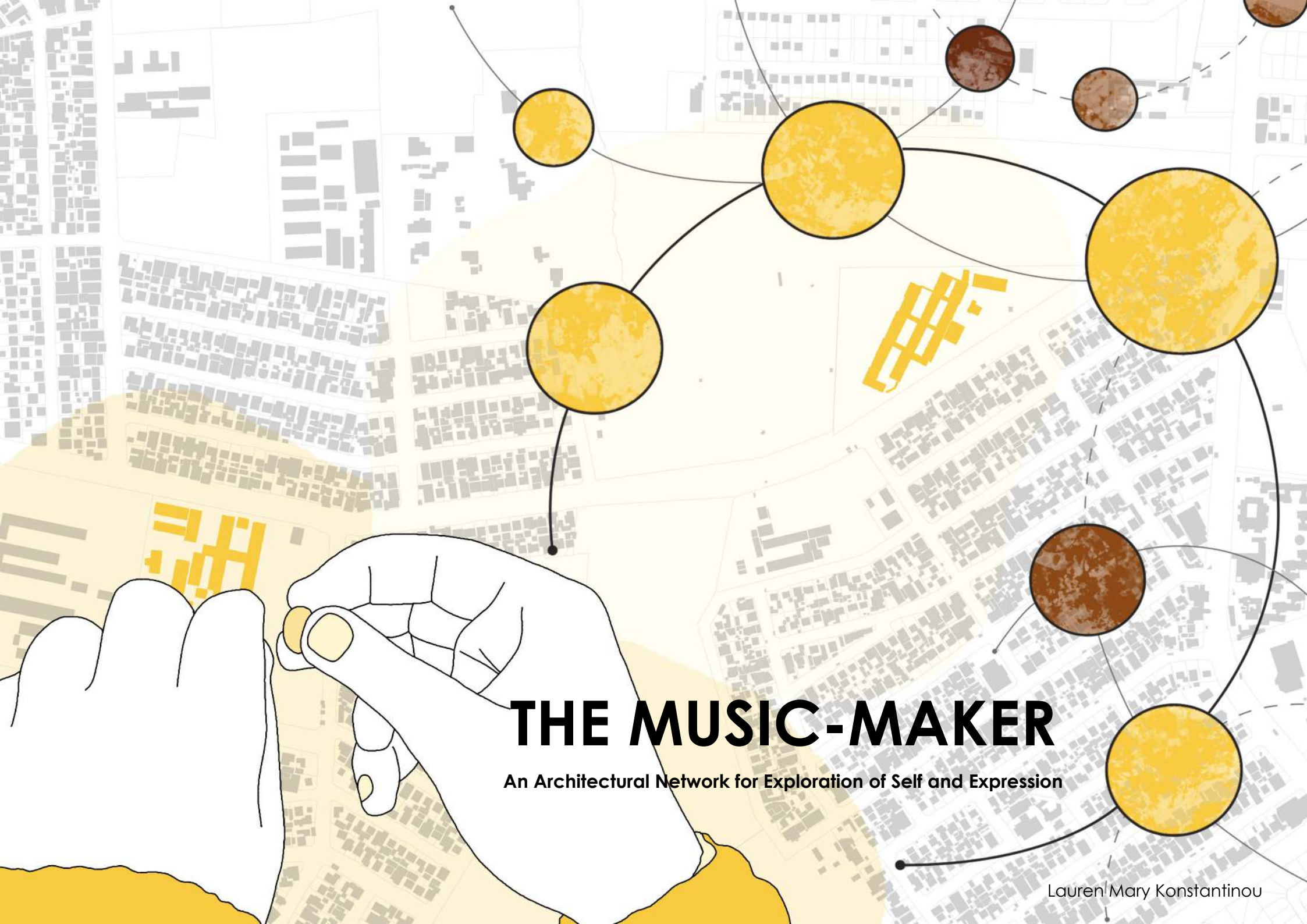

THE MUSIC-MAKER

An Architectural Network for Exploration of Self and Expression

Lauren Mary Konstantinou

THE MUSIC-MAKER

An Architectural Network for Exploration of Self and Expression

by:
Lauren Mary Konstantinou

Submitted to fulfill part of the requirements for the degree of Master in Architecture (Professional), Department of Architecture, Faculty of Engineering, Built Environment and Information Technology. University of Pretoria.

December 2020

Course Co-ordinator:
Prof. Arthur Barker

Study Leader:
Dr. Carin Combrinck

DECLARATION

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

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

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

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Lauren Mary Konstantinou

EXPRESSION OF THANKS

Firstly, to my unfailing Father. There are no words of prayer or melodies of worship that could express how eternally grateful I am to You for supporting me. This dissertation taught me many things, but ultimately it taught me Your merciful love and powerful support through all the highs and lows.

To the team at Tsako Thabo Secondary School: Mr Clement Gama and Mr Alfred Lithuli, I am forever grateful for all of your dedication and willingness to help out at every corner. Your students are so blessed to have you in their lives and I know your efforts are making changes on incredible scales.

To Kelsey and Purll, this year would've gotten the worst of me if it wasn't for your support. I am so honoured to have met you and gone on this journey with two of the strongest people I know. Here's to changing the world, no matter what it throws at us.

Dr C, without you, I would not have had such an incredible experience and exposure to this kind of architecture - the kind that really makes a difference and resonates with my soul. Thank you for all your effort and constant support in every step of this journey.

To everyone who has had even just the slightest influence on this dissertation, Reggie, Juliana, Kirstin, Sas, Courts, Masters 2020 and everyone else, thank you. Thank you for virtual co-design sessions and constant faith in me, wine nights when I just needed a break, a fantastic inflow of tea offerings and last minute design debates to clear my head. You made this possible.

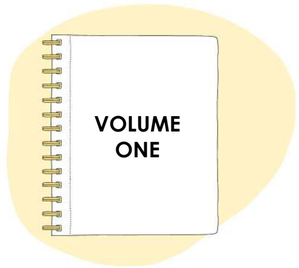
Lastly, to my family. Mom, your editing, chocolate gifts and keen ear were the foundations of this project. Dad, our conversations helped me build up the walls and put the trusses where they needed to be. Nic, you showed me the importance of acoustics; the roof over everything. I love you all.

This dissertation is split into two Volumes.

Volume One is a collaborated authorship between three Master of Architecture students within the Unit for Urban Citizenship: Lauren Konstantinou, Purll Naidoo and Kelsey Smith. We all share the same passion for participatory research and creating architecture beyond just the building.

This chapter consists of a background of us as students, the Educational Ecosystem, Mamelodi East and Tsako Thabo Secondary School, the Unit for Urban Citizenship, research methodology, and our involvement in the NRF STINT project, Stitching the City.

We have each written our own version of **Volume Two** wherein we investigate different layers uncovered in Volume One and their relations to architecture. This Volume, *The Music Maker*, looks through a lens of music and performance as a positive platform for expression.



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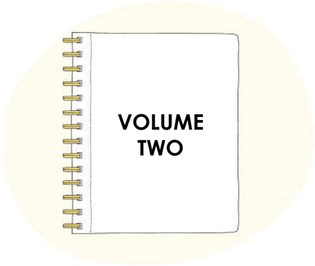
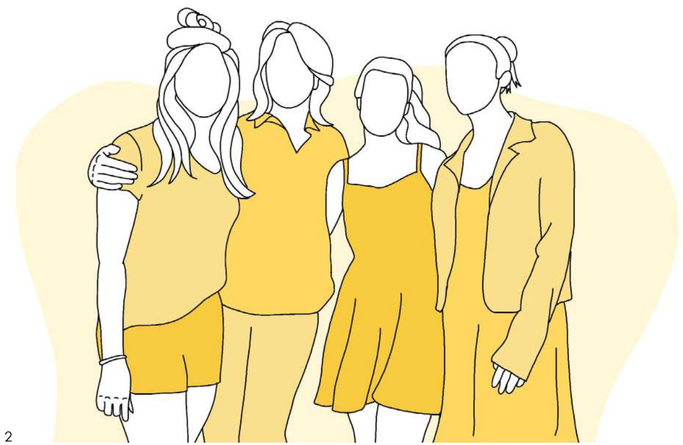


**The Music-Maker:
An Architectural Network for Exploration of Self and Expression**



VOLUME ONE

Investigating the Spatial Consequences of Architecture on the Educational Ecosystem through the Approach of the Unit for Urban Citizenship

Co-authored by
Kelsey Smith
Lauren Konstantinou
Purll Naidoo

Under the guidance of
Dr Carin Combrinck

Edited by
Sharon Konstantinou

VOLUME ONE: CONTENTS

We dedicate this volume to the Urban Citizen

Herewith lies our discovered passion,
wherein we hope to inspire like-minded creatives.

"Architecture is about people, [...] it can do more than we expect." - Francis Kéré

Agents of change,
Kelsey, Lauren & Purll

GLOSSARY

- **MCLC:** (Mamelodi Community of Learning Collaborative) Through the University of Pretoria (UP) Mamelodi Campus, the university has engaged with multiple community upliftment projects. The MCLC is funded by the Kresge Foundation.
- **Educational Ecosystem:** a concept through which there is a large focus on the educational sector of a community, identifying and understanding the interrelationships between stakeholders and how these can be enhanced in order to uplift the educational quality of the community as a whole.
- **UUC:** (Unit for Urban Citizenship) Within the Department of Architecture, this unit involves agents of change, engaging deeply with underserved communities through participatory-based projects.
- **Tsako Thabo Secondary School:** Part of the MCLC's effort to uplift the educational ecosystem within Mamelodi East. The principal is Mr Clement Gama who has worked closely with us during the participatory process of both 2019 and 2020.
- **JCP:** Community engagement course that makes provision for university funded community service projects to be completed by undergraduate students in the EBIT faculty during their second year of study.
- **STINT:** National Research Foundation project titled, Stitching the city: From micro-data to macro-views (STINT), aimed at establishing a "transdisciplinary collaboration" to develop a methodology for collecting and sharing non-traditional types of information, on a digitized platform.
- **STEM & STEAM:** approach to learning and development that integrates the areas of Science, Technology, Engineering and Mathematics. STEAM was recently created to incorporate the Arts as well, to ensure an all-rounded and inclusive educational system.
- **PAR:** (Participatory Action Research) An approach to investigation that involves participants and researchers working together in order to uncover issues and solutions within a community or topic.
- **ukuDoba Method:** A methodological framework that has been developed for the collection and sharing of non-traditional types of spatial and socioeconomic data at a street and precinct level in an online platform. All three researchers were actively involved in the creation of this method.

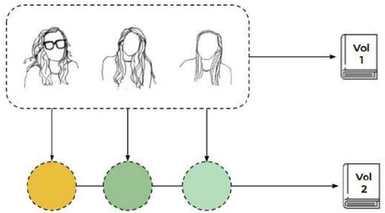


Fig. 01: Dissertation Structure Division (Authors 2020)

01_INTRODUCTION

This document is inclusive in three mini-dissertations in the professional Master of Architecture degree in the Department of Architecture at the University of Pretoria: Lauren Konstantinou, Purll Naidoo and Kelsey Smith. We have collectively been a part of the University of Pretoria's (UP) Unit for Urban Citizenship, in the Department of Architecture, since our Honours year in 2019. As part of our involvement, we have engaged with the topic of investigating the spatial consequences of the architectural discipline on the educational ecosystem, through the approach of the Unit for Urban Citizenship. This engagement began in 2019 and occurred over the year within Mamelodi East, as a collaboration with the Mamelodi Community of Learning Collaborative (MCLC). This resulted in a focused study of Tsako Thabo Secondary School and a continued collaboration into the 2020 Master's year.

The 2019 experience highlighted the power of alternative architectural processes and the depth that can be added to a project when engaging in participatory design methods. There is a desire and need, within us, to challenge conventional architectural processes by focusing on the end-users as knowledgeable and tangible assets to design projects. We were all captivated by our experience during the 2019 Honours year and sought to continue our engagement in the Master's year, 2020. Due to our common foundation and architectural approach, we have closely collaborated during the Master's year. As an outline, each researcher's dissertation is made up of two parts (Fig. 01): Volume One being the co-authored chapters and Volume Two outlining our individually authored chapters. Volume One of this dissertation document engages in our collective experience and foundation that contributed to our individually focused chapters in Volume Two.

Our research methods and architectural approach to the dissertation are influenced by our involvement in the Unit for Urban Citizenship (UUC). The UUC is a collaboration within the Department of Architecture and is currently headed by Dr. Carin Combrinck. Both students and staff from the department form part of the UUC, as well as identified community members who are integral to the success of the unit.

The unit is intended to be used as a platform for civic engagement and participatory development within disadvantaged communities. This is done in an effort to gain real-world understanding and result in community upliftment (Kilfoil 2019). The particular research method, carried out in each dissertation, is the outcome of the unit's involvement in a National Research Foundation (NRF) project, titled 'Stitching the City" (STINT). This project is a joint effort between the University of Pretoria in South Africa and Chalmers University in Gothenburg, Sweden. All three researchers were integral to the research project from 2019 to 2020 (see *Appendix A*) and contributed towards the development of the *ukuDoba Method* (see *Appendix B*), a methodology for both data collection and sharing on an easily accessible digital platform. Together with the *ukuDoba* research method, participatory design processes are integral to the approach of the unit, therefore all three dissertations place particular emphasis on this in the design process.

From the start, we set out to change the way we tackle the architectural discourse at UP from a Master's point of view. We intended to actively engage with our participants, site, community members, architectural professionals and peers as well as to be part of a movement of students who actively challenge the standardized process of a Master of Architecture (Professional) degree. We started the year with the intention of adapting the prescribed design format of the Master's year-end exam. This included hosting a winter studio in July that would involve a live-build in partnership with the community and other active participants in our respective projects. The winter studio was to be implemented so that a part of our designs could be physically built and form part of our technical resolution and design outcome for our dissertations. This was to extend and consciously involve ourselves in the participatory design process. Due to the nature of the COVID-19 pandemic and lockdown restrictions within the country, the possibility of a live-build was short-lived. Our shift in thinking happened immediately concerning producing a piece of work that could still possibly be executed in smaller increments and thus contribute to potential future implementation.

The end goal remains for us to be proactive in developing platforms and ways of engaging the end-user under any given circumstance. COVID-19 has posed its set of challenges regarding interaction and design development regarding participatory design processes. The impact of the circumstances surrounding this pandemic has been inevitably consequential to our design process. However, it has encouraged us to think out of the box while remaining in the box more so than ever. Most importantly it has challenged us, as researchers and designers, to become resilient in our architectural approach. To ensure that, even when obstacles present themselves, we are still able to adapt and ground ourselves in our approach, instead of accepting the traditional approach to architecture. The pandemic has also shed light and caused reflection on the outcome of our designs and the role we play as designers going forward into our careers as young architects.

Collectively we adjusted to online engagement to continue our paths and include participants in the design development process. Our resilience as researchers and designers has remained intact throughout our journey to obtain our Master of Architecture (Professional) degree and we have continued and will continue to learn and adapt along the way.

The following information provides the foundation for our three dissertation topics. Lauren Konstantinou's study has a focus on the spatial decentralization of music-making as a platform for positive self-expression to enhance collective community identities. Purll Naidoo considers the redefinition of South African government school typologies to encourage lifelong learning potential and Kelsey Smith explores the role of architecture and its intersection with food sovereignty in an attempt to rehabilitate secondary school feeding schemes within South Africa. Overall, we hope that Volume One of this dissertation document will provide a deeper understanding of the context we are engaging with, our approach to architecture and rationale for our individual dissertations.

Fig. 02: Educational Ecosystem (Authors 2020)

02_BACKGROUND

Educational Ecosystem

It was Nelson Mandela who declared that "Education is the most powerful weapon which you can use to change the world" (Mandela 2003). To equip children with an engine for development (Mandela 2007) is to equip them with the knowledge and practical learning to maintain a sustainable life.

The educational ecosystem (Fig. 02) is a concept in which there is a large focus on the education sector of a community (Kurshan 2015). "Ecosystems are defined by the network of interactions among organisms, and between organisms and their environment" (Mueller & Toutain 2015: 6), therefore when looking at the educational ecosystem it becomes important to understand the interrelationships within that environment. There has been a focus on education as a means to direct a cultural shift, where the school is seen as the medium for moulding the society we envision. It is recognised that an effective educational ecosystem is seen as a nodal point to connect people and to address societal challenges. However, even though it is recognised that our educational ecosystem has the largest impact on society, it, unfortunately, remains the most fragmented (Luksha et al. 2018). Real-world case studies, stakeholders and implementations are used to see how relationships between educational facilities can benefit "urban education environments" (Kurshan 2015). Within a well-functioning ecosystem, educational institutions have the opportunity to work together to improve the current curriculum, equip staff and teachers with more knowledge and skills, and create a more enhanced and engaging learning environment (Kilfoil 2019). Referring to the educational environment as an ecosystem is to understand the impact of educational institutions as nuclear agents. They have the capabilities of reinforcing existing and creating durable connections within networks in their context. For this reason, it becomes increasingly important to address the role of education within an ecosystemic context.

As part of the United Nations (UN) Sustainable Development Goals (SDG), education is seen as a priority (Fig. 03). The vision of quality education for all is stressed as an important aspect in the development of better lives and social sustainability, by the year 2030 (United Nations 2016). Education is a primary focus of the UN as it is essential to achieving numerous goals on the SDG list. Importantly, education is seen as the key to addressing the world's poverty cycle. In the same light that education is seen as a determining factor in achieving multiple SDG's, it also functions widely within poverty-stricken areas. Schools serve, not only as a medium for knowledge transfer but are integral in the support they provide to learners and communities, such as the provision of a learners' daily meal source (Peterson 2020).

In 2020, the COVID-19 pandemic resulted in the temporary closure of schools across the majority of the world's countries (United Nations 2020). Specifically, within underprivileged and marginalized areas, the underlying issues of the current education system were suddenly exposed, both globally and locally (Carte Blanche 2020; United Nations 2020). As stated by Basil Manuel from the National Professional Teachers' Organisation of South Africa (NAPTOSA), in South Africa the nation-wide lockdown exposed and exaggerated the inequalities of the education system almost overnight. The issues discussed are particularly related to inclusivity, participation, equality and transformation (Peterson 2020). These issues proved that middle to upper-class learners were able to continue their education through online platforms. However, those who are financially disadvantaged, could not. This stems from a general lack of technological knowledge and skills to the lack of finances to buy internet data or even

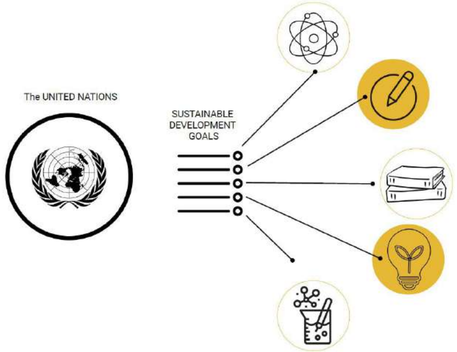


Fig. 03: Sustainable Development Goals (United Nations 2016)

Fig. 09: Tsako Thabo (Naidoo 2019)

Fig. 10: Tsako Thabo (Naidoo 2019)

print notes (Carte Blanche 2020; Peterson 2020). Parents are also often unable to help their children learn from home as in most households, their child is the first to go to school, leaving the rest of the family illiterate (Peterson 2020). As the schools have closed, many are left without a safe learning environment to attend daily, resulting in increased stress and anxiety for both learners and parents (Peterson 2020). Exposing this significant gap in both the economy and the knowledge of these citizens truly highlights the importance of the evolution of the current education system.

When engaging with the educational ecosystem it is important to be aware of the influence of STEM (Science, Technology, Engineering and Mathematics). Both globally and locally, the focus on STEM has a major influence on the educational ecosystem, in terms of curriculum. Since 2009, in South Africa, the subjects Mathematics and Science were seen to result in public schools being in a state of "national crisis" (Pols 2019). This affected the qualitative outcomes of scientists, engineers and health practitioners in the workforce. The concept of STEM was introduced into schools as a way to increase the critical thinking capacity of current school generations (White 2014), ultimately leading to a stronger workforce that is more employable, setting up South Africa's society for success (World Economic Forum 2017). This would contribute to breaking the poverty, crime and unemployment cycle of underprivileged communities within the country (Pols 2019).

However, there have been numerous debates and much research conducted regarding the addition of the arts into STEM to expand scientists' knowledge from critical to humanitarian and empathetic (Lachman 2018). STEAM (Science, Technology, Engineering, Arts and Mathematics) education allows for learners to be critical and analytical while recognizing the personal, social and cultural potentials of what they are doing (Pienaar 2017) (Fig. 04). Such pedagogical methods align and challenge school curricular reform to challenge the current education model.

Psychologically, this educational concept teaches learners self-expression, wider forms of criticism and ultimately helps to develop them for the working world where they would be more susceptible to taking risks and developing new ideas (Lachman 2018; Pienaar 2017). Initiatives such as Leap Science and Maths schools are a chain of non-fee paying schools that aim at offering quality education to underprivileged, low-income communities. Sustainable models like these are imperative to empowering people as they focus on the fostering of learners' cultural

and communal identity while ultimately creating a pathway to future employment (LEAP 2017). Robinson (2010) emphasizes that schools are currently failing to acknowledge and encourage multiple types of intelligence. He states that the traditional standardization of education needs to be revised to develop the youth's ability for creative and practical thinking. This type of curriculum change impacts the educational ecosystem by allowing more opportunities for the inclusivity of all students, not only those that fit the critical-thinkers mould. As designers and researchers, this is the standpoint from which we approached the educational ecosystem. Robinson (2010) highlights that the future of our economy is dependent on innovation and a person's ability to anticipate future concerns and have the skills and capability to implement solutions. This way of learning encourages students to engage realistically with skills that will help them sustain their lives in the future (Carson 2016).

Within the educational ecosystem, it is crucial to understand the relationship between people and their environments and to engage in how/why these relationships are created and exist (Mueller & Toutain 2015: 8) (Fig. 05). An understanding of these relationships is crucial to inform our approach as designers. As designers and researchers with a major interest in developing social cohesion within communities, the educational ecosystem becomes a significant influence on design considerations. This is due to thinking beyond the case of standard systems within a community, but rather considering a number of deeper and interconnected themes that accumulate and influence the way communities work. It is about looking beyond surface observations and engaging in uncovering the social interrelations making up a community.

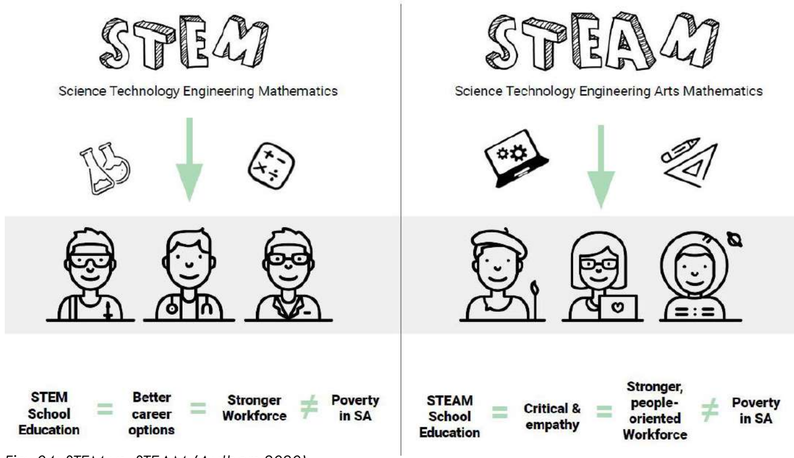


Fig. 04: STEM vs. STEAM (Authors 2020)

Fig. 05: Interrelation Between People and their Environments (Authors 2020)

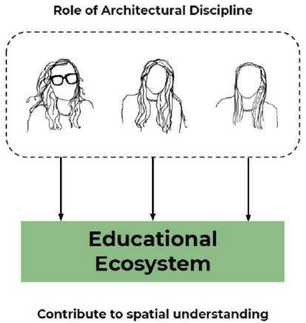


Fig. 06: Relation to Architecture (Authors 2020)

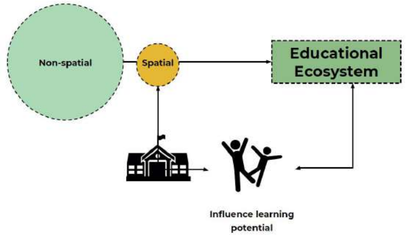


Fig. 07: Non-Spatial and Spatial Contribution (Authors 2020)

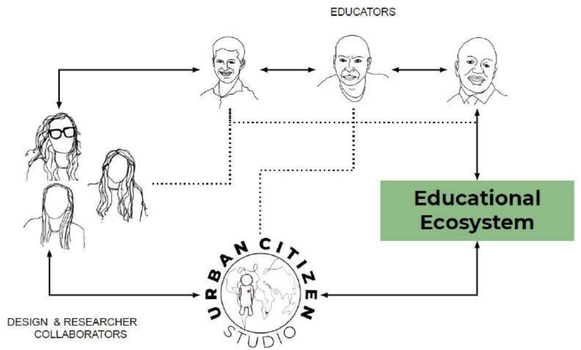


Fig. 08: Educational Ecosystem Collaborators (Authors 2020)

Relation to Architecture

The importance of addressing the educational ecosystem has already been established across various disciplines. However, as designers and researchers within the architectural discipline, we must ask ourselves how we can contribute to educational ecosystem discourse. The educational ecosystem has largely been discussed from a non-spatial point of view, however, the role that architecture plays within that discussion is limited in comparison (Cleveland & Fisher 2013:1) (Fig. 07). The spatial constructs of the educational ecosystem affect a child's ability to learn, however, the design consideration given to these learning environments is significantly under-developed (Higgins et al 2005). Our project motives align with the Action Plan towards schooling 2025 released by the Department of Basic Education (DBE) which focuses on giving priority to the wellbeing of the learner. Goal 24 emphasizes the need to "ensure that the physical infrastructure and environment of every school inspires learners to want to come to school and learn, and teachers to teach "(DBE 2014).

One of the biggest challenges facing South Africa is the development and improvement of the knowledge and skills of its learners, primarily amongst disadvantaged and low-income sectors of the population (Albertyn 2015).
Although access to education has improved significantly since the educational reform in 1994, the equality of access does not yet translate to opportunity. According to Dr. Jonathon Clark, director of the Schools Development Unit and Schools Improvement Initiative at the University of Cape Town, the quality of learning outcomes has not escalated in parallel (Albertyn 2015). Clark states the importance of building a network of innovators and educators who are "like-minded change-makers", who are actively willing to transform the educational ecosystem in South Africa to improve the quality of education. We see our dissertation proposals not only contributing to this network but also stretching its outlook to understand the impact of this type of architecture.

An ecosystem, in an academic environment, constructively frames the need for interdependency and sustainability. A schools' functioning through a facility and built environment point of view, is a result of its infrastructure and resource management (NEIMS, 2014). The control and implementation of these elements allow for the creation of a safe and enabling learning environment. Networks are catalysts used to enhance knowledge as well as provide support for innovators. A shift in paradigm that fosters an educational ecosystem is necessary to advocate for education that is facilitated by a network of teachers. Educators are lifelong learners, so to improve learning, the commitment to educator development is crucial. Our research and dissertations unpack key educators and knowledge innovators in the community that form part of a larger educational ecosystem used as part of lifelong learning within the schools, as well as the surrounding communities (Albertyn 2015) (Fig. 08).

Through investigating the relationship between architecture and education with specific relation to our case study, Tsako Thabo, we found a need to go further into exploration and design, to create a significant change in the education environment. This can often be perceived as a place that is confining and static. Herman Hertzberger (2008:169) unpacks this concept further when he discusses the culmination of multiple schools within a neighborhood mutually benefiting from their shared resources. Bringing together multiple schools, all of which have different aspects to add to the success of the ecosystem, results in flexibility, social cohesion and saving of funds (Hertzberger 2008). The learning between the schools becomes far more inclusive for all. Through an architectural lens, to contribute towards a well-functioning educational ecosystem, "new, more stimulating spatial conditions and forms" need to be considered (Hertzberger 2008: 57). Our dissertations serve to contribute to that discussion and engage in the impact of architecture on the educational ecosystem.

Top: Fig. 11: Tsako Thabo (Naidoo 2019)
Bottom: Fig. 12: Mamelodi (Naidoo 2019)

Mamelodi Community of Learning Collaborative

The following chapter provides the foundation for the contextual understanding of the dissertations. Our dissertations are based within the context of Mamelodi East, where the University of Pretoria's Mamelodi Campus serves as an anchor institution. As such, the Campus has increased its awareness of the role it plays within its context by contributing to overall community upliftment and individual student success within schools (Kilfoil 2019). The Campus has engaged in multiple community projects within Mamelodi since 2008 (Ogude 2019). These projects are conducted in an effort to uplift the community as a whole and to socially, academically and economically impact the larger society of South Africa.

A relationship was established between the UP Mamelodi Campus and Rutgers University in Newark, United States, when the universities recognised that their ambitions, as anchor institutions within their contexts, aligned. An outcome of this relationship is the Collaborative of Learning Community (CLC), funded through the support of the Kresge Foundation. In 2017, the initiatives were officially founded in both Newark (NCLC) and Mamelodi (MCLC) (Ogude 2019). The involvement of the MCLC is influential within the dissertations. The MCLC is composed of numerous faculties within UP, each investigating the educational ecosystem from the perspective of their discipline. The collaborative has identified key partners within the Mamelodi educational ecosystem to engage with, including Early Childhood Development centres (ECDs), Primary and Secondary schools as well as the local and provincial departments of Basic Education. Tsako Thabo Secondary stood out within this selection of partners due to the growing relationship the university has with its principal and MCLC member, Mr. Clement Gama. The school has been open to engaging with the university and its students and is, therefore, a significant collaborating partner.

The Department of Architecture, within the Engineering, Built Environment and Information Technology (EBIT) Faculty is represented in the MCLC through the Unit for Urban Citizenship (UUC). The Unit's contribution to the collaborative is to investigate the educational ecosystem within Mamelodi from the perspective of the architectural discipline. Numerous projects undertaken within the Unit have contributed to our spatial knowledge database of Mamelodi's educational ecosystem. Throughout the Unit's investigations, smaller nodes of activity are recognized as active educational nodes that could potentially contribute to a lifelong learning process within the community.

The MCLC actively intends to contribute to its hyper-local context. As part of its initiative, the collaborative is also involved in the Joint Community Project module (JCP), situated within the EBIT Faculty. This course makes provision for University-funded community service projects to be completed by undergraduate students in the EBIT faculty during their second year of study. The volume of these students makes this course a powerful tool within community action initiatives. Many schools in the Mamelodi East community have collaborated with students from the JCP course. Tsako Thabo is amongst the schools to have received support from these projects, in the form of personal protective equipment (PPE) to maintain health standards for the reopening post-2020 COVID-19 lockdown. Due to our long involvement in Mamelodi, we have become acquainted with pressing areas of concern that have the potential to be addressed through the JCP course. Using this knowledge, we intend to produce directed JCP project briefs for students to undertake at Tsako Thabo.

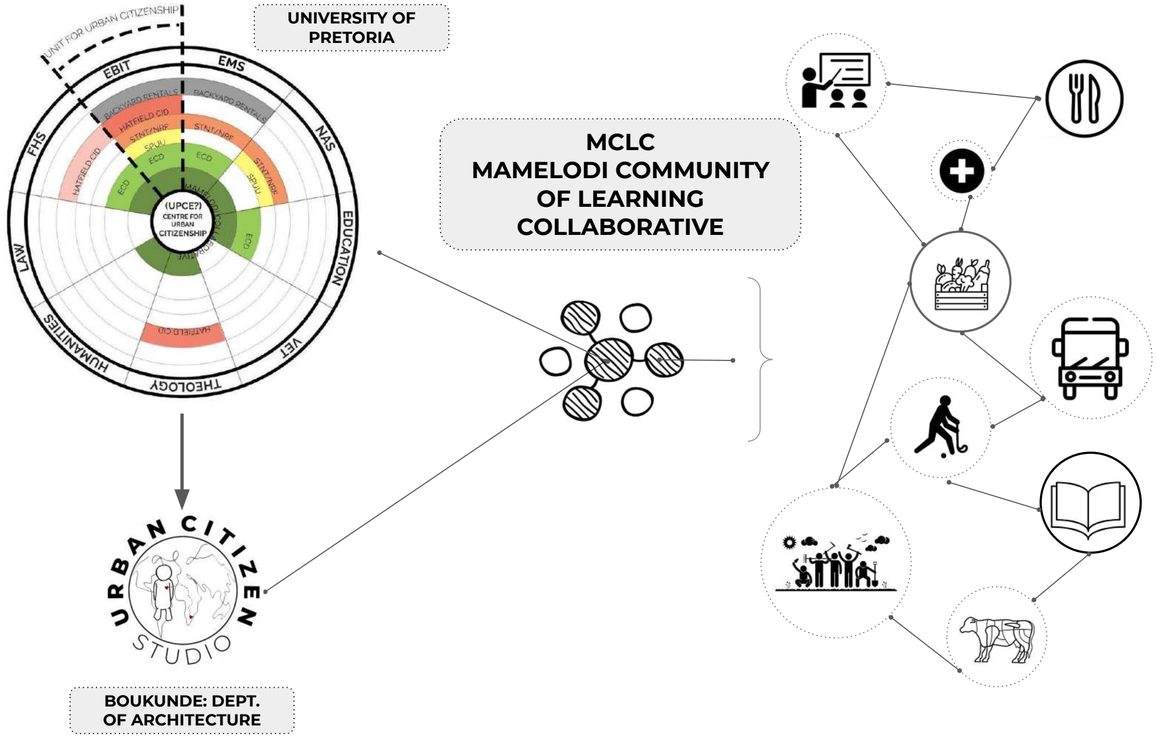


Fig. 13: MCLC Diagram (Authors 2020)

Mamelodi East

The MCLC provided the direction towards the township of Mamelodi East in the City of Tshwane as our context for the investigation. This township was formed during the Apartheid regime for the African population in 1945 (van der Waal 2000). Like most disadvantaged communities in South Africa, this settlement has a history of government neglect and social struggle. The oldest part of Mamelodi runs along Tsamaya Road and the Moretele River (van der Waal 2000), including the area surrounding the case study school.

The UUC has been actively involved in investigating the spatial qualities of the educational ecosystem in Mamelodi East since 2017. Our engagement began in February 2019. The following timeline sets out our period of involvement.

In 2019, the following themes were uncovered through the participatory process of mapping conducted by the UUC Bachelor of Architecture Honours group:

- Routes: pedestrian access and movement in terms of safety and trade (Du Bois and Mulder 2019) (Fig. 18, 19 & 20)
- Recreation: sports as a platform for social cohesion and ownership (Ras 2019) (Fig. 21)
- Social capital: relationships and networking that strengthen the community (vd Hoven 2019)
- Food culture: informal and formal distribution of food (Smith 2019) (Fig. 22 & 23)
- Informal Economy: the value of trade and trends of income (Mlambo 2019)
- Education typologies: quality of school typologies and the impact on education (Achi 2019) (Fig. 24 & 25)
- Cultural aspects: social cohesion through music, dance and the arts (Konstantinou 2019) (Fig. 26 & 27)
- Sacred space: understanding ownership and the role sacred space has within the community (Motshabi & Naidoo 2019) (Fig. 28)

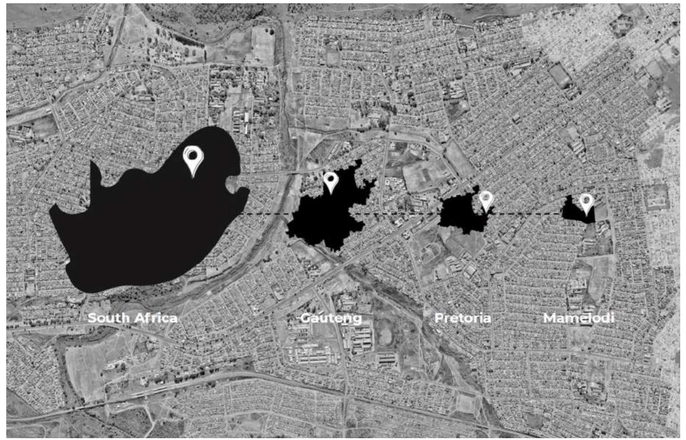


Fig. 14: Mamelodi Context Map (Authors 2020)

These themes were all thoroughly unpacked through mapping, unstructured interviews, community action planning and participatory sessions. This information moved beyond the surface of simple observation and assisted in our directed understanding of the context we are dealing with.

All data accumulated over the period, as indicated in the timeline above, has formed a database of information for our dissertations. The type of information mapped and recorded includes patterns of movement, the evolution of the space over the years, activity and program mapping as well as public and private space indicators.

To better understand architecture and the story we are trying to tell, we have to contextualize the environment, the people and the process. These elements involved in our research have influenced our perspective on the community itself and provided us with insightful knowledge on how certain systems, groups and programs function. We have had the privilege to work in and with such a culturally rich community who's potential and passions have remained the drivers during our process of development.

Top: Fig. 15: Mamelodi Transect Walk (Honours 2019)
Middle: Fig. 16: Mamelodi Context (Honours 2019)
Bottom: Fig. 17: Mamelodi Context (Honours 2019)

Fig. 18: Pedestrian Routes Mapping (Authors 2020)

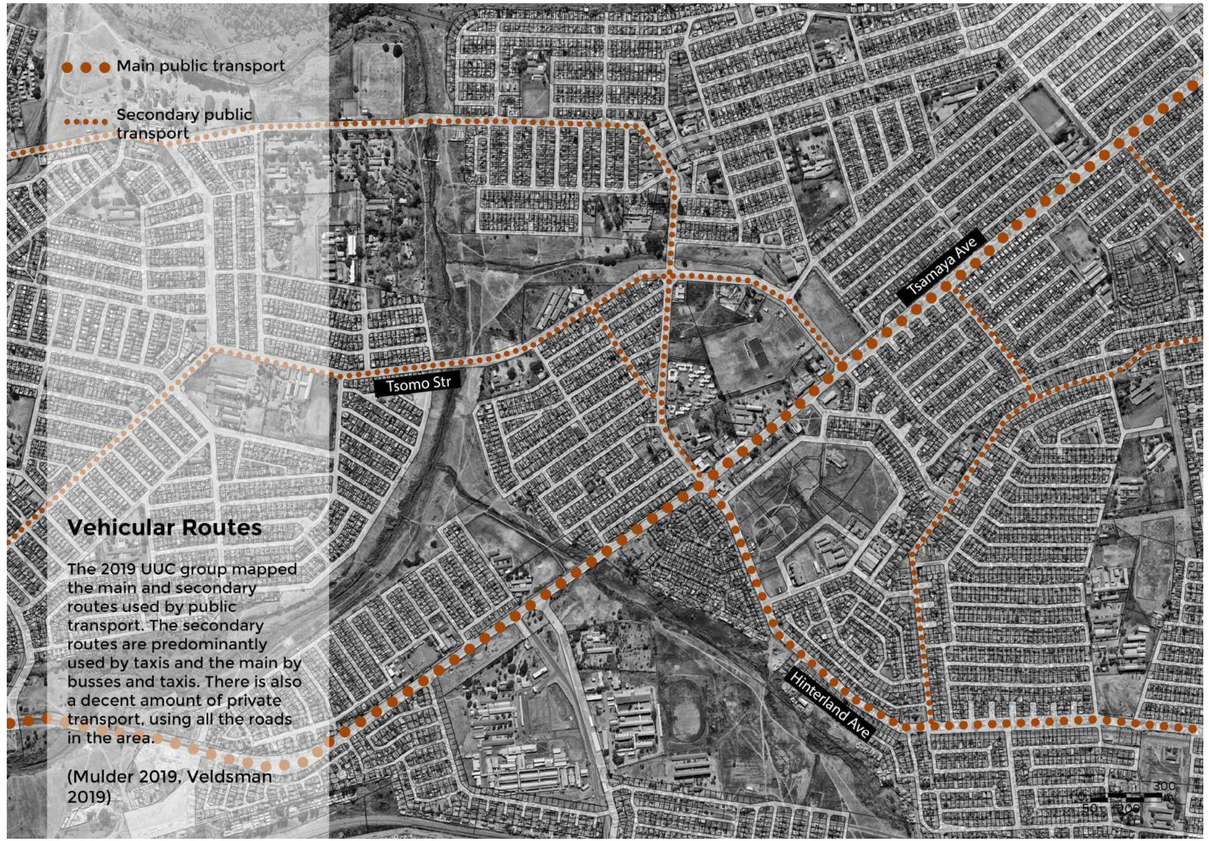


Fig. 19: Vehicular Routes Mapping (Authors 2020)

Fig. 20: Safety Mapping (Authors 2020)

Fig. 21: Recreational Mapping (Authors 2020)

Fig. 22: Food Culture Khalambazo Mapping (Authors 2020)

Fig. 23: Food Culture Tsako Thabo Mapping (Authors 2020)

Fig. 24: School Typologies Mapping (Authors 2020)

Modern classroom school typologies

Throughout Mamelodi East, there are numerous public schools that have been identified that reflect the modern classroom typology and share numerous characteristics

1. Reneilwe community learning centre
2. Mononong primary school
3. Motheo primary school
4. Balebogeng primary school
5. Zakhele primary school
6. Pula difate primary school
7. Tlakukhani & mveledzo primary school
8. Sindawonye primary school
9. Tsako thabo secondary school

(Achi & Venter 2019)

Fig. 25: Classroom Typologies Mapping (Authors 2020)

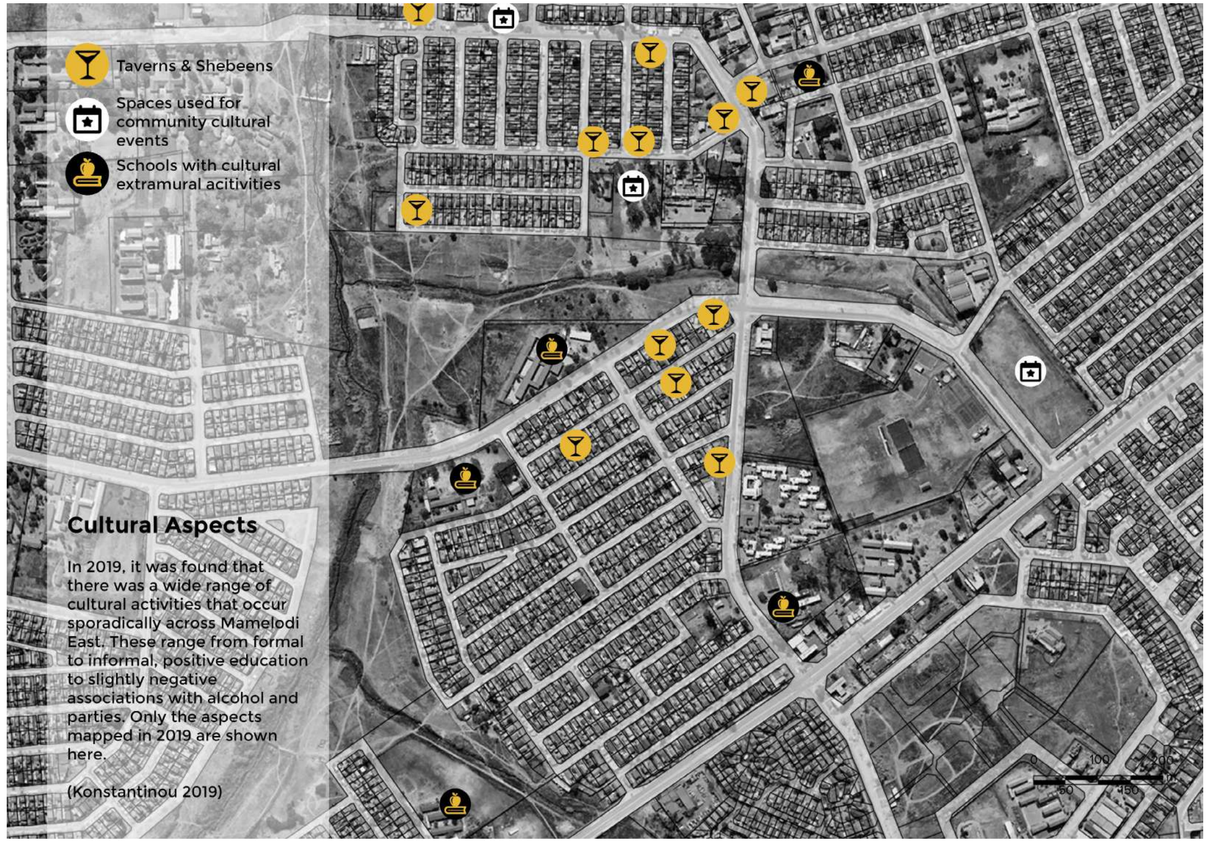


Fig. 26: Cultural Aspects Mamelodi Mapping (Authors 2020)

Fig. 27: Cultural Aspects Tsako Thabo Mapping (Authors 2020)

Fig. 28: Sacred Space Mapping (Authors 2020)

Tsako Thabo as a Case Study

Due to the relationship with the MCLC and the open engagement with UP, Tsako Thabo Secondary School was identified as a base case study for our dissertations. The intensive mapping conducted within Mamelodi East provided us with contextual grounding for our investigation into the school. Thereafter, the school provided a platform to observe, investigate and explore the current educational ecosystem within Mamelodi East. It was the foundation for identifying opportunities for an expansive educational network that could empower and contribute to the community.

At a postgraduate level, UUC architecture students have worked closely with Tsako Thabo Secondary School, since 2019 (Kilfoil 2019). The school is currently used as the anchor node for postgraduate architecture studies within the UUC. These students actively engaged within the school and the surrounding community, where school learners and community members participated in intensive mapping and participatory research. This methodology was a part of the process that resulted in community action planning strategies, urban visions and responsive architectural interventions (Kilfoil 2019).

Our personal involvement with the school began with our introduction to Mamelodi East, in 2019. From an introduction session with the current principal, Mr. Clement Gama, a brief overview of the school was conducted:

> "The aim of the school is to be all-inclusive, however, it is difficult as the staff is not equipped or trained to do so. [...] They have the number one volleyball team in Tshwane but use the community hall to practice (not the school). Their goal is to have a proper art studio. [...] [The school] was built in 1981 in a train layout. Now it looks more like a jail because it has been fortified [due to the many break ins]. People steal metal (cooking pots, chairs, etc.), electronics and food. [...] There are eight or nine unused classrooms that could be used for other [community] activities. This is a good idea as community centres are far from this area. [...] There is a direct correlation between doing well in school and attendance (influenced by the parent's input). Parents try to live their dreams through their children and give pressure in the wrong areas (therefore kids don't enjoy school). However, most parents of the school are not involved (e.g. parent's associations)" (Personal notes during 2019 introduction by L. Konstantinou).

Thereafter, we carried out intensive participatory research at the school. Previous engagements with students in the school ranged across a wide variety of themes.

> Focusing on sport and the current facilities, "Students of the volleyball team, in particular, are extremely proud and their involvement in the sport is a constant grounding and motivator to them" (Personal notes during 2019 introduction by R. Ras). Music focused workshops also took place within the corridors of the school, "the melodies generated from these participants were so evident of their passion and zest for life and clearly illustrates the power music instils for social inclusion" (Personal notes during 2019 introduction by L. Konstantinou). Food Sovereignty

was unpacked through design activities involving the students interacting in games that illustrated what food types and proportions are consumed daily [...] " Entrepreneurial activities of food selling ignited negotiators and good sales people within the participant group" and kitchen conversations were welcomed by the kitchen staff as they prepared lunch daily (Personal notes during 2019 introduction by K. Smith). Transect walks in and around the school led by the students provided a perspective of the unseen activity that exists between transition times within the school….. (Personal notes during 2019 introduction by P. Naidoo).

The Mamelodi East mapping as well as the collected sources of information from the above formed the basis for our dissertations. With this information we hoped to layer on our specific dissertation focus through our 2020 participatory action research (discussed in volume 2 of our individual dissertations), to inform our design interventions that are rooted in the school's ethos and are catalytic contributors to the school and surrounding community.

