architecture and Urban Planning
The University of Witwatersrand Johannesburg, South Africa

A research report proposal submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Architecture (Professional).

02/03/2022

DECLARATION

I, Thandolwethu Mtshabe (student no. 813825), am a student registered for the course Master of Architecture (Professional) in the year 2020. I hereby declare the following:
I am aware that plagiarism (the use of someone else's work without permission and/or without acknowledging the sources) is wrong. I confirm that the work submitted for assessment for the above course is my own unaided work except where I have stated explicitly otherwise. I have followed the required conventions in referencing thoughts, ideas and, visual materials of others. For this purpose, I have referred to the Graduate School of Engineering and the Built Environment style guide. I understand the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my unaided work or that I have failed to acknowledge the source of the ideas or words in my own work.

Illustrations and photographs are by the author (Thandolwethu Mtshabe) unless otherwise stated.



02/03/2022

ACKNOWLEDGMENT

Thank you, Mom and Dad, for the supporting me through my academic journey

Litha and Amahle for the emotional support

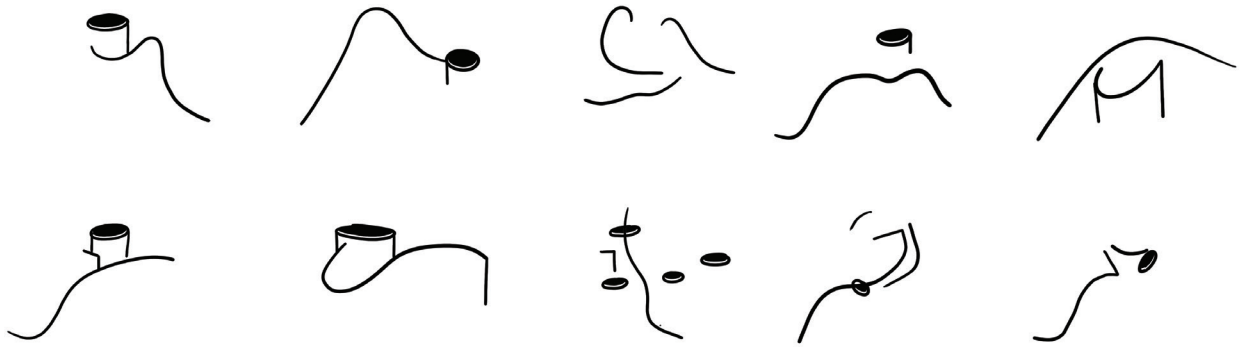
Thank you Sipokazi and Lerato for the administration assistance

Hillton Judin for coordinating the year

To my fellow students , thank you for allowing me to bounce off ideas and steering me towards a solid direction

Thank you, Deborah Kirkman for being patient with me throughout this year and allowing to push boundaries

ABSTRACT



The word ‘harmony’ is commonly used in music, and is defined as “the combination of simultaneously sounded musical notes to produce a pleasing effect” according to the Oxford dictionary(1998). In architecture, harmony is used to describe complexities and differences that co-exist in relation to one another. In this research reported, the word harmony is going to be used as a middle position between music and architecture, allowing music to inform the design process for an architectural outcome. The design process is conducted in a series of exercises that will translate music into architecture, while the theoretical writing navigates through a timeline of expression emphasizing on the importance of evolving. This journey of finding harmony highlights the main idea of this research report: temporal experience and spatial permanent.

The new Urban Development Plan of the Buffalo City Metro Municipality which aims to connect marginalised areas to the main economical hub and the lack of multi-functional music spaces in East London is the leading motivation to the research report. The report proposes an extension to the corridor that starts at the selected site, creating a celebrated entrance/end by adding a permanent experience of sound.

CONTENTS

RESEARCH STATEMENTS,THEMES AND QUESTIONS

INTRODUCTION

FROZEN TO LIQUID ARCHITECTURE

Evolution.
Rhythm in Space(Steven Holl and the equation).
Architecture a Instrument- Freeway.

SAMPLING AND SYNTHESIS

The Culture of Hip Hop.
Retrofit.
Music for Harmony.
FL Studio.

ART OF TRANSLATION

Y-Condition and Musico Spatial.
FL Studio.
Applying The Levels of Inventions.
Sound Sketche.
Sound Models.

ARCHITECTURAL ACOUSTICS

Hearing (The semantics of sound).
Principals of Acoustics.

PRECEDENTS

Casa da Musica - OMA
Parco della music - Renzo Piano
Lewis art complex - Steven Holl

Buffalo City Metrolitan Municipaity

East London Framework
MELD Corridor
East London Harbour
Fort Hare Precinct

Brief

Technical Systems

HARMONY (FINAL DESIGN)

CONCLUSION / REFLECTION

REFERENCES

LIST OF FIGURES

PREVIOUS DESIGNS

ETHICS CLEARANCE

RESEARCH STATEMENT

“Hearing structures articulates the experience and understanding of space. We are not normally aware of the significance of hearing in spatial experience, although sound often provides the temporal continuum in which visual impressions are embedded.”

- Pallasmaa

As humans, we are told to see the world rather than hear it, this saying has made sight to become a primary sense that designers such as myself who are visually driven to miss the opportunity to use other senses as design drivers. Hearing is not for listening to music only, it is an important survival sense with the ability to reach distances beyond sight and touch. Christen’s book “The Musical Timespace: A Theory of Music Listening” describes hearing as an engaging sense that measures the quality of sound and the arousal of attention. Christen breaks down the five fundamental dimensions of hearing and identifies the quality description of a space, narrowing down important factors of how to archievement the best quality of sound in a space.

The relationship between time and space is accurately expressed in Steven Holl and Jessical Langs’ collaboration, “The tesseract of time”, a performance where the poetic movement of the dancers are a physical representation of sound; performed in four vibrant acts that correspond to the relation of architecture to the ground. From this performance, I have highlighted four main themes: repetition, tone, rhythm and proportion to which this research report will use to relate performance to the community with the hope of understanding the fundamental topics of place and emplacement, expression and song, temporal experience and spatial permanency.

Zueg’s paper “Architecture as a Instrument” describes the shadows cast on the road and a car on the freeway as a the visual representation of a temporal experience with a seeming less feeling of arrival and departure. This paper plays attention to the importancy of the journey rather than the distination. Is paper with be use in trying to link music to architecture by connecting the music as the journey while architecture becomes the celebrated spatial distination. Links between music and architecture can also be narrowed down to three dynamic levels of creation: through process- the means of inventing, realising product- the outcome of these processes and experience- the human interaction

with the outcome (Ham, 2005). Jeremy Ham's research paper Starting with nothing and ending up with something plays around the notion of improvisation and the ability to adapt through the lens of Musico-Spatial Design.

He then describes jazz as one of the musical genres that requires a great deal of improvisation and the chapter 'Generation complexity through solo drumming improvisation' speaks on the different unique creative design techniques influenced by time, that both professional drummers and architects share during the creative process(Ham 2005). He discusses the idea of reinvention, where two mediums which are bound by different components can shape each other.

Although Elizabeth Martin's 'y-condition' is the idea of a membrane that connects music and architecture. Her research uses the layering process as a method of translating music into architecture to create and define a new methodology (Martin 1994). Similar to Ham's idea of stepping away from traditional musical notation her research focuses on minimal music which was visually represented creating a graphical notation with a set rules to how each note is going to be represented as a physical element. My experimentation will take a more relatable approach by focusing the the origins on hip hop in america and how South African artists have reinterpreted it to appeal to South African audience. The idea of reinterpritation is also going to be view through an architectural lens.

In this research report, I also aim to do experiments and explorations on finding harmony by taking certain aspects from Hams and Martins experiments and reinterpreting them with the hope of answering the key questions: Can music be inhabited? Can music be used as a design tool to boost the cultural heritage in South Africa? Can music and its rich history of empowerment be used to design spaces of expression? What does a permanent expression of sound?

ESSAY



INTRODUCTION

Music and architecture are two art forms that have been around since the creation of man and with each century they both have a new definition of what constitutes them through new sounds and forms that give us a detailed timeline of expression to which they both become more refined. This research report focuses on the significance of music as a temporal experience and the spatial permanence of architecture by developing a methodology of finding harmony which will be conducted in a series of experiments that visually produce sound models that will inform the design process for an architectural outcome.
The first chapter Frozen to Liquid navigates through iconic periods in architecture and highlights the importance of inter-disciplinary movements that has helped music to exist in architecture and architecture to exist in music. Works from architects like Bernheimer, Holl and Zeug will be discussed and are going to set a foundation in orchestrating the methodology of finding harmony, and in this research report the word harmony is defined as a permanent experience of sound.

Music has given the marginalised communities around the world a voice and has been used as a tool of empowerment that connects people from different communities. Serving as a unifying social tool that battles oppression and promotes resistance through cutthroat lyrics and sounds that tell a story of the battle at hand. Even though architecture has been used for the same reasons, in countries like South Africa it has been used to oppress and segregate and left modern-day South African architects with spatial and identity issues that are being dealt with through transit-oriented development such as Corridor of freedom (initiative in Johannesburg, Gauteng) and Meld Corridor (initiative in East London, Eastern Cape that the research report will focus on). The music component of the research report will focus on a music genre that I personally think has the most interesting origin story. Hip hop was created by the black community in America, a community that was stripped of their humanity and traditions and left with no reference of their cultural belonging but still manage to create a ‘cultural system’ through music that they can proudly call their own. The chapter Sampling and synthesis navigates through the evolution of hip hop and will give a clear understanding on the sounds that birthed the genre and highlight the desire that human beings have to find a sense of belonging.



Fig 01: Philips pavilion at the 1958 AD Classics expo Le Corbusier and Iannis Xenakis

This chapter will also explain how sampling helped Hip hop to evolve to a genre that appeal to a young and ool audience and will also view sampling through an architectural lens and look at case studies of architects that have applied the juxtaposition of old and new to inspire the architectural outcome.

The framework of finding harmony is to orchestrate a design process that investigates what sound looks like and will be conducted through a series of experiments and look at case studies of architects that have flirted with the idea of architecture inspired by music or dance. The main motive of the research report is to come up with a argument that proves other disciplines mashed into architecture will help architecture to reach a level of design that has not be applied. The first exercise is conducted in a classroom where a group students are asked to sketch what they hear while music is playing in the background and the second experiment is a reinterpretation of the y-condition by Elizebeth Martin to which a series of sound models are created and form part of the methodology of finding harmony: a permanent expression of sound.

FROZEN TO LIQUID

This chapter highlights essential elements that were considered beauty in architecture from the colossal structures of classical architecture to the attention to dramatic detailing of the Braque movement. The timeline dives into Steven Holls fascination in the notion of inter-disciplinary, focusing on his House Stretto and his collaboration with Jessical Langs in the tesseract of time. The attention to time during the performance brings light to the relationship between temporal experience and permanent structure to which Zeugs' article is going to be discussed.



Fig 02: *Last Judgment, drawing Vienna, Albertina Museum by H. Tom*

2.1 EVOLUTION

In every century there is a group of writers, artists and architects who lead the popular creative movement of that time and develop guidelines of what constitutes beauty in writing, music, art and architecture. The close attention to detail of the Baraque movement started to link music and architecture as a way for buildings to embody movement and time, and was described as frozen music due to the fact that architects, artists and sculptures (Murry 1963) understood architecture as a "combination of different elements that produce beauty of form, with an expression of emotion" (Oxford Dictionary definition of music(1998). This inter-disciplinary notion allowed for boundaries to be pushed and new definitions of what beauty in architecture was, as religious buildings that were constructed swerved towards the ideas of dramatic elegance with rich details (Murry 1963). Its impact was to give an enhanced excitement and a feeling of anticipation that draws us into the tension of the emotional condition of the building (Wolfflin 1961). This poetic connection to architecture strengthens this research reports objective; for architecture to reach new levels of design there has to be a cross-pollination of ideas from different disciplines.



Fig 03: *The San Carlo alle Quattro Fontane by Borromini*

In classical architecture, beauty was conceived in terms of colossal and Vitruvius's Ten Books on Architecture give detailed instructions on how to build classical temples with proportion and symmetry being the primary design principles to which Vitruvius also stated that "without them, there can be no temple" (Vitruvius 1960). This movement closely related the symmetry of the human body and identified the number 10 as the perfect number due to the number of fingers and toes.

It was difficult to apply such principles to domestic architecture due to the scale and intimacy required,but inventors like Brunelleschi, Donatello and Masaccio manage to introduce emotion and poetry into the architecture of the 17th-century renaissance movement(Murry 1963). During this period the number seven was considered to be the lucky number because of the seven planets and the seven times Christians say the word "thy" in the Lord's prayer. This then swerves the inter-disciplinary relation of architecture to music to architecture and to the heavens(Bernheimer 1956). These ideas show us that architecture is a poetic process that can be linked to various elements to create a metaphorical idea that gives architecture wings to ascend to levels greater than the heavens. Using numbers and stars to organise and regulate the design of buildings is only one way of design. Other styles explored different methods or design influences.

These ideas and motives start to demonstrate that architecture cannot exist on its own and certifies that the beauty in architecture had to be related to elements outside the built environment. If during the classical movement architecture was linked to the body and in the Baroque movement it was closely linked to drama and performance then a movement solely inspired by sound and movement is in the pipeline.



Fig 04: *Steven Holl's sketch of the tesseract fragment in relation to the Jessica Lang choreography*

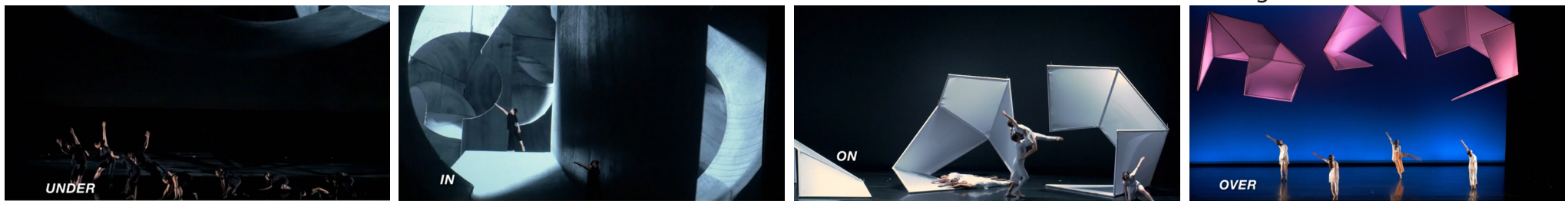


Fig 05: *Jessica Lang Dance "Tessaract of Time" Demonstrating the four sections of Architecture in relation to the ground - Under, In, On and Over.*

2.2 RHYTHM IN SPACE

Theatrum Mundi was also a popular idea that eThe Theatrum Mundi was another popular metaphoric idea that emerged during the 17th century that described the world as a huge stage and people's everyday activities were viewed as a performance. The idea created a dialogue between performance art and architecture which Steven Holl and Jessical Langs' collaboration, "The tesseract of time" a modern-day expression of this metaphoric idea due to its ability to demonstrate the shared relationship with time, body and architecture (Holl 2017). The performance is conducted in four vibrant acts that correspond to the relation of architecture to the ground:

1 - Under the ground.
2 - In the ground.
3 - On the ground.
4 - Over the ground.

The first section UNDER, starts with the dancers entering the stage wearing all black with a beam of light shining down on the stage giving an impression of the heavens opening up onto the earth. The movement of the dances and this beam of light is in correlation with the percussive score of Anvil Chorus and the elements that represent architecture are in hiding but are revealed by the repetitive high pitched knock of the woodblock.
The second section IN show that the Architecture is not in hiding anymore. The dancers' movement defies the laws of gravity and explores movements with emotional expression that is synchronized with the minimalist piano pattern that allows architecture to be infused with its context.
The third section ON, the architecture stands firm on the ground and demonstrates its permanence while the dancers move through the tesseract fragments.

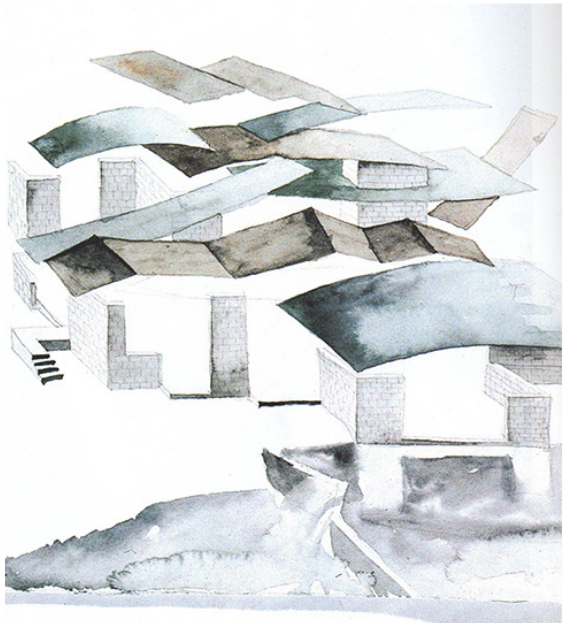


Fig 06: *Steven Holl's watercolor painting of house Stretto*

The fourth section OVER, pays homage to the revolutionary, Innis Xenakis. In this act, architecture is raised from the ground as if there is a new barrier that has been broken and a new level of thinking in design has been reached. The architecture exists in a realm where it cannot be constrained by physical properties thus giving it a closer relation to the heavens and the stage is flooded with a range of lights from green to red, signifying the birth of a new architecture (Holl 2017).

One of Steven Holl's methods of connecting architecture with other artistic disciplines is done by highlighting similarities between the two mediums to enable a smooth transition from one form to the other. The organisation of the tesseract fragments and the dance's movement demonstrate another theme of this research report which is time in space. Holl describes music as a measurement of time and in the performance, the dancers are moving on the same vibration as the sounds projected from the music. If sound is a measurement of time and space is the outcome of architecture I then believe that during this performance the poetic movement of the dancers are a physical representation of

$$\frac{\text{material x sound}}{\text{time}} = \frac{\text{material x light}}{\text{space}}$$

sound which then leaves us with the question of how it can be transitioned into architecture?

Another methodology that Holl's has development in establishing a link between music and architecture is through a formula in which can be followed during the design development stages:

House Stretto in the is first project that he used in developing this formula and was designed in correlation to Bartok's Percussion and Celestra musical notation. The building manages to combine structure, light, material and spaces to one organic molecule that ties everything together with a clear distinct division in materiality by using the juxtaposition of heavy and light.

"Where music has a materiality in instrumentations of sound, architecture attemptsananalogue in space and light."

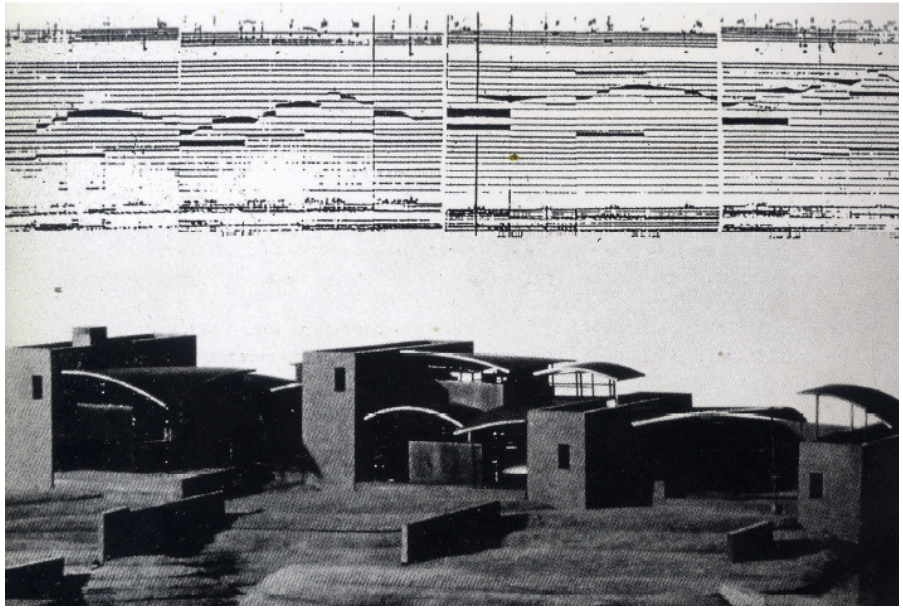


Fig 07: Top-Musical notation by Bartok's Percussion and Celestra. Bottom-Steven Holl's timber model of house Stretto.

In Bartok's musical piece there is a combination of drums and string instruments to which Holl linked the heavy materials with the drums and the light material with the strings that becomes a mismatch to make a whole (Holl 2017). The main house aqueous space is devolved by several means: floors plans pull the level of one space through the next, roof planes pull the space over walls and an arched wall pulls light down the skylight. The House Stretto demonstrates interlinking of space through light and materials and the beginning finds of harmony.

Holls' Fourth sections of architecture suggested a new type of thinking in Architecture which Jeffrey Kipnis article, Folding in Architecture is a step towards this discovery.

DeFormation is a type of architecture which underlines the importance of the residual – leftover spaces (Kipnis 1993) an idea similarly experienced in music where the pauses in between the song are just as important as the compilation.

In the article, Kipnis describes the spaces as the in-between and the interstitial spaces. Traditionally an interstitial space represents the middle-ground as opposed to a use-space which is seen as the primary space of a building or the destination point for specific activities(Kipnis 1993). The interweaving of space and the journey in architecture emphasizes the relationship between temporal and permanent. The inevitably of an end in the temporal experience shows the importance of the start while the permanence of the start shows the need for the journey.

In the journey of finding harmony: a permanent expression of time, the traveller must have a more interactive connection to the building and experience all the different themes which are repetitions, tone, rhythm and proportion through the materials and the journey to make the destination a more celebratory event.

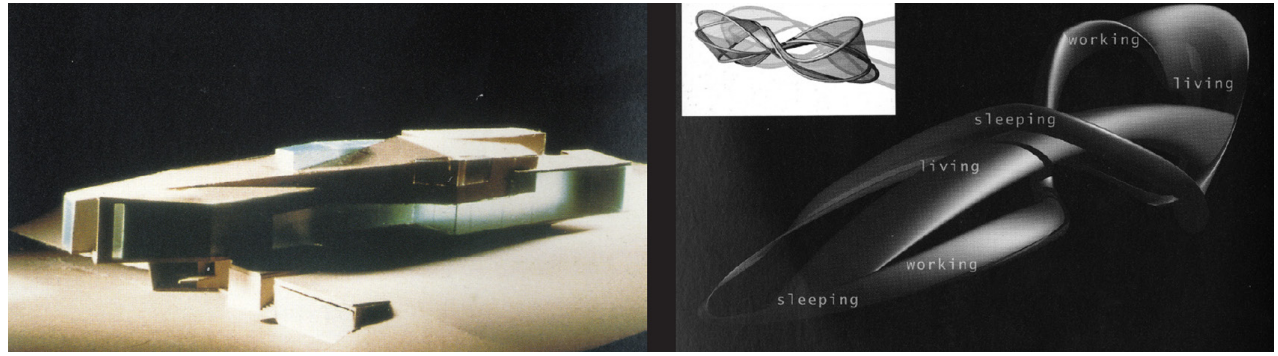


Fig 08: Model exploring the interplay of glass and concrete and loop diagram of spatial organization of the Mobius House (Van Berkel & Bos 2006)

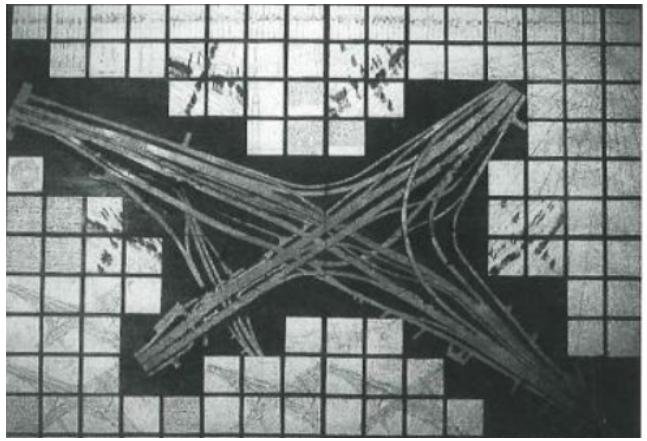
2.2.1 ARCHITECTURE AS A INSTRUMENT-FREEWAY

Touching back on the fundamentals of reinterpretation, it is important to note that the same instrument that is played by Håkan Hardenberger and Huge Masekela produces two different genres. The reinterpretation of the instrument allows for its transcends through sound. This notion sparks the evanescence of music and the permanence of instruments(architecture). Highlighting the relationship between temporal celebration and spatial permanence - one of the underlying principles in the journey of finding harmony - by defining sounds to visual elements expressed through time.

Zeug's descriptions of the shadows cast on the freeway and a car on the freeway are the visual representation of temporal experience. The Freeway is structured with a seeming less feeling of arrival and departure giving the driver a direction favourable to destinations. A similar moment to this is when the conductor takes the podium and the musicians await for instruction. The freeway awaits the dawn as the sun peeks over the horizon. The conductor raises the baton and moves it with rhythms, harmonies, melodies that counterpart patterns of the shadows created by the element surrounding the freeway awakened by the movement of the sun. (Zeug 1994)

Zeug closely compares a day on/of the freeway to the orchestra by describing the first instrument as the green landscape playing the role of the cello; setting the base temporal structure to the piece. The second instrument, analogous to the viola and consisting of a series of masts attached to the roadside, adding the harmonic overlays. The third instrument plays the role of the first violin that creates primary melody trees of various heights, shapes and flowering patterns(Zeug 1994).

This project took a unique direction of linking music to architecture, and by doing so it has opened more paths on identifying similarity in rhythm, proportion and tone, the same themes that will be explored in the design process.



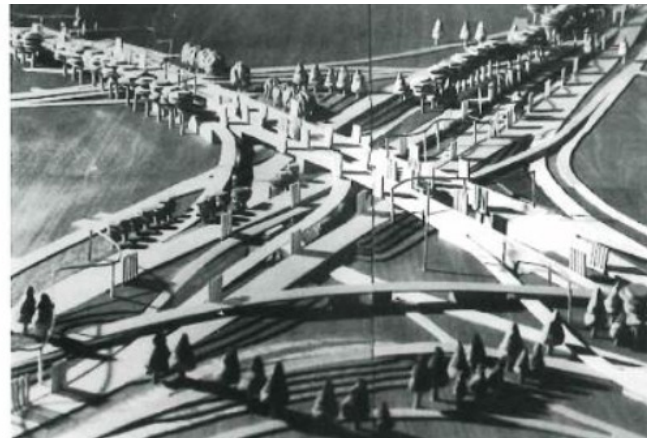
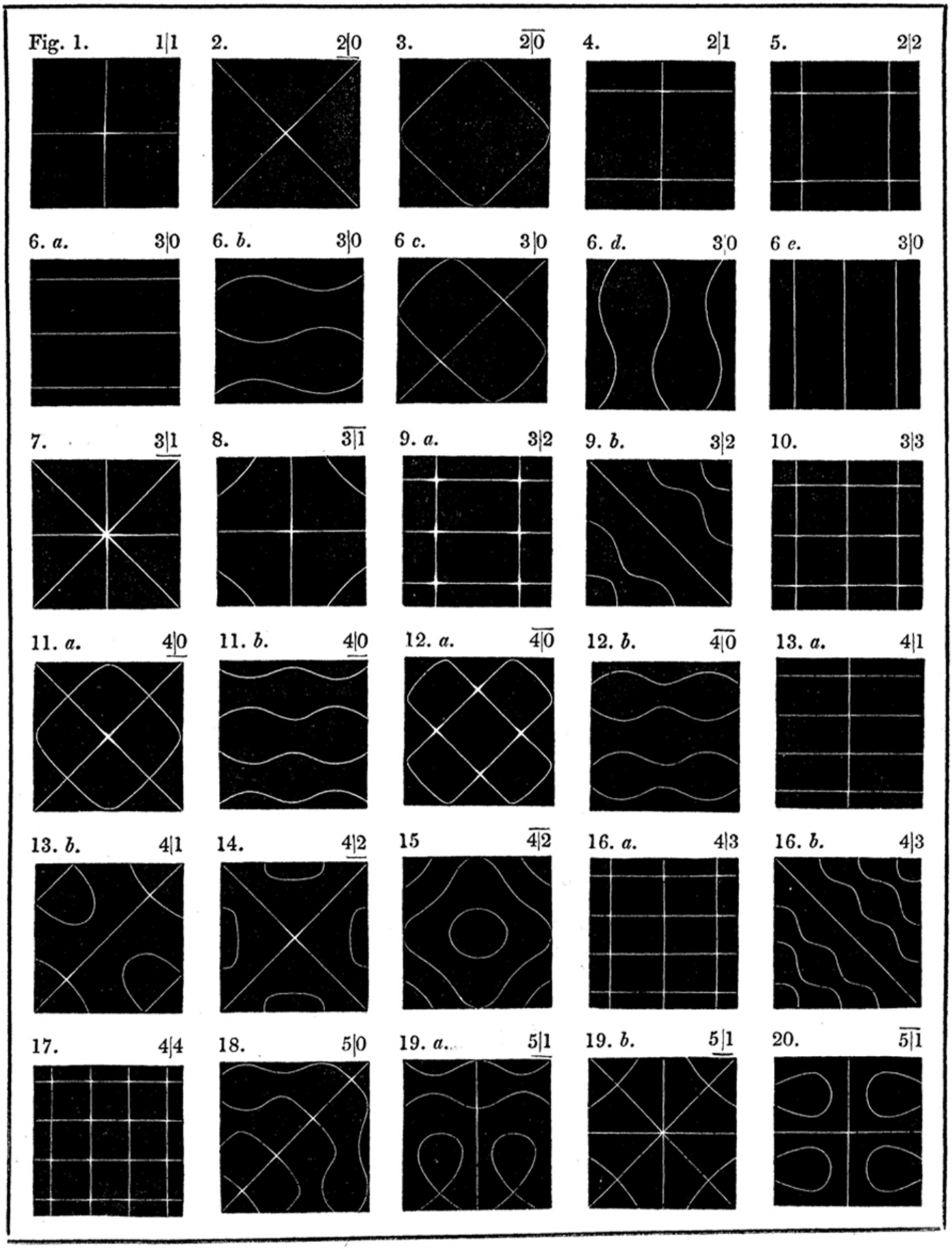


Fig 09: *Zeug images of Architecture as a Freeway*


Fig. 1. 1|1
2. 2|0
3. 2|0
4. 2|1
5. 2|2
6. a. 3|0
6. b. 3|0
6 c. 3|0
6. d. 3|0
6 e. 3|0
7. 3|1
8. 3|1
9. a. 3|2
9. b. 3|2
10. 3|3
11. a. 4|0
11. b. 4|0
12. a. 4|0
12. b. 4|0
13. a. 4|1
13. b. 4|1
14. 4|2
15 4|2
16. a. 4|3
16. b. 4|3
17. 4|4
18. 5|0
19. a. 5|1
19. b. 5|1
20. 5|1

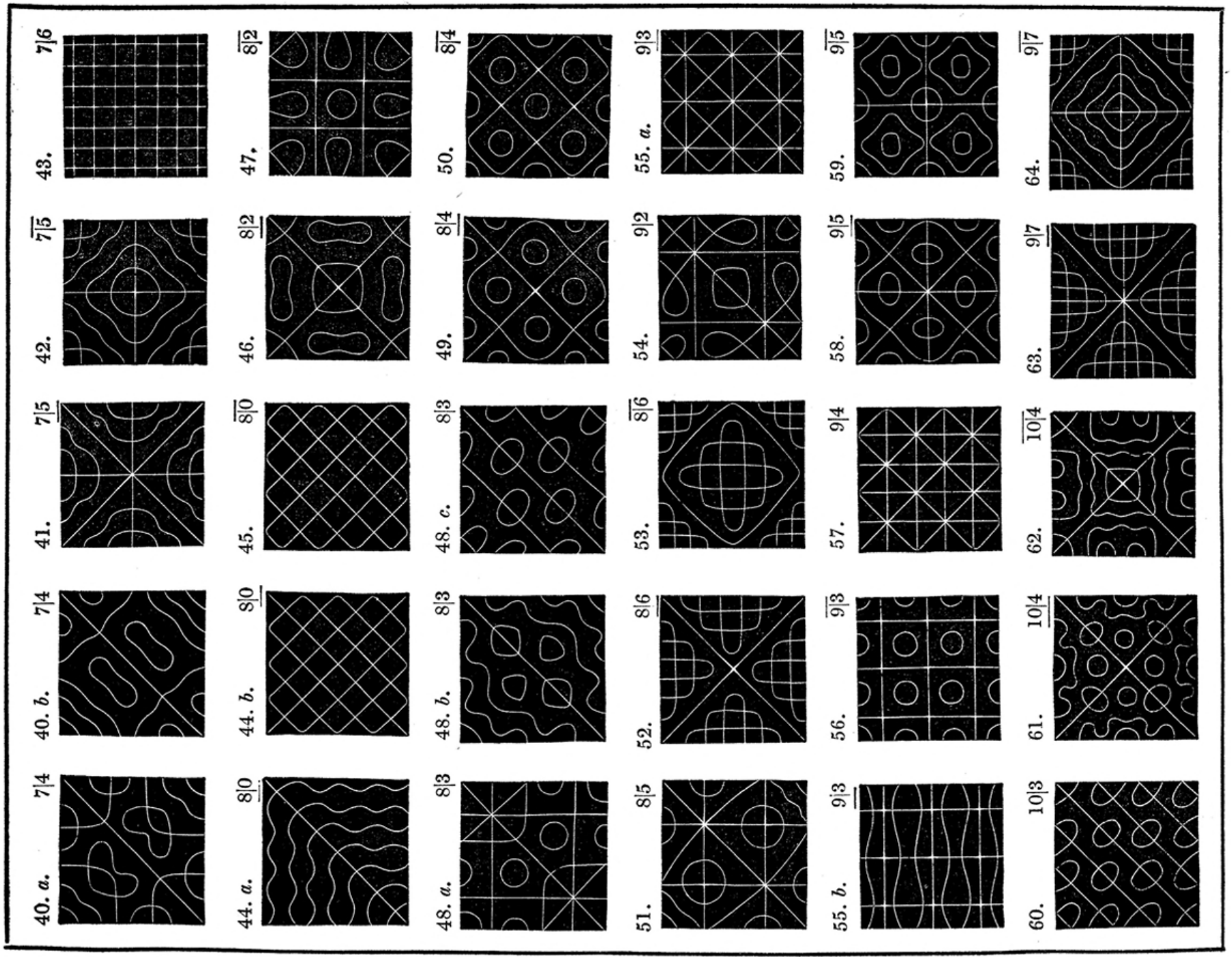


Fig 10: Chaladni figures demonstrating dynamic sound vibrations by employing a violin bow on a plate with sand on

SAMPLING & SYNTHESIS

3.1 THE CULTURE OF HIP HOP

In the past, music has demonstrated its ability to give a voice to the voiceless and how it can connect people from different cultures and believes to a common idea that is portrayed in the lyrics. Some of these lyrics are written with emotion, aspirations, and depiction of life experiences that the artist is sculpting through the arrangement of words, metaphors and rhyme scheme that he/she's audience can relate to and empower. For this research report, we will sail across the Atlantic ocean toward a country where black people were stripped of their humanity and beliefs but still managed to build a 'cultural system' through music that helped them empower themselves.

Culture in the oxford dictionary (1998) is defined as "ideas, customs, and social behaviour of a particular people or society". From this definition of culture, we can literally call every musical genre a cultural system due to the fact that peoples' wardrobes are influenced by the music they consume and in the 1960s at the peak of disco music silk and platform boats were the social customs.

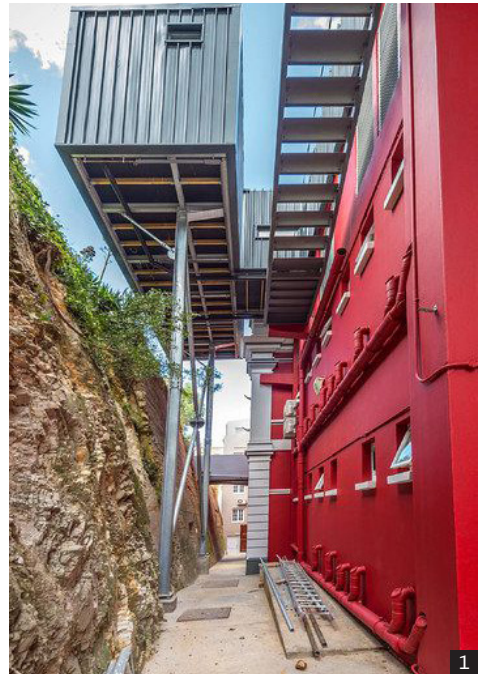
At the decline of disco music in the 1970s in America, black djs started to search for sounds that would fuel the audience dance moves with something they can resonate with rather than the mainstream music at that time. These sounds were found in, Incredible Bongo Band, James Brown, Cymande, The Jimmy Castor Bunch, Dennis Coffey and the Detroit Guitar band are the bands that would play in their parties and clubs and one of the first hip hop parties was hosted by a dj called DJ Kool Herc(Hip-Hop Evolution 2016). He introduced a new style on how o play songs on a vinyl record player where he would only play the breakdown section and extend it while smoothly sliding another song with a similar tempo. This breakdown section of the song happens when the band gives the drummer the freedom to showcase their drumming skills shifting the attention of the audience from the vocalist to the drummer and gave the song a second section to it and would be later fused with 808s and smooth lyrical rhyming to create a genre that would headline in mainstream media, influencing fashion, business, sports and politics (Hip-Hop Evolution 2016). This reinterpretation of an original idea strengthens the main theme of this research report, temporal vs permanence and demonstrates this through the emotional experience.

3.1.1 RETROFIT

The breakdown section of songs were the early sounds of hip hop (Charnas 2010) and was taken to the next level by a producer called J Dillar who would take segments in jazz music or soulful song, mix it with the breakdown sections of songs to make a hip hop beat. This technique of composition of a song emphasizes the relation between temporal vs permanent that exist within the body. Music is a developed language with a high degree of complexity that the body experiences through vibration caused by the tempo. Beats per minute (bpm) measures the tempo and gives a loose indication of which genre the song belongs to. Due to the complexity of music, genres cannot be boxed by bpm but on average a jazz song has a bpm of about 120bpm and disco song ranges between 130-160bpm, Hip hop has a bpm that ranges at about 140 sitting in between jazz and disco music which is why the audience that prefers disco or jazz can loosely enjoy some hip hop songs.

It would be challenging to harness the same emotional connection to a jazz song before it is sampled into hip hop. The feel of the song and the emotional connection caused by the new arrangement of the song, steers it towards a direction of dance thus relating it to disco. By this, I am not saying that all jazz songs reinterpreted through a hip hop lens result in dance but those songs are more likely to get your head moving or your feet tapping and displays a new rhythm and movement of the body that makes the emotional connection to the song a temporal experience and the body the permanent medium. This type of experience does not only exist in music and sample but has appeared in other disciplines such as art and architecture, and in architecture, the idea of sampling appears as retrofit architecture architects are instructed to make an old building new. In sampling, segments of a song are arranged differently to make a new song with no historical sensitivity but in architecture, the segment takes the form of key elements of the building that are to be kept to show where in the timeline of expression did the building fit into before reinterpretation.

The Matrix Urban Designers and Architects are one of the few South African architectural firms that deal with architectural conservation. Gareth Leonards article Opera House: An Architecture of Synthesis praises the firms' critical approach to establishing a new architectural narrative of the building that addresses the present culture of integration and synergy (Leonard 2016). Officially opened in 1892, the new additions to the oldest opera house in Southern Africa (Leonard 2016) display what sampling is in architecture.
The building's dramatic expression between new and old is expressed through the choice of material. Steel, glass and concrete contrast the old plastered brick of the opera house. This reinterpretation of the building gives new meaning to the building and is a fundamental part of the journey on finding harmony.



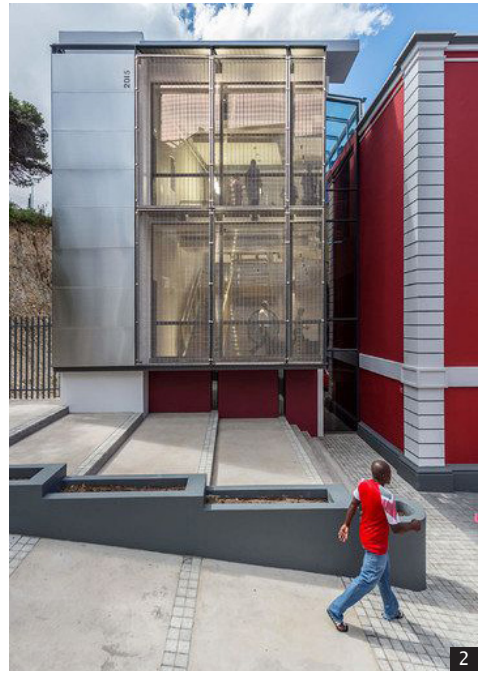




Fig 11: Images *Opera House in Port Elizabeth*
1. Back allay way. 2. Street elevation. 3. Circulation space

3.2 MUSIC FOR HARMONY

Elizabeth Martins y-condition is an experiment that bridges the gap between music and architecture. The experiment is conducted by translating minimal music into architecture and for this journey on finding harmony, I will be using instrumentals from a song by a Zulu born musician - Sjava
Jabulani Hadebe is Kwa-Zulu Natal born musician also known as Sjava. He has managed to bridge the gap between traditional Zulu music and hip hop. Although he was not the first person to experiment with the idea. The late HHP and Khuli Chana swooped the hip hop scene with the Motswako movement, which is basically Tswana rhymes on a steady hip hop beat. Sjava's technique is not so far off to Motswako but he introduces more instrumentals that resonate with the black-natives and allows him to bring in traditional Zulu melodies to the genre.
This piece of music was selected so that it can have a closer connection to the site and its surrounding. The different chords struck by the instruments give a smooth mellow feel to the song like the water flowing by the harbour. The vocals introduce a feeling of pain and suffering relating to the tragic history of South African during the apartheid regime. Although the song is about a break-up, the connection is not made through the lyrical contain but rather the emotion evoked while listening to the song.
The exercise will focus on the main six instruments and are going to be re-created on a digital program called FL Studio to get a graphical arrangement of the instrumental that could influence the conceptual modelling. This development tread of digital chord arrangement and the creation of the sound models aims to create a connection between sound and the physical realm and this is the beginning composition of harmony - a permanent experience of sound.



Fig 12: Sjava at BET Awards wearing Zulu traditional attire.

3.2.1 FL STUDIO

Through this exploration of music and architecture, I wanted to do my own exercise taking certain aspects from Ham and Martin ideas to create my own frame-work of finding harmony. In the chapter, I will be demonstrating the re-create of the instrumentals on the selected song-Before.

FL Studio is a software that can be downloaded for free off the Internet and gives people without any musical background a chance to explore with sounds that professionals create. This is a similar software to the one used during the y-condition experiment which will be explained in the next chapter. These programs can be best described as a music production environment or Digital Audio Workstation (DAW). The one that I will talk about is Fruity Loops Studio created by Didier Dambrin in 1996. Fl Studio offers huge amounts of plug-ins that sample different types of musical instruments from the highest pitch of the violin to the heart pumping, speaker vibrating bass guitar.

When opening FL Studio one is greeted by a blank canvas that can be imprinted with one's own identity which can be put out to the world as a piece that can redefine music or jump on the bandwagon of what is currently trending during that time.
Before another button is pressed there is a sound that is always at the back of the creator's heads that flows throughout the song, which can be seen by their long stretched out bar lines which allow for smaller instrumental inputs like a hi-hat or the neck-breaking sound

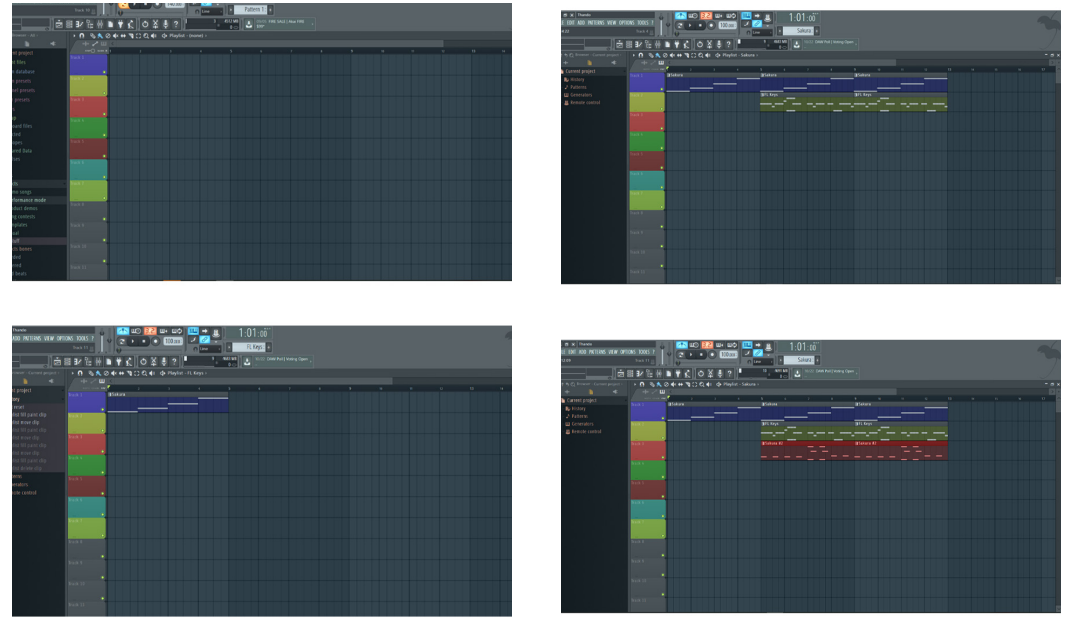


Fig 13: Diagram of Piano keys translated into qwerty keyboard on FL Studio.

of the snare drum to be included to give the beat a little bounce to it. These long bars are the melodic chord in the song which in architecture could be closely compared to the conceptualisation on a project. A concept in architectural terms wraps itself around the entire building and can be seen from any part of the building. Not saying that music cannot be conceptually derived, but it is rather the melodic flow that makes the song whole.

The qwerty keyboard becomes your keyboard: the button ‘z’ to ‘m’ are the white keys ‘z’ being middle c and ‘m’ being middle b. And the buttons ‘a’ to ‘j’ are the black keys. After the melody has been set the song can take many different directions through its journey towards the climax. In the case of the song Before by Sjava, it is about 1:30 when you can hear most of the instruments played beside the vocals and when a song reaches this point, where every instrument that has been selected plays and only as this point does, we get the true meaning of harmony and its principles.

In architecture, we describe harmony as points of interaction wherever they are two clashing networks of information with the intent to find orderliness (Cook 1970). If we use words like harmony in architecture and in FL Studio there is a sense of orderliness to how each instrument is introduced, Then I think we can say that; if architecture is influenced by music the hybrid of the two mediums results in harmony.