As a primary participant target group, the dissertations focused on high school learners, between the ages of 13 and 20, that attend Tsako Thabo Secondary School. Each of the student participants was specifically identified through the Honours mapping of 2019, through unstructured interviews and word of mouth through social groups within the school. Within our individual dissertations, we have expanded on this focused target group to include participants related specifically to our dissertation topics. It is important to note that due to each researchers' specific topic and the COVID-19 nation-wide lockdown of 2020, additional participants from other schools and elsewhere, were identified to partake in certain stages of the research and design.

From observations, mappings and analysis done over the last few years within Mamelodi East, a common spatial language was found between most schools in the area (Achi & Venter 2019). This is specifically related to their social context and built form. Although our dissertations are based at Tsako Thabo, it is important to note that we intend to not spatially resolve surfaced issues at a single school. Tsako Thabo Secondary School has been used as a case study to represent other schools in Mamelodi East. Although each school still has its unique characteristics, issues and opportunities, Tsako Thabo has been used as a basis to understand and test the researchers' solutions through proposed design interventions. These proposals are then not limited to the school and can be proposed for other schools across the area, addressing similar social issues. We intend that the lessons learned, information captured and designs developed, through our dissertations, will contribute to the knowledge base for addressing similar issues existing within our country and even globally.

Fig. 29: Tsako Thabo as a Case Study (Honours 2019)

Unit for Urban Citizenship

The Unit for Urban Citizenship (UUC) has provided a much-needed platform, within the University of Pretoria's (UP) Department of Architecture, to challenge conventional architectural discourse. It was once run as a studio within our Honours year in 2019 (Fig. 30) but has grown in recognition within the Department, in 2020. Urban Citizenship is now one of the three research fields in the department (Fig. 31), along with Heritage and Cultural Landscapes and Environmental Potential. During the Unit's introduction session, a question was posed to the staff and students of the department to construct a collaborative description of what it meant to be an "Urban Citizen". Collectively the "Urban Citizen" was described to be an agent of change, who strives to create sustainable relationships and maintain unity through diversity and social inclusion. The studio is run by urban citizenship enthusiast Dr. Carin Combrinck, who currently oversees both the Honours and Master's Programmes in Architecture at UP. Dr. Combrinck's active involvement in community-driven projects, engagement in the MCLC and passion for urban citizenship contributed to the foundation of the unit. The impact of the UUC is not isolated to postgraduate approaches to architecture. It has influenced all years within the architecture department, from small scale modules in undergraduate years to full-scale studios at a postgraduate level. UUC has been the driving force for our dissertations and has provided the foundation for our research and architectural approach. Urban Citizenship values the diversity of people, cultures and environments and aims at encouraging citizen participation throughout the design process to establish a framework for architecture that is inclusive and empowering to the user.

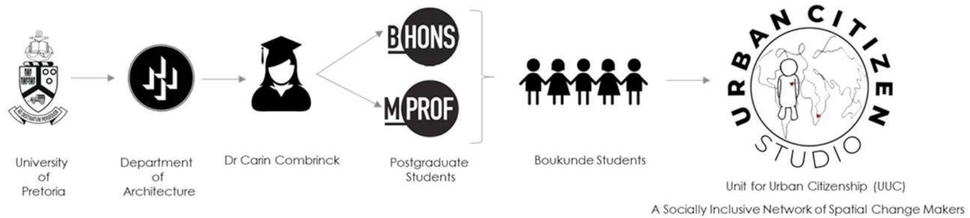


Fig. 31: UUC Programme Development (Authors 2020)

Research Approach

Due to the nature of the UUC, the approach to our research was through the interpretive paradigm by collecting and analyzing qualitative data of the real-world context of Mamelodi East. Our particular focus was on participatory action research (PAR) to expand the discourse of architecture. PAR allowed for the process of analysis and critical reflection to happen simultaneously at intervals throughout the design and engagement phase. The research approach values diversity and is focused on positive social change as an outcome (Macbeth 2020). It constantly kept us grounded on the basis to create greater awareness for citizen participation to address issues with a greater sense of agency (Awan et al. 2011). The spatial agency defines the process as working at the intersections between the individual and the collective, the virtual and reality realm (Awan et al. 2011). Qualitative data collection has been integral to our PAR approach. Collecting qualitative data allowed us to study end-users' lives from a direct and engaged perspective within their own environments, resulting in contextually relevant data sets. This represented the real-life views of the people who would directly be affected by the research conducted (Merriam 2009, Yin 2011) and the potential outcomes that the dissertations posed. This method is supported by professionals, researchers and creatives that use collaborative design strategies from a conceptual approach to the tangible outcome phase.

Mapping and unpacking qualitative data allow researchers to contribute to existing and current emerging ideas within the human social environment. This allows for trends to be noticed and certain events to be explained through existing social concepts (Yin 2011).

It is vital for researchers to be completely transparent with their methodologies when taking a qualitative approach. This is necessary for future researchers to contribute to the data or test the mapped trends for credibility (Merriam 2009, Yin 2011). To do this, analysis of data must be taken from a grounded framework that allows focused reflection and removes the researcher's personal bias (Merriam 2009, Yin 2011). Describing fieldwork should also show that the researcher was "really and fully present - physically, cognitively and emotionally" (Yin 2011: 574). Using the actual language quoted in interviews and collecting data from multiple sources aids in finding patterns and contradictions which ultimately strengthen the credibility and value of qualitative research (Yin 2011).

Through our engagement in the context of Mamelodi East over the two years, qualitative research was conducted through fieldwork observations, interviews and engaging conversations (Yin 2011). Our process was incremental and built up our qualitative data sets through a series of interactions with the context. Firstly, we documented our first impressions through our observations of the site. This set up our biased opinion which was important to reflect upon once we accumulated richer information. Thereafter, we conducted transect walks with community members to gather an educated outlook on the context and to assist us in organising our first impressions of the site. Once this was done, we moved onto semi-structured and formal interviews for more background information on our observations, as well as the intangible information we missed (Hamdi 2010:69). This type of data collection involved asking, watching and reviewing (Wolcott 1992). Data that was collected in the field was run in parallel with desktop data collection of literature and case studies (Merriam 2009). All of these data sets helped develop a deeper understanding and discover insights relevant to our research problem.

The collective processes and data resulted in the development of the Ukudoba Method, further described in chapter 5, which serves as our research methodology for our dissertations.

It is important to acknowledge that this type of research is only based on a sample of people within the area the researcher is investigating. It does not represent all extents of the issue uncovered but allows for future addition and comparison of research and trends (Yin 2011).

Fig. 30: Qualitative Research at Tsako Thabo (Konstantinou 2019)

Opposite page
Top Left: Fig. 32: Qualitative Research at Tsako Thabo (du Bois 2019)
Top Right: Fig. 33: Qualitative Research at Tsako Thabo (Greyling 2019)
Bottom left: Fig. 34: Qualitative Research at Tsako Thabo (du Bois 2019)
Bottom Right: Fig. 35: Qualitative Research in Mamelodi (Combrinck 2020)

Right: Fig. 36: UUC Studio (Authors 2019)

Design Approach

As architects, we use design to unpack, understand, translate and address issues and opportunities. However, this process is usually biased to the individual outlook of the design practitioner. The process of design starts to evolve when the emphasis is placed on certain characteristics of design thinking methods and tools. Our particular focus on design was through the processes of co-design. Co-design explores a parallel narrative that emphasizes engagement and collaboration. Within the design thinking process, this method of engagement favours participatory involvement throughout the design process, from the discovery of the project to the delivery of a solution (Muller 2002, Steen *et. al* 2007). This collective nature often includes a variety of stakeholders and participants involved in the design process, from design practitioners to end-users (Zamenopoulos et al. 2018). Involving the end-user in the design process is an integral part of effective and efficient design decision-making (Hamdi 2010). Co-design encourages user participation and aids in transferring the power of decision making from design practitioners, who traditionally have it, to the affected marginalized target group within society. It is acknowledged that every participant around the co-design table holds tacit knowledge, integral to the success of the project. Vital contributions from the marginalized group result in higher quality outputs (Ehn 1993, Schuler *et. al* 1993, Spinuzzi 2005) that are socially inclusive and able to live beyond the years of the project development.

Co-design contributes to the design process as well as the lives of the participants involved. The methods are aimed at a specific context and require the input of spatial agents through citizen participation. It uses participatory action research to mediate and facilitate the process of engagement, knowledge sharing and problem-solving. The hope is to create a collaborative approach that democratizes societies and allows citizens to take ownership and control of their environment (Zamenopoulos et al. 2018). Participants benefit from this approach through social interaction and developing a sense of community, through shared values and interests (King 1983). It provides citizen attachment to the particular site of investigation within the community, inspiring action and motivation to protect and improve the location at an individual and community scale (Sanoff 2011).

Professor Nabeel Hamdi, along with other key theorists advocating for co-design processes,

has impacted our positioning as researchers. These theorists move away from the traditional approach to design and suggest "other ways of doing architecture" (Awan *et. al* 2011). Co-design moves towards socially engaging architecture. This alternative approach aims to use architecture to uncover existing potentials within communities that can be harnessed for upliftment overall and act as mediators to improve the conditions, wellbeing and functioning of societies. Architecture becomes more about spatial agency and collaboration, focusing on the social implications of the built environment rather than the typical aesthetic and monetary value. Each individual's interpretation of architecture is challenged and criticism is invited into the practitioner's design process, resulting in constant iteration and reflection on the value of social architectural work (Spatial Agency Online *n.d.*). Hamdi focuses on "small-scale change at a grass-roots level" (Spatial Agency Online *n.d.*), where he aims to work with the given, having small changes over time that lead to agency and success in the long run, rather than a quick solution led from the outside.

There are numerous methods to co-design engagement. Model building, sketching, writing, role-playing and design games are amongst the list of interactive and collaborative tools to mediate the co-design process between stakeholders, participants and designers. These are traditionally held face-to-face, to form relationships with one another (Kensing 2003, King 1983, Simonsen and Robertson 2013), that allows for mutual understanding and respect to create an open and supportive environment amongst the group (Markus and Mao 2000). As participatory researchers, we aimed to have multiple face-to-face participatory and co-design sessions. This would add to our co-design workshops that were conducted in our 2019 Honours year. However, due to the COVID-19 pandemic, our co-design methods were adjusted (Fig. 37). The circumstances of the pandemic, and the resulting country-wide lockdown, pushed the need for digital engagement to interact with participants and collaborate on the design development of our projects. These platforms and methods of engagement included websites, participatory games, conversational platforms and social media platforms to maintain our ability to co-design through social distancing restrictions. Having to adapt to changing circumstances widened our spectrum of co-design experience. Our varied engagement spoke to the resilience of co-design discourse, as we were able to adapt our process along the way, without losing sight of the importance of collaboration.

This method of collaborative design thinking challenges architectural discourse, particularly within our department. Co-design encourages the design practitioner to act as a spatial agent and to look beyond familiar contexts. It focuses on marginalized communities that are often discriminated against and deals with real-life issues present within less fortunate, rural contexts (Zamenopoulos et al. 2018). As we are trying to challenge the current discourse, it is important to point out that small steps are required to incur big change. According to Hamdi (2010:19), "Clever projects have a small number of meaningful indicators". Therefore, throughout our dissertations, co-design has been used at particular stages of our design processes to enrich a design response that is true to the context and community involved.

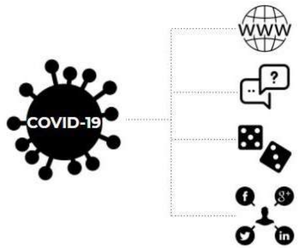
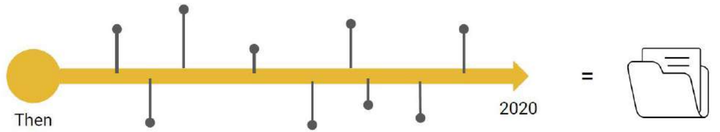


Fig. 37: COVID-19 Impact (Authors 2020)



Continuous Data Collection

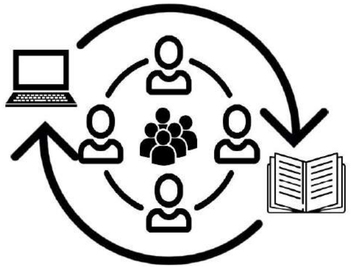


Fig. 38: Continuous Data Collection (Authors 2020)

Reflection

Layers of rich information were uncovered through our PAR approach within Mamelodi East, highlighting the untapped goldmine of opportunities for upliftment. Numerous qualitative data collection methods were tested throughout our process. Through reflection and iteration throughout the process, we were able to learn and grow in our understanding of how to efficiently and effectively approach participants during our limited time in the area.

Due to the UUC's continual engagement in Mamelodi East, layers of data had accumulated over the years (Fig. 38). Year after year students aimed at building on the previous years' work to contribute to the existing data collected and to inform a richer design response. Amongst the data set, recurring themes and observations were presented, however, the storage of the data in unorganised folders on a Google Drive hindered access to the information. This made it difficult, during our dissertations, to collate the collected information and fully grasp the richness of the layered data. This stagnant method of data storage led to the need to change the format (later discussed in Chapter 5) and method in which we were capturing this intangible qualitative data, to assist future researchers.

05_METHODOLOGY AND RESEARCH DESIGN

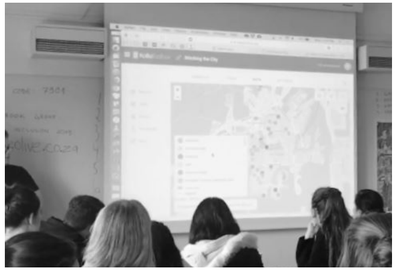
STINT Research Project

In 2019 we were afforded the opportunity to be involved in a Departmental National Research Foundation (NRF) project. The NRF project titled, Stitching the City: From micro-data to macro-views (STINT), aimed at establishing a "transdisciplinary collaboration" to develop a "methodological framework and digital platform for the collection, storage, and sharing of spatial, socio-economic data at a street and precinct-level" (Roussou, Brandao, Adelfio & Thuvander 2019). The STINT project was a collaborative effort between the University of Pretoria (UP), South Africa (Departments of Architecture and GeoInformatics) and Chalmers University in Gothenburg, Sweden (Department of Architecture) from 2019 to 2020. In particular, the collaboration was between the Unit for Urban Citizenship (UUC) and the Social Inclusion Studio (SIS) from Chalmers University's architecture department. For many years, both studios worked within similar contexts that were socially marginalised and segregated (Chalmers 2018). The two contexts under investigation were Mamelodi East in the City of Tshwane, South Africa and Hammarkullen in Gothenburg, Sweden.

Due to UP's architecture Head of Department, Prof. Chrisna Du Plessis' working relationship with members of SIS, this collaboration was born. To understand the complex layers of cities and communities of today, it is vital for multiple components of involvement, as a way to inform and shape the social and built environment (Roussou, Brandao, Adelfio & Thuvander 2019). University students routinely collected quantitative and qualitative data. Both studios found common ground in their methods of data collection. This took the form of visual and spatial data from immersive field research sessions. Over the years, this data revealed many significant trends and patterns related to the real-world context and use of the environments investigated. We shared in the issue that layers of rich data were being collected by students within both studios, critical to the holistic understanding of the contexts in question. However, this information piled up in printed notes or shared folders on an online server. These invaluable discoveries were lost due to the ad hoc storage of data in multiple formats. This made it increasingly difficult to effectively access, layer and share the collected data with decision-makers and the end-user to effect change. It became frustrating that the methods of data collection invoked static data storage methods. The STINT project was therefore developed in response to this common issue.

The Department of GeoInformatics, at UP, involvement in the STINT/NRF project resulted in the creation of an online server (Geonode), to store the collected data. This platform allows the digitalisation of collected information and the database will continue to develop for future endeavours. The information contributes to a large collaborative database and forms the basis for many design projects and research initiatives. The collaboration between the universities, allows the developed platform to be tested in two areas, to compare the effectiveness of the platform in capturing non-traditional data sets (Chalmers 2018). Part of our involvement in this process was the testing of this through field research for our dissertations.

Collectively, we needed to change the way data was collected, translated, stored and shared within our department, to make a greater contribution to society and research. By acknowledging these shortcomings and actively engaging in the STINT/NRF project we collectively contributed to the development of a framework (ukuDoba Method). The framework allows non-traditional information types to be collected using digital and geospatial tools, thereafter, stored and shared on an online platform. It allows for local and global collaboration between researchers and designers on shared issues and similar contexts (ukuDoba manual 2020). The aim of collecting and sharing data of this nature is to allow informed and responsive urban and socio-economic transformation policies for future development (Chalmers 2018) and identification of contextually relevant development interventions.



From top left to right
Fig. 39: Hammarkullen: First immersion walk (Konstantinou 2019)
Fig. 40: Hammarkullen: Analogue data collection from first immersion walk (Konstantinou 2019)
Fig. 41: Hammarkullen: Run-through of digital data collection methods using KoboToolboxTM (Konstantinou 2019)
Fig. 42: Hammarkullen: Social Inclusion Studio (Unknown 2019)
Fig. 43: Pretoria: Digital Tool Analysis (Naidoo 2020)
Fig. 44: Pretoria: Testing the effectiveness of KoboToolboxTM, on site, in the data collection process (Brandao 2020)

ukuDoba - The Methodological Framework

The ukuDoba Method was created from a collaboration between three Master of Architecture students from Chalmers University of Technology, Sweden (Robin Eskilsson, Mumtaheena Rifat and Markus Zorn) and three Master of Architecture students from the University of Pretoria, South Africa (Lauren Konstantinou, Purll Naidoo and Kelsey Smith). All authors were actively involved in the STINT/NRF research project and have a background in participatory design, social inclusion and urban citizenship within architecture. This background influenced the interest in the creation of the ukuDoba Method. In Zulu, the word ukuDoba means 'fishing'. This methodological framework aims to assist users in 'fishing' for non-traditional types of data that can be collectively stored, openly shared, layered over and analysed qualitatively over time. The ukuDoba Method was developed in response to the STINT/NRF project, to guide researchers, from various fields, in the methods of data collection and translation to efficiently store and access the data thereafter.

ukuDoba - the methodological framework (See *Appendix B*), has been developed for the collection and sharing of non-traditional types of spatial and socioeconomic data at a street and precinct level in an online platform. Cross-disciplinary micro-data can be added over time and easily accessed by researchers from different disciplines as well as students and community members. This makes it susceptible to comparison and trend studies, as well as documenting the rich histories of communities. The developed methodology can eventually replace hard-copy storage that is limited in accessibility and fragmented in data.

The UkuDoba method was developed through multiple trials and tests during the process of collaboration between the two universities (See *Appendix A*). For the duration of the research project, two exchange trips were planned between the two contexts, to test the effectiveness of a digital method. The first exchange trip was hosted by the Social Inclusion Studio from Chalmers University in September 2019. The UP Masters students (Lauren Konstantinou, Purll Naidoo and Kelsey Smith) and supervisor (Dr. Carin Combrinck), involved in the project, travelled to Sweden intending to test the developed data storage platform (Geonode™) in Hammarkullen, Gothenburg. The platform was first tested according to its ability to capture traditional analogue methods of data collection. Thereafter, it was tested against its compatibility with various digital data collection tools. The information and feedback gathered from these sessions were used for further development of the Geonode™ platform. This part of the project was developed further for the remainder of 2019. In January 2020, the continuation of the STINT/NRF investigation was given a trial in the City of Tshwane, South Africa. The team from SIS joined the UUC's STINT/NRF team in South Africa. The main aim of the exchange in South Africa was to build on the testing of the various tools for data collection and the effectiveness of the storage platform. This was done within Mamelodi East. We intended to see if Geonode™ was able to store the information collected without losing the richness of the data. A recurring issue was the understanding of these tools by the research team. Thereafter, it was decided that due to the complex nature of the process, it needed to be broken down into streamlined steps. This resulted in developing an instruction manual, referred to as ukuDoba - the methodological framework, dictating a simplified but guided process from data collection to storage.

Multiple data collection tools were considered and tested, each against their accessibility and usability. It was important for the research team that the tools selected allowed for the inclusivity of researchers from various fields and the consideration for the use of the framework by the end-user. This consideration widened the contribution that a project of this nature could make. Providing allowance for wider use, meaning that the data collected could not only be layered by time, but also by discipline and community perspective.

The ukuDoba method makes use of three platforms and functions in a three-step systematic process, to make the data capturing and sharing process seamless and productive. Firstly, Kobo Toolbox™ (Data collection tool) was used as a digital platform to geospatially capture information, such as interviews, surveys and conversations. Secondly, QQISTM (Data translation tool) was used as a "middle-man" to translate collected data into an appropriate format to be imported into the third platform, Geonode™ (Data Storage Platform). This platform was used to document all the geospatially collected data. Having Geonode™ as the single platform for data storage allows for the layering of data year after year by researchers from various fields of research.

As part of the Participatory Action Research (PAR) approach of the UUC, the ukuDoba method, allows researchers to do justice to the rich information collected. Using this methodology also provides the opportunity for community members to collect real-time information within their communities and this contributes to their social empowerment, providing them with opportunities to uplift their own surroundings.

The developed framework has been workshopped by postgraduate students, within the UUC, by the student research team. Feedback from these workshops influenced the refinement of the manual, which later guided the beginnings of our PAR approach within our mini dissertations, in 2020. This method was used for mapping and analysis of existing social trends in Mamelodi East as a way to gain a hands-on understanding of the area and its community. As this method is an iterative process over months and years, it is important for us to reflect on our process and experience with the application of the framework to continuously update the methodology to the current research conditions and development in technology. As Master's students, we have constantly engaged with the method alongside our peers and colleagues. The framework has encouraged this interaction of fieldwork. We hope to influence other fields within the department to take to the method to create opportunities for collaborative data collection and sharing.

Being part of this collaborative process during the development and application phases has been crucial to our understanding of the importance of the data collected in the field. The information, often personal and engaged, allows for a greater perspective of the user and the people in a community and is vital in the field of Urban Citizenship. Collectively, during our Honours year in 2019, we had to recapture data and mapping that was conducted previously, rather than build on it. The STINT/NRF project gave us an opportunity to be part of creating a framework that would not only benefit ourselves but also contribute to the discourse of Urban Citizenship within architecture. Locally and globally we share similar contexts and issues. This project allowed us to collaborate, discuss and have a broader understanding of the issues and possible resolutions.

Opposite page from Top to Bottom
Fig. 45: Pretoria: Composing Draft 1.0 of the ukuDoba Framework Booklet (Naidoo 2020)
Fig. 46: Pretoria: Presenting ukuDoba Framework Draft 1.0 to the Honours Urban Citizen studio (Naidoo 2020)
Fig. 47: Pretoria: Presenting ukuDoba Framework Draft 1.0 to the Masters Urban Citizen studio (Naidoo 2020)

06_RESEARCHERS' INTENTIONS

As active participants in the Unit for Urban Citizenship, we consider ourselves to be Urban Citizens. The Urban Citizen is proactive for change; they challenge rules and constraints and are intentional about their involvement. We strive to be agents of change and to not fall victim to the star architect mindset, but to be receptive to the knowledge that exists within others (Awan et al 2011). It is important for us that we continue to rewrite our own professional code of conduct as we are exposed to the values attached to participatory action methods.

Including participatory action methods in the architectural design process needs to be distinguished from a community outreach project. Participation of all stakeholders is integral, adding to the efficiency and resulting in the effectiveness of the overall project (Hamdi 2010). Architects and other built environment practitioners have loosely implemented community projects over the years. However, these projects deal with surface-level issues due to their lack of engagement with the end-user. Therefore, the intervention is a product of the 'outsiders' interpretation of the community needs. Often these interventions fail due to the lack of ownership and pride by the targeted community. Challenging the conventional methodologies of architecture can be highly influential in the creation of higher-performing interventions that address multi-issued layers (Awan et al 2011, Hamdi 2010, Sanoff 2011).

Ultimately, the dissertations following this Volume One, unpack alternate ways of 'doing architecture' that result in an increased social responsibility within communities, causing upliftment and a stronger sense of belonging for community members (Sanoff 2011). Unfortunately, within the Department of Architecture at the University of Pretoria, there is no precedent for this approach being undertaken by a Master of Architecture (Professional) student. We hope that the participatory design process that we have undertaken in our dissertations opens the conversation within our discipline (Fig. 51).

Our contribution to the establishment of the Unit for Urban Citizenship is the hope that we have helped create a foundation for future like-minded students to collectively participate and take on real projects that impact communities in need. The Unit has encouraged us to challenge the authorship of architecture in the design process (Hamdi 2010) and prioritize the participatory action research approach. Our ambition is to encourage others to start thinking and designing by acting as spatial agents who effect change through the empowerment of others (Awan et al 2011). Our research collectively aims at emphasizing architectures' role and capacity in contributing to social inclusion and transformative action (Awan et al 2011:33).

Fig. 51: Recognition of the PAR approach (Authors 2020)

Ultimately we aspire to widen and embrace young, innovative designers' perspectives on the true definition of community engagement in architecture and the opportunity for architecture to be socially inclusive. Our dissertation outcomes intend to pave the way for projects of this nature in the future. Projects that combine elements of interdisciplinary discourse to actively make a change to the community, as well as to contribute to the research development of spatial design within the co-design context locally and globally.

Opposite page from Left to Right
Fig. 49: Researchers collaboration (Smith 2019)
Fig. 50: The team (Unknown 2019)
Fig. 52: Dr Carin Combrinck, our supervisor, in the field (Zorn 2020)

LIST OF FIGURES

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50 *Fig. 01: Model photograph of proposed Performance Centre (Author 2020)*

VOLUME TWO

THE MUSIC-MAKER

An Architectural Network for Exploration of Self and Expression

Lauren Mary Konstantinou

Edited by
Sharon Konstantinou

VOLUME TWO: CONTENTS

Fig. 02: Site Location (Konstantinou, Naidoo & Smith 2020 edited by Author 2020)

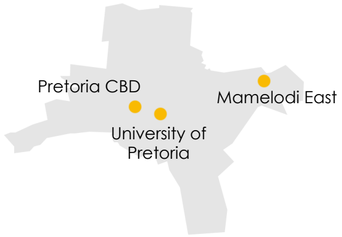
PROJECT SUMMARY

ADDRESS:
Tsako Thabo Secondary School, Tsomo Street,
Mamelodi East, Pretoria, South Africa

COORDINATES:
25°42'34.3"S 28°22'17.8"E

MACRO SCALE:
Music Network as a part of the Mamelodi Heritage Route,
Mamelodi Community of Learning Collaborative and
UNESCO's Creative Cities of Music

MICRO SCALE:
Performance Centre at Tsako Thabo Secondary School



PRETORIA, SOUTH AFRICA

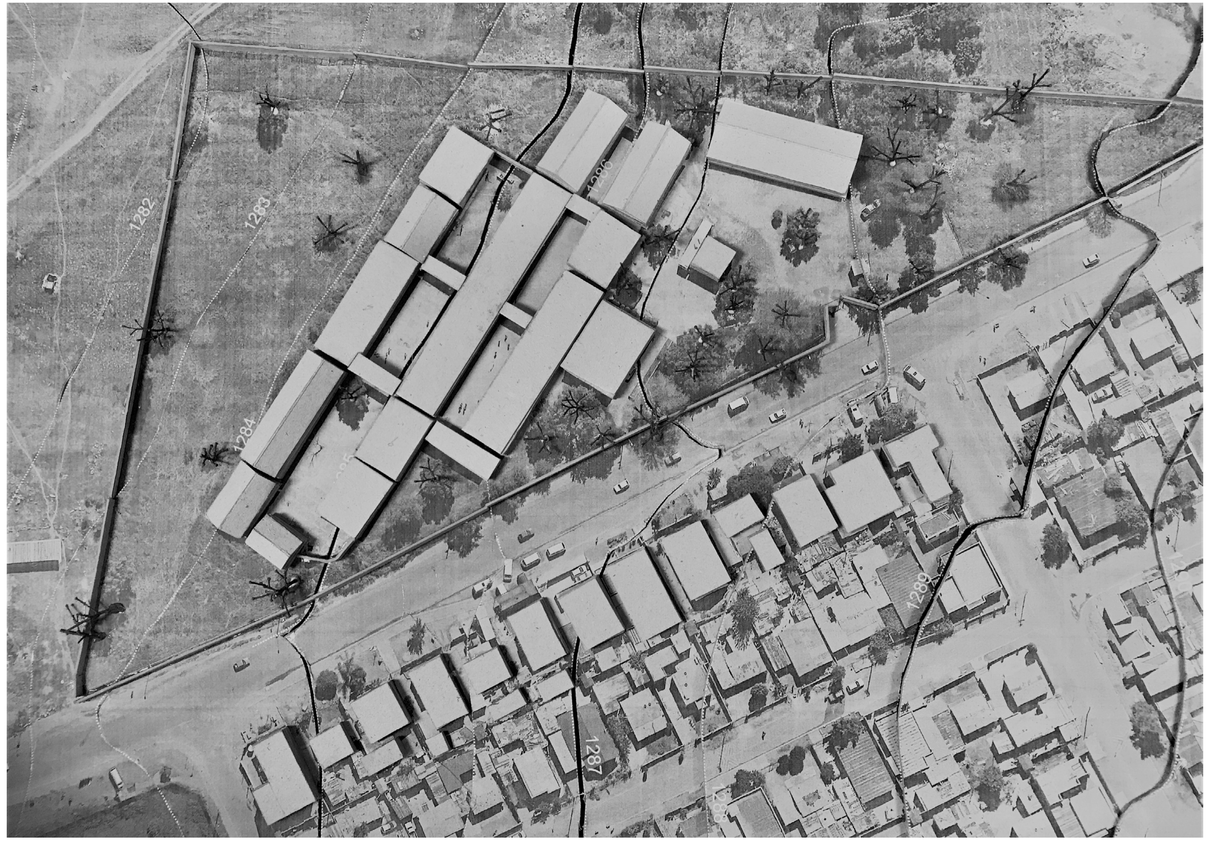


Fig. 03: Site Model photograph of existing school (Author 2020)

ABSTRACT

This dissertation explores the impact of providing platforms for school learners to positively express themselves through multiple educational activities, in turn, developing a collective identity through performance. The existing school typologies in Mamelodi East, Pretoria, are found to hinder such explorative and all-round inclusive activities, resulting in the exclusion of many types of learners. Through a filter of music-making, the architecture of Tsako Thabo Secondary School in Mamelodi East has been assessed to have inadequate spaces and cause a disconnect with the community. Identified through literature, there is an opportunity to investigate the connection between music-making, participation and architecture as a way of transforming both the social and physical aspects of the school and surrounding community.

The proposed intervention networks between existing nodes of music-making. With a focus on the node of Tsako Thabo Secondary School, an expressive architectural language is used to provide platforms for inclusive and adaptable educational and social activities. This language ripples out through the built fabric of the community and creates a sense of identity through the intersection of music and architecture. This dissertation uses participatory research in order to identify real world problems and social agents of change within the community. Furthering participation, co-design methods are used to influence the iterative design process to work beyond the single author limitations and remain contextually and socially relevant throughout. This was largely affected by the COVID-19 pandemic, proving resilience and adaptability for the approach, relevant for current research methodologies.

KEYWORDS

Performance Architecture, Participatory Research, Codesign, Music-making, Positive Self-Expression, Platforms, Social Cohesion, Agents of Change, STEAM Education

01_INTRODUCTION

Fig. 04: Mamelodi collage (Author 2020)

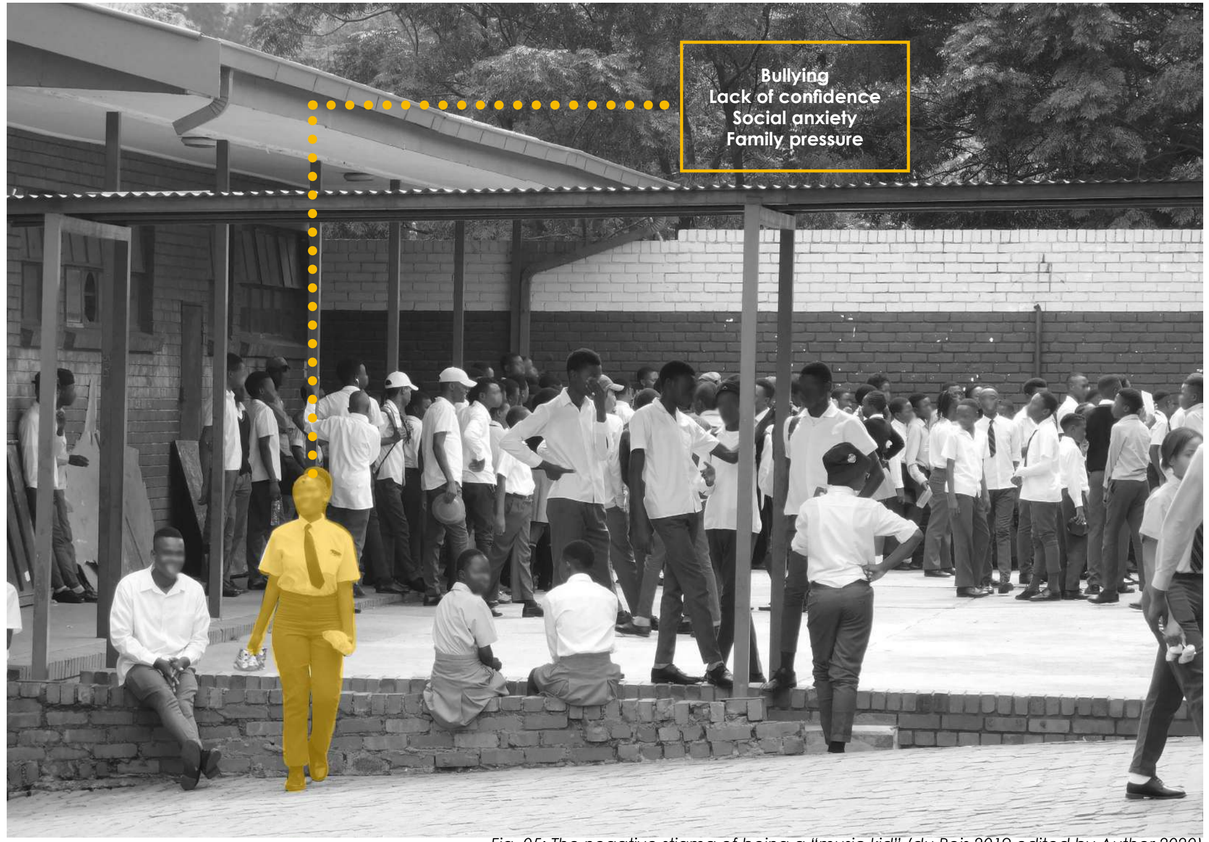


Fig. 05: The negative stigma of being a "music kid" (du Bois 2019 edited by Author 2020)

01_INTRODUCTION

Background to the study

As unpacked in the collaborative Volume One of this dissertation, the Unit for Urban Citizenship (UUC) within the Department of Architecture at the University of Pretoria has many projects active in Mamelodi East, South Africa. This is due to the connection with the Mamelodi Community of Learning Collaborative (MCLC) through Dr. Carin Combrinck. Through this and specifically within the Master's year of 2020, there is a direct link with the postgraduate students and Tsako Thabo Secondary School. Through mapping and participatory workshops, inspired by the works of Nabeel Hamdi (2010) and Jeremy Till (2011), one of the major themes uncovered was music-making.

Over the years of 2019 and 2020, this theme was thoroughly explored, critiqued and mapped out, resulting in the findings of established music schools in the area. These range from conventionally medium scale to much smaller informal learning. A crucial finding from this investigation was that no matter the capacity of the music school, nor the distance between such schools and other institutions where music was subtly evident, there was limited knowledge regarding these institutions to the surrounding community of Mamelodi East and with one another. This, according to Till (2011), can be used as an opportunity for bringing light to what is already there, exposing to the community what underlying potential it has.

Participatory design methodology was used to gain a full hands-on and real-world understanding of the context for the design response to be firmly contextualized. This method was largely interrupted in 2020 and called for much adaptation to the 'conventional' participatory methods due to the COVID-19 worldwide pandemic. This resulted in predominantly online communication and workshopping as South Africa was placed on a nation-wide lockdown. Please refer to Volume One of this dissertation for further explanation of the methodology and responsive adaptations.

Analysing the built form of each music school, it was found that the architecture was hindering the exposure of talent to the community, as well as the qualitative output of music-making in both practicing and performing. For example, classrooms that have been designed and built on a minimum budget have been converted into the music room. However, lack of natural daylighting, ventilation and acoustic consideration immensely affects the quality of learning and actual sound output. Generally, the spaces are small, unsafe, with limited resources and have very little storage for instruments as well. The lack of architectural consideration impacted the learners' abilities to learn and simultaneously the teachers' abilities to teach. From a more psychological and emotional point of view, as well as being thoroughly discussed in the literature, a stigma revolving around 'music kids' was uncovered through personal interviews with school learners (Fig. 05). This includes bullying, lack of confidence, social anxiety and pressure from parents to rather focus on 'real' academic subjects that would create a path for learners to have a stable future career. Once again, these issues provided a positive opportunity instead for music to be used as a platform to develop an identity, social acceptance and to explore future impacts of music through a career-oriented lens (Campbell *et. al* 2007, Firth 1987, Hudak 1999).

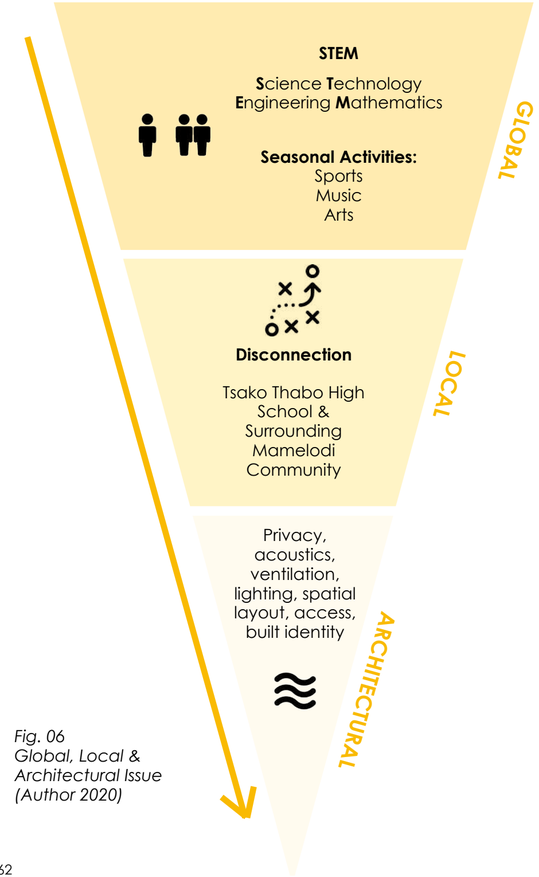


Fig. 06
Global, Local & Architectural Issue (Author 2020)

Informed by literature, case studies and previous theses done within the same context of Mamelodi East, the initial design response of a single, all-encompassing, large scale music school and performance venue shifted concerning the existing anchor institutions obviously in need of connection and belonging within a larger music network. As many networking theorists have explored, grouping together individual elements to make up larger entities results in far greater successes than those of the individual parts (Augustyn 2018, Castells 2011, Kozikoglu & Cebi 2015, Sahyouni 2014). The designing of a network for inevitable change and development over time can enhance the eventual intervention's overall design of this proposal. This responds well to the inherent dynamic form of a network (Kozikoglu & Cebi 2015). Not only networking through communication and organizations, but the relationship between networking and architecture is also a natural response as architecture ultimately relies on the design of configurations, relations of forms and elements with one another and interrelated spatial units (Do & Gross 2001).

Concluding the findings, the issues were summarized into the following (Fig. 06): globally, there is a stigma and underappreciation of the inclusion of music in a child's life, where the focus is usually on science and mathematics to provide the opportunity for a successful career. Locally, in Mamelodi East, there is a disconnection between the existing music schools themselves as well as with the surrounding community. The architectural issue present is the lack of resources and design considerations within these identified schools. These range from privacy to acoustics, ventilation to lighting, spatial layout, access and building identity.

Aims and objectives

The project critiques the existing school typologies in Mamelodi East in terms of inclusive and alternative education by providing an example through the efforts of music-making and performance. Connecting schools with the surrounding community through a music network provides an international opportunity for collaboration and support with UNESCO's *Creative Cities of Music* (Wall 2020). This creates an incentive for solidifying Mamelodi East's identity through the expression of her musical heritage roots and a desire to maintain and uplift the community.

Main Research Question

How can the decentralization of music-making provide a platform for positive self-expression for school learners, enhancing the collective community identity of Mamelodi East?

Secondary Research Questions

- How can the intersection of music and architecture fundamentally uplift the educational ecosystem?
- How can architecture assist the interrelation between music and education institutions with the surrounding community for overall empowerment?
- How can collaboration with the end user provide a platform for community development and intervention success overtime?

Fig. 07: Photograph of site model of proposed design (Author 2020)

Methodology

This research uses an interpretivist paradigm, collecting qualitative data sets. Interpretivism provides the opportunity for representation of real-world user views and perspectives, dealing with contextualized and local issues. Qualitative data sets collected contribute to the existing social ideas that help explain certain human events and pattern behaviours (Merriam 2009, Yin 2011). The data is analysed using Robert Yin's (2011) qualitative data analysis methodology through a process of iterative stages to identify trends or contradictions that add to the value and credibility of the research (Yin 2011).

The following methods have been used to develop a contextually, socially and culturally relevant framework and design response.

- Personal investigation: The researcher undertook multiple transect walks (Hamdi 2010) through the community of Mamelodi East, observing and talking to different passers-by each time throughout 2019 and 2020. This method set certain individual foundations and provided the researcher with the basic contextual lens for the project.
- Participatory Research: This process actively engages with users of the context in the field through interviews and observations about Mamelodi East, with a focus on music, education and collective identity. This was largely done using the *UkuDoba Method*, developed through collaboration by the researcher with other like-minded students & professors. The *UkuDoba Method* is outlined in Volume One of this dissertation.
- Desktop Research: This research was done to provide a comparison for the data collected in the field. This not only includes literature, but quantitative and qualitative data about the specific context and surrounding area.
- Co-design Workshops: As a part of participation, co-design workshops were done to remain relevant throughout the design process, removing the limitations of single authorship and collaborating with users and professionals across dimensions (e.g. programme, acoustics, social inclusion, etc.) to ensure well-rounded and pertinent design considerations.

(Top) Fig. 08: Transect Walk Through Mamelodi (Hendrikse 2020)
(Middle) Fig. 09: Participatory Research (Herbst 2020)
(Bottom) Fig. 10: UkuDoba Investigation (Author 2020)

Limitations

This research-led design project is intended to be implemented in three stages, following Nabeel Hamdi's (2010:67) concept of "now, soon, later". This is done to allow small changes in dealing with specific issues over time. The *now* and *soon* stage of this project is small scale implementations that can be put into effect by the direct community members and stakeholders. These are seen as precedents for enablement and empowerment and used as evidence of its success when asking for funding and resources for the implementation of the *later* stage. The *later* stage is a much larger, more complex scale that would only be implemented once the need arises. It requires council approval and funding from stakeholders or outside donors. The design focus for this dissertation will be on this *later* stage implemented at Tsako Thabo Secondary School. It is important to note that the design is not a music school, but an inclusive celebration of identity, expression and performance across many aspects of a growing child's life, from music, academics and sport, to nutrition and everyday life.

Fig. 11: Participatory Research in Mamelodi (Author 2020)

02_INFORMANTS I: THE NETWORKED NARRATIVE

Fig. 12: Desktop research during the STINT workshop (Original photo Naidoo 2020, edited by Author 2020)

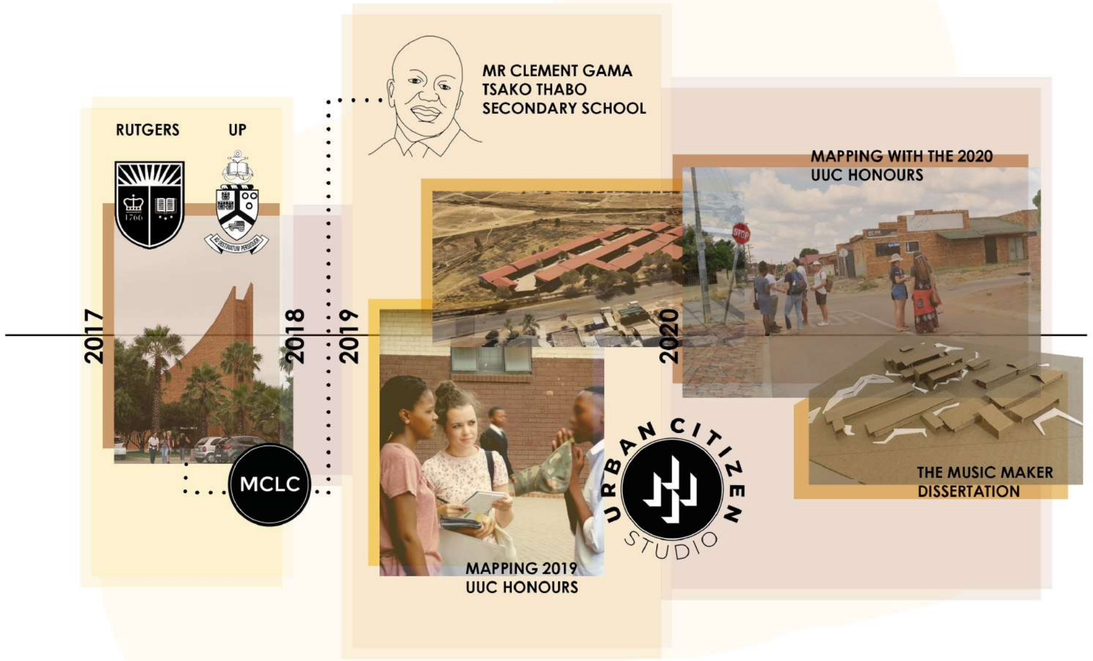


Fig. 13: Narrative timeline (Author 2020)

02_INFORMANTS I: THE NETWORKED NARRATIVE

Introduction

This chapter provides the background context for the dissertation. It is written through the personal development of the topic, summarizing each layer of the overall foundation from both a macro and micro scale. Ultimately, this chapter leads to the problem statement that addresses the research question.

Background

The narrative begins before this 2020 year of the dissertation. In 2017, the collaborative effort between Rutgers University-Newark and the University of Pretoria was awarded an official title for their multiple anchor institution strategies that had been implemented over the years since 2008 (Ogude 2019). These strategies shared common upliftment goals for disadvantaged communities like Newark (USA) and Mamelodi (South Africa). This initiative is called the Community of Learning Collaborative. A major member of the Mamelodi Community of Learning Collaborative is Mr. Clement Gama, the principal of the severely underprivileged secondary school, Tsako Thabo (Honours 2019). The principal joined the collaboration to help make a change in his community and find ways to uplift the lives of his learners. In 2019, the Honours group of the Unit for Urban Citizenship studio qualitatively mapped and uncovered some significant themes in detail within Tsako Thabo Secondary School and its surroundings in Mamelodi East. One of these themes was music in education.

Fig. 14: View of Mamelodi East from the Mothong Heritage Site (Author 2020)

Music in Mamelodi: A History

Mamelodi itself has a long-standing history of music, specifically the jazz culture of the older generations (SA History 2019). Well known jazz artists, like Philip Tabane, were born and raised in this culturally rich community. In fact, music is ingrained in *Mamelodi*. The very name of the township translates to 'Mother of Melodies', stemming from two different cultural stories: colonialist and local (Iwan 2016, Roue 2017, Sosibo 2018, Interview with Alfred Lithuli 2019).

Colonialist Mamelodi: 'Mamelodi', a name given to the then current white president of South Africa, Paul Kruger, by the local residents of Vlakfontein farm. He was given this name as he had an innate ability to imitate and whistle a wide variety of bird sounds.

Local Mamelodi: during the apartheid years, there was much oppression from the white government, causing black citizens to be fearful for their lives. The people living on Vlakfontein farm (nowadays Mamelodi) fled to the caves hidden in the Magaliesberg mountain range, surrounding the farm. As a signal for when the police were coming, the community members would make sounds with traditional instruments as a warning for their fellow citizens. The melodies created were what inspired the name 'Mamelodi'.

2019 Findings

Through engaging transect walks and fascinating conversations with some of the local citizens in Mamelodi East in 2019, it was uncovered that some musical activities occurred in the community. Please see **figures 26 and 27** in Volume One for the existing cultural aspects mapped in 2019. This ranged from live performances in taverns to church choirs to the largest annual jazz tribute concert at Moretele Park that everyone in Mamelodi and beyond looks forward to.

Within the school itself, there existed an after-school choir that met up to practise once a week. This was led by the art teacher at the time. When interviewing some of the learners that participated in the choir practices, it was found that there was a lot of stigma and bullying around the activity. This predominantly occurred from those who were not a part of the choir and ultimately caused the choristers to feel embarrassed or too shy to perform or sing elsewhere outside the comfort of the group choir.

This, however, did not apply to one specific learner with a passion for sharing his musical abilities (Fig. 15). **Thula*** was first introduced to music-making when he snuck into the worship team practice at his local church. The lead guitarist and singer spotted him and introduced him to the musical world. The worship leader taught him to play the guitar in his own free time, then the drums and the beginning of keys. From there, Thula took his guitar to school with him and practised passionately during lunch breaks. Other students came to watch, and he offered them lessons free of charge. The art teacher (and choir conductor) noticed his passion and ability and offered to teach him how to read and write sheet music. Thula started writing his own songs and taught these to his fellow school learners as well. His dreams were of starting his own school band, then moving on to studying music at university and learning all the instruments available to him. Thula sub-consciously became a **network actor.**

The formal and informal musical activities in and around Tsako Thabo Secondary School and the community are seemingly disconnected (Author 2019), but they open up the opportunity for a potential relationship through music, with Tsako Thabo being the anchor institution.

This theme connected well with the Educational Ecosystem topic, unpacked fully in Volume One of this dissertation, for the project as music is a valuable addition to a child's life, both academically and psychologically. It is a positive outlet for expression and helps create a sense of belonging, adding confidence in a child's identity (Eisner 2002, Campbell *et. al* 2007, Hodges and O'Connell 2013, Roue 2017).

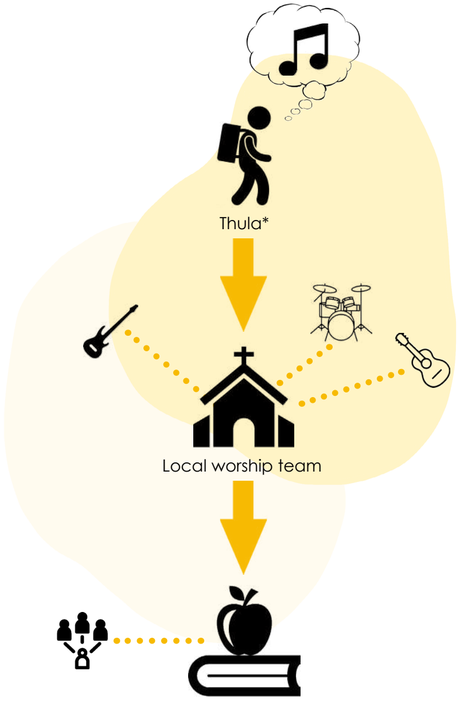


Fig. 15: Thula's Story (Author 2020)

Network Actor: as a part of the Actor Network Theory (ANT), an individual becomes an actant when they share an action with others, creating an interrelation between lives through shifting networks of relationships (Bencherki 2017).

**Name changed for anonymity*

Fig. 16: Music identified in Mamelodi (Author 2020)

2020 Findings

In 2020, further mapping and exploration of Tsako Thabo Secondary School and surrounding Mamelodi were conducted as a test for the *UkuDoba Method* (*see Dissertation: Volume One*). This resulted in the uncovering of a much larger yet still individualized musical community than was initially found (Fig. 16). Within the community there are formalized music schools within a 4km travel distance from the initially investigated school, Tsako Thabo; one being a mere 800m down the road. An important and highly influential piece of information uncovered through interviews and engagement with these music schools is that each music school, along with many aspiring musicians in Mamelodi, do not know about each other. There is a complete sense of isolation, yet a great opportunity for networking through engagement.

Within Tsako Thabo, musical opportunities seemed to have changed over the last year of investigation. The choir was disbanded in June 2019 due to the performance season having come to an end. In February 2020, however, a community member from the *Peaceful Boys Choir* approached Tsako Thabo and offered his free services to start a choir from scratch (Interview with Jacob 2020). This only cements how flexible and adaptable townships like Mamelodi are: constantly changing, growing and shifting in relationships.

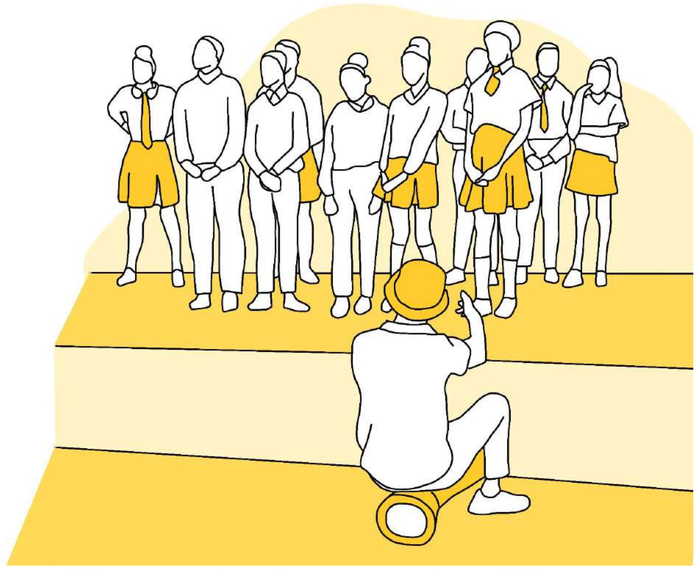


Fig. 17: 2020 Tsako Thabo School Choir led by Jacob (Author 2020)

Developing a Music Network

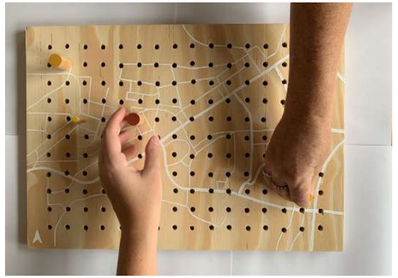
From the foreshadowing of Thula's mini music network within his school, the solid and active nodes of the establishment of the music schools in the community and the already existing historical and cultural homage for music in Mamelodi, the initial concept of design needed to be adapted. An all-inclusive, multi-functional and expensive music centre on the site of Tsako Thabo would no longer be effective for connecting the school with the surrounding community and uplifting the school as a whole. The opportunity presented was far richer.

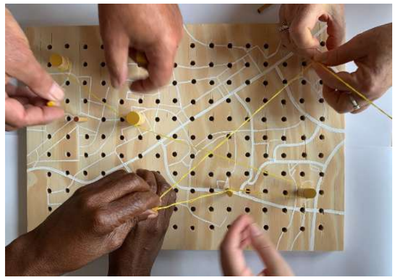
According to Awan *et. al* (2011), networking, and especially when using networking as a social innovator, exposes the limitations of the existing individual participant's power. However, linking them and merging common interests and goals results in a "substantial force that can fundamentally alter the direction of an event" (Awan *et. al* 2011:77). In Mamelodi, it was only a matter of uncovering what was existing and already working to expose the underlying potential to the community.

Initially, the design intention for this project was a single elaborate building with a typical focus on the visual and temporal (Awan *et. al* 2011), however, after the participatory research findings, it was adapted to a complex and contextually rich architectural network with music as its focus. Spanning across sites, scales and programmes, the proposed Mamelodi Music Network is designed and maintained by the connected community members to result in a more successful intervention due to a sense of ownership (Ehn 1993, Sanoff 2011). The network's entirety will be examined for the remainder of this dissertation, scaling into individual nodes and their connections with one another.

Problem Statement

Within the disadvantaged community of Mamelodi East, there is a wide variety of potential for upliftment and formation of collective community identity. The potential focused on this research is that of music. The existing extra-curricular music elements in the community are small and isolated from both one another and the surrounding community but are in controlled and supportive settings. The perception of musical experiences by most of the community is generalised to music being a vehicle for negative influences on the psyche of young developing school learners (Honours 2019). The music referred to here is that of parties, large events in the park, and the brawly life of music associated with alcohol consumption at the local shebeens and clubs. These experiences are closely related to substance abuse, crime and negative role models for children (Honours 2019). Exposing and emphasizing the positive music anchor institutions creates an opportunity for a better understanding of the positive aspects of the musical culture such as connection, collaboration and upliftment, a platform for positive self-expression.





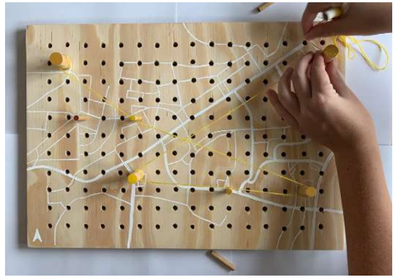
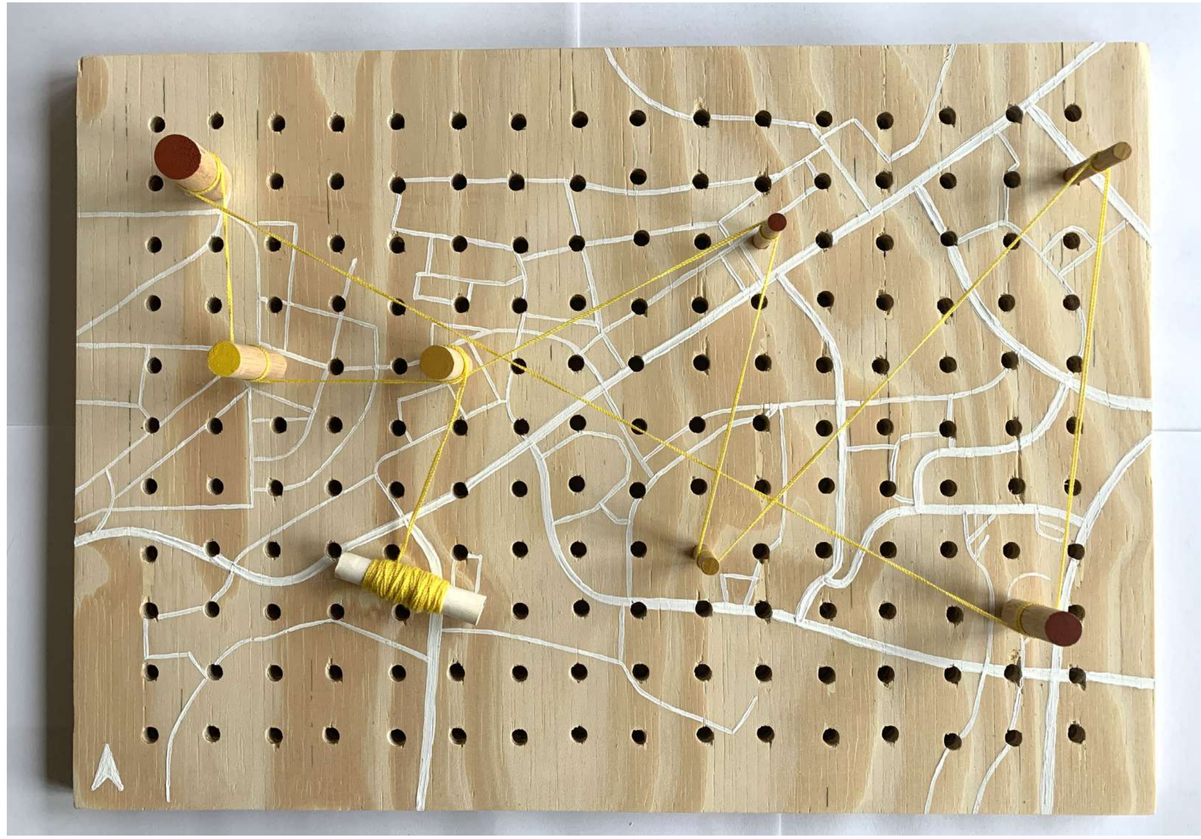


Fig. 18: Network peg board developed as the Touchstone for Milestone 1 in March intended to be used as an interactive way of showing the development and change of the proposed Music Network overtime (Author 2020)



2019: Introduction to UUC

In 2019, the researcher was exposed to the Unit for Urban Citizenship (UUC) through the chosen studio project, Community Action Planning, running from 8 February to 3 April 2019 and led by Dr. Carin Combrinck. This led to working within the community of Mamelodi East, Pretoria, and the Tsako Thabo Secondary School. For more information about the background of the UUC and the type of work done through the unit, please refer to Volume One of this dissertation.

2019: Mapping in Mamelodi

After an introduction to Tsako Thabo and other schools in Mamelodi East during the researchers' first immersion walk on 14 February 2019, the cultural aspects sparked an interest. This resonated with the researcher who is a musician as well. Starting with desktop research, specifically focusing on the cultural aspects of Mamelodi, in general, it was found that Mamelodi had a rich musical heritage as well as some dance groups. However, there was not a significant amount of information provided through this initial desktop research.

From the following transect walk on 19 February 2019, this time experienced through a more focused musical lens, the researcher uncovered far more cultural aspects within Mamelodi than what was available through the desktop research. From annual jazz concerts in Moretele Park to the local *shebeen* to community member's interests (or lack thereof) in learning and listening to music. There was a niche to be unpacked.

2019: Tsako Thabo Mapping

Working back within Tsako Thabo Secondary School in Mamelodi East, the researcher yearned to uncover more about the existing music and culture beyond the surface. On 21 February 2019, the group of Honours students spread out into the classrooms, courtyards and offices within the school, uncovering and diving deeper into their explorations of their chosen themes. From the cultural aspect, it was found that the high school learners loved the idea of entertainment far more than standard education. Teachers, such as Mr. Alfred Lithuli, tried to incorporate this into lessons to better engage the learners. Learners would experience Life Orientation lessons and History through dance, rhythmic clapping and song, all done in a group. Much to the researcher's delight, there was an existing school choir. This was led by the art teacher at the time in after school sessions. Most choir members of the school that the researcher engaged with said they did enjoy singing in the choir, but not as much as they wanted to. This was due to the apparent lack of inspiration from the teacher and bullying from other learners who were not a part of the choir. Most students, unclear of their involvement with the choir, described how they love music, specifically the Deep House type, but mostly listened to it using their phone applications.

After studio sessions, additional theoretical research and reflection, another visit was paid to Tsako Thabo Secondary School. This visit, in hindsight, would turn out to be the inspiration for this mini dissertation. On 5 March 2019, the Honours group once again worked within the school. Each researcher had identified their necessary theme and narrowed it down immensely. The cultural theme focused specifically on the musical activities within the school and its connection to similar musical activities in the surrounding area. It was found that learners who participated in the school choir also had experience with singing in their respective gospel choirs. There was also mention of choir competitions with other schools that happen at the end of the choir season. The researcher then met a young boy named Thula*. His story inspired those around him and the musical culture within the school, ultimately grounding the concept for a musical network, using the school as an anchor institution. This would later be expanded on by the researcher in the further exploration of the Mother of Melodies community in 2020.

As a summary from the initial community mapping of Tsako Thabo Secondary School and surrounding Mamelodi East, it was clear that there was once a rich culture of music, but this was no longer as celebrated and open as it was in the past.

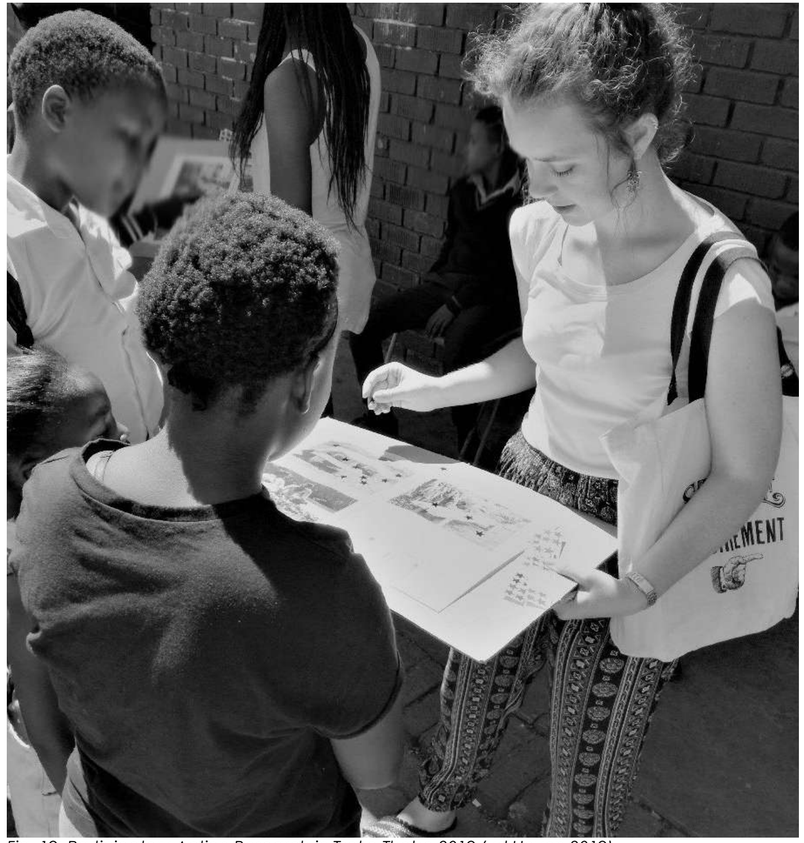


Fig. 19: Participatory Action Research in Tsako Thabo 2019 (vd Hoven 2019)

2019: Participatory Design Workshops (PDW)

Following the research done in the first studio group, the researcher continued the project into the second studio of the UUC: Co-design. This studio was run from 8 April to 30 May 2019, led again by Dr. Carin Combrinck. This studio intended to work even closer with selected participants to co-design aspects or the entirety of Tsako Thabo school through the chosen theme. This studio focused a lot more on the process of participation than the outcome of the design.

Each workshop was designed and organized by the researcher before it was implemented at the school. Necessary equipment, materials and ethics were all organized beforehand to ensure a smooth running on site. As Pirjo Friedrich (2013) stated, face-to-face sessions are fantastic in building relationships with participants, but limited due to time and place. In Tsako Thabo, the researchers could only work during the lunch break so as not to disrupt the learners' education. This posed its own challenges as there were constantly many on-lookers laughing or jeering or wanting to participate as well, resulting in the session becoming quite rowdy and often overwhelming for the individual researcher.

Before designing the workshops, it is necessary to identify what the expected outcome is (Simonsen & Robertson 2013). This can be influenced by similar precedents or theoretical research as well as being influenced by previous engagements with the participants, but ultimately assists in the qualitative analysis thereafter (Yin 2011).

PDW 1

Friday
26 April 2019

Tsako Thabo
Secondary School

AM
11h30-12h30

± 12 participants

Acoustics, volume & materiality

Workshop 1: Acoustics

This workshop was designed to help the participants understand the idea of acoustics, volume and materiality within a space. Long term, the participants would remember these considerations when co-designing music spaces within their school. Certain spaces were selected by the researchers that were vastly different from one another in terms of materiality, openings, pedestrian traffic and overall volume (Konstantinou & van der Hoven 2019). These included a classroom, outdoor courtyard, school hall, under the trees and in a narrow corridor. The participants were then asked to sing the same song they all knew in each different space and reflect on how the space impacts their sound. Additionally, glass jars and wooden chopsticks were handed to some students for improvised music-making, which also inspired dancing, clapping and stomping in certain spaces.

We started in the school hall, however there were many other children there making a lot of noise and resulting in the students being very shy and concerned about being laughed at. After much persuasion, we moved on to the computer classroom which was empty except for furniture. The students ensured the door was kept closed but were happy to sing and even enjoyed it. One boy started drumming on a chair and that inspired us to pass around the glass jars and chopsticks. The group fell into a joyous rhythm and made music and song together. Moving outside to the courtyard, once again the participants were unhappy to express themselves in front of other students' prying eyes. So instead we moved around the front of the school, to a quiet grassy patch under a tree. The music process was repeated. In reflection, the students decided this space was the best one as the air was fresh, the space was free, there was shade and no one else could see or hear them. The final space we moved to was within a narrow corridor between two classrooms. This space was covered by exposed corrugated roof sheeting and had a decent amount of staff traffic. Once again, the students were uncomfortable and pushed themselves up against the walls on either side. Reflecting on this session, the students described their sound as if they were singing inside the glass jars they were holding.

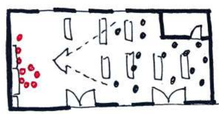
(Personal notes made by the researcher 26 April 2019)

IMPACT ON THE FOLLOWING WORKSHOP:
Initially the next workshop was going to analyse light. However, it was important for the researcher and participants to continue the impacts of space on acoustics and performance. These two conclusion were drawn:

- Space impacts the performance
- Participants impact the space

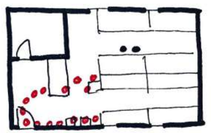
ART CLASSROOM

Large open space
Other students -- noisy & embarrassing
Singing: stood in a very tight circle so others could not hear or see what they were doing.



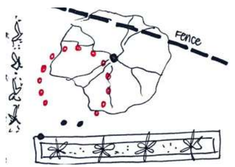
COMPUTER CLASSROOM

Smaller space, quieter
Door closed muted noise from courtyard
More furniture, curtains, painted walls, lower ceiling



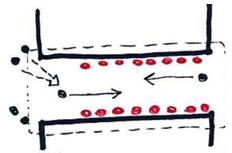
OUTSIDE - UNDER THE TREE

Away from other students
Open space, fresh air, quiet, shade
Participants sang louder and started dancing



CORRIDOR SPACE

Small space, open on either side with tall tin roof.
Uncomfortable - watchers
Sang softer and more reserved.
"Like singing in the glass jar"



(Top) Fig. 20: Images taken during Participatory Research Workshop 1 (Author 2019).
(Bottom) Fig. 21: Sketch diagrams made on site to note how the participants used the space (Author 2019).

PDW 2

Monday
29 April 2019

Tsako Thabo
Secondary School

AM
11h30-12h00

11 participants

Spatial layout, tangible/intangible space

Workshop 2: Role Play

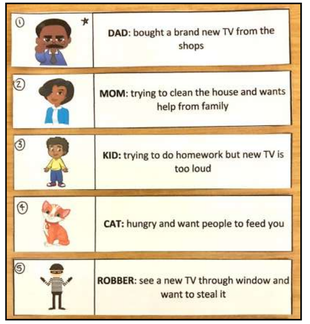
Workshop Two was initially planned to experiment with natural lighting in different spaces. However, the researcher identified that the participants understood the concept of needing light and open space to make music successfully during the first workshop. Therefore, the workshop design was reconsidered before the second session. The aim of Workshop Two was to test the boundaries of intangible space. This was used to identify how spatially analytical the participants would be for the co-design session in the following weeks. The workshop was created to be a role-play of specifically designed scenarios. Two different scenarios were set up, one with a tangible object around which space is focused, and the other in which no spatial aspects are attached to the object. Each participant drew characters from a hat, keeping their identity a secret from the onlookers and other actors within their group. Each character had a description of the action they were doing. No voices or sounds were allowed, encouraging participants to rather use their bodies and the space around them to express their specific character. Slowly, one by one each character was introduced to the scene, joining the previous actor "on stage", working up to a full charades performance. The tangible object used was a large cardboard box.

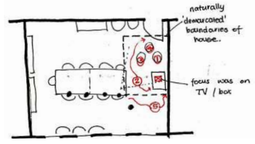
Scenario 1: A family watching TV, while a robber breaks into the house.
The box represented the TV in this scenario and was introduced in the beginning of the scene. Each character was a different family member with different roles (e.g. doing homework, cleaning the house, watching the TV and a cat wanting to be fed). Each character tried to communicate with one another but ultimately ended up congregating around the "TV". When the robber character was introduced, she could clearly identify the boundaries of the house through the way the previous characters had moved around. The whole group initiated small movements and stayed within a certain imaginary box within the overall space.

Scenario 2: A furniture shop, a villain with a bomb, a police officer and a superhero.
The box represented the bomb and was only introduced to the scene when the villain brought it in later. It's valuable to note that only the villain character knew what the box represented. The customer of the furniture shop defined the initial space by moving around and "trying out" all the furniture. The villain used that space and hid the "bomb" under a chair, then proceeded to act normal in the shop. The police officer tried to get the customers out of the shop, not knowing that one of them was the villain. The villain thought she was being arrested, so much chaos happened. Lastly, the superhero ran into the space, and in true hero fashion, identified the "bomb" and catapulted it across the entire room, breaking all intangible spatial boundaries.

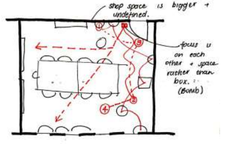
(Personal notes made by the researcher 29 April 2019)

SCENARIO ONE





SCENARIO TWO



(Top) Fig. 22: Images taken during workshop (Author 2019)
(Middle) Fig. 23: Character profiles with brief description (Author 2019)
(Bottom) Fig. 24: Sketch diagram showing usage of space (Author 2019)

PDW 3

Tuesday
30 April 2019

Tsako Thabo
Secondary School

AM
11h30-12h30

± 13 participants

Important qualities of a music space

Workshop 3: Group Sketch

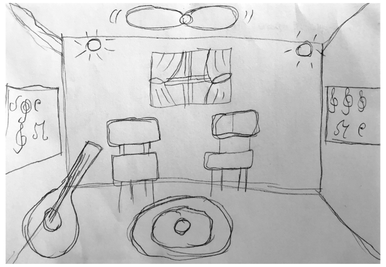
The expectation for this workshop was to start co-designing on paper the ideas for a space specific for music-making. The concepts sketched could be as dream-like or outrageous as needed. To inspire the participant beyond simply four walls, the researcher displayed images of some precedents. The first being the acoustically successful Danish Music Museum by Adept Architects (2001) and the second being the slightly less successful local renovation of the Afrikaanse Hoër Seunskool Kunste Kampus (Afrikaans High Boys School Art Campus) done by Matthews and Associates (2015). This purpose was to inspire thinking amongst participants regarding what type of spaces are good for music and which are not.

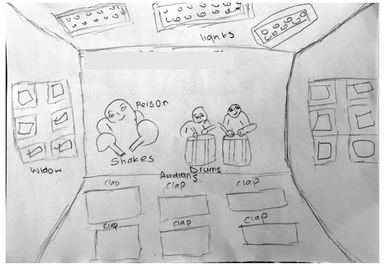
	INDOORS	OUTDOORS
Seating	Minimum: one for teacher and one for student.	Singular (student seating only).
Ventilation	Windows and fans: need for fresh air/ circulation (anticipates heat)	Under the trees for fresh air and a breeze (circulation).
Lighting	Some artificial (fluorescent as in existing classrooms).	Natural lighting.
Space	Simple box classroom.	Space to self; open.
Levels	Performance spaces stepped up (stairs – similar resemblance to existing stage in school hall).	None.
Interaction with others	Some, but not much (a few spaces for audience members).	None (alone).

Table 1: qualitative organization of different elements shown within the collective group of drawings.

I worked with a much larger group this time (more than 13 children), some who had been in all the previous workshops, others were new. We moved tables outside under the trees to a quiet place to work. We first discussed music spaces and related it back to the previous workshops. I then showed them pictures of the two precedents and asked for some feedback. They simply agreed with my description instead of providing their own ideas (I do not think they were very interested). I passed around A5 sheets of paper and ten pencils and explained the task. Some had to share pencils and desks, others leaned on their friends' backs for a harder surface to draw on. Looking at the data received (sketches and explanations) less than half of the group understood the task properly, sketching their dream music spaces. Others simply drew what they knew (a room with four walls, windows and some chairs).

(Personal notes made by the researcher 30 April 2019)





Analysing the drawings done by the high-school participants, there is a clear understanding of the spaces in terms of what each participant has experienced in their real-world life. This is analysed through the confidence of the lines drawn (Morra 2008). In some cases, the entire drawing is done with solid, confident lines. In others, most of the space depicted is confident, but when it comes to the instruments and the spaces directly around them, i.e. how the participant interprets the space to be used by the musician, the lines become shaky and faint, suggesting discomfort and unsure depictions of the space.

(First column) Fig. 25: Photographs taken on site during the sketching workshop (Author 2019)
(Second & third column) Fig. 26: Original sketches done by the participants (Author 2019)

PDW 4

Monday
13 May 2019

Tsako Thabo
Secondary School

AM
11h30-12h30

± 10 participants

Programme layout and hierarchy

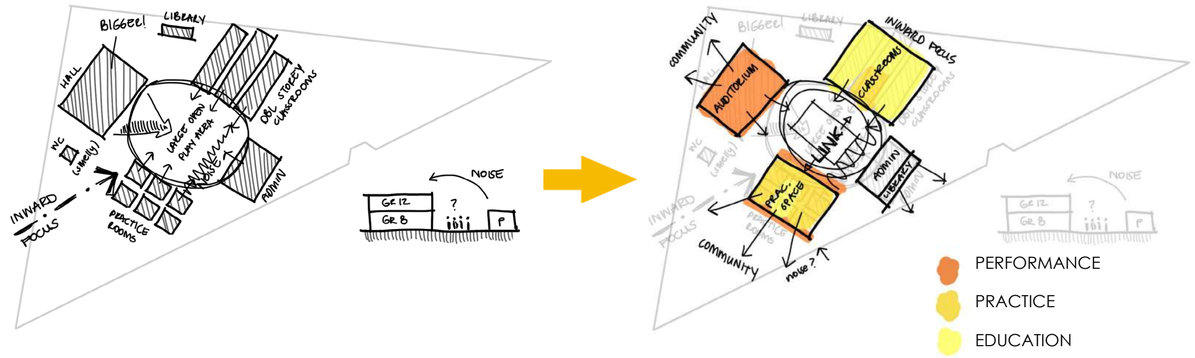
Workshop 4: Group Model

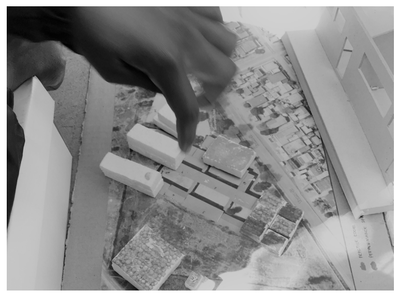
This workshop aimed at defining hierarchy within the school using the existing school programs and arrangement. The workshop was set out using moveable massing pieces of each existing space in the school (e.g. hall, classrooms, bathrooms, staff area, etc.) that were accurately scaled, and colour coded according to programme. The model pieces were laid out on the aerial view of the school printed on a flat base. Additional massing pieces were cut out, intended for new programmes or a variety of sizes for adaptation to the existing.

Once again, I worked with about ten children. They were quiet and ready to work at the beginning of the session but got rowdier as the workshop went on. The participants enjoyed the massing model workshop and passionately deliberated amongst each other. There was a slight language barrier when deliberations occurred so I could not understand all their reasoning throughout. Some concerns that the children brought up in reflection were: noise between classrooms, smell from the bathrooms, big play area that can also be used for outdoor performances, hall at complete opposite end of the school (away from the road), double storey classrooms with ramps all grouped together and not separated, music spaces away from other classrooms and courtyards.

(Personal notes made by the researcher 13 May 2019)

HIERARCHY SKETCH | **PROGRAMME SKETCH**





(Top) Fig. 27: Sketch diagrams showing findings & analysis from workshop 4 (Author 2019)
(Bottom) Fig. 28: Photographs during the model building workshop (Author 2019)

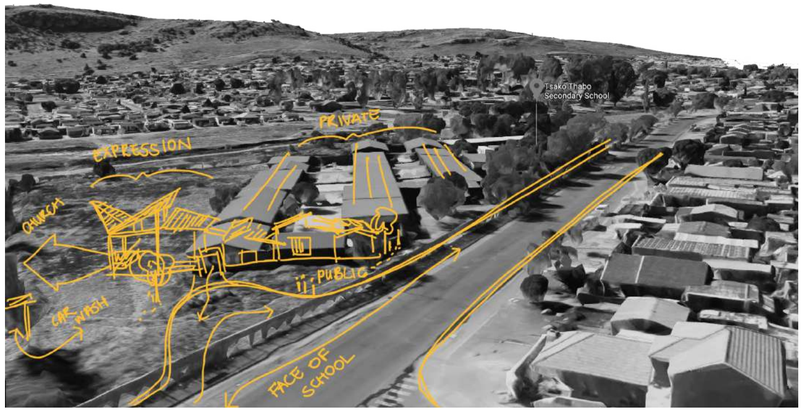


Fig. 29: Honours co-design concept sketch (Author 2019)

2019: Participatory Workshops Reflection

As an overall reflection on the workshops completed at Tsako Thabo Secondary School, it was found that most of the children who were involved with the arts, in one form or the other, understood certain spatial requirements for such activities. This assisted with their own reflection and provided a basis to follow when analysing the spaces within the existing school environment. This included aspects such as lighting, natural ventilation, materiality, volume, spatial layout, etc. The same participants who were involved with music or other cultural activities were also far more creative when using a space for different activities than its programme or designing their dream space. It was found they could think beyond the known and apply their own imagination in logical ways. Compared to the students who were not exposed to any form of cultural activity, they simply depicted what they see in their everyday surroundings with little to no input or critique of their own.

In terms of spatial hierarchy of the school and through the numerous conversations with the participants throughout the studio, the school hall was at the centre of the debate. It was seen as the most important aspect by both the participants with musical background and those without, however failing as an option in its current state and location.

Summary of Participatory Findings

Through the 2019 participatory workshops, a few similarities were found, specifically when it came to design consideration. The participants had a great understanding of acoustic concerns, not the way spaces should be designed but more in terms of placement and sound as a disturbance to other programmes on the site. This led to the repetitive design of separating music spaces from classrooms, as well as moving the hall to the end of the site. The hall layout was also in response to hierarchical ideas as well as the journey of moving through the school to get to the main hall. Similarly, performance spaces were elevated above other programmes in terms of hierarchy. This ran as a common idea throughout all the workshops; however, the minor music spaces fell to the lower end of the food chain. This was due to the participants being immensely concerned about onlookers and bullying during practice sessions. Comparing this concern with the topic of music as a positive platform for expression, the contradiction is plain. Perhaps this is due to the current way music is perceived in the school, reflecting only on what the participants know and understand in their real-world, rather than what possibilities they could imagine.

There was also a very intriguing result regarding spatial and social gatherings around tangible or intangible objects. This relays back to the idea of formal and informal activities, specifically with regard to engagement and music-making. Spaces can be appropriated irrelevant to their pre-existing function or quality, providing the opportunity for heightened use of imagination, as is typical of children. This was also complemented by the creative use of objects and spatial qualities as ways of making rhythmic sounds. In hindsight, this creativity was very evident through the work and comments produced by students that were involved in the arts, whether it be dance, choir or music-making when compared to those who weren't. This encourages the positive influence of STEAM (Science Technology Engineering Arts Mathematics) education versus the slightly more limited STEM (Science Technology Engineering Mathematics) education. As unpacked thoroughly in Volume One of this dissertation, the advantage of STEAM education allows for learners to be critical and analytical, while recognizing the personal, social and cultural potentials of what they are doing (Pienaar 2017). This topic of STEAM education is taken further into the design of this project.

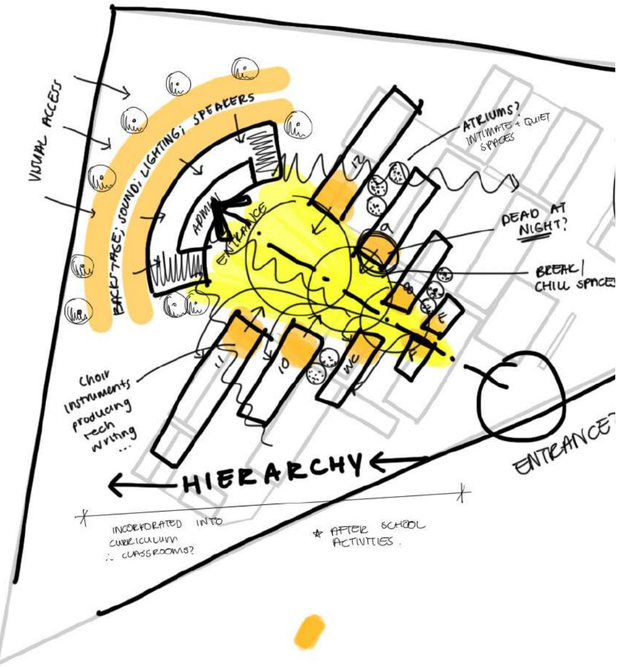


Fig. 30: Visual representation of participatory workshop findings (Author 2019)

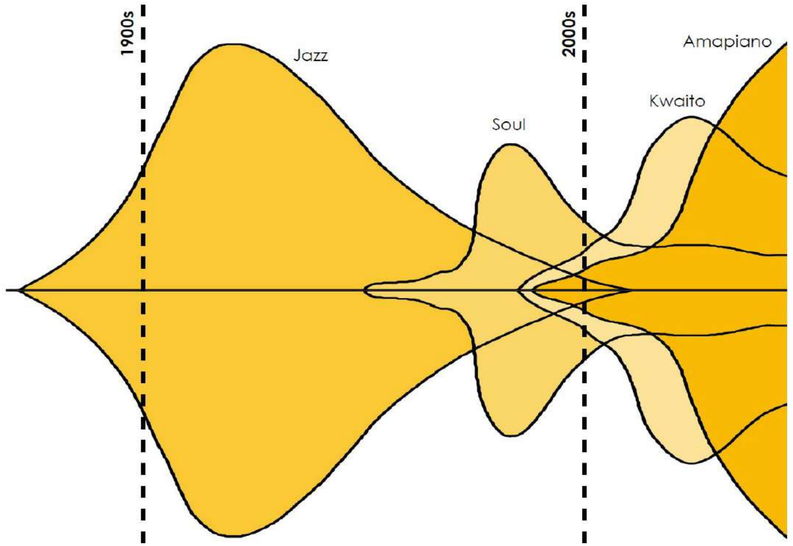


Fig. 31: The Rise and Fall of Music Genre Popularity in Mamelodi (Author 2020)

2020: Mapping in Mamelodi

The researcher continued in Mamelodi East in January of 2020. This was done as a part of the NRF/ STINT research project: *Stitching the City,* a collaborative effort between the Chalmers University of Technology in Gothenburg, Sweden, and the University of Pretoria, South Africa. The project was implemented in the field, using the developed *UkuDoba Method* to collect qualitative data samples that can be used to explain the emerging trends and patterns within the context of Mamelodi East. More about this project has been detailed in Volume One of this dissertation.

This research continued with the UUC Honours Studio of 2020, formulating interviews and transect walks to find information about the musical culture in the community that could be added to or compared to the information uncovered in 2019. The research was done both in the surrounding community and within Tsako Thabo Secondary School. It was confirmed that the culture of music was still largely disconnected within the community and the school. Members of the community that engaged in conversation with the researchers expressed their love and appreciation for music (whether it be different genres, music-making or mere appreciation) and thought it a very useful aspect of a child's academic and psychological development.

An interesting finding through participatory research was that of the development of a music genre called *AmaPiano*. During a transect walk on the 20th of February 2020, the researcher, along with a group of UUC Honours students were attracted to a make-shift tuckshop just down the road from Tsako Thabo Secondary School. Here, a group of young adult boys were dancing and "vibing" (Interview with the tuckshop boys 2020) to a very loud, *kwaito* mixed with house music, with a slight jazz undertone, coming from a nearby speaker. This is known as *AmaPiano*. Originally developed in South African townships, this genre was quickly spread across the country, between townships and music fanatics through low quality music sharing phone applications and forums (Spotify 2019). As described by the tuckshop boys and others interviewed around the community and within Tsako Thabo School, *AmaPiano* is a culture of its own, one that takes its listeners to a memory of family, friends and a simple life. Young children in schools sometimes sit at break time or on the weekend with their phones developing a beat and writing lyrics to record. Music became both a place to escape to and one to inspire.

Furthering the connections made in Mamelodi in 2020, the researcher connected more with the Mamelodi Community of Learning Collaborative (MCLC) in an effort to situate the research in a real-world context with the hope of making a lasting impact. This led to a domino effect of discovering musical nodes within the community and the founding of the Music Network.

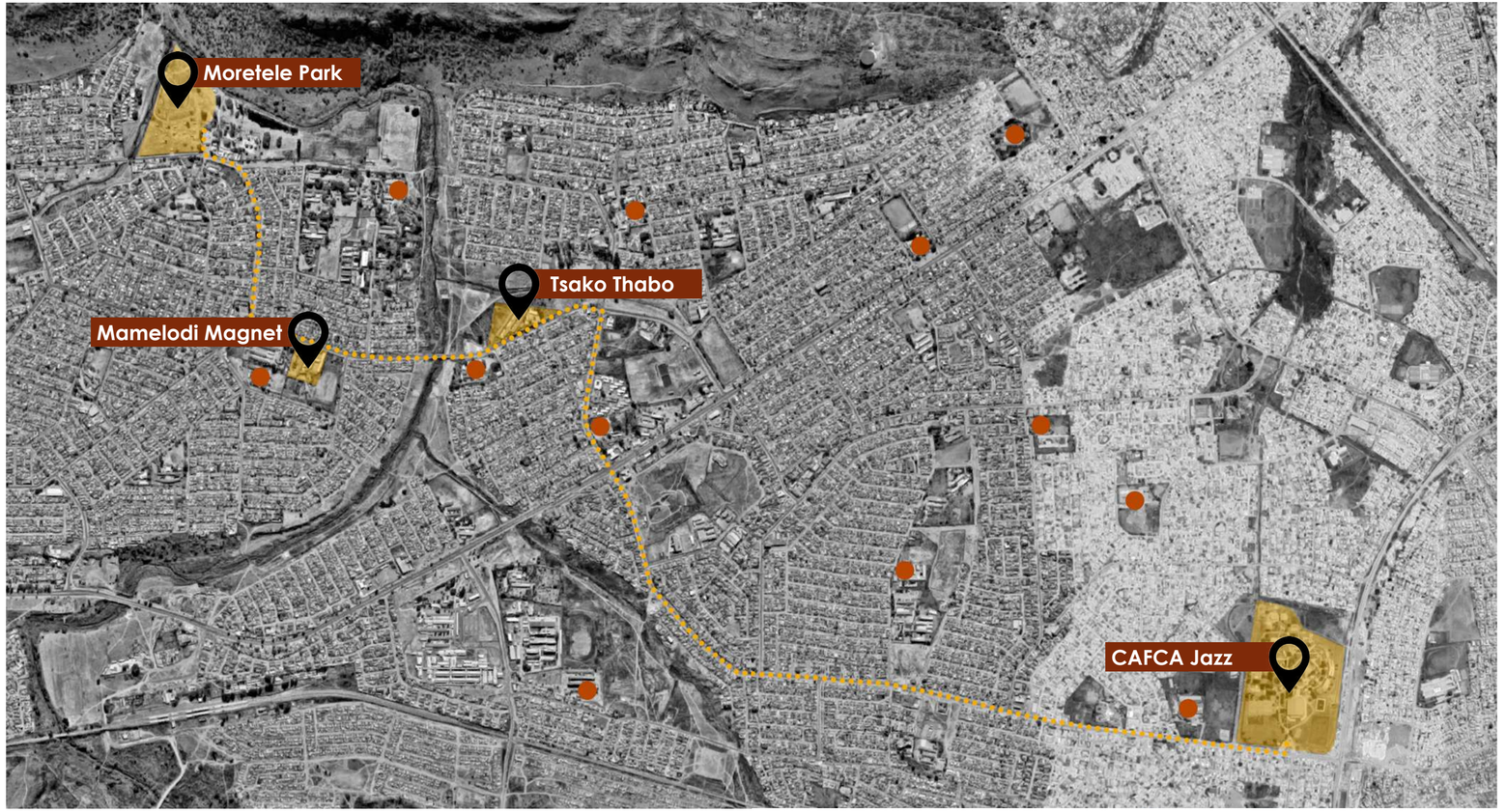
(Top & middle) Fig 32: Images taken of the mapping and analysis done by the 2020 UUC Honours studio (Author 2020, Honours 2020)

(Bottom) Fig. 33: 2020 Honours studio analyzing data collected by 2019 Honours studio to determine patterns or discrepancies (Honours 2020).

DISCOVERING NODES

The accompanying map shows the location of each major musical node within the proposed Music Network. Additionally, both primary and secondary schools within the area have also been highlighted. This provides a visual representation of the possibilities of growth of the network through incorporation of surrounding schools.

Fig. 34: Discovering music nodes in Mamelodi (Author 2020)



CAFCA Jazz School

Through the connection of the MCLC with the UP Mamelodi Campus, the researcher was introduced to Jesse Mogale, an extremely talented musician proficient with many instruments and the director of CAFCA (Committed Artists for Cultural Advancement) jazz school. Started in 1999 as a way to uplift the recognition and careers of musicians in the community (Interview with Jesse Mogale 2020), this school provides a safe and supportive environment for children to explore their musical talent and express their own sense of creativity without the fear of judgement and pressure (Tesnir-Smith 2019). The children can choose their own instrument to play from the ones that are available and learn in groups. "Music is not a competition; it is about cooperation" (Interview with Jesse Mogale 2020). Jesse went on to express how music and social cohesion go together, allowing the expression of shared needs and concerns. Playing in a group allows students to learn from one another, emphasizing the support offered through reassurance that no one is better than the other, but has "only been playing longer" (Interview with Jesse Mogale 2020).

Partnership is seen as a vital element to CAFCA's success. From the connection to the MCLC, Rutgers University in Newark often sends out teachers or visitors to the school. Other partnerships have resulted in CAFCA's students getting the opportunity to perform elsewhere, even overseas (Tesnir-Smith 2019). Similarly, the connection with the University of Pretoria has provided CAFCA with a weekly practice space on the Mamelodi Campus. Although this space was not designed for music-making in terms of acoustics, lighting and storage, it was a large improvement from the dilapidated school classroom of Vukani Mawethu High School they were practising in.

Although CAFCA is not formally a part of the Pre-University Academy at the UP Mamelodi Campus, just the music students' exposure to the campus has inspired them to continue their studies further (Interview with Jesse Mogale 2020, Tesnir-Smith 2020). Although the students started as musicians, their further studies often have nothing to do with music at all, for example, taking a business degree. Music was the gateway for opportunities that did not exist before.

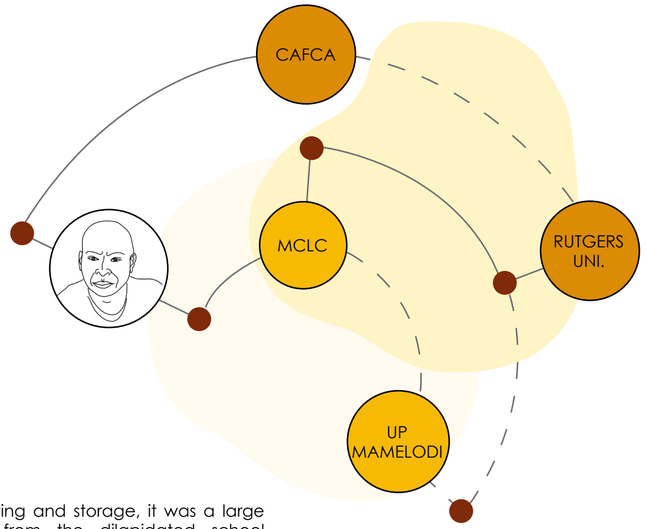


Fig. 35: The network of CAFCA Jazz School (Author 2020)

Mamelodi Magnet School

A mere 800 metres down the road from Tsako Thabo Secondary School is a high school that provides music as formalized education. Mamelodi Secondary School (MSS) was chosen to be a part of the Magnet Schools initiative, developed by the Gauteng Department of Education (Pruneau 2005). The idea behind this initiative was to create an opportunity for learners across communities to learn a specialized skill as an extracurricular activity, also known as 'feeder schools' (GDE 2002). This was started to develop the talent of South Africa's youth, "the country's future generation of leaders" (GDE 2016/2017:28). MSS was specifically chosen to offer specialized music tuition in 2003 and the implementation was called *Melodi ya Mamelodi*, 'Doing Hope Through Music' (Pruneau 2005, Roue 2017).