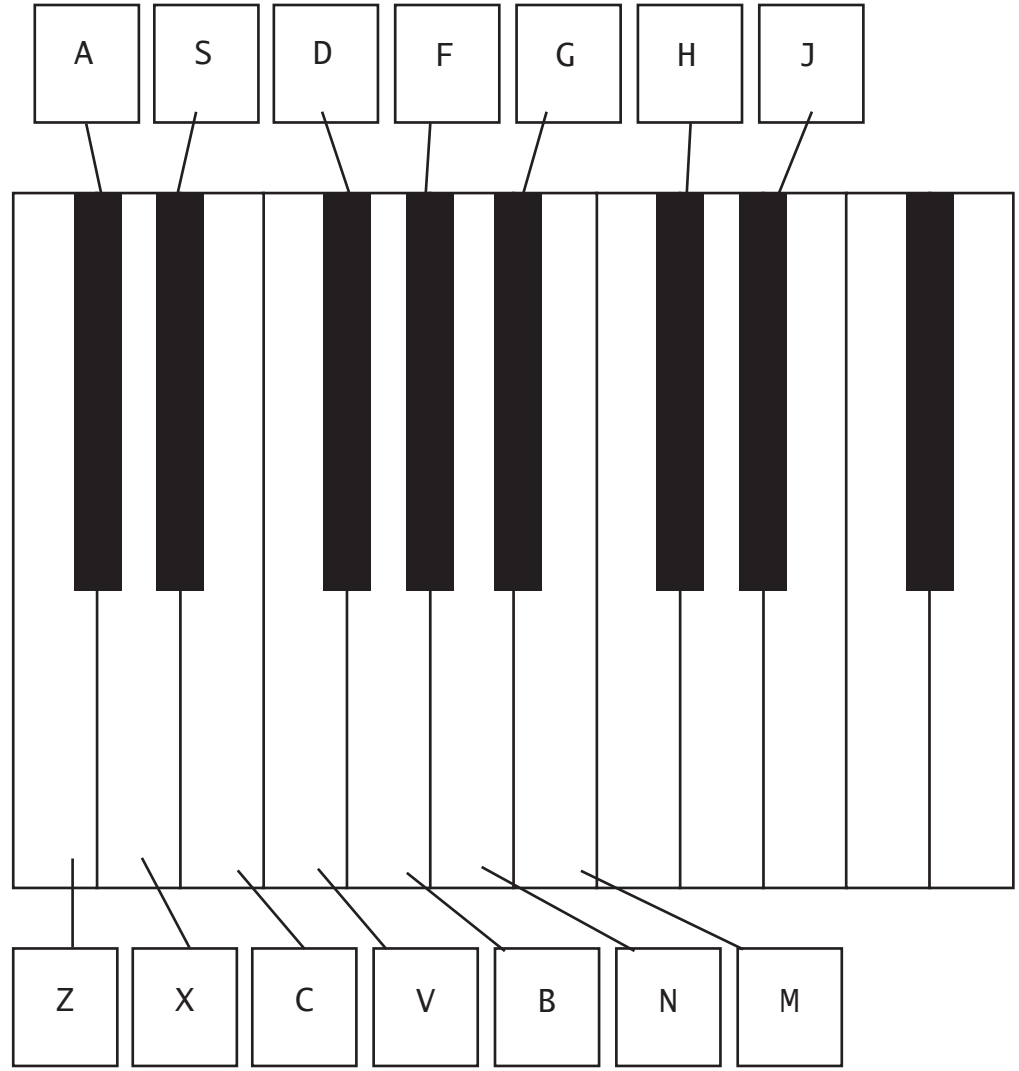
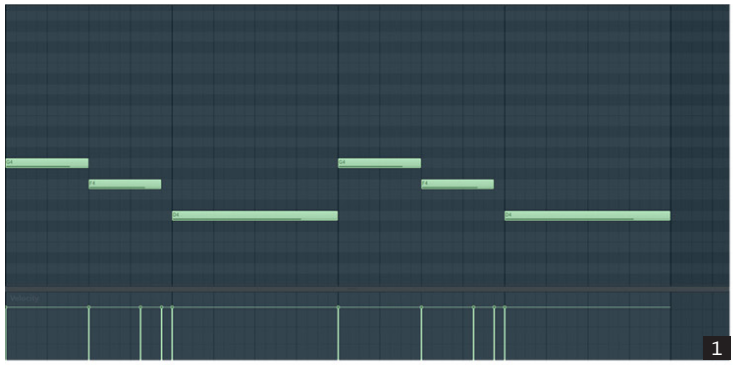
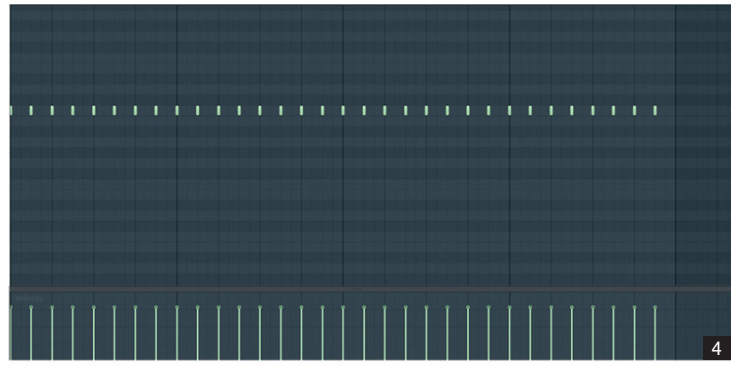
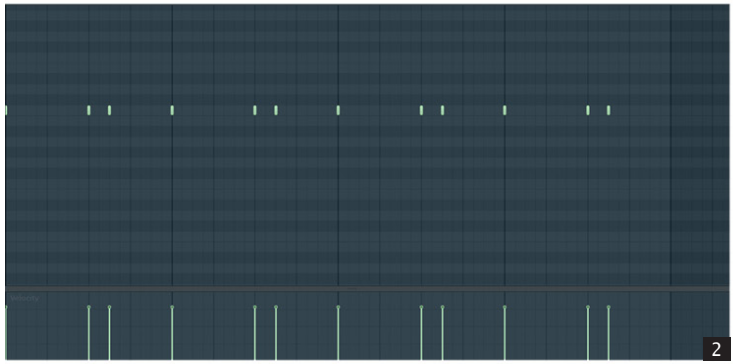
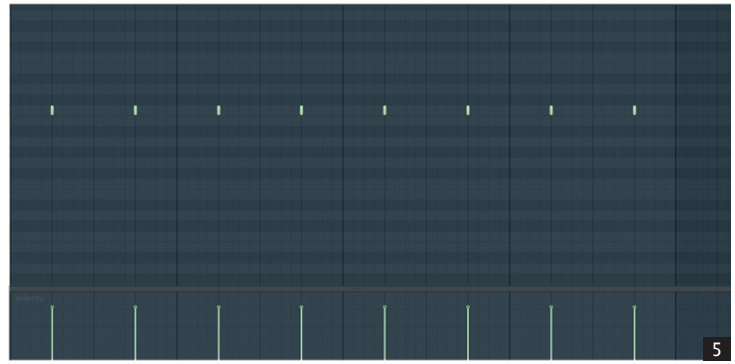


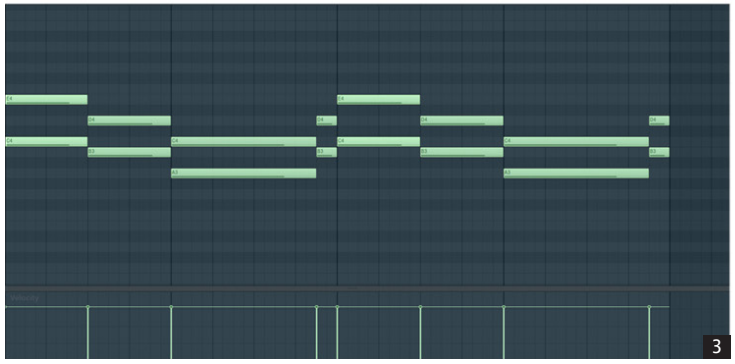
Fig 14: Diagram of Piano keys and the qwerty keyboard. The button ‘z’ to ‘m’ are the white keys ‘z’ being middle c and ‘m’ being middle b. And the buttons ‘a’ to ‘j’ are the black keys. *Translated into qwerty keyboard on FL Studio.*











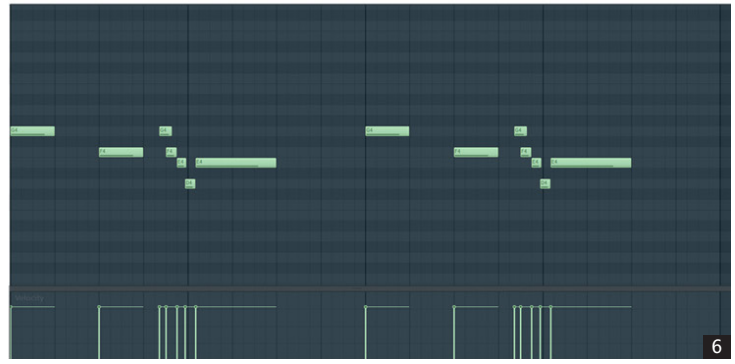


Fig 15: FL Studio musical notation of :
1. Bass guitar
2. Kick drum
3. Organ
4. Hi hat
5. Snare drum
6. Guitar

THE ART OF TRANSLATION

4.1 Y-CONDITION AND MUSICO SPATIAL

The development thread from one link to the other will not show the difference between music and architecture but rather discuss them as one to ensure that the experiment conducted can answer one of the key questions: Can music be inhabited? I plan on linking architecture to a piece of music through the layering process of Elizabeth Martin and Jermey Hams three levels of creation.
Elizabeth Martin philosophy on the y-condition bridges the gap between music and architecture basing the project on the role of a semi-tone or semi-vowel which are sounds that can be heard but not seen like the 'y' sound between 'i' and 'e' in 'quiet'. The experiment sets to find this middle position between music + architecture when translating the one to the other with a focus to create and define a methodology. (Martin 1994). For that, she also had to move away from the traditional musical notation, and analyze music that does not follow a scheme of tension or a climax, but with a cyclical experience like minimal music.
Hams essay "Starting with Nothing and Ending with something" can use as a form of analysing the y-condition through the three levels of invention:
1. through the process- the means of inventing
2. realising product- the outcome of the processes
3. experience- the human interaction with the outcome (Ham 2005).

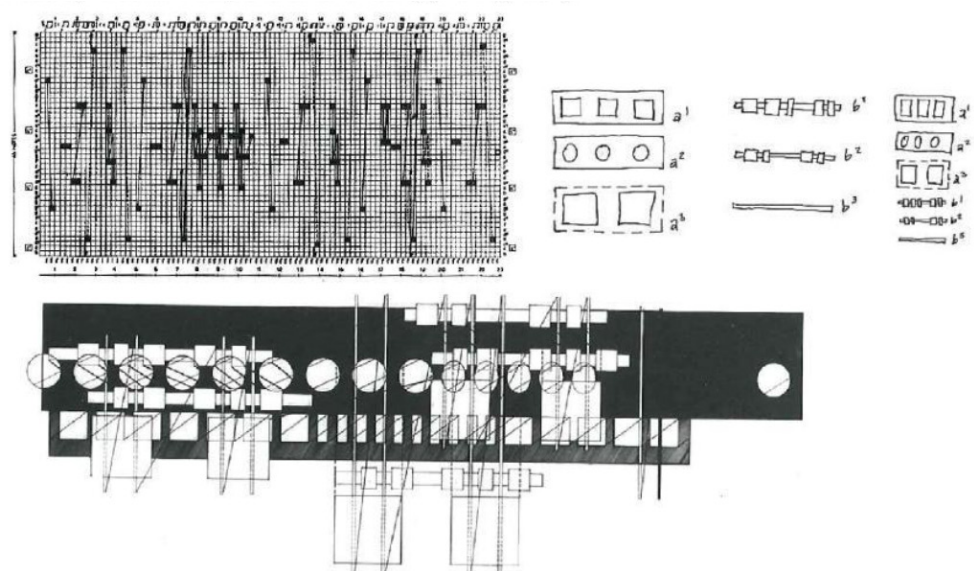
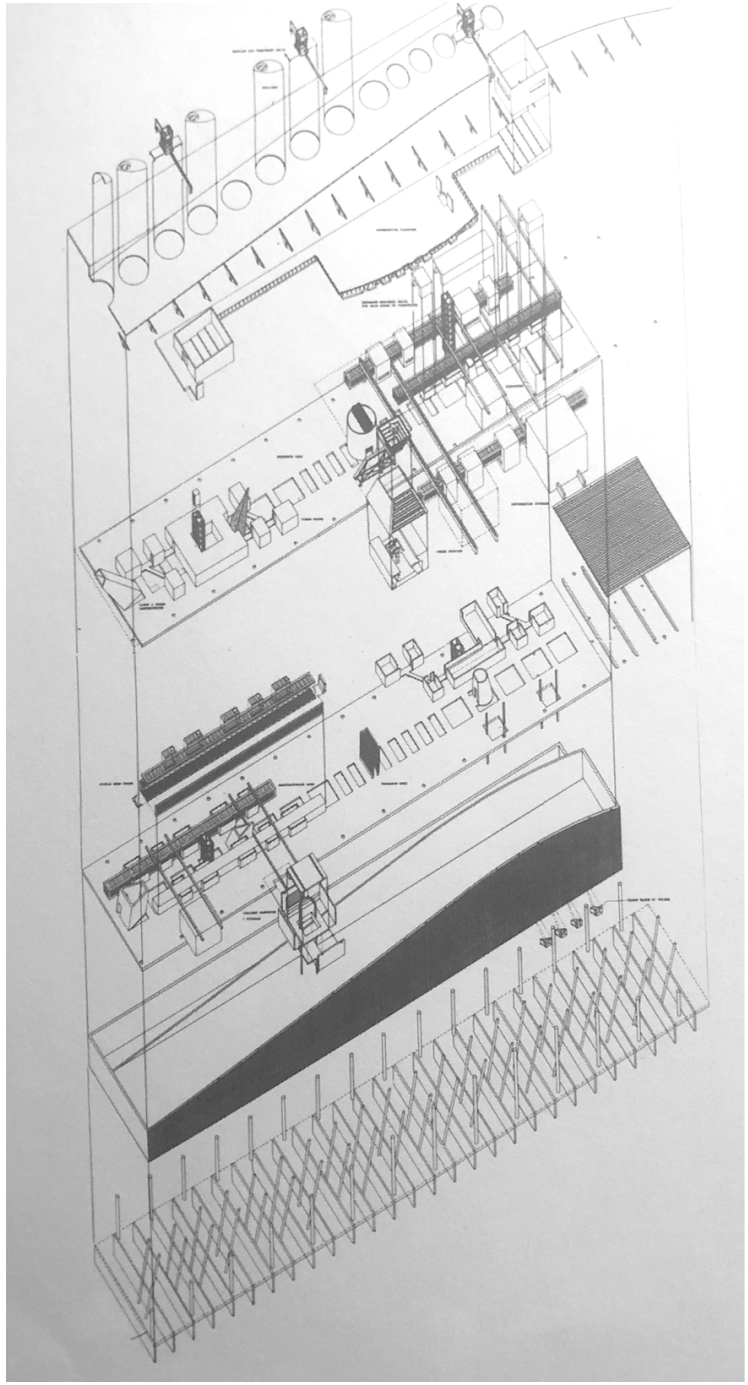
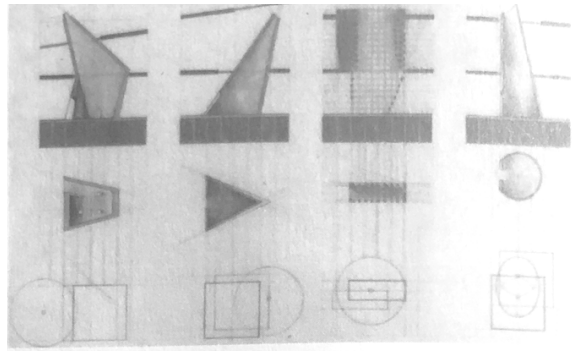


Fig 16: The development process of the Y-Condition methodology where Elizabeth Martin asigns figures to note and arranges the figures according to the computerized musical notation.



In Martin's y-condition the means of invention started when she created a graphic notation and assigned a set rules to how each bar is going to be represented in the physical realm to create models for articulation. From that, she connected the elements through a series of lines to complete a layered drawing of the outcome and a building was created for human interaction.
Jeremy Ham also touched on the notion of improvisation and the ability to adapt that he closely links it to jazz music. The fact that most jazz performances are live there is a high chance of an unexpected event to happen and when this happens the band has to keep the showing going without alarming the audience. This level of improvisation will be demonstrated in this research report when the outcome of the sound models that will be created is placed on the selected site.



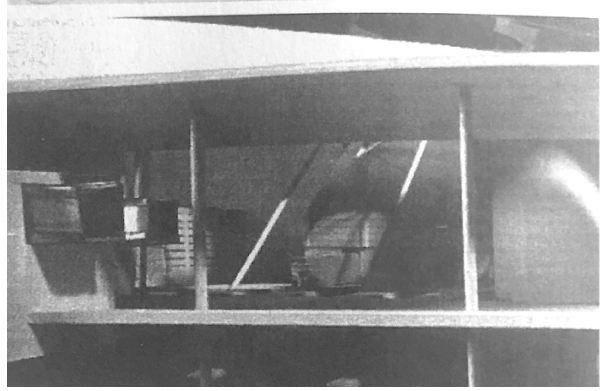


Fig 17: Axo diagram and render of the Y-Condition methodology showing the third level of invention which is the human interaction with the outcome

4.2 APPLYING THE LEVELS OF INVENTIONS

The following exercises try to bridge the gap between music and architecture by analyzing them through the three dynamic levels of creation: the process- the means of inventing, realising product- the outcome of these processes and the experience- the human interaction with the outcome (Ham 2005). The first exercise was conducted in a class full of architecture students who are tasked to draw what they could see when a piece of music was playing in the background. The second exercise was to create repetition, tone, rhythm and proportion in ‘sound models’ that are going to be developed further by a series of lines and dots to create forms that will inform the final design sketch.

4.2.1 SOUND SKETCHES

The process - Means of inventing
During a presentation about music and architecture, I conducted an exercise with the WITS Architecture Honours (2019) group where I asked them to sketch what they saw while music was playing. This exercise was to try create a connection between music and architecture by having guidelines to what type of sketches architecture students consider as musically bound.

A YouTube video of Nicolas Yee was the piece of music selected for this exercise. In the video Yee starts off by running he’s bow through the cello, producing soothing sounds that calmed the room. During the performance booming drums were introduced, adding a kick to the piece that resulted in head movements in the room.
After the performance, the students returned the pieces of paper and the most common element throughout the series of sketches was that they all perceived a movement language.

Realising product - The outcome of these processes
Instead of drawing musical notations, they began to draw a series of lines, dots and curves that moved in a vertical position representing the different pitches produced by the instrument. Some sketches showcased a romantic gesture emulating the feeling evoked while listening to the performance. This exercise proves that curves in architecture are not only influenced by nature but are also influenced by music and movement and that music can be used as a design tool for new architectural forms that confront autonomous architecture.

The experience- the human interaction with the outcome.

The human interaction of the outcome manipulates the sketches to reach an outcome that is more favorable to the architectural mind. Developed on the thread of spatial notation, the sketches are interpreted for a facade or movement development. This experiment was useful in widening my understanding of translating music into architecture. The links between the two should not only be on the visual side but also show the romance in the underlying principles that both music and architecture share which are repetition, tone, rhythm and proportion, and these principles are going to be the are the sub-themes for this research report.

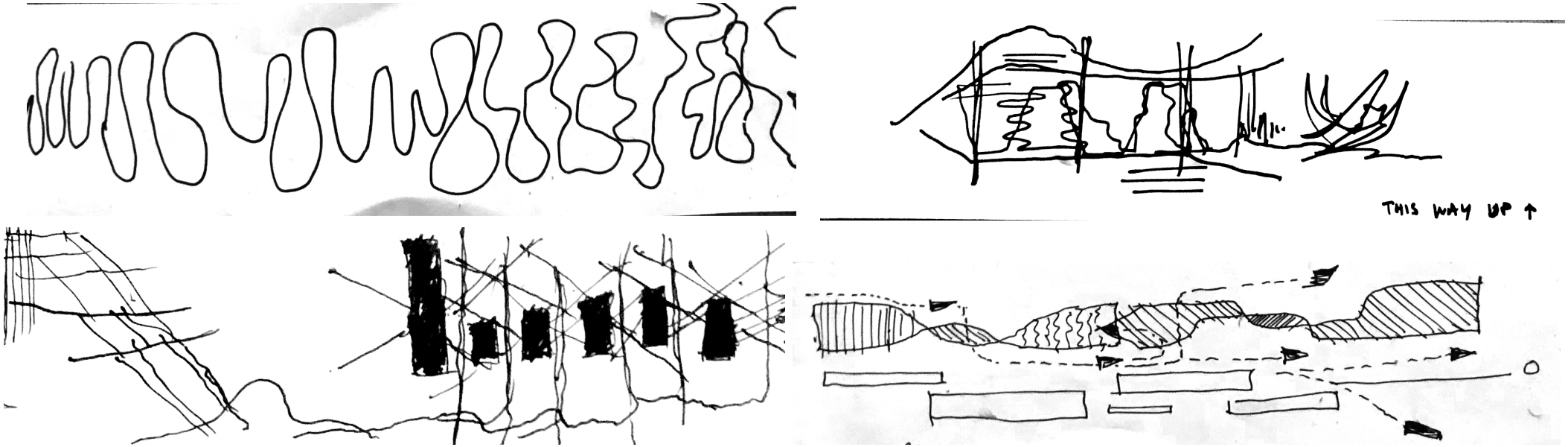


Fig 18: Sound sketches drawn by Wits Honors students of 2019 while music was playing in the background.

4.2.2 SOUND MODELS

The previous exercise of translated music into architecture is analysed as the journey of sound from the ear to hand and showcases the romance of the pen and paper when the student is trying to imitate sound as a visual sketch. In this experiment I plan to create visual representations of moments in a song that will display characteristics found in both music and architecture: repetition, rhythm, tone and proportion.

<u>The process - means of inventing.</u>
As explained in the chapter 'Music for harmony' the journey on finding harmony re-creates the musical notation of the main six instrumentals of a song by Sjava. The experiment 'y-condition' assigned shapes and lines to graphical musical notes and to which my journey of finding harmony threads along the same line but uses found objects that display a sense of raw and ruggedness to highlight the idea of synthesis. The objects alone have no relation to the research report but since this section of the report is about the process of inventing, a comprehensible connection between the two will be discussed.
The six main instruments: Guitar, Organ, Hi-Hat, Snare Drum, Bass Guitar and Kick Drum are linked to the elements by the visual representation of the musical cords. The longer cords are paired together with the heavier material and the same rule is applied to the lighter ones.

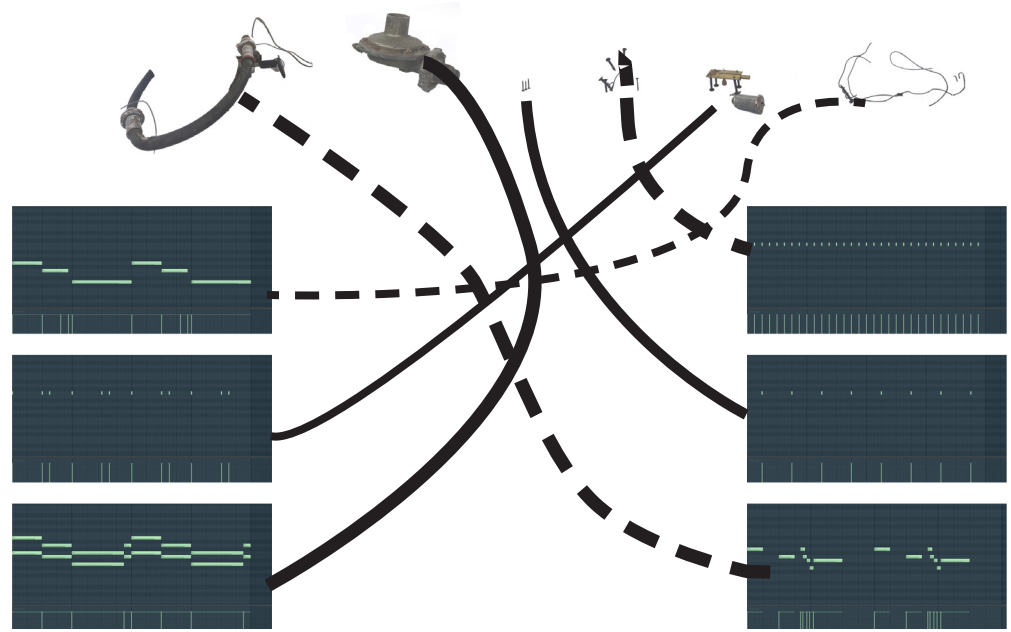


Fig 19: Objects found around the house linked with instrumental from the song *Before* by Sjava recreated on FL Studio.

01: Gas hose - Guitar
02: Gas adapter - Organ
03: Screws - Snare Drum
04: Screws with wire - Hi Hat
05: Locks - Kick Drum
06: Wire - Bass Guitar

To add more to the visual link mentioned above, there is an underlying link in terms of sonic dominance. The instruments that already perceive a sense of dominance by being the backbone of the song are linked with the objects that have a visually dominant and will give the arrangement of the objects a variety that will highlight the four sub-themes.

Realising product- the outcome of these processes

The arrangement of the models is derived from the four sub-theme that can be founded in both music and architecture which are repetition, rhythm, tone and proportion and the sound model represent these themes in a physical form in moments in the song where these themes are highly noticeable.

1) 0:50 - repetition
2) 1:30 - tone
3) 1:50 - rhythm
4) 3:15 - proportion

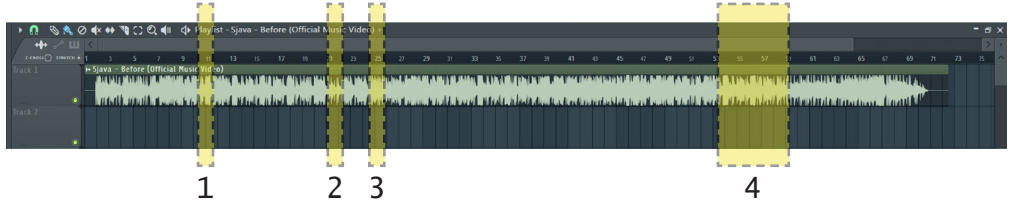
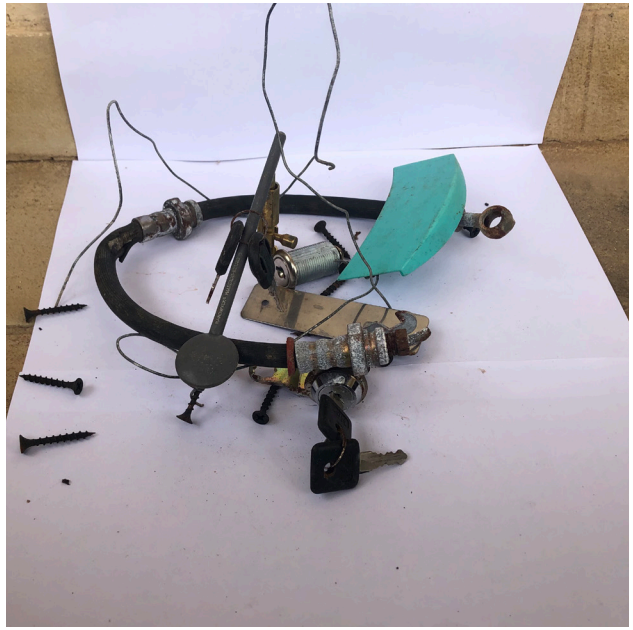


Fig 20: FL Studio sound bit of the song *Before* by Sjava with yellow stripes highlighting repetition, tone, rhythm and proportion.







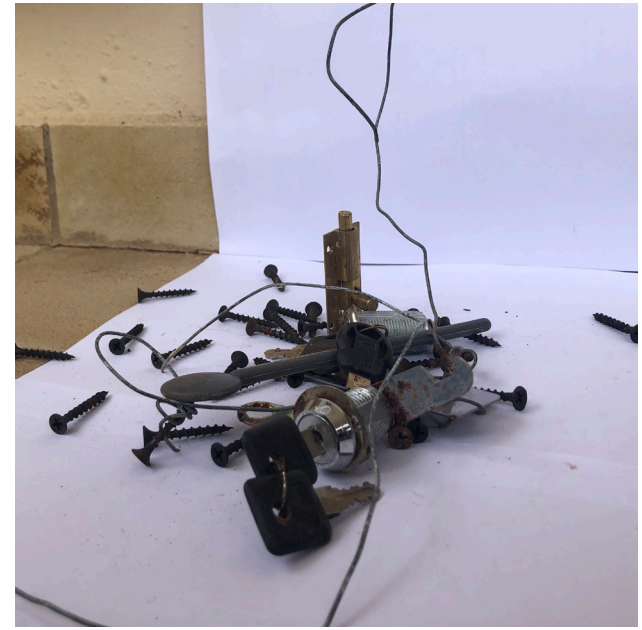


Fig 21: Sound models that represent repetition in the song Before by Sjava.

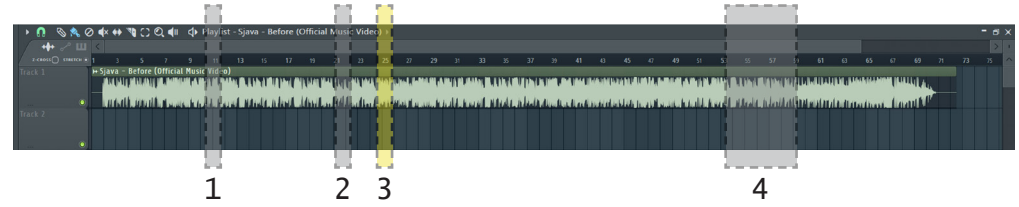


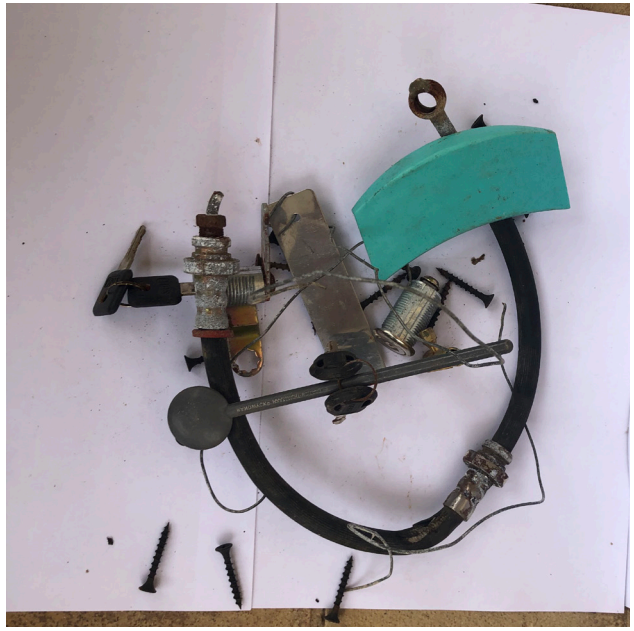


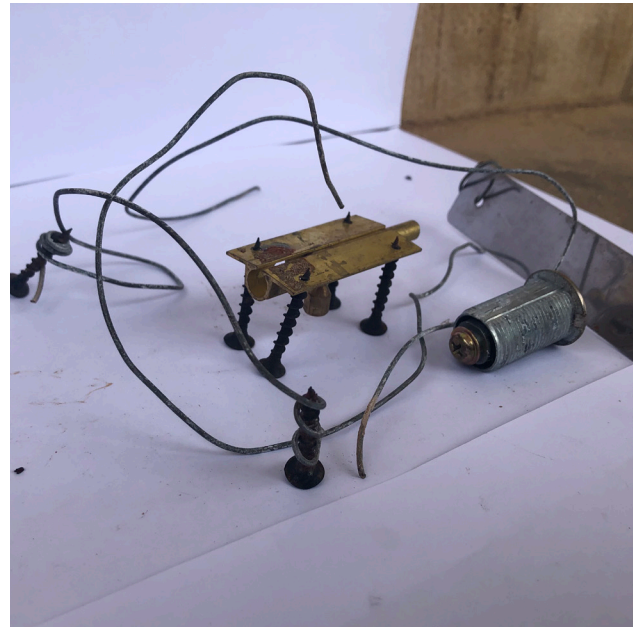




Fig 22: Sound models that represent tone in the song Before by Sjava.







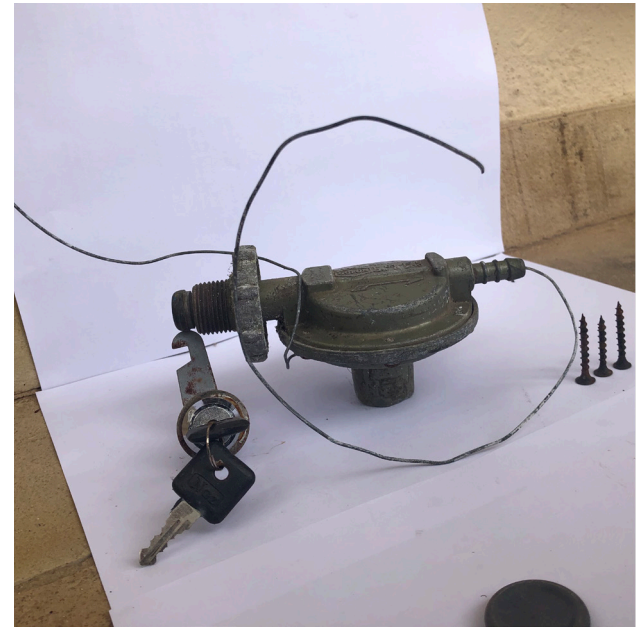


Fig 23: Sound models that represent rhythm in the song Before by Sjava.









Fig 24: Sound models that represent proportion in the song Before by Sjava.

Experience- the human interaction with the outcome.

For the last part of the experiment, I created a final sound model that has elements of each of the four main themes and further developed the model by adding features that suggest how the model can transition into a building. The development process is pushed to the next level by highlighting movement and moments within the model to simplifying it into a series of lines and dots similar to Martines first step of the y-condition. By creating this process not only did I develop a process of translating music into a physical form but i have also found a composed event of harmony.



Fig 25: Final sound model overlaid by lines and dots that highlight movement and moments within the model.

ARCHITECTURE ACOUSTIC

“Music is flux, movement, it is not an abstract form, it exists only in its incarnation in time and in sound; timbre is its very substance.”

- Jean-Claude Risset 1986

If the conversation of music and architecture is going to be effective, the question of what is music needs to be answered but before that, we need to know what are the components of music and at the end of this chapter, there will be an understanding of sound and it properties and how to archive the best possible quality of sound in a room by looking at the five dimensions of hearing.

5.1 HEARING (THE SEMANTICS OF SOUND)

Sound is a product of molecular disturbance through air, solid, liquid or gas. (Howard D & Angius 2006). The disturbance differs by the amount of vibration of the molecules, therefore, causing wavelength that ranges from low frequency to high frequency. Each instrument has it own set of low and high frequency but in the language of music, these frequencies are called harmonics. The quality of the harmonics is related to the ability of the instrument to combine the different harmonics. This quality of sound is also known as timbre.

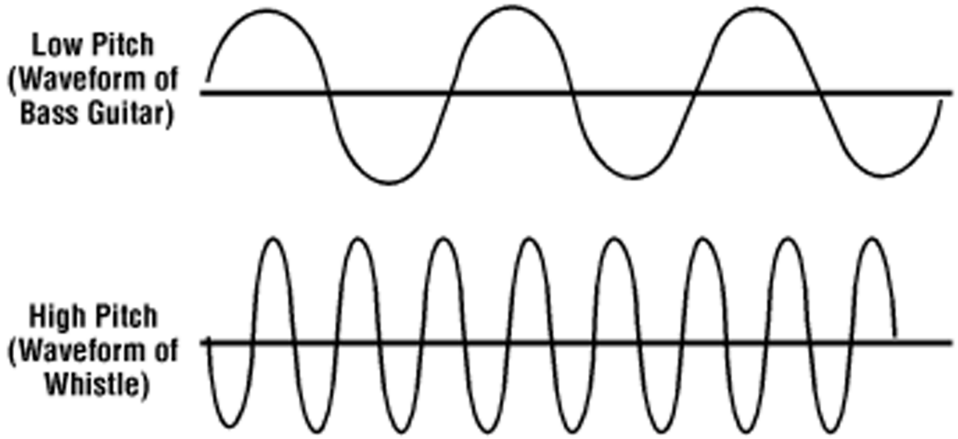
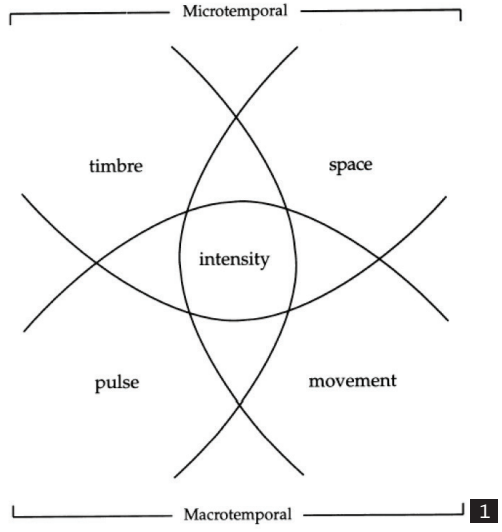


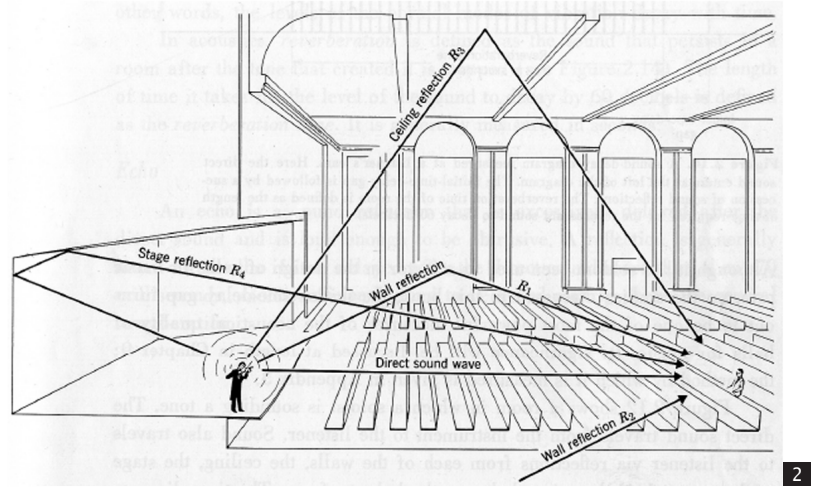
Fig 27: Different wavelengths with appropriate frequency rate.

For performers, one of the import factors in performance is if everyone understands the message being portrayed. In a musical performance, the person sitting at the back needs to hear it just as clear as the person in front. So the level of acoustic elements in the room needs to ensure that this experience happens and understand how the organ that is receiving the sound works.

Hearing is not for listening to music only in fact it is one of the most important survival sense that humans have. It permits localization of danger distant beyond visual ability. Making it the only sense that operates when we are sleeping, The amount of the auditory perceptual process is measured in three fundamental dimensions intensity, timbre, pulse, space and movement (Christensen 1996). Christens went a bit further by identifying intensity as both a *microtemporal* and *macrotemporal* dimension because of its ability to provide information on where the sound is coming from and the successive change of state while movement and pulse are only macrotemporal because they create the experience of time (Christensen 1996). By understanding these fundamentals one can start to design spaces that evoke a sonic experience. At the right time and space and a squeaking sound, can take someone to the rainforest only to remember you are in a museum in Namibia. Tom Rices paper on the sonic experience as a way of knowing discusses the evaluation of sound environments as a way of mapping.



1



2

Fig 28: **1.** Diagram showing microtemporal dimension in relation to macrotemporal dimension.
2. Path of direct sound and reflected sound waves in a concert hall. Reverberation is a collection of all thereflected sounds in an auditorum.

5.1.2PRINCIPALS OF ACOUSTICS

Since we now know the properties and characteristics of a sound wave, we can start manipulated its movement by bouncing it on surfaces that to ensure everyone in the room can hear what is happening on stage with zero disturbance. Bouncing sound off the acoustic surface will archive a room that flattens the soundwave so that the sound that is being produced currently is not disturbed. The time it takes for the sound to be flattened is called reverberation time. Two elements that affect the reverberation time - space and material. These two element work hand in hand when it comes to designing an acoustically rich space. The bigger space the longer



Fig 29: Notre Dame in Paris image by Samuel-J.-Juett (2018).

the reverberation time so additional surfaces will be added to bounce the sound in a shape that will increase acoustic quality.
The founders of architectural acoustic, Prof. Wallace Clement Sabine discuss the fundamental components in making an acoustically rich auditorium. He states that it is necessary for each sound to be sufficiently loud but also maintain its proper relative intensity (Sabine 1927). He speaks on the desirable reverberation time in speech and music as 1,5-2,5 seconds, anything higher makes speech difficult to understand. He noted that the Notre Dame in Paris has a reverberation of 8 seconds, perfect for organ not for speech. (Sabine 1927) During his time at Harvard, he came up with a formula to calculate the reverberation time that we still use today.

Understanding how sound works we can start to design spaces that evoke emotion. Connection and disconnecting can create a experience when moving through spaces so it would only make sense take a music school be design in a manner in which music gives us an experience weatherer by connection or disconnecting us.

$$RT = (0{,}16s/m)\ \frac{V}{S_e}$$

RT is the reverberation time

V is the interior volume of the enclosure (length x breadth x height)

Se is the effective absorptive area (sum of all surface areas)

Casa da Musica

ARCHITECT: **OMA**

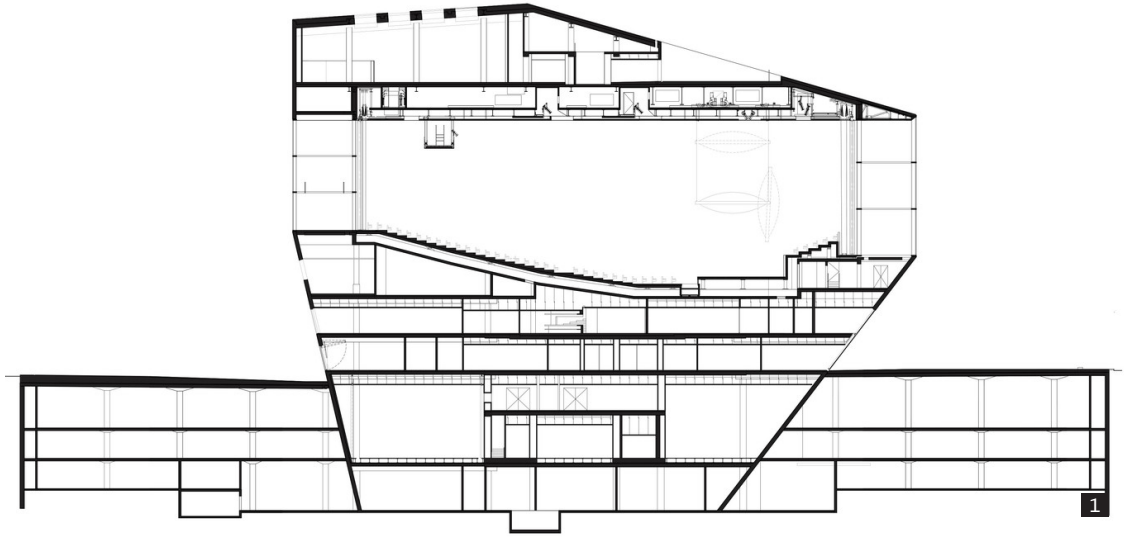
“OMA chose not to articulate the new concert hall as a segment of a small scale circular wall around the Rotunda da Boavista but to create a solitary building standing on the new, more intimate square” (OMA 2005: 97). ‘With this concept, issues of symbolism, visibility and access were resolved with one gesture. Through both continuity and contrast, the park on the Rotunda da Boavista… is not longer a mere hinge between the old and the new Porto, but it becomes a positive encounter of two different models of the city’

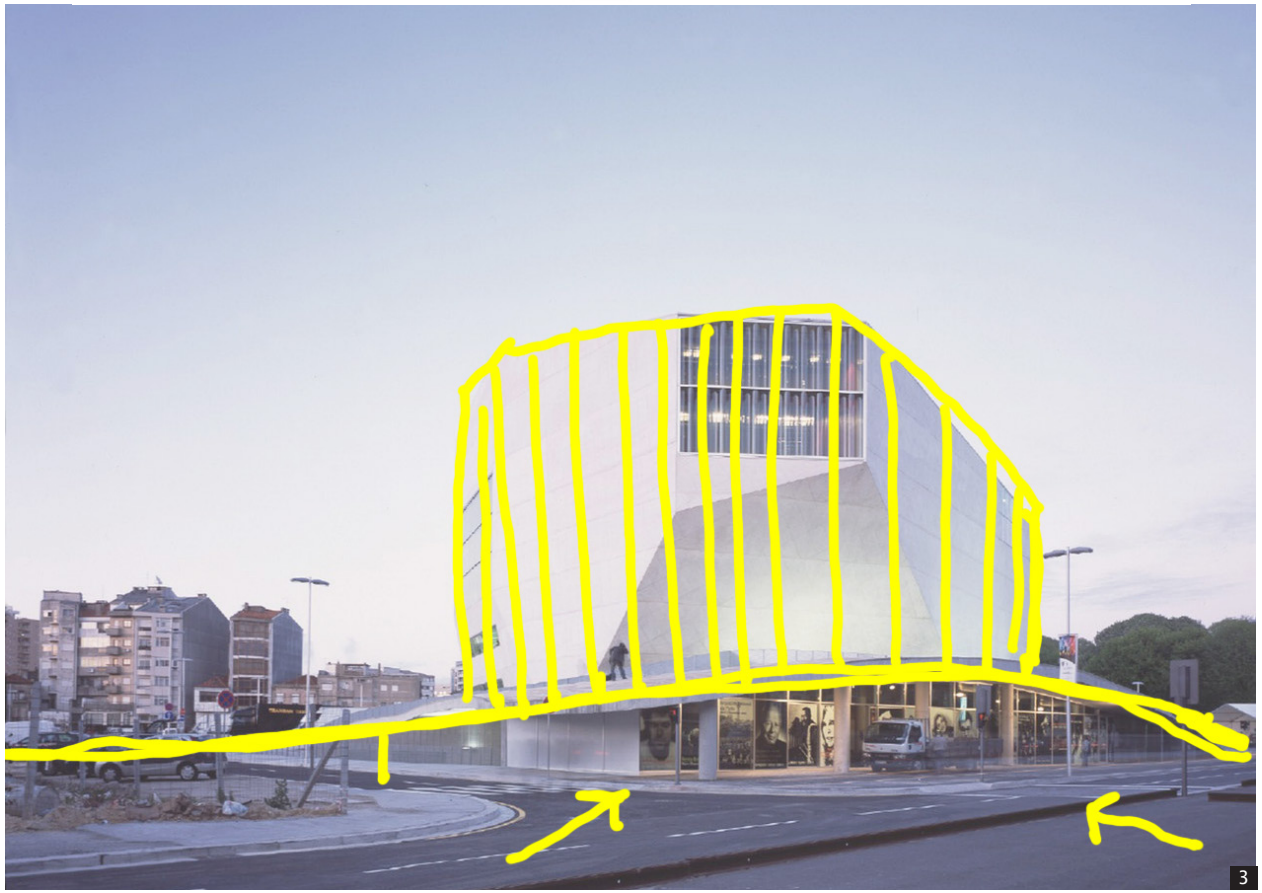
Putting the theaeter at the center took up allowed for the edge to become secondary spaces for restaurant, vertical transport and technical spaces.

‘The continuous public route connects all public functions and “remaining spaces”, located around the Grand Auditorium by means of stairs, platforms and escalators: the building becomes the architectural adventure. The loop creates the possibility to use the building for festivals with simultaneous performances: the House of Music’. The surrounding facilities and circulation also act as sound buffers.



Fig 30: Main entrance of the Casa da Musica





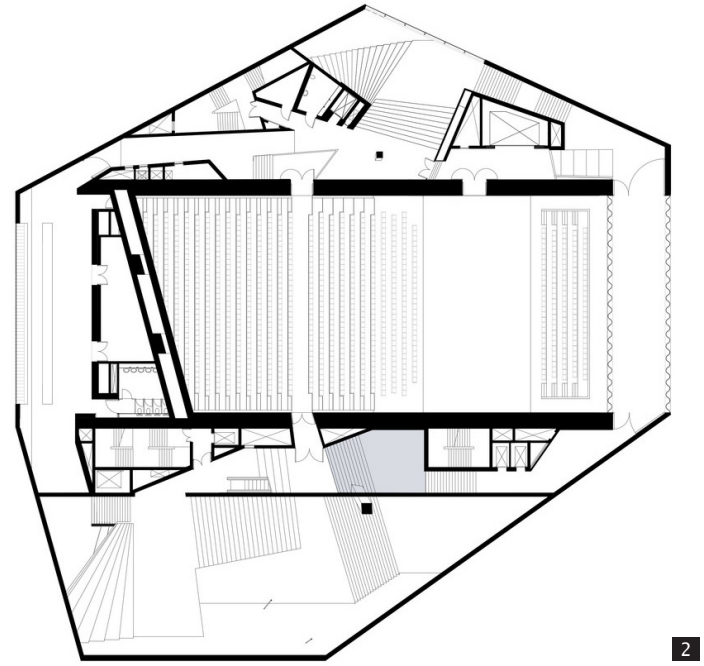


Fig 31: **1.** Section of the Casa da Musica. **2.** First floor plan 700 seater theater. **3.** Image highlighting the retail ground floor and the geometric mass.

Parco Della Musica

ARCHITECT: **Renzo Piano**

Il Parco della Musica Auditorium is the home of Rome a classical music This building has three halls of differing sizes acoustic halls with a cwwoncert hall seating 2,800 people. The during construction a discovery of the remains of a Roman villa which dated back 2 600 years were found on site. This gave the site a stronger narrative and significants. The remaons where planned to be part of the complex as the will start to
difine old form new. So the studio decide to create three elements that resembling “giant soundbox” connected them with a semi-circle which is the outdoor amphetamine which become the fourth auditorium.
The **Sala Petrassi** 750-seats is a very versatile space.
The **Sala Sinopoli** 1,200-seat is also a flexible space, with a mobile stage and adjustable ceiling.
The **Sala Santa Cecilia** 2,800-seat specially reserved for symphonic concerts.

“The various parts of the auditorium call to mind a functional analogy with musical instruments, which is inspired by the form and use of wood. A second analogy derives from the site and the arrangement of the buildings. There is something archaeological about these atypical constructions, surrounded by greenery: they would be among Piranesi’s ruins, a metaphor for classical antiquity.”

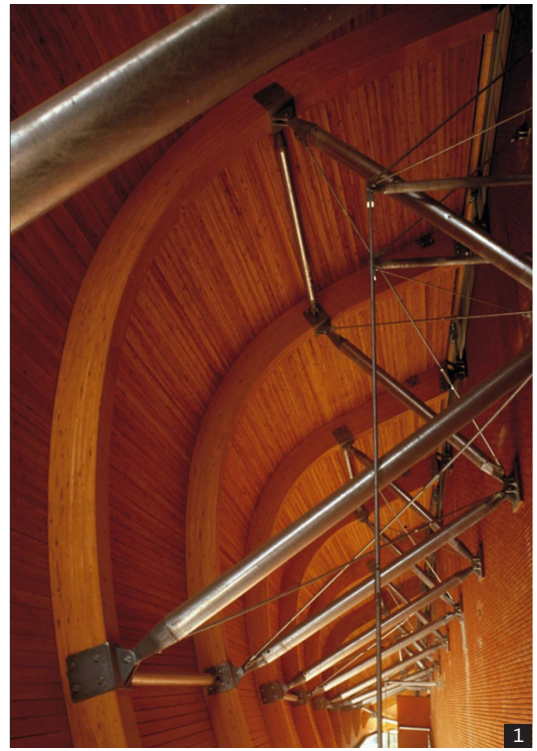
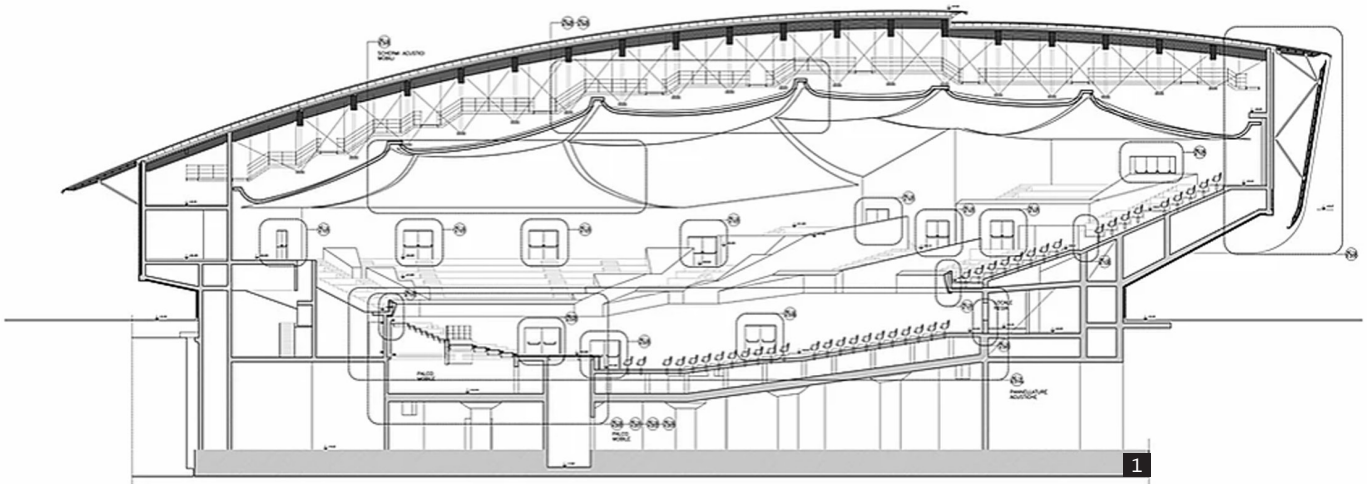




Fig 32: **1.** Cross laminated internal structure of the Parco della musica and steel trusses fixed to the building. **2.** Images showing the relationship of old and new.