The Magnet School was started in 2004 but without any facilities. The teachers would teach their students in any open and quiet space, from outside under the trees to empty classrooms in the high school. A few years later, the head of department of the time connected with the Spanish Embassy and secured funding to build an official music school building on the site of MSS. Although a large improvement from the school classrooms, this music school building is only partially suitable for music-making (Interview with Jaco van Staden 2020).

Jaco van Staden, the current HOD of *Melodi ya Mamelodi* Music Project, is a brass teacher from Afrikaanse Hoër Seunskool (AHS) in Hatfield, Pretoria. Along with his colleagues, Jaco travels to Mamelodi every school day to teach music. They were recruited as specialized teachers at the beginning of the Mamelodi Magnet School program. Due to van Staden's involvement with AHS, there is a connection between the magnet school and the music department of AHS in Pretoria. *Melodi ya Mamelodi* was supplied with violins, clarinets, trumpets, harmonicas and an electric piano from the GDE, but other sponsors like the UNISA Music Foundation, Waterkloof House Prep School and Polliacks supplied the violins, cellos and recorders (Interview with Jaco van Staden 2020, Pruneau 2005). The learners from the *Melodi ya Mamelodi* Music Project participate in concerts, exams and festivals, held off-site. These are often at the ZK Matthews Hall, UNISA or the Tshwane Music Festival (*Melodi ya Mamelodi* Music Project 2019). Additionally, the Magnet School is used to link communities, bring children and adults together to make music and share knowledge with others. More advanced students from more privileged areas outside of Mamelodi East are recruited to assist with music teaching (Pruneau 2005).

Since 2019, *Melodi ya Mamelodi* has hosted an open day in April for primary school learners. Communication is sent to the surrounding primary schools and around 120 students attend. The music learners of *Melodi ya Mamelodi* play demonstrations on their instruments for the primary school children. Some of these children come back with applications to learn at the music school and pursue their musical dreams. This open day is a fantastic opportunity for musical exposure for the surrounding community and those who have had no interaction with music at all.

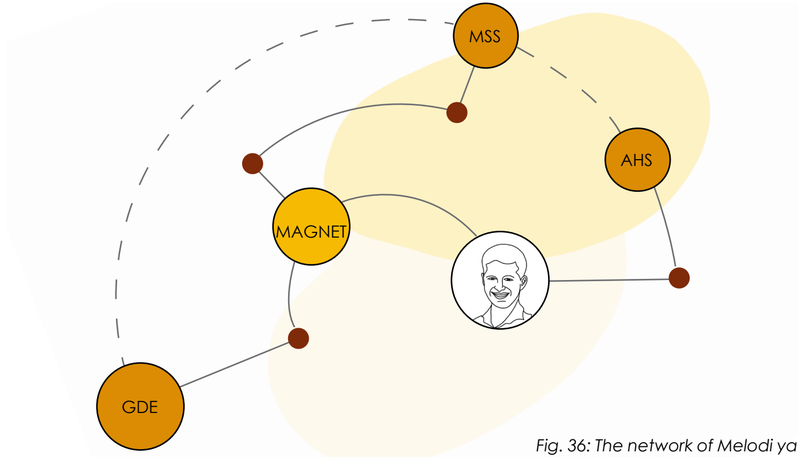


Fig. 36: The network of Melodi ya Mamelodi (Author 2020)

Fig. 37: Moretele Jazz Festival (Unknown 2015)

Moretele Park

To the north of Tsako Thabo and Mamelodi Secondary School lies Moretele Park, at the base of the Magaliesberg Mountain Range and adjacent to the Pienaarsrivier (Pienaar's River). For most of the year, Moretele Park is used as a recreational resort that was opened in 1986 (Tshwane Government *n.d.*), with overnight facilities with hot water and electricity, swimming pools, picnic and braai areas that can all be rented out for use by the community (Blokland 2007). According to Blokland (2007), the facilities require an upgrade, especially the hall which is hardly ever used.

The open field on the left of the site is where the majority of music festivals occur. Since the early 80s, there have been jazz festivals that attracted thousands of people (Gauteng 2018). These festivals were also a place for political rallies and a platform of expression for the equal rights movement of the Apartheid struggle. Internationally famous artists like Miriam Makeba and Hugh Masekela have performed to hundreds of thousands of people over the years (Blokland 2007). A typical temporary open-air stage and additional festival facilities are set up before each event and disassembled at the end.

Over the past decades, there has been an annual jazz festival called the *Moretele Park Tribute Concert* where local jazz artists perform. It is also a place for new up and coming musicians to make their debut. The tribute concert was first launched in 1998 at the Orlando Stadium in Soweto but has since moved to Moretele to pay homage to Mamelodi's musical heritage (SA-V, *n.d.*). Here South Africa's diversity is celebrated through music, bringing everyone together for a celebratory event.

Another large music festival that is hosted at Moretele Park is *Mamelodi Heritage Day*, organized by the Mamelodi Tourism Association (MTA) (Ntuli 2019). This is only fitting as Moretele Park is a significant stop along the Mamelodi Heritage Route (Van der Waal 2000). Employees of the MTA express Mamelodi as "having a lot to offer... stories worth telling" (Ntuli 2019). MTA's Abraham Mohale (Ntuli 2019) expressed the community of Mamelodi as having their own way of speaking, their own behavioural conduct and their own sounds of music. The culture and heritage are so rich in Mamelodi and deserve to be expressed as a form of collective identity, especially through its musical heritage.

Additional Music Education

Through desktop studies, it was found that there were a handful of other schools, both primary and secondary, within the context of Mamelodi East that has music education as an after-school activity. These predominantly serve the children within that specific school and similarly seem to have a lack of connection with the surrounding community. These schools do not have any music-making facilities but rather use open spaces or empty classrooms that are in the same dilapidated state as those at Tsako Thabo Secondary School.

Each musical node identified through the mapping in 2020 further emphasized this opportunity for networking and upliftment of the community through music. The additional schools identified increase the potential success and reach of this networking opportunity by providing supporting platforms of positive expression for school children.

Summary

Comparing all of the identified nodes to one another, a common thread runs throughout. Through the act of music-making, the proposed aim for each node is to expose the community to the skill, celebrating Mamelodi's heritage and providing opportunities for new generations to express themselves positively, as well as form connections and relationships through the language music, bringing the community together under one collective identity.

Each musical node identified through the mapping in 2020 further emphasized the opportunity for networking and upliftment of the community through music. Each node has some sort of outside connection already for their success to grow and therefore provides the opportunity for this proposed collaboration within the local context of Mamelodi East. The additional schools identified increase the growth and reach of this networking opportunity for providing supporting platforms of positive expression for school children. Each musical node started with nothing, from an empty brick box to the shade of the trees. They proved that no matter the situation, music can and will be made if the people are together. Networking through these current nodes, and additionally with future nodes, could provide each node access to amenities, relationships and resources that they are each in need of to further their individual music-making agendas. This could alleviate their limitations and hindrances, simultaneously contributing to the success of the overall Music Network, the greater whole (Castells 2011).

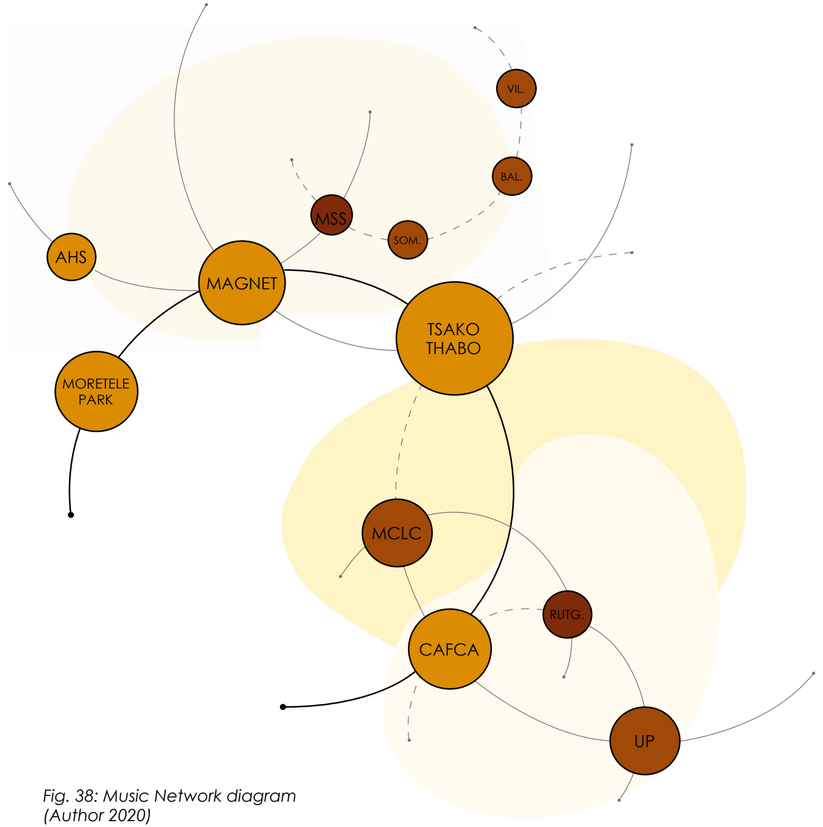


Fig. 38: Music Network diagram (Author 2020)

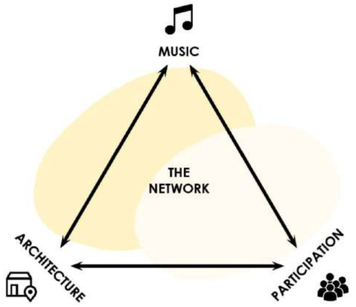


Fig. 39: Theoretical breakdown (Author 2020)

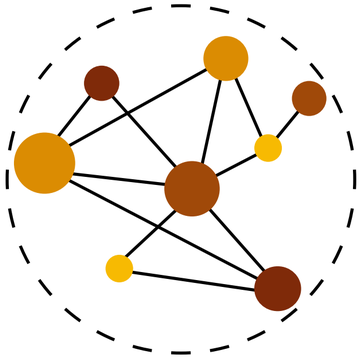


Fig. 40: Network Diagram (Author 2020)

THEORETICAL CONTEXT

Networking

The concept of networking can exist in most, if not all, aspects of life. From computer design to sociology, neurology to a plumbing system: it is the way everything works. Even our own bodies and the entire world as we know it is made up of tiny atoms that are networked with one another. The term *network* has multiple definitions and theories, but the underlying principle is that there are small entities of individual value and function that are connected in an organized system, making up a larger entity of greater value as the whole (Castells 2011, Kozikoglu & Cebi 2015, Lima 2011, Wigley 2007). According to *The Gestalt Theory,* each individual attribute can be put together in multiple configurations, with different functions, shapes and sizes, however, the whole of anything is greater than its parts (Augustyn 2018, Sahyouni 2014). *The Gestalt Theory* has a few principles that sit well with our mental well-being worthy of noting for this dissertation (Sahyouni 2014). The first being the *Law of Similarity*. Whether it is function, shape or materiality, our brains automatically group similar aspects together. This also works for the *Law of Distance*: aspects that are closer together are also grouped. The *Law of Pragnanz* relays that the overall reality of an event is reduced to its simplest form. Lastly, with regards to design, the *Law of Order* suggests symmetry and alignment are essential. These laws all form part of making sense of something when viewing it as a whole, rather than seeing its individual parts (Augustyn 2018, Sahyouni 2014).

Networking and Participation

Participatory design processes rely on connections and networking with various stakeholders, community members, professionals and more, all learning and designing together for upliftment and better user-suited technologies (Bødker *et. al* 2004). Each participant has a vital role to play which can inform many important decisions made together by the group (Simonsen & Robertson 2013). While each participant, or a smaller group of participants, have their own knowledge and skills, these are often limited (Awan *et. al* 2011). Choosing participatory processes automatically results in the acknowledgment of these limitations for a single author, the "incompleteness and limitation of the lone" (Awan *et. al* 2011:77). Joining such individuals, each with their own limitations makes up a more substantial force with minimal limitations as a group. Communication between participants and stakeholders is vital to participatory processes and embedded in networking, as Castell (2011) argues. It inspires synergy and limits the number of contradictions a varied group may face. The crucial and indispensable communication between all participants, whether they be designers or community members, is seen as the links between the actors within the participatory process (Erickson 1995, Friedrich 2013, Hamdi 2010, Simonsen & Robertson 2013). Participatory design cannot be done without communicating and therefore is redundant without networking.

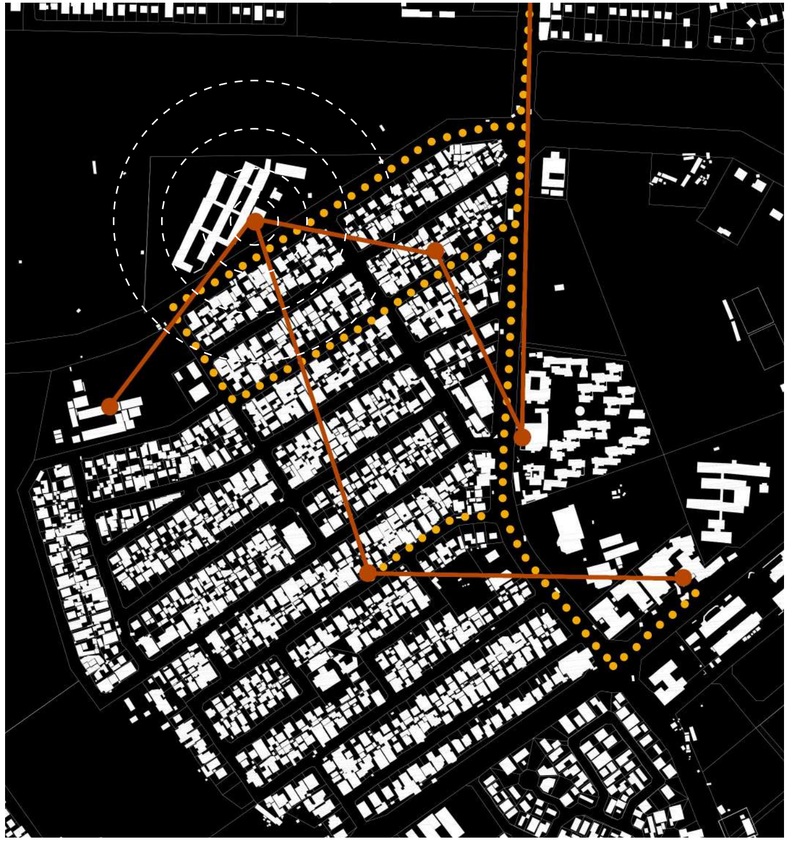


Fig. 41: Diagram depicting participants' networks in community. (Author 2020)

(Left) Fig. 42: Map showing connection within Soulsvile, USA (Author 2020)
(Above) Fig. 43: Sketch of Memphis Slim Collaboratory (Author 2020)

Networking and Music

In the music industry, one cannot succeed without networking. From teaming up with producers, writers, orchestras, media managers... the list goes on. Right down to a single individual wanting to learn the cello, they need to network with a teacher, who is part of an exam group who can help the learner qualify. As proved by the *Melodi ya Mamelodi* Music Project in Mamelodi, South Africa, music can be used as a platform to bring communities together and provide better future opportunities for children from an underprivileged background (Pruneau 2005, Roue 2017). The Magnet School is actively successful in its networking; from connections to sponsors, music halls, exam groups, teachers and assistants, each entity adds to the greater project resulting in its overall success.

Similarly, there are two additional examples/ precedents that have proved music can be used as a valuable networking platform, not only on the ground but online and internationally. The first being the Memphis Music Magnet Plan. This online project developed from a need to revitalize the community of Soulsville in Memphis, USA (Faber 2016, Shapiro 2017). It identifies derelict buildings within the area, reclaiming them for music and the arts through events, recording studios and music schools, ultimately providing a platform for advertising Soulsville as the place to be for musicians (Memphis Slim *n.d.*). The soul music heritage of Soulsville is vital for this network's success as it provides a foundation to build on. Linking to the STAX Museum of American Soul Music, the buildings and implementations work in conjunction with the already existing community, exposing and celebrating the existing untapped potential (Faber 2016). This networking project relies on small scale creative-oriented implementations and projects as catalysts for uplifting the community as a whole (Hill 2014), ultimately growing and strengthening the identity of this music district.

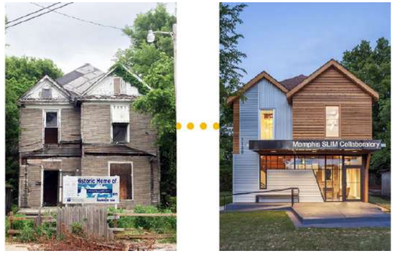


Fig. 44: Memphis Slim Collaboratory, before and after renovation by brg3s Architects (West 2014)

Fig. 45: UNESCO Creative Cities of Music (Author 2020)

The second international example is that of UNESCO's Creative Cities. Once again, this is a major online network that connects physical places and cities across the world through shared interests and themes. One of these themes is music. The concept behind the network is to use the culture and creativity of certain cities as the driving force for sustainable development and urban regeneration through social cohesion and intercultural dialogue (UNESCO n.d.). This relates to Lorenzo Fioramonti's (2017) concept of *The Well-Being Economy*: using the underlying existing potential of communities to enable growth and development as a whole. Each Creative City of Music has been identified due to its rich history embedded in music and music festivals, signifying the importance of music within that city. Each city is uplifted through the celebration and value of music and often encourages exchange schemes of learners or musicians with other Creative Cities of Music to share knowledge and learn about the creative world we live in (Interview with Sandra Wall June 2020, UNESCO n.d.). Sandra Wall is the project leader for the Creative City of Music, Norrköping, in Sweden. She connects different music organizations across the city with one another through the networking of events, institutions and other smaller project implementations (Interview with Sandra Wall June 2020). This allows for as much diversification as possible, including all genres and types of music. The overall network looks at incorporating and using music as a driver for uplifting the city as a whole through focusing on four major areas: education, industry, business and communication (Grundtman 2016). Stimulating music in these areas allows for opportunities for these groups to support themselves. The city is also slowly incorporating music through the built environment to accommodate the projects. The old paper mill in the city has been transformed into the concert hall of the Norrköping Symphony Orchestra, playing an important role in the city's development (Interview with Sandra Wall June 2020). Using architecture to uplift the musical qualities of the community links directly to this dissertation. Over time, the Creative City of Music could save funds for renovating spaces to meet the increasing musical activities. Through networking within Norrköping, the city becomes Sweden's Capital of Music and a hub of innovation that inspires the rest of the country through music (Grundtman 2016).

Networking and Architecture

In architecture, networking is the interrelation of spatial units, purposefully designed to allow potential social interaction through connections and boundaries (Kozikoglu & Cebi 2015). Researchers agree that the design of spatial dispositions affects the quality and quantity of social interactions; from accommodating to separating, celebrating or hindering, spatial design affects our lives, activities and relationships (Dovey & Dickosn 2002, Hillier 1996, Lawson 2005). In an investigative game of networks with architecture students, Kozikoglu & Cebi (2015) explored the extent of network architecture and how each node of the network impacts another. The findings were that the network structure is ultimately informed by the choices of each node. Only certain relationships impact the network as a whole, while others do not. This can be affected by additional 'rules' that apply to the overall network system. Fundamentally, the main conclusion drawn from the workshop with the students was that the nodes, or spatial entities, are fixed in terms of their links, but their geometric compositions are constantly changing (Kozikoglu & Cebi 2015). This agrees with other research done for architecture and networks, emphasizing the importance of the iterative process of this type of design (Do & Gross 2001). Proposing that certain nodes help activate the network must be followed by the potential development and growth of the network, where those initial nodes might change, be removed and others might be added. Understanding that networks are dynamic forms which cannot fully be pinned down, can inform and enhance the design of the overall architectural network as well as its individual elements (Kozikoglu & Cebi 2015).

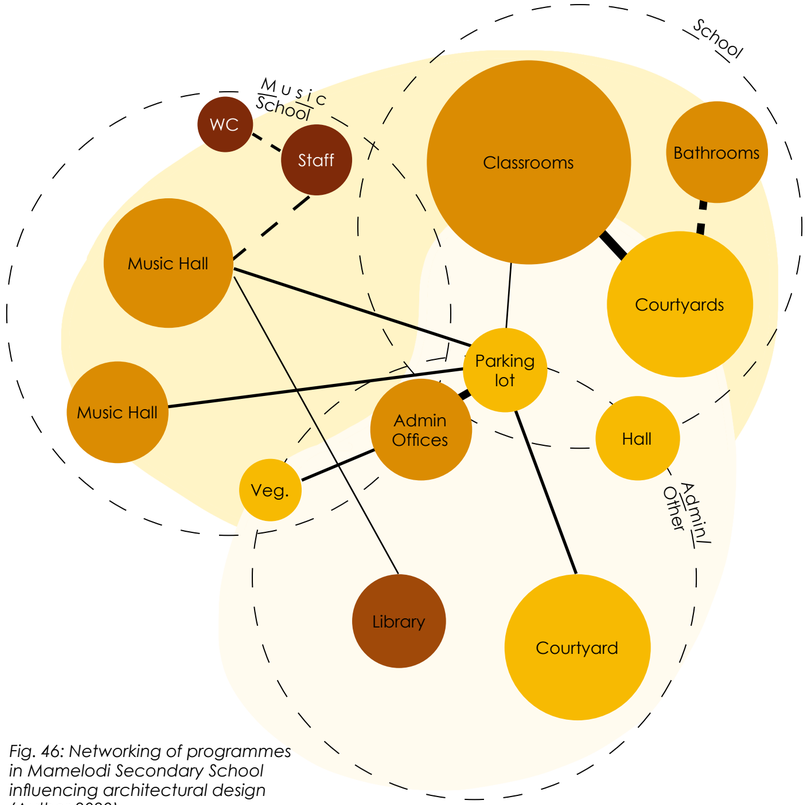


Fig. 46: Networking of programmes in Mamelodi Secondary School influencing architectural design (Author 2020)

Music and Architecture

There have been numerous studies that have investigated the relationship between music and architecture and their influences on one another. According to literature, there are three types of relationships between music and architecture: inspiration, image and method (Capanna 2009, Tayyebi 2013, Young *et. al* 1993).

Inspiration drawn from music for architectural design may be derived from a certain genre of music, but more often than most, it is drawn from a specific piece of composed music (Young *et. al* 1993). Visual inspiration can come from the "kaleidoscopic collection" (Capanna 2009:258) of the lines and symbols used to represent a piece of written music. This may result in a purely aesthetic or geometric form of architecture but can also inspire the programmatic layout of a building (Capanna 2009, Tayyebi 2013), whether it be disharmonic or melodic. Mood, dynamics, and structure of a space can also be inspired by a specific piece of music (Young *et. al* 1993). Similarly, inspiration can be drawn from an architectural piece to write a musical melody or composition (Kloos *et. al* 2012, Young *et. al* 1993). It can be composed in terms of audible output for a specific location (Kloos 2012) or related to the building's cultural and historical connections (Young *et. al* 1993). There are many sources of influence that apply to both sides of the music-architecture relationship. A study done (Young *et. al* 1993) between architecture and music students uncovered a list of these sources, many of which have been mentioned above. Additionally, materials, physical context, function, geometry, user, statement, cost, text and many emotions or perceptions (for example aggression, tension, triumph, etc.) form part of this list.

The most visual relationship between architecture and music is that of an image. This can be the literal transferring of the graphical aspect of music to the design of a built form or an architectural element (Capanna 2009). The rhythmic form of written music notes can be abstracted to represent architectural towers, walls or streets (Capanna 2009, Tayyebi 2013). Architecturally, the overall built form can be designed to represent a musical image, such as Piano House by Huainan Fangkai Decoration Project (2007). Similarly, architectural elements can take on the identical imagery of music: piano staircases or swimming pools, for example (Tayyebi 2013). On the opposite end, the visual design of musical instruments can have architectural designs or geometries, such as Daniel Libeskind's Grand Piano (2003).

Lastly, music can be used as a method of extraction of design concepts and principles (Capanna 2009, Tayyebi 2013). This ranges from the types of musical instruments used (for example strings and brass) to the types of sounds these instruments emit in a certain piece of music; for example, violins producing smooth, light sounds versus heavy, discontinuous sounds produced by percussion instruments (Capanna 2009). A specifically composed melody can be used as the starting point for an architectural concept (Young *et. al* 1993) or simply the abstract analysis of a genre to inspire a spatial mass (Tayyebi 2013). Vice versa, the Golden Sequence found in architecture can inspire the concept behind a musical suite, as discussed by Tayyebi (2013).

Ultimately, the literature agrees that there is an interrelation between architecture and music. That music can be used as a "leap-vehicle" (Young *et. al* 1993:39) for architectural design and vice versa.

Inspiration

Acoustic & auditory qualities
Emotion (aggression, excitement etc.)
Cultural context & location
Concept or story
Harmony

Fig. 47 Walt Disney Concert Hall (Gehry 2003)

Method

Weight
Inversion
Rhythm
Composition
Sound

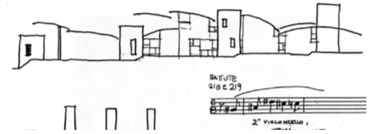


Fig. 48 Bartok vs Steven Holl (Capanna 2009)

Image

Aesthetics
Materiality
Colour
Form
Proportion

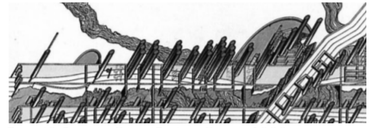


Fig. 49 Bloch City (Peter Cook 1992)

Decentralization

There are two types of decentralization that run through this research-led design project. The first being *decentralization* as a shift of authority and decision making from those in power outside of the local context to those directly engaged with the community. This form of decentralization achieves increased economic growth and improves living standards (Ndeneche 2011) as the decision-makers have greater communication and relationships with the direct context of the community. Although there are no policies or hard theoretical frameworks for implementing decentralization, the literature argues that decentralization and decision making by local councils, "the more directly concerned" (Ndeneche 2011:145), is vital to creating and maintaining certain community upliftment projects. Examples of these are museums, craft centres, markets and cultural festivals. Decentralization depends on "strengthening the accountability and administrative efficiency" (Ndeneche 2011:40), while simultaneously bringing the decision-making process to the local users of the community. This ultimately results in the desire to sustain such livelihoods in the community, as social and cultural identities are formed (Ndeneche 2011).

There are many reasons to implement decentralization strategies. The less political reasons involve the following (Ndeneche 2011): Decentralization adds to existing developing institutions that have direct involvement with users, creating a strong communication link between the user group and the local decision-maker; Community members now have a valid choice in what happens within their area, resulting in a focus on targeted needs rather than generalized assumptions from removed authorities; Community members become more purposeful with their choices as they often immediately see the results being implemented, similar to action-based initiatives (Höök 2016). The pioneering town planner, Patrick Geddes, comments on this fundamental topic: "The ordinary citizen should have a vision and comprehension of the possibilities of his own city" (Hamdi 2010:91, Ward 1996). This is further commented on by Nabeel Hamdi (2010) explaining that for a community to thrive, there needs to be a "re-absorption" (2010:91) of authority, specifically that of the government, directly into the community. This results in the community being able to take and reap the benefits of directly informed and immediate action, instead of waiting on the communication through the chains of authority. This links participation with the concept of decentralization, ensuring the community is engaged with their stakeholders on the ground (Hamdi 2010).

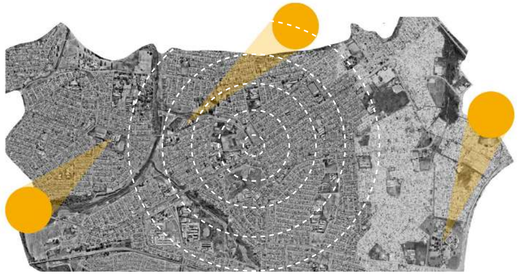


Fig. 50 Decentralization in Mamelodi, making decisions directly within the community (Author 2020)

To evaluate the success of implementing decentralization in a community, one must consider the following questions of social change (Ndeneche 2011):

- Has there been an improvement of local public services in the area?
- Is there an increased involvement of community members in the decision-making process and participation of development projects?
- Are decision-makers able to perform their duties more efficiently and make decisions more in line with the direct needs of the community?

The second form of *decentralization* considered in this dissertation is spatial. Instead of designing the programmatic and spatial layout around one central site, this research-led design takes the approach of a network, across programmes and sites. Each site has its own main function and contributions to the overall success of the network, while still relying on and engaging with the other sites in a mutually beneficial relationship.

In architectural networks, the success of the system relies on the communication and engagement between nodes through their representatives with one another (Kozikoglu & Cebi 2015), encouraging interaction of the community. This can be achieved through the sharing of facilities and reliance on distributed functions or programmes across sites or nodes within the network, instead of merging all the functions and amenities on one centralized site. Each node still functions with its own separate authority but is influenced through its connections and interactions with other sites (Seal 2020).

Music, in and of itself, is a decentralized activity (Tanzi 2001). Although music-making requires a "space" to occur, this does not need to be a permanent structure, as the act of music-making is in essence a temporary activity (Novak 1997, Tanzi 2001). Acoustic and reverberation properties of a space may enhance or impact the production of sound but do not hinder the performance in any way. In fact, these properties are not always considered when deciding on performance space, but the consideration is rather influenced by the impact and exposure to music and the social experience that the musicians are offering (Uy 2012). This has been proved in multiple projects all over the world, such as Korogocho Streetscapes in Nairobi.

In Korogocho, a disadvantaged community in Kenya, there is a severe lack of intentional public space, resulting in the streets being used for functions beyond transportation. The streets are used as a space for trading, a playground, meeting spaces and more (Skottke 2016). A collaboration between Architects Without Borders Sweden and Hope Raisers Youth Initiative brought about the Korogocho Streetscapes project, aimed at creating inclusive ways of working with the residents of Korogocho, to initiate positive urban development through small-scale yet high-impact activities and implementations within the public streets (Höök 2016, Skottke 2016). Instead of following contemporary and traditional design processes of urban regeneration, Korogocho Streetscapes focuses on more temporary and direct interventions through an action-based approach (Korogocho *n.d.*). The target group is specifically young children and the youth, acknowledging that they are a resource that can improve their city and own lives. The project implementations result in ownership, community identity, responsibility, inspiration, positive self-expression and proof that it is possible to transform city life (Höök 2016, Korogocho *n.d.*, Skottke 2016). This is done through using the streets as a common performance ground for sport, art and play.

Music has been used as an important theme to transform the city in this project, from music and cultural festivals to discussion sessions and flash mobs. The *Koch fest* supports the exposure and celebration of the city's rich musical and cultural heritage by giving a platform for local and international artists to share their expertise and experiences with the local community members. Seeing this support for the community instils a sense of civic pride and encourages community members to become socially committed to uplifting their city (Höök 2016, Korogocho *n.d.*). Temporary stages and events are set-up to accommodate this festival. A far more temporary project was that of *Voices in Spaces*. This was a flash mob set up by members of the Ghetto Classics orchestra, the only orchestra in Korogocho. Young musicians popped up one after another from their hiding spaces and gathered in the street which had been previously closed off by young cellists. Eventually, the whole orchestra had grouped and was performing for community members who gradually gathered to watch. The street was transformed into a performance ground, exposing music to those who may not have any previous musical experience, while showing alternative uses of the streets (Höök 2016, Korogocho *n.d.*). It brings a voice to the previously quiet community members, giving opportunities for upliftment and sustainable community livelihoods.

Fig. 51: Korogocho Streetscapes flash mob on the streets of Kenya (Author 2020)

Music and Participation

Birch & Epp (2015) conducted participatory workshops with music students to develop an app that will help the students learn self-discipline and remain motivated when practising their instruments at home. According to Cooper (2001), practising individually at home is a music student's least favourite activity, resulting in ineffective use of time. Through participatory design approaches, Birch & Epp (2015) aimed to reduce the power gap between researchers and participants by directly involving and collaborating with the children from the beginning, fostering emancipatory participation for a successful technological design (Kensing and Greenbaum 2013). The students were inspired to practise using the app as it was developed collaboratively and connected them with other music students. Music-making ultimately relies on participation with other musicians for individual growth, motivation and discipline (Koopman 2007).

As implemented at CAFCA and other institutions across the globe, music students all work together in an effort to motivate one another and increase each other's musical abilities through focusing on a common goal, rather than their different backgrounds (Friere & Ramos 2003, Interview with Jesse Mogale 2020). Koopman (2007) strongly argues for music education through community participation as a platform to develop personal growth, it is not a one-person act. He argues that through social cohesion, creativity and positive self-expression are encouraged, enabling learners to enhance their artistic abilities and identity. Group teaching should be at the centre of education, specifically music education, to give individual purpose and support (Slevin & Slevin 2013). Woodward, Sloth-Nielsen and Mathiti (2004) state that social and personal growth and music development are of equal importance (page 4). Bowman (2005) and Koopman (2007) both emphasize that although there are numerous forms of involvement with music, the intentional action of participation with music, i.e. music-making, develops a person far more than merely listening. This can be clearly seen by the success of the international community group of upliftment, El Sistema.

El Sistema Venezuela was started in 1975 but is recognized today as the "most significant example of collective music education" (Majno 2012:56). The project targets and encourages the youth of Venezuela as a way of changing their lives through intense immersive musical experiences, to grow and achieve individual empowerment (Tunstall 2013). Students feel more motivated to practise as it becomes a social and communal activity (Slevin & Slevin 2013, Uy 2012). In turn, music becomes far more than just musical education. Through participation and active immersion in music-making, the youth learn civic and social qualities that improve their overall life and future (Majno 2012, Koopman 2007, Tunstall 2013). These include cooperation, responsibility, empathy, empowerment and self-discipline. As the conductor of the El Sistema orchestra states: "We are not trying to create musicians. We are trying to create citizens" (Tunstall 2013:70). Participation through music allows a platform for social issues to be raised, motivation for education and knowledge exchange between students, teachers and peers.

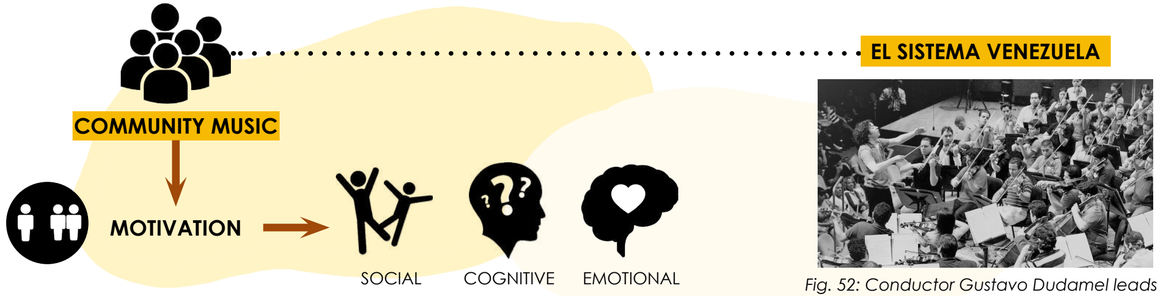


Fig. 52: Conductor Gustavo Dudamel leads El Sistema during a June 2009 rehearsal in Venezuela (Coex 2009)

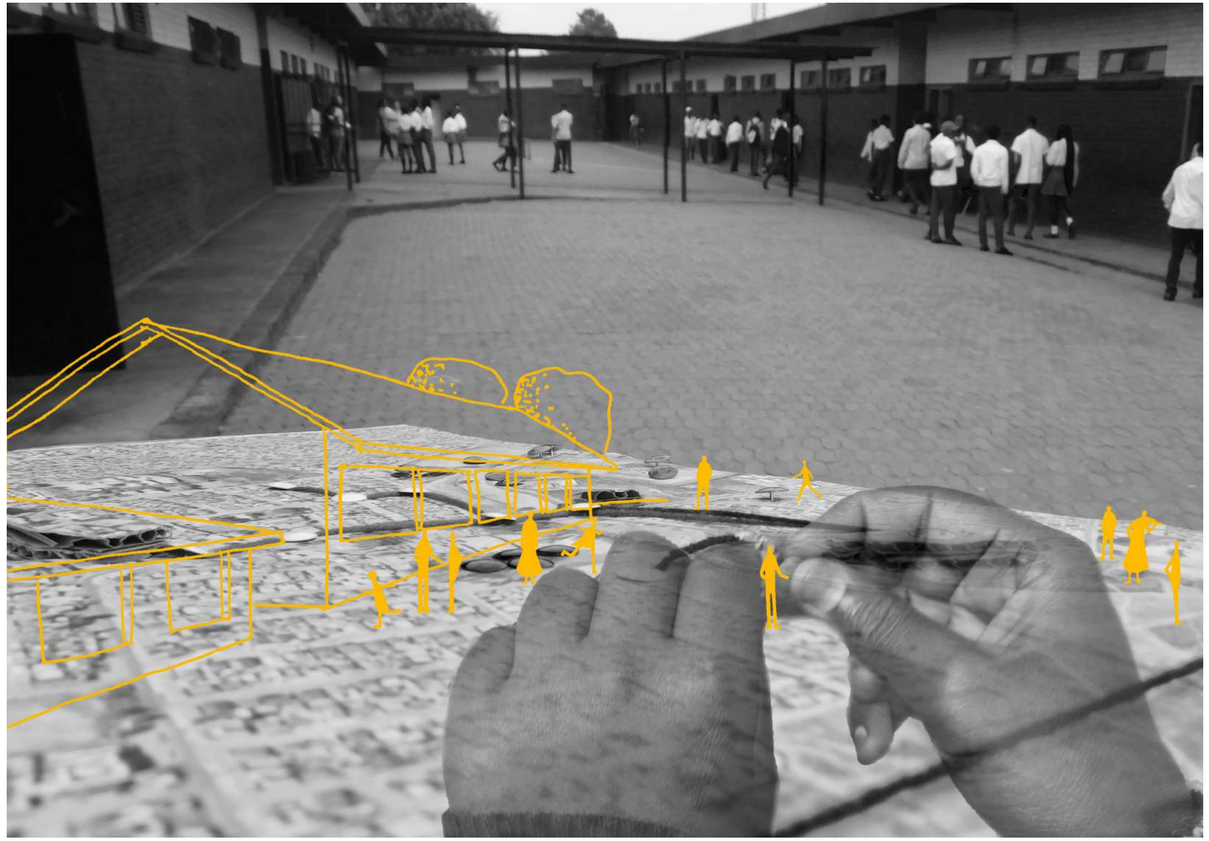


Fig. 53: Architecture and participation. (Original images du Bois 2019 edited by Author 2020)

Architecture and Participation

An architect can typically be defined as one who designs buildings (Awan *et al.* 2011:27). They characteristically spend a lot of time concentrating on the detailing and systemic functions of the building, putting it together piece by piece. However, according to *Spatial Agency* (Awan *et al.* 2011), this brings multiple limitations to the design and ultimate success of the building. Firstly, the building becomes very static and dominant in the elements within the control of the architect, for example, the form, style and aesthetic (Awan *et al.* 2011). Not designing beyond the box, for those elements that are unpredictable and changing, the people themselves, is an inevitable matter that needs to be immeasurably considered or it could result in the failure of the design (Awan *et al.* 2011). Secondly, focusing on the commodification of the building simply meets the face-value of society's approval, but fails in the post-occupancy department and does not meet the real-world requirements of people's well-being. Lastly, suggesting that only architects are involved in the imaginative and creative output of the environment surrounding us daily limits the opportunity to "…capitalize upon the informal aspects of urban life" (Brillembourg *et al.* 2005:19) simply because we, as architects, are not taught to fully immerse ourselves into the field and gain a meticulous understanding of what is going on around us. It is important to work at the intersection between the individual architect and the users on the ground (Awan *et al.* 2011). Similarly, architects focus on standard theories presented to them over the decades and apply them to a context without considering the in-field elements of the social life of the site. This forms a stamped repetition of buildings and cities throughout the world and more unhappy and dissatisfied civilians.

Through participation, the architect begins to confront real-world issues and produce successful spaces, not with the intent of making a name, but rather to be transformative and make a change in society (Awan *et al.* 2011, Hamdi 2010). "Every line on an architectural drawing should be sensed as the anticipation of a future social relationship and not merely as a harbinger of aesthetics or as an instruction to a contractor" (Awan *et al.* 2011:30). According to Geddes (Ward 1996), the users of a space should have the right to envision and provide input on the potentials of their surrounding built environment. Not only does this satisfy their needs for their community, but it provides them with the opportunity of learning leadership and entrepreneurship skills which will benefit both the individual and the collective community in the future (Hamdi 2010). These skills will also come in handy when proposing a much larger intervention that requires authority beyond the community (Hamdi 2010).

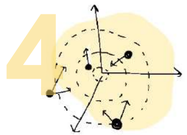


Fig. 44: The 5 Themes identified through theoretical analysis (Author 2020)

Summary of Theoretical Context

Analysing the qualitative data, according to Yin's (2011) qualitative analysis methodology, the following codes or themes were determined:

1. **Music and the collective identity** (how does music bring people together and benefit the group as both a whole and individuals?).

2. **Music and self-expression** (how is music used as a platform for positive self-expression, and what kind of effect does that have on the music-makers?).

3. **Networking** (as general and specific to the overlapping topics of music, architecture and participation).

4. **Decentralization** (authoritative decentralization of participation and spatial decentralization of architecture and music).

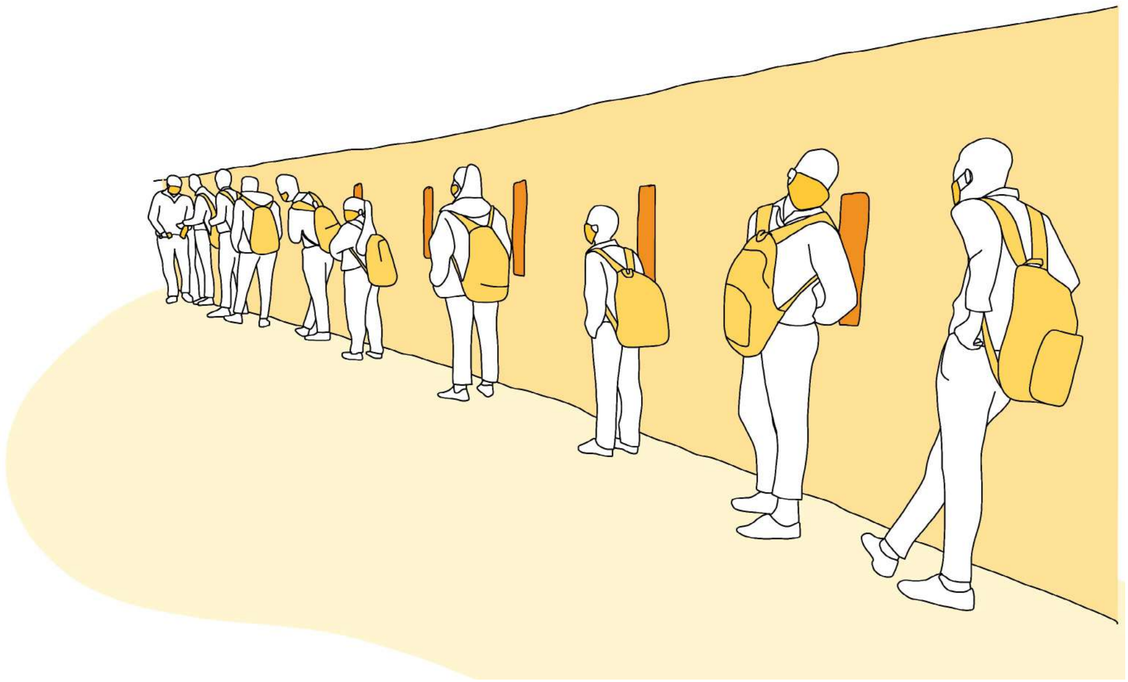
5. **Participation** (why is it necessary for communities? How is it enhanced through music? How does it relate to architecture?).

This qualitative analysis process was followed by multiple iterations in order to ensure legitimacy and thorough investigation and understanding of the research (Yin 2011). This goes hand-in-hand with the iterative process of co-design (Please refer to Volume One of this dissertation), ensuring co-authorship throughout the project (Hamdi 2010). It is important to place emphasis on this iterative process in any design project as it would need to be considered from multiple perspectives to ensure contextually and socially relevant decisions are made.

In summary, it was found that the overall success of an architectural network and the higher success rates of the individual nodes can be greatly influenced through interactions and engagement within the network, sharing a common goal. This relays back to *Spatial Agency's* (Awan *et al.* 2011) limitation of the lone actor, which is combatted through communication, especially between networked nodes.

To develop these connections for communication, direct action on the ground is necessary. Number Eleven on the Sustainable Development Goals 2030 list, states that it is vital to "make cities and human settlements inclusive, safe, resilient and sustainable" (UN *n.d.*). UNESCO's Creative Cities go on to unpack how this can be achieved through culture and creativity from a bottom-up approach, shifting the authority and decision-making responsibilities to those directly involved in the human settlements. Uplifting the community through a "now, soon, later" (Hamdi 2010:67) type of project, goes hand-in-hand with this kind of authoritative decentralization (Ndeneche 2011). To achieve this, it is imperative to tap into education, industries, businesses and communications within a city or community (Grundtman 2016). Networking through music as a positive platform for expression, specifically focusing on these areas, may result in the transformation of society. As is so important in the El Sistema Venezuela project and the CAFCA Jazz programme in Mamelodi, music is used as the gateway to future career opportunities, to "create citizens" (Tunstall 2013:70). Exposing and celebrating the existing untapped musical potential within a community, as proved by Memphis Slim Collaboratory and UNESCO's Creative Cities of Music, truly unlocks the opportunity for social cohesion and the creation of collective community identity, uplifting the community as a whole.

Fig. 55: Theoretical Context summary (Original images Honours 2019 edited by Author 2020)



Taking it online

In March 2020, the COVID-19 virus was determined as a global pandemic, shutting down cities and countries across the world into lockdown. South Africa was hit with a total lockdown, impacting workers, students and businesses across scales, economic classes, ages, races and religions, except for the limited essential workers. CEOs and janitors alike were suddenly thrown into the same playing field, supported exclusively by what was available to them within their own homes. In general, this consisted of being confined to the four-walled homes that they then needed to appropriate to continue their work online. For example, setting up a virtual office in the dining room or cleaning out a room from its clutter to have a more open space for activities such as exercising or playing instruments. This completely changed the research methodology for this project, challenging it and exposing the fundamental needs for daily survival without physical interaction with the world outside. After a few weeks, the lockdown was extended indefinitely with minor alleviations. During this unprecedented period of isolation, the stark reality of South Africa's devastating economic gap began to surface. It revealed that not only most of the population did not have access to the technology required to work and study virtually, but also the severe impact of a decreased or terminated income with regards to paying bills and providing food for survival (Mathibela 2020, Petersen 2020).

The following article was written as a part of this dissertation in response to the above-mentioned issue.