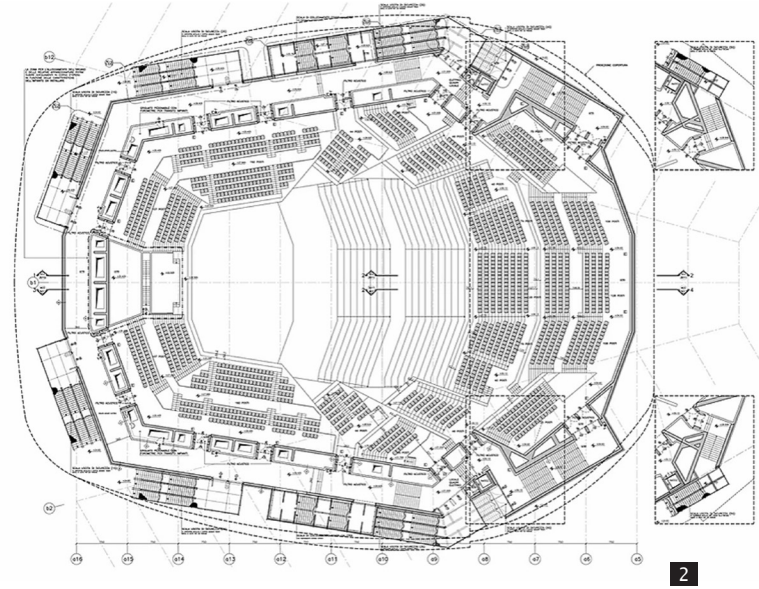


Fig 33: **1.** Section of the Parco della musica auditorium. **2.** Ground floor plan 2 800 seater theater. **3.** Highlight the vertical pattern of the sound boxes.

Lewis Art Complex, Princeton University

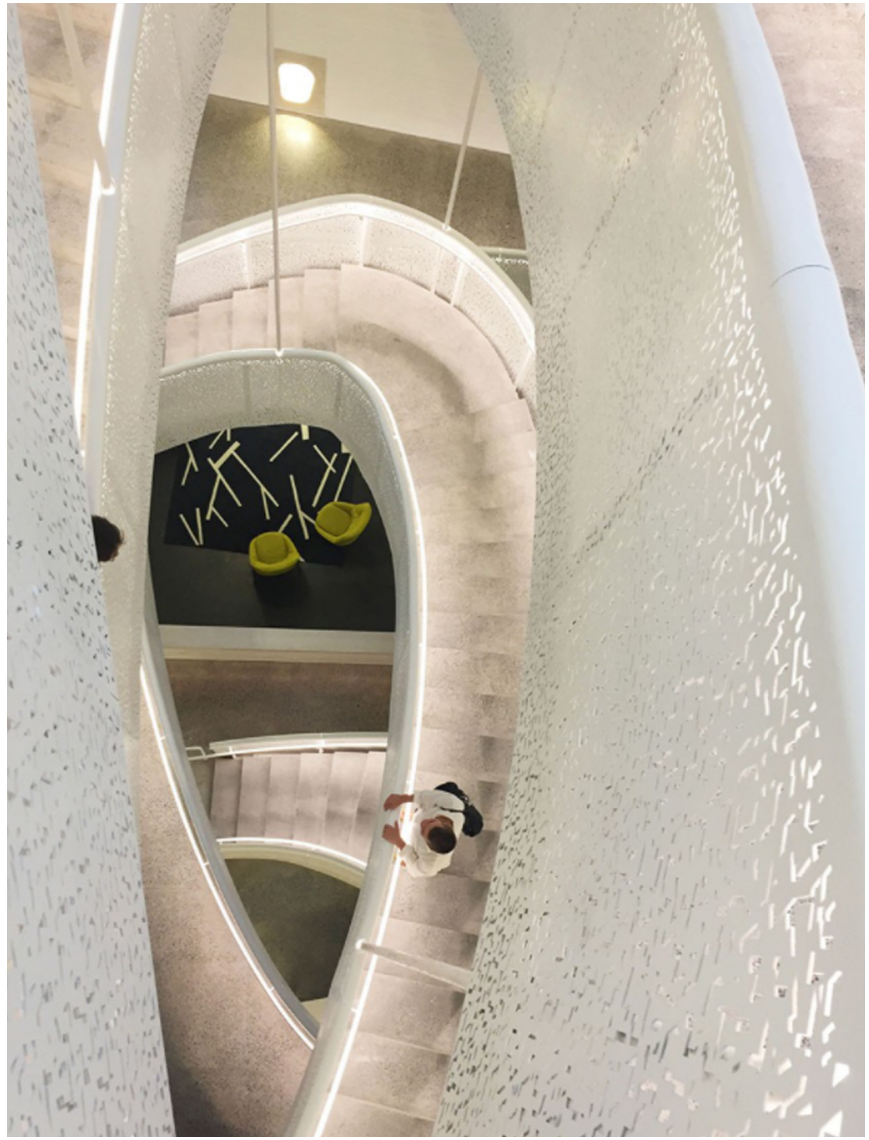


Fig 34: Main circulation of Lewis art complex.

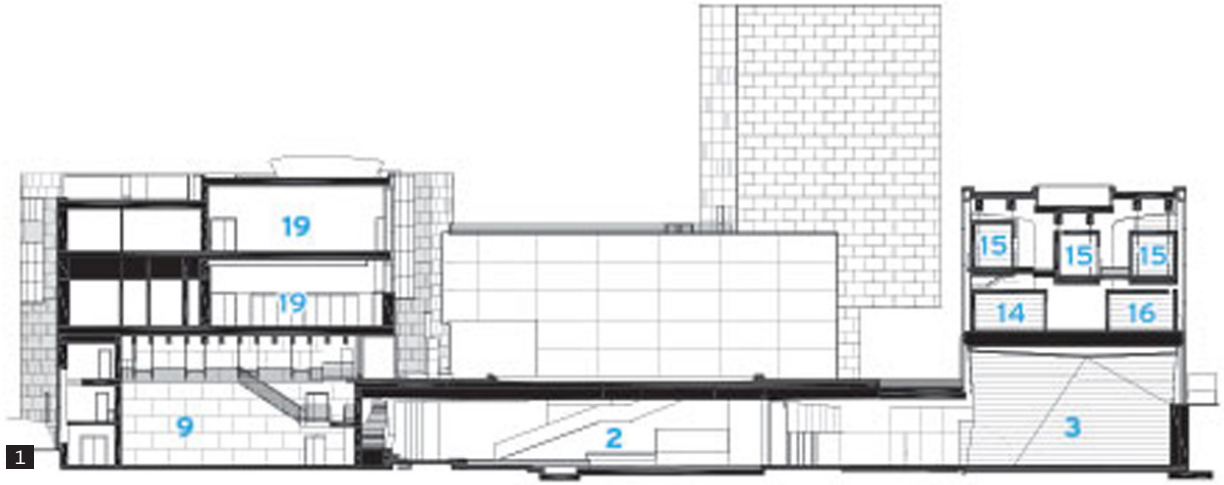
ARCHITECT: **Steven Holl**

The Lewis Arts Complex includes a theatre and dance building, an arts building, and a music building with instrumental rehearsal and practice rooms. All three buildings are integrated in a for below ground. The project creates a new campus gateway, allowing movement from all sides of the building. Walkways views into the dance and theatre practice spaces and the orchestral rehearsal space are aimed at provoking curiosity and interaction. Ground floor has open gallery spaces that invite local community and the University.

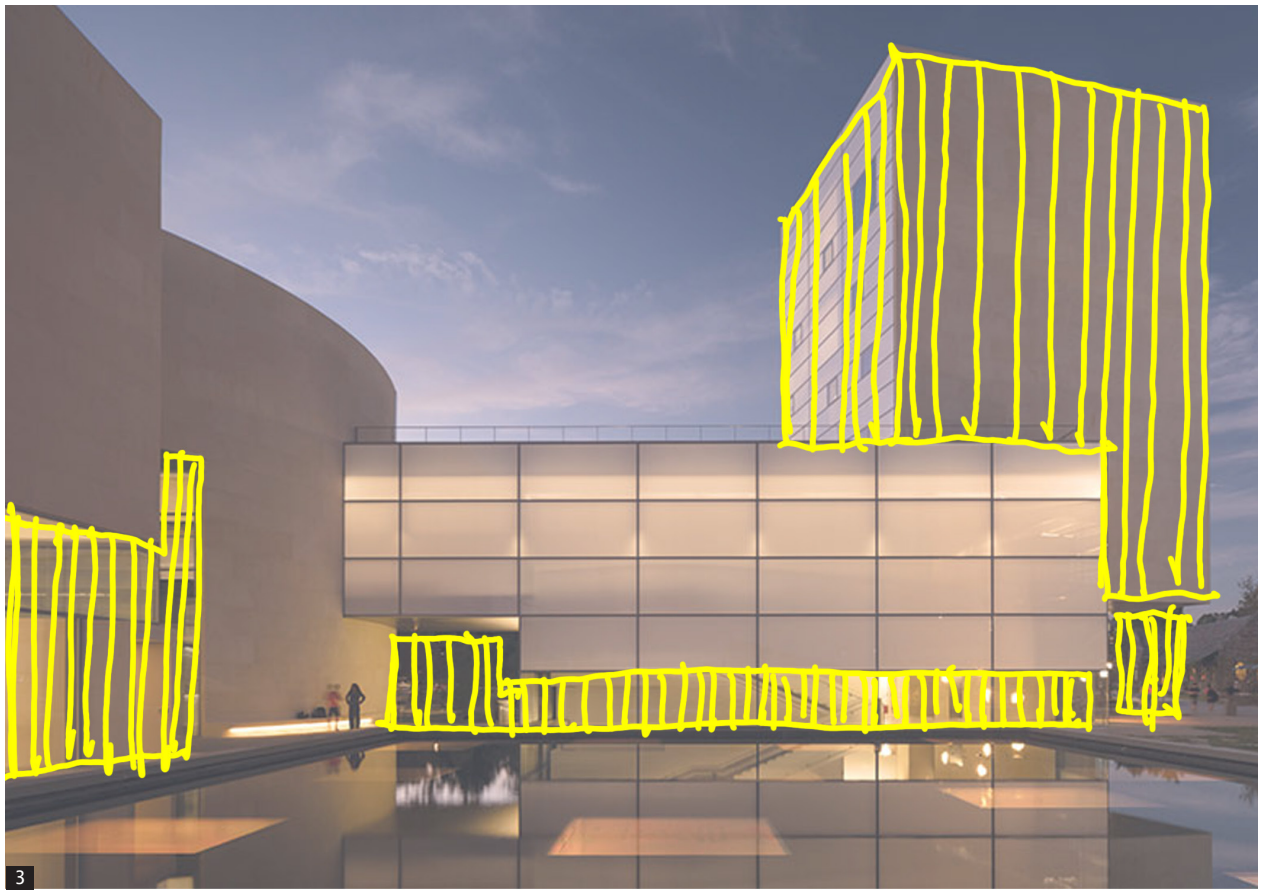
‘The Wallace Theater and Dance Building is developed according to the idea of a “thing within a thing”. Different types of materials are used connecting all floors with a “dancing staircase.’

‘The Arts Building is developed with an embedded concept by its concrete and stone tower connecting to Princeton’s historic Blair Arch.’

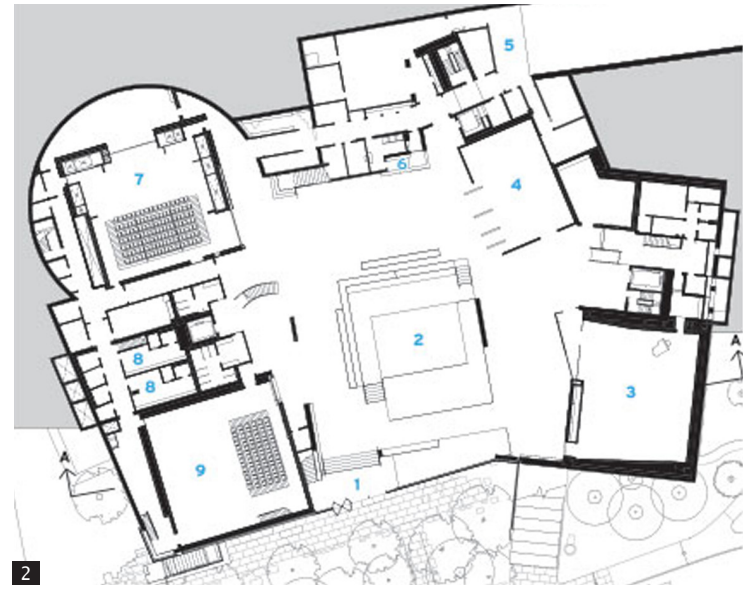
‘The Music Building is developed according to an idea of “suspension”. Above the large orchestral rehearsal room individual practice rooms are suspended on steel rods. Acoustically separate, these individual wooden chambers have a resonant quality.’



1

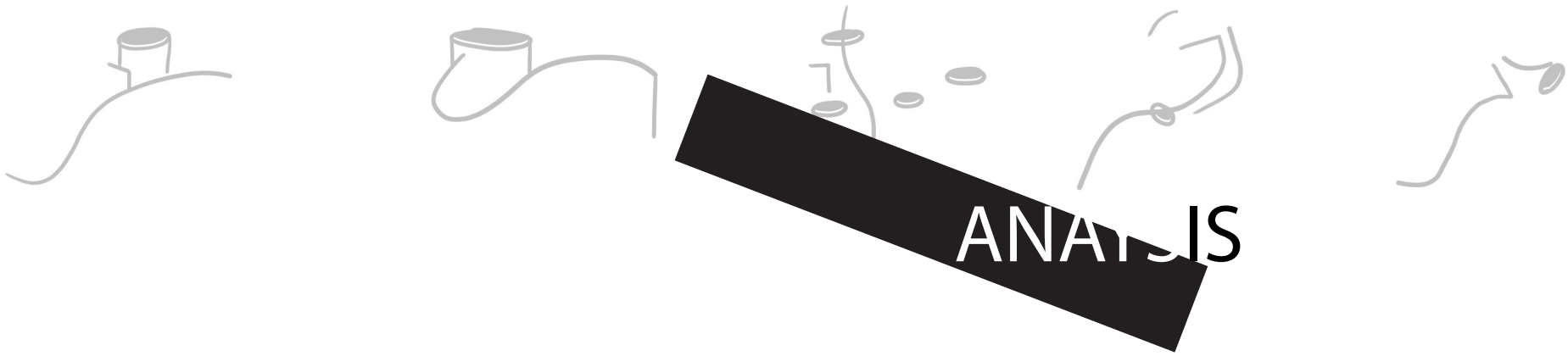


3



2

Fig 35: **1.** Section of the Lewis art complex. **2.** Ground floor plan. **3.** The view of the Lewis art complex from the pond highlighting openings and geometric mass.


ANALYSIS

BUFFALO CITY METROPOLITAN MUNICIPALITY

The Eastern Cape is the second largest province in South Africa and covers 169, 580 square kilometer, which is 12.7% of South Africa's total land area. The province has the third-largest population of South Africa's; approximately 6,996 976 million people (Community Survey 2016), which is about 12, 8% of South Africa's people. In the province sits the Buffalo City Metropolitan Municipality which is situated on the east coast bounded by the long coastline along the Indian Ocean. It includes of East London, Bhisho and King William's Town, as well as the large townships of Mdantsane and Zwelitsha.



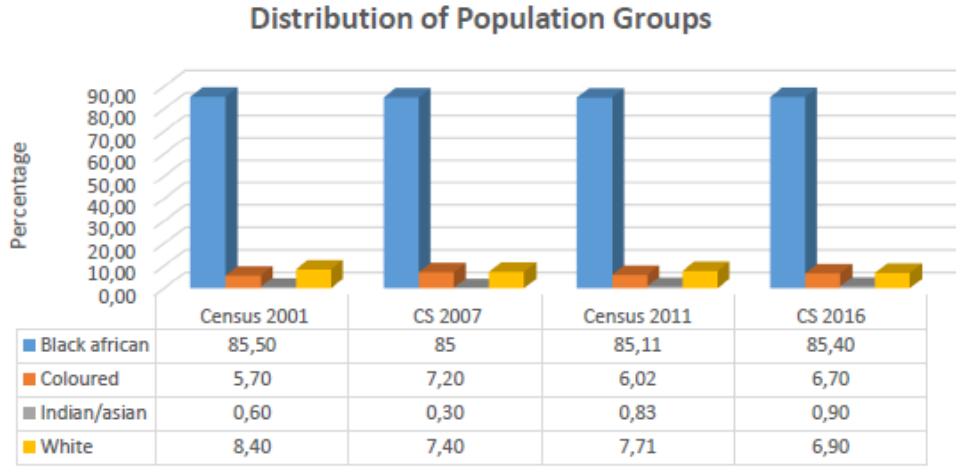
Fig 36: Google earth image of Southern Africa highlighting the eastern cape the Buffalo City Metropolitan Municipality.

The land use and settlement patterns within the Municipality indicates that the urban settlement pattern is dominated by the East London – Mdantsane – King William's Town – Bhisho. East London dominates the industrial and service sector centres with a well-developed manufacturing base, with the auto industry playing a major role. Mercedes-Benz South Africa (MBSA) has a large assembly plant located next to the port of East London, which produces a variety of vehicles for export. This then makes East London the primary economic hub.

King William's Town functions as a Regional Service Centre and together with Bhisho, is the Provincial Administrative Hub and contains the seat of the Provincial Government of the Eastern Cape Province.

The graphs are based on a variety of sources, including the 2001 Census Data, 2007 Community Survey Data, 2011 Census Data and the 2016 Community Survey.

According to the Community Survey 2016, the total population of Buffalo City Metropolitan Municipality is 834 997, with about 85.40% of these being black Africans, followed by 6.90%



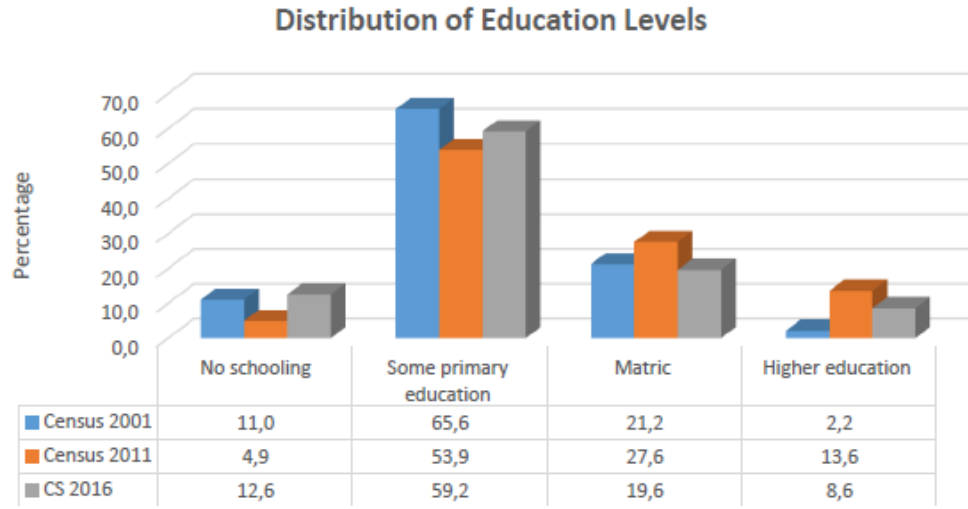
	Census 2001	CS 2007	Census 2011	CS 2016
Black african	85,50	85	85,11	85,40
Coloured	5,70	7,20	6,02	6,70
Indian/asian	0,60	0,30	0,83	0,90
White	8,40	7,40	7,71	6,90

Fig 37: Census demographic chart for the Buffalo City Metropolitan Municipality.

Whites, 6.70% Coloureds and 0.90% Indian/Asian. These ratios have remained consistent over the previous Censuses and Community Survey of 2007, except for the ratios of whites that has gradually dropped slightly and is now almost equal to the ratio of the coloured population.

The proportion of people with matric or higher education have dropped slightly from 2011 to 2016, while the proportion with no schooling has increased to 12.6%, as has the proportion with some primary education. As shown in Figure 17 below, this could translate to an increase in the illiteracy levels within the Metropolitan.

This research report focuses on the education sector and aims to improve the quality of life for students through the creation of vibrant city spaces to try effect the decrease of student in the higher education.



	No schooling	Some primary education	Matric	Higher education
Census 2001	11,0	65,6	21,2	2,2
Census 2011	4,9	53,9	27,6	13,6
CS 2016	12,6	59,2	19,6	8,6

Fig 38: Census demographic chart for the Buffalo City Metropolitan Municipality.

6.1.1 EAST LONDON URBAN FRAMEWORK

East London's Revitalization initiative highlights key activation projects that will have a high impact on improving the quality of the city while bridging the gap between disadvantaged areas to the main economic hub. The initiatives key focal areas are transport, education and economic resources; to widen the impact of the initiative and improve the quality of life through the creation of vibrant city spaces.

Key projects in the CBD Revitalization are the Sleeper Site development and CBD upgrades to which this research report will focus on. Opportunities for transit-oriented development (MELD Corridor) through encouraging quality of pedestrian-friendly streets and public spaces that promote gathering. The initiative has broken down the city into six major precincts to allow for smoother implementation phases.

The Spatial Development Frameworks proposes three Spatial Priority Areas within the BCMM Urban Edge focused attention is placed on implementing key catalytic projects, enormous developmental benefits can be attained over an extended period of time for the benefit of all communities and residents of Buffalo City as well as the broader region over which the socio-economic influence of BCMM extends. The main framework includes the inner city of East London to West Bank then moves west towards Mdantsane.



MELD Corridor

Main transport routes

Fig 39: *BCMM Spatial Priority Areas map showing priority maps zones and Routes connecting areas .*

Priority 1: East London and Mdantsane

In order to provide Strategic direction to spatial development to BCMM, and in order to support investment and growth, it is proposed that the URBAN CORE i.e. East London and Mdantsane and the areas in between should be Priority 1.

This area contains the bulk of BCMM's population and is subjected to critical infrastructure/service backlogs, which severely hinders the progress of development. The urban area within this Priority Area has the potential to accommodate between 40 000 to 50 000 households at increased densities in the future. Creating infrastructure capacity in roads and services networks will give the "biggest bang for the buck" in shortest time-frame.

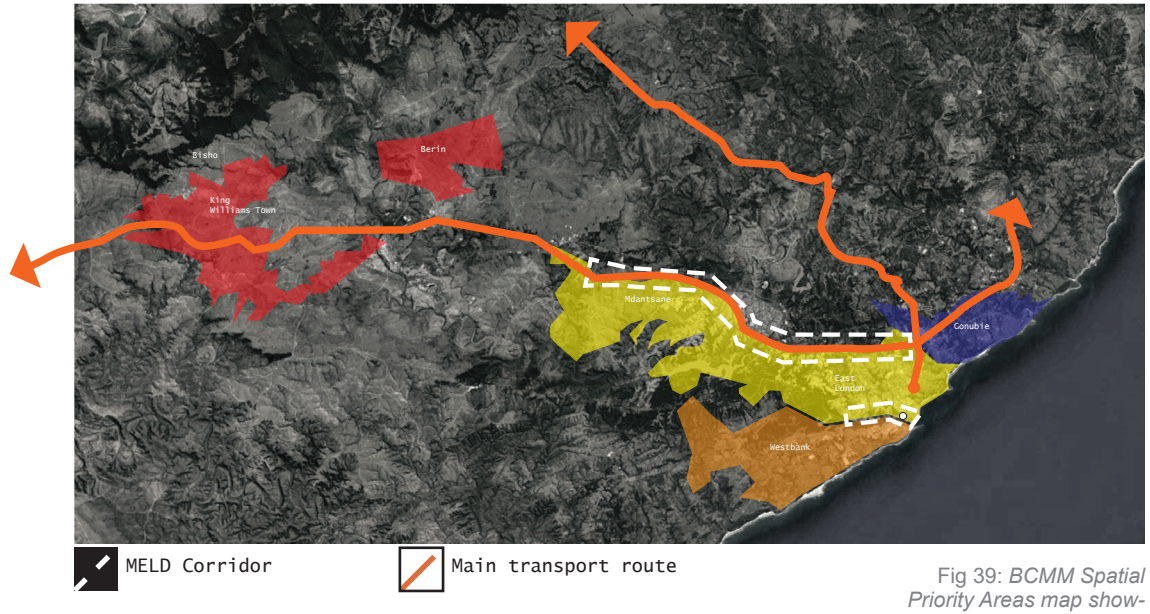


Fig 39: *BCMM Spatial Priority Areas map showing priority maps zones and Routes connecting areas .*

Priority 2: West Bank

The West Bank area has since the 1980's been seen as having the best potential for large-scale urbanization in the Greater East London area. Investment in the East London Industrial Development Zone (ELIDZ) is constrained from being fully realised by the lack of key infrastructure in Wastewater Treatment on the West Bank. As land prices have inflated and the develop-able land in close proximity to the City Centre is depleted. The West Bank has ample well-located land for integrated, higher density and mixed land use development.

Critical for the success of the West Bank area is the need to complete catalytic projects that resolve the issue of Waste Water Treatment for the area as well as Roads and Bridges to link the West Bank to the Central Urban Area and Regional linkages

Priority 3: Bhisho and King Williams Town

Bhisho/King Williams Town which acts as an administrative hub as well as an extended Rural Service Centre, is an important segment of BCMM. The Provincial Government is leading initiatives to consolidate Bhisho as an Administrative Capital of the Eastern Cape Province. BCMM is therefore playing a supportive role by ensuring that there is sufficient bulk infrastructure.

By focusing on priority 1 this research report will fall part of the development framework and discuss a number of ideas to integration and re-generation to the University Precinct. For this to happen an extension to the interventionist approach referred to as “MELD Corridor” that connects Mdantane to the main economic hub is proposed. The vision is to extend the corridor to corner Church and Buffalo Street in the Sothern Precinct that is designated to the University of Fort Hare. This opens up an opportunity to improve the quality of life for students through the creation of vibrant city spaces, active building edges that are going to give a dignified entrance to the corridor.

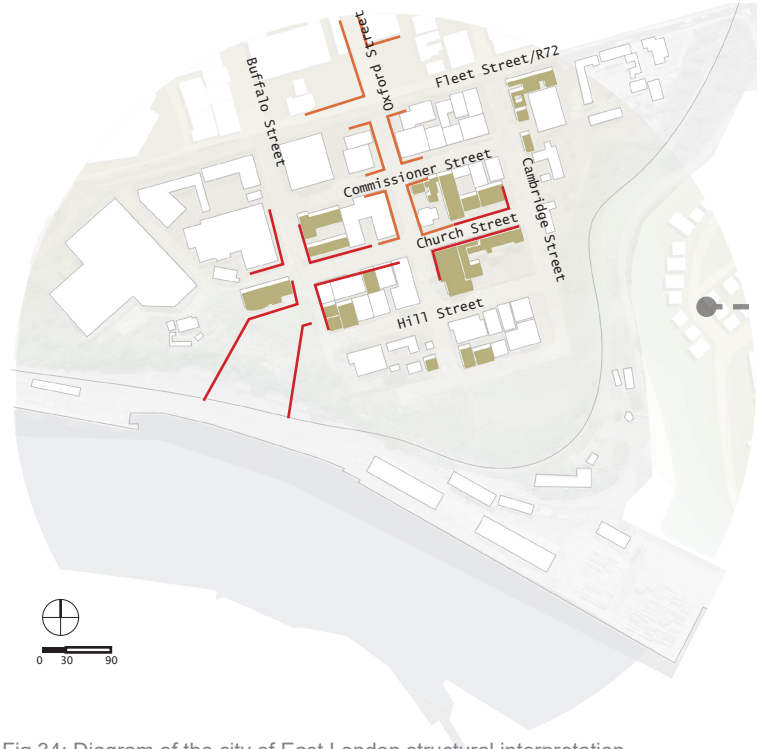


Fig 34: Diagram of the city of East London structural interpretation

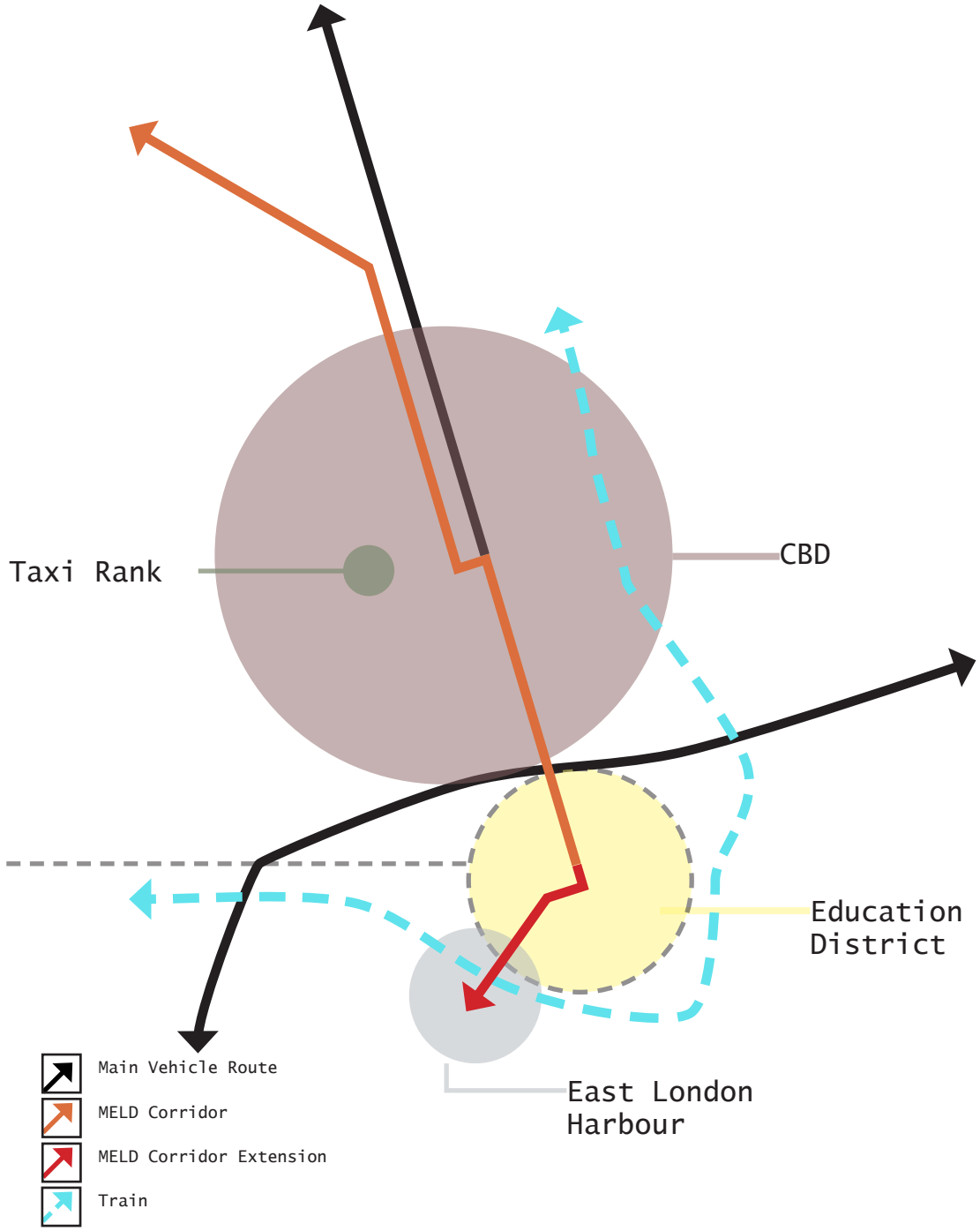


Fig 40: Diagram of the city of East London structural interpretation



Fig 41: Google map showcasing priority 1 in yellow and the Meld Corridor.

6.1.2 MELD Corridor

The BCMM development framework consists of two strategic focal zones that pay attention to the transport orientated development that will increase in densities and the mix land uses within the identified zones. The primary integration zone includes of East London CBD and Mdatsane urban hub, while the secondary consists of King Williams Town and Bhisho. The densification in the identified integration zones will be to attain an improvement in public transport so that it becomes sustainable and economically viable. Both primary and secondary integration zones, have active corridors have been identified as significant transport routes that link areas previously disadvantage to the main economic hub. (BCM SDF of 2003 and the BCMM SDF of 2013).

According to the BCMM SDF of 2018, the number of informal dwellings in free-standing settlements around Bhisho AND KWT is about 1,200 versus 43,000 around EL and Mdantsaneand and for this, the reason is why this research report won't being focusing the Bhisho/KWT Corridor but will discuss the MELD Corridor.

The BCMM Transport Register (2018) identified predominant transport mode for work-related trips in the area during a typical weekday was by taxi (43%), private car/truck (29%), walking (21%), train (5%) and bus (2%). And for educational trips, the predominant mode was by walking (56%), taxi (25%), private car/truck (10%), bus (6%) and train (2%). These stats show the need to focus more on public transport and pedestrian-friendly streets to serve the majority of the population.

The MELD Corridor lays on the main transportation routes (roads and railway) that link the townships of Mdantsane to East London's CBD. Surrounding areas such as Duncan Village and Amalinda Junction benefit from the integration transport development plan with catalyst developments projects in infrastructure, social facilities and public transport. The corridor stretches for 10km three streets away from my site to which I aim to propose that the corridor be extended and the site becomes the gateway to the corridor. Further details are discussed in the program chapter on how the building will serve the public and university.

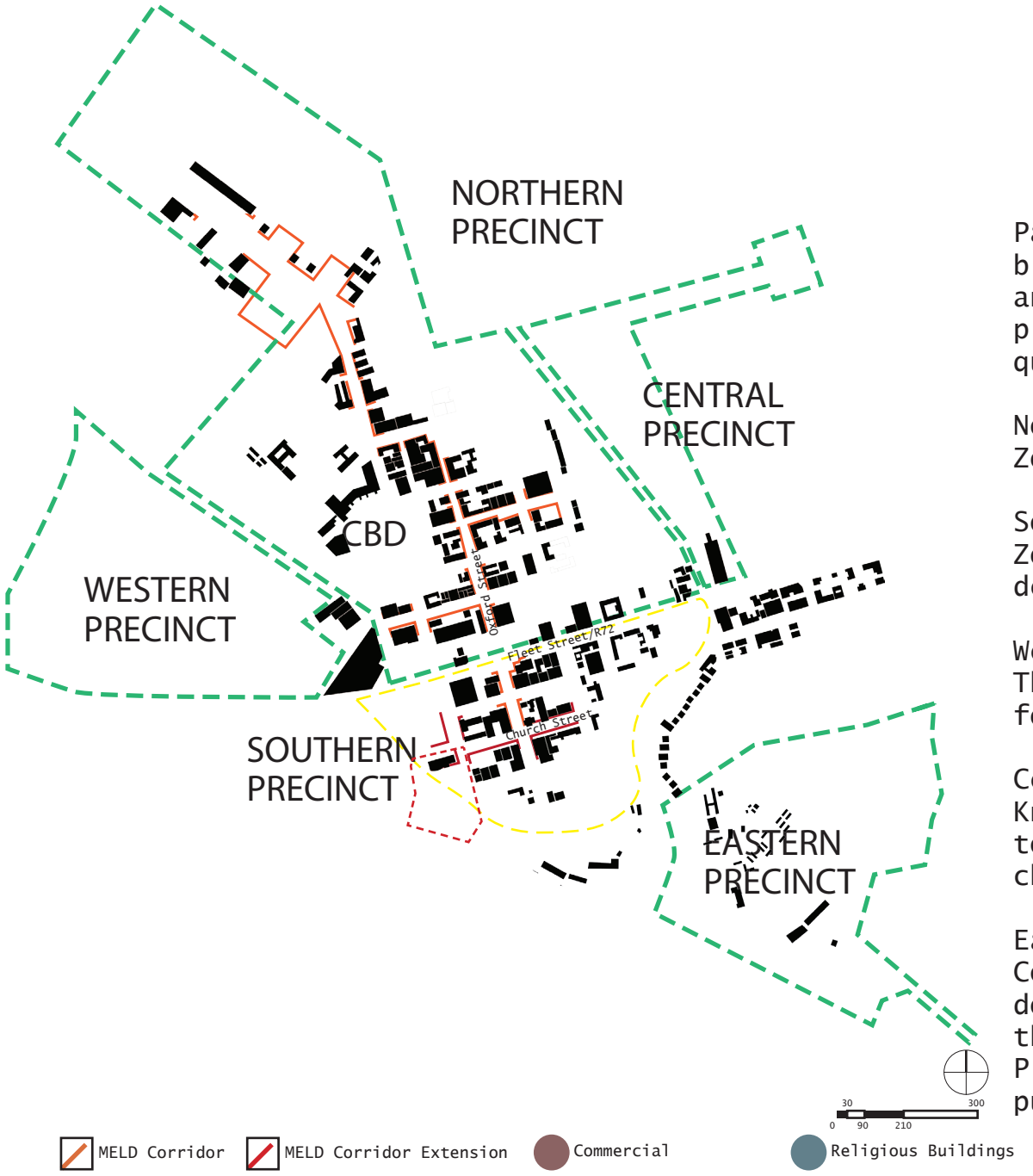


Fig 42: East London with the different zoned precincts part of the Buffalo City Municipality.

Part of the Spatial development plan was to break down the city into six major precincts and identify issues that will be addressed by proposing future developments to improve the quality of the city.

Northern Precinct:
Zoned for civic admin and civic centre.

Southern Precinct:
Zoned for the university of Fort Hare Campus development.

Western Precinct:
The open green space on this precinct is zoned for future mixed land use.

Central Precinct:
Known as the **Sleeper site** is being developed to accommodate public, auditorium council chambers and tertiary education.

Eastern Precinct:
Collaboration between the Port of East London and BCMDA to invest on the East Bank of the East London port to provide Mixed-use Precinct for Signal Hill and other potential public Industrial Development.

The six precincts are connected by the Transport Integration Plans that will introduce a BRT system on the MELD Corridor with six inner-city stations that will be close to the train station, public library, taxi rank and the university precinct. Majority of the buildings along the corridor are used for commercial, retail and educational purposes and will create a balanced solution that will benefit both the public and transport with the introduction of the brt system into the +20 meter wide streets.



Fig 43: Images the +20 meters with streets of East London taxi rank and a Church Street.

The station and the combination of building topology along the meld corridor will immediately charge the street condition and address the research provided by the transport registry of the BCMM that shows a decrease in the use of trains in the past couple of years due to low maintenance and has caused disintegration to various parts of the BCMM. Even though the second part of the MELD corridor is to upgrade existing railway facilities, tracks and time schedules for faster travel time during peak hour demand there is a number of railway tracks that have been tagged as non-functional and are situated on the East London harbour and present an opportunity to convert the existing infrastructure into an urban regeneration project that will link the general public to the harbour.

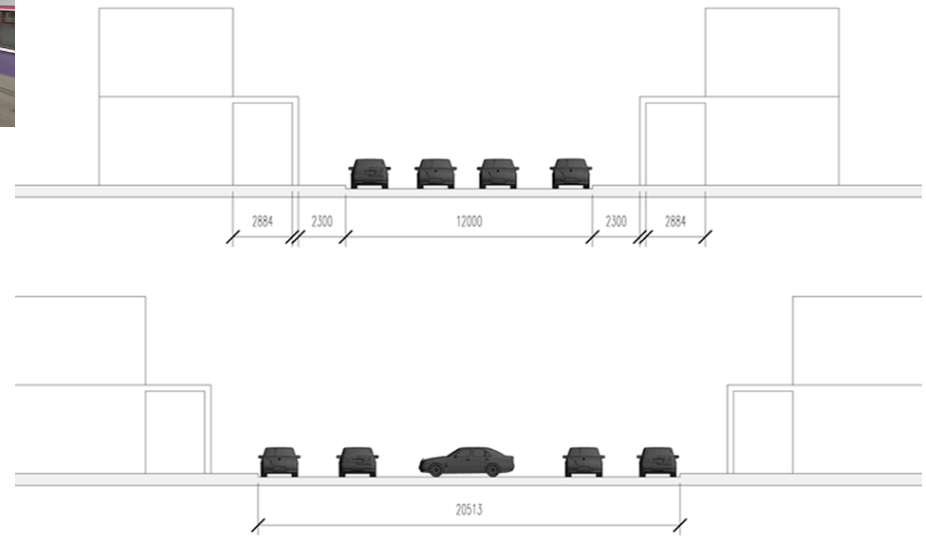


Fig 44: Typical street section of East London CBD and University Precinct.



Fig 45: East London maps showing movement structure



Fig 46: East London maps showing Commercial, Retail and Transport hub.



Fig 47: East London maps showing
Civic Buildings and Educational Buildings



Fig 48: East London maps showing
Green structure .



Fig 49: Image highlighting the green terrain separating the university precinct with the East London harbour.

As mentioned before this research report ties itself into the Meld Corridor by providing new urban strategies for a better public environment for students. The section below demonstrates the existing relationship between the university precinct and the harbour, and highlights the disconnection created by the +40 hector green terrain that presents an opportunity to link the harbour and the general public.

Urban strategies used by Nyréns Arkitektkontoron on Strandpark along the Hornsbergs waterfront created a link between the water and the land through creative park features and pathways that celebrate all natural elements. The 700 meter long park has several informal seating areas, three long floating piers and a shower with a solar heated tank to be used by walkers, joggers and cyclists. Eventhough the green terrain separating the university precinct and the harbour has a significantly greater slope than the Strandpark, the idea of activating the green terrain through pathways and open spaces that holds different functions and events between various tree populations will be incorporated into landscaping of the 40 hector green space.

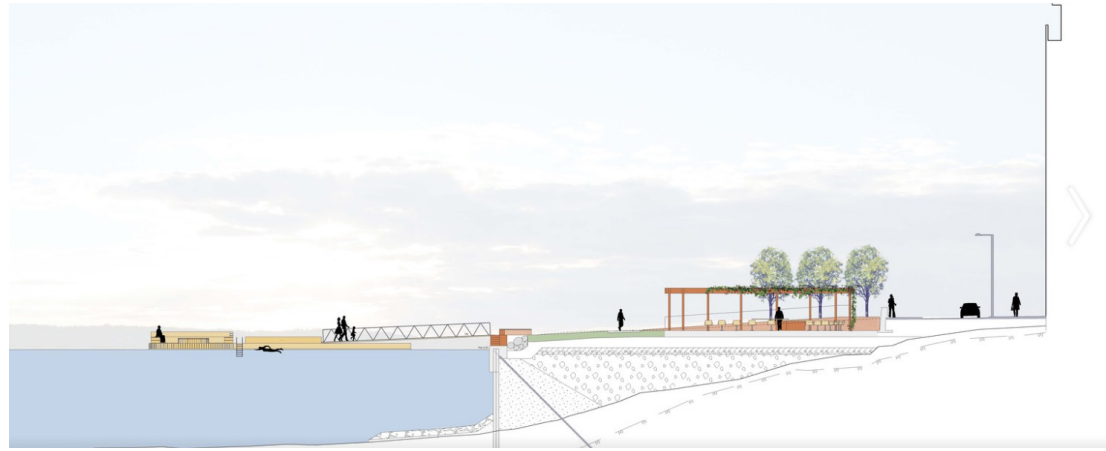


Fig 50: Section of Strandpark in Hornsberg

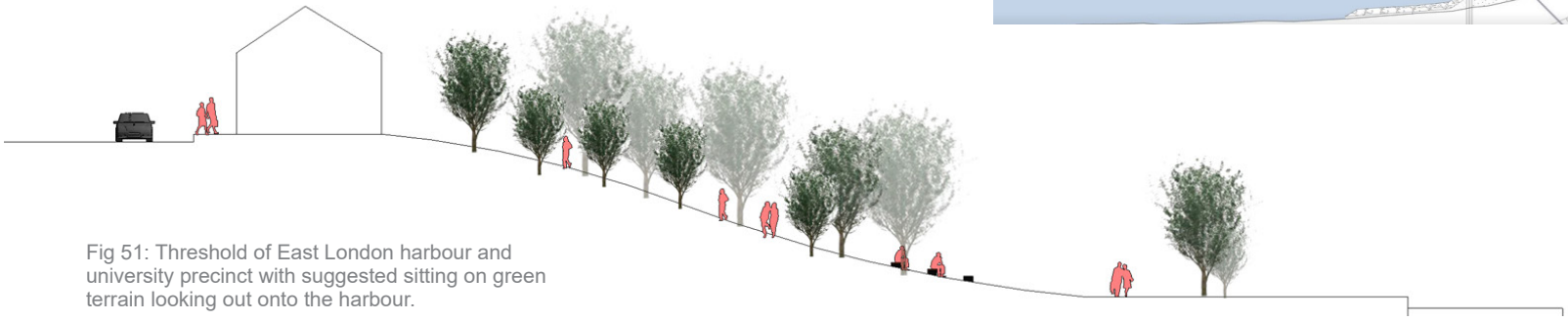
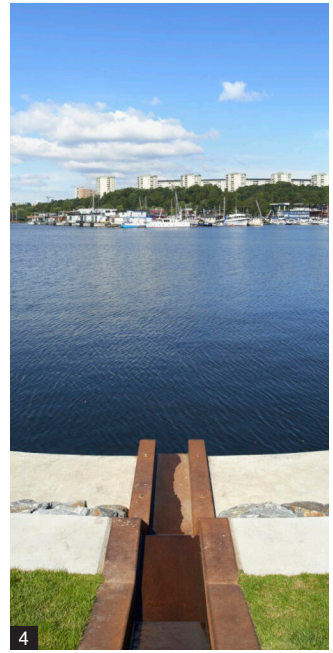


Fig 51: Threshold of East London harbour and university precinct with suggested sitting on green terrain looking out onto the harbour.









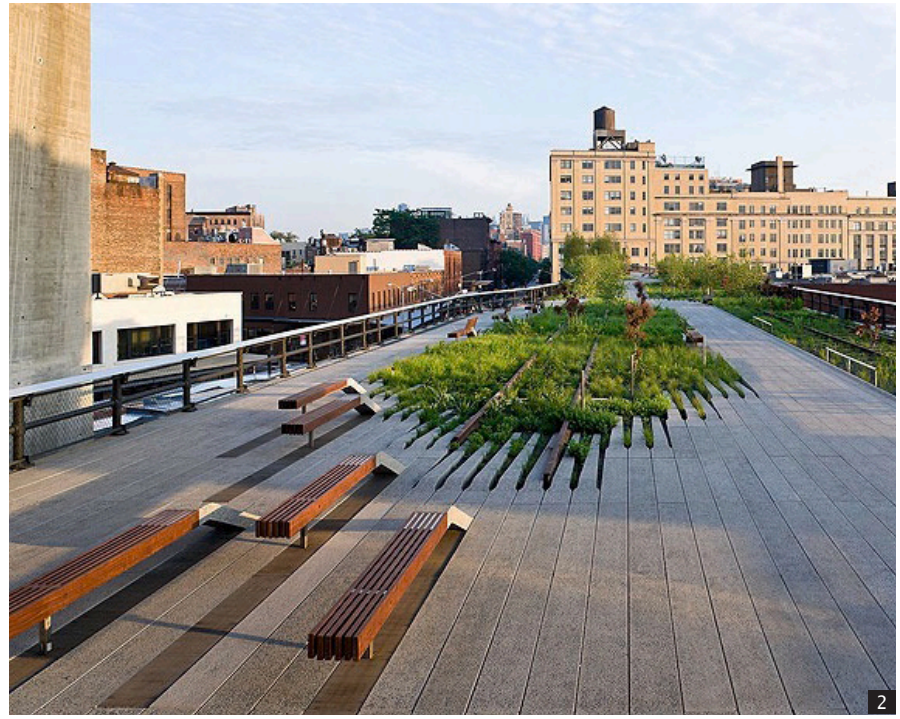
The material choice of the strandpark was well considered and merges in perfectly with the natural landscape of the site and the manner in which materials are finished and demonstrates the authenticity that Adolf Loos discusses in his book Ornament and Crime. Loos haterade of fake and fussy steered him into writing his laws of clad that briefly states that materials like wood can be painted any colour but not a wooden colour or stuccowork and sculpt any form but not rough brick. This law is found in the chapter Principle of Cladding and is demonstrated in Strandpark by the rustic finish on the corten steel shows ageing of steel, and it being used in close proximity to the water starts a conversation between the two elements.

Fig 52: **1.** Circular space that host different events **2 & 3**. Image of timber deck floating on water showcase the unique relationship of the park and the water **4.** Drainage that showcase the rich material combination.

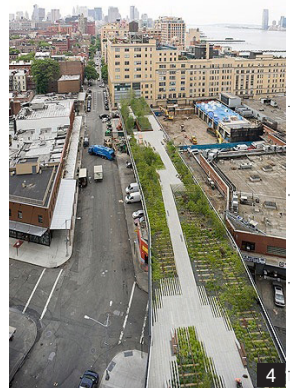


Fig 53: Image highlighting the non-functional railway tracks on the East London harbour.

This reinterpretation is taken from the Highline Park by James Corner Field Operations with Diller Scofidio + Renfro won the competition to regenerate the non-functional railway tracks in New York, America. Cilento's article (2009) states that the brief was to convert the exciting infrastructure into a public park with various entrances with key components that will attract the user to spend time on the park and admire the uninterrupted view of the Hudson River. The 4 meter high park has paving that follows the flow of the train tracks and disappears in the seemingly wild growing grass to highlight the idea of the park being an old natural feature.
The choice of material and landscaping approach will be incorporated into the non-functional train tracks with the hopes of linking the harbour to the people.







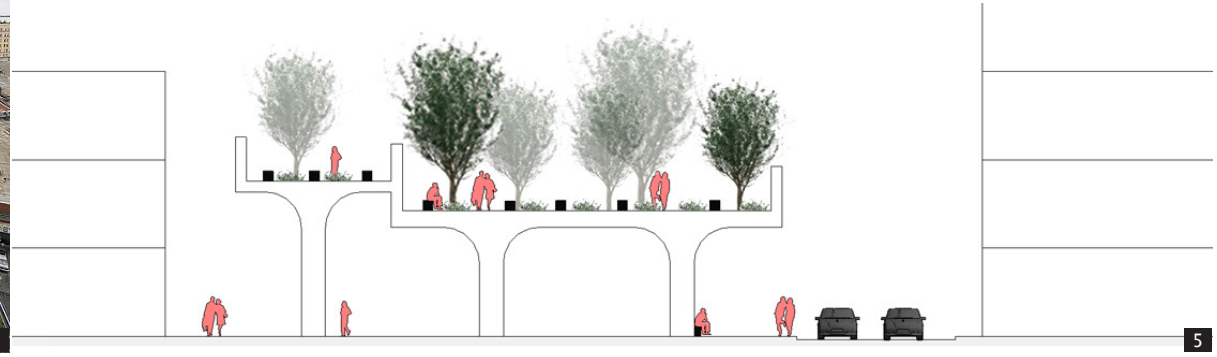


Fig 54: **1.** Park furniture on the High-line. **2.** Plant infused with old railway tracks. **3.** High-line Relationship with the city. **4.** Section Of the High-line park.

6.1.2 EAST LONDON HARBOUR

It is recorded that the first Europeans settlers arrived around 1820, and by 1914 declared it a city (Hockly 1948). Before being renamed East London, Port Rex's main settlement hub was the West Bank which is now an Industrial Development Zone. The existing port in the mouth of the Buffalo River, adjoining the Indian Ocean exposing it to trade operations created by the Portuguese navigator around the 15th Century.() Vasco da Gama sailed across the ocean with a stone cross known as the Padrao to mark their route and with the objective to create a route that would sail from the West to the East to break the monopoly of the Muslim-held main land routes.

The idea of traveling great distances to exchange goods is one that music executes quite well. If we consider the lyrics as good that are written in the comfort of the artist's home to which they convey their background and upbringing, the trade happens when the listener experiences their life and cultural mannerism through the song. Before this iteration of music being a product of trade goods such as cattle, spice, gold ivory and beads were being traded.
Prime Minister John Molteno, attained a degree of independence from Britain. The new government was a combination of East London, East Bank and Panmure which became the East London Municipality. When the merger was successful there was a fast growth in the infrastructure rapidly accelerating the development of the city (Bond 1956).

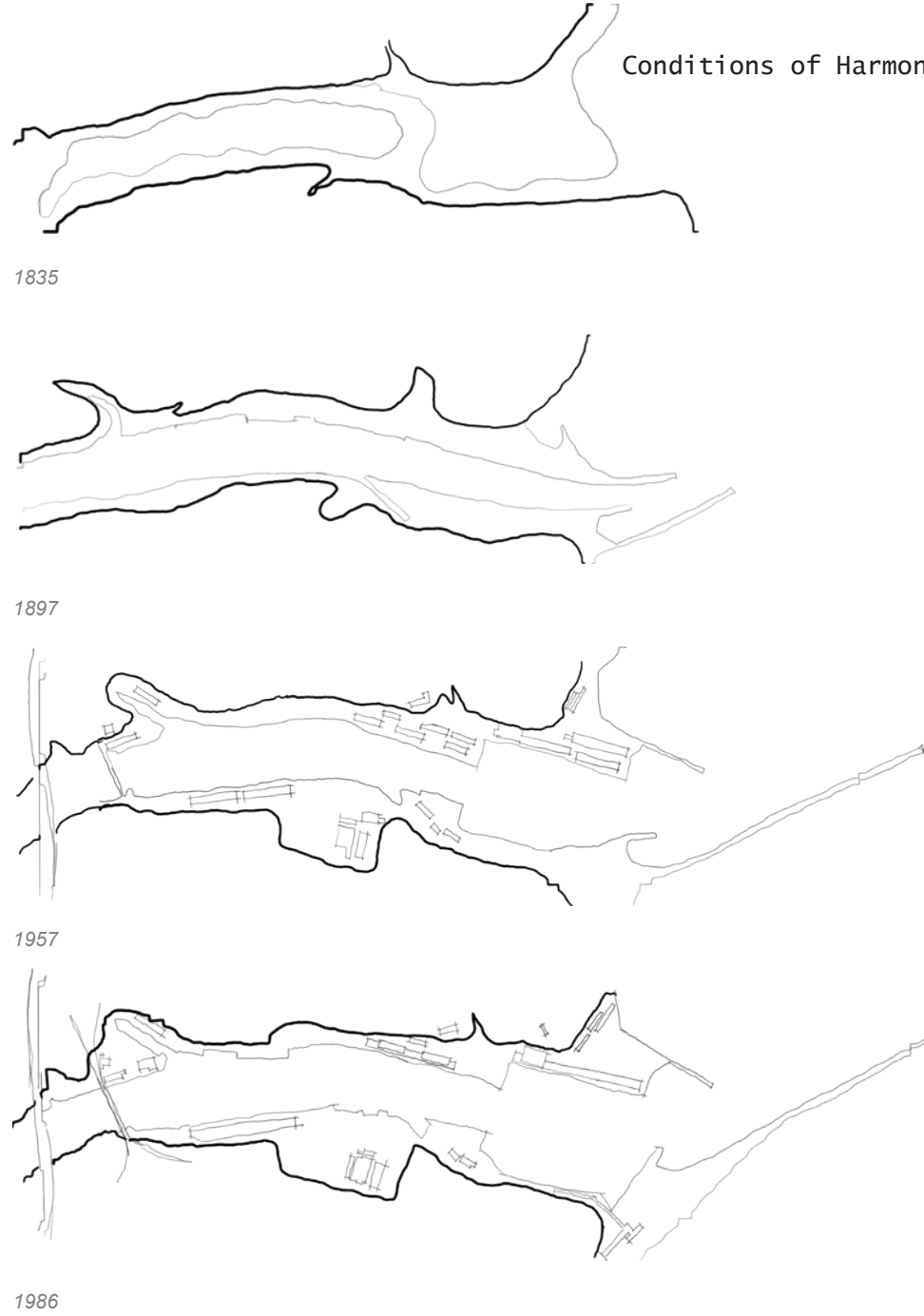


Figure 55: Sketch of the development of East London harbour in 1986



Fig 56: Images of the Development of the East London Harbour from the early 1800 - 1990s.





Fig 57: East London maps showing industrial buildings around the harbour

The Port of East London is operated by the Transnet National Ports Authority (TNPA) working with BCMM have taken on one of the identified catalytic urban initiatives which is the East London waterfront development at Latimars Landing, Signal Hill and the Container terminal as part of the East London Port Expansion.
Some of the harbours Latimer's Landing situated on Erf 33369 of the East London Harbour will be made available for the development of a mixed use waterfront precinct through BCMDA. This development will change the port of East London and transform it into major South Africa tourist destination as it falls in line with the Ports regulator of South
Africa strategic plan for 2017/18 to 2021/22. The potential land uses for this development will be as follows: Hotel, Retail, Office, Residential, Boutique Residential

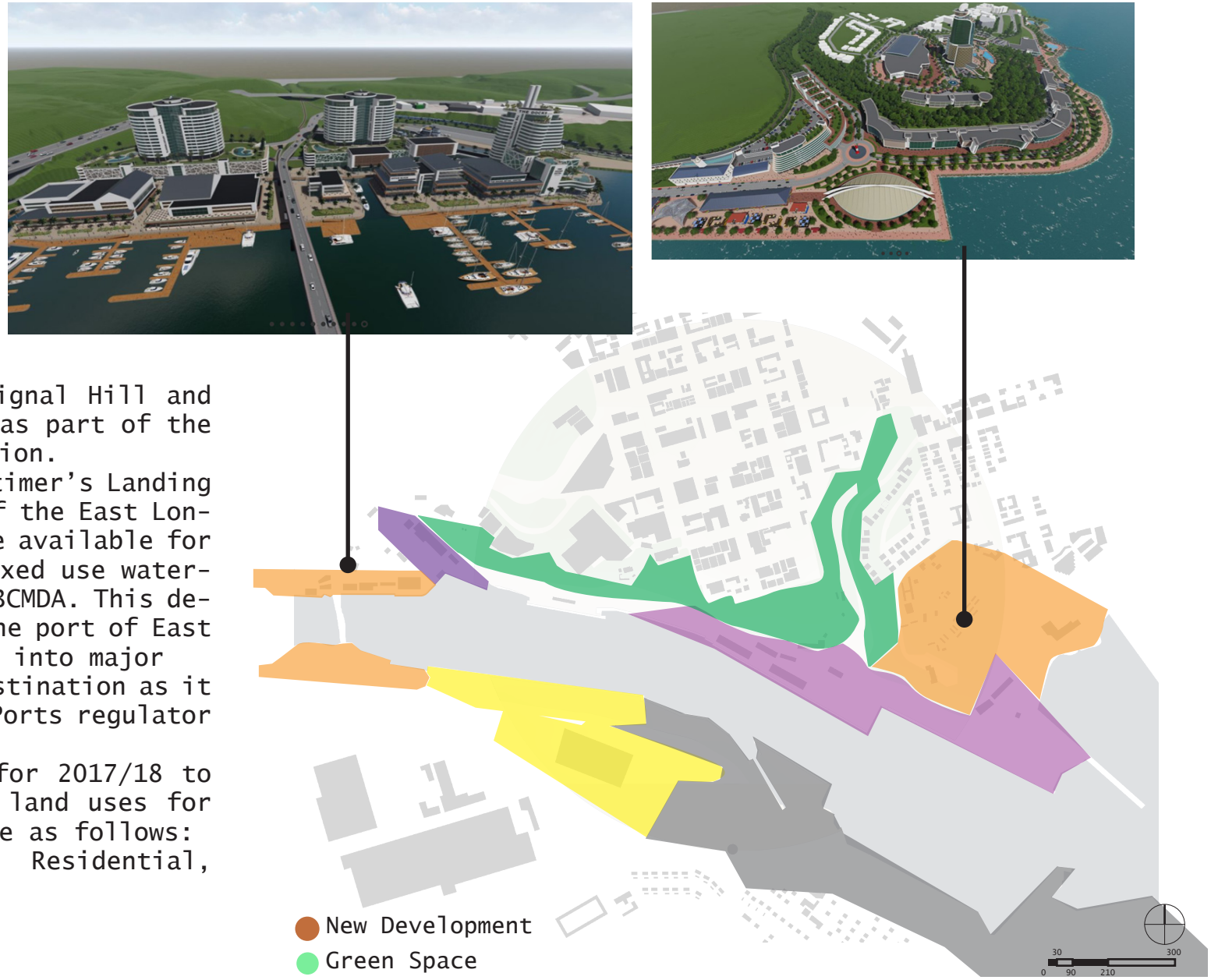


Fig 58: Different functions of the East London harbor part of the Trasnet Future Harbour Development plan.



Fig 59: Image highlighting the site, portion of the green terrain that will be developed and the non functional tracks

6.1.2 FORT HARE PRECINCT

The University of Fort Hare is planning on expanding its campus to the Buffalo City CBD and creating a “full-scale city campus” in the city. The initiative, undertaken in partnership with BCM and Amathole District Municipality, will be “strategically positioned as a link between the city and the port, aiding the future development and sustainability of the city centre and the beachfront”. The commerce faculty and nursing sciences will be moved to the City and its location in the CBD aims at rejuvenating the designated area and enhancing the city through the establishment of a prominently positioned, wide-spectrum university campus”

The map show the university buildings, chosen site and building edges that will fall part of the MELD Corridor within the Southern Precinct.

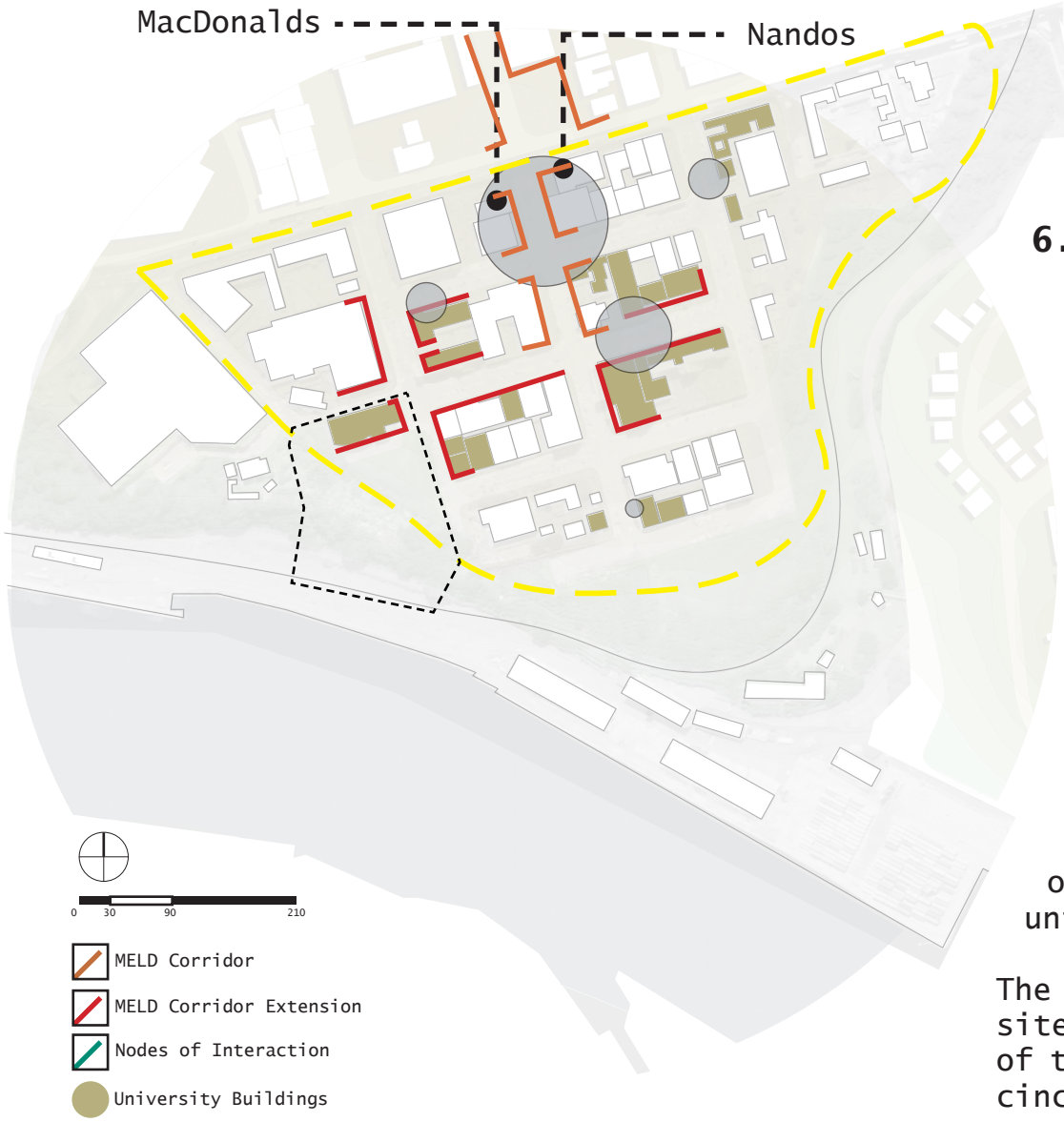
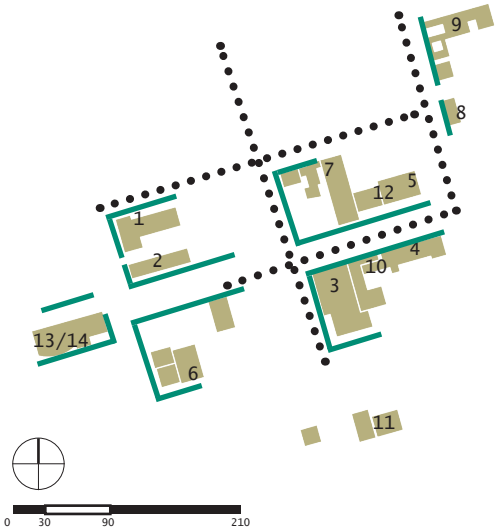


Fig 60: Map of the University precinct highlighting building that the University of Fort Hare has bought and the proposed MELD corridor



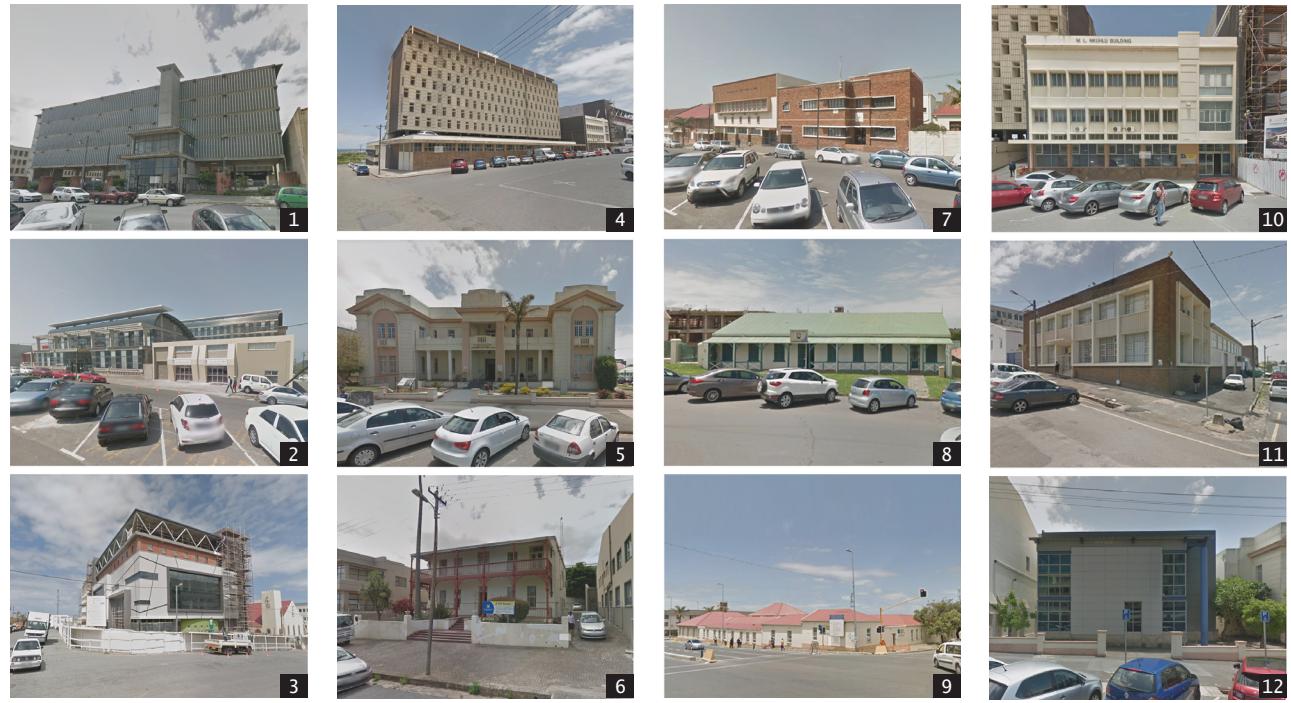


Fig 61: Map showing Fort Hare University building and images highlighting the lack of street interact from buidling and can be addressed by adding trees, street furniture and Wifi Hot stops.

Multi-way Boulevards have been implemented successfully all over the world. It is a type of street that requires a wide road reserve of at least 20 meters wide road which the streets of East London can provide.
It provides with slow speed service lanes (front streets) where parking can occur providing a pedestrian friendly environment, and a faster central carriageway for through traffic with no parking. Usually, a lineal defence, or a tree line separates both roads. If set- backs along the property lines can be controlled, the result could be in arcade-like type of retail on the front street. Bus services find their stops on the intersections with perpendicular streets where the service lane narrows eliminating parking and the defence widens to hold a bus bay.

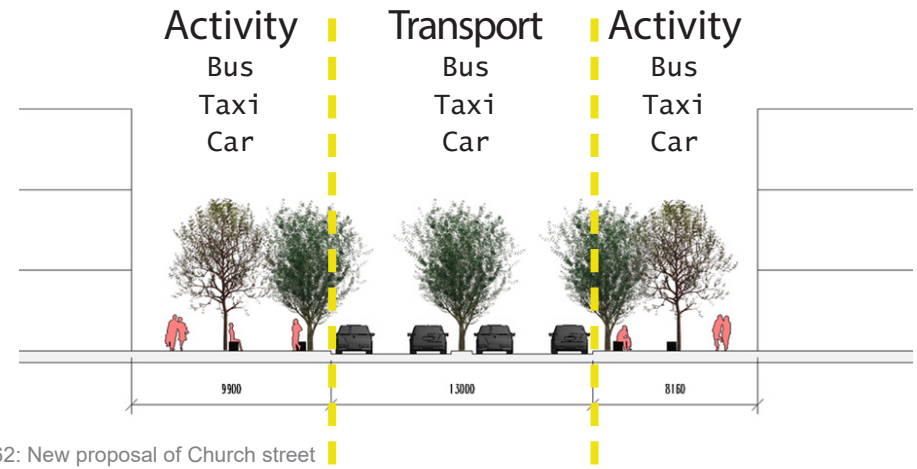


Fig 62: New proposal of Church street with trees and street furniture.

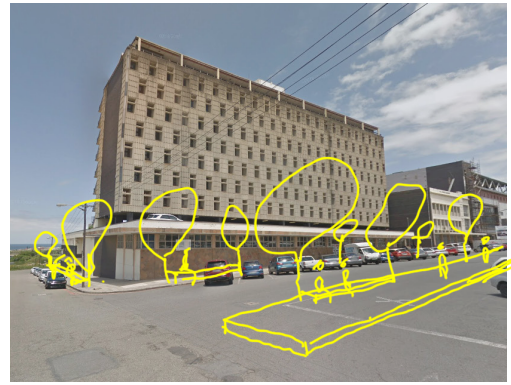


Fig 63: Pedestrians freely streets will middle island with trees and street



Fig 64: Restaurants outside admin buildings for students, lectures and the general public to enjoy.



Fig 65: Street furniture outside student residencies to bring students out and promote outdoor gathering.



Fig 66: Highlighting the selected site

In 2004 the New Miriam Makeba Audio Centre was built as part of the Universities development scheme to create a precinct in East London campus. The new additions to the centre were designed by Ngonyama Architecture and offers a One-Stop-Shop in Music, Film and Photography and Education and Training in the Miriam Makeba Audio centre with the vision and mission the Centre will offer services and programs in the various spheres of artist and management relationships.

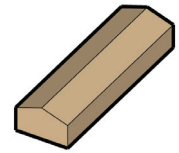
Also offering an undergraduate and postgraduate degree programs as currently offered in the UFH Department of Music, a Diploma in Music and a Certificate in Music and short courses in Music, Film and Photography.

The green belt offers an opportunity to connect the harbour to the site by designing landscaping that will evoke movement and gather while looking a the still waters and the re generated train tracks.



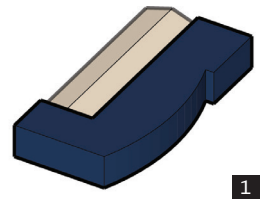
3





2

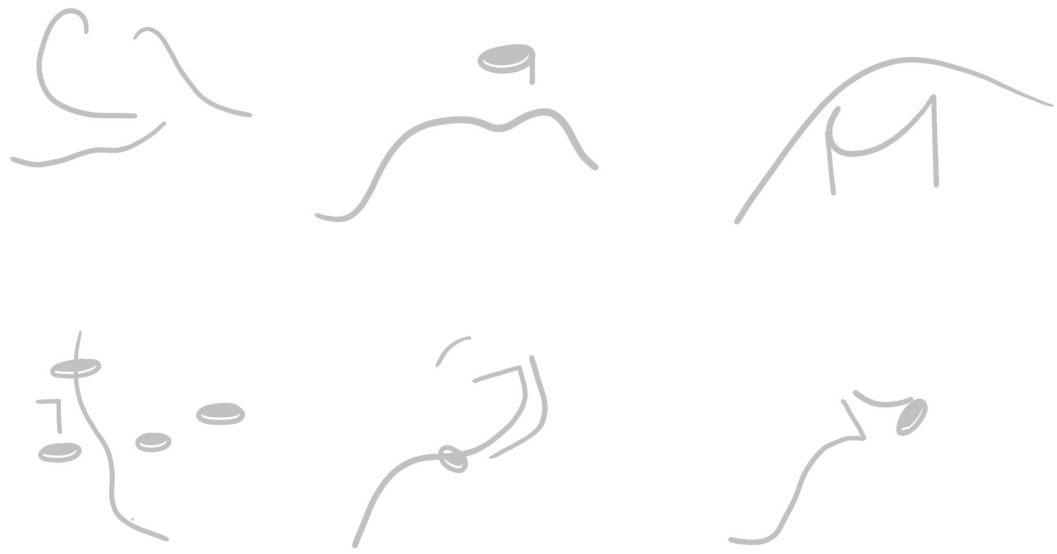




1

Fig 67: **1.** Old seaman's building from Church street. **2.** Audio centre extension designed by Ngonyama architecture and associates. **3.** Ground and first floor plan of the Audio centre

PROGRAM



BRIEF

The project is going to be implemented by private and public investors at specific nodes of potential within this broader precinct. These stakeholders include Transnet, who own a large portion of the Southern side of the site, UHF, Buffalo City Metropolitan Municipality and SAMRO. For the Project to be a success it needs to have specific economic magnets that will be favourable for each stakeholder and also improve and better define the CBD area of East London, in accordance with the aspiration of a World Class African City that integrate institutional facilities with the inner city.

-OBJECTIVES-

1. Define a safer, easily identifiable, walkable core of high urban quality.

2. Upgrade harbour to promote interest from the private sector, adding value to the precinct as a whole.

3. Redefine streets to accommodate various modes of transport.
4. Establish a network of civic spaces to further enhance identity.

5. Integrate Transit system within to better connect with the rest of the city.

6. Identify the source of uniqueness of the precinct and promote it.

The site is situated in the Eastern Cape home to the Xhosa speaking tribe. The site offers strong elements of how spaces can be reinterpreted in South Africa, and its rich history and heritage to the East London harbour will guide my design and give me knowledge on how to be sensitive to sites of great significance. In 2004 the New Miriam Makeba Audio Centre was built as part of the Universities development scheme to create a precinct in East London campus.
The thesis will add on to what is existing creating an extension to the Audio centre, accommodate musicians and performers from the surrounding context.

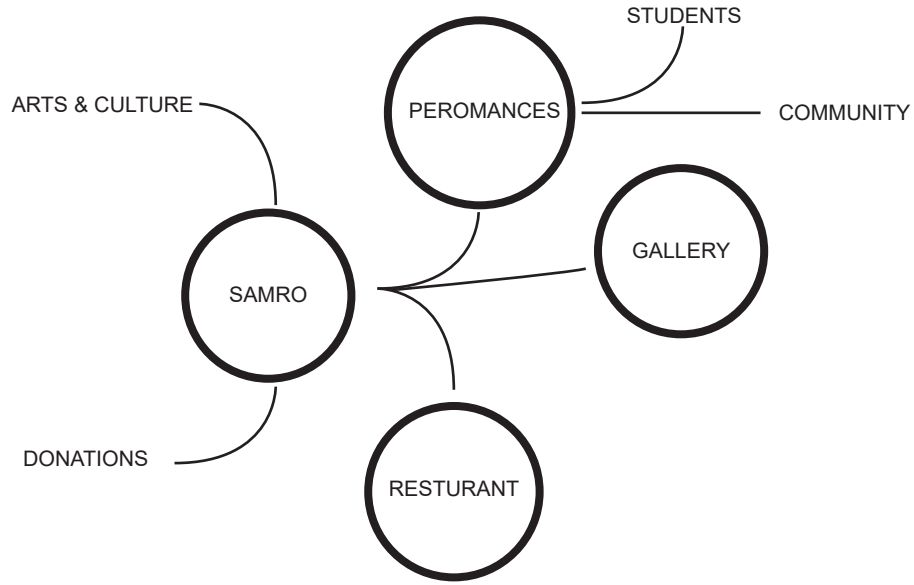


Fig 68: Structure of how the New Music Research Center will be ran and what if will offer the general public.

The site is 10 000m² in size.
·There is a stipulation that the developed site
contains a minimum of 25% landscaped garden space.
·On grade parking ratio-1.75/100m2.
·Height zone-3 storeys.
·Coverage-60%
·F.A.R-2

The University of Fore Hare has an increasing number of enrolled student since its existence in 1970. This influx started creating issues of housing and high-end facilities for the student to ensure great quality in work and student livelihood. A joined partnership between the UFH, SAMRO and Transnet was formed to tackle this issue, but only choose to focus on the creative departments of the institution. This decision was determined by the possibilities of the design team to introduce a more playfulness and harmonic design that will set a new vocabulary within the precinct.

The project will have spaces that will encourage collaboration from other disciples to create new sounds, visuals, theories and art forms that are an expression of a decolonized South Africa. The centre will also have performance spaces of various sizes that aim to integrate the building to its context and serve as an icon on the urban fabric pulling people of different backgrounds into a space of expression. This development plan comes with exciting and new ideas of how a university and the city can be merged creating a ‘town and gown’ idea.

The University of Fort Hare:
More facility provide for the students

SAMRO: A closer relationship with new talent
Early education on itelletual property

Transnet: Regeneration of the harbour

Buffalo City Metropolitan Municipality: Tourist attraction (Jazz festive)

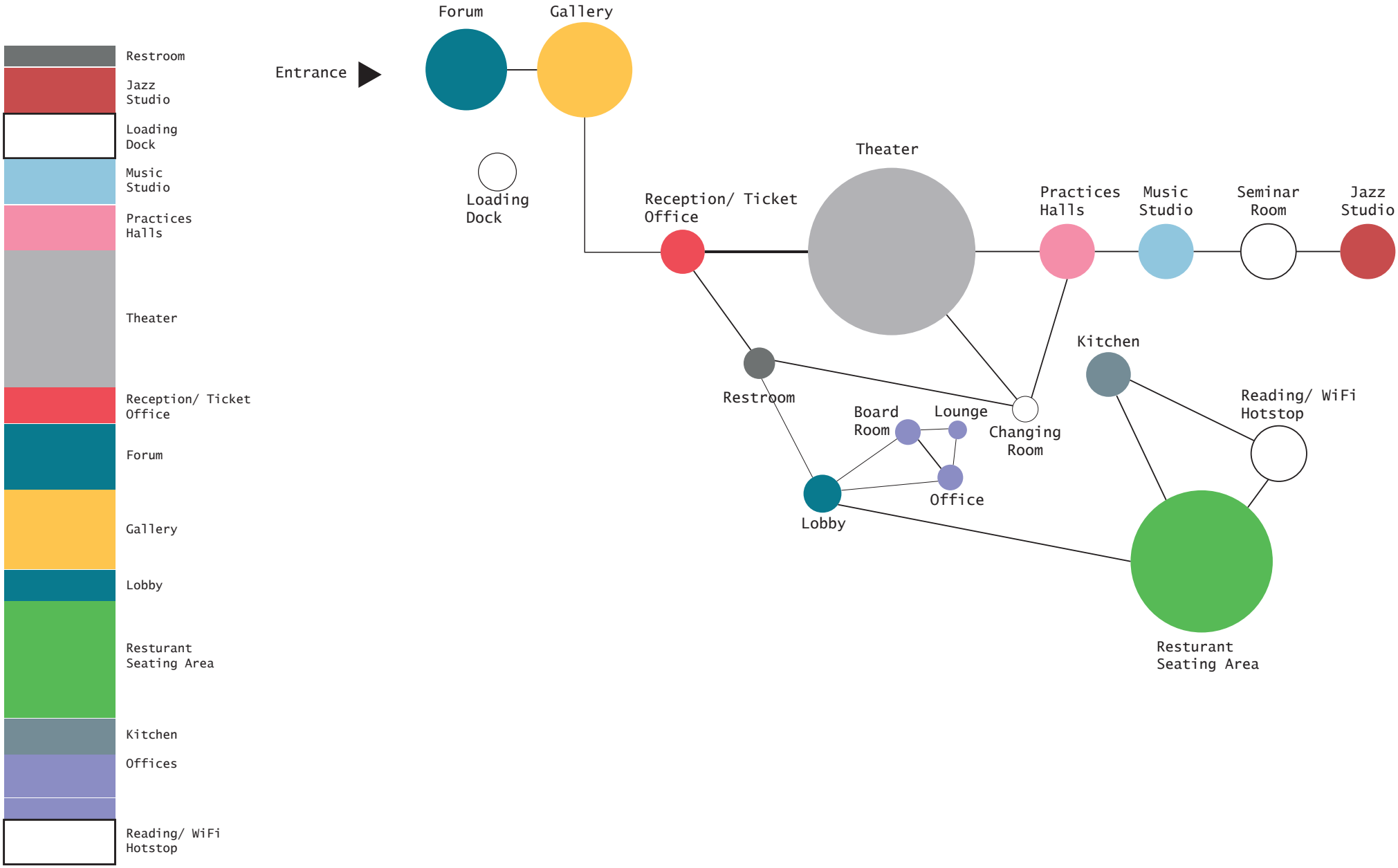


Fig 69: Structure of the program of the New Research Center.

TECHNICAL SYSTEMS

“The chemical process that occurs within a living organism in order to maintain life”.

- Oxford dictionary (1998) Definistion of Metabolism

The materiality of the building is closely linked to the same themes that helped in creating the sound models. From these four main themes, the building naturally merged itself into forms that give off a clear distinction of theme that is being portrayed which then slips into the material choice and structure of the building.

In this section of the research report, music and architecture are connected by the art of crafting an instrument. Symmetry plays a great deal in the process of making an instrument and would make it easy to relate to classical architecture since proportion and symmetry are the key principles in designing a temple (Vitruvius 1960). Temples are constructed with one material with a single theme across the building, but since this research report’s core motivation is about evolution it would progressive to introduce the idea of Metabolism.

At the end of the modernist movement, ideas emerged all over the world on what is postmodern architecture? The thought process to answer the question lead towards merging traditional building methods, spatial arrangements and geometric form into the modern commercial world. Embracing the past while looking to the future is what Japanese architect Kisho Kurokawa and Dutch architect Aldo van Eyck rooted himselfs in the philosophy of continuity through a linear narrative of “architecture, society and nature”(Kurokawa, 1988).
Dividing the building into the four elements allows the building to address architecture, society and nature by designing the building to become a social tool that merges with nature. The fascination of inside-outside, man-technology and history-present were some of the ideas and sub-theme that will be exercised in the building to strengthen the Metabolism ideology and will allow me to design a dynamic contradiction that values the preservation of these relationships.

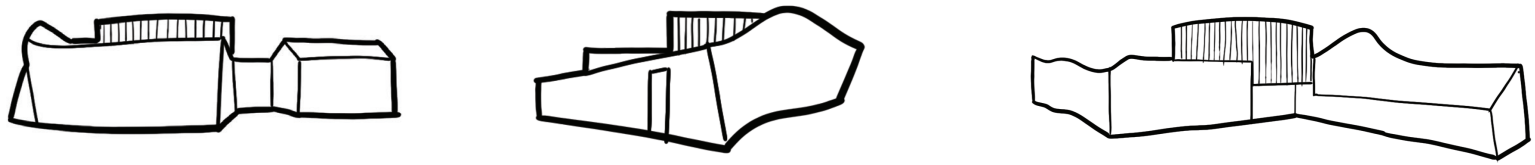


Fig 70: Sketches of the idea of metabolism in architecture which are demonstrated by the different geometric forms that make a harmonious building.

Figure 00 show a spatial arrangement of a homestead in the Eastern Cape and the difference in the geometric forms of the dwellings. The shift from circular to rectangular buildings started during the time where Christianity was introduced to the natives people and created a separation in the homesteads among black South Africa. The homesteads with rectangular dwellings were viewed as progressive while the ones that stuck to the traditional circular structure were viewed as backwards (McAllister 2006).
Regardless of the shift, each homestead is required to have a particular dwelling for certain events and the arrangement of these dwellings does not matter as much as it used to. In the case of my grandparents' homestead, the hut is the furthest dwelling from the kraal and is now a space where guests and the elders are welcomed and served. From that, I have taken the idea of a structure having a symbolic meaning that gives the traveller a sense of direction and makes it easier to navigate on a site because of the two different architectural geometries. This highlights the importance of the two architectural geometries and the idea of metabolism in architecture.

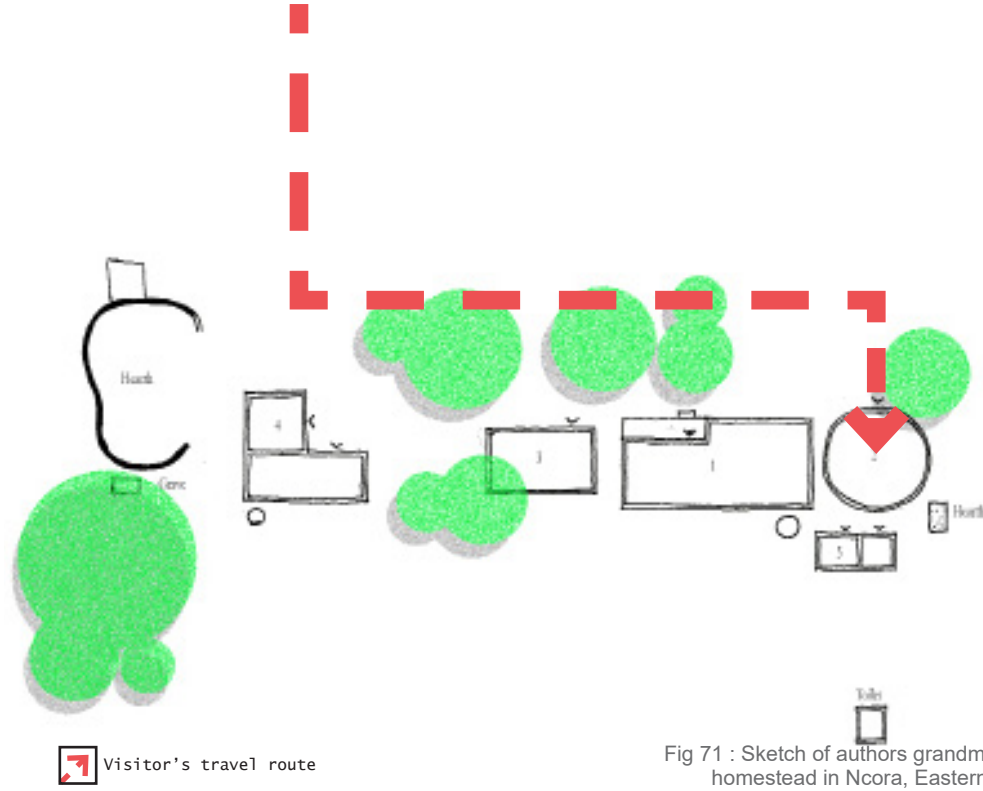
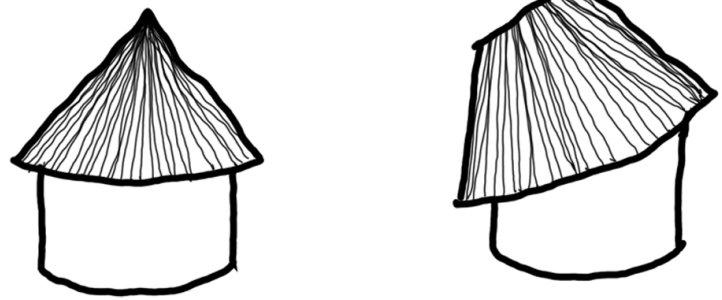


Fig 71 : Sketch of authors grandmothers homestead in Ncora, Eastern Cape



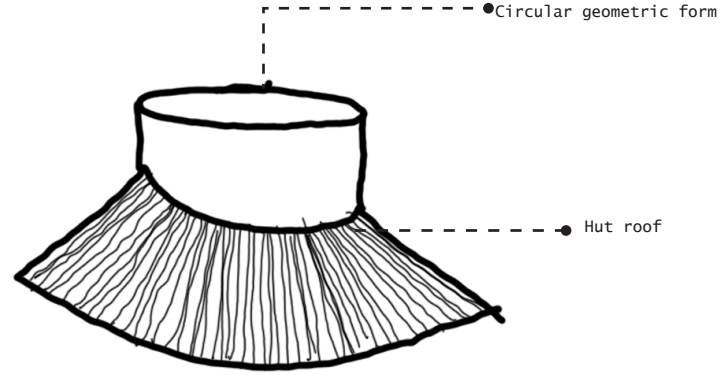


Fig 72 : Sketch of how the roof of a Traditional xhosa hut could be reinterpreted into a multi story building.

Repetition
The repetition in structure is the main reason why I have used repetition as an underlying design principle in developing the cut sections of the building. The cast-in-site concrete that will be used will help in creating a common material that will be slightly used in the other 3 key elements of the building.

Rhythm
This portion of the building represents the element in music that evokes movement. The building represents rhyme through the vertical timber slats and the form of the southern section of the building which has introduced a new language on the site.

Tone
Brick is the most common material used in post apartheid architecture in South Africa and is used in the building to fall in the movement to at least identifying its geographic location.

Proportion
A variety of Cross Laminated timber truss sizes is used in supporting the roof structure of the southern portion of the building. Steel is used in the connection detail between different materials and the ability of steel to exist in a 1:50 section to a 1:25 section highlights the reason why steel is linked with the proportion.

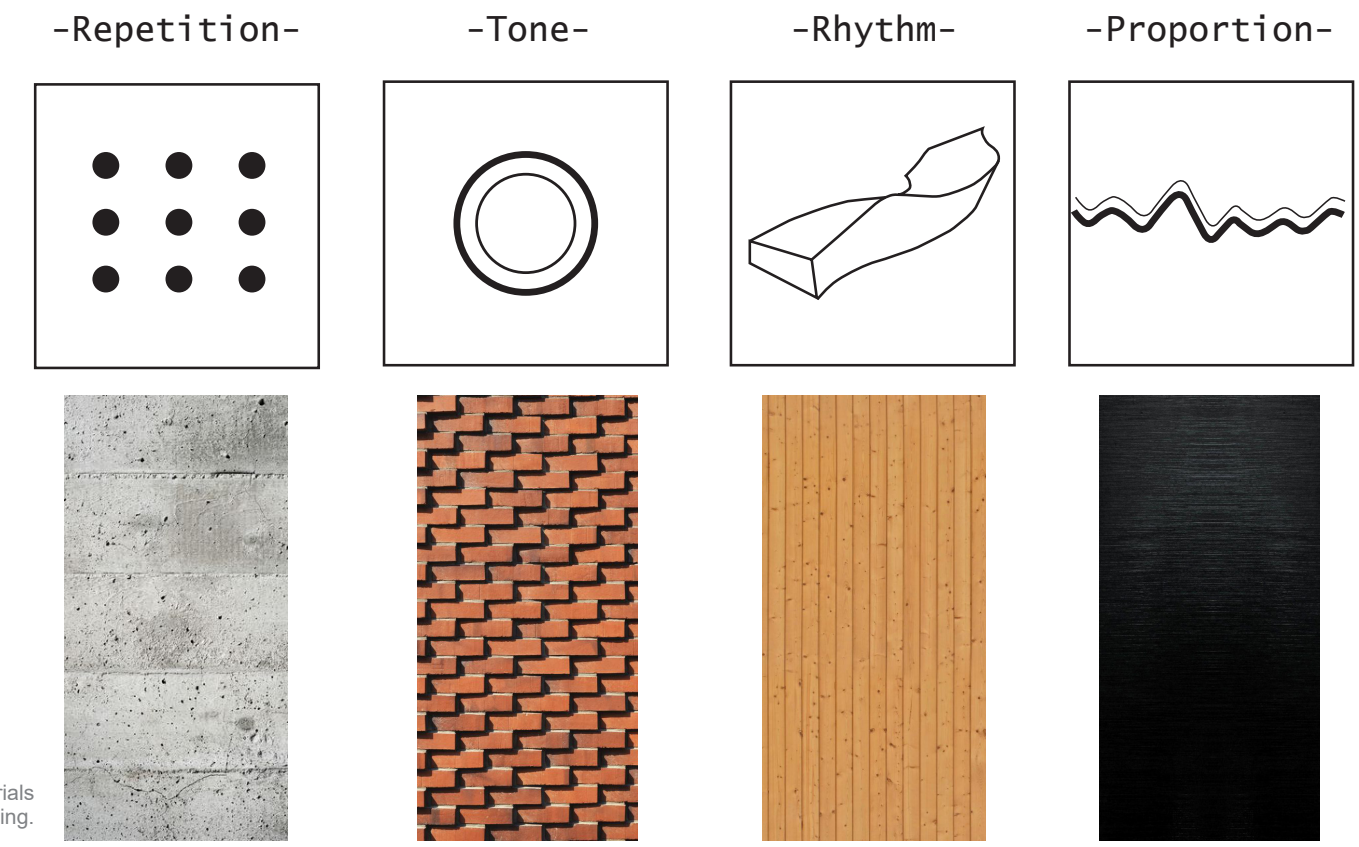
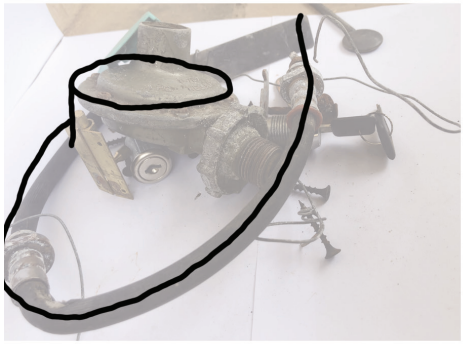
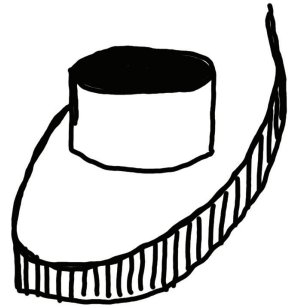
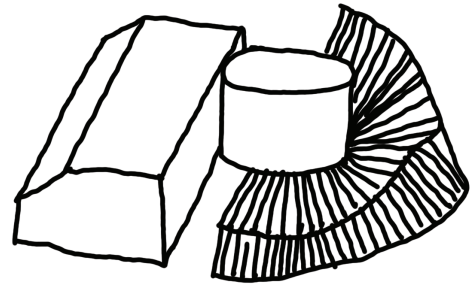
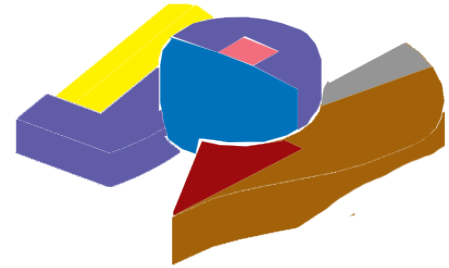


Fig 73: Main four themes and materials that will be used in the building.