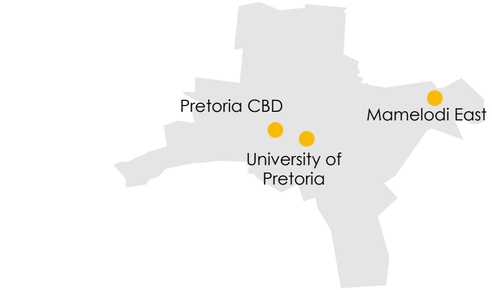
Fig. 56: Students practice social distancing as schools reopen after the COVID-19 lockdown (Original image by Sishi 2020, edited by Author 2020)

The Impact of Economic Status on Participatory Design Methodologies During A Global Pandemic

What is seen as a simple solution for some, is a significant inhibitor for others.

ABSTRACT

Participatory Design involves the end users in the co-design process through active engagement and communication with one another. Conventionally, participation sessions are held face-to-face in order to directly cooperate with participants. This is most often used in order to fully engage qualitatively and draw inspiration from the people around you during the session; a constant ebb and flow of knowledge. Advances in technology assist alternative methods of participation online for when physical contact is not an option. However, this favours developed countries. The majority of participants in developing countries are from disadvantaged communities with limited to no access to resources, specifically technology, as well as a lack of skill and knowledge to use such technology for online participation. This issue created a significant gap between citizens of different economic classes in South Africa when the COVID-19 nationwide lock-down was enforced. For the majority of advantaged citizens, the transition to online life was only a slight adjustment. However, in the disadvantaged community of Mamelodi East in the City of Tshwane, life was brought to an indefinite halt. Considering the economic and knowledge gap, this article investigates the existing toolkits for online participatory workshops. This is done both through literature reviews, case studies and the researcher's own implementation of an interactive website. As a result of the lack of participation with the website, the researcher critiques the current ways of appropriating participatory sessions. This results in the need for incentives, specifically chosen in response to the exposed needs brought on by the economic gap specific to South Africa. The research gathered is analysed according to the interactive success and response to the implemented workshops. The case study is a high school in Mamelodi East, Pretoria, that was severely affected by the COVID-19 lock-down. This article provides a foundation for disadvantaged communities to build on collectively during times of crisis and uncontrollable exclusion.



PRETORIA, SOUTH AFRICA

Fig. 57: Working from home, the "new normal" (Original by Byworth 2020, edited by Author 2020)

INTRODUCTION

During the COVID-19 nation-wide lockdown in South Africa, most people were stuck indoors, taking their daily work and education routines online. This solution was to ensure the continuation of working and learning during the pandemic, so as to keep the country going. As a middle-class citizen with access to the internet and a laptop, the researcher was one of the many who easily shifted their daily routine to indoor confinement. The true impact of going online was only exposed to the researcher and the rest of the country as the lock-down days rolled on.

To the East of Pretoria exists a township called Mamelodi. Formed during the Apartheid regime for the African population in 1945 (van der Waal 2000), this settlement has a history of government neglect and social struggle. Today, like most disadvantaged communities in South Africa, the people of Mamelodi have little to no access to services, specifically internet, technology and in some cases even electricity (Petersen 2020). This resulted in millions of people sitting at home, unable to work, learn or connect physically with anyone outside their homes due to the social distancing of the nation-wide lock-down.

As an integral part of the researcher's Masters of Architecture research, the approach for a design intervention in Mamelodi East was considered through a participatory lens. Through engagement with high school students of Tsako Thabo Secondary School in Mamelodi East, the theme of music-making and its connection to the surrounding community was uncovered. This developed into further research and co-design with specific Tsako Thabo Secondary School students who had an interest in or participated in musical extracurricular activities.

According to the well-versed participation researcher, Nabeel Hamdi (2010), designing through a participatory lens is done as the most basic form of effective and efficient design, especially when practised in emergent communities. Traditionally, participation workshops are arranged face-to-face, directly involving the users of the end intervention from the beginning of the process (Friedrich 2013, Kensing 2003, Simonsen & Robertson 2013). This helps all participants (professionals, stakeholders and community members) to fully engage qualitatively and have an abundant flow of knowledge and inspiration with one another. Face-to-face workshops pose certain challenges, such as the limitations of meeting times, places and the number of participants. However, the number one challenge for traditional participatory design methods would be when face-to-face workshops are not a viable option (Friedrich 2013).

As technology develops and global cross-communication opens opportunities for a larger catchment of knowledge, such participatory workshops have been adapted to online platforms. In the past, online participation was limited to such things as surveys or questionnaires. These resulted in limited feedback but from a much larger pool of participation than face-to-face workshops with smaller and more intimate groups of people (Markus & Mao 2004). Today, there have been numerous technological advances that allow for far more interactive and collaborative online methods. These range from social media platforms to web services. There are also video conferencing and virtual meeting platforms which combine online works with face-to-face interaction (Sanders et. al 2010).

This development in participatory design methodology allows for both traditional and online workshops to take place and for design research to continue without hassles, specifically when faced with a nation-wide lock-down from the COVID-19 pandemic. However, as literature very clearly points out, progressing from face-to-face to online workshops has its own challenges. This article focuses on the gap in knowledge for real world application of online participatory design: what happens when the very community that participatory design methods are intended for, such as Mamelodi East, does not have access to the internet in order to participate in online workshops during a forced social distancing regime?

This article sets out the traditional methodology of participation design and its transition to online platforms. It is then followed by the background and history of the case study: the disadvantaged community of Mamelodi East (van der Waal 2000), clearly defining why such participatory methods are necessary in underserved areas. Following the lock-down of the COVID-19 pandemic, critique of literature and investigation of alternative participation methodologies will be outlined, in order to expose the necessary measures that needed to be taken for the inclusion of users during such trying times.

(Top) Fig. 58: Participatory Action Research workshop at Tsako Thabo school (vd Hoven 2019)
(Middle) Fig. 59: Co-design workshop at Tsako Thabo school (Author 2019)
(Bottom) Fig. 60: Analyzing a scale model of Tsako Thabo school (Greyling 2019)

LITERATURE REVIEW

Using Participatory Methods

General citizen participation in community decision making goes back as far as Plato's Republic (Plato in Grube 1992). More specifically, participation in design processes can be traced back to the development of computers in the workplace in 1970 Scandinavia (Simonsen & Robertson 2013). Over time, methods and processes of participation have developed and have been researched thoroughly across multiple discourses. Today, participatory methods are used to help design technologies and aspects of daily life to be more successful in use, durability and more contextually suitable (Hamdi 2010, Simonsen & Robertson 2013). This is done by tapping into participants' knowledge and skills, emphasizing the richness and underlying potentials of lived members of the community, ultimately acknowledging them as experts in their own field (Simonsen & Robertson 2013).

In architecture, designers implement participatory methods in order to gain a real-world and hands-on understanding of the context (Brown 2009), starting from immersive mapping of social relations and issues in the field, to the iterative process of design and finally the implementing of the project as a built form (King 1983, Sanoff 2011). Joining forces with community members and other stakeholders at every stage of the design process creates a sense of community, social relations, citizen empowerment and results in more ownership for the intervention's success (Bens 1994, Guy 2002, Kretzmann & McKnight 1993, Sanoff 2011). From an efficiency point of view, participatory design often minimizes costs and delays and can prepare for any anticipation of the community's concerns or critiques early on (Creighton 1994). It also solidifies the legitimacy of the project through a fair, open and often democratic process (Sanoff 2011).

Conventional Participatory Methods

Participation starts with a collective drive around shared interests and values (Simonsen &Robertson 2013). Through a process of investigating, understanding and developing, the desired outcome comes to fruition. Most literature states that this process is conventionally done in the field and face-to-face with the relevant participants and stakeholders (Kensing 2003, King 1983, Markus & Mao 2000). Physical interaction amongst the group of participants allows for relationships to be formed through mutual respect and the learning about one another (Simonsen & Robertson 2013). This helps each person involved to fully understand each other when opinions and decisions are brought to the table (Kensing 2003, King 1983, Markus & Mao 2000). Fundamentally, participatory design is "designing futures for actual people" (Simonsen & Robertson 2013:5), including both action and reflection, constant reiteration of the end design. This back and forth ends up being a social activity through which interaction creates design (Ehn 1993).

There are multiple ways of conducting participatory design research *conventionally* (Sanoff 2011). Sanoff (2010) is well versed in using participatory prototypes in the USA for community planning and architecture. In his workshops, small scale models are built to represent buildings and other physical features of the community design (Sanoff 2010). Other researchers have used 3D prototypes that are more robust than simple paper models (Hussain & Sanders 2012). Most often, questionnaires and surveys are used in the beginning of the process, as well as in a qualitative form of reflection later on (Gaver *et. al* 1999). More generative tools that provide qualitative data sets are immersion walks, personal journals of daily life, sending a camera home and collaging (Sanders & William 2001, Simonsen & Robertson 2013). These tools enhance a participant's creativity and can often unveil information deeper than the surface level. Physical activities, such as enacting a possible future through improvisation, or role playing "as if by magic" (Lepir & McPherson 2019:113) scenes can surface intrinsic values and feelings of participants. They are also an excellent tool to use for reflection and learning about a situation from multiple perspectives (Carroll 2000). Mike Ford, also known as the Hip Hop Architect, uses the writing of rap songs as a platform for kids to express the issues and needs of their communities in order to envision better architecture for the future (Hooper 2017). Similarly, sport, games and other activities can be used as platforms for participatory processes (Bødker *et. al* 1993).

The challenges that the participatory process faces through conventional methods are that of practicality and quantity, as discussed thoroughly by Pirjo Friedrich (2013). Starting from the beginning of the process, one can find it challenging to obtain participants. This is due to lack of interest or, more so, mistrust of professionals from past experiences (Friedrich 2013, Hamdi 2010). In terms of meetings or workshops, the time available is limited. This often only allows a smaller group of selected participants and isolated sessions. In such variable workshops, researchers find that there is a much wider pool of information and far richer aspects brought to light that encourages deep discussion. These open-ended conversations often take much longer than expected and result in running out of time (Ehn 1993). Lastly, when participants cannot be reached face-to-face, conventional methods of participatory design need to be adapted (Friedrich 2013, Gaver *et. al* 1999).

Web-based Participatory Methods

As Friedrich (2013) points out, the main focus of the participatory design process is not so much on the methods used, whether these be conventional or not, but rather on the actual participation. The point is to design for real humans by actively and thoroughly involving those people in the process (Hamdi 2011, Simonsen & Robertson 2013). This allows for flexible participatory method typologies without losing the overall impact.

In the 21st century, there have been multitudes of technological development. One technological typology, specifically, that most of the world's population engages with every day of their lives is social media (Friedrich 2013). The term is used in this paper to refer to any form of user generated content through online services. This includes social platforms, software and developed web services. As Friedrich (2013:17) describes so well, social media has "changed the way people, communities and companies interact over the internet". It has resulted in far more immediate forms of communication, connecting people from across the world, expanding boundaries like never before.

Along with Friedrich (2013), other researchers have explored how the power of social media platforms can be used to gain a large number of qualitative data sets (Fischer 2004, Hagen 2011, Johnson 2013, Markus & Mao 2000, Nambisan 2002, Sanders *et. al* 2010). Choosing participants is no longer limited to their physical location and availability of time but is now open to a much larger pool that shares interests and have different backgrounds (Fischer 2004). Physical workshops can be combined with online virtual conferences, increasing the ease of access for most users (Sanders *et. al* 2010). As many people are familiar with social media platforms, collaboration and networking becomes easier and more enjoyable (Friedrich 2013). Research points out that there are many additional benefits for both the researcher or designer and the users of social media, above and beyond that of physical participatory processes. The process can be monitored constantly and at any time of the day by the researchers (Hagen 2011, Vanattenhoven & Jans 2007) while also being accessible across countries, allowing for qualitative insights and communication from varied physical contexts (Hammer-Jakobsen and Goldman 2009). As social media platforms are generally open source, other participants and researchers can see each other's content and the conversation of inspiration can flow (Hagen 2011, Vanattenhoven & Jans 2007). The data becomes richer and more elaborate (Kaptein *et. al* 2009) as anonymity can easily be achieved, giving users the confidence to speak with complete honesty and raw self-expression (Reid & Reid 2005). Without interruptions and constraints of physical interaction, there can be continuous contact between the researchers, designers and users resulting in immediate interviews or action if required (Hagen 2011, Vanattenhoven & Jans 2007). From cost savings to unlimited participants and more flexible schedules, participatory efforts of collecting qualitative data have been opened up to far more new possibilities through the use of social media (Bolt 2006, Gough & Phillips 2003). Lastly, a very important note from literature about using social media as a platform for participatory processes, is that all the data collected is immediately in a digitized form. This saves time from transferring the raw data collected on site to a digital platform and makes the storage and sharing of collected data much easier (Friedrich 2013, Yndigegn 2010).

Friedrich (2013) also breaks down the uses of social media attributes for co-design possibilities. This ranges from the openness of the platform to interaction, collaboration, immediacy and connectedness through user-created content. Each of these aspects can be considered and applied for any social media platform the researcher chooses to use.

Online tools for participatory methods have disadvantages and challenges specific to the design process (Friedrich 2013, Kaptein *et. al* 2009). It is necessary to note that each case is user-specific, and the presence of the challenges is variable to each session and user. The most obvious challenge for social media platforms is internet accessibility (Kaptein *et. al* 2009). This ranges in levels of the obstacle, from no electricity to lack of money to pay for the internet to limited amounts of data. For researchers, it takes a lot more effort to learn and master the social media platform for co-design than for physical workshops (Friedrich 2013). User participation and maintaining user interest through a screen is also a considerable challenge that needs to be prepared for prior to the session (Bolt 2006).

Although technology has developed favourably in light of participation processes, these methods prove to be both a challenge and a new opportunity when faced with a global lockdown and the large economic gap found in developing countries.

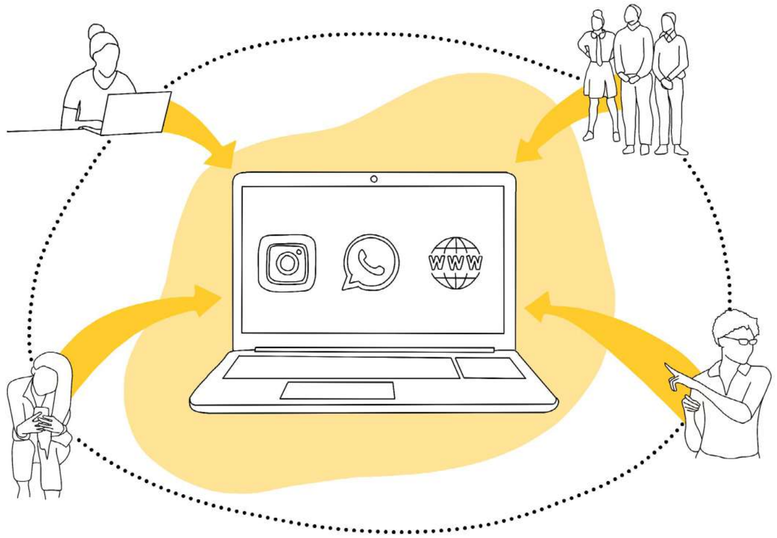


Fig. 61: Taking co-design and participatory research online during a global pandemic (Author 2020)

METHODOLOGY

The research done as a part of this article falls within an interpretivist paradigm, collecting qualitative data. This type of data collection is used in order to gain a real-world and hands-on understanding of the context in which the project is based (Friedrich 2013, Simonsen & Robertson 2013). It is human-centred and uses real people in order to gain real perspective (Brown 2009), ultimately resulting in a higher success rate. The data was analysed according to Robert Yin's (2011) qualitative analysis methodology. This was done to draw similarities or contradictions of phrases, themes and metaphors between primary and secondary sources, as well as to summarize the overall findings and identify the gap in knowledge.

This research was done in response to an obstacle for a Professional Masters of Architecture mini-dissertation at a South African university. Founded on participatory design methods, initial investigation and collaboration were conducted by implementing traditional methods of face-to-face interviews and workshops. When the COVID-19 pandemic struck South Africa, traditional methodology for the participatory design stage of the project was interrupted indefinitely. In order to continue with the design process, web-based methods were adopted, and a user-oriented website was developed.

The website developed for this research was created using a free open platform called *Wix*™. This platform allows for both desktop and mobile versions of a customized website to be developed. This creates the opportunity for inclusive access for the majority of users. The designed website, *Music Makers* (https://lakonst.wixsite.com/musicmakers), briefly outlined the dissertation project and very clearly indicated what form of participation was required from the users. Ethical disclaimers were featured on every page of the website in order to ensure full understanding of the intended use of the data collected. Verbal or physical acknowledgment of the ethical disclaimer prior to commencement of workshops, video calls and questionnaires were compulsory. An important aspect to note is that all users' anonymity was ensured throughout the entirety of the project.

Two main functions of the website became evident over the course of the research. Simultaneously, the website acted as an interactive platform for collecting data as well as a platform for uploading and sharing of data collected off the website. This was done by linking to forms made using *KoboToolbox*™ as the platform for collection. In general, the researcher found the first function to be limiting in terms of control and ensuring participation. The site was shared on many social media platforms by both the researcher and others, as well as direct communication via email and *WhatsApp*™ messages, however lack of encouragement and motivation resulted in limited interaction or declined responses with the online workshops. The level of interaction was decided by the user and could not be managed or supervised by the researcher at all. The second function of the site proved to be more successful from the researcher's side. Private and supervised workshops were held on separate online platforms and the summarized data and conclusions were uploaded to the website. This resulted in the data being collected to be more effective and ensured, while the viewing and sharing of this data with others remained limited and difficult to trace. During video conferences, for example examinations, the website proved to be a user-friendly and successful platform for sharing the data and other uploads.

The initial target group of musically inclined students from Tsako Thabo Secondary School could not be reached throughout the lockdown period of the COVID-19 pandemic. This was due to the complete lack of access to the internet and limited financial opportunities to buy data, typical of the economic gap prevalent in South Africa. This resulted in total isolation with regard to communication and participation with the researcher. Although there are community members who have access to most services, the research was limited due to the target group required for the dissertation. The focus group of Tsako Thabo Secondary School learners that participate in musical extracurricular activities within Mamelodi East were chosen specifically due to their ability and education in the making of music (i.e. playing instruments and singing). As the target group was established during face-to-face workshops, only a small number of members were involved. Transitioning online, however, was found to be necessary for the continuation of the research, to expand beyond the initial target group, allowing larger groups of people to participate (Markus & Mao 2004). This was still predominantly focused on music makers within Mamelodi East, but due to the lack of participation, the catchment area grew larger and expanded into any musician willing to participate. An opportunity for international engagement and participation presented itself as a result of the COVID-19 lockdown. Although this did not directly involve the target group of Mamelodi musicians, it did allow for collaboration with international musicians, social enthusiasts and participatory professors, all contributing to the development of the research-led design project.

The adaptation to the research methodology was largely influenced by literature, specifically that of Pirjo Friedrich (2013). Social media platforms were found to be far more powerful for reaching a wider number of individuals. This was proved through the joint effort between unofficial meme pages of the University of Pretoria and Stellenbosch University using *Instagram Stories*™ (Life At Tuks 2020, SU Just Kidding 2020). A student-led initiative was organized to ask other students to voluntarily buy data for other certified financially disadvantaged learners. This helped them gain access to the internet in order to continue their studies during the COVID-19 lock-down, when their universities provided futile solutions that could not help most disadvantaged students (Life At Tuks 2020). It has since developed into an initiative for raising funds for students with no financial means to buy food or pay rent. It has also influenced similar initiatives run by the student key committees of the University of Pretoria to raise funds through social media platforms (Mathibela 2020). These initiatives were proactive responses to the spotlight on the severe economic gap within the University's educational ecosystem as a result of the COVID-19 lockdown.

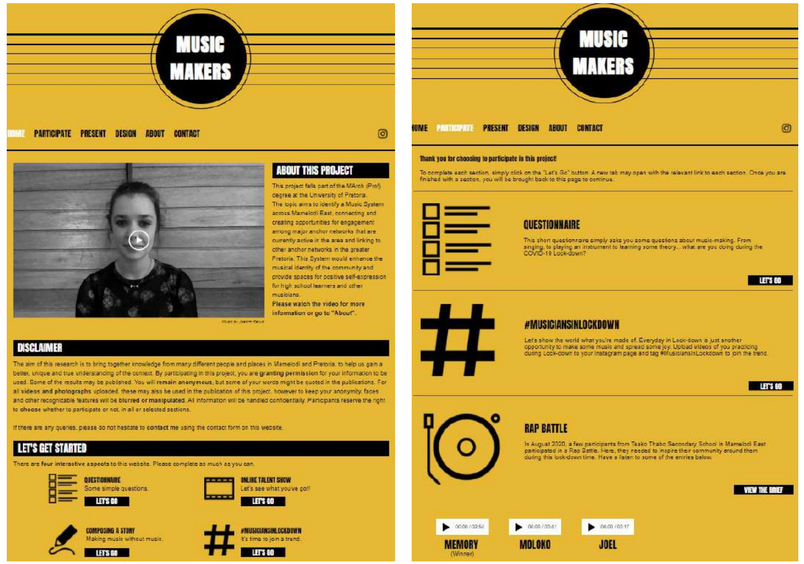


Fig. 62: Screenshots of the developed website Home and Participate page (https://lakonst.wixsite.com/musicmakers) (Author 2020)

DISCUSSION

This article has gathered and correlated information regarding the conventional participatory methods as well as the development of online participation. Both have been proved to be greatly successful in practice and as ways of overcoming certain obstacles along the participatory journey. These online methods, although providing the opportunity for further connections and larger pools of qualitative information, do not solve the initial problem of the lack of consideration for the majority of underserved communities in South Africa when moving daily life online. As the community members of Mamelodi East are vital contributors to the research led design of the researcher's Masters of Architecture (Professional) project, it is instrumentally important that they are included and considered in the process, no matter the challenges.

Some of the students in the Honours year of 2020 in the Department of Architecture thoroughly explored virtual platforms that can be used for participatory processes, with specific relevance to those available and popular in South Africa. These were analysed according to accessibility/ usability (data usage, installation etc.), interactivity (creative tools, communication types, participant collaboration etc.) and academic soundness (use for research, design, empowerment of users etc.) and thoroughly compared to one another (Buffa *et al.* 2020). This largely influenced the platforms used for this research project. Engaged co-design workshops were implemented with participants outside of the initial Mamelodi target group, due to the disconnection caused by the economic gap. These participants had internet access and shared similar interests or contextual backgrounds with the project, ultimately falling on the 'greener side' of South Africa's gap. It is important to note that although the initial target group could not participate in the design stage of the project, due to the COVID-19 lock-down, the background research had already been completed using traditional face-to-face participatory methods with users in Mamelodi East. This provided the foundation on which further investigation could be built that would not leave it uncontextualized and assumed.

Concluding from the analysis done by the Honours group, it is found that data and money is still a predominant issue when it comes to the first stage of accessibility for virtual participatory processes. As uncovered through the student initiative run by the Life At Tuks meme page on *Instagram*™ and Fiona Samuels (2020) *Tips for collecting primary data in a Covid-19 era*, a way to address the issue of not being able to reach disadvantaged users is through networking and word-of-mouth (Life At Tuks 2020). However, for them to engage directly with the social media page, data is required. Researchers and facilitators have provided money for data for their participants to collaborate virtually during workshops. This could be a financial incentive with both pros and cons. Firstly, participatory processes should not be a job nor chore for participants; it is a voluntary engagement that inspires overall community empowerment and upliftment (Byrne & Alexander 2006). Using incentives for participatory processes can result in lack of ownership and responsibility for the end product once the incentives end, which completely contradicts the point of participation (Byrne & Alexander 2006). On the other end of the spectrum, buying data for participants, for example, could result in motivation for the process, which in turn results in ownership and identification with the end participatory product; participants can see the 'bigger picture'. This is a risk that researchers and facilitators need to consider in both physical and virtual participatory processes. If an incentive is used for virtual participation, there is no guarantee or assurance that the participant will deliver their end of the bargain.

Although there were no clear solutions to the initial problem statement of the economic gap, perhaps it is more about learning from this unique experience than forcing the puzzle pieces to fit. The economic gap is not unknown in South Africa, but most did not realize the dire consequences it could result in. Taking everything online during the COVID-19 pandemic has only begun to exhibit the extent of this issue (Croukamp 2020). As seen by the student-led initiatives and the many seminars that have been held virtually, the economic gap has predominantly inspired others to reach out and help change things for the better. Web-based co-design sessions are certainly a positive development for those who can access internet and technology, however, a data crisis is not something of desperate value when the real issue is a lack of income for mere survival.

Simply moving online is not an entire solution on its own. Perhaps a hybrid of conventional methods with alternative processes that respond directly to the context of the research is necessary.

The Gauteng City-Region Observatory (GCRO), Human Sciences Research Council (HSRC) and Social Surveys Africa (SSA) have collaboratively run a series of seminars during the lockdown period where professionals and like-minded people have presented and discussed ways of collecting social data during this time of restriction (GCRO 2020). It is imperative that these activities cannot be put on hold due to this disruption, but rather continued vigorously so as to understand the multi-dimensional impact the pandemic has on people's lives. This will largely influence future design considerations in order to ensure well-being of people in South Africa. Some researchers had merged techniques and processes in order to work with the lockdown obstacle. It was emphasized that using mixed research methods in order to collect the qualitative data was the best way to go around the restrictions of the lockdown (Croukamp 2020). This includes both online participatory sessions, telephonic and face-to-face, where possible. It was also found that using incentives, whether it be airtime vouchers or the likes, were a necessity to encourage participants to give their feedback (Croukamp 2020). Lebogang Shilakoe (2020) from SSA spoke about their experience with telephonic surveys and conversations. These were found to be a great opportunity as more people were at home with more free time and they wanted to talk to somebody. However, this type of research quickly becomes costly and has a stigma from participants. The stigma associated with telephonic surveys is that they waste the participant's time as the participant does not get anything in return (Shilakoe 2020). Working with network providers, the cost of calling many people could be reduced as well as providing incentives for participants, such as airtime vouchers (Shilakoe 2020). This process relies on having contact details for participants. If the researcher does not have these details from past projects or fieldwork prior to physical restrictions, they could use social media platforms to advertise. Similarly, to the incentive with the *Life At Tuks Instagram*™ page, participants (or donors) responded to adverts placed on social media and privately exchanged contact details with the researcher. Once again, the facilitator does not necessarily have control or assurance that a certain quantity and quality of participants would respond, although there is a higher chance of success if incentives are provided.

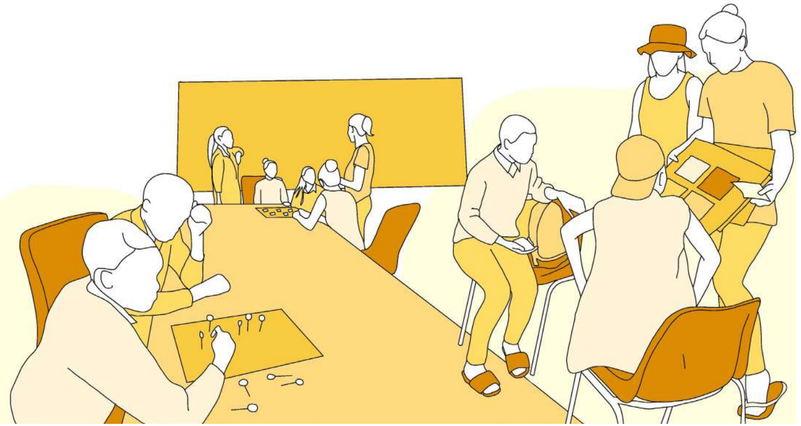


Fig. 63: Conventional participatory research workshops collage (Author 2020)

Participatory Test during Lockdown

Following the initial research trial done through the website, findings from the literature reviews and research done by the Honours group, the researcher found it imperative to test a combined participatory research approach.

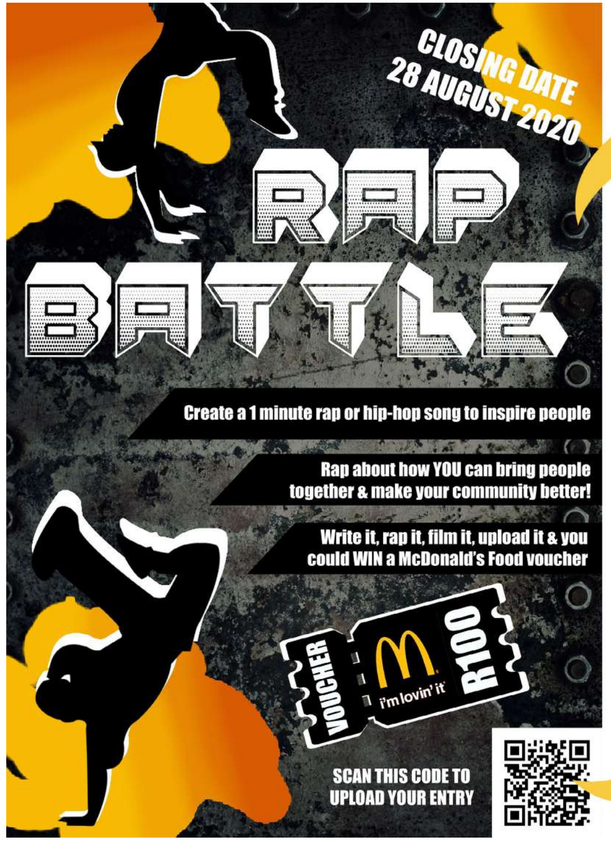
The researcher set up a 'Rap Battle' competition in a digital poster format to send to the principal of Tsako Thabo Secondary School. This poster was visually similar to those uploaded on the researcher's website for the previous participatory challenges. A QR code was provided on the poster, linking to a collection form on *KoboToolbox*™. The form created for uploading the entries was tested multiple times using the researcher's and other cell phones both with and without internet access. The only issue that came up was that internet access was required to upload the data, however, this would happen automatically as soon as a phone would connect to the internet, even hours after the form had been submitted. This form consisted of the ethical disclaimer, acknowledgement of consent, request for contact details (in order to communicate with the winner) and space to upload the participants' video or audio files. The poster indicated that the winner of the competition would receive a R100-00 *McDonald's*™ food voucher. This specific prize of a food voucher was chosen in response to the dire needs of citizens falling on the lower side of the economic gap, as proved clearly through the data-turned-food initiatives set out by *Life At Tuks*.

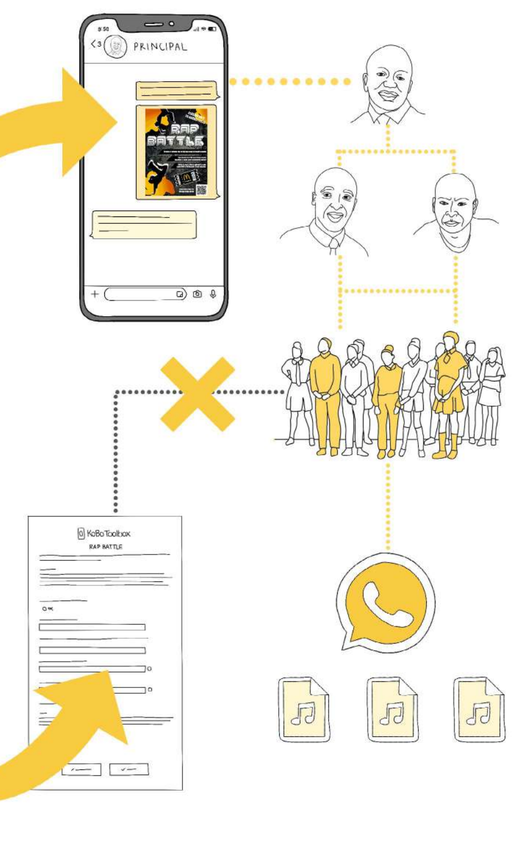
The poster was sent to the principal using *WhatsApp*™. The researcher had formed a good relationship with the principal and had his contact details from previous engagements with the school prior to the COVID-19 lockdown. Within three-quarters of an hour, the researcher had been connected with two school teachers who had already shared the poster with their students and had received a lot of interested feedback from their students. Comparing this stage of sharing the poster to the same stage of sharing the website previously for weeks with still little interest, the Rap Battle competition was a much bigger hit. This could be due to the prize, the more direct approach of sending the poster directly to the principal instead of merely sharing a link or the lack of internet access that was required in order to complete the competition. It is unclear as to whether the teachers forwarded the poster to their students or simply expressed the competition brief verbally. At this point in time, the teachers involved did have face-to-face contact with the students during the week.

The morning of the deadline for the competition entries, the researcher contacted one of the teachers to ensure everything was moving smoothly. The teacher responded saying the students had uploaded their entries, however, on the researcher's side of the *KoboToolbox*™ form, there were no uploads. The researcher then lost contact with the teacher due to unknown reasons. A few days later, the researcher reached out to the principal again to try and understand what the issue was. Eventually, through the principal contacting the teacher again, the researcher regained contact with the teacher and worked together over the *WhatsApp*™ voice call feature to solve the issue. It seemed that the students did not have internet access to upload their work and therefore required the school's infrastructure in order to complete their entries. This again, proved to be insufficient and the teacher had to go out of his way to buy his own data for his phone to upload the student's entries. This brought about its own set of challenges. The teacher would download the entries sent to him via *WhatsApp*™ and upload them to the *KoboToolbox*™ form. Somehow, this messed with the file type and could not be opened from the researcher's side. Eventually, to simplify the situation, the researcher suggested the entries to be sent to her using the same platform they were sent to the teacher: *WhatsApp*™. This proved to be far more efficient and successful. The participants' contact details (cell phone number and name) and acknowledgement of the ethics disclosure were provided through the *KoboToolbox*™ form.

In total, there were three entries that met the brief that the teacher was happy to submit to the researcher. The winner was selected and sent a winner's poster via *WhatsApp*™. The researcher had to change the prize as *McDonald's*™ would not sell a singular voucher. However, an even better solution came to play. *KFC*™ sells virtual vouchers that can be sent to the receiver via SMS and is valid for three years from the purchase date. This voucher is extremely useful, especially during a nationwide lockdown as it requires no face-to-face contact.

As a summary, *WhatsApp*™ proved to be the more efficient and successful way to contact participants and to share data collected. As proved by the students in the Honours studio, *WhatsApp*™ is used by most of the population in South Africa and uses an incredibly low amount of data. Although, it does not provide a formalized way to collect data anonymously and ensure ethics acknowledgement, it is the researcher's responsibility to ensure these issues are dealt with.





CONCLUSION

Considering the research done, the projects implemented during the *Collecting Social Data: Adapting to the COVID-19 Pandemic* seminar and the Rap Battle initiated by the researcher the initial concern raised by this article is that of compatibility and accessibility over the large economic gap in South Africa. Citizens on the lower side of the economic scale were simply unable to adapt to the online transition for work and education during the COVID-19 nationwide lockdown. The golden thread is access to technology and predominantly the lack of income in order to afford this access.

The research collected in this article has provided numerous ways of collecting participatory data, both online, face-to-face and a combination. Tools, such as *KoboToolbox*™ were developed in order to collect qualitative data from emergent communities in order to make a difference through social innovations and bring awareness to issues found. It was specifically designed to provide a platform that can be used by anyone, irrelevant of economic class. Practically, *KoboToolbox*™ works without an issue face-to-face with researchers and community members. However, as proved by the Rap Battle submissions, the interface became inaccessible for participants due to the lack of internet access. As suggested by the Honours studio and proved by the Rap Battle, *WhatsApp*™ is a far more accessible platform for contacting participants, but still requires a certain amount of internet access.

One may be disheartened by the impact of economic status in that what is a simple solution for some is a significant inhibitor for others during a nation-wide lockdown. However, one can also choose to be inspired. The reason for this is that lockdown exposed this inequality of access to high tech solutions between the different economic classes. This is an exciting opportunity to create awareness and to drive the relevant stakeholders to address this issue. This research can contribute to the development of knowledge concerning these differences and it can challenge both government and the private providers of internet connectivity to join together to find an innovative solution. This opportunity for collaboration may be a starting point for various sectors of the economy to address other such inequalities as we stand together on the cusp of a new, post-lockdown world.

Fig. 64: Participatory research at Tsako Thabo Secondary School (Author 2020)

03_INFORMANTS II

Urban Vision

Moretele Park Proposal

MMS Proposal

CAFCA Proposal

Tsako Thabo Design

Proposed Users

2020 Co-design Workshops

Summary

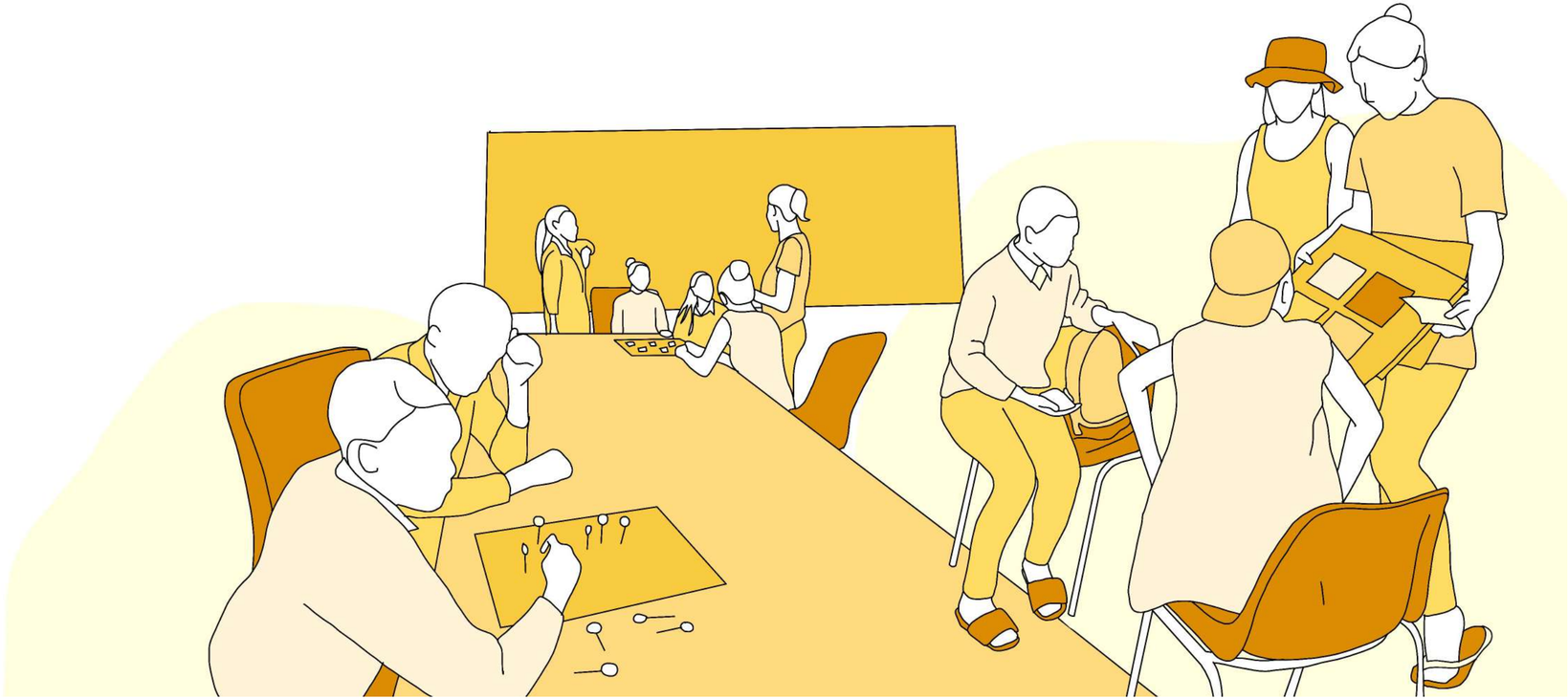


Fig. 65: Community Action Planning and Codesign collage (Author 2020)

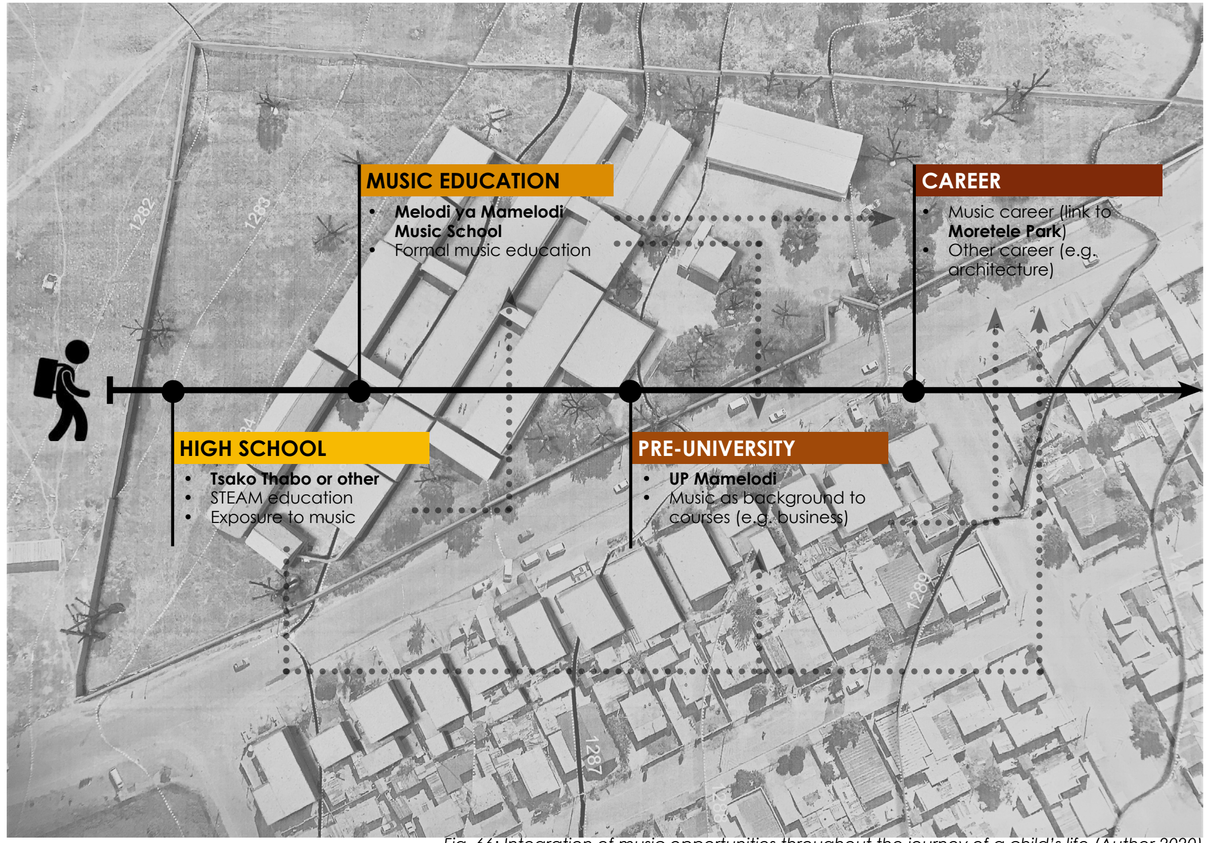


Fig. 66: Integration of music opportunities throughout the journey of a child's life (Author 2020)

03_INFORMANTS II

Previous architecture dissertations (Blokland 2007, Thomo 2007) have been researched and proposed in Mamelodi East and other areas in Pretoria, speaking on the musical heritage of the relevant community. These projects consisted of extravagant designs on a single site, namely Moretele Park and a vacant plot in Marabastad, in the form of an amphitheatre and assisting buildings with a function of performance and music education centres. These dissertations were well thought out and considered in terms of conventional architecture and methodology; it is therefore vital that this project does not repeat the same interventions and process, but rather considers a project that is more inclusive, relevant and socially informed due to the participation and active co-design with the end-users of the intervention. Adding to the knowledge imparted by these previous dissertations, as well as the previous 2019 Honour's design project proposed by the researcher herself, should provide this project with a solid foundation on which to build.

During the nationwide lockdown of the COVID-19 pandemic in South Africa, a lot of the research for this dissertation was taken to an online platform. This inspired many opportunities for reaching out to researchers and other people with shared interests to broaden the influential field of this dissertation. One major virtual connection that was made is that with Sandra Wall from UNESCO's Creative City of Music, Norrköping in Sweden. On a global scale, the qualitative and quantitative data documented in Mamelodi East, as well as the proposed Mamelodi Music Network can be used as part of the application process for Mamelodi to become one of UNESCO's Creative Cities of Music. This can activate the community on a global scale and enhance the proposed musical identity of the community as a whole.

Largely influenced by the primary and secondary qualitative data collected and analysed, this research-led design project suggests a Music Route on an urban scale that would form part of the existing Heritage Route of Mamelodi East (van der Waal 2000), connecting the main nodes of CAFCA at the UP Mamelodi Campus, Mamelodi Magnet School at Mamelodi Secondary School and Moretele Park, with the allowance for future connections to be made.

On a local scale, each node has its own typology and programme, addressing each situated local issue. This was largely influenced by the different stages of musical exposure in a child's development and its impact on their future. Adding to these main nodes are schools within the community that participate in musical extra-curricular on their respective sites. These sites, as mentioned previously, were not considered in terms of such activities and therefore the built aspects hinder these musical activities. It is not intended for these schools to become well-established music schools as there are already these in the existing nodes. Instead, these schools intend to provide a more inclusive and all-rounded STEAM education through music as the gateway. Tsako Thabo Secondary School is one of the schools and is proposed as an example of design considerations for the other schools. The proposed interventions would be implemented in different stages, as inspired by Nabeel Hamdi (2010).

Each main node within the Music Network has been considered in terms of a proposal based on its existing functions and opportunity for connection with one another.

URBAN VISION

Through participatory workshops with the students of Tsako Thabo Secondary School and other knowledgeable role-players, the development of an entire Music Network took place. This system links to the Mamelodi Community of Learning Collaborative (MCLC) and reaches across all anchor nodes identified within the community. This Network will be constantly evolving in terms of connections and spatial interventions. Activated by agents of change on the ground, the Network is decentralized both authoritatively and spatially through the sharing of facilities and skills. This allows growth over time, introduction of new role-players and developing existing relationships into something more pertinent. Encompassing multiple interventions, across scales, sites and programmes, each node is connected and supported by the other.