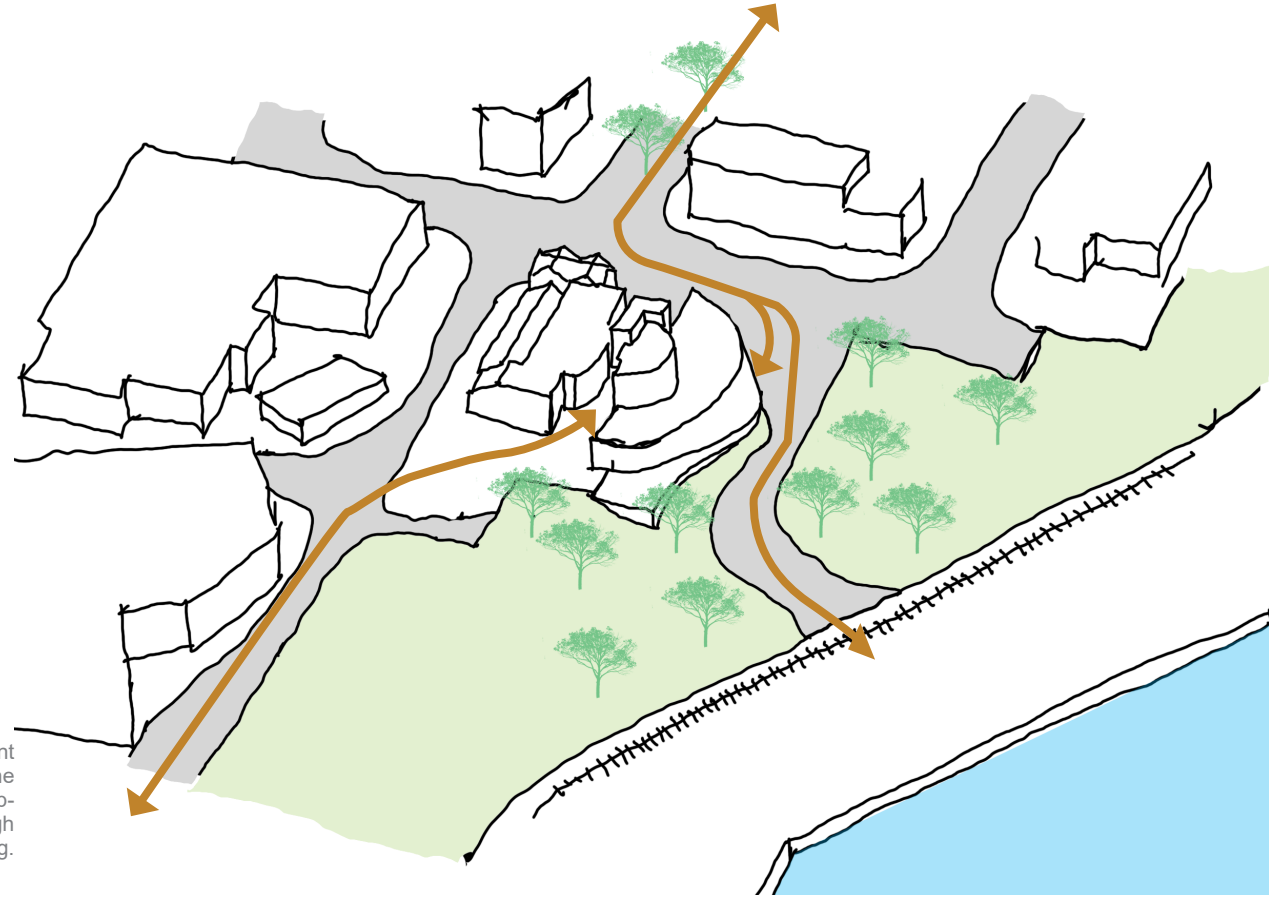
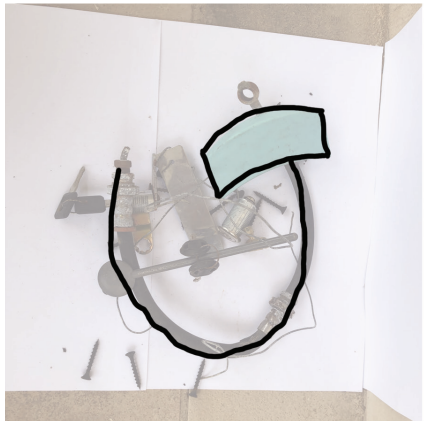
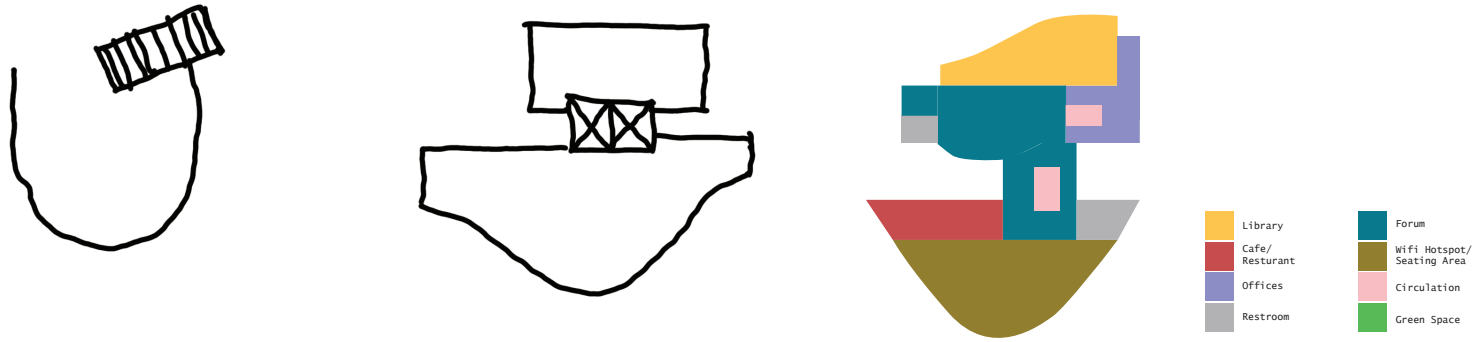


Fig 74: Development process from the proportion conceptual model to rough axo of the building.





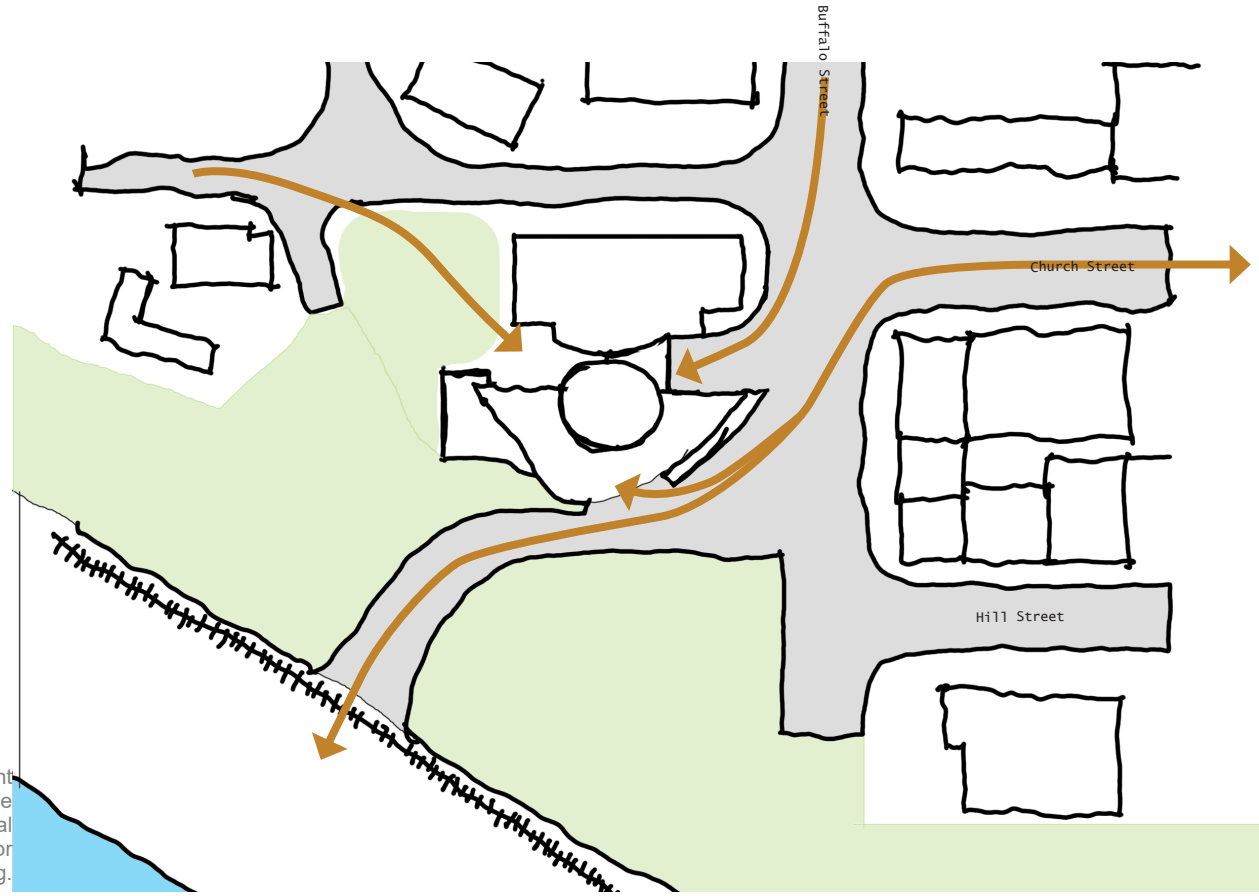
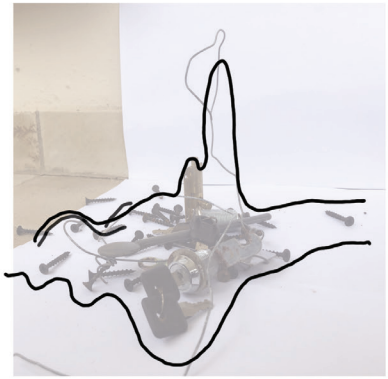
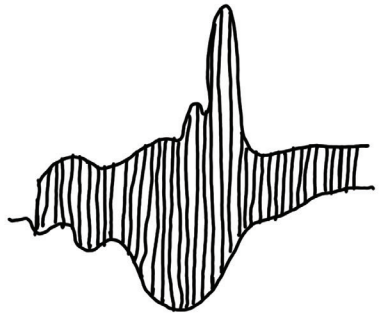
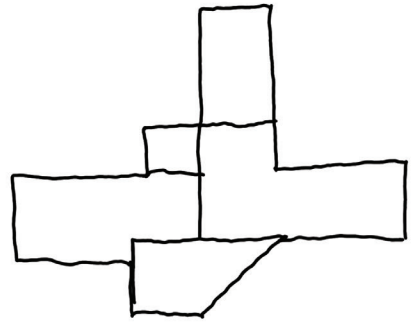


Fig 75: Development process from the rhythm conceptual model to rough floor plan of the building.









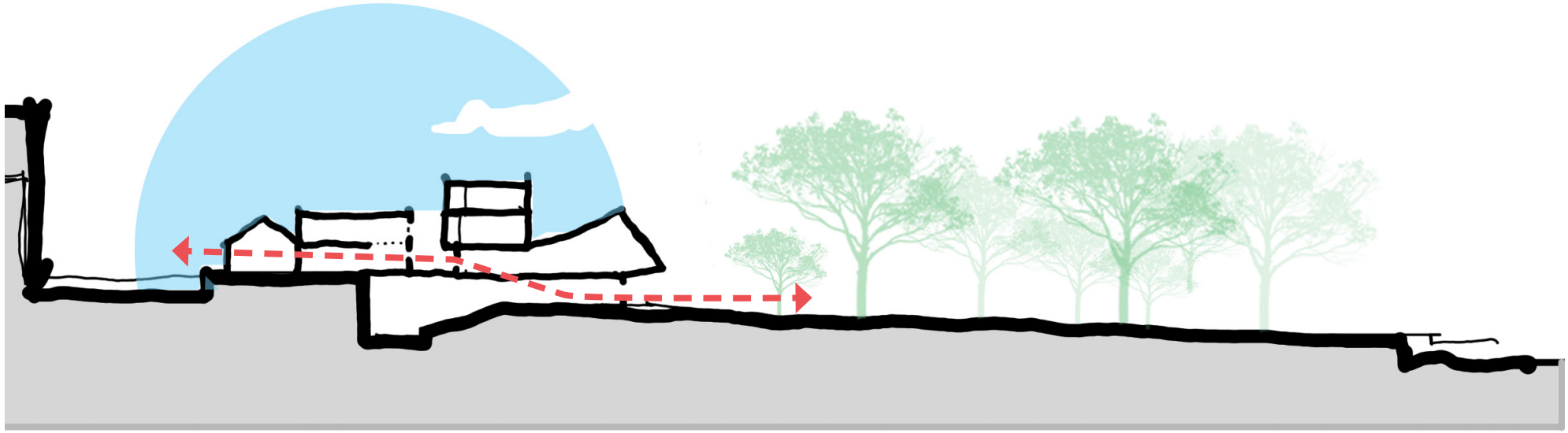
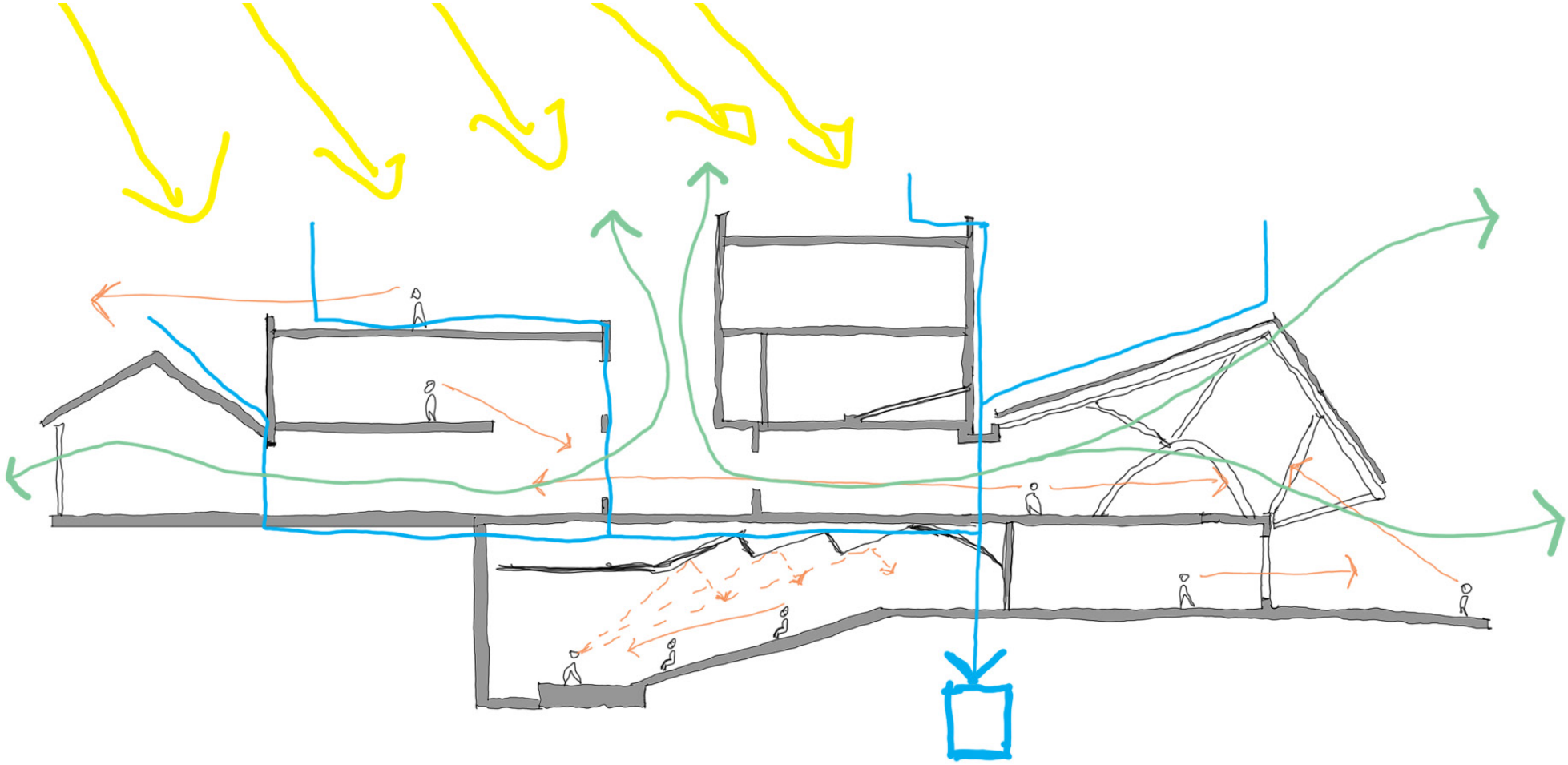


Fig 76: Development process from the repetition conceptual model to rough section of the building.



Water Collection

Natural Ventilation

Fig 77: Diagram water collection and ventilation

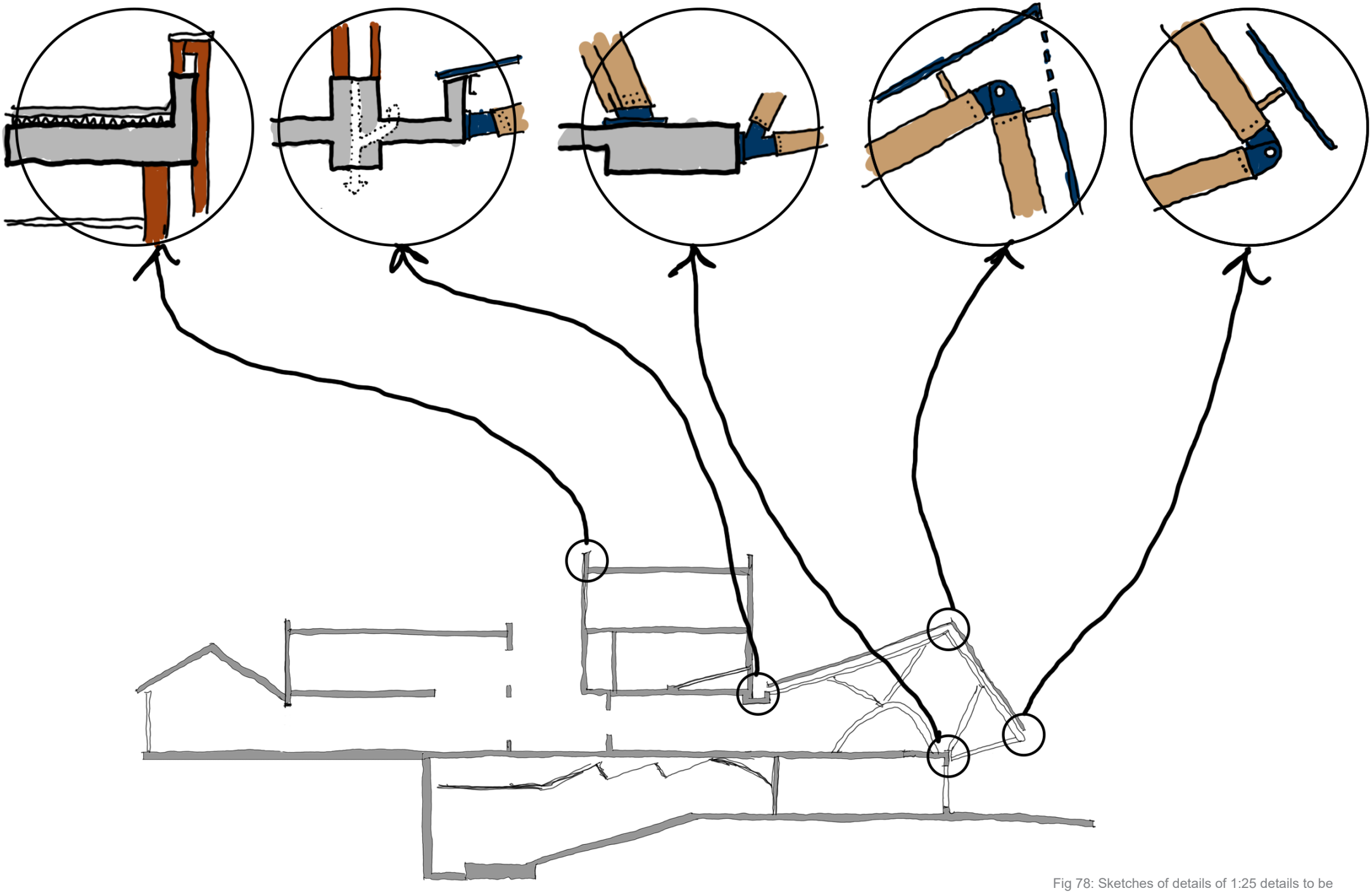
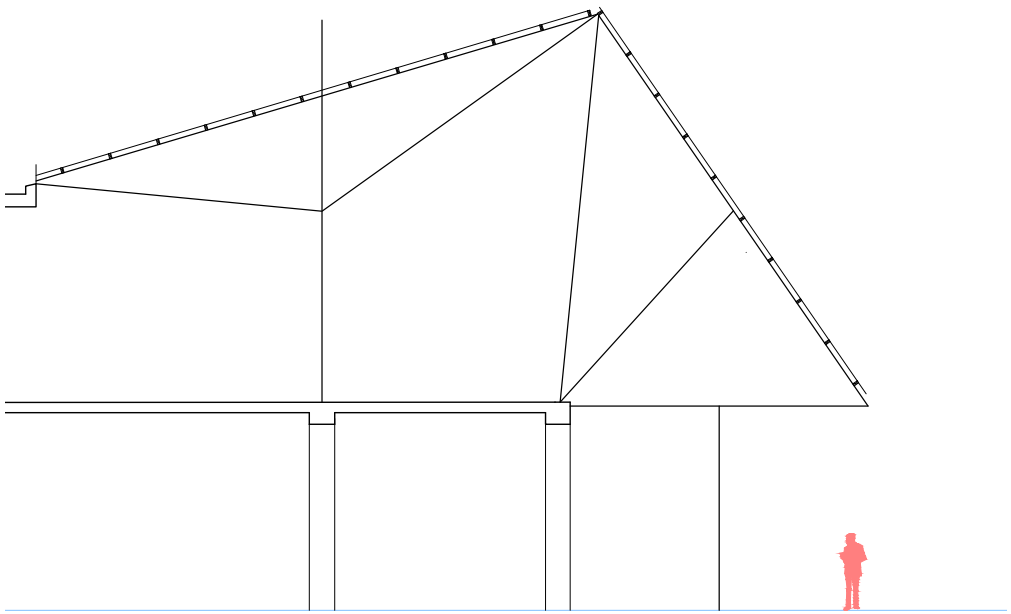
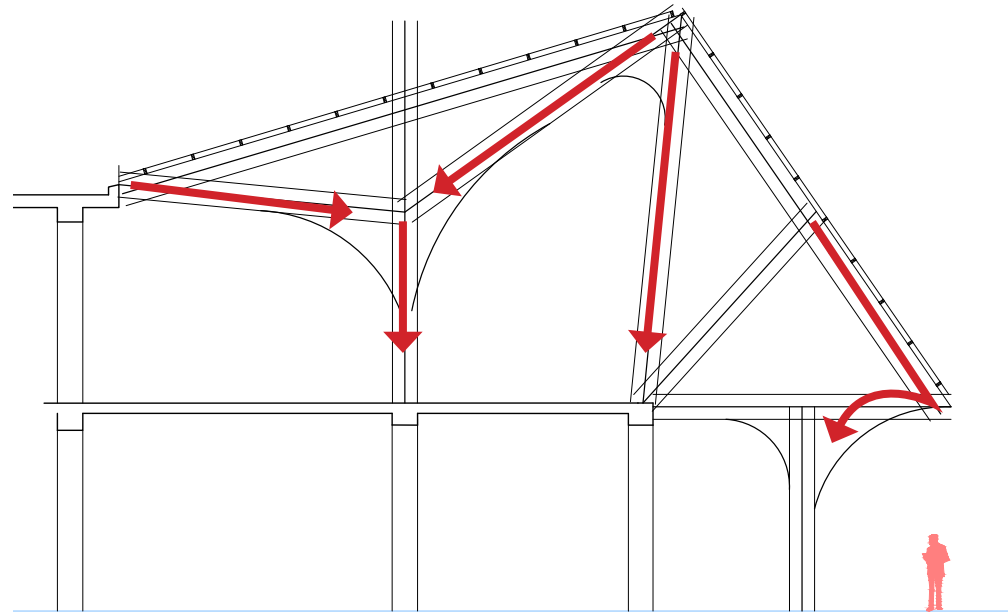
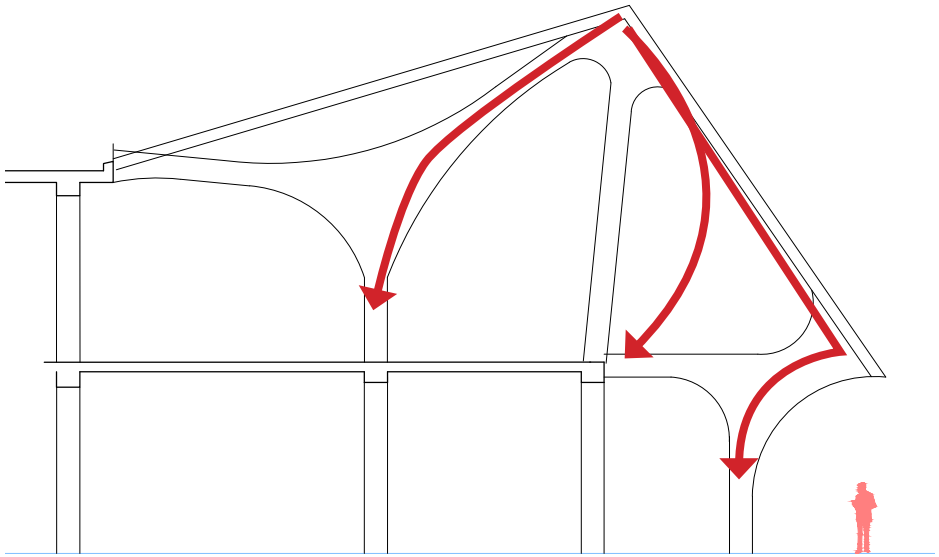


Fig 78: Sketches of details of 1:25 details to be explored.







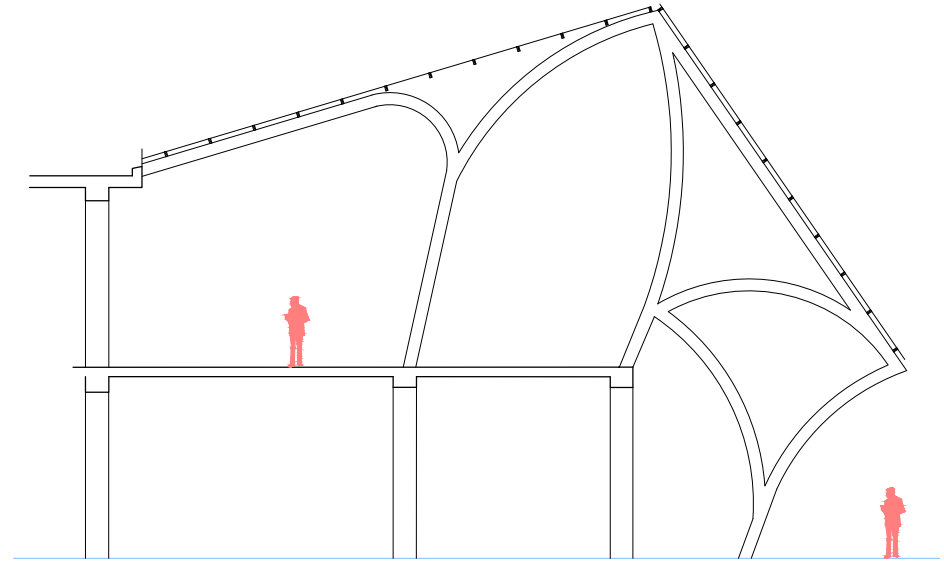
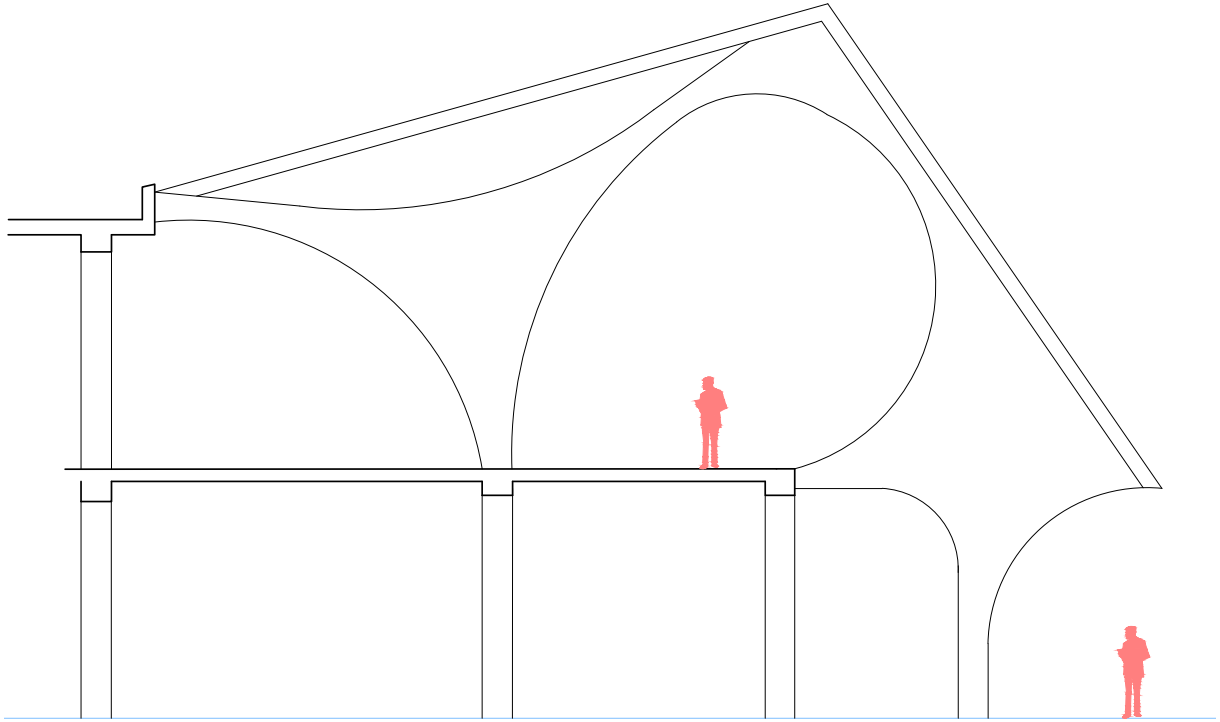
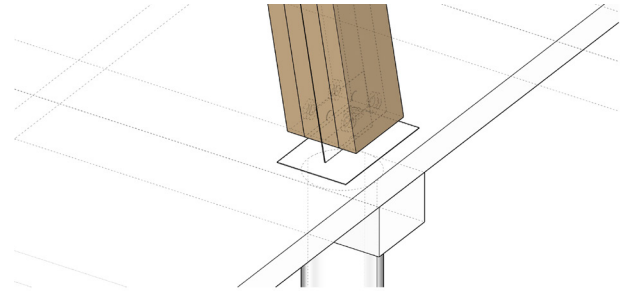


Fig 79: Axiomatic of the roof structure supported by cross laminated timber.





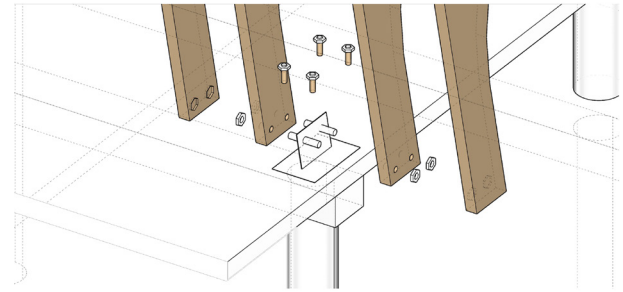
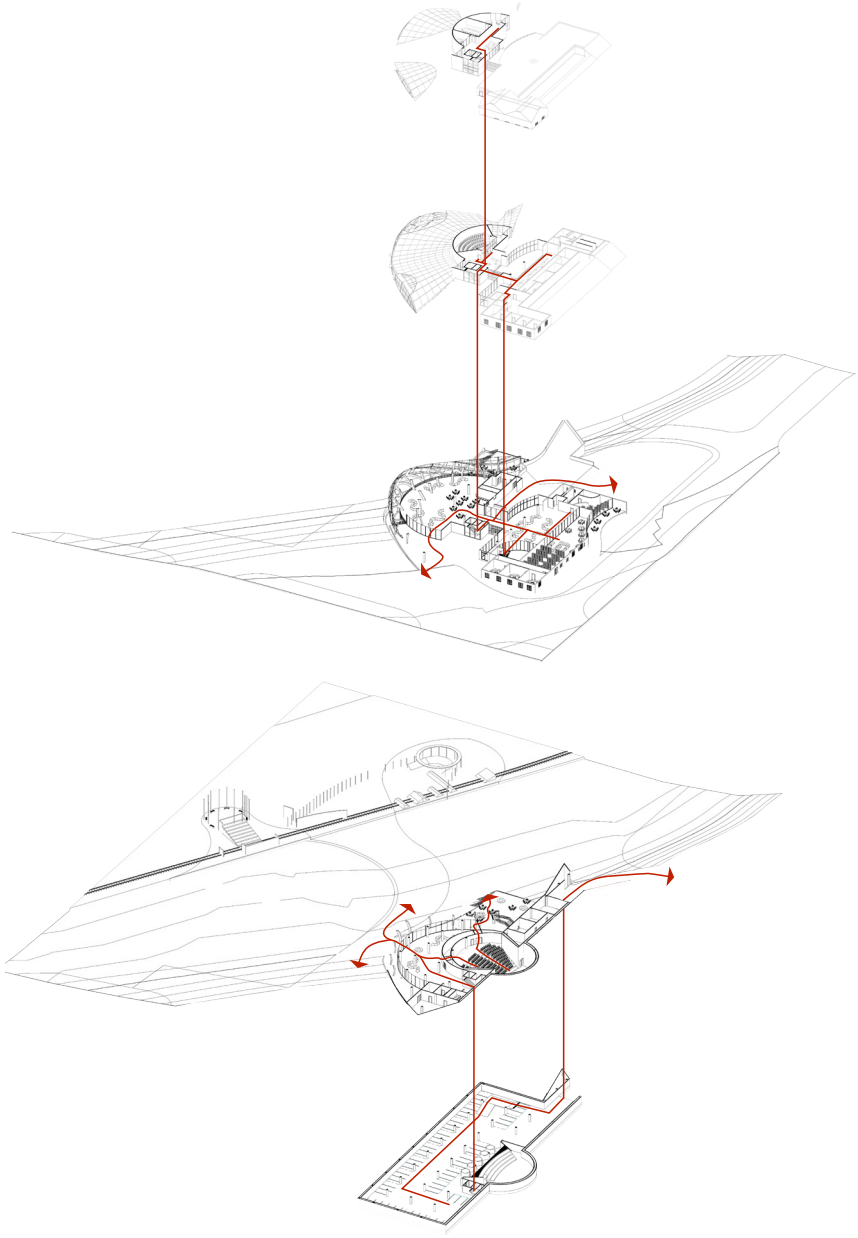


Fig 79: Axiomatic of the roof structure supported by cross laminated timber.



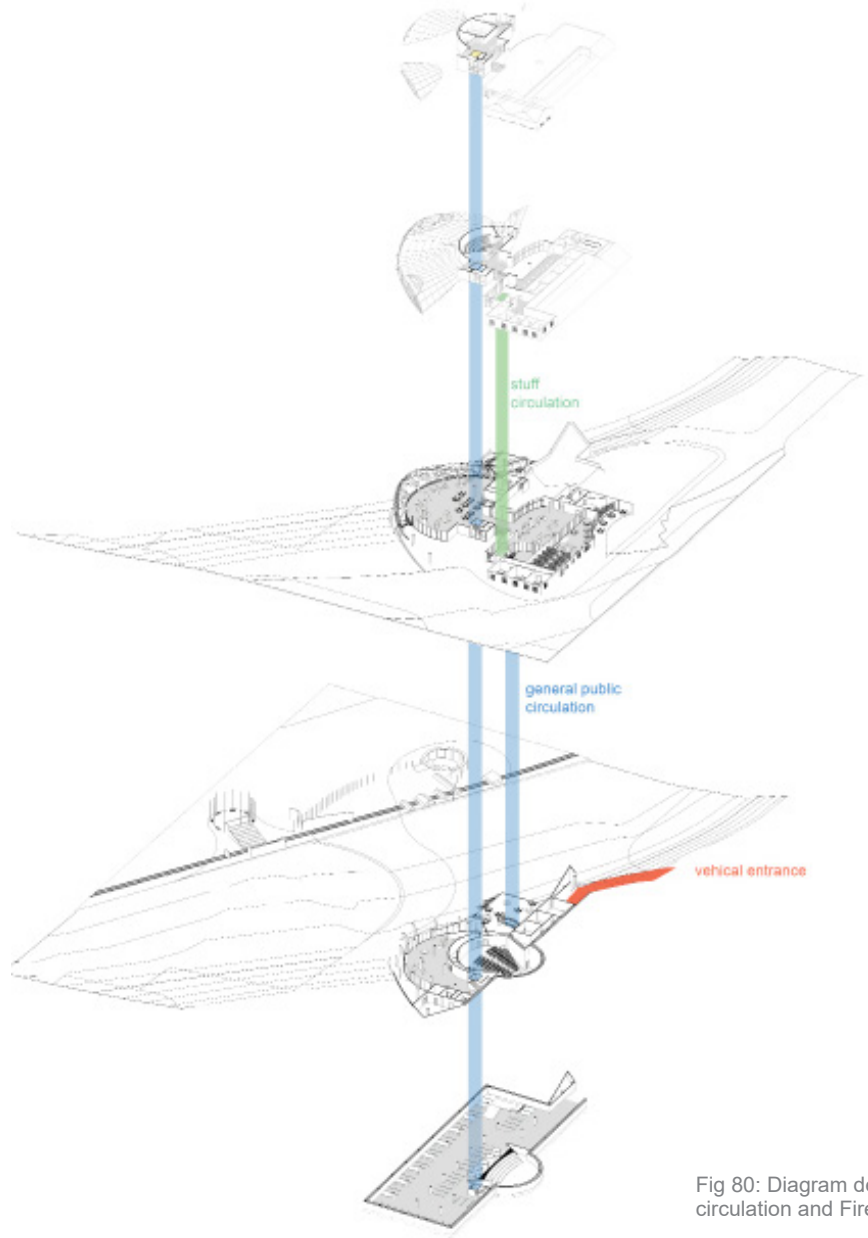


Fig 80: Diagram demonstration Vertical circulation and Fire escape routes.

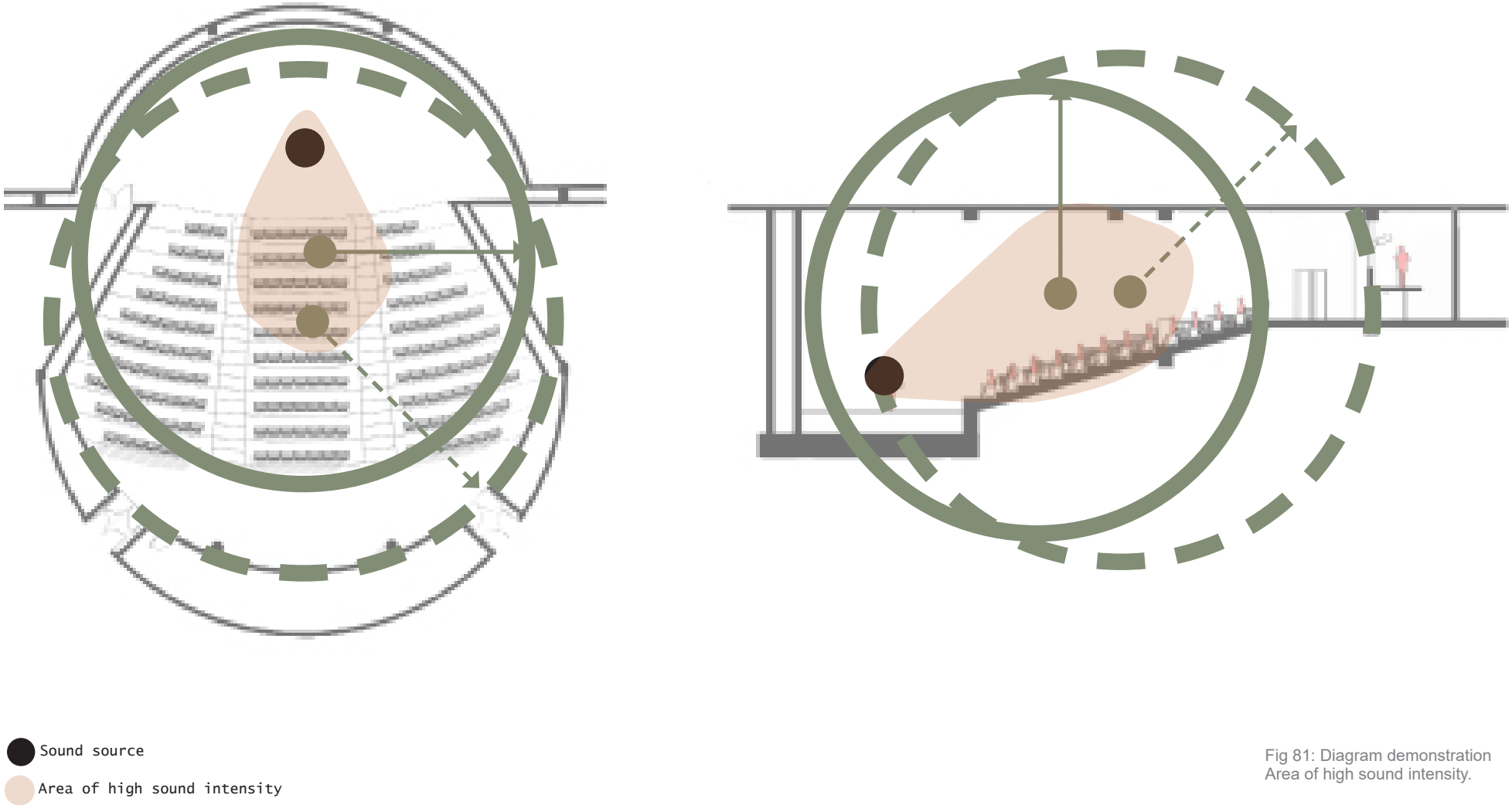
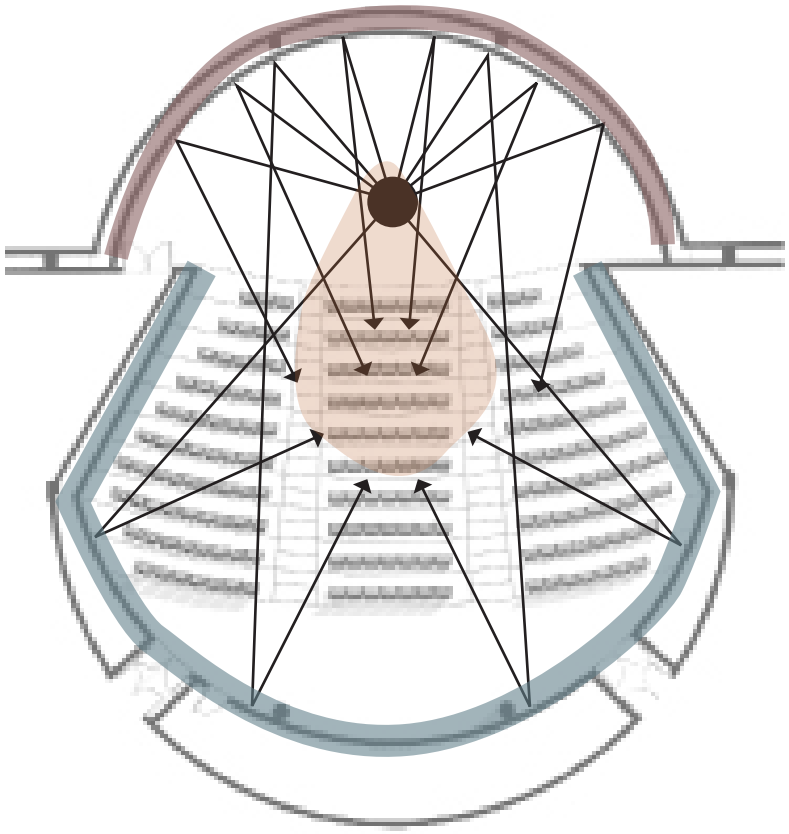
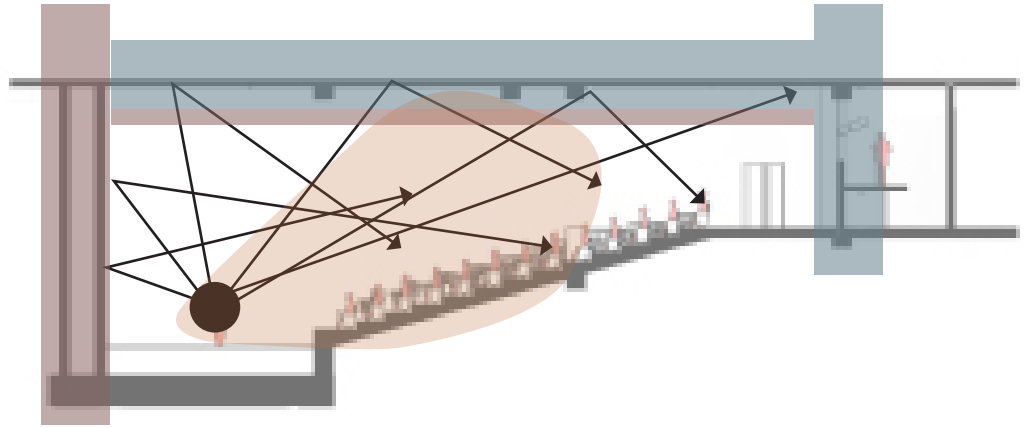


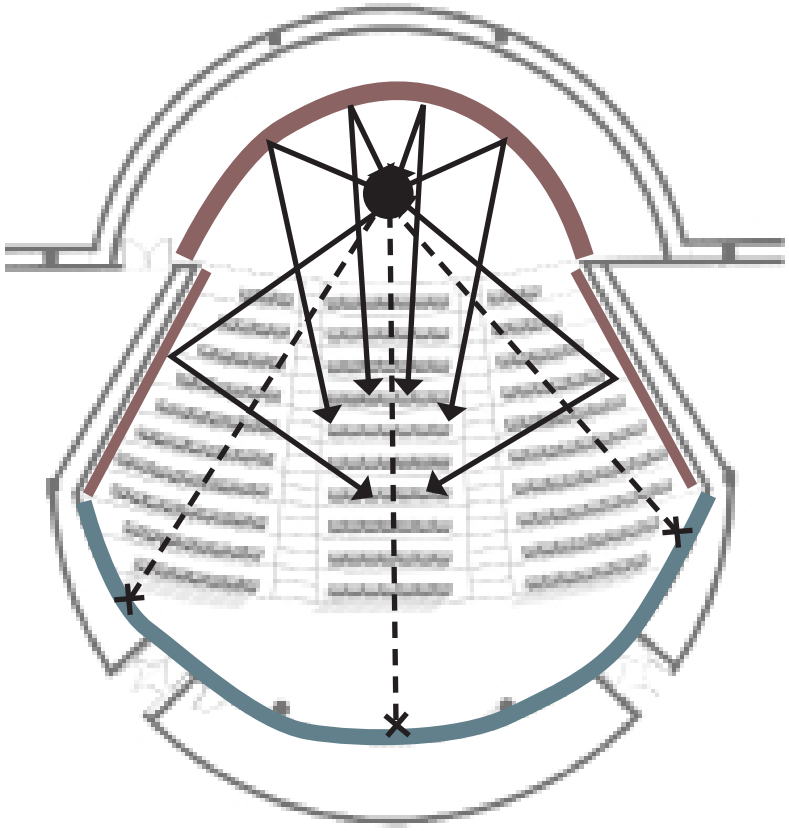
Fig 81: Diagram demonstration
Area of high sound intensity.

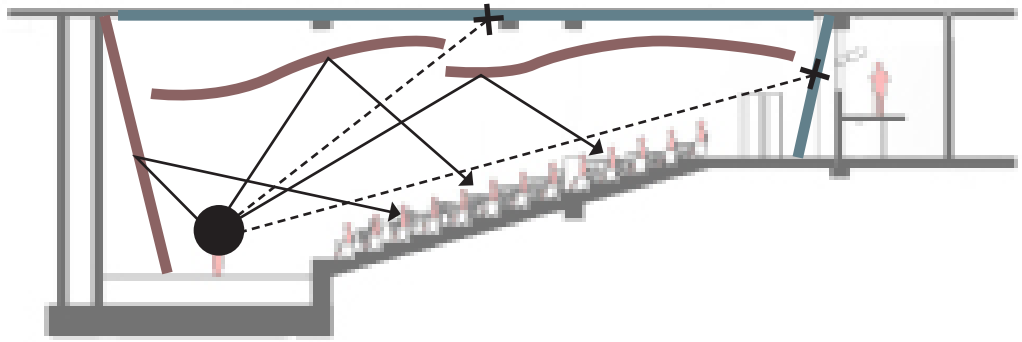




Sound waves
Sound source
Area of high sound intensity
Surfaces that need Reflect sound
Surfaces that need to Absorb sound

Fig 82: Diagram demonstration
Wall surfaces that need reflective
and absorbing panels.





Sound waves

Sound source

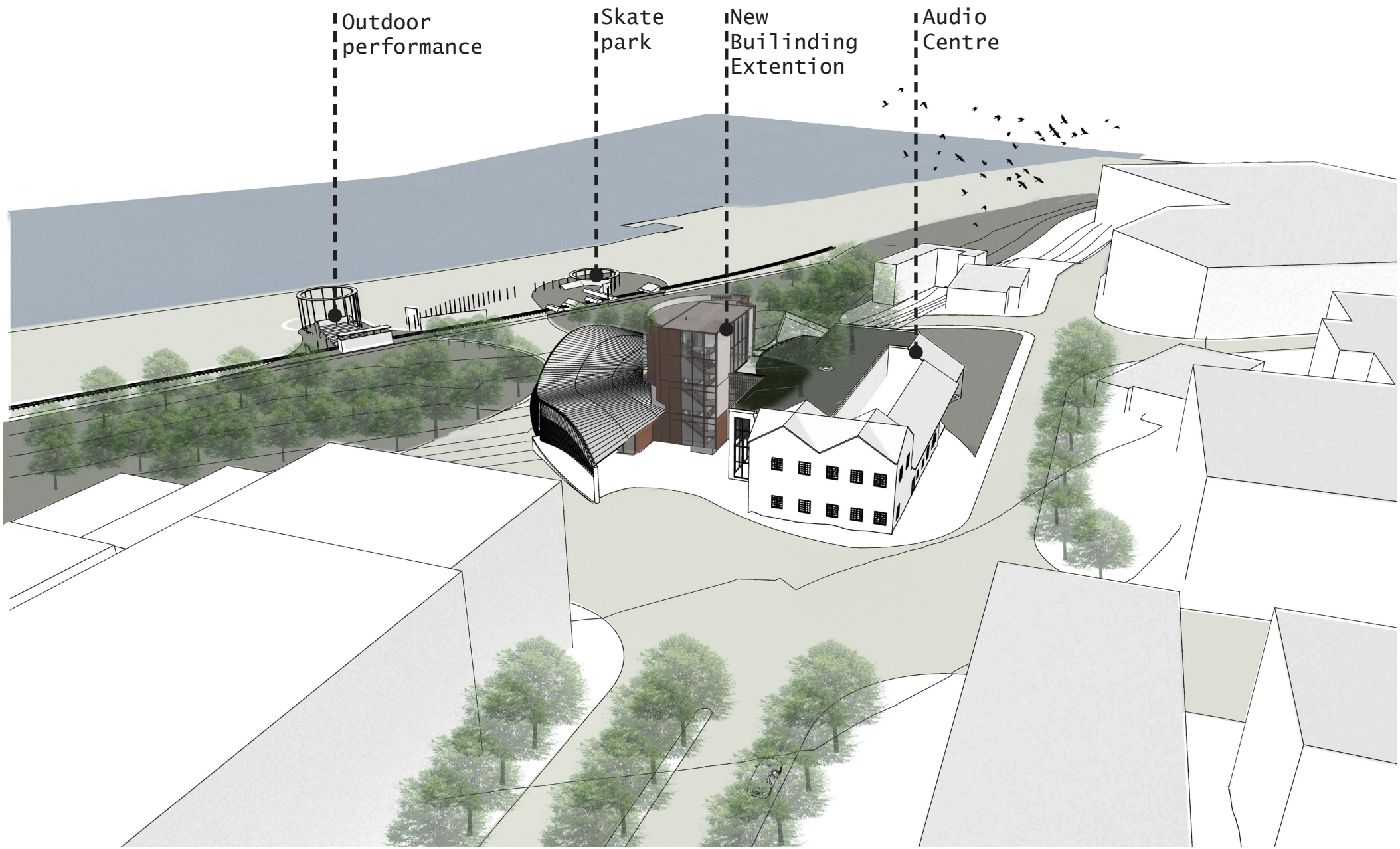
Surfaces that need Reflect sound

Surfaces that need to Absorb sound

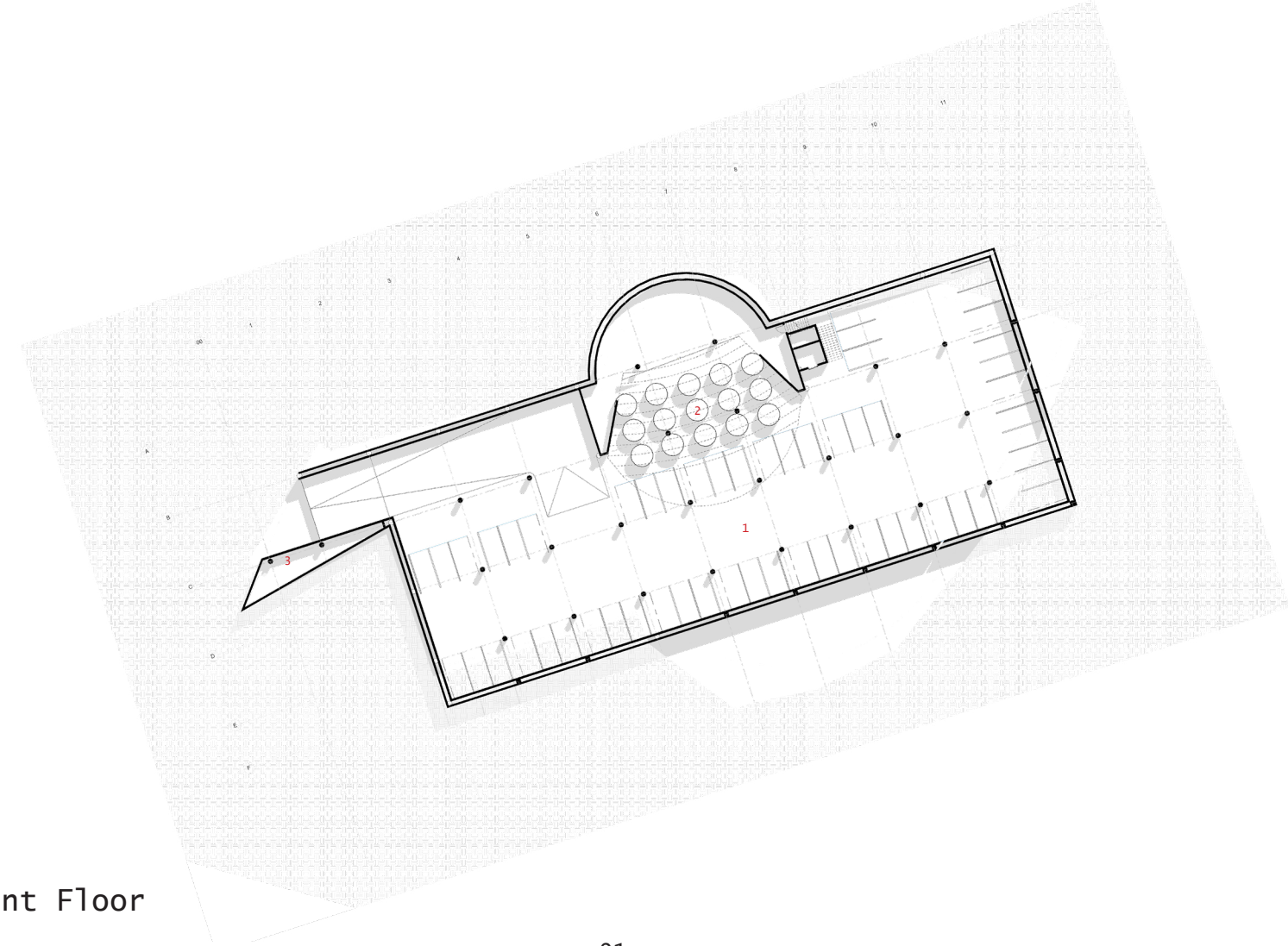
Fig 3: Diagram demonstration Acoustic panels.



FINAL DESIGN

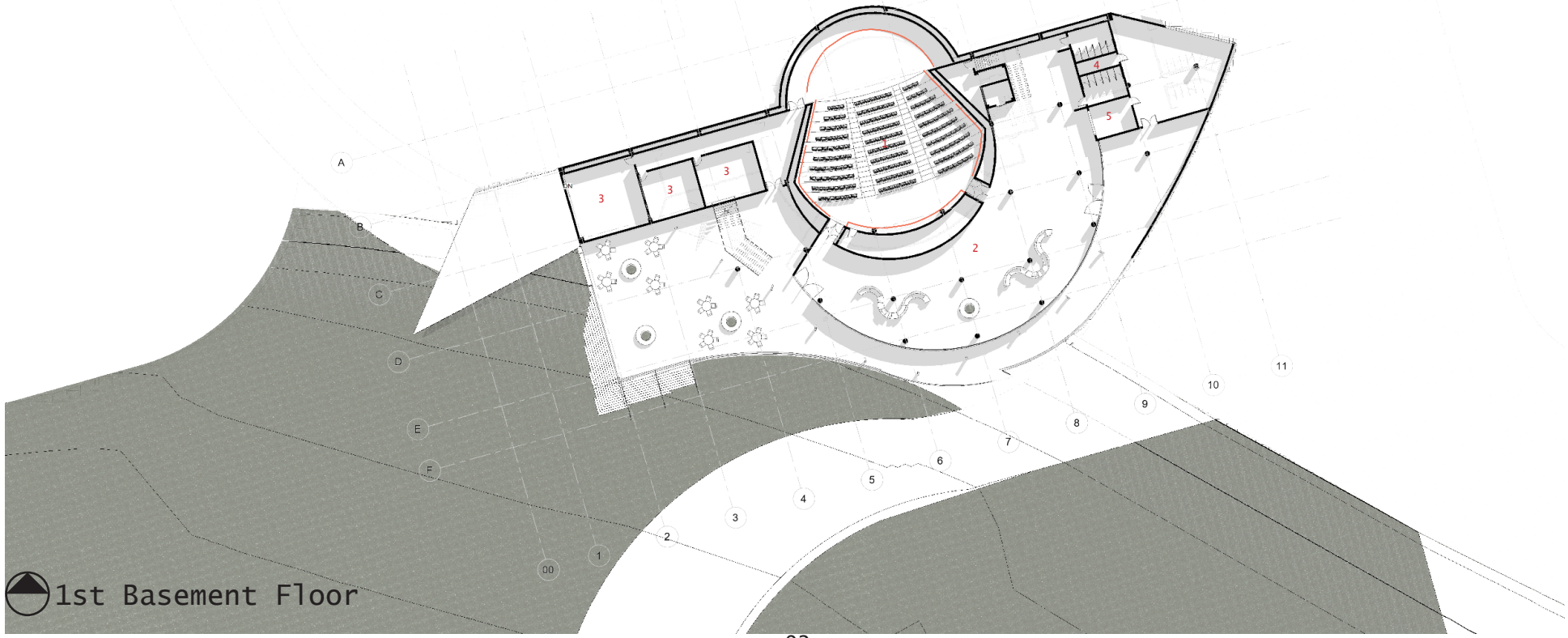

Outdoor
performance
Skate
park
New
Builinding
Extention
Audio
Centre

1. Parking
2. Water Storage
3. Security Office



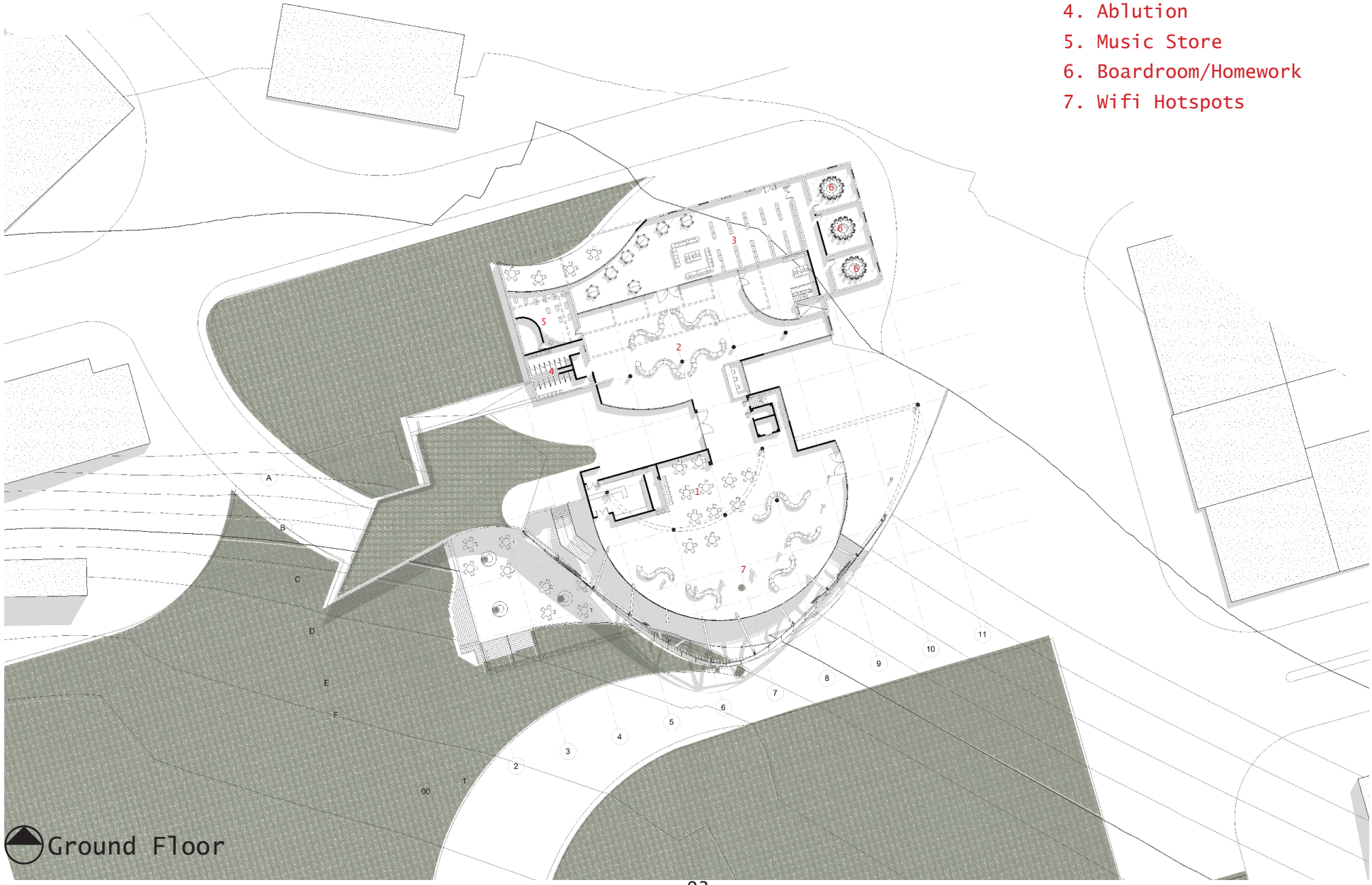
2nd Basement Floor

1. Theater
2. Lobby
3. Practices Halls
4. Ablution
5. Tuck Shop

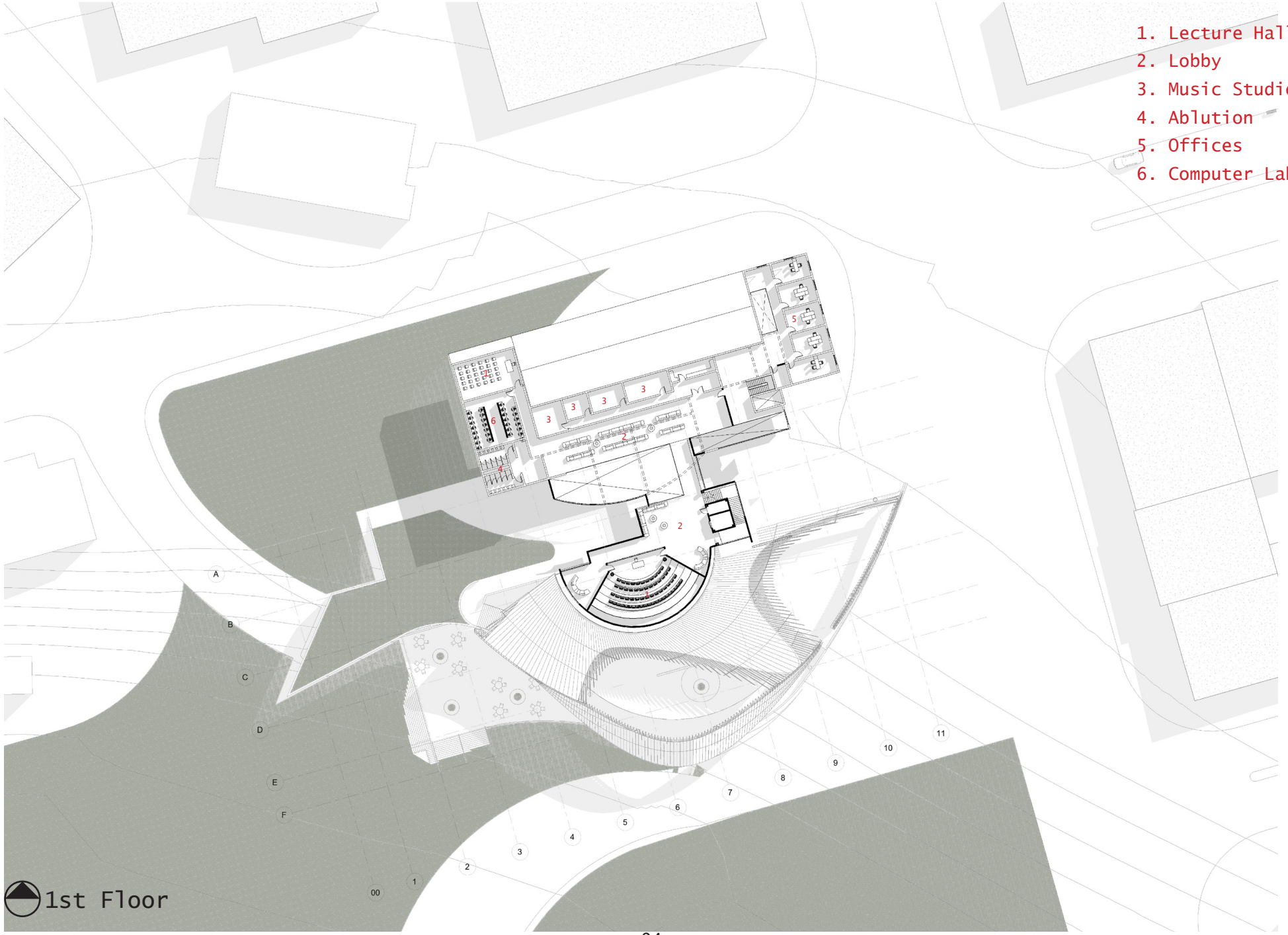


1st Basement Floor

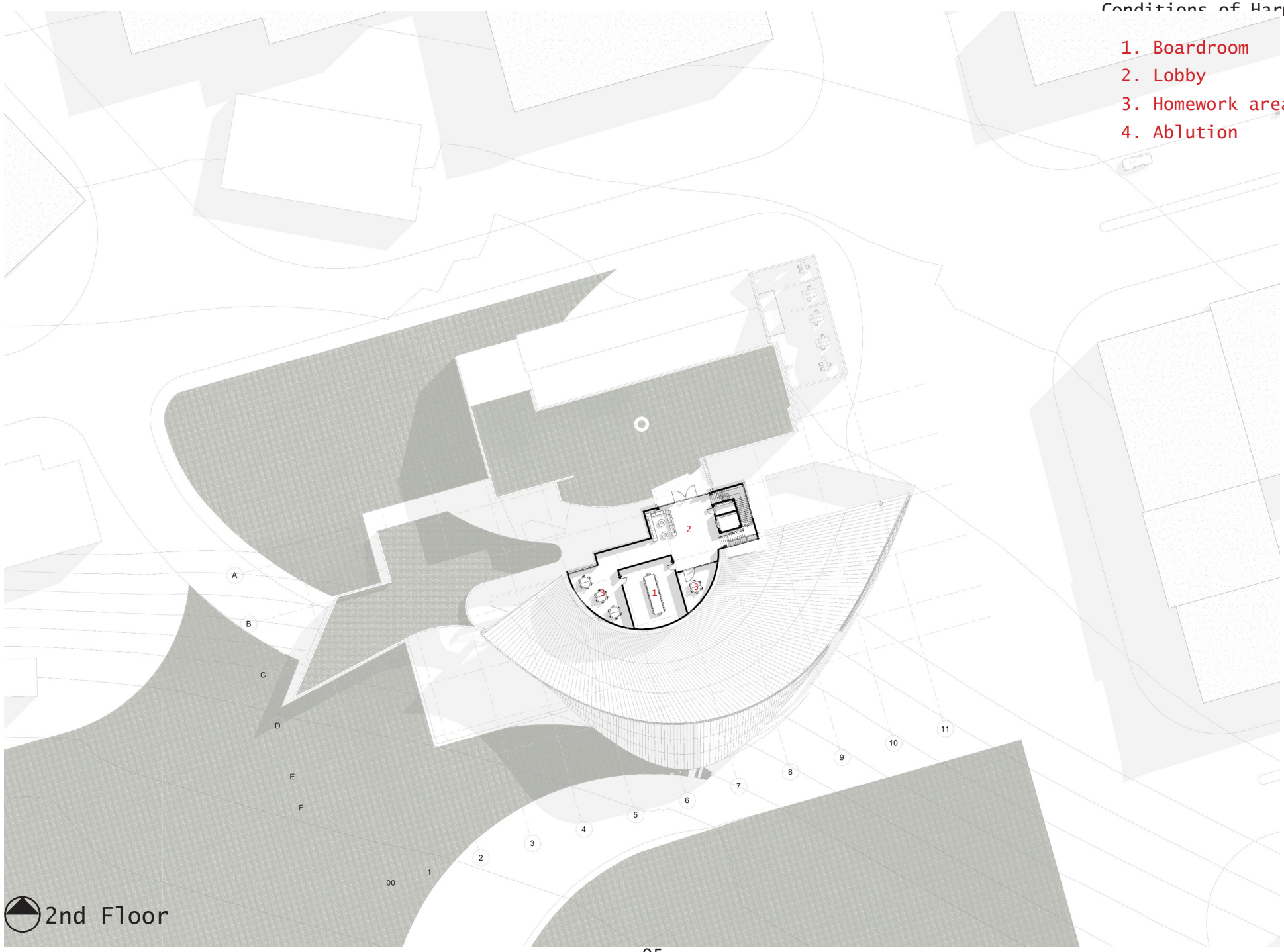
1. Resturant
2. Lobby
3. Library
4. Ablution
5. Music Store
6. Boardroom/Homework
7. Wifi Hotspots



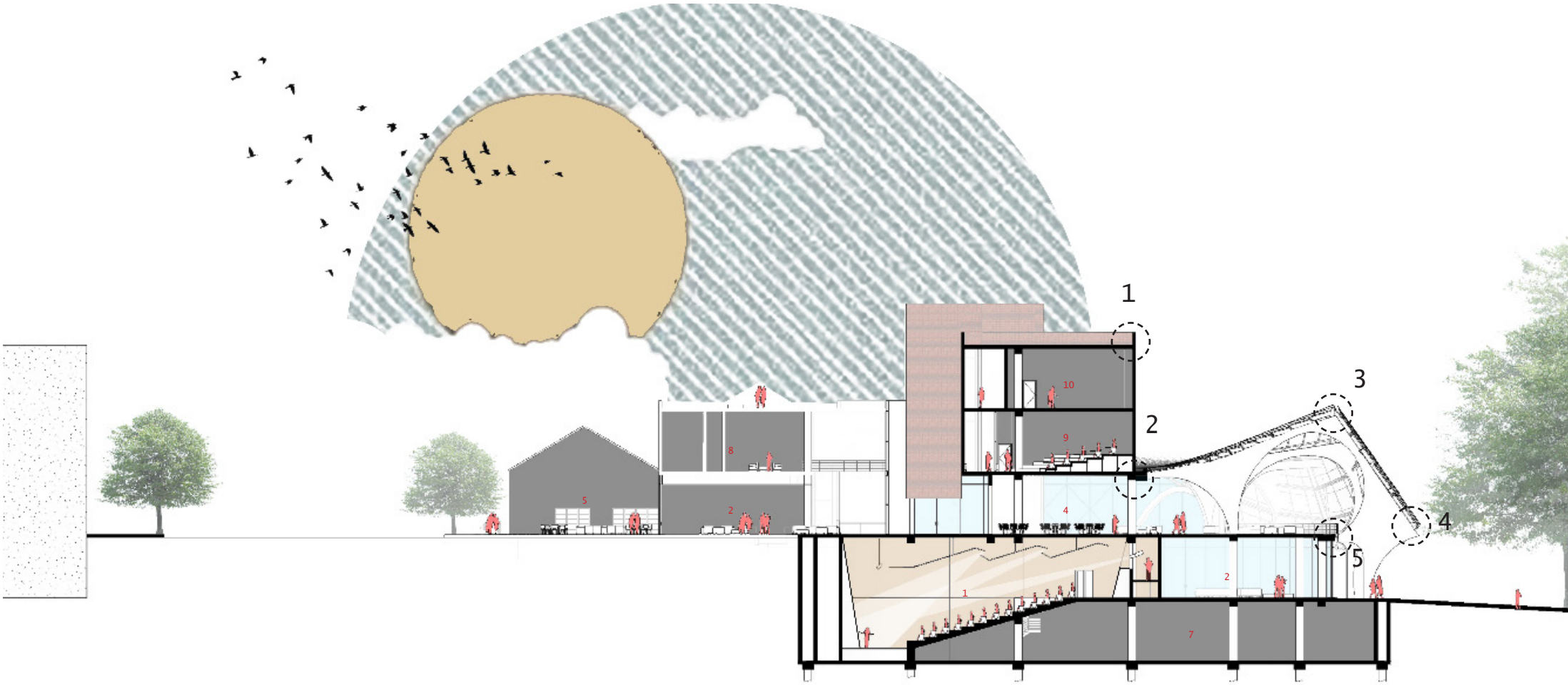
Ground Floor


1. Lecture Hall
2. Lobby
3. Music Studio
4. Ablution
5. Offices
6. Computer Lab
1st Floor

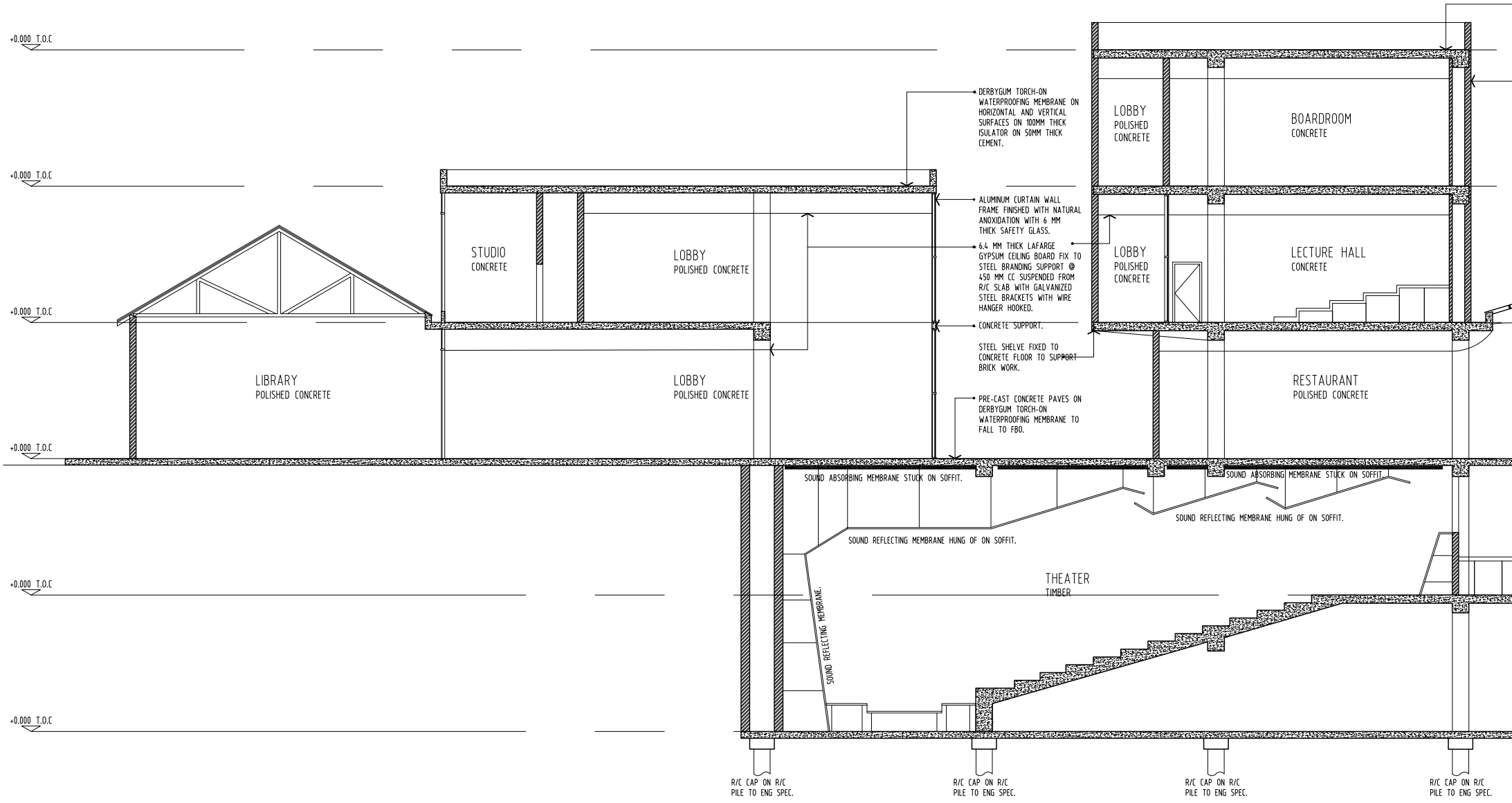
1. Boardroom
2. Lobby
3. Homework areas
4. Ablution

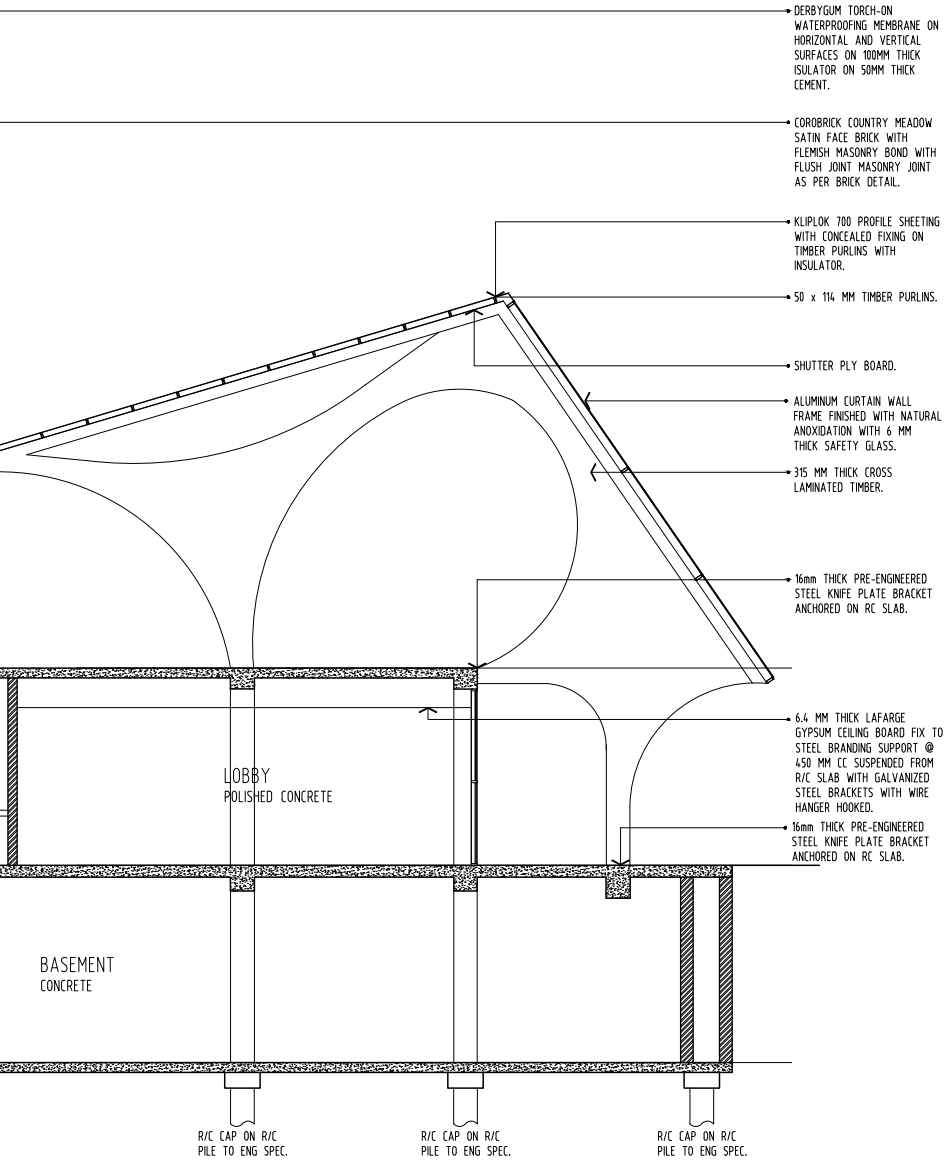


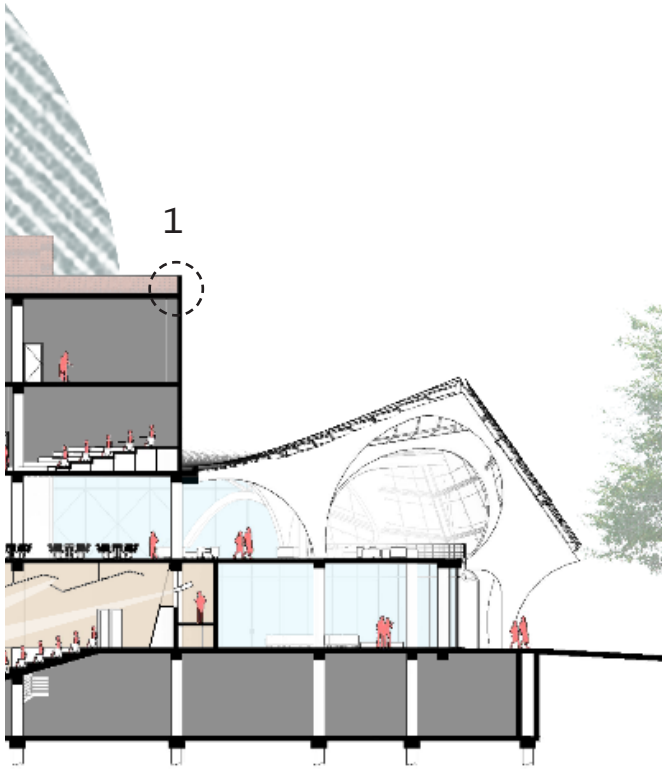
2nd Floor

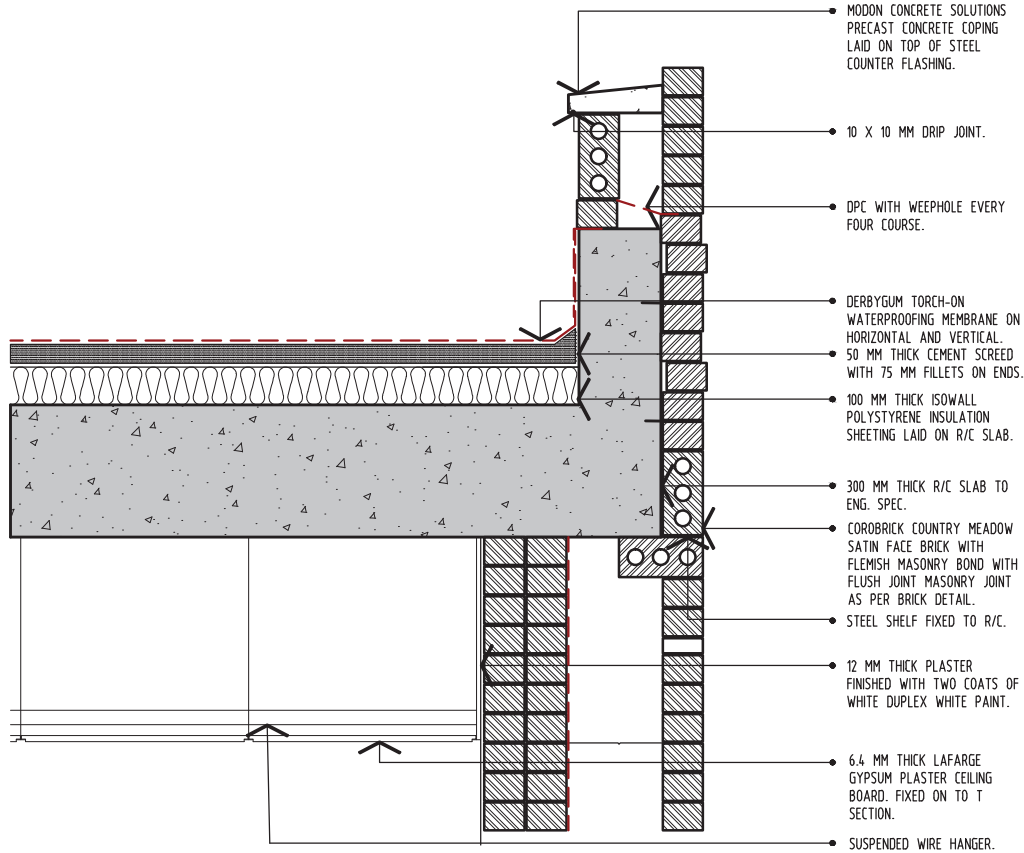

1
2
3
4
5
10
9
8
5
2
4
2
1
7

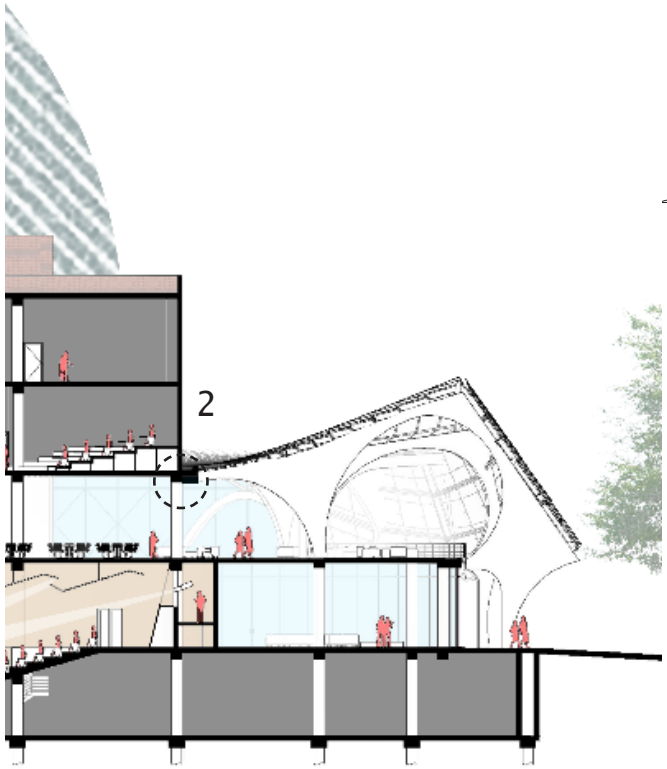


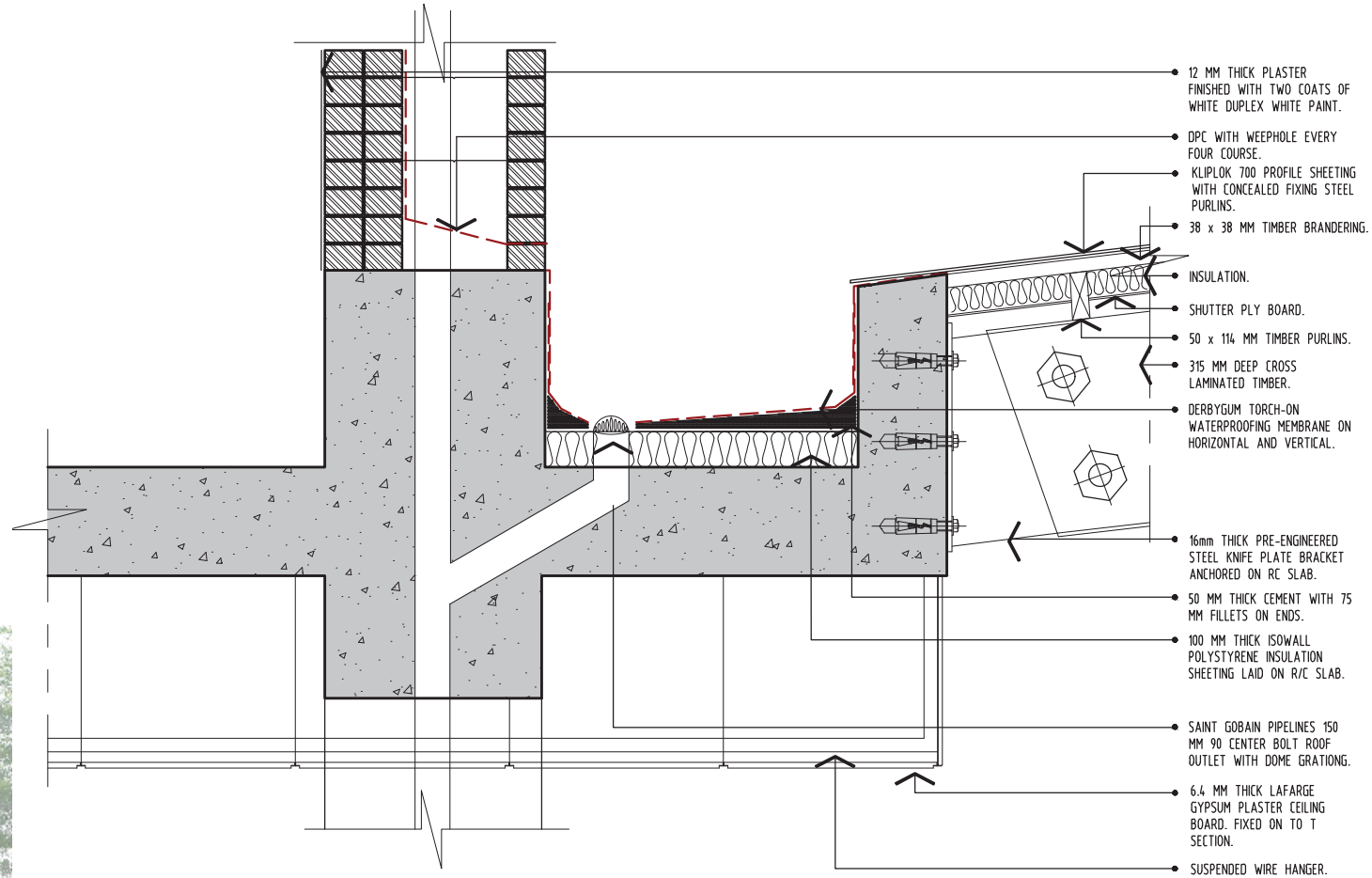

+0.000 T.O.C
+0.000 T.O.C
+0.000 T.O.C
+0.000 T.O.C
+0.000 T.O.C
+0.000 T.O.C
DERBYGUM TORCH-ON WATERPROOFING MEMBRANE ON HORIZONTAL AND VERTICAL SURFACES ON 100MM THICK ISULATOR ON 50MM THICK CEMENT.
ALUMINUM CURTAIN WALL FRAME FINISHED WITH NATURAL ANOXIDATION WITH 6 MM THICK SAFETY GLASS.
6.4 MM THICK LAFARGE GYPSUM CEILING BOARD FIX TO STEEL BRANDING SUPPORT @ 450 MM CC SUSPENDED FROM R/C SLAB WITH GALVANIZED STEEL BRACKETS WITH WIRE HANGER HOOKED.
CONCRETE SUPPORT.
STEEL SHELVE FIXED TO CONCRETE FLOOR TO SUPPORT BRICK WORK.
PRE-CAST CONCRETE PAVES ON DERBYGUM TORCH-ON WATERPROOFING MEMBRANE TO FALL TO FBO.
LIBRARY
POLISHED CONCRETE
STUDIO
CONCRETE
LOBBY
POLISHED CONCRETE
LOBBY
POLISHED CONCRETE
LOBBY
POLISHED CONCRETE
BOARDROOM
CONCRETE
LOBBY
POLISHED CONCRETE
LECTURE HALL
CONCRETE
RESTAURANT
POLISHED CONCRETE
SOUND ABSORBING MEMBRANE STUCK ON SOFFIT.
SOUND ABSORBING MEMBRANE STUCK ON SOFFIT.
SOUND REFLECTING MEMBRANE HUNG OF ON SOFFIT.
SOUND REFLECTING MEMBRANE HUNG OF ON SOFFIT.
THEATER
TIMBER
SOUND REFLECTING MEMBRANE.
R/C CAP ON R/C PILE TO ENG SPEC.
R/C CAP ON R/C PILE TO ENG SPEC.
R/C CAP ON R/C PILE TO ENG SPEC.
R/C CAP ON R/C PILE TO ENG SPEC.

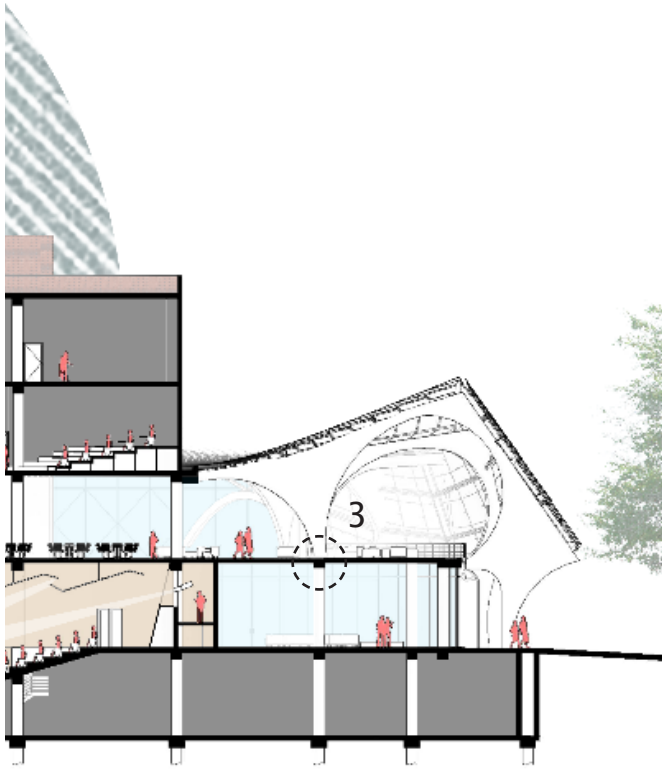

DERBYGUM TORCH-ON WATERPROOFING MEMBRANE ON HORIZONTAL AND VERTICAL SURFACES ON 100MM THICK ISULATOR ON 50MM THICK CEMENT.
COROBRICK COUNTRY MEADOW SATIN FACE BRICK WITH FLEMISH MASONRY BOND WITH FLUSH JOINT MASONRY JOINT AS PER BRICK DETAIL.
KLIPLOK 700 PROFILE SHEETING WITH CONCEALED FIXING ON TIMBER PURLINS WITH INSULATOR.
50 x 114 MM TIMBER PURLINS.
SHUTTER PLY BOARD.
ALUMINUM CURTAIN WALL FRAME FINISHED WITH NATURAL ANOXIDATION WITH 6 MM THICK SAFETY GLASS.
315 MM THICK CROSS LAMINATED TIMBER.
16mm THICK PRE-ENGINEERED STEEL KNIFE PLATE BRACKET ANCHORED ON RC SLAB.
6.4 MM THICK LAFARGE GYPSUM CEILING BOARD FIX TO STEEL BRANDING SUPPORT @ 450 MM CC SUSPENDED FROM R/C SLAB WITH GALVANIZED STEEL BRACKETS WITH WIRE HANGER HOOKED.
16mm THICK PRE-ENGINEERED STEEL KNIFE PLATE BRACKET ANCHORED ON RC SLAB.
LOBBY
POLISHED CONCRETE
BASEMENT
CONCRETE
R/C CAP ON R/C PILE TO ENG SPEC.
R/C CAP ON R/C PILE TO ENG SPEC.
R/C CAP ON R/C PILE TO ENG SPEC.

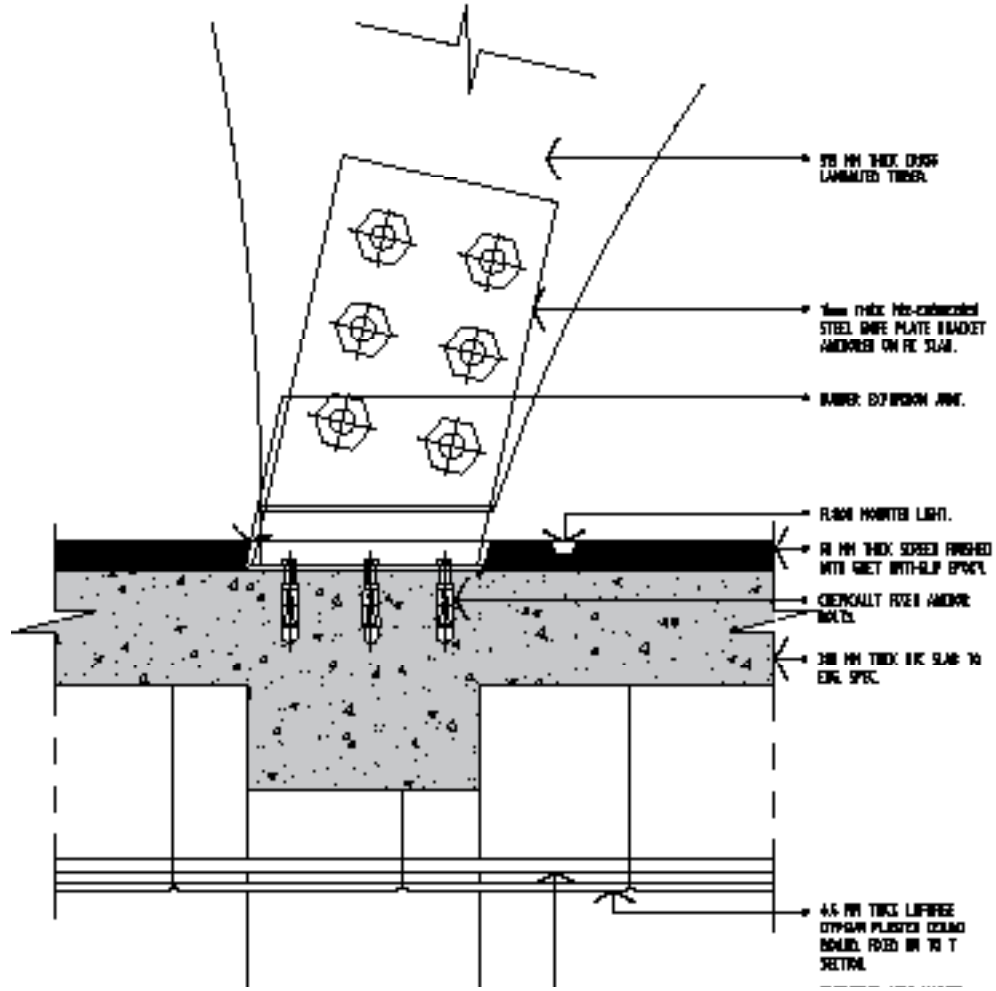

1

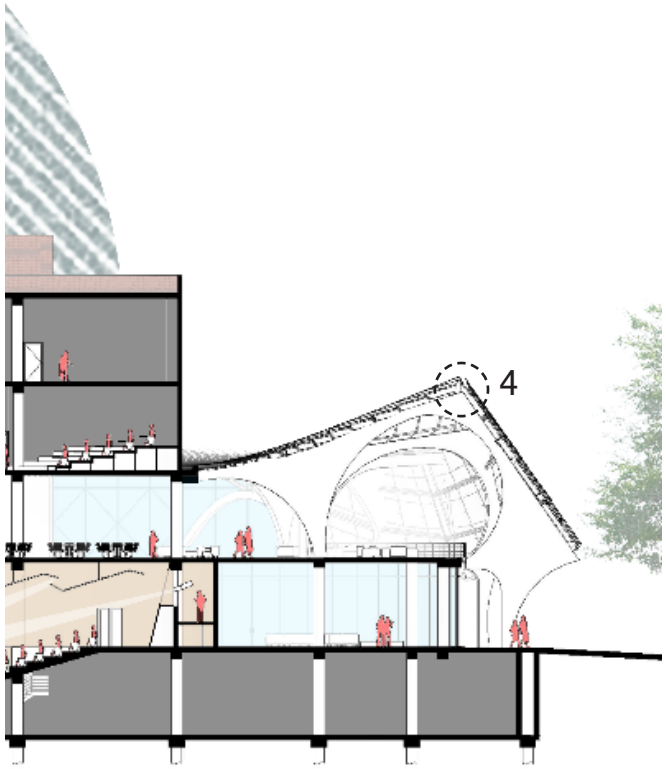

MODON CONCRETE SOLUTIONS PRECAST CONCRETE COPING LAID ON TOP OF STEEL COUNTER FLASHING.
10 X 10 MM DRIP JOINT.
DPC WITH WEEPHOLE EVERY FOUR COURSE.
DERBYGUM TORCH-ON WATERPROOFING MEMBRANE ON HORIZONTAL AND VERTICAL.
50 MM THICK CEMENT SCREED WITH 75 MM FILLETS ON ENDS.
100 MM THICK ISOWALL POLYSTYRENE INSULATION SHEETING LAID ON R/C SLAB.
300 MM THICK R/C SLAB TO ENG. SPEC.
COROBRICK COUNTRY MEADOW SATIN FACE BRICK WITH FLEMISH MASONRY BOND WITH FLUSH JOINT MASONRY JOINT AS PER BRICK DETAIL.
STEEL SHELF FIXED TO R/C.
12 MM THICK PLASTER FINISHED WITH TWO COATS OF WHITE DUPLEX WHITE PAINT.
6.4 MM THICK LAFARGE GYPSUM PLASTER CEILING BOARD. FIXED ON TO T SECTION.
SUSPENDED WIRE HANGER.