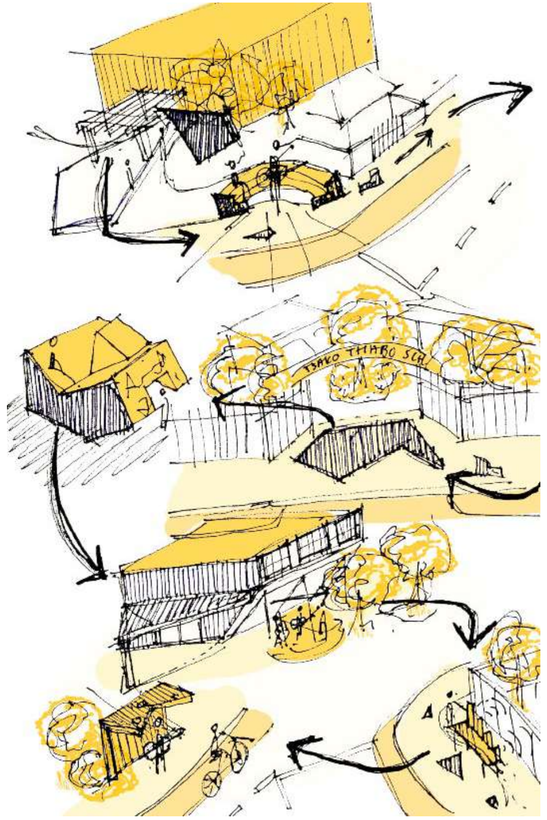


Fig. 67: Urban Vision sketch concept April (Author 2020)

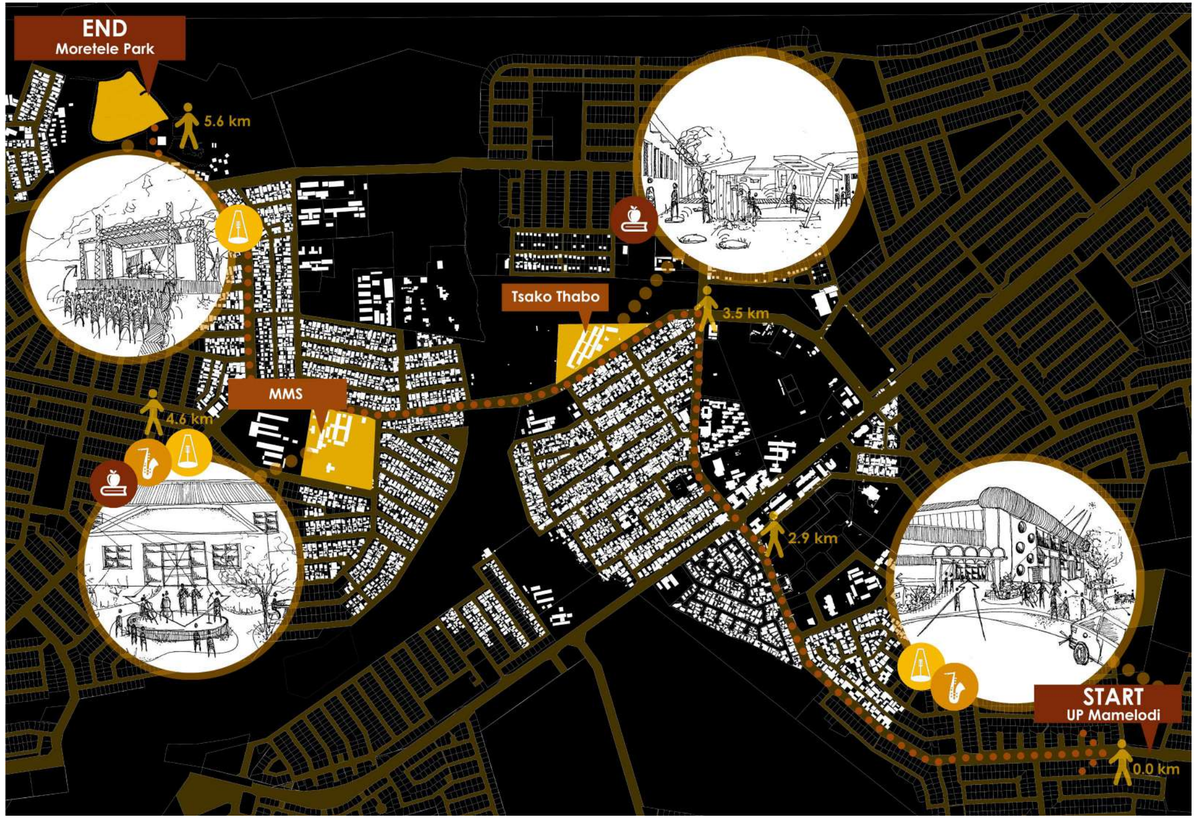
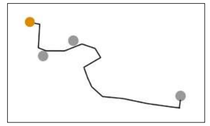


Fig. 68: Urban Vision (Author 2020)



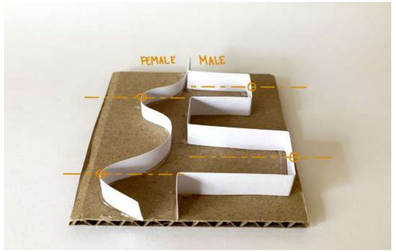
Moretele Park (Proposal)

This node responds to music and architecture as a temporary performance. Used ever only for events, the overall stage and set up is constructed and then again deconstructed, returning the site to its original function, removing the musical performances with it. Not taking away from this temporality, the proposal for Moretele Park as a part of the Music Network is to act as a conglomerate of the other main nodes. Embracing Castells' (2011) delimitations of networking, the temporary stage structure and other interventions required for large outdoor events are built up from fragmented pieces from the other sites, each with their own function. These functions are re-appropriated when brought together, becoming greater as a whole (Augustyn 2018, Castells 2011, Kozikoglu & Cebi 2015, Sahyouni 2014). The aim of this proposal is to inspire community members, users and stakeholders of each node and the surrounding areas to come together and create something that can be used to celebrate their cultural history, something of which they can be proud. This also provides opportunities for knowledge and skill-sharing amongst participants, uplifting the overall community. At the end of the event, the shared elements making up the temporary structure are dismantled and returned to their original sites and functions.

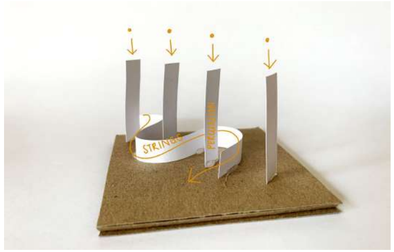
This is largely inspired by the interventions done by RAW at the World of Music, Arts and Dance (WOMAD) festivals from 2010 through to 2013. Roots Architecture is a design/build workshop in the UK that brings people with shared interests together to create and build temporary structures, functioning as stages and others during the WOMAD world music festivals (Schoof 2013). The idea was developed through a constant frustration of the commodification of architecture and design and the resulting disempowerment of its users (Wood 2012). RAW aims to encourage its participants, both professional and laymen, to think beyond the structured box and be creative, active and involved. Each year, there have been many inspired and clever design outputs, including stages that are interactive and create relationships between the musicians and the audience; a dynamic energy (Oppenheim 2011).

As inspired by literature, abstract analysis of the typical music played at the festivals using music as a method (Capanna 2009, Tayyebi 2013, Young *et. al* 1993), namely Philip Tabane's music commemorated at the annual jazz tribute concert at Moretele Park found an inherent relationship between the beat and the melody, the main vocal and the backups; background elements are of necessity to emphasize the main element of the show.

ANALYSIS THROUGH MUSIC



Voices: smooth female falls as an echo after stronger male voice.



Strings vs percussion: elegant relationship between staccato and smooth sounds.

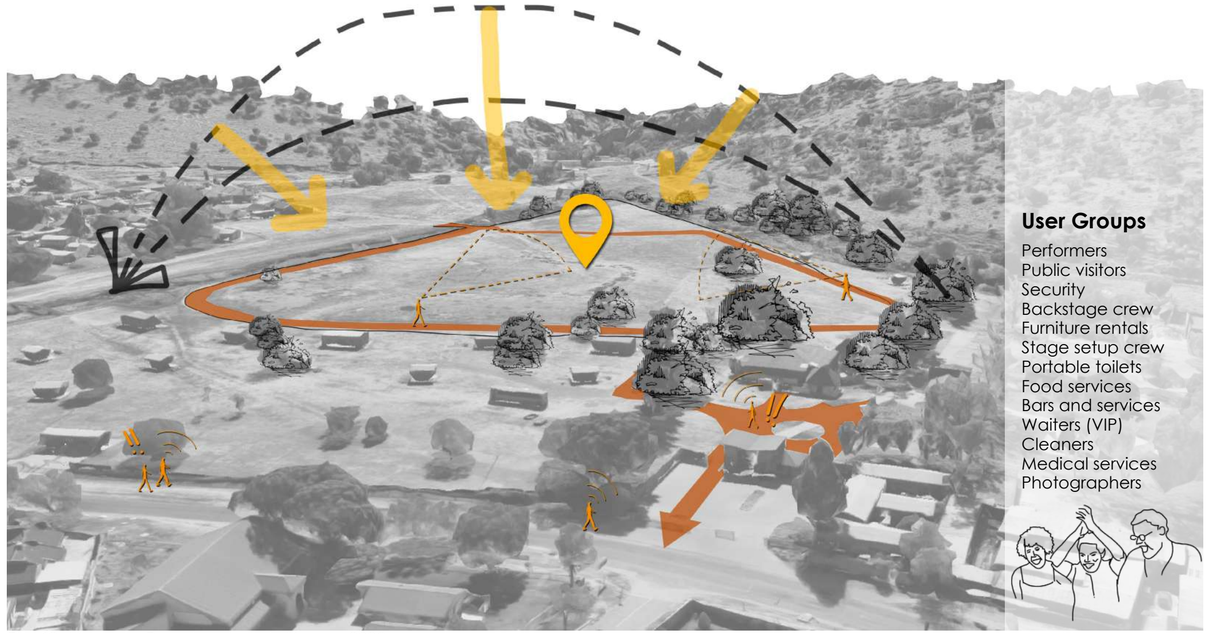
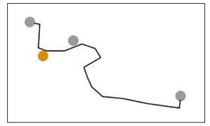


Fig. 69: Moretele Park site analysis (Author 2020)

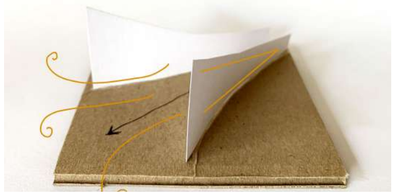


Melodi ya Mamelodi Music School (Proposal)

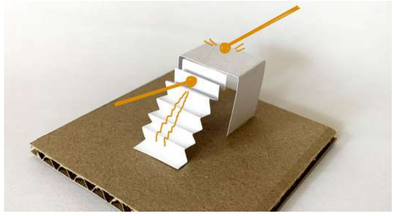
As discussed in the analysis, this existing music school is physically separate from the academic side of Mamelodi Secondary School. Due to this, many students and members of the community miss out on the opportunity to be exposed to the offerings of music. The proposal for this site is to serve as an opportunity for the future development of co-music and academic schools. This is done through the celebration of music and architecture, with music largely influencing the transition between different zones within the school. The idea of physical, visual and audible accessibility throughout the site is influenced by the proposed drama of roof overhangs. The roof becomes a performance in and of itself, attracting attention and interest from beyond the school boundary. The journey of music starts from the street, drawing those curious into the building and exposing them to the experience of learning and performing music.

Analysing the imagery (Capanna 2009, Tayyebi 2013, Young *et. al* 1993) of the specialized instruments taught at the music school, it was found that sound only occurs through the interaction and transitioning of an external element through, on or with the instrument itself. This largely influenced the relationship between music and architecture, looking at their intersection and what opportunities were provided for interaction, physically, visually and audibly.

ANALYSIS THROUGH MUSIC



Brass: movement through a chamber, air and sound crescendo.

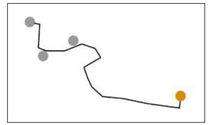


Percussion: requires an external element to make a sound.

Strings: friction between two elements moving in the opposite direction.

Practise Learn Perform

Fig. 70: Melodi ya Mamelodi site analysis (Author 2020)



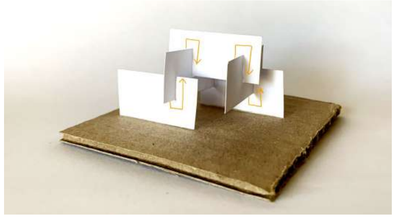
CAFCA at UP Mamelodi (Proposal)

The arena at UP Mamelodi Campus is, for the most part, successful. It does, however, place musicians and performers in awkward spaces due to the lack of design consideration within the building. As CAFCA was developed for bridging between different backgrounds and providing a stable ground to build futures on, the proposed intervention of opening up the arena, bringing performance and celebration of music and academics right to the entrance threshold through architecture, will give music a platform within the established pre-university academy of the campus.

Using music as inspiration (Capanna 2009, Tayyebi 2013, Young *et. al* 1993) to analyse the context of CAFCA, creating a purpose and value for music through architectural interventions provides job opportunities for a member of the community to build both themselves and each other up. The community of music becomes a strength in Mamelodi's identity.

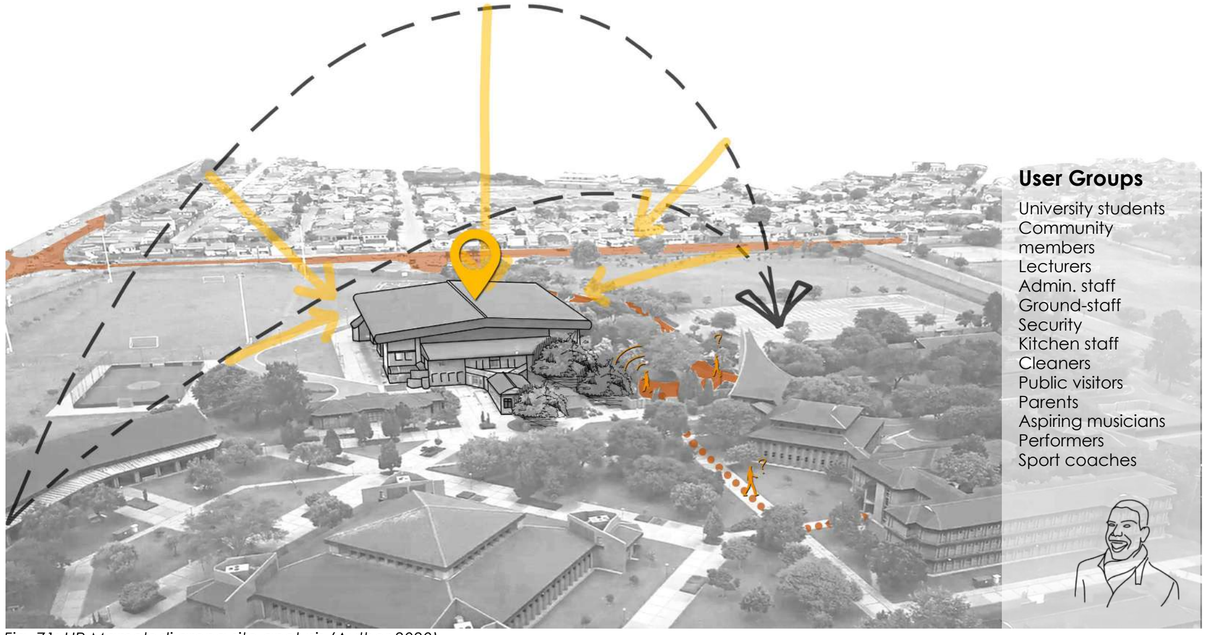
ANALYSIS THROUGH MUSIC

CAFCA: bridge between different backgrounds.



CAFCA: building up community and creating jobs for musicians.

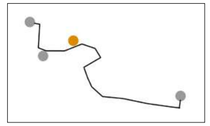
Practise Perform



User Groups

University students
Community members
Lecturers
Admin. staff
Ground-staff
Security
Kitchen staff
Cleaners
Public visitors
Parents
Aspiring musicians
Performers
Sport coaches

Fig. 71: UP Mamelodi arena site analysis (Author 2020)



Tsako Thabo Secondary School (Design)

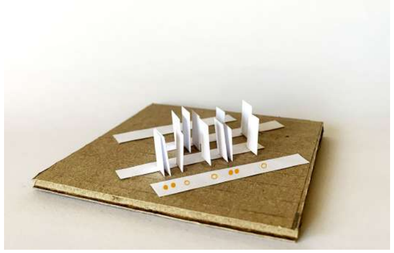
Tsako Thabo Secondary School has been identified as the weakest link within the overall network but can serve as a fundamental precedent for the future development of other schools with regards to STEAM education. Therefore, this site has been selected for the main design proposal for this dissertation. The main issue uncovered here is the current linear education (STEM) and architecture resulting in the exclusion of alternative learning and the freedom for learners to express themselves along their journey of self-discovery. By not redesigning the entire school, the adaptation proves to be possible for implementation in current existing schools.

Using Capanna's (2009) methodology of music and architectural analysis, the researcher used the music and lyrics of *AmaPiano* songs to form an abstract understanding of the social context of music in the school. It was found that there was a strong correlation between the founding beat and the lighter synthetic instruments. The lyrics, specifically Team Mosha's *East and West* (written about Mamelodi East and West) were that of inspiration and pride in the community.

The process and development of the design proposal for Tsako Thabo Secondary School are outlined in the following chapters.

ANALYSIS THROUGH MUSIC

Thula's Story: micro-network of music education.



Amapiano: typical staccato rhythm over synthesized piano chords.

Learn Perform

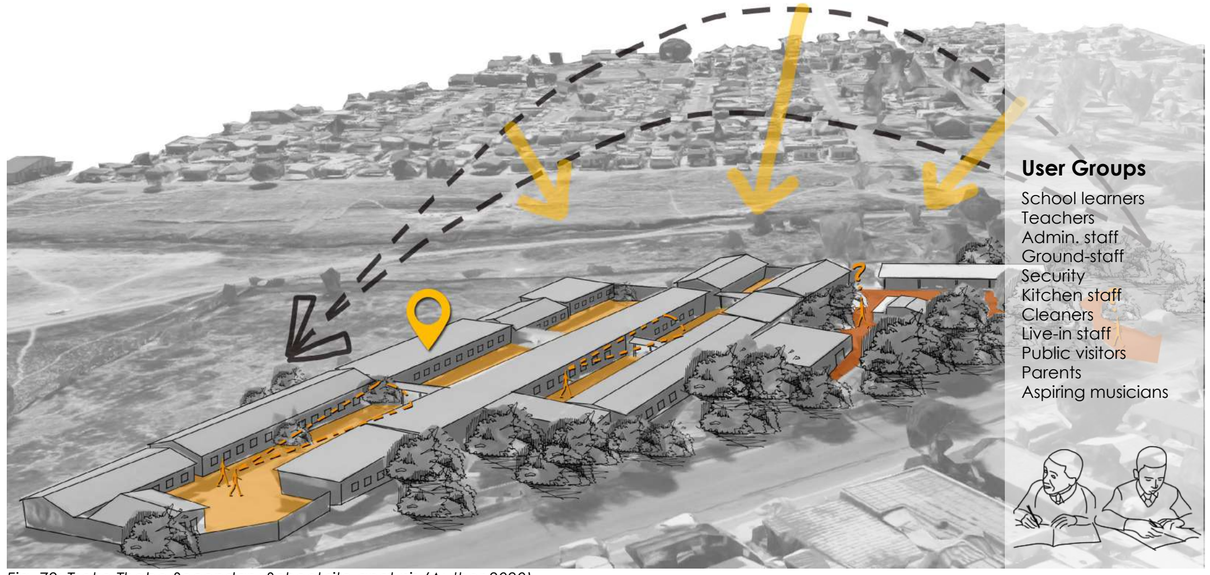


Fig. 72: Tsako Thabo Secondary School site analysis (Author 2020)

Identified User Groups

The following user groups were identified as the predominant and common users of the overall network and its individual nodes. These users would move between each node within the network and perform as the network actors (Bencherki 2017), similar to the story of the young aspiring musician, Thula. The times, several users and proposed ages have been assumed based on the data collected throughout the 2019 and 2020 mapping through participatory research. The narratives accompanying each profile is also assumed as a part of this project.

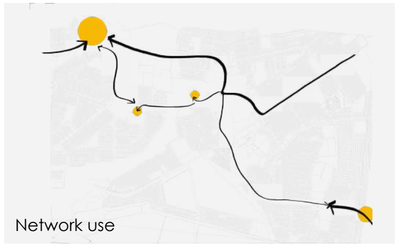
Public Visitor

Ages: ALL

Visiting hours:

# of users: 100 - 10 000

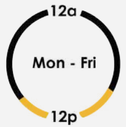
People from all over the country visit Mamelodi East to experience its rich culture, history and community. From huge annual music festivals to walking the Music Route, everyone feels the Mamelodi vibe flow through their veins.



Community Member

Ages: 16 - 60

Visiting hours:



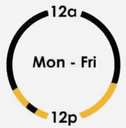
# of users: 100

Since the Music Route became an official leg of the Heritage Route tour, multiple jobs have been created.
From being the tour guide to the entertainer playing music, ensuring each site is communicating and well maintained is vital to the success of the project.

School Learner

Ages: 7 - 20

Visiting hours:



# of users: 1 200

Getting through school is tough enough, struggling to learn shouldn't be added to the list of problems. When there are opportunities to learn in a more creative way, some of our brains find it easier to understand work and can concentrate for longer periods of time.

Aspiring Musician

Ages: 7 - 25

Visiting hours:

# of users: 200

Introduced to music at any age, the musician can partake in extracurricular activities in order to further their passion, perhaps all the way to a career.
Learning and performing in both groups and individually creates a way for that passion to be shared with the world.

Fig. 73: User diagram inspired by Simmons & Lee 2017 (Author 2020)

Fig. 74: Researcher's setup during Co-design Session 1 (Author 2020)

2020 Co-design Workshops

Following the nationwide lock-down in South Africa due to the COVID-19 pandemic, the participatory workshops and co-design sessions for the year of 2020 were held online using interactive platforms such as *Google Meets™* with *Google Jamboard™*. As unpacked in the article attached before this chapter, the initial participants from Tsako Thabo Secondary School were unable to be reached to participate online. Therefore, participants needed to be carefully selected based on their previous experiences with the context of both Mamelodi East and Tsako Thabo Secondary School. Fortunately, the researcher had worked closely with the UUC Honours group of 2020 within this exact context and in relation to the musical topic of this dissertation.

CD 1A

Tuesday
30 June 2020

Online
Google Slides

AM
10h00 - 11h30

3 participants

Context & user

Why these participants?

- Three University of Pretoria post-graduate students, each with a background in **community architecture** and **social inclusion** who have worked with the UUC in Mamelodi East before.
- These participants have a knowledge of the **contextual and social issues** of the area.
- The participants have engaged with the facilitator before and have forged a **collaborative relationship** through the UUC.
- These participants are the same for each co design Workshop 1.

Co-design session 1A: Persona

This workshop aimed to provide a personified lens through which participants can respond to the following workshops. Randomizing the attributes of the persona removes the facilitator's bias and preconceived user ideas. Each attribute is based on existing user stories from the initial mapping stage.

Session Structure:

1. The facilitator selects three categories: Current Status, Dream and Current Issue. Predetermined descriptions for each category are numbered according to a dice.
2. Each participant has a turn to roll the dice three times to determine an attribute in each category.
3. Participants are encouraged to provide a brief story about their persona, adding in additional details they feel fit the description.
4. These personae are used for workshops that follow.

Expected outcomes: To determine more specific user types that the facilitator may not have preconceived. This allows for a wider but still focused range of information to be gathered.

This workshop was run virtually using *Google Meets*™ as the video/audio feed, while the group was working together through a shared project on *Google Slides*™. Each participant opened a dice on their own screen which could not be seen by the facilitator, therefore numbers could've been manipulated by choice. This wouldn't impact the outcomes of the workshop.

Conclusions: Participants are able to identify clearly with their persona and easily get into character for the rest of the session. All three personas are extremely relevant to not only students in Tsako Thabo, but any youth or adult within the community. Both from users within the school and those from the community were covered in order to gain a well-rounded perspective of using the site.

A. CURRENT STATUS	B. DREAM	C. CURRENT ISSUE
1. /6 Standard student at Tsako Thabo high school	1. To be a world famous scientist	1. /5 My parents don't support my dream
2. Student at Tsako Thabo who is a part of the choir	2. /6 To be a successful singer/musician	2. I have nowhere to learn further
3. Community member who plays the trumpet in his spare time	3. /5 To be a part of a group with people who share my interests	3. /6 I am shy because I get bullied
4. /5 High school dropout who makes music on his phone app	4. To inspire others with my passion	4. My school doesn't support my dream

Fig. 75: Predetermined categories and attributes for persona workshop (Author 2020)

RESULTS FROM SESSION

PARTICIPANT A

Participant A: High school dropout who makes music on her phone app. Her dream is to be a part of a group with people who share her interests. Her school didn't support her dream.

PARTICIPANT B

Participant B: Standard student at Tsako Thabo high school. His dream is to be a successful singer. His parents don't support his dream and want him to focus on maths and science.

PARTICIPANT C

Participant C: Community member who plays the trumpet in her spare time. Wants to inspire others with her passion for music. However, she is shy because there are many people who bully her because they think the trumpet isn't cool.

**Representative sketches*

CD 1B

Tuesday
30 June 2020

Online
Google Slides

AM
10h00 - 11h30

3 participants

Program; concept; schematic design development

Co-design session 1B: Side-by-Side

This workshop reflects the value of relationships between certain programs by the specific context-related persona chosen earlier. This helps the designer consider effective program organization. This workshop was inspired by the "Side by Side" co-design workshop for The National Design Leadership Initiative of Enterprise Community Partners (Hwang 2014).

Session Structure:

1. The facilitator provided a range of programs that exist between Mamelodi High School and Tsako Thabo High School.
2. There were two sets of programs: those with solid lines and those with dashed lines, representing open or closed, direct or indirect relationships respectively.
3. The participants each had to pick as many or as little programs as they wished and organize them based on their persona's perceived experience, wants and needs.
4. It was emphasized that the layout was based on how they wished the programs to relate, not necessarily what is usually expected.
5. Each participant presented their layouts through a brief description.

Expected outcomes: Participants would focus on the music-based programs, placing them at the centre or most interactive position in the layout. Participants would choose many programs and create large layout diagrams.

Virtual adaptation using *Google Slides*™: each participant had their own slide to work on, each with the same number and type of programs. Some participants did not understand the solid/dashed line relationship, but the relationship between programs was still explained well during the discussion.

Conclusions: Spaces surrounding the music room are serving spaces to both standard and musical programs, suggesting much interaction between the disciplines. Being connected to outdoors was evident in all three options, complimenting the conclusions from the 2019 workshops. There was not much interaction with other subjects (e.g. physics, maths or history class were all options), all acting separate from one another. This contradicts the outcomes of Session 1C.

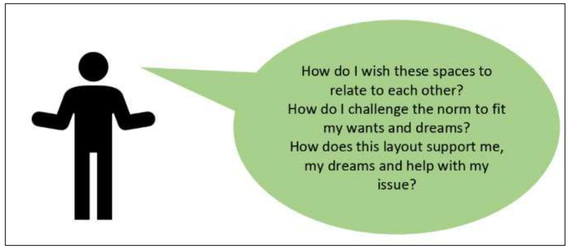
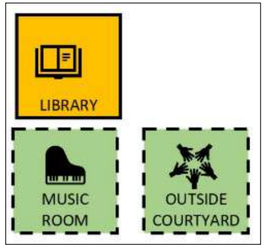
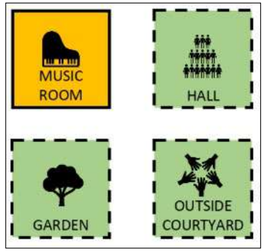


Fig. 76: Questions for participants to consider when arranging their programmes. (Author 2020)



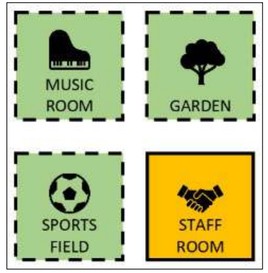
PARTICIPANT A

- Library: quietness to sit and concentrate on work with earphones
- Music room: creativity and learn more
- Courtyard: meet new friends and share interests
- Music with courtyard: becomes a stage when needed to share with public



PARTICIPANT B

- Music close to hall (opening to public): show parents (and community) there are different layers of education, not just science and maths.
- Garden and courtyard: sing and showcase to others
- Concern: music rooms and sounds traveling and disturbing others



PARTICIPANT C

- Music room: spills out to other spaces (e.g. garden and sports field) for performances and interaction
- Staff room: visual security for bullies, but closed so the security is subtle (don't get the feeling of being constantly watched)

Inspired by "Side by Side" co design workshop for The National Design Leadership Initiative of Enterprise Community Partners.

CD 1C

Tuesday
30 June 2020

Online
Google Slides

AM
10h00 - 11h30

3 participants

Program; design development

Fig. 77: Visual representation of co-design discussion (Author 2020)

Co-design session 1C: Design Crit

Using an existing design proposed by the facilitator (in this case, the researcher), the participants were encouraged to re-imagine the spaces through the lens of their individual persona. Critique, suggestions and comments were all encouraged. This workshop helps the facilitator to develop their design from perspectives other than their own.

Session Structure:

1. The facilitator briefly explains the design plan, pointing out important aspects that have been developed.
2. Participants are encouraged to circle aspects that work well or are not successful in different colours, show arrows or sketches for suggestions, make notes on the side etc.
3. Throughout the workshop, participants are encouraged to engage with one another and the facilitator, asking questions and discussing suggestions.

Expected outcomes: The expectations were to fully engage with the design and critique it extensively. Using many tools to visually express suggestions and comments. Re-design of the plan from specific user lenses.

Due to it being done virtually, the participants did not know how to use the drawing tools provided by the online platform. This resulted in more discussion and verbal critique than visual expression. Notes were made by the facilitator. The participants were shy to start so the facilitator needed to ask questions to start off the workshop.

Conclusions: Integration of STEAM through levels and transitions between zones. Addressing the specific issues of Tsako Thabo through music and alternative forms of education (more contextually & socially relevant than general and assumed). Most suggestions ran parallel with outcomes of 2019 co-design workshops.

PARTICIPANT A

- Open to the **community:** inviting and engaging
- No spaces for **introverts** (students/ musicians) to pull back in to - loud and overwhelming (**inclusion for all students**)
- It's not STEAM on its own but **integration between disciplines**, informing each other

PARTICIPANT B

- All the "cool" things on one edge of the school
- Organize school according to **sound & adaptability** of spaces
- **Levels of transition** (music, sounds, safety, interaction etc.)
- Classrooms act as **harsh boundaries** in centre: unsafe & bullying

PARTICIPANT C

- **Proximity** of music classes and hall is good but sound travels
- Buffer zones between different disciplines
- Parents and community **first engagement with music** (appreciation)
- Music as an overarching theme **addressing all issues** in Tsako Thabo (e.g. bullying, community engagement, lighting, corridors, courtyards etc.)

CD 2

Friday
3 July 2020

Online
Google Slides

AM
10h00 - 11h30

3 participants

Concept & design development

Co-design session 2: Imagine if…

Participants create imaginary situations by randomly combining an object and a property. They then consider what could happen in that special situation, discussing creative design implementations. These are then reflected on for more practical design solutions. This session was adapted from "Combine and Fantasize" co-design workshop by Studio Delft (Hageman & Nieuweboer 2018).

Session structure:

1. The facilitator chooses specific architectural objects/elements that are relevant to the context prior to the workshop, as well as some musical qualities (properties).
2. At the beginning of the workshop, encourage participants to suggest their own musical properties.
3. All the objects and properties are covered with respective coloured cards and the game board is set-up.
4. Each participant is encouraged to pick a random card from both the object and properties pile, placing them on the game board.
5. The other participants instantly propose the first creative design solution that comes to mind.
6. The first participant who picked the cards then questions, critiques, adds to and chooses their favourite option presented.
7. The round is repeated, with a different participant starting each time, as long as the time or number of cards permit.
8. The facilitator encourages reflection for more practical solutions inspired by the creativity at the end of the workshop.

Expected outcomes: Through the unusual situations created, this game stimulates creativity, allowing for unique and creative design solutions for an existing issue. Due to the background of the participants, it was expected for social inclusion to be a major influence on the design considerations.

This workshop was run through *Google Slides*™, with audio/video through *Google Meet*™. The researcher controlled the tools for *Google Slides*™ as a lesson learned from the previous virtual workshop, avoiding lack of tool knowledge from participants.

Why these participants?

For this co-design session, the researcher worked with lecturers from the Social Inclusion studio of the post-graduate architecture program at Chalmers University, Sweden. The researcher has a social relationship with them due to engagement through the NRF STINT research project (as discussed in Volume One of this dissertation). The participants are professionals within this field of architecture, providing a high level of qualitative information.

EMILIO DA CRUZ BRANDAO

Director of the master's programme Architecture and Planning Beyond Sustainability with a focus on social sustainability, co-creation and participation. He was a part of Architects Without Borders (ASF-Sweden) for many years.
(Chalmers 2019)

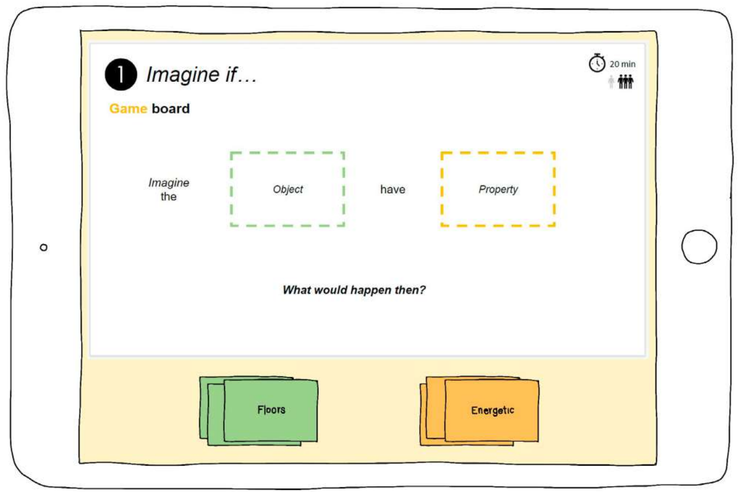
MARCO ADELFIO

Urban Planner with an interest in multi-stakeholder processes and driving forces contributing to compact, mixed-use and socially sustainable urban development.
(Chalmers 2020)

LIANE THUVANDER

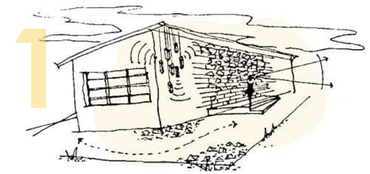
Architect and researcher within the field of sustainable building. Liane focuses on the visualization of environmental aspects & implementing sustainable design within architecture.
(Chalmers 2020)

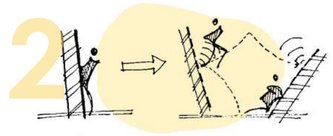
Conclusions: There are many, many layers of the intersection between architecture and music, whether this be through inspiration, method or image as discussed in the theory (Capanna 2009, Young *et. al* 1993:39). Using the existing structure of the buildings to create and manipulate spaces through musical qualities creates unique, interesting and interactive spaces. Additionally, incorporating the performance of music (e.g. expression and emotion) into architecture can create an inspired intervention that is both functional, practically and socially, as well as aesthetic.

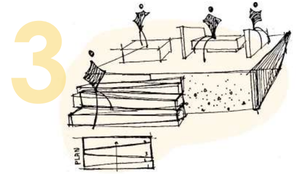


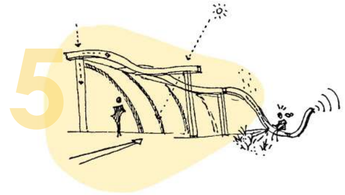
"Imagine If..." game board showing the object (floors) & the musical property (energetic).

Fig. 78: Liane, Marco and Emilio during their trip to South Africa for the STINT Research project (Zorn 2020)









Some favourite suggestions...

1. **"Imagine if the bricks are loud"** - very big, overwhelming structure with bricks bashing against each other, taking over the space, making me feel small.
2. **"Imagine the walls are soft"** - the walls allow movement (e.g. jumping) to happen against them.
3. **"Imagine the concrete is staccato"** - sprinkles of concrete, remains after an implosion, solid but fragmented, dismantling or destruction of a structure.
4. **"Imagine the roofs are energetic"** - meeting space on walkable roof, poetic energy below roof storing and collecting intimate moments and memories.
5. **"Imagine the beams have emotions"** - sense of responsibility, balance and spiritual equilibrium
6. **"Imagine the floors are slow"** - you think you are moving fast, but you are slow.

Fig. 79: Reflective sketches (Author 2020)

CD 3

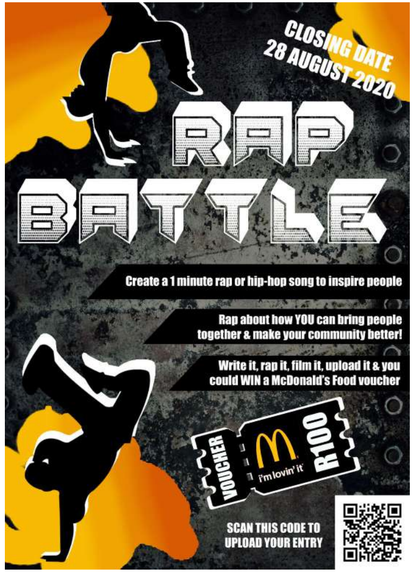
12 August -
28 August 2020

Online
WhatsApp

-

3 participants

Music as method for design inspiration



Co-design session 3: Rap Battle

When the levels of the lockdown in South Africa had decreased and more freedom of movement and interaction was allowed, the researcher implemented the Rap Battle. Although the researcher was still not allowed to interact with the participants involved, the workshop managed to go ahead. This workshop used Capanna's (2009) music as method concept as an abstract informant for the design.

Rap Battle structure:

1. A catchy and vibrant poster was created and sent to the participants (school learners at Tsako Thabo Secondary School) through social media applications.
2. The instructions were to create a one-minute rap or hip-hop song to inspire people.
3. Participants were encouraged to rap about how they see their world and how they can bring people together to make their community better.
4. Freedom of music as backing, lyrics, recording options and sound making devices were all left up to the participants.
5. A *McDonald's*™ voucher was advertised as the winner's prize.
6. The winner was chosen by the researcher based on feedback and relevance to the topic.
7. A time period of two weeks was given for the battle to run.

Expected outcomes: participants would respond with lyrics written about the current state of staying at home in lockdown and show support for their friends and family as a source of inspiration.

The methodology and breakdown of this Rap Battle workshop has been unpacked in the article written for this dissertation in Chapter 2: *The Impact of Economic Status on Participatory Design Methodologies During A Global Pandemic* (Author 2020).

The submissions for the Rap Battle were beyond expectation in quality of both lyrics and musical talent. Students used applications on their phones to create professional-sounding backing tracks and recordings of their songs.

(Left) Fig. 80: Rap Battle poster sent to participants over WhatsApp (Author 2020)

A few select lines of inspiration from the submitted entries transcribed by the researcher (only first names have been provided in order to protect identities):

"With every sun comes a new day"
"My grandpa taught me how to lead the way
That's the thing I got from my grandpa
Every time I close my eyes I remember"
- Moloko

"Pour me a cup of that vision
Make sure my stories get written for as long as I'm living
For the music I'm driven
For the image I'm driven"
- Memory (winner)

"Ain't nobody believed in me
You put your faith in me"
"I'm from the mud, straight out of the gutter but I'm going to shine"
"I don't care about the fame
I just want to jump on the stage"
"I was made for it"
- Joel

Conclusions: as informants for the design proposal, the music developed in the Rap Battle can be translated into architecture through music as inspiration (Young *et. al* 1993:39) and concept or principles (Capanna 2009, Tayyebi 2013). As a "cup of that vision" (Memory 2020), inspiration can flow through the material choice, geometry, emotion and layout of the architecture. It is not about simply providing equipped music rooms, but designing places for experiences to take place, stories to be told and expression to be celebrated.

Fig. 81 Selected lyrics from the Rap Battle entries (Author 2020)

04_SITE ANALYSIS

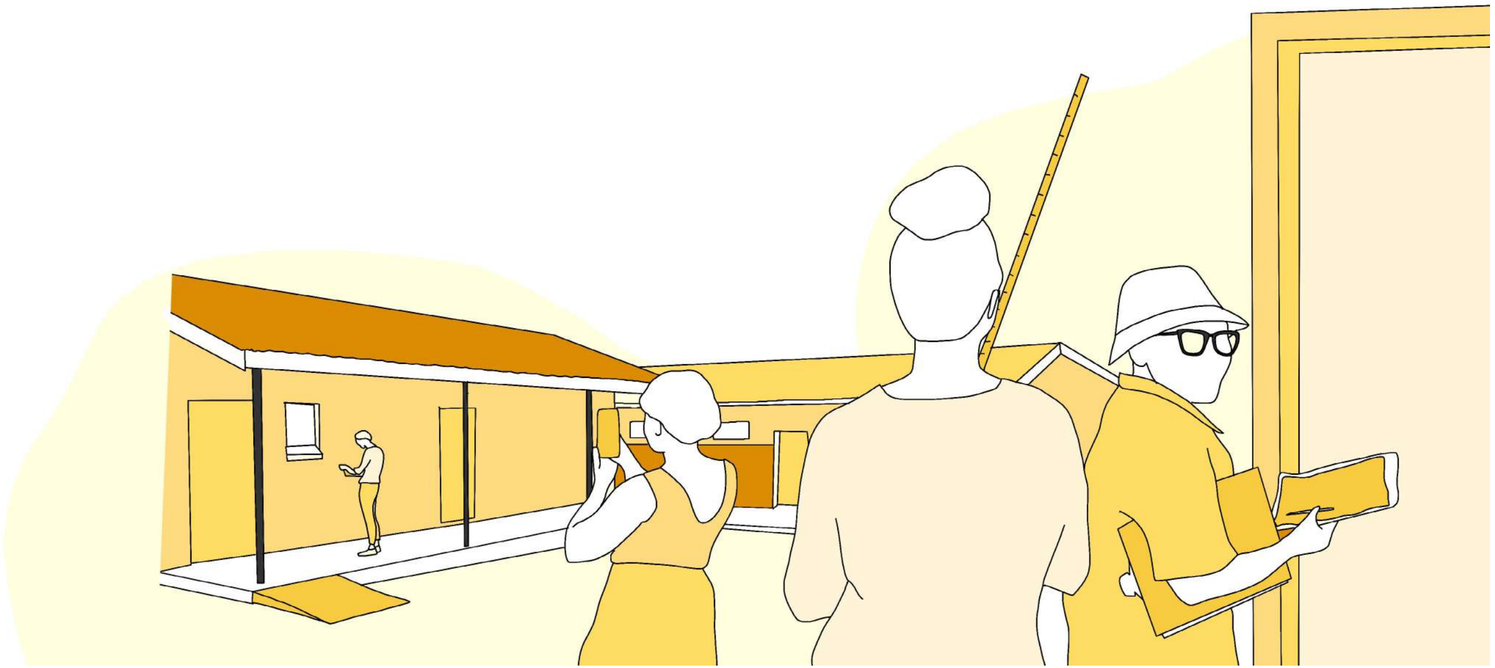


Fig. 82: 1:500 context model of the site in the foreground, with a 1:50 model in the background (Author 2019)

04_SITE ANALYSIS

General Analysis

Tsako Thabo Secondary School is situated on Tsomo Street in Mamelodi East. The contours slope the site towards the North-West boundary. Most of the buildings lie in an East-West orientation with larger windows on the Eastern side and smaller clerestory windows on the West. The main, and only entrance is currently off Tsomo Street on the North-East side of the site. It is used for both pedestrian and vehicular access and is controlled by a single guard, signing visitors in and out. Moving through the school, starting at the entrance, visitors can be very lost due to the lack of "entrance" and direction through the school due to the monotonous design and single level buildings. As a child, making your way through Tsako Thabo school is not a pleasant experience. Especially those who partake in the seasonal, singular music activity: the choir. The choir practiced in an empty classroom in 2019 (Author 2019) which, although had a good amount of daylighting, was cramped and rigid, leaving little room for flexibility. The choir master also received many complaints about their practice venue due to the noise carrying to surrounding classrooms and the makeshift library (Interview with Alfred Lithuli 2019). In 2020, the choir practiced in the school hall (Author 2020). The journey the school learners take to get between classes, leaves one exposed in the large, open courtyards and vulnerable or trapped in the pinched corridors – the perfect opportunities for bullies.

The school hall is lengthy & narrow, susceptible to noise and mean onlookers, with a lack of space, lighting, acoustic and ventilation consideration. There is a slight sense of ownership of this hall as patterns and graphics have been painted in bright primary colours along the bricks on the inside walls. The floor, wall and roof surfaces are all hard and reflect sound throughout the hall. This is an issue as the sound continues to bounce and mixes with other sound reflections. The sounds overlap and therefore are not crisp and clear to hear in the audience. When other instruments, such as the African drum, are played with the choir, the sound becomes overwhelming and messy. The stage is also minute in comparison to the rest of the building and only raised slightly off the ground floor surface. This would make it difficult for visual accessibility for large crowds and audiences during a meeting, assembly or performance. The larger windows on the Eastern side of the hall do not let much light in due to the large overhangs, but rather allow for a significant amount of noise to travel through from the courtyards. This is exceptionally disturbing for the choristers practicing during lunch breaks, which is the only time the choir can practice (Interview with Jacob 2020). Due to the design flaws of the school hall, the building becomes an underused resource in dire need of a redesign.

Fig. 83: Circulation & bullying in corridors (Author 2020)

Fig. 84: Sun path & impact of openings on Western facades (Author 2020)

Fig. 85: Noise density (Author 2020)

Fig. 86: Vegetation - shading & noise barrier (Author 2020)

Fig. 87: School hall (Greyling 2019)

Fig. 88: School hall stage (Greyling 2019)

Fig. 89: Students watching the choir practice during break (Author 2020)

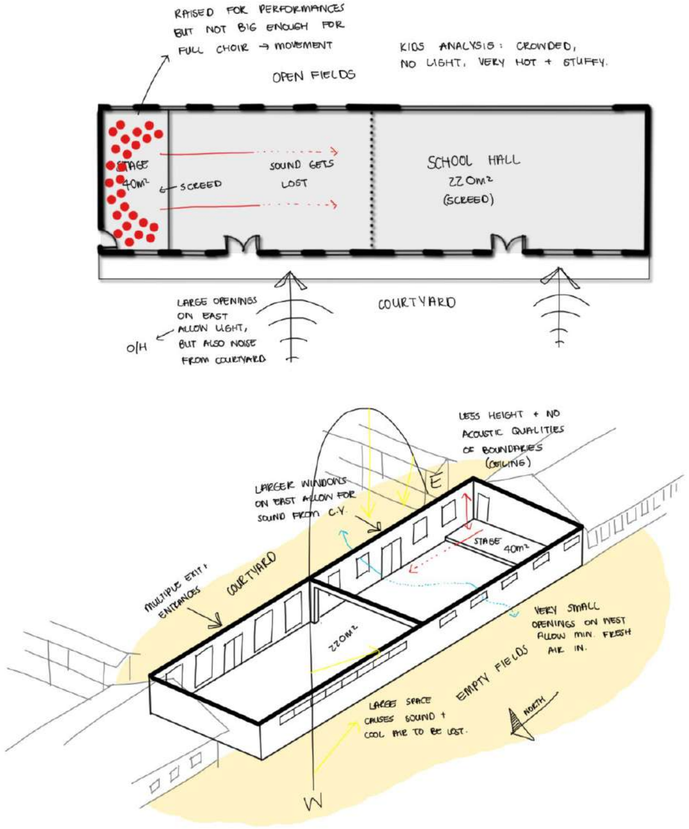
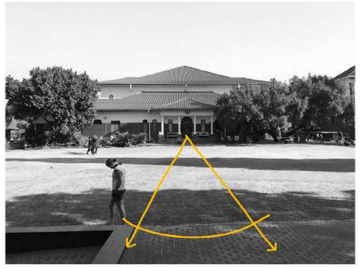


Fig. 90: Analysis of school hall (Author 2019)

ST. MARY'S DIOCESAN SCHOOL FOR GIRLS PERFORMING ARTS CENTRE, HILLCREST, PRETORIA

The Performing Arts Centre (PAC) is separate from the main school buildings, housing a variety of cultural activities (van Wyk 2014). The grouping of these activities creates a place for ownership, where "music is cool" and you want to be a part of it (Author 2019). The PAC has its own Concert Hall, small in size, with a sprung floor, large teaching rooms and twelve smaller practice rooms with sufficient daylighting and ventilation. The layout of these programs create an awkward shaped open courtyard in the centre which provides an intimate space for waiting and socializing between practices and events. THE PAC also has a well-equipped Music Technology and Recording Studio with all the latest software and sound equipment (van Wyk 2014). Academic learners and staff are all invited to use this facility, as well as the general public, for a fee.