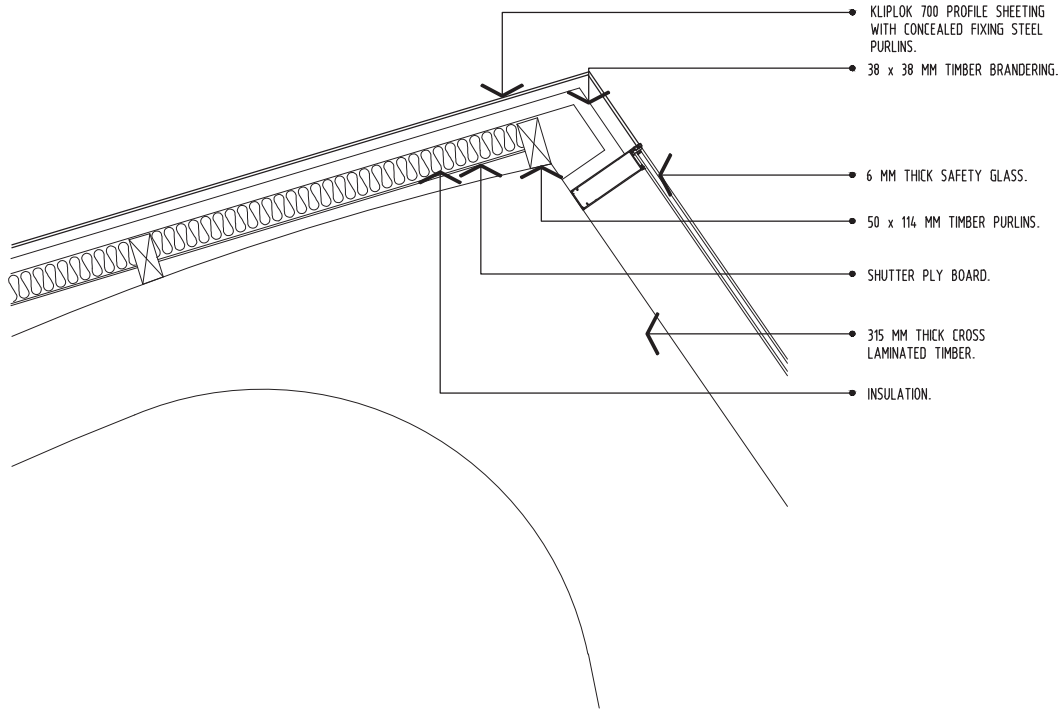

2

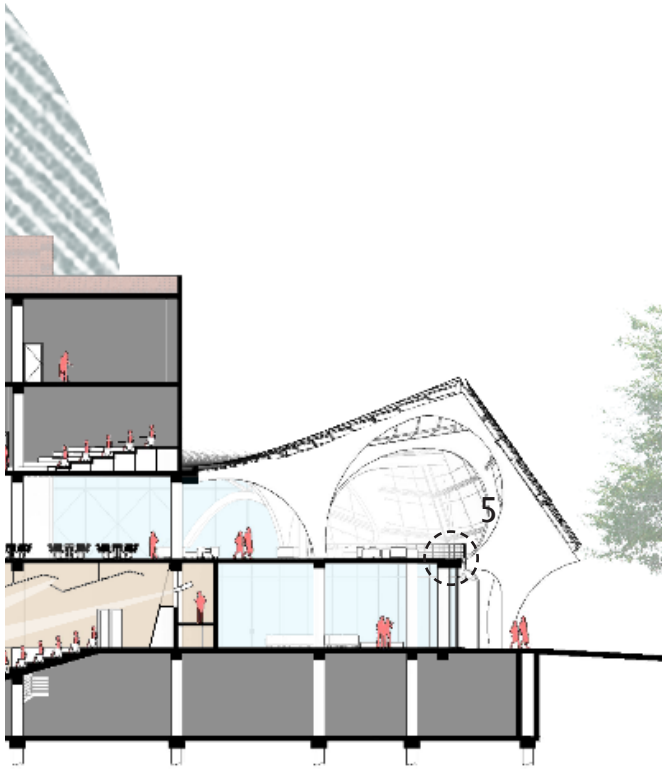

12 MM THICK PLASTER FINISHED WITH TWO COATS OF WHITE DUPLEX WHITE PAINT.
DPC WITH WEEPHOLE EVERY FOUR COURSE.
KLIPLOK 700 PROFILE SHEETING WITH CONCEALED FIXING STEEL PURLINS.
38 x 38 MM TIMBER BRANDERING.
INSULATION.
SHUTTER PLY BOARD.
50 x 114 MM TIMBER PURLINS.
315 MM DEEP CROSS LAMINATED TIMBER.
DERBYGUM TORCH-ON WATERPROOFING MEMBRANE ON HORIZONTAL AND VERTICAL.
16mm THICK PRE-ENGINEERED STEEL KNIFE PLATE BRACKET ANCHORED ON RC SLAB.
50 MM THICK CEMENT WITH 75 MM FILLETS ON ENDS.
100 MM THICK ISOWALL POLYSTYRENE INSULATION SHEETING LAID ON R/C SLAB.
SAINT GOBAIN PIPELINES 150 MM 90 CENTER BOLT ROOF OUTLET WITH DOME GRATIONG.
6.4 MM THICK LAFARGE GYPSUM PLASTER CEILING BOARD. FIXED ON TO T SECTION.
SUSPENDED WIRE HANGER.

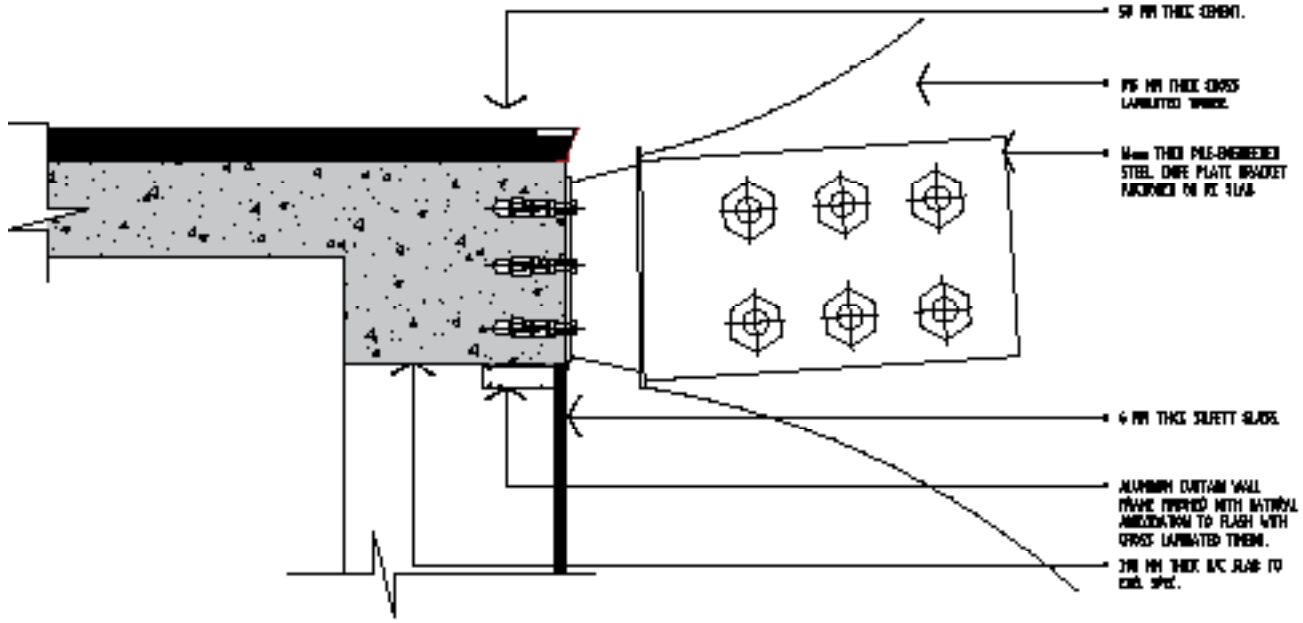

3

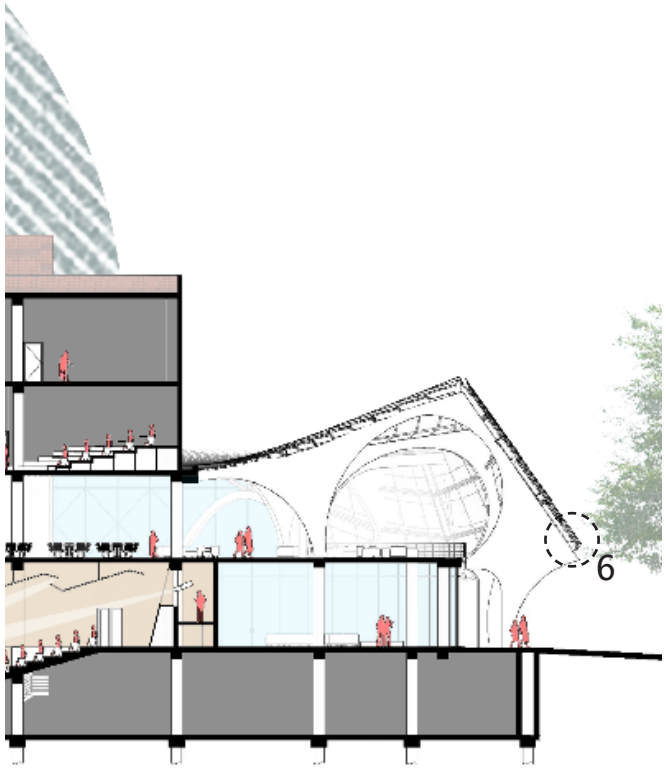

STEEL BASE PLATE BRACKET
FLUSH MOUNTED LIGHT.

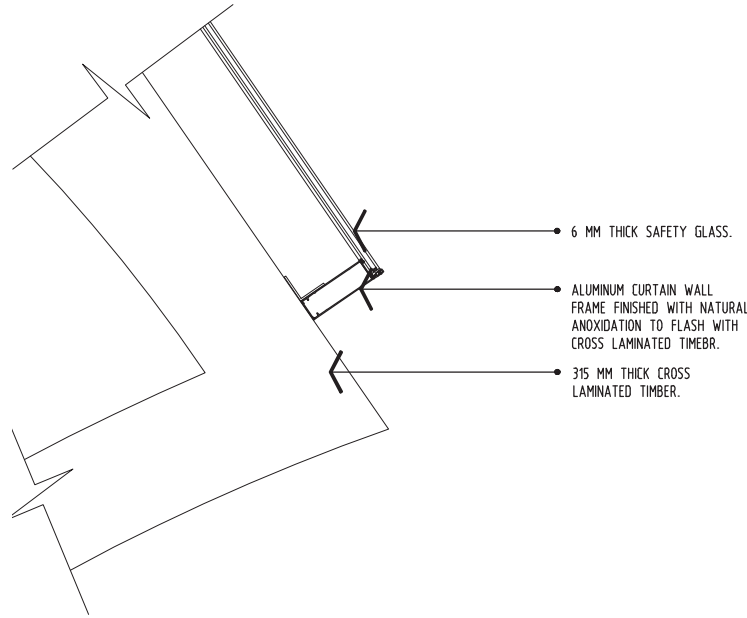

4

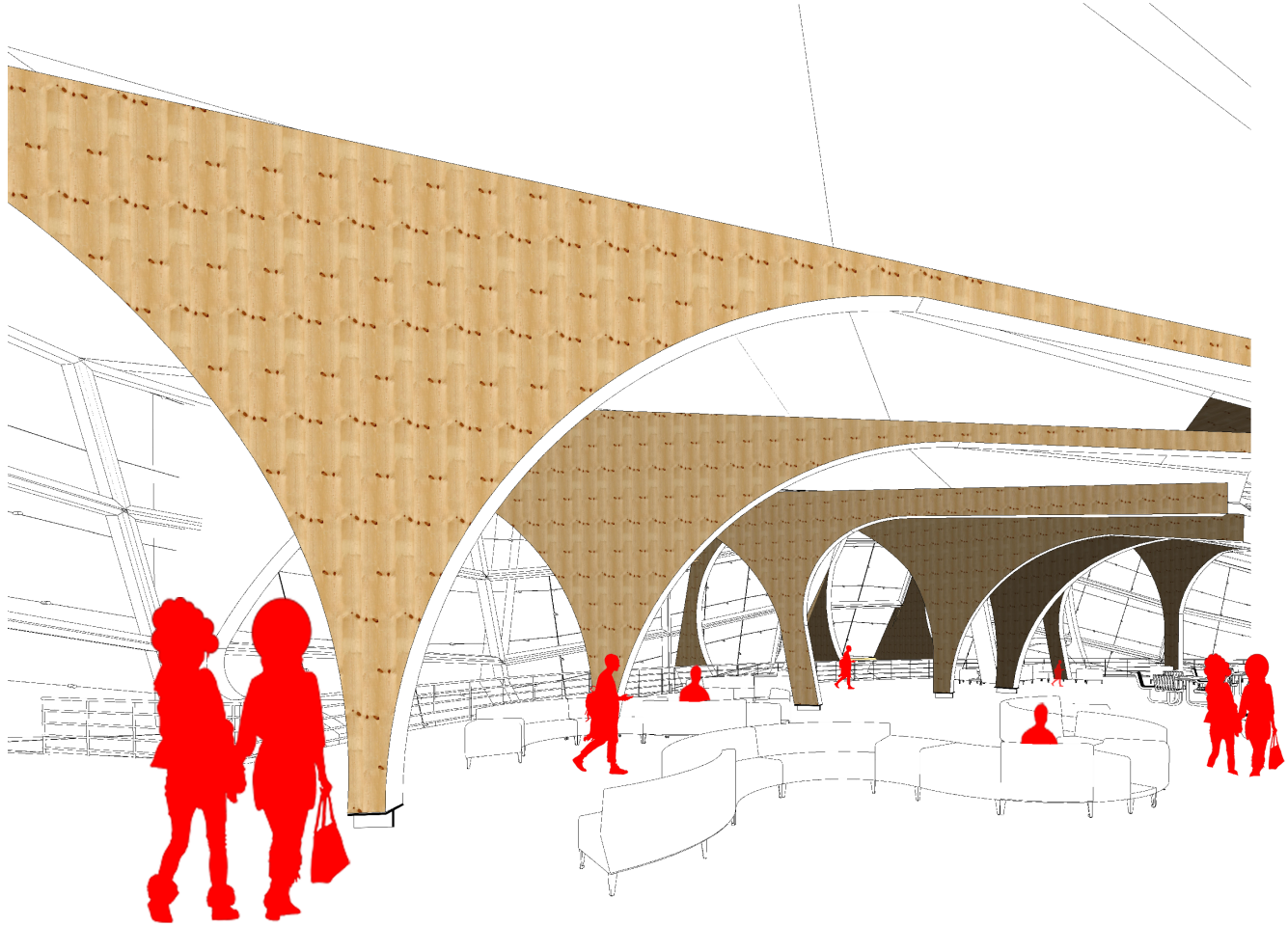

KLIPLOK 700 PROFILE SHEETING WITH CONCEALED FIXING STEEL PURLINS.
38 x 38 MM TIMBER BRANDERING.
6 MM THICK SAFETY GLASS.
50 x 114 MM TIMBER PURLINS.
SHUTTER PLY BOARD.
315 MM THICK CROSS LAMINATED TIMBER.
INSULATION.

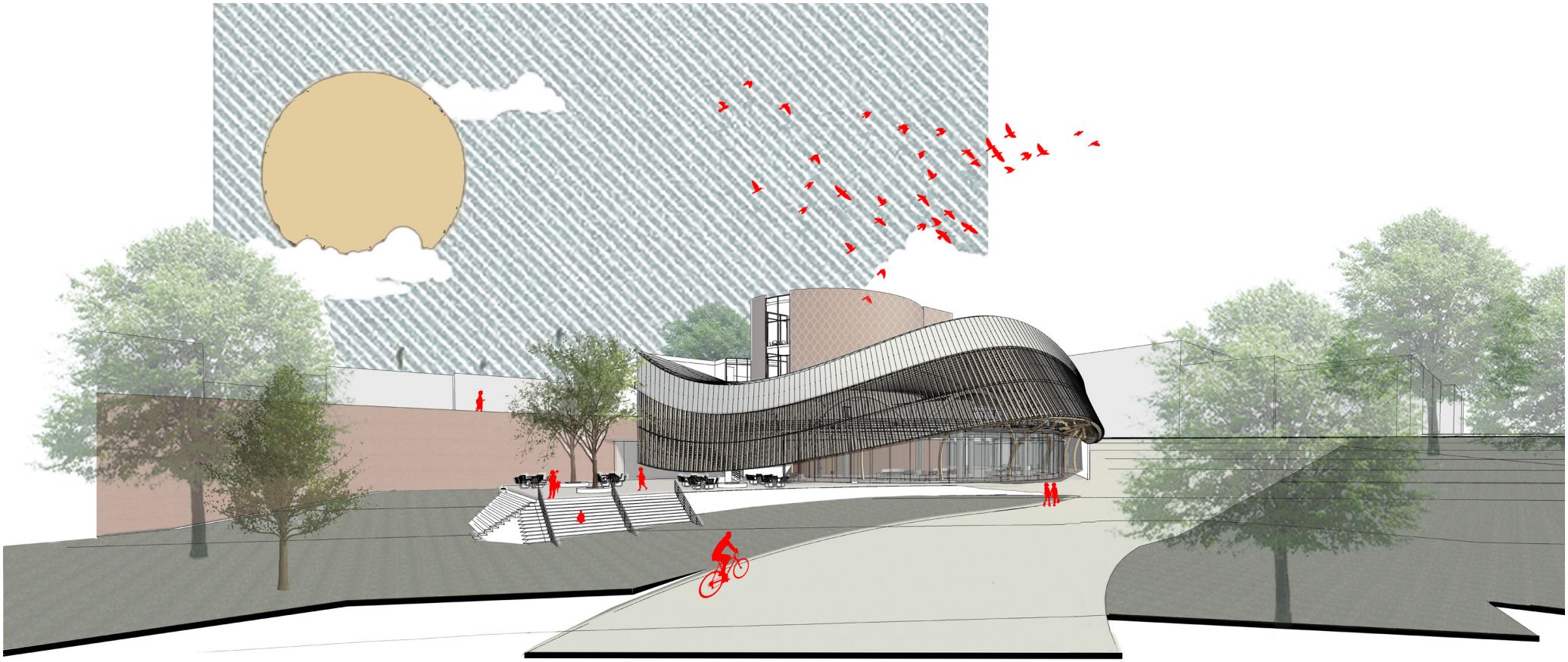

5

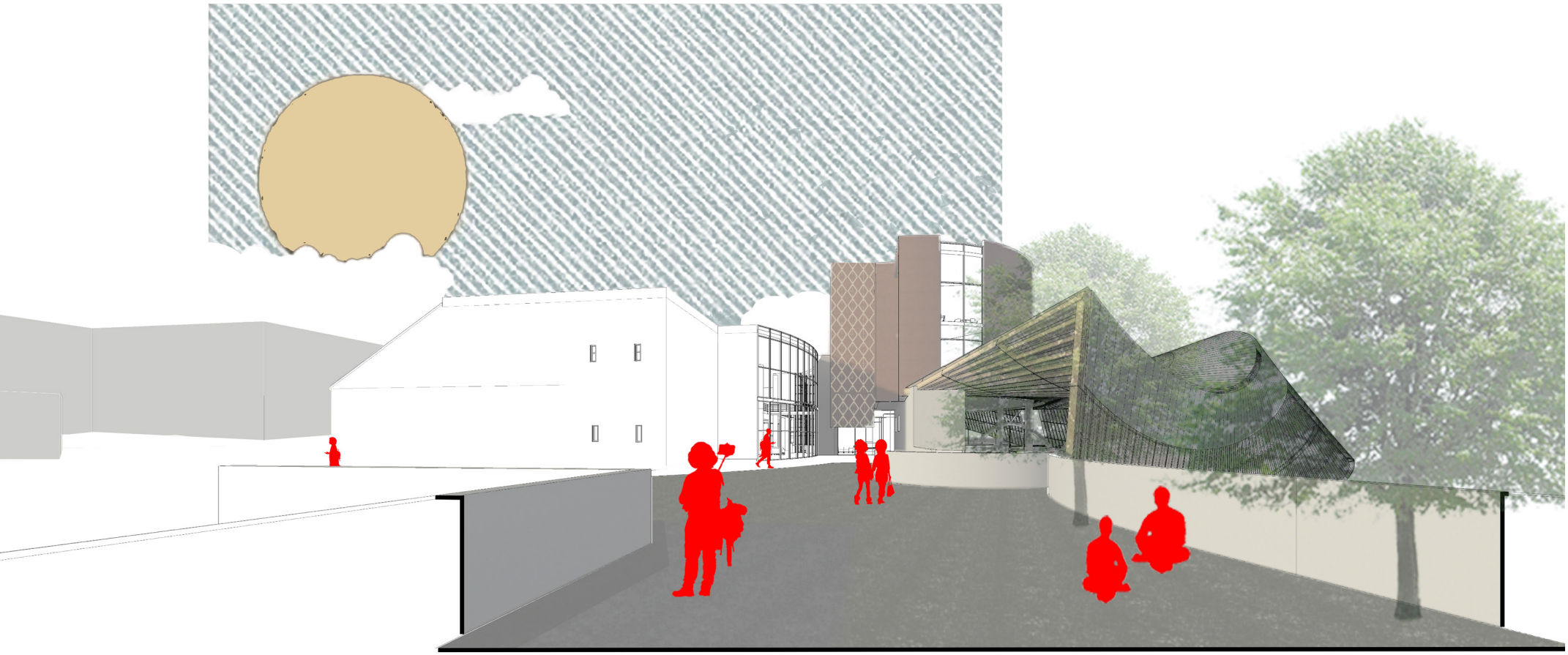

50 MM THICK CEMENT.
6 MM THICK SAFETY GLASS.

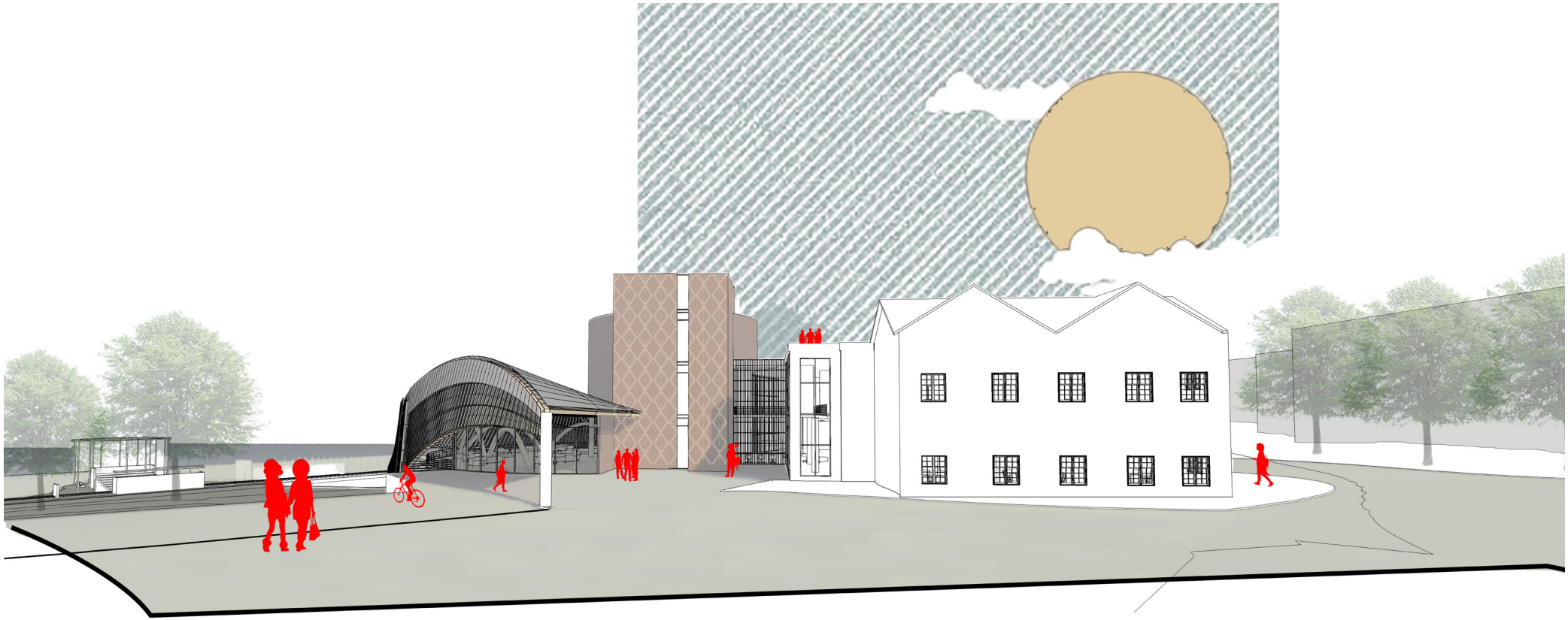

6

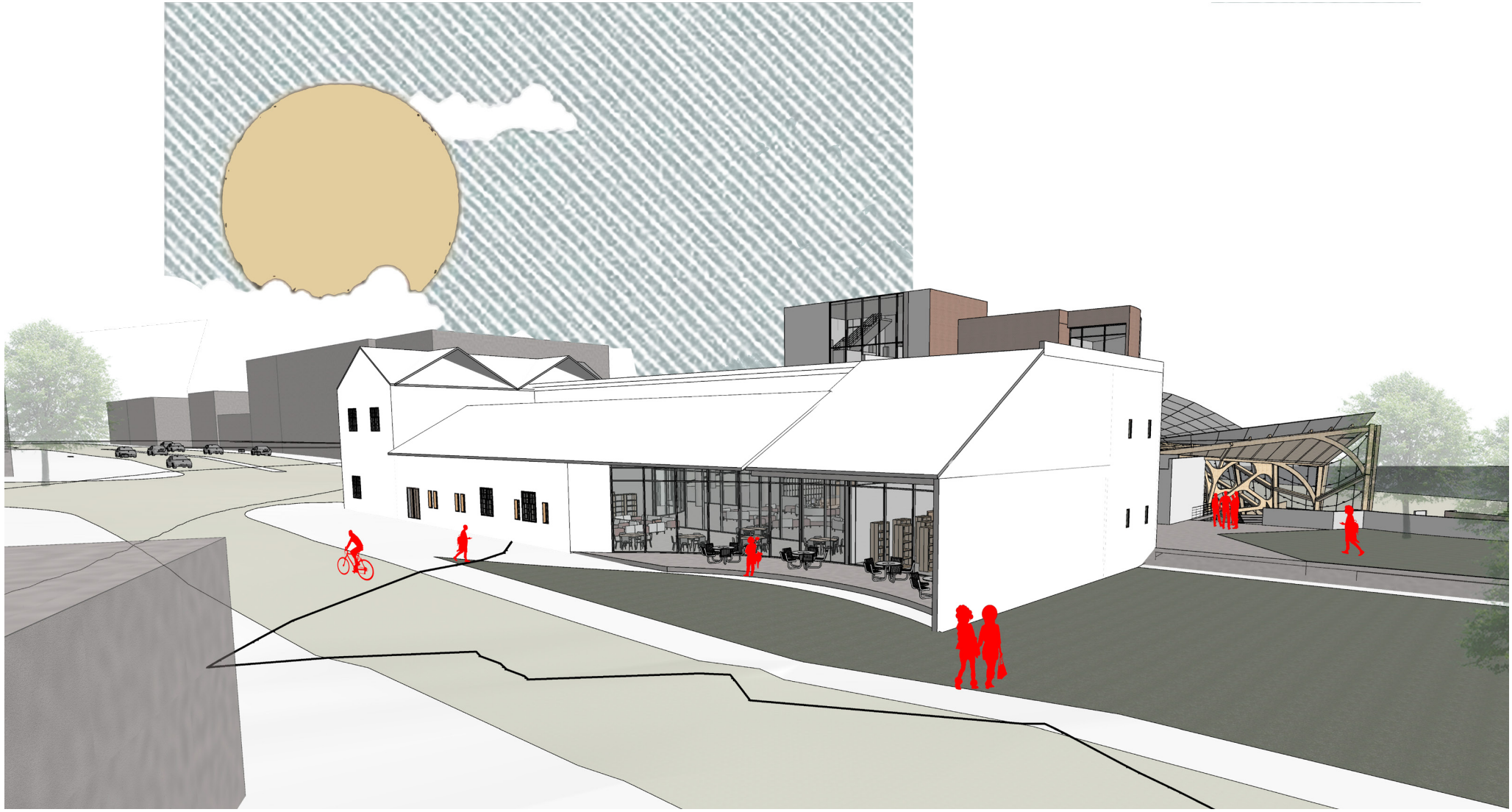

6 MM THICK SAFETY GLASS.
ALUMINUM CURTAIN WALL FRAME FINISHED WITH NATURAL ANOXIDATION TO FLASH WITH CROSS LAMINATED TIMEBR.
315 MM THICK CROSS LAMINATED TIMBER.

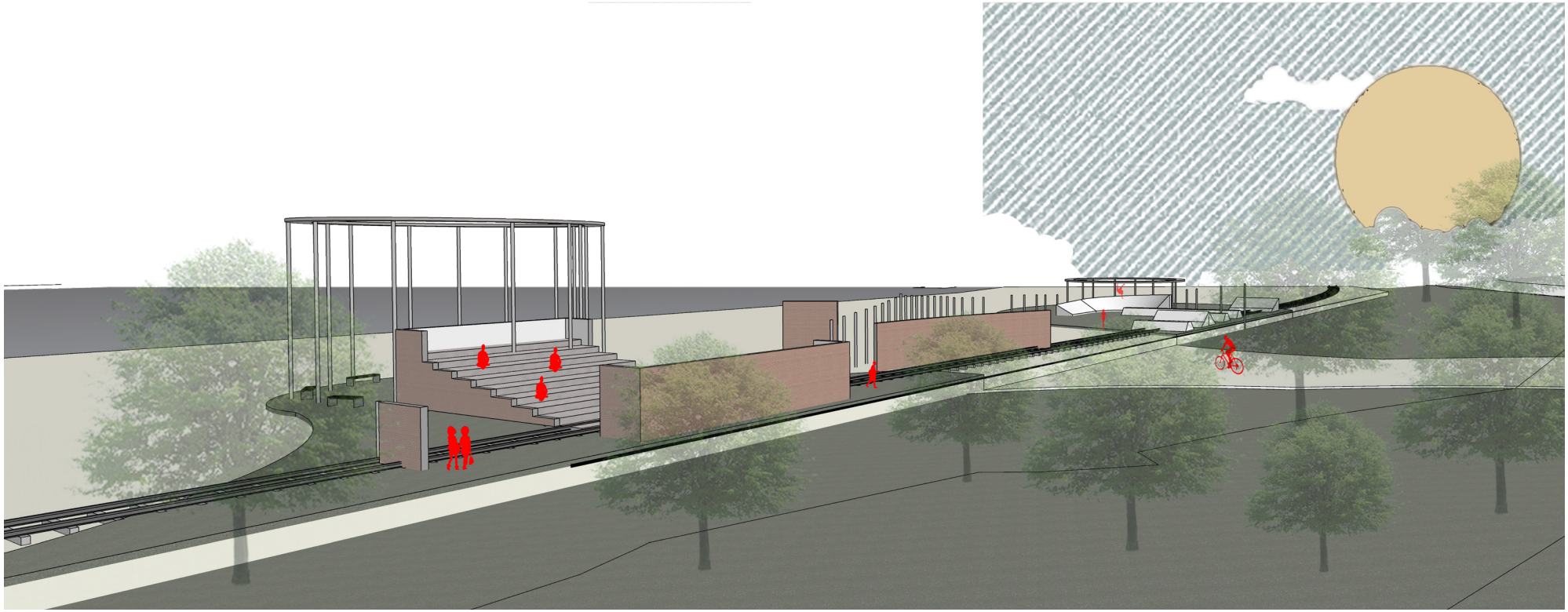












end...

REFERENCE

-BOOKS-

Smith, P F. (1987), Architecture and the principles of harmony. London: RIBA Publications Limited

Murry, P (1963), The Architecture of the Renaissance. New York: Schicken Books

Wolddlin, H. (1961), Renaissance and Barque. (1964) Verlag: Benno Schwabe & Co.

Cook, P. (1970), Experimental Architecture. Great Britain: Studio Vista London. 11-68, 133-154

Pallasmaa, J. (1996), Polemics: The eyes of the Skin Architecture and the Senses. Great Britain: Academy editions

Holl, S. (2000) Parallax. America: Princeton Architecture Press

Holl, S. (2017), The Architectonic of Music. Columbia University's Graduate School of Architecture, Planning and Preservation

Aucoturier, J.J and Pachet. (2004), Tools and Architecture for Evaluation of Similarity Measure: Case Study of timbre similarity. University Pompeu Fabra

Cage, J. (1993), Composition in Retrospect. Cambridge, Massachusetts: Exact Change

Leitne, B. (1998), PULSE: Space and Time. Vienne University of Applies Arts

Novak, M. (2007), The Music of Architecture: Computation and Composition

Ham, JJ. (2005), Music and architecture: from digital composition to physical artefact

Martin, E. (1994), Pamphlet Architecture 16: Architecture as a translation of music

Peters,D, Miller,R. (1982), Music Teaching and Learning.

Bernheimer, R. (1956), Theatrum Mundi. The Art Bulletin, 38(4), 225-247.

Christensen, E. (1996), The Musical Timespace: A Theory of Music Listening

Cusick, Suzanne G. (2013), “Towards an Acoustemology of Detention in the GlobalWar on Terror.In Music, Sound and Space: Transformations of Public and Private Experience

Schafer, R (1977), The Soundscape: Our Sonic Environment & the Tuning of the World

Hockly, H. E. (1948) The Story of the British Settlers of 1820 in South Africa

Bond J. (1956): They were South Africans. London: Oxford University Press. Chapter 19, The Makers of Railways: John Molteno

Charnas, D. (2010) “The Big Payback: The History of The Business of Hip Hop.” America: Penguin Group

BERANEK, L. (1962). Music, Acoustics & Architecture. New York: John Wiley & Sons, Inc

Pallasmaa, J. (1996). Polemics: The Eyes of the Skin. London: Academy Group Ltd.

Howard D & Angius J. (2006) Acoustic and Psychoacoustics. London: Elsevier.
Kipnis, J. (1993). Towards a New Architecture in: Architectural Design, Vol. 63, No. 3-4, (March – April 1993): pg 41 - 49

Loos, A (1898). Spoken into the void: Collected Essays: The Principle of Cladding. Cambridge: Mass pg 66-69 Pallasmaa, J. (1996). Polemics: The Eyes of the Skin. London: Academy Group Ltd.

Howard D & Angius J. (2006) Acoustic and Psychoacoustics. London: Elsevier.
Kipnis, J. (1993). Towards a New Architecture in: Architectural Design, Vol. 63, No. 3-4, (March – April 1993): pg 41 - 49

Loos, A (1898). Spoken into the void: Collected Essays: The Principle of Cladding. Cambridge: Mass pg 66-69.

-ELECTRONIC-

BUFFLO CITY INTERGRATED DEVELOPMENT PLAN. (2017/8). Electronic Document: Buffalo Spatial Development Framework Update. 22 July 2017, East London: BCCM

-FLIM-

Hip-Hop Evolution (2016). Directed by Wheeler D & Bascunan R [Flim]. Netflix.)

-NEWSPAPER/ ONLINE ARTICLE-

Levitt, J. (2018). 'Sjava wins BET Award and his acceptance speech was epic', Sowetan, Johannesburg, 25 June. Available at: https://www.sowetanlive.co.za/pic-of-the-day/2018-06-25-watch-sjava-wins-bet-award-and-his-acceptance-speech-was-epic/ (Accessed: 25 June 2018).

Doke, L. (2006) "Campus will help city retain skills". Sunday Times, 29 August 2006. Available at: http://www.sundaytimes.co.za/articles/article-specialreport.

Cilento, K (2009) "The New York High Line officially open" Archdaily, 9 Jun 2009. Available at: <https://www.archdaily.com/24362/the-new-york-high-line-officially-open.

-MUSIC RECORDING-

Hadebe, J (2016) "Before

-LIST OF FIGURES-

Fig 01: Philips pavilion at the 1958 AD Classics expo by Le Corbusier and Iannis Xenakis (www.archdaily.com/157658/ad-classics-expo-58-philips-pavilion-le-corbusier-and-iannis-xenakis)

Fig 02: Last Judgment, drawing Vienna, Albertina Museum by H.Tom Ring from Bernheimer, R. (1956), Theatrum Mundi. The Art Bulletin, 38(4), 225-247.

Fig 03: The San Carlo alle Quattro Fontane by Borromini(www.teggelaar.com/en/rome-day-4-continuation-2/)

Fig 04: Steven Holl's sketch of the tesseract fragment in relation to the Jessica Lang choreography (Holl, S. (2017), The Architectonic of Music. Columbia University's Graduate School of Architecture, Planning and Preservation)

Fig 05: Jessica Lang Dance "Tesseract of Time" Demonstrating the four sections of Architecture in relation to the ground - Under, In, On and Over. (Holl, S. (2017), The Architectonic of Music. Columbia University's Graduate School of Architecture, Planning and Preservation)

Fig 06: Steven Holl's watercolor painting of house Stretto (Martin, E. (1994), Pamphlet Architecture 16: Architecture as a translation of music pg 10-27,50-72)

Fig 07: Top-Musical notation by Bartok's Percussion and Celestra. Bottom-Steven Holl's timber model of house Stretto. (Martin, E. (1994), Pamphlet Architecture 16: Architecture as a translation of music pg 10-27,50-72)

Fig 09: Zeug images of Architecture as a Freeway (Martin, E. (1994), Pamphlet Architecture 16: Architecture as a translation of music pg 10-27,50-72)

Fig 10: Chaladni figures demonstrating dynamic sound vibrations by employing a violin bow on a plate with sand on(www.monoskop.org/Ernst_Chladni)
Fig 11: Three Images Opera House in Port Elizabeth with new addition and renovation by The Matrix... Urban designers and Architects (www.thematrixcc.co.za)

Fig 12: Sjava at BET Awards wearing Zulu traditional attire.(www.sowetanlive.co.za/pic-of-the-day/2018-06-25-watch-sjava-wins-bet-award-and-his-acceptance-speech-was-epic/ (Accessed: 25 June 2018)).

Fig 13: Diagram of Piano keys translated into qwerty keyboard on FL Studio by T.Mtshabe.

Fig 14: Diagram of Piano keys and the qwerty keyboard. The button 'z' to 'm' are the white keys 'z' being middle c and 'm' being middle b. And the buttons 'a' to 'j' are the black keys. Translated into qwerty keyboard on FL Studio by T.Mtshabe.

Fig 15: FL Studio musical notation of the Bass guitar, Kick drum, Organ, Hi hat, Snare drum, Guitar by T.Mtshabe.

Fig 16: The development process of the Y-Condition methodology where Elizabeth Martin asigns figures to note and arranges the figures according to the computerized musical notation. (Martin, E. (1994), Pamphlet Architecture 16: Architecture as a translation of music pg 10-27,50-72)

Fig 17: Axo diagram of the Y-Condition methodology (Martin, E. (1994), Pamphlet Architecture 16: Architecture as a translation of music pg 10-27,50-72)

Fig 18: Sound sketches drawn by Wits Honors students of 2019 while music was playing in the background.

Fig 19: Objects found around the house linked with instrumental from the song Before by Sjava recreated by T.Mtshabe on FL Studio.

Fig 20: FL Studio sound bit of the song Before by Sjava recreated by T.Mtshabe with yellow stripes highlighting repetition, tone, rhythm and proportion.

Fig 21: Sound models created by T.Mtshabe that represent repetition in the song Before by Sjava.

Fig 22: Sound models created by T.Mtshabe that represent tone in the song Before by Sjava.

Fig 23: Sound models created by T.Mtshabe that represent rhythm in the song Before by Sjava.

Fig 24: Sound models created by T.Mtshabe that represent proportion in the song Before by Sjava.

Fig 25: Final sound model overlaid by lines and dots that highlight movement and moments within the model by T.Mtshabe

Fig 26: Development sketch of the three dynamic levels of creation: 1. the process- the means of inventing, 2. realising product- the outcome of these processes, 3. experience- the human interaction with the outcome by T.Mtshabe

Fig 27: Different wavelengths with appropriate frequency rate (www. docstore.mik.ua/orelly/web2/audio/)

Fig 28: 1. Diagram showing microtemporal dimension in relation to macrotemporal dimension.
2. Path of direct sound and reflected sound waves in a concert hall. Reverberation is a collection of all thereflected sounds in an auditorum.

Fig 29: Notre Dame in Paris image by Samuel-J.-Juett (2018)(www.loeildelaphotographie.com/en/notre-dame-de-paris-interior)

Fig 30: Main entrance of the Casa da Musica (OMA 2005: 99 -104)

Fig 31: 1. Section of the Casa da Musica. 2. First floor plan 700 seater theater. 3. Image highlighting the retail ground floor and the geometric mass (OMA 2005: 99 -104)

Fig 32: 1. Cross laminated internal structure of the Parco della musica and steel trusses fixed to the building. 2. Images showing the relationship of old and new. (www.rpbw.com/project/parco-della-musica-auditorium)

Fig 33: 1. Section of the Parco della musica auditorium. 2. Ground floor plan 2 800 seater

theater. 3. Highlight the vertical pattern of the sound boxes. (www.rpbw.com/project/parco-della-musica-auditorium)

Fig 34: Main circulation (www.architecturalrecord.com/articles/13054-lewis-arts-complex-at-princeton-university-by-steven-holl-architects)

Fig 35: 1. Section of the Lewis art complex. 2. Ground floor plan. 3. The view of the Lewis art complex from the pond highlighting openings and geometric mass. (www.architecturalrecord.com/articles/13054-lewis-arts-complex-at-princeton-university-by-steven-holl-architects)

Fig 36: Google earth image of Southern Africa highlighting the eastern cape the the buffalo city metropolitan municipality (https://www.google.com/maps/search/google+east+london/@-32.5750485,26.5301863,8z/data=!3m1!4b1).

Fig 37: Census demographic chart for the Buffalo City Metropolitan Municipality. (Buffalo City Intergrated Development Plan. (2017/8). Electronic Document: Buffalo Spatial Development Framework Update. 22 July 2017, East London: BCMM).

Fig 38: Census demographic chart for the Buffalo City Metropolitan Municipality. (Buffalo City Intergrated Development Plan. (2017/8). Electronic Document: Buffalo Spatial Development Framework Update. 22 July 2017, East London: BCMM).

Fig 39: Buffalo City Metropolitan Municipality Spatial Priority Areas map showing priority maps zones and Routes connecting areas from the Buffalo Buffalo City Metropolitan Municipality Spatial development plan recreated by T.Mtshabe. (Buffalo City Intergrated Development Plan. (2017/8). Electronic Document: Buffalo Spatial Development Framework Update. 22 July 2017, East London: BCMM).

Fig 40: Diagram of the city of East London structural interpretation by T.Mtshabe.

Fig 41: Google map showcasing priority 1 in yellow and the Meld Corridor from the Buffalo Buffalo City Metropolitan Municipality Spatial development plan recreated by T.Mtshabe.

Fig 42: East London with the different zoned precincts part of the Buffalo City Municipality from the Buffalo Buffalo City Metropolitan Municipality Spatial development plan recreated by T.Mtshabe Buffalo City Intergrated Development Plan. (2017/8). Electronic Document: Buffalo Spatial Development Framework Update. 22 July 2017, East London: BCMM).

Fig 43: Images the +20 meters with streets of East London taxi rank and a Church Street.

Fig 44: Typical street section of East London CBD and University Precinct.

Fig 45: East London maps showing movement structure by T.Mtshabe.

Fig 46: East London maps showing Commercial, Retail and Transport hub by T.Mtshabe.

Fig 47: East London maps showing Civic Buildings and Educational Buildings by T.Mtshabe.

Fig 48: East London maps showing Green structure by T.Mtshabe.

Fig 49: Image highlighting the green terrain separating the university precinct with the East London harbour by T.Mtshabe

Fig 50: Section of Strandpark in Hornsberg (www.nyrens.se/projekt/hornsbergs-strandpark)

Fig 51: Threshold of East London harbour and university precinct with suggested sitting on green terrain looking out onto the harbour by T.Mtshabe.

Fig 52: 1. Circular space that hosts different events 2 & 3. Image of timber deck floating on water showcases the unique relationship of the park and the water 4. Drainage that showcase the rich material combination (www.nyrens.se/projekt/hornsbergs-strandpark)

Fig 53: Image highlighting the non-functional railway tracks on the East London harbour.

Fig 54: 1. Park furniture on the High-line. 2. Plant infused with old railway tracks. 3. High-line Relationship with the city. 4. Section Of the High-line park.(Cilento, K (2009) “The New York High Line officially open” Archdaily, 9 Jun 2009. Available at: <https://www.archdaily.com/24362/the-new-york-high-line-officially-open.)

Fig 55: Sketch of the development of East London harbour in 1986 by T.Mtshabe.

Fig 56: Images of the Development of the East London Harbour from the early 1800 - 1990s from the East London Museum.

Fig 57: East London maps showing industrial buildings around the harbour by T.Mtshabe

Fig 58: Different functions of the East London harbor part of the Trasnet Future Harbour Development plan.

Fig 59: Image highlighting the site, portion of the green terrain that will be developed and the non functional tracks by T.Mtshabe.

Fig 60: Map of the University precinct highlighting building that the University of Fort Hare has bought and the proposed MELD corridor by T.Mtshabe.

Fig 61: Map showing Fort Hare University building and images highlighting the lack of street interact from buidling and can be addressed by adding trees, street furniture and Wifi Hot stops. Map and images taken and drawn by T.Mtshabe.

Fig 62: New proposal of Church street with trees and street furniture by T.Mtshabe.

Fig 63: Pedestrians freely streets will middle island with trees and street by T.Mtshabe.

Fig 64: Restaurants outside admin buildings for students, lectures and the general public to enjoy by T.Mtshabe

Fig 65: Street furniture outside student residencies to bring students out and promote outdoor gathering by T.Mtshabe.

Fig 66: Highlighting the selected site by T.Mtshabe

Fig 67: 1. Old seaman's building from Church street. 2. Audio centre extension designed by Ngonyama architecture and associates. 3. Ground and first floor plan of the Audio centre drawn and taken by T.Mtshabe.

Fig 68: Structure of how the New Music Research Center will be ran and what if will offer the general public by T.Mtshabe

Fig 69: Structure of the program of the New Music Research Center by T.Mtshabe

Fig 70 :Sketches of the idea of metabolism in architecture which are demonstrated by the different geometric forms that make a harmonious building. By T.Mtshabe

Fig 71 : Sketch of authors grandmothers homestead in Ncora, Eastern Cape by T.Mtshabe

Fig 72 : Sketch of how the roof of a Traditional xhosa hut could be reinterpreted into a multi story building.

Fig 73: Main four themes and materials that will be used in the building by T.Mtshabe

Fig 74: Development process from the proportion conceptual model to rough axo of the building by T.Mtshabe

Fig 75: Development process from the rhythm conceptual model to rough floor plan of the building by T.Mtshabe

Fig 76: Development process from the repetition conceptual model to rough section of the building by T.Mtshabe

Fig 77:Development process from the repetition conceptual model to rough section of the building by T.Mtshabe

Fig 78: Sketches of details of 1:25 details to be explored.

Fig 79: Axiomatic of the roof structure supported by cross laminated timber.

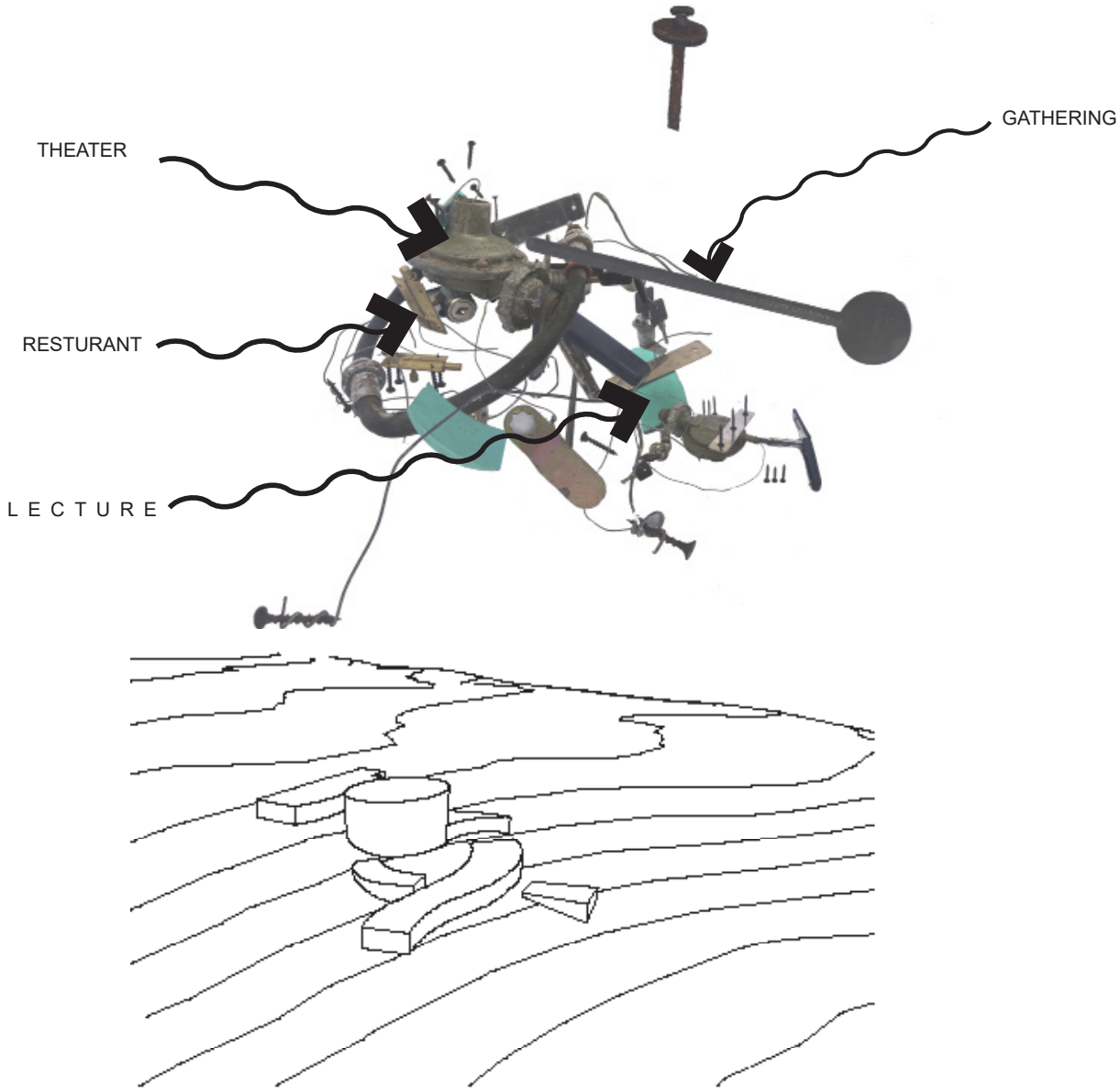
Fig 80: Diagram demonstration Vertical circulation and Fire escape routes.

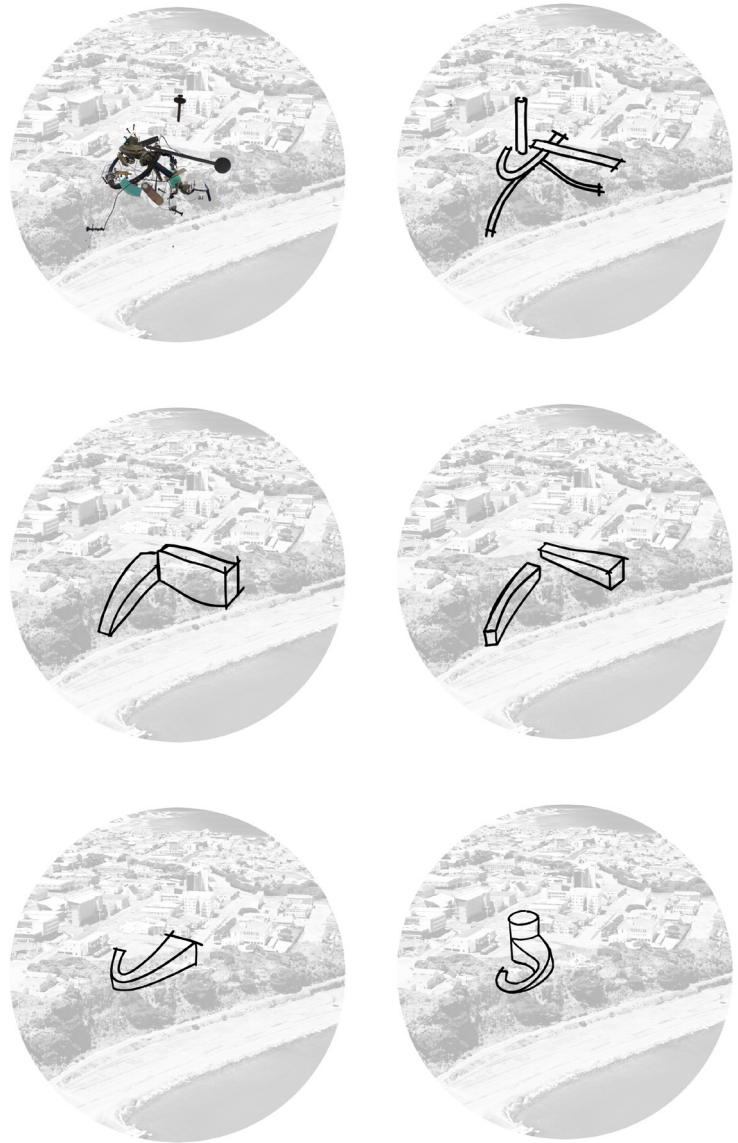
Fig 81: Diagram demonstration Vehicular and Pedestrian movement within the building.

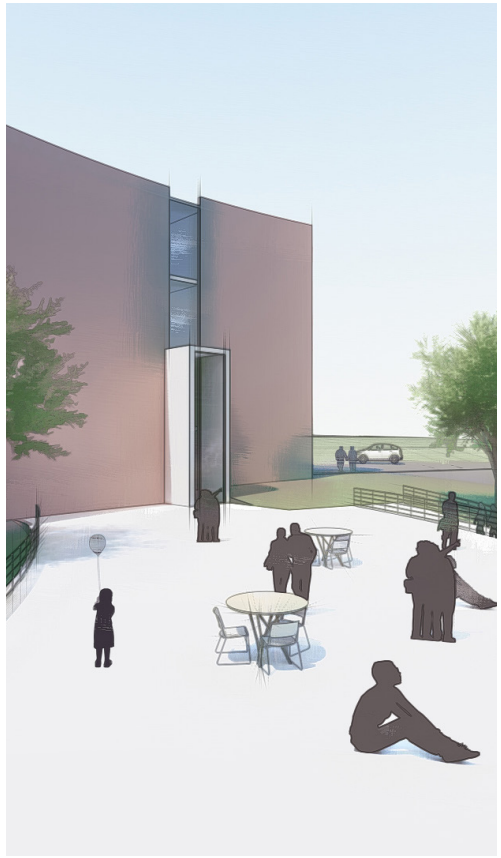
Fig 82: Diagram demonstration Wall surfaces that need reflective and absorbing panels.

PREVIOUS DESIGNS

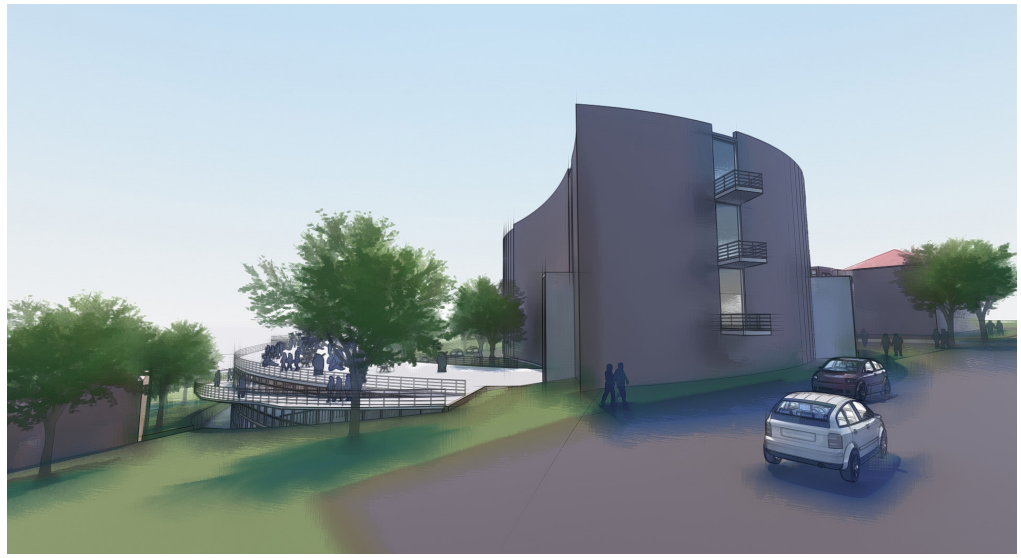
Design 01

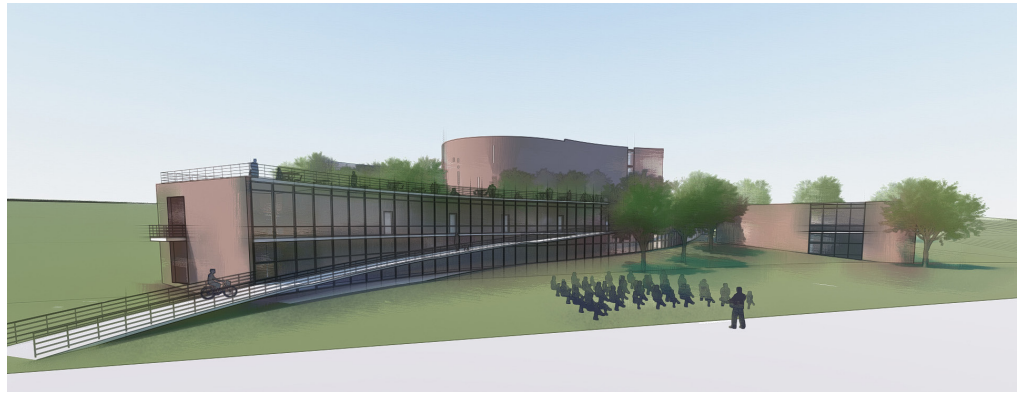


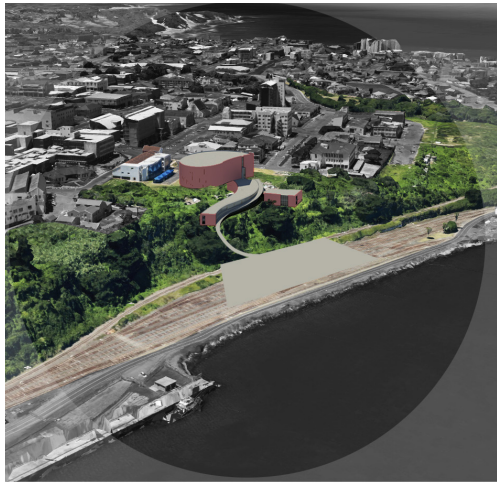


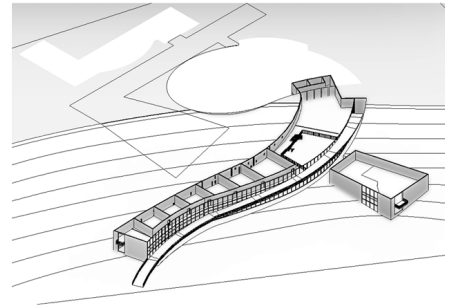


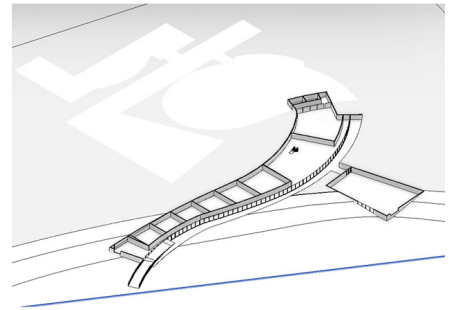


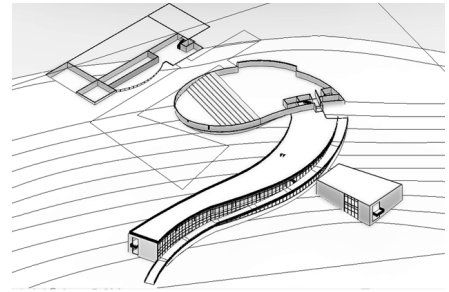


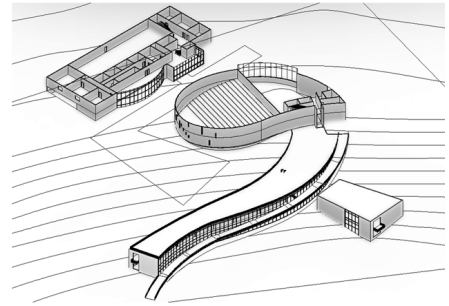






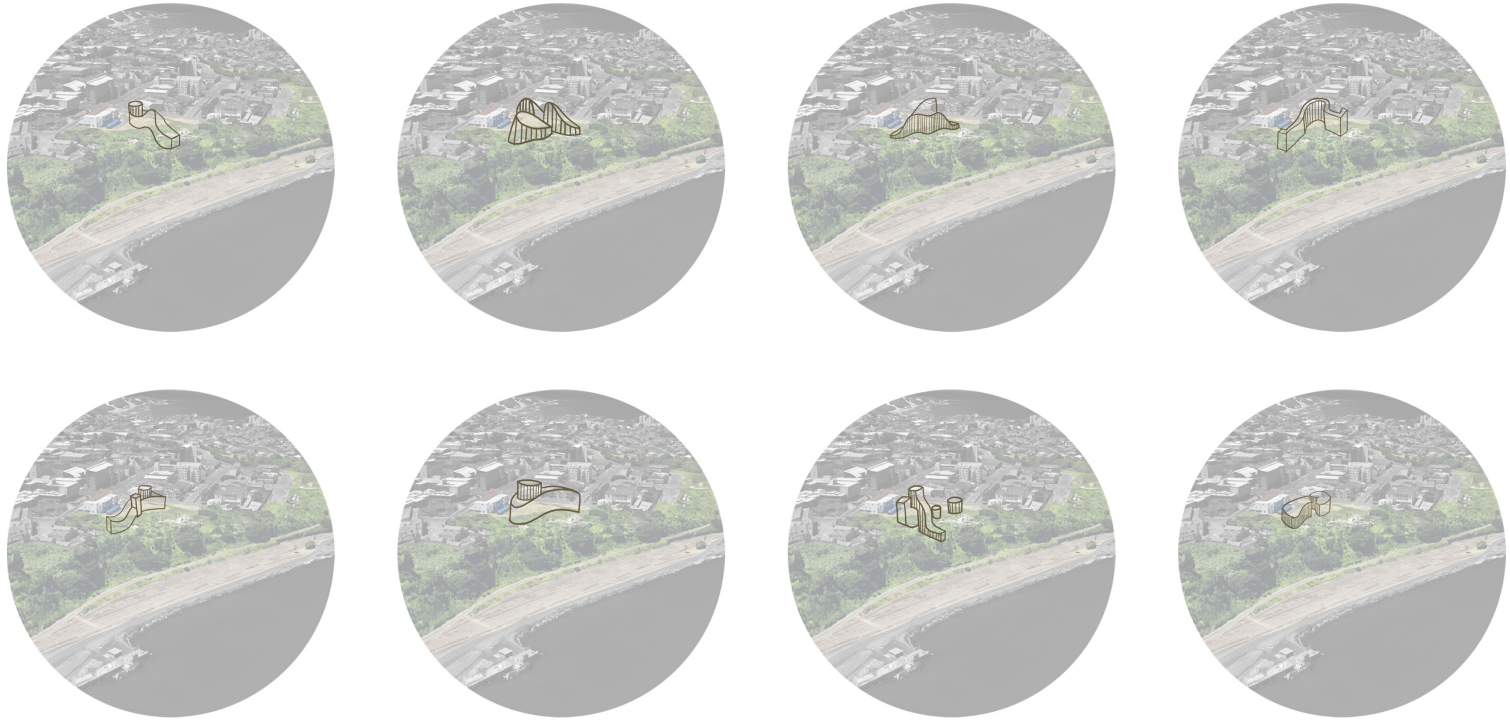


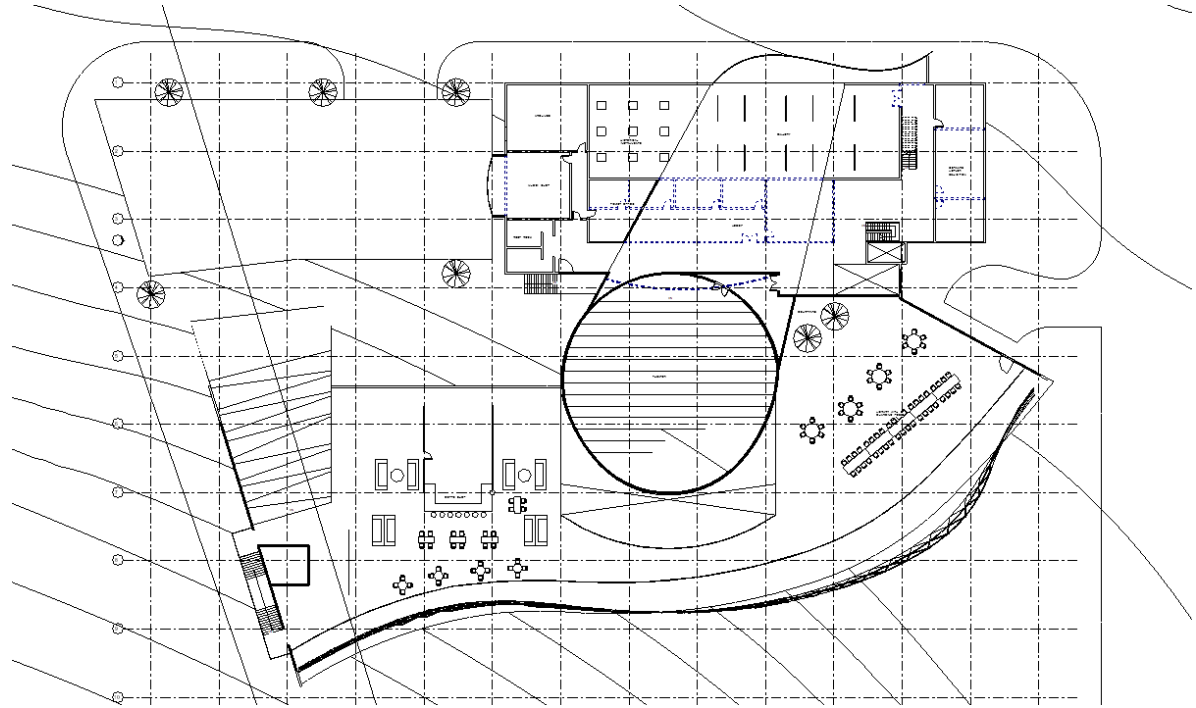


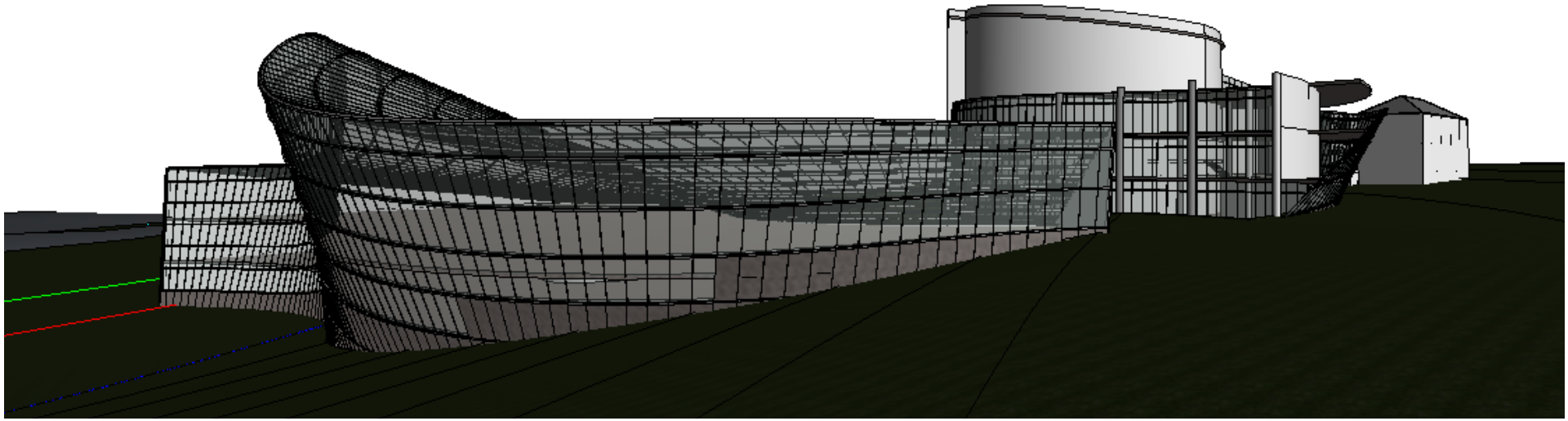


Design 02

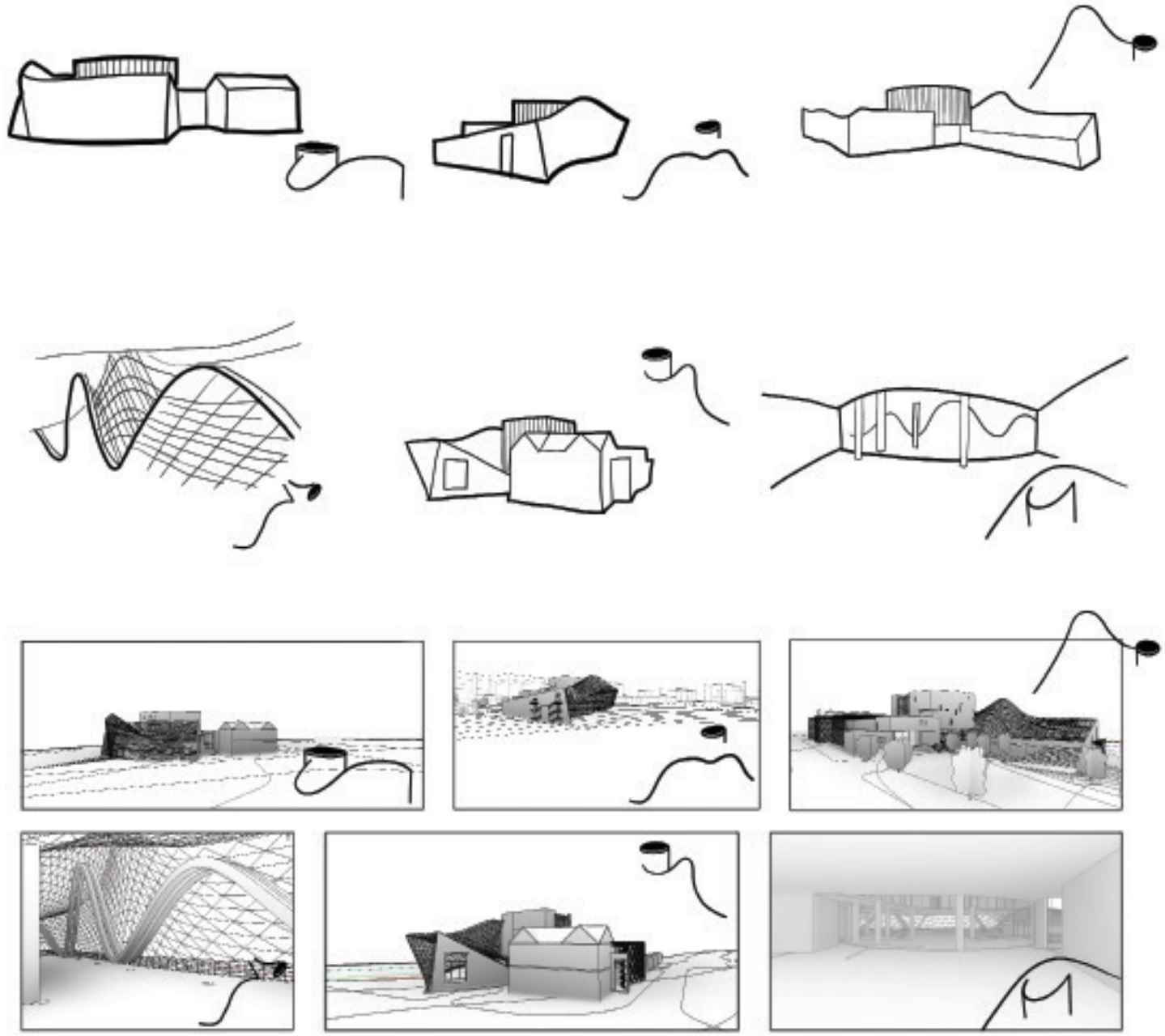


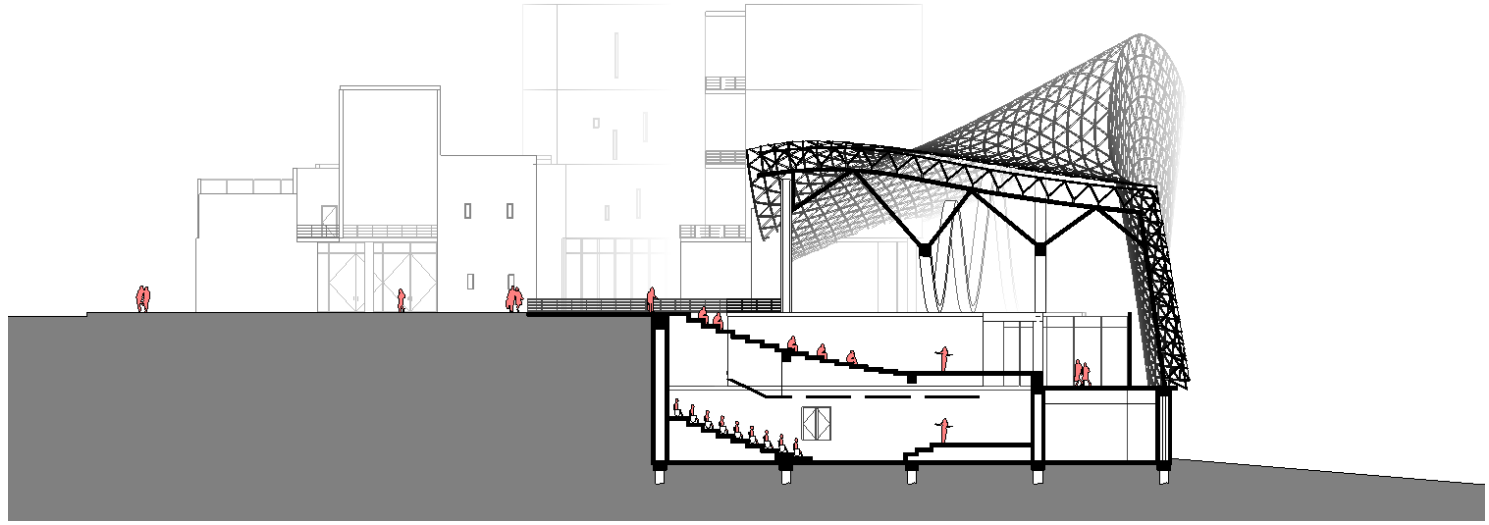






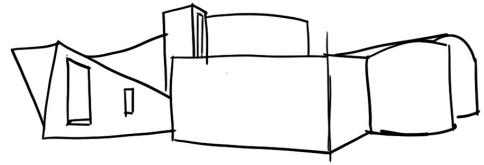
Design 03



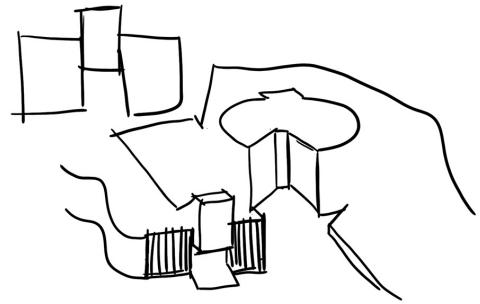


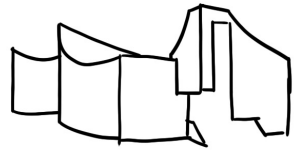


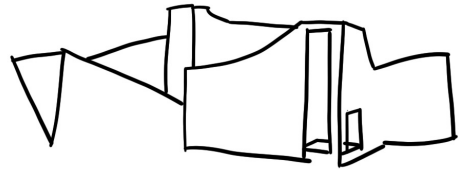
Design 04





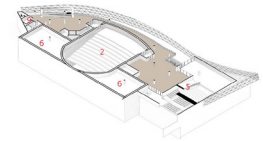




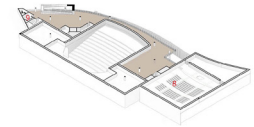




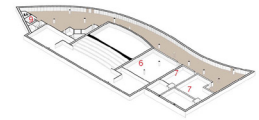
GROUND FLOOR



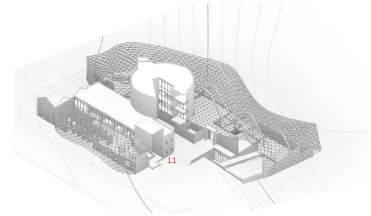
BASEMENT 1



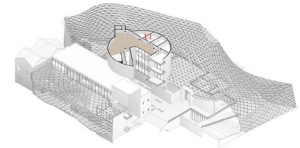
BASEMENT 2



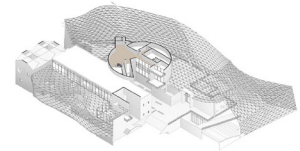
BASEMENT 3



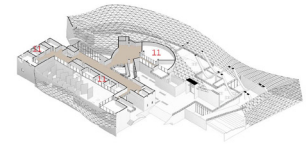
ROOF



THREE FLOOR

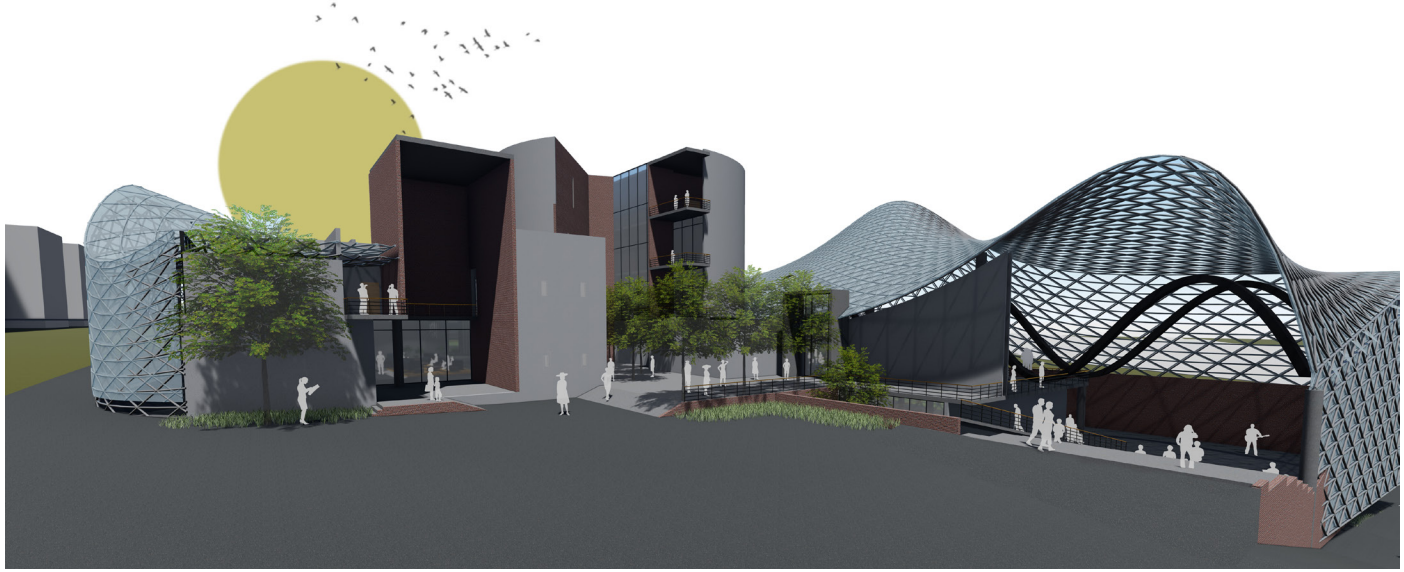


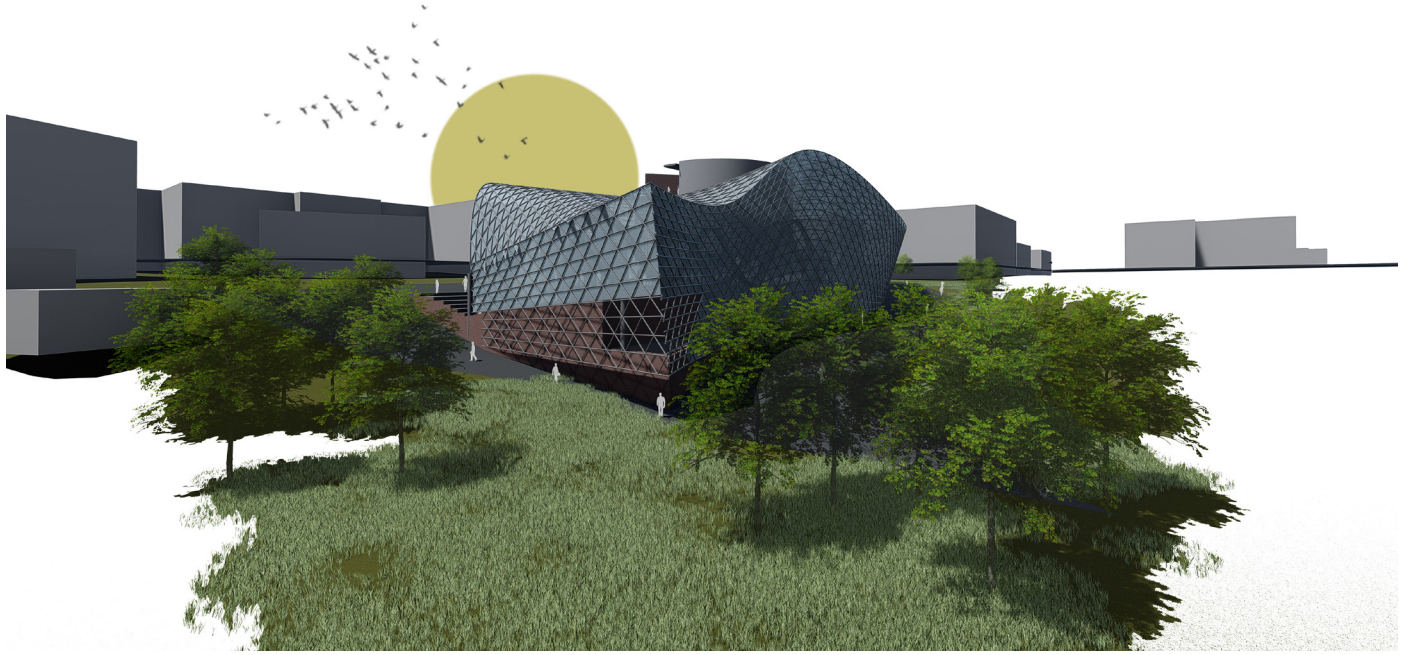
SECOND FLOOR

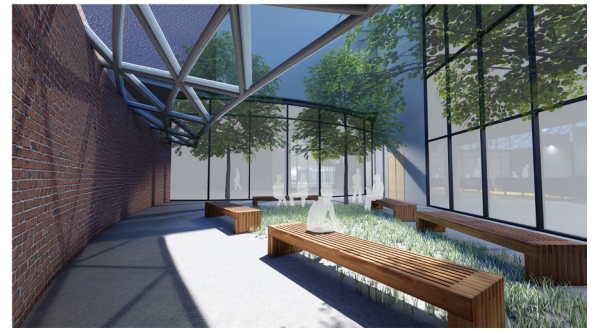


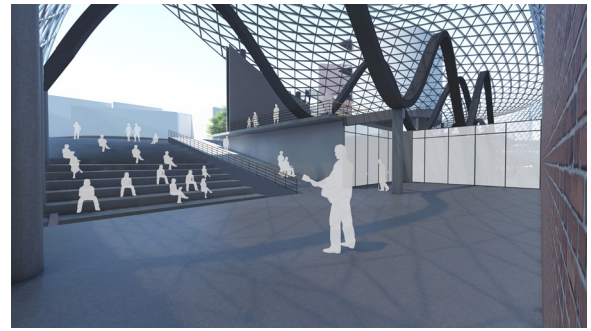
FIRST FLOOR

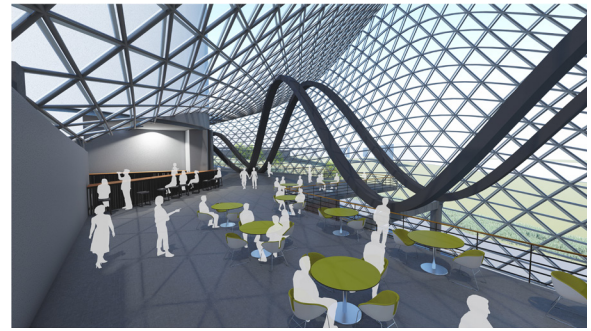
1. Gallery
2. Theater
3. Resturant
4. Reading/Wifi Hotspot
5. Forum
6. Practice Hall
7. Music Studio
8. Jazz Studio
9. Restroom
10. Reception/Ticket Office
11. Office
12. Courtyard
12. Archives

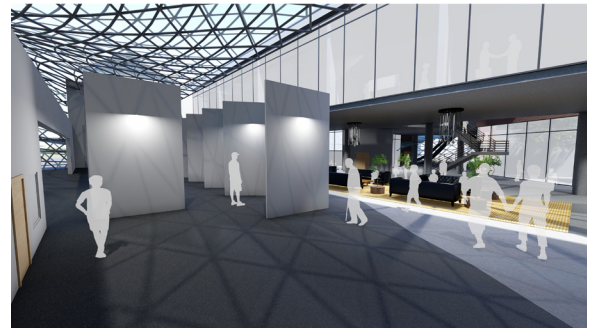


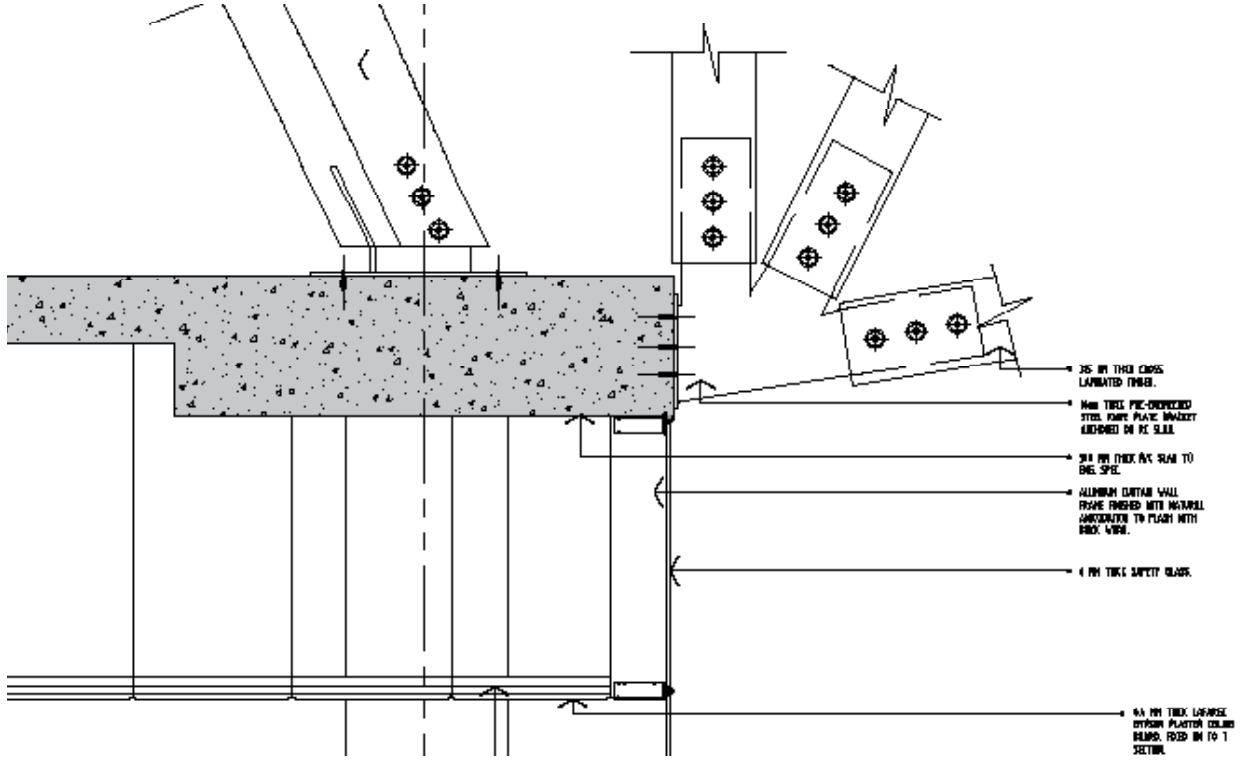


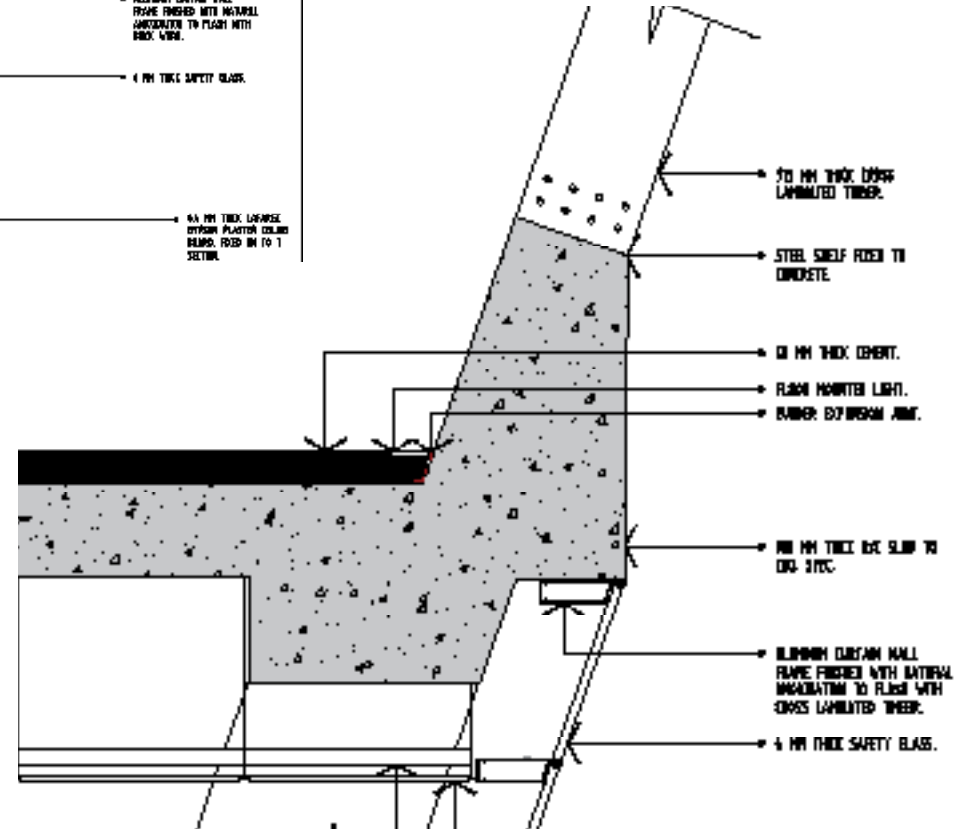


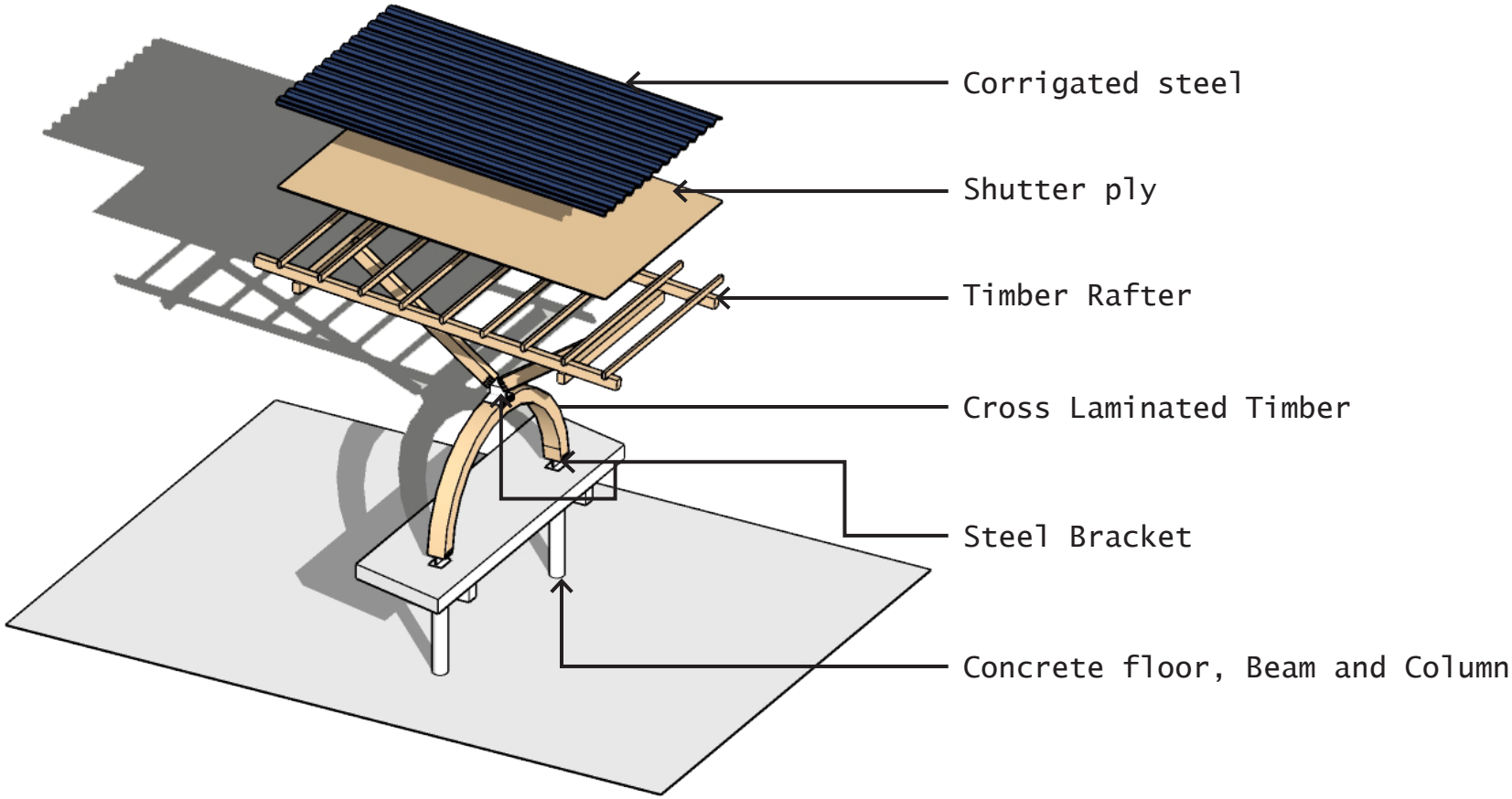









STEEL SHELF FIXED TO CONCRETE.
FLOOR MOUNTED LIGHT.
ALUMINUM CURTAIN WALL FRAME FINISHED WITH NATURAL ANODIZATION TO FLUSH WITH CROSS LAMINATED TIMBER.
6 MM THICK SAFETY GLASS.


Corrigated steel
Shutter ply
Timber Rafter
Cross Laminated Timber
Steel Bracket
Concrete floor, Beam and Column

SCHOOL OF ARCHITECTURE AND PLANNING
HUMAN RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE
PROTOCOL NUMBER: SOAP045/03/2020

PROJECT TITLE:	Condition of Harmony: An Applied Musical Research Centre
INVESTIGATOR/S:	Thandolwethu Mtshabe (Student No: 813835)
SCHOOL:	Architecture and Planning
DEGREE PROGRAMME:	Master of Architecture Professional (MArch Prof)
DATE CONSIDERED:	27 November 2020
EXPIRY DATE:	27 November 2021
DECISION OF THE COMMITTEE:	Approved

CHAIRPERSON _____
(Dr Brian Boshoff)

DATE: **2.12.20**

cc: Supervisor/s: DEBORAH KIRKMAN

DECLARATION OF INVESTIGATORS
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to endure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

School of Architecture & Planning
University of the Witwatersrand
Private Bag 3 Wits 2050
Johannesburg South Africa
www.wits.ac.za

T + 27 11 717 7623
F + 27 11 717 7649