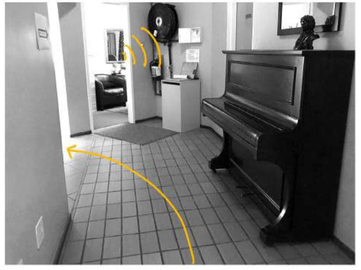
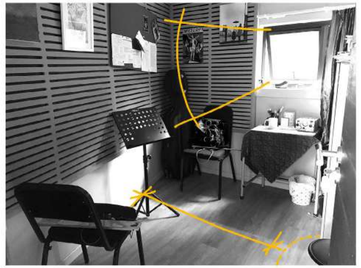


Fig. 91: St Mary's Performing Arts Centre (Author 2019)

AFRIKAANSE HOËR SEUNSKOOL: ART CAMPUS, HATFIELD, PRETORIA

(Mathews and Associates Architects, 2014)

Afrikaanse Hoër Seunskool (AHS) has one of the largest music departments in South Africa. Jaco van Staden, the Head of Department for *Melodi ya Mamelodi* at Mamelodi Secondary School, is a teacher at AHS. AHS offers both individual and group learning classes, allowing the collective gathering of musicians and skills. The Art Campus aims to bring all of these activities together (Mathews 2014) through a vibrant artistic precinct made up of a main performance hall, recording studio, four classrooms with acoustical design, twenty individual practice rooms and admin facilities for staff. Although the Art Campus is situated within the larger school campus, it is at the back of the academic complex on a small, leftover triangular piece of land. This presented opportunities for urban corridors and courtyards to be designed, connecting aspects of the classes and rest of the school (Mathews 2014). During a visit to the campus, the researcher noted that the main performance hall in fact had little consideration for natural ventilation and lighting and hardly any storage room for the chairs, instruments and makeshift stage. The stepped threshold between the courtyard and hall hindered and embarrassed a guest performer from attending a performance due to his wheelchair disability (Author 2019). The courtyard outside the hall has an open pergola reflecting the keys of a piano, but functionally does not provide covering for visitors during the rainy seasons in summer. The individual practice rooms, although acoustically designed, are very tight and cramped, especially for those learning larger instruments, such as the cello. The ceilings are extremely low and uncomfortable with little natural lighting from a very small window (Author 2019).



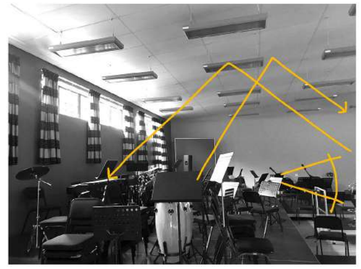


Fig. 92: AHS Kunste kampus (Author 2019)

EXISTING MATERIAL STUDY

Sites within the Network

Concrete

- Readily available, cheap, durable, very hard surface.
- **Tsako Thabo:** all floors, sealed, hard surface that bounces sound.
- **UP Mamelodi:** structural columns, external panels.

Timber

- Aesthetic and acoustic properties.
- **UP Mamelodi:** used for sliding panels with gaps allowing audible access.

Structural steel

- Expensive, durable, easily made aesthetic.
- **Tsako Thabo:** horizontal and vertical members.
- **UP Mamelodi:** horizontal members.

Exposed masonry

- Readily available, cheap, can create interesting aesthetics.
- **Tsako Thabo:** painted exterior, exposed interior.
- **UP Mamelodi:** semi-permeable and aesthetic.

Tiles

- Readily available, slightly pricey, durable, hard surface, can create a harsh glare.
- **Mamelodi Magnet School:** laid in an angled pattern, reflects sound.

Corrugated Roof Sheeting

- Readily available, cheap
- **Tsako Thabo:** exposed and effects the acoustics within the Hall.
- **UP Mamelodi:** easily forms the organic shape of the roof.

Plaster and paint

- Finishes interior well - aesthetic.
- **Mamelodi Magnet School:** entire inside is painted.
- **Tsako Thabo:** paint used to express ownership and positivity.

Ceiling board

- **Tsako Thabo:** none.
- **Mamelodi Magnet School:** implemented.

Affordable and readily available materials.
Not much consideration for acoustics or sound quality.
Important to respect material properties but also test their limits.

Fig. 93: Existing material palette (Author 2020)

EXISTING MATERIAL STUDY

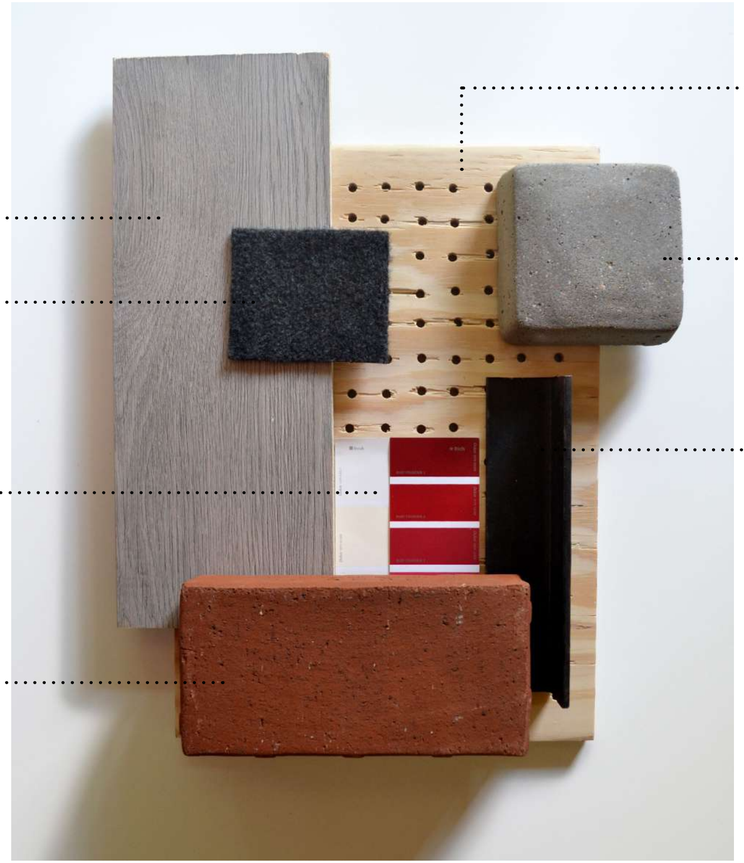
Acoustic qualities

Laminated flooring
- Relatively durable
- Hard reflective surface
- Can create interesting patterns and movement with different layouts (expression)
- Creates sound when walked on

Carpet
- Absorptive surface
- Can be used on both floors and walls
- Maintenance required
- Quiet surface for circulation

Paint
- Predominantly little effect on acoustic qualities of a surface
- Impacts other materials aesthetically

Exposed masonry
- Reflective surface with little absorptive properties
- Masonry walls act as sound insulators (especially cavity walls)



Acoustic panels
- Alternating reflective and absorptive panels on walls and ceilings for best effect
- Timber, stainless steel, gypsum etc.

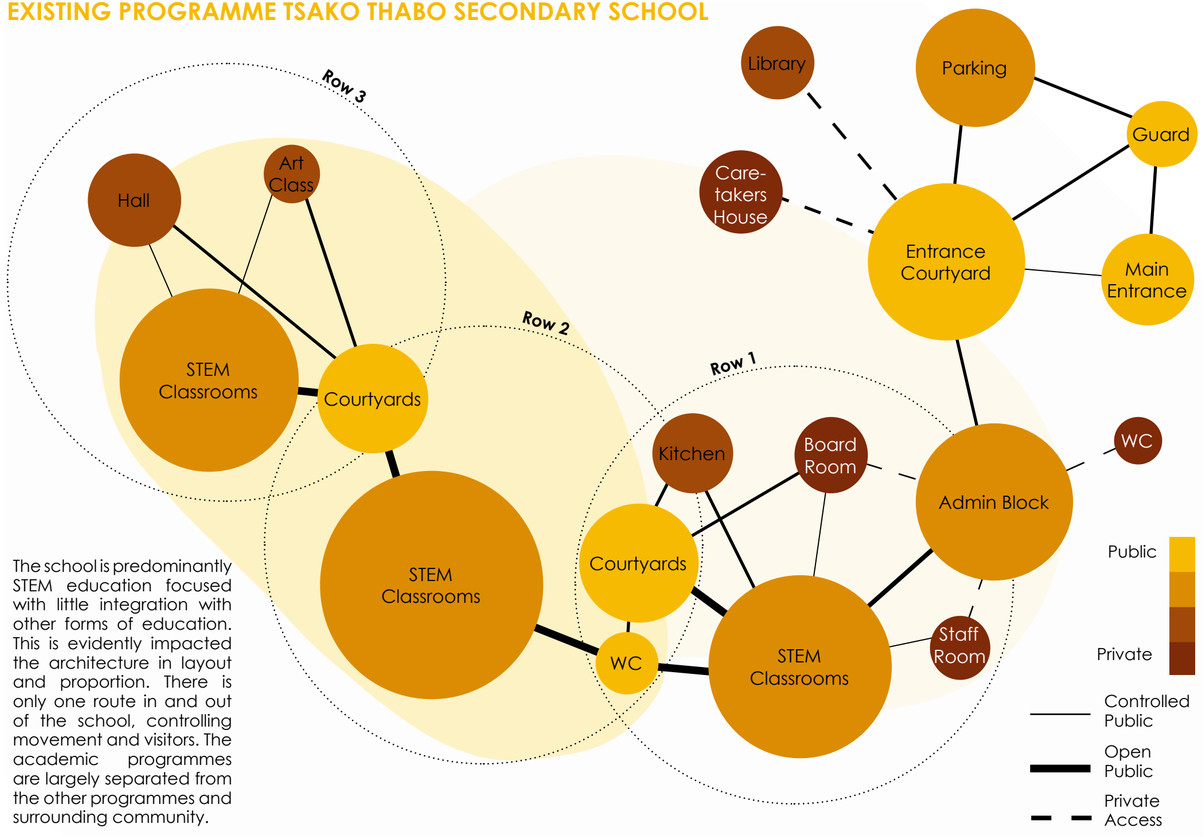
Paving
- Hard reflective surface
- Emits sound when contacted (e.g. walking on paving with hard shoes)

Structural Steel
- Reflective surface
- Structural function for acoustic panels/ ceiling/roof etc.

Ceiling board
- Alternating reflective and absorptive panels for best results
- Can be created in an interesting design
- Suspended ceiling allows sound to travel through and be absorbed in space beyond

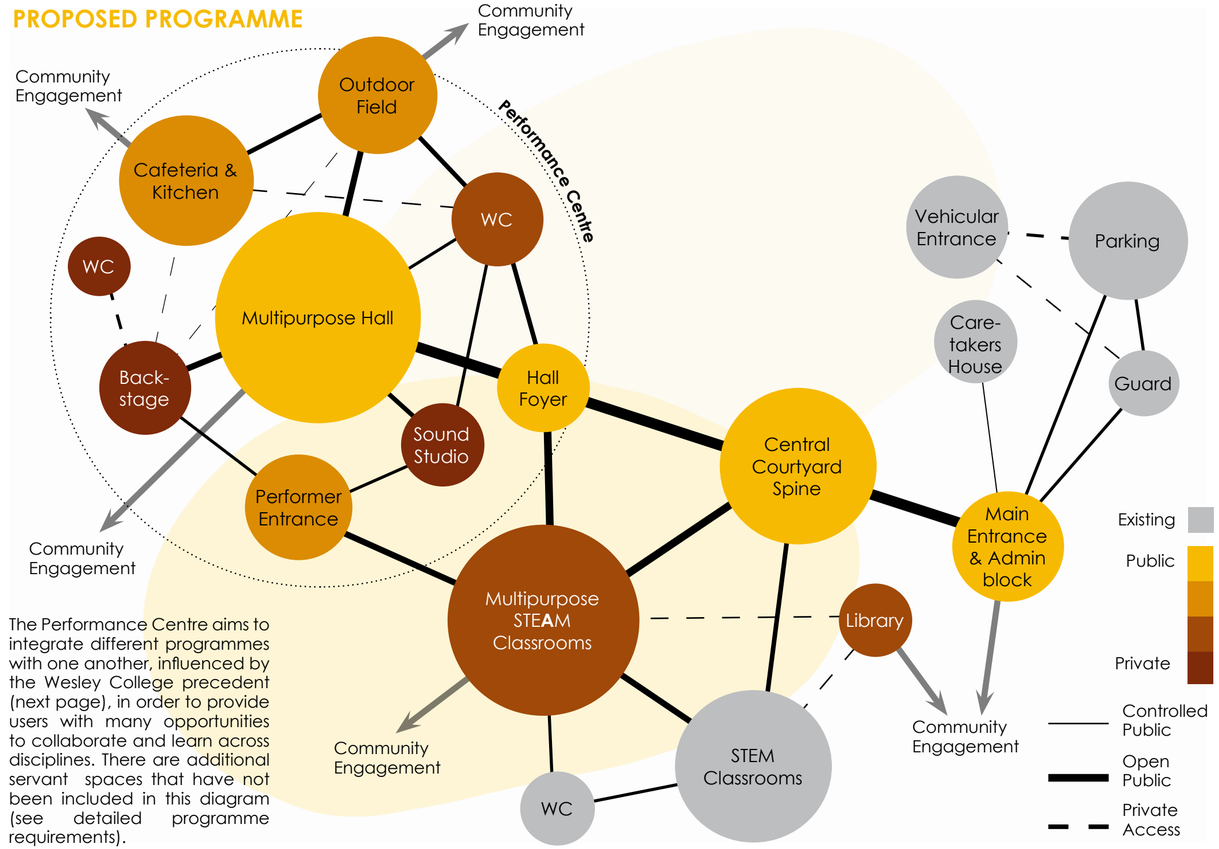
Fig. 94: Acoustic material palette (Author 2020)

EXISTING PROGRAMME TSAKO THABO SECONDARY SCHOOL



The school is predominantly STEM education focused with little integration with other forms of education. This is evidently impacted the architecture in layout and proportion. There is only one route in and out of the school, controlling movement and visitors. The academic programmes are largely separated from the other programmes and surrounding community.

PROPOSED PROGRAMME



The Performance Centre aims to integrate different programmes with one another, influenced by the Wesley College precedent (next page), in order to provide users with many opportunities to collaborate and learn across disciplines. There are additional servant spaces that have not been included in this diagram (see detailed programme requirements).

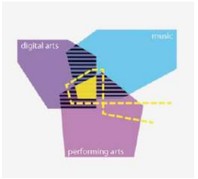
PROGRAMME PRECEDENT: WESLEY COLLEGE MOUBRAY STREET MUSIC SCHOOL, MELBOURNE, AUSTRALIA

(COX Architecture 2013)

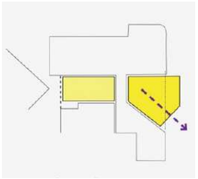
Centrally located facility that houses the departments of music, performing arts and digital arts. Each department has its own required internal spaces that visually impacts the exterior rhythm of the facade. The school also houses individual spaces for practicing and performing as well as multipurpose classrooms. By overlapping all of the departments in the centre of the building at the Sound Chamber Staircase, there is an opportunity for constant collaboration. This results in the sharing, interaction and exchange of information between all departments (Cox 2013).

Fig. 95: Wesley College rhythmic facade (Author 2020)

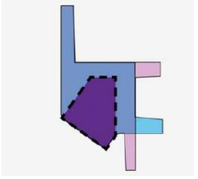
4 Key Features



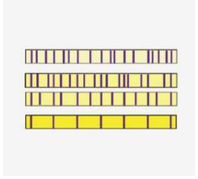
Music & performing arts centre: incorporation of multiple departments allows for one to learn from the other and gain inspiration



Courtyard character: movement through the building, ease of access, connection to surrounding landscape, outdoor performance spaces.



Interconnecting volumes "sound chamber": where all departments meet; interactive, multi-functional and collaborative space.



Facade composition: rhythmic patterns representing the de-constructed school crest. Gives dynamic and musical feel.

Fig. 96: Key musical aspects of Wesley College design (Gardiner 2013)

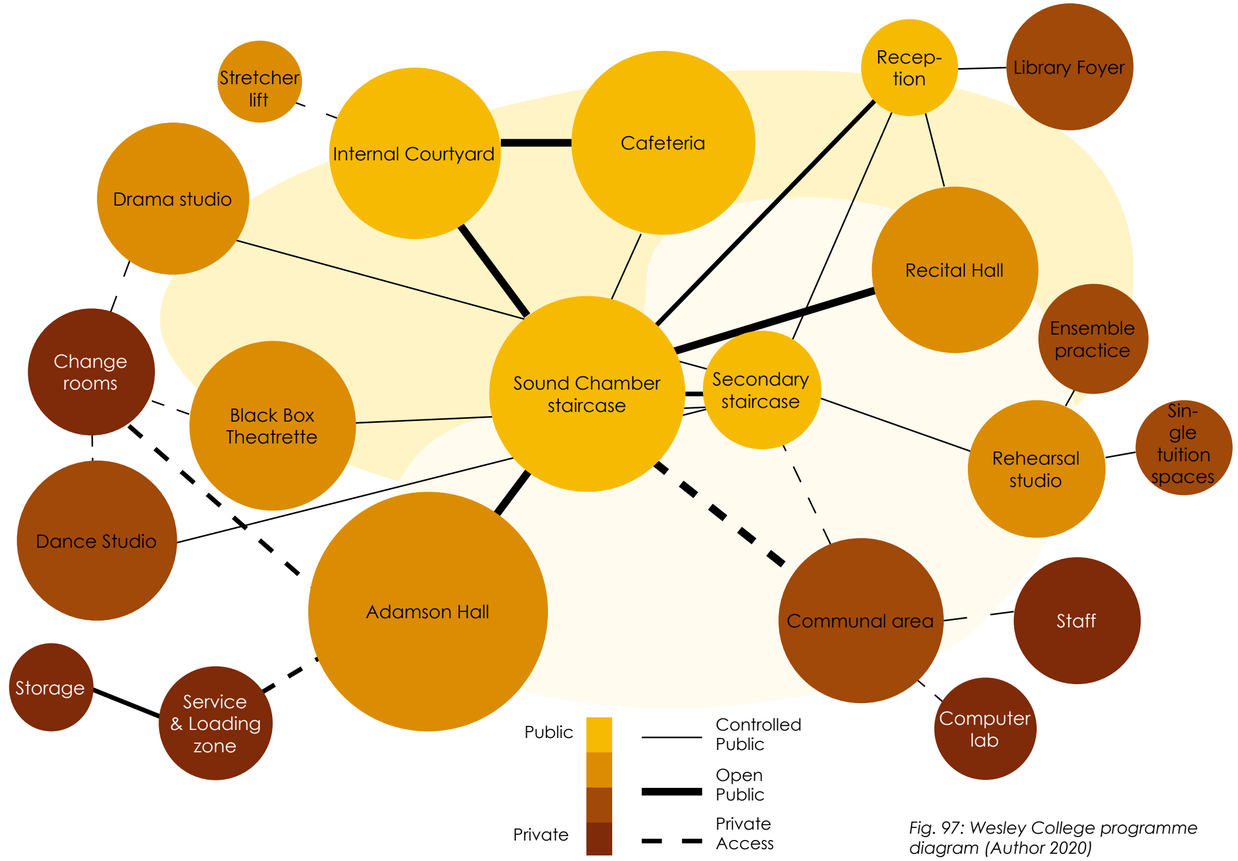


Fig. 97: Wesley College programme diagram (Author 2020)

PROPOSED PROGRAMME & REQUIREMENTS

**Rooms and minimum sizes and requirements according to DBE Guidelines 2012 and in accordance with SANS 10400.*

L Learners
S Staff
T Teachers
O Outside visitors
P Parents

Natural ventilation
Multi-functional spaces
Natural daylighting
Acoustic consideration
Connection with outdoors

Name	Description	Users	Size (m^2)	Amount	Requirements
Main Entrance & Admin Block					
School reception	The first space visitors come into contact with when entering the school (visual & physical) with printer and storage space.	L T P S O	42 (min. 15*)	1	Waiting space
Staff offices	Offices for administrative staff with storage space.	L T P S O	55 (combined)	4	Principal, Administrative Personnel
Staff bathrooms (Unisex)	Private bathrooms for staff and teacher access only.	L T P S O	28	1	<30 people (G1): 4 WC, 2 WHB
Staff bathrooms (Disabled)	Private bathrooms for disabled staff and teacher access only.	L T P S O	(included above)	1	1 WC & 1 WHB Min. area 2.9m^2 Min. dimension 1.6m
Staff room	Break room for teachers & staff, equipped with seating & a kitchenette (fridge, sink, kettle, storage etc.)	L T P S O	40	1	<30 people (G1): 3 WC, 2 WHB
Sick room	Quiet space away from noisy programmes for children or adults to rest. Equipped with storage and clean facilities with direct access to reception.	L T P S O	10	1	Minimum two beds, storage and fresh air
Boardroom	A quiet space with furniture that can be moved around to suit conference needs	L T P S O	45	1	15 - 30 people
Cleaner's closet & storage	Store for cleaning chemicals & equipment.	L T P S O	4,5	1	Secure locking, hard-wearing
Academic					
STEM Classrooms	Existing classrooms for standard learning. Improvement of requirements.	L T P S O	45 - 60	19	15 - 30 people
STEAM Classrooms	Widely adaptable and open classrooms with spaces both inside and outside for alternative learning.	L T P S O	45 - 135	8	15 - 50 people

**Rooms and minimum sizes and requirements according to DBE Guidelines 2012 and in accordance with SANS 10400.*

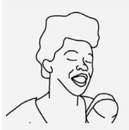
Name	Description	Users	Size (m²)	Amount	Requirements
Academic Ancillary Spaces					
Student Bathrooms	Unisex & disabled bathrooms that are an upgrade from the existing in terms of safety.	L S O	73	2	300 girls 300 boys Disabled
Courtyards	Open aired spaces that are used predominantly during break times by students. Spill out spaces for classrooms (STEM and STEAM).	L T S O	2920	-	Visual safety Storm water drainage Adaptable Seating
Parking	Existing parking for teachers and visitors.	T P S O	400	1	Security 30 cars
New Performance Centre					
Main Foyer	Gathering & spill out space for audience members for events.	P S O	268	1	Tangible objects to congregate around (PDW 3 2019) Minimal seating Fire safety
Cafeteria	A small kitchen that provides meals for students during the day and visitors and performers during events (music & sport). A source of income for community members.	L T P S O	655	1	Basic kitchen to serve 600 students & visitors.
Main Hall	Large hall with loose seating that allows for multiple uses - indoor sports, performances, dances, large conferences, school assemblies, community meetings etc. Acoustics NB.	L T P S O	633 (180* min.)	1	650 Seats Fire safety Acoustics Durable flooring

Name	Description	Users	Size (m²)	Amount	Requirements
Backstage	Areas dedicated to performers to get ready and wait during performances and events. Additional smaller spaces for rehearsals (black box setting).	L T P S O	570	1	Rehearsal space Unisex WC Storage & lockers Adaptable Fire safety
Main Stage	Largely adaptable stage for different uses. Off-stage wings. Acoustic properties.	L T P S O	530	1	Durable flooring Multiple configurations Indoor & outdoor
Balcony	To provide additional seating, performer movements during events or additional lighting/decoration support.	L T P S O	280	1	Railing Fire safety Visual accessibility
Sound Box	Room for all technical and lighting support systems. Clear and unobstructed view to stage and hall at all times.	S	20	1	Fire Safety Ventilation & lighting
Storage	Storage for all chairs (Room & under the stage) & other furniture items e.g. conference tables.	S	10 each	2	Fire Safety
Outdoor Amphitheatre	Permanent seating used for community meetings, watching outdoor sports, outdoor performances etc.	L T P S O	280	1	Durable material Multiple uses Orientation & weather
Performers' Entrance	Welcoming entrance space that is controlled with a reception and office. Space for visitors or music-enthusiasts to socialize.	L T P S O	215	1	Reception Small office Pausing space

Name	Description	Users	Size (m²)	Amount	Requirements
Performance Centre Ancillary Spaces					
Bathrooms (Unisex)	Bathrooms including disabled. Divided throughout the Centre to serve all programmes.	O	263 (combined)	4	<1000 people (A2): 15 WC, 4 WHB (min.) 1 Disabled
Shower rooms (Unisex)	Shower and change rooms for sport activities with locker spaces.	L, O	45	1	<20 people (A2): 4 Showers (min.)
Delivery zone	Drop off zone for equipment, furniture, food deliveries etc.	O	-	1	Direct to road Back of house
Waste & Recycling	Close to kitchen & cafeteria. Recycling bins that can be accessed from the road (pick-up).	O	90	1	Direct to road Back of house Security
Electrical Room	HT-LT room with a generator, fuel storage and transformers for solar panels. DB cupboard.	O	15	1	Natural ventilation Ground floor Council access
Cleaner's closet & storage	Store for cleaning chemicals & equipment in the Performance Centre.	S	4	2	Secure locking, hard-wearing
Dry and cold store	Shelves for food & cooking equipment. Walk-in fridge for cold food store.	S	35	1	Near duct for drainage

PROPOSED USER GROUPS

VISITORS



PERFORMERS
Whether these are performers of sport, food or music, they travel to express themselves at the Centre, sharing knowledge and skills along the way.

# of peak users: 30

AM / PM — M T W T F W/E

COMMUNITY MEMBERS
Intrigued by the architecture and passion, friends, families & others come to watch different performances and be exposed to the underlying talent of Mamelodi East.

# of peak users: 500

AM / PM — M T W T F W/E

SCHOOL LEARNERS
In need of facilities to practise and perform, learners and teachers from other schools come to the Centre, engaging with those at Tsako Thabo.

# of peak users: 50

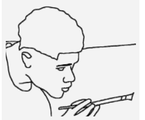
AM / PM — M T W T F W/E

LEARNERS

STEM LEARNERS
Passing through high school with their main focus on academics with little interest in other aspects.

# of peak users: 400

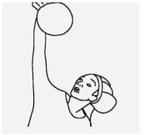
AM / PM — M T W T F W/E



STEAM LEARNERS
Learning through alternative methods i.e. incorporating music into Maths class, makes it easier for these learners to understand and pass.

# of peak users: 200

AM / PM — M T W T F W/E



EXTRAMURAL LEARNERS
With a passion for sport, music or nutrition, these learners engage in after school activities to further learn what the Centre has to offer.

# of peak users: 100

AM / PM — M T W T F W/E

STAFF

TEACHERS
Whether these teachers are STEM or STEAM, they have a world of knowledge to pass on to their students, with little distraction, much motivation and a love of learning more.

# of peak users: 30

AM / PM — M T W T F W/E

ADMIN STAFF
From the principal to the accountant, these staff are the bones of the school, organizing, ensuring and maintaining a happy schooling experience for all.

# of peak users: 15

AM / PM — M T W T F W/E

GROUND STAFF
The foundation of the school. Cleaning, gardening, fixing and securing takes up a lot of time and effort to ensure the school and Centre can run smoothly.

# of peak users: 15

AM / PM — M T W T F W/E

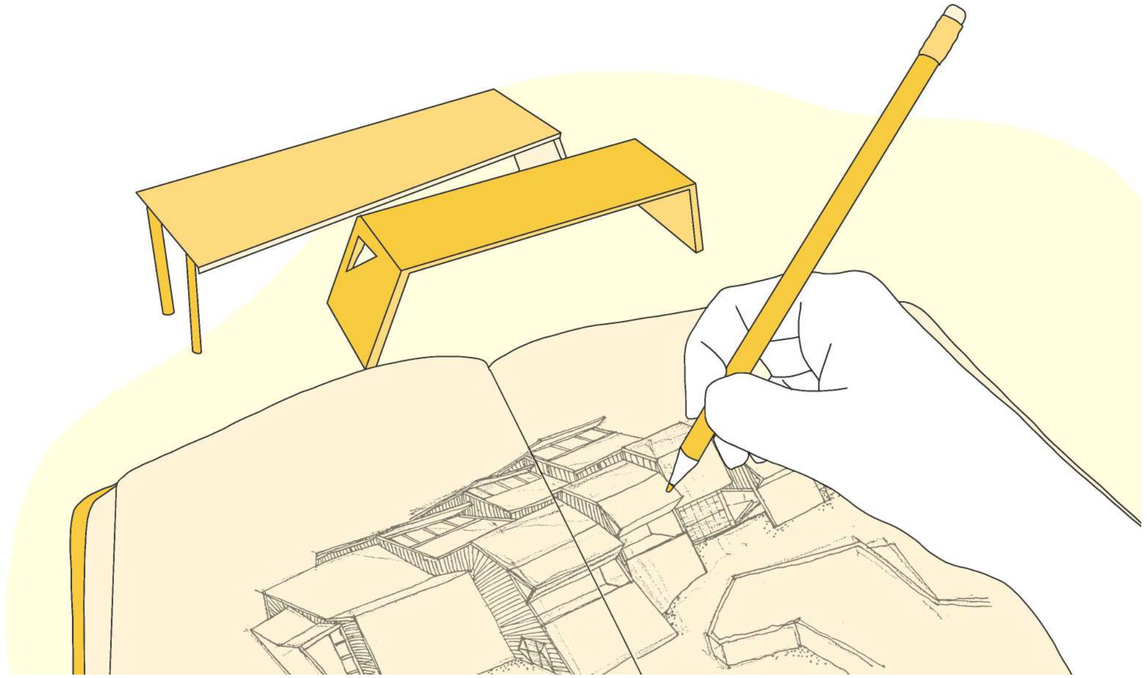
05_RESPONSE: CONCEPT

General Issue

Urban Issue

Architectural Issue

Concept Narrative



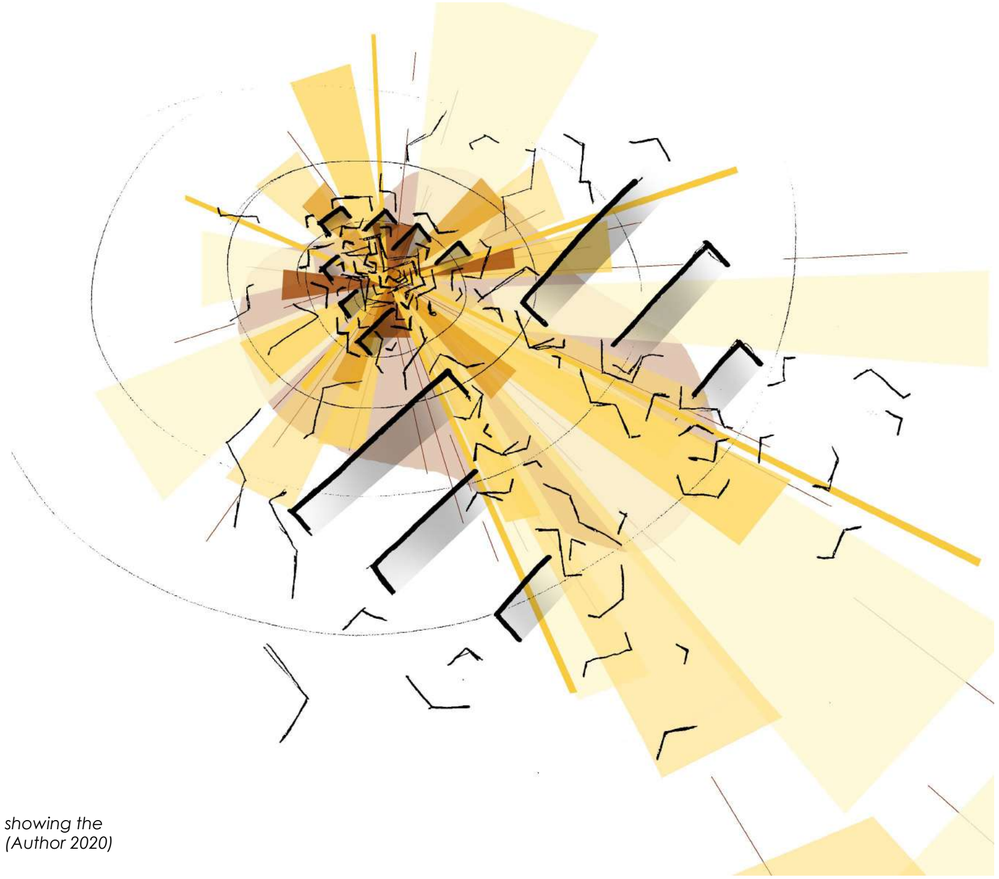


Fig. 98: Concept graphic showing the "explosion of expression" (Author 2020)

05_RESPONSE: CONCEPT

This chapter aims to provide an outline of the overall concept presented in the design portion of this dissertation. It is then followed by the specifics of both design and technical development. To begin, a summary of the general, urban and architectural issues is required.

General Issue

Generally, the typical school typology implemented at Tsako Thabo Secondary School does not allow for freedom of alternative learning and inclusion of many different types of learners. The curriculum is STEM (Science, Technology, Engineering, Mathematics) focused, resulting in rigid education with which a lot of students struggle. Recreational activities, such as the choir, art classes and sports are seasonal activities that do not have prescribed spaces. This ultimately results in little to no sense of belonging and acceptance for a lot of learners within the school.

Urban Issue

The urban issue presented here is that of disconnection between the school and the surrounding community, including minimal interaction with other schools in the area. This is a missed opportunity as each school or institution could share facilities and resources in an effort to uplift the Educational Ecosystem of Mamelodi East. Again, it can result in community members lacking a sense of belonging and identity, both on an individual and community scale. Little inspiration then flows through the streets, missing the open door for upliftment.

Architectural Issue

The form of the school buildings hinder the opportunities for positive self-expression and development of identity due to its rigid and contained layout. Harsh boundaries surround the school, creating a clear division from the community. The buildings exhibit a severe lack of consideration for privacy, acoustics, natural ventilation, daylighting, spatial layout, accessibility and a built identity, especially the school hall.

Concept Narrative

Following Nabeel Hamdi's (2010:67) concept of "now, soon, later", small changes are proposed for immediate integration, followed by small scale design implementations in the near future. Lastly, a large-scale architectural intervention will be implemented later to fully serve and uplift the school and surrounding community in response to the abovementioned issues and overall research question.

The concept, for *now*, is to integrate STEAM (Science, Technology, Engineering, Arts, Mathematics) into the curriculum, providing alternative forms of education that are inclusive and allow more opportunities for learners to lead successful and experiential educational careers.

Following this, the existing architecture needs to be adapted to accommodate these new forms of learning. The *soon* stage looks at stripping away the existing structure and refurbishing it in terms of natural ventilation, daylighting and especially acoustics. Taking the concept of a typical learning environment and spilling it out into the courtyards with interactive seating and platforms, with expressive roofs and overhangs creating a comfortable yet enjoyable space in the shade. This intervention was largely inspired by the principles drawn from the Korogocho Streetscapes, whether these spaces be used for formal or informal learning or socializing. The classrooms along the boundary edge are proposed to open up and provide spaces for the community to integrate with the school through learning and skills development in the afternoons and on weekends. This stage serves as a very plausible precedent for other schools and institutions to adapt and integrate with STEAM and the community.

The *later* stage, and the focus for this dissertation, is the demolition of the fatally flawed existing school hall and replacing it with a large scale Performance Centre. Metaphorically, the Performance Centre is the epicentre of a musical and expressive explosion, rippling out through the landscape and impacting change through the site and proposed Music Network within the community. This intervention celebrates identity, expression and performance across many aspects of a developing child's life, from music, academics and sport, to nutrition and everyday life. The existing admin block has also been affected by this explosion and has been developed to serve as an exciting and welcoming entrance, exposing those beyond the school boundaries to the idea of encouragement of positive self-expression and celebration of identity.

Acoustic consideration becomes the most dominant influencer throughout the design of the site, both aurally and visually. From "loud bricks" (Co-design session 2 2020) to the rhythm of water fountains, there is constantly a sense of acoustic integration as one moves through the site. Not only increasing the interior acoustic qualities of the existing classrooms, but also ensuring sound does not add to the list of issues of the site. By incorporating natural sound elements, such as water and vegetation, the transition of noise between programmes, both within and beyond the site boundaries, can be designed and controlled.

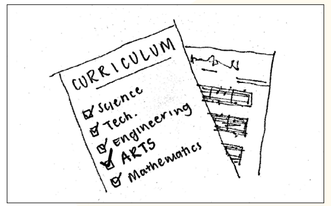
The acoustic design of water elements relate to the architecture through rhythm, movement and sound (Songabau 2019). This expression of water is given an opportunity through the catchment and reuse of rainwater collected throughout the site, both existing and proposed. Adding to this sustainable aspect is the implementation of ground cooling of the natural ventilation fed into the main hall. This is assisted through the function of the stepped roofs, housing fans for the removal of the hot air within the building, expressing the implementation's process. The roofs' openings towards the South allow a consistent flow of daylighting into the hall, adding to the environmental considerations. Lastly, the landscape is reused as much as possible across the site in order to ensure a sustainable approach is taken towards the intervention.

Stages of Design Interventions

NOW

STEAM education for inclusion of all students.

● Small scale intervention



SOON

Development of STEAM **classrooms & courtyards** for **social & interactive** learning.

● Medium scale intervention

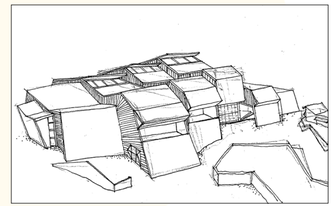
Adapted to needs of each school

LATER

School Hall & amphitheater for larger engagement with the community & exhibiting of The Arts within the school.

● Large scale intervention

Unique & bespoke to each school



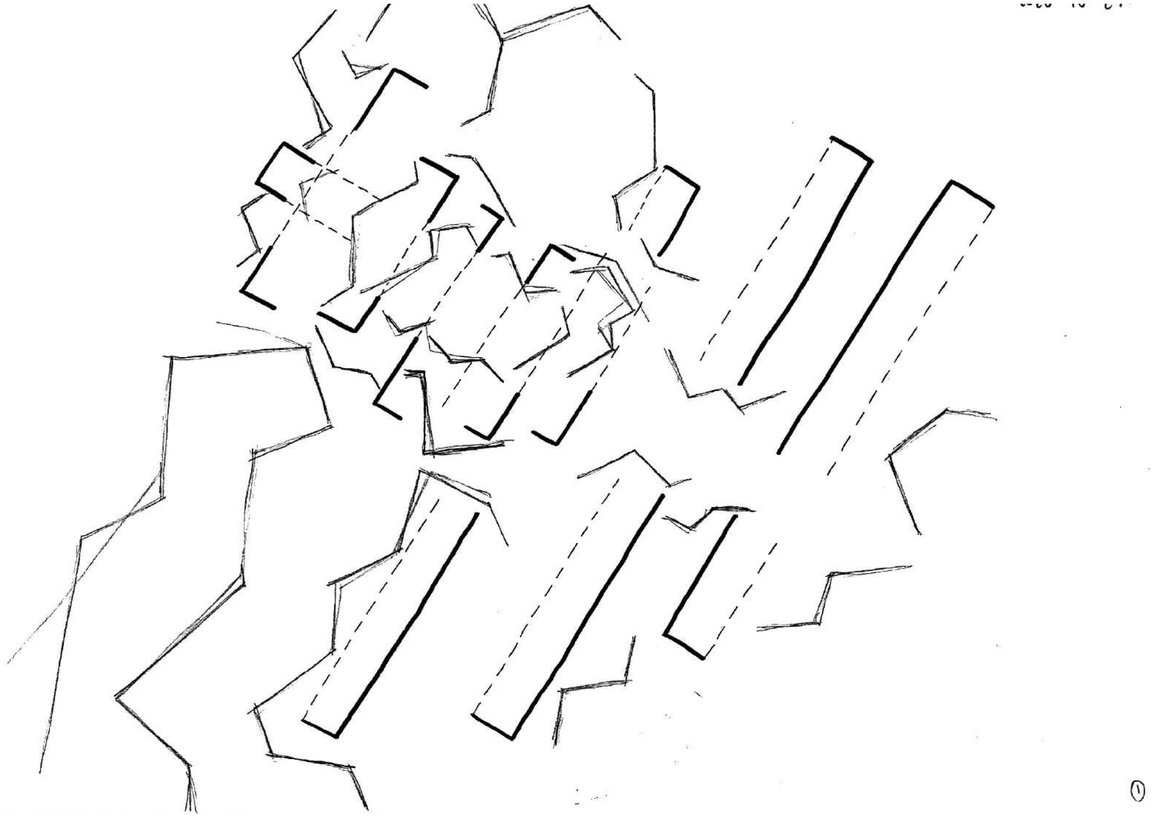


Fig. 99 Plan parti diagram depicting the overall concept (Author 2020)

Through many iterations of basic drawings and *parti* diagrams, it was found that a major shift in architectural language needed to be embraced. As a part of the Music Network, this language needed to be identifiable throughout the networked nodes in order for it to make sense and have its necessary impact. Following the principles of *The Gestalt Theory* (Sahyouni 2014) reviewed in the literature, *similarity* is the most obvious principle for users to identify and recognize. Therefore, it was vital for this aspect to be unique in form and stand out from the existing built environment of the community. This was needed in order to answer the initial research question of exploring the effects of music-making within Mamelodi East as a positive platform of self-expression for school learners and the surrounding community. It was imperative for the building to be dynamic and have energy, to use music and performance as the driver for uplifting the community as a whole (Grundtman 2016, Young *et. al* 1993).

This intervention acts as the flagship for the proposed Mamelodi Music Network, feeding into the global project of UNESCO's Creative Cities. This will put Mamelodi on the map and bring inspiration and pride to the community. The Performance Centre stands out from the surrounding community respectfully and inspires its users. The architecture is made up of expressive symbolism: platforms and acoustics driving the overall language, challenging the rigid grid and creating a new identity for both the school and the community founded in Mamelodi and her citizens' past, present and future in music-making. The Performance Centre is grounded by the existing school language and filled in with expressive lighter elements and roofs, interacting between both architecture styles and academic disciplines, as highlighted in Co-

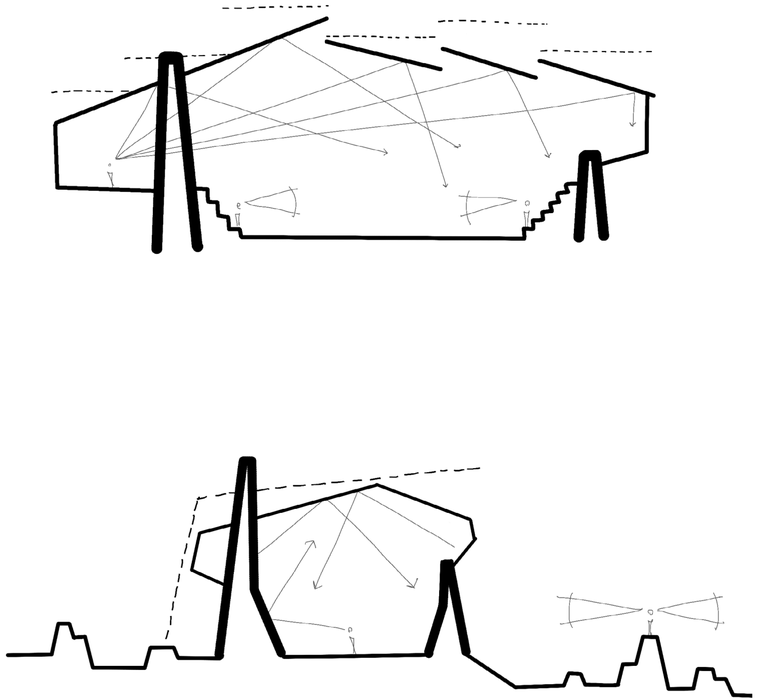


Fig. 100: Section parti diagrams expressing the concept (Author 2020)

design Session 1B (2020). The transition of music and performance became vital, according to Co-design Session 1C (2020), as a way of addressing both the research question and the existing issues found within the school.

From exploring the existing site, multiple opportunities were made available for the integration of the architectural intervention with the surrounding site and community. Using the *Law of Similarity* (Sahyouni 2014), the individual networked nodes are brought together by the expressive elements rippling through the community, providing opportunities for social interaction (Dovey & Dickosn 2002, Hillier 1996, Lawson 2005) through their connections and boundaries (Kozikoglu & Cebi 2015). These opportunities are enhanced by the shift of decision making from those in power to those within the nodes, directly linking to the community (Ndeneche 2011). This is further made possible through the physical decentralization of decision making (Seal 2020) across the musical nodes, integrating deeper into the community. As proved successful in the Korogocho Streetscapes project, Memphis Slim Collaboratory and UNESCO's Creative Cities of Music, the proposed intervention uses the music nodes to network and transform the community through exposure and celebration of its underlying potential.

Literature, co-design sessions and thorough analysis is summarized into the following conceptual intentions for the design development of the Performance Centre.

- The intersection between performance and architecture creates a new collective identity for Tsako Thabo Secondary School and the surrounding community.
- Platforms provide places for performance and positive self-expression.
- The concept of networking runs through-out. Celebrating each aspect in a child's academic life in a way that generates a greater whole, as well as the detailing of the architecture working together and adding to the overall narrative.
- Providing places for expression allows de-centralization of authoritative and spatial hierarchies, allowing freedom of perfor-mance and expression.
- Participating both in the design develop-ment, with the end proposed design inter-vention and across the networked nodes, enhances the relationships between and within the school and community.

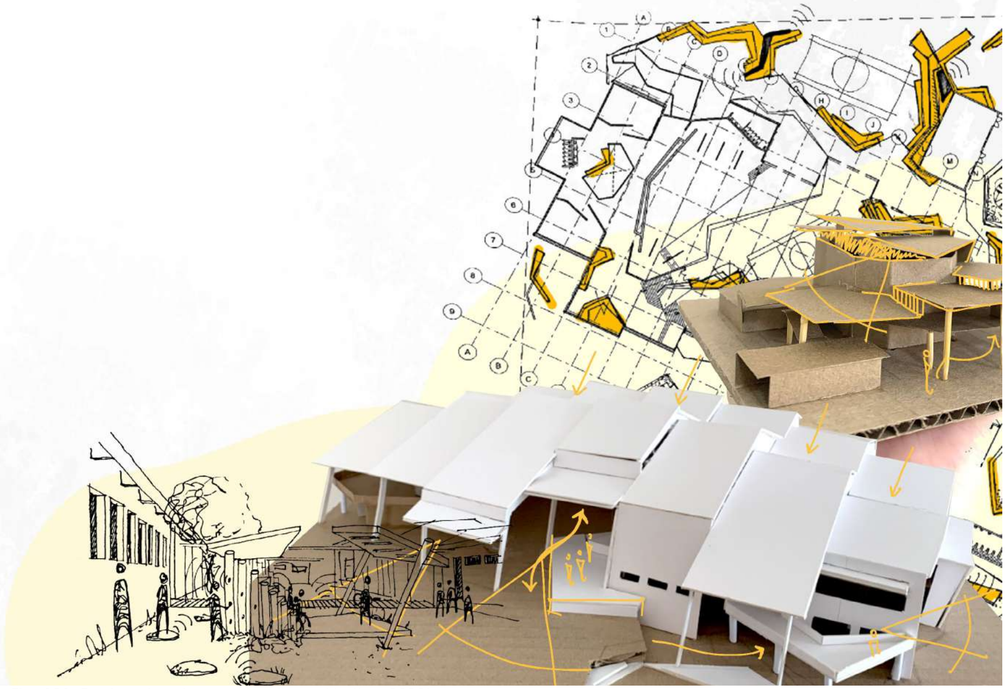


Fig. 101: Design development collage (Author 2020)

In response to these intentions, six design strategies were developed in order to ensure a relevant language that is theoretically, architecturally, programmatically and conceptually driven. Each strategy is considered within their relevant programmes and places, often integrating with another strategy as well.

Engage: this is defined in terms of accessibility. Not only visual and physical access with areas across the site, but also audible access as a way to encourage interaction through interest and curiosity.

Perform: enhanced by raised levels and framed views, music, academics, sports, nutrition and everyday life is put on display and the performance of each is celebrated.

Acoustics: throughout the site it is vital to consider the travelling of sound and noise, both outdoors and indoors. Acoustic reverberation, insulation, isolation and interference are all great influences on the architectural consideration of places.

Appropriation: due to the integration of STEAM education and the intent to celebrate all aspects of a child's development, both formal and informal, place appropriation is required.

Transition: performance becomes the transitional layers while moving through the site. Whether this be level changes, thresholds above, accessibility or acoustic considerations. *(three transition typologies sketches)*

Water: as a part of the sustainability of the site, water is also largely used for the acoustic qualities of outdoor spaces. In some cases, the water camouflages and masks unwanted noise, in others it is a physical element of guidance.

These strategies are refined and carried through both the design and technical development of the performance centre.

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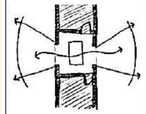
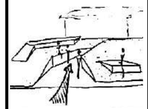
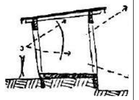
ENGAGE			
PERFORM			
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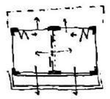
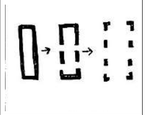
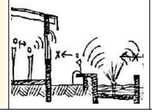
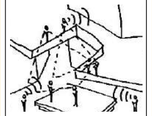
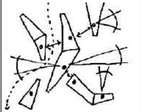
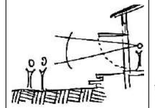
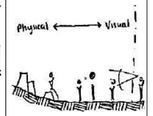
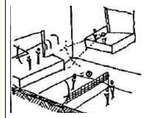
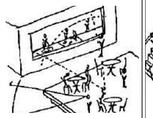
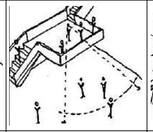
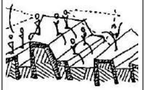
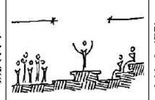
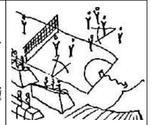
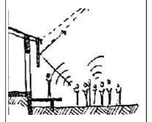
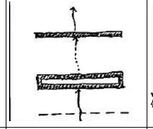
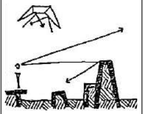
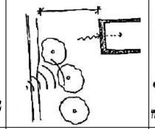
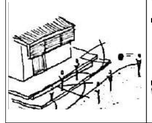
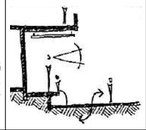
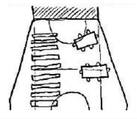
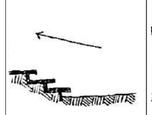
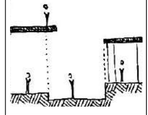
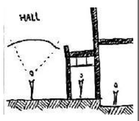
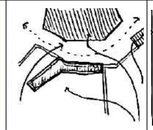
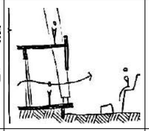
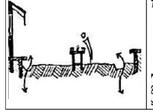
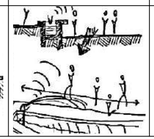
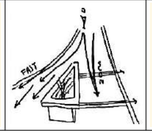
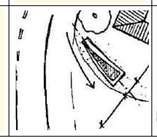
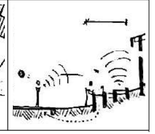
APPROPRIATE			
TRANSITION			
WATER			

COURTYARDS	FOYER	HALL	CAFETERIA	CIRCULATION	AMPHITHEATER	EDGE	SPORT
							
							
							
							
							
							

06_DESIGN DEVELOPMENT

Design Iterations

Concept Precedent

06_DESIGN DEVELOPMENT

Throughout the process, and within the principles of participatory design, iterative exploration is vital (Simonsen & Robertson 2013). Each iteration was critiqued and reflected on by both the researcher and other members of the UUC. As the design intervention is intended to act as a flagship of expression for the proposed Mamelodi Music Route, the roofs became a driving factor from the very beginning. Further along the design process, the expressive quality of the form and roofs were derived from music as inspiration, concept and the relation to design principles (Capanna 2009, Tayyebi 2013). This inspiration was analysed and inspired by the abstraction of the *AmaPiano* music genre and Thula's music networking story within the school. These underlying music narratives have acted as the "leap vehicle[s]" (Young *et. al* 1993:39) through which the architectural language has been designed.

Fig. 102: Photograph of 1:200 model (Author 2020)

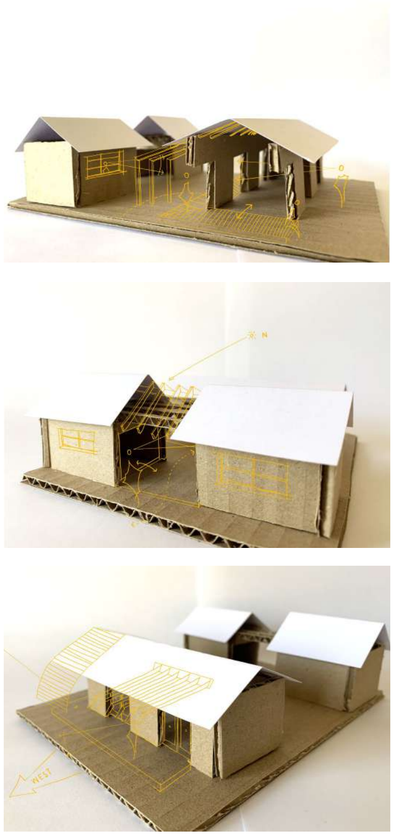


Fig. 103: Maquettes investigating the existing school structure (Author 2020)

Iteration 1: June

Prior to this iteration, an analysis and comparative table was drawn up between Mamelodi Magnet School and Tsako Thabo Secondary School. This was done in order to determine which site would be most beneficial in terms of providing an example for other schools across the community. Tsako Thabo was chosen as it serves as the weakest link in the overall network and can be used as the most relevant example for other schools.

The first iteration was very subdued and worked a lot with the *soon* and *later* stage (Hamdi 2010) of the school. Prioritizing the orientation of the school hall, this iteration sets out the school as largely separate from the majority of the community. It was further taken online to Co-design Session 1 and developed to use the existing buildings as much as possible. Extension and celebration of existing structure began creating new spaces for interaction and alternative learning. The connection with the community was inspired by the small-scale, high-impact implementations of Korogocho Streetscapes (Höök 2016, Skottke 2016). The classrooms opened up to the activities across the street, exposing the surrounding community to music and other activities at an interactive scale. This also provides the opportunity for micro-networking between the school and the community through music. As argued by Koopman (2007), this community music-making encourages social cohesion, creativity and positive self-expression. The idea of platforms and performance started making an appearance as a way of transforming the edge conditions into a common performance ground (Höök 2016, Skottke 2016). This intervention was still at a very small scale and needed further developing.

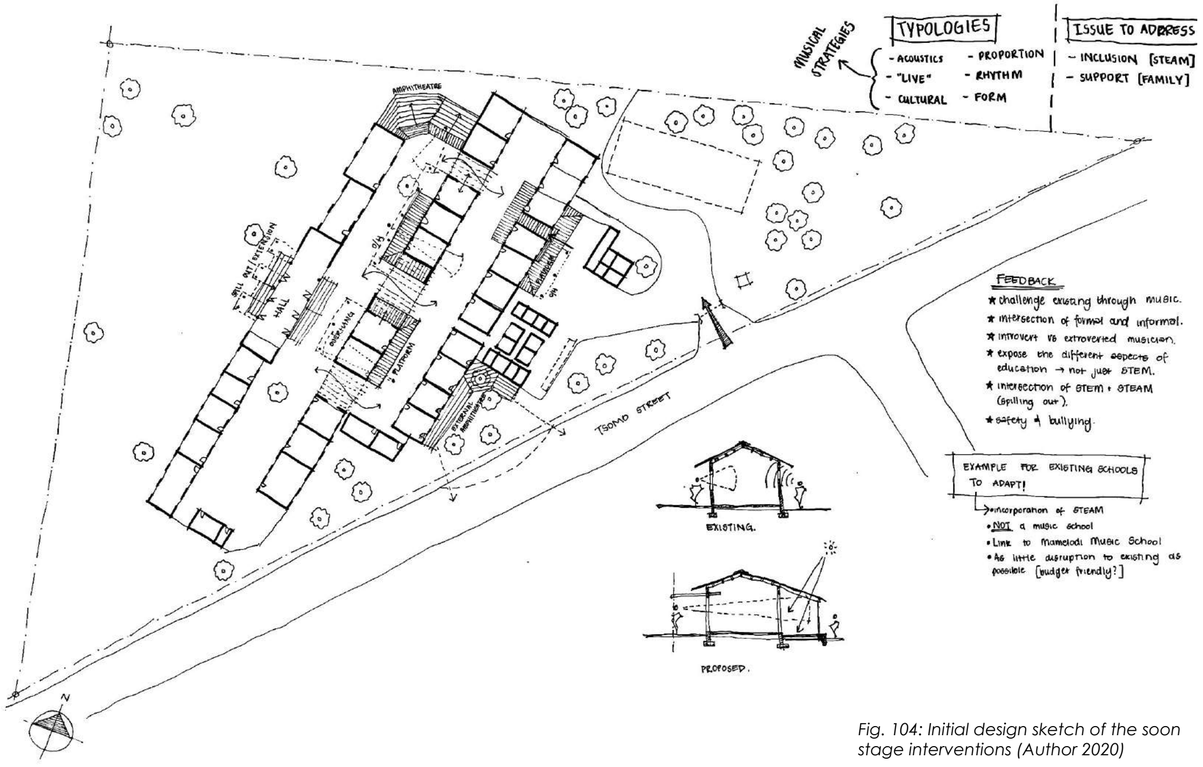
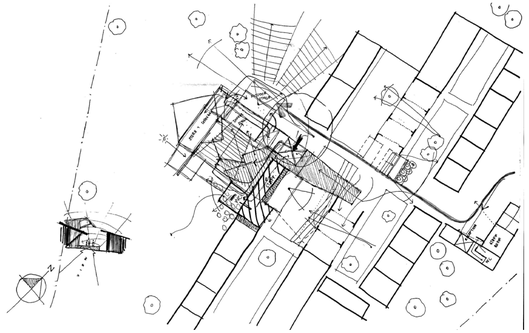
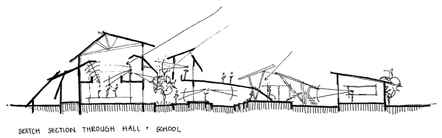
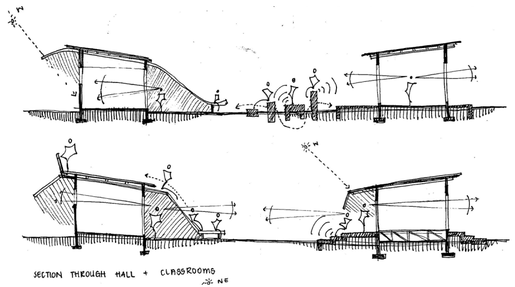


Fig. 104: Initial design sketch of the soon stage interventions (Author 2020)







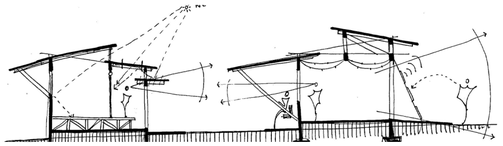
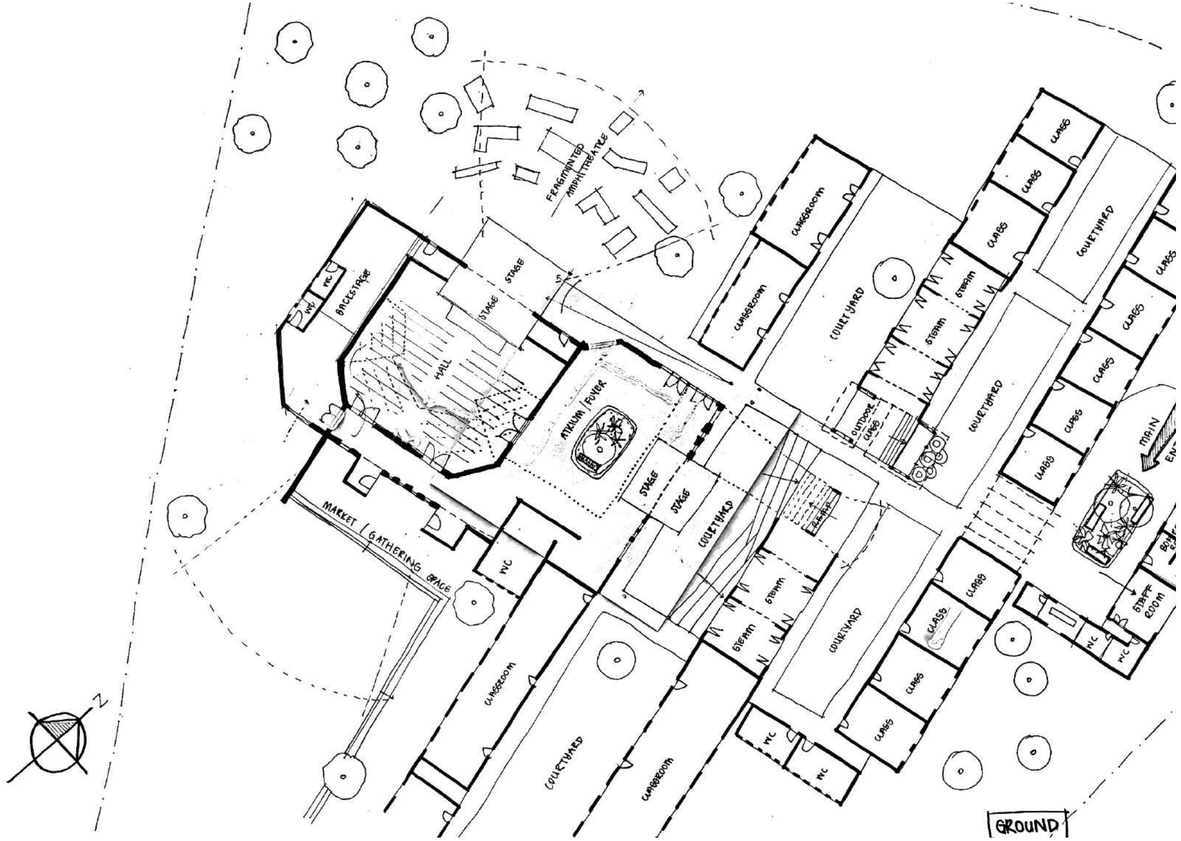
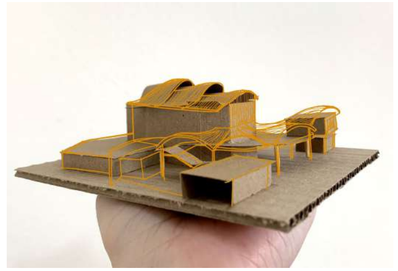


Fig. 105: Plan and section investigations (Author 2020)

Iteration 2: July

The second iteration followed Co-design Session 2 which, in section, was largely impacted by the creative architectural solutions posed in the workshop. This iteration further developed the *soon* stage of the intervention with regards to the STEAM classroom adaptations. The hall started developing at a larger scale as a hierarchical response, with fragmented elements that would later inspire the overall language of the design. These fragmented elements started bringing through the language of networking in architecture, allowing potential social interaction (Kozikoglu & Cebi 2015). The main axis was developed and existing buildings that were completely hindering the opportunity of performance and expression were reconsidered. The roof started becoming a performance of its own, influenced by some acoustics and daylighting. The overall emotion of the roof (Young *et. al* 1993) was influenced by the upbeat and positively inspiring *AmaPiano* music that is extremely evident in both the school and the surrounding community. The roof also started framing views and guiding movement through the site, influenced by the alignment depicted in *The Gestalt Theory's Law of Order* (Augustyn 2018, Sahyouni 2014).





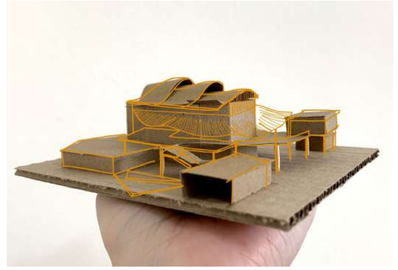
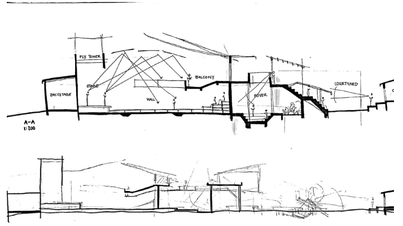


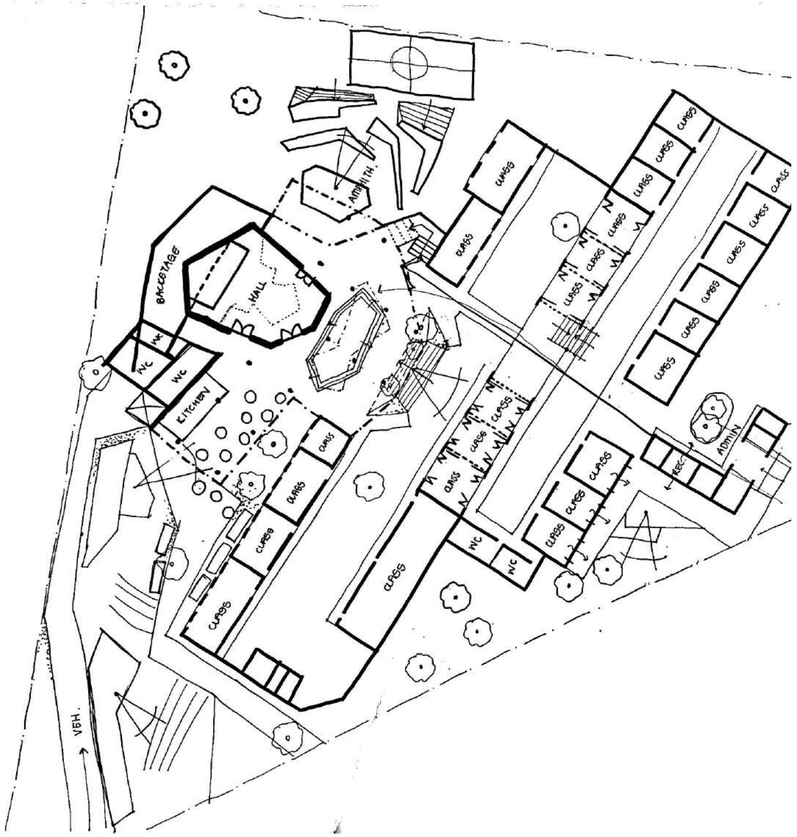
Fig. 106: Organic roof explorations (Author 2020)

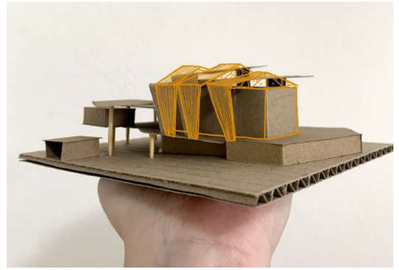
Iteration 3: July - August

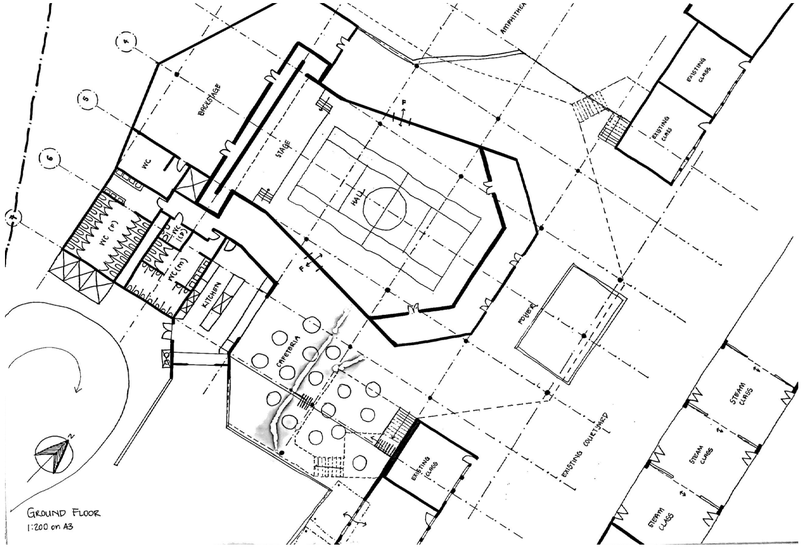
The third iteration sees the first development of the Performance Centre, including music, sports, nutrition and academics. The concept of performance started going beyond the built intervention and started at the street, spilling into the community. The fragmented elements started playing a bigger role in the overall design. This is significant in the design as it begins to respond to the research questions in terms of providing a platform for expression and discovery of self, overall empowering both the individual and the community. The intersection of multiple programmes within the Performance Centre, as influenced by the Wesley College precedent, added to the value of the greater whole (Ndeneche 2011). Principles from *The Gestalt Theory* of symmetry, grouping rhythm and order were also pulled through the design (Sahyouni 2014). Spaces were provided for group music making and other forms of group interaction as a place for social, cognitive and emotional development, as inspired by the outcomes of the El Sistema project (Majno 2012, Tunstall 2013). The concept for water as a sound barrier was also introduced.

The endless iterations of the roof began at this stage. Initially, the roof iterations were done based off the researcher's instinct in order to get an overall idea of what the possibilities were. These were then influenced by the acoustic qualities as well as the structural implications. The roofs' overall expression was largely inspired by the findings from Co-design Session 2, where the roofs were imagined to have energy. This influenced what the roof was creating below: meeting spaces, spaces to create memories, social interaction etc. Starting with an organic type roof, the intersection between orthogonal and organic became important. From an acoustical point of view, this type of geometry actually proved to be less effective when carrying sound than its more linear counterpart. Following this, a more reserved set of roofs were developed as lighter elements that simply sat over the main structure of the Performance Centre. In some cases, the roof touched the ground lightly, defining movement on the pedestrian scale. This principle was developed further, looking at how one could slip behind the roof which created a new space within the building. Where the roof touched down to the ground, the idea of roof as threshold was explored: where does the roof become a wall? Does the roof create visual, physical or audible boundaries?





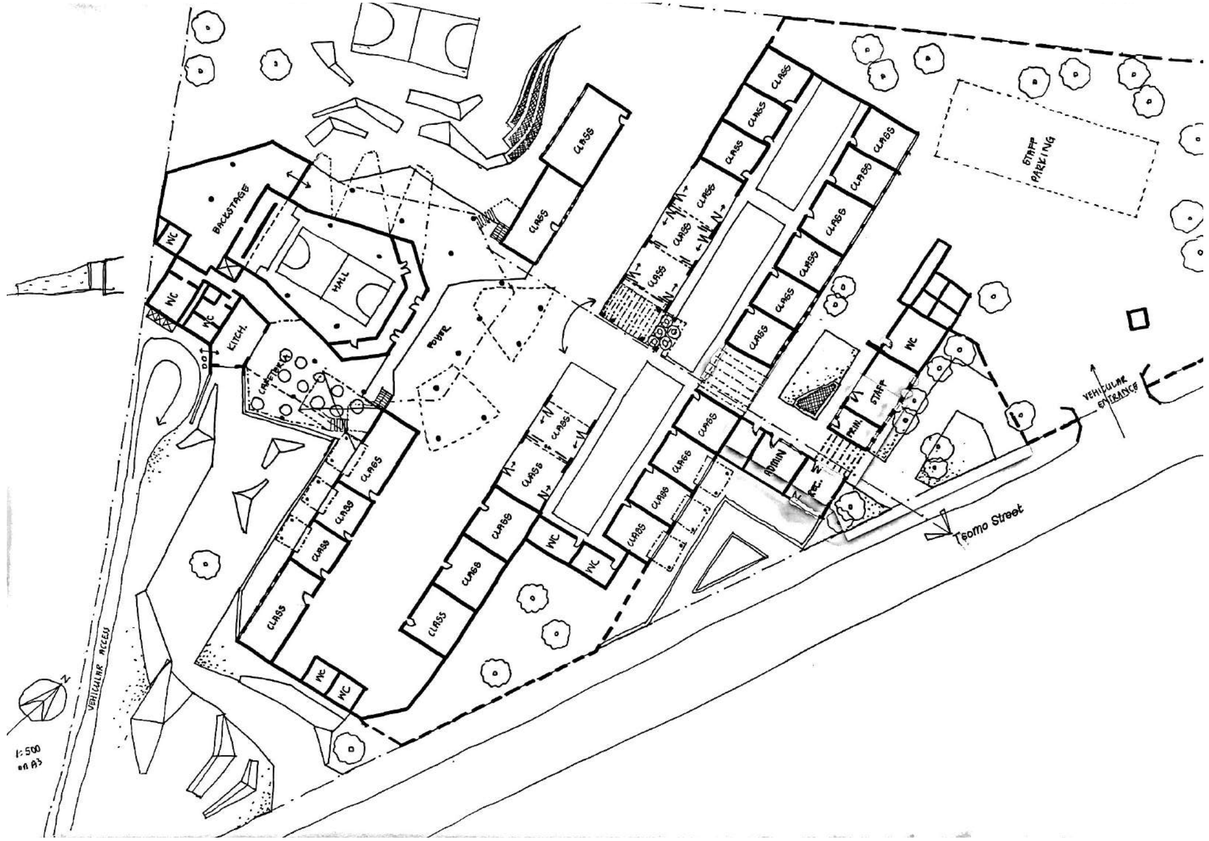


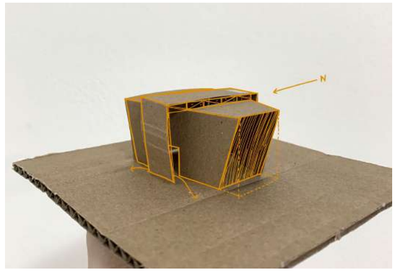


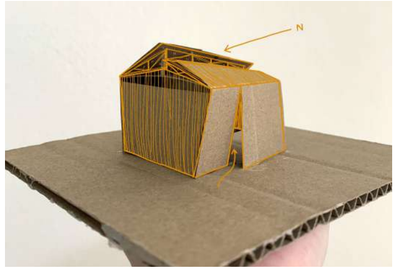
Iteration 4: September

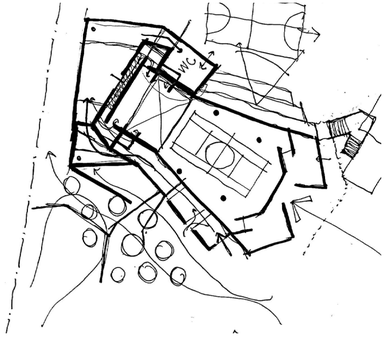
Looking at the current design in context and with the contours of the site, it became important to decide whether the proposed language wanted to relate to the existing or stand proud. Where did it become appropriate to challenge the rigid geometries of existing architecture? This was greatly inspired by the initial fragmented elements of the amphitheatre in Iteration 2, subtly pulling through the concept of expression into the architecture. Transition spaces, movement, interaction between "performances", harmonic and rhythmic considerations (Capanna 2009, Young *et al.* 1993) were all redefined and iterated during this design iteration. This was largely influenced by the conclusions drawn from the theory triangle of relationships between music, architecture, participation and networking.

(Photographs) Fig. 107: Orthogonal roof explorations (Author 2020)
(Sketches) Fig. 108: Incorporating an expressive language on plan and site plan (Author 2020)





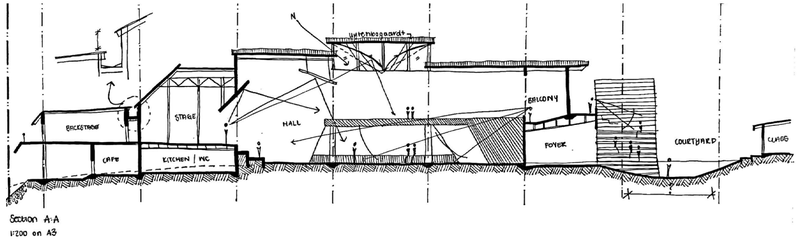


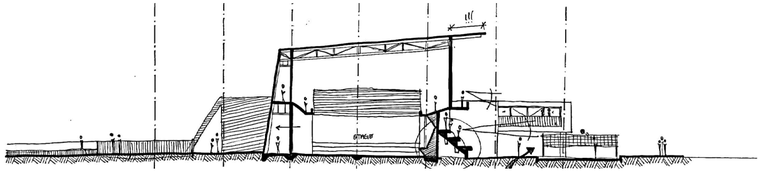


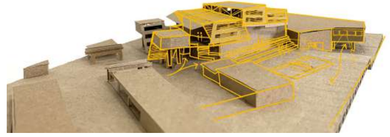
(Photographs) Fig. 109: Additional roof explorations (Author 2020)
(Sketches) Fig. 110: Refining the plan and sections (Author 2020)

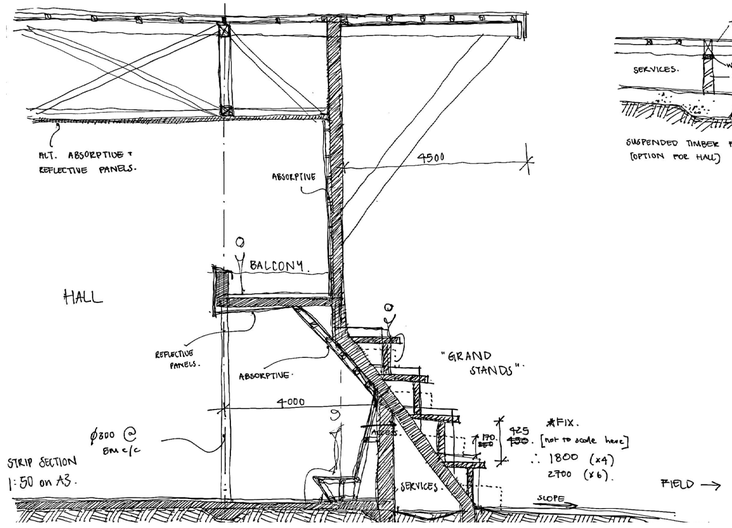
Iteration 5: September

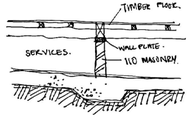
This iteration redesigned the previous iterations' explorations. From the roof becoming wall and threshold, to slightly challenging the grid for acoustic purposes. Transition spaces and functional requirements were all the same and the design started to become rigid and repetitive. The kinetic energy and expressive aesthetics were missing. Taking the design back to its simplest attributes, the plan and section *parti* diagrams were explored through a collaborative workshop with other members of the UUC studio. It was concluded that a shift in language was imminent in order to respond to the overall research question. This current design was not achieving that. The first cutting of the landscape for the Lower Ground Floor was taken into consideration here. This provided an opportunity for sustainable reuse of the cut land as fill for underneath the ground floor, as well as opening up and connecting to the community along the Western threshold of the site.

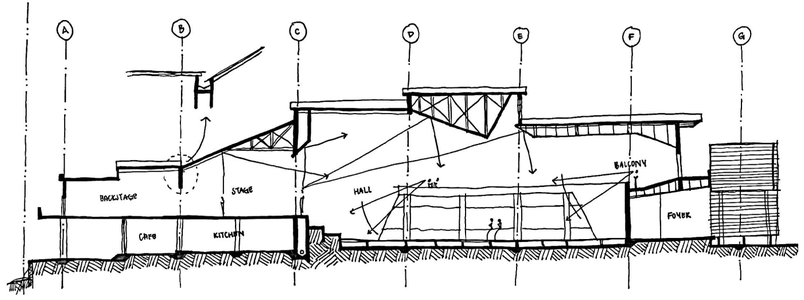


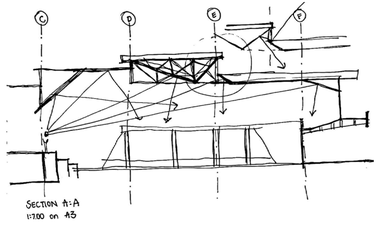


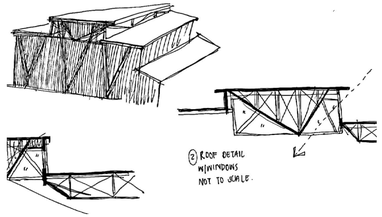


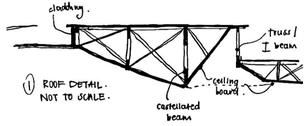




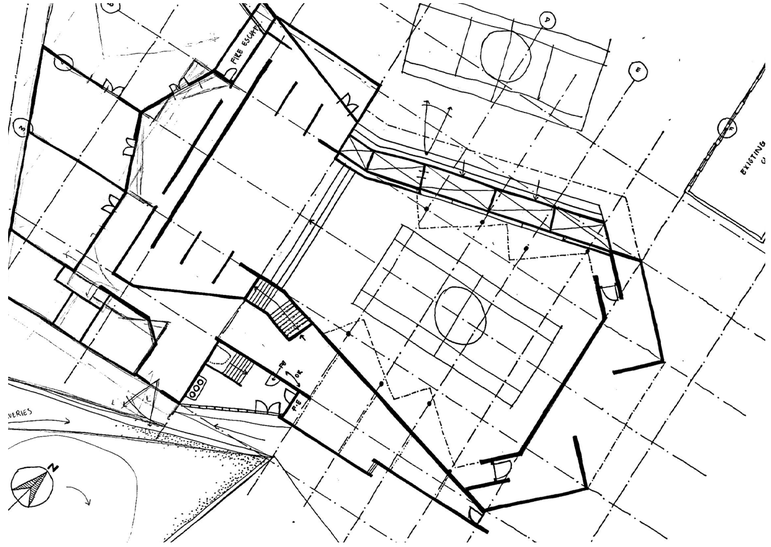


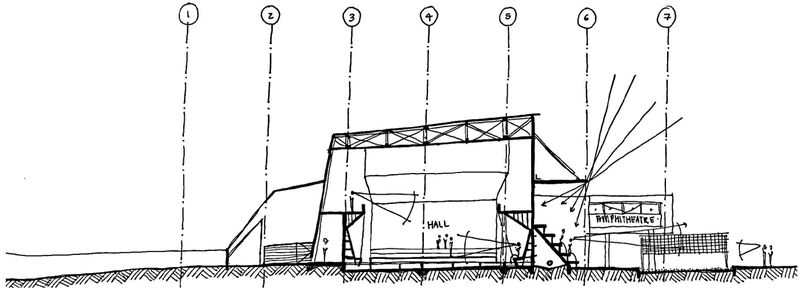


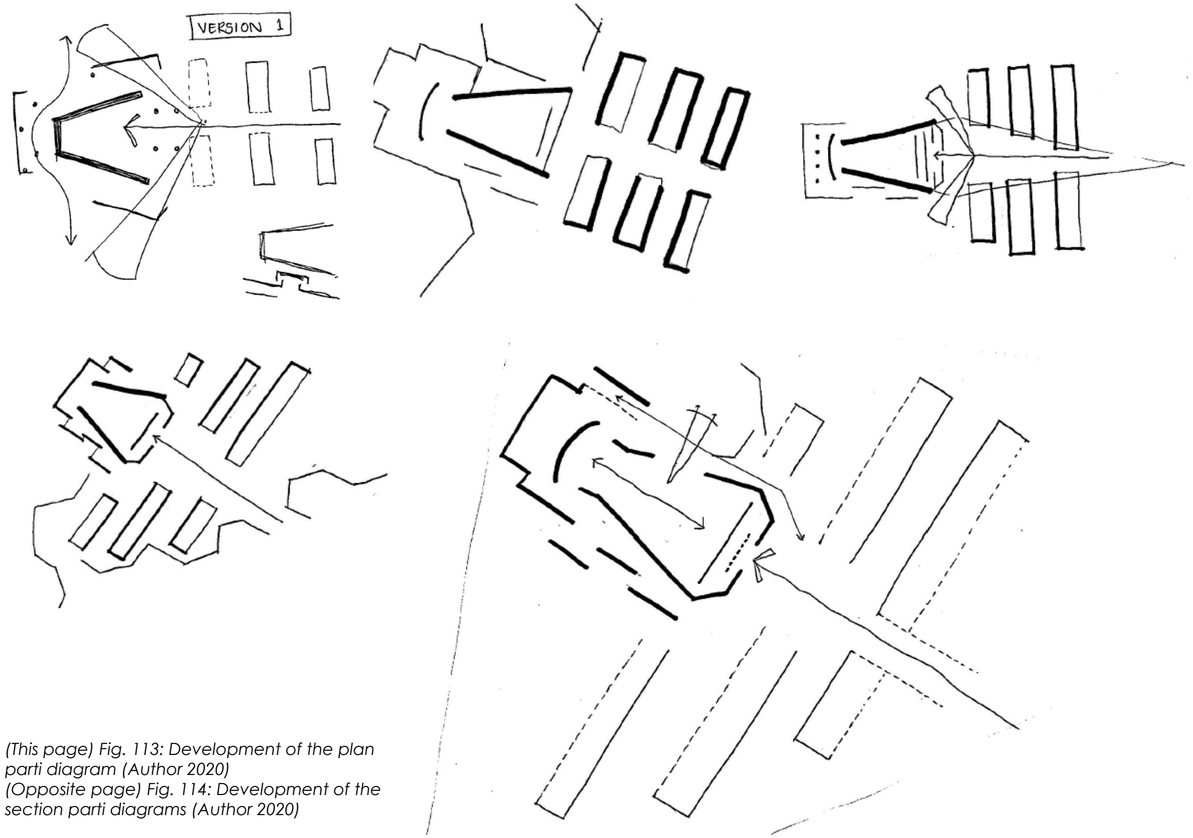




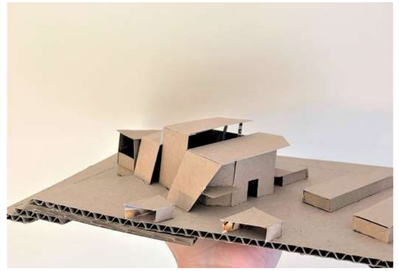
(Photographs) Fig. 111: Roof implications with existing classroom roofs & site (Author 2020)
(Sketches) Fig. 112: Detail exploration of connections, plans and sections (Author 2020)

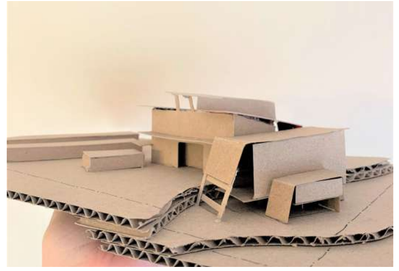


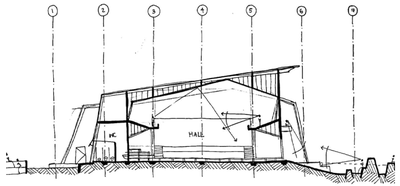


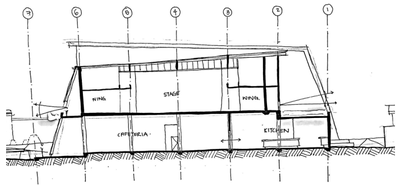


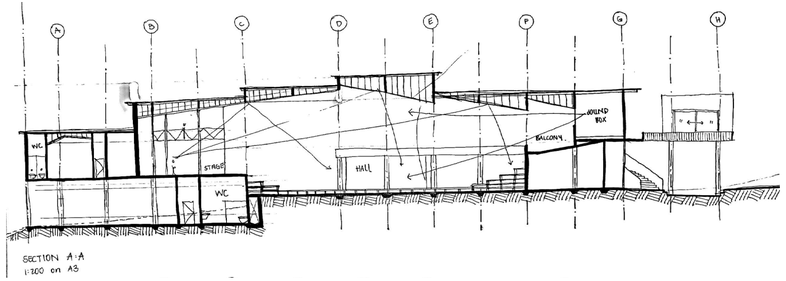
(This page) Fig. 113: Development of the plan parti diagram (Author 2020)
(Opposite page) Fig. 114: Development of the section parti diagrams (Author 2020)







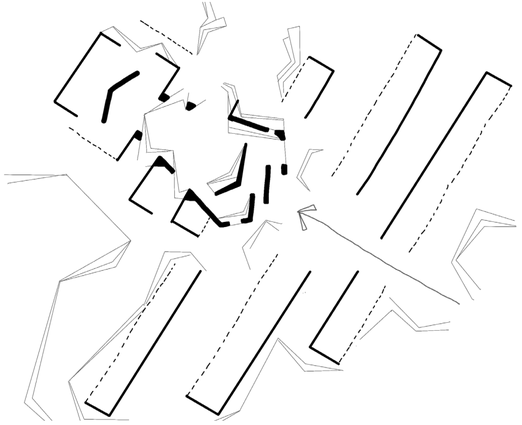


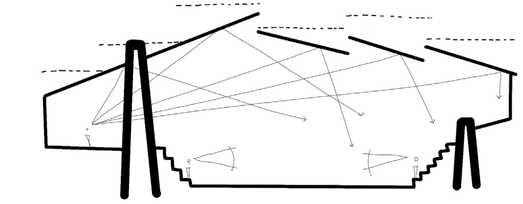


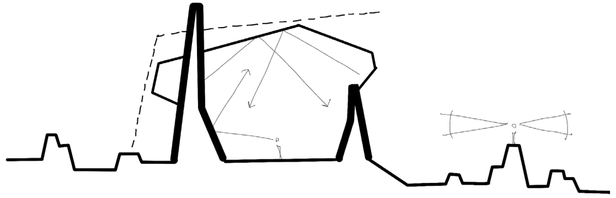
Iteration 6: October

Finally, expression revealed itself, at least in section. Inspired by the developed *parti* diagrams, this iteration saw the beginning of the biggest changes in architectural language and decision making. Inspired predominantly by the relationship between acoustics and expression, the section started becoming interesting. Stereotomic elements were introduced and exaggerated, holding the performance space and relating to the fragmented elements. This was achieved through the inspiration of music (Capanna 2009), specifically the relation of the different sounding instruments coming together and forming one harmonious piece. The different languages of architecture were considered on a more detailed level, coming together as a network of architectural elements forming a whole harmonious design (Dovey & Dickosn 2002, Hillier 1996, Lawson 2005). On plan however, this still lacked in an explosion of expression. Looking at the developed maquette, the overall building still felt overly controlled and rigid.

(Photographs) Fig. 115: Investigating the terraced roof on site (Author 2020)
(Sketches) Fig. 116: Implications of the roof on plan and section (Author 2020)







Iteration 7: October

Developing the previous iteration's *parti* diagrams and being free from the rigid grid resulted in a far more expressive language coming through. The technical concept of stereotomical structures grounding the overall building, with expressive elements and a light roof spanning off them was developed. Circulation became an aspect of performance and expression, while the conversation between ordered and offset began in a way of ordered fragmentation. The words "capturing" and "exuberant" started describing the two-dimensional qualities of the design. The roof still remained uncertain and in need of much further exploration to reveal an expressive quality like the rest of the design. This iteration was influenced by the principles derived from the precedent, Vitra Fire Station in Germany by Zaha Hadid Architects (1993).

(Top of this page) Fig. 117: Updated site plan parti diagram (Author 2020)
(This page) Fig. 118: Updated section parti diagrams (Author 2020)
(Opposite page) Fig. 119: Transferring the parti diagram into the ground floor plan (Author 2020)

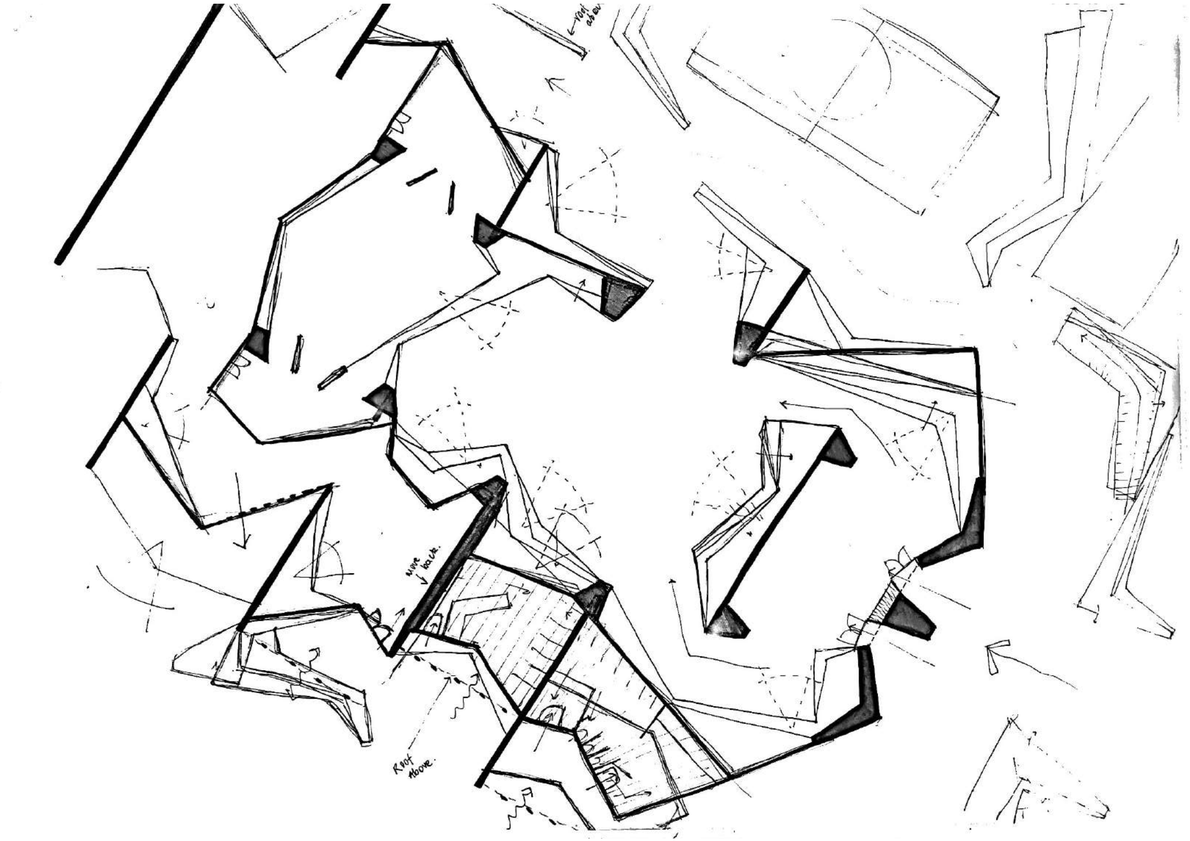


Fig. 120: Concept painting (Hadid n.d.)

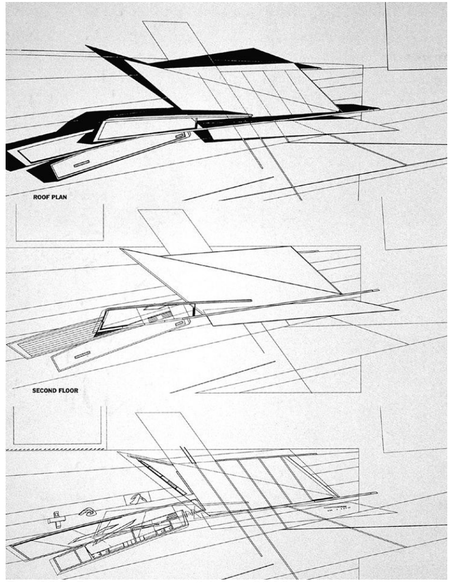


Fig. 121: Plan drawings (Victor 2018)

Precedent: Vitra Fire Station, Germany (Zaha Hadid Architects 1993)

The Vitra Fire Station's movement and tension begins as an extension of the street, acting as a linear reference for the surrounding complex. This linearity is defined and shaped by the obliquely intersecting concrete wall and roof planes, in turn defining the functional space within. From the outside, the walls appear smooth and pure, but are given a form of expression through being punctured, slanted or folded to create circulation spaces or accommodate specific programmes inside (Fiederer 2016). In order to maintain the purity of the materials and planes, distractions such as cladding and edging were avoided (Fiederer 2016, Noever 2003). This simplification was carried throughout the building; from frameless glazing to the hidden lighting on the interior. The walls and roofs emit a sense of "frozen movement" (Noever 2003:146) in tension, with the expectation for the entire building to burst into action at any moment. As one moves around the building, the overall impression changes dramatically, framing oblique views and hinting at openings (Fiederer 2016).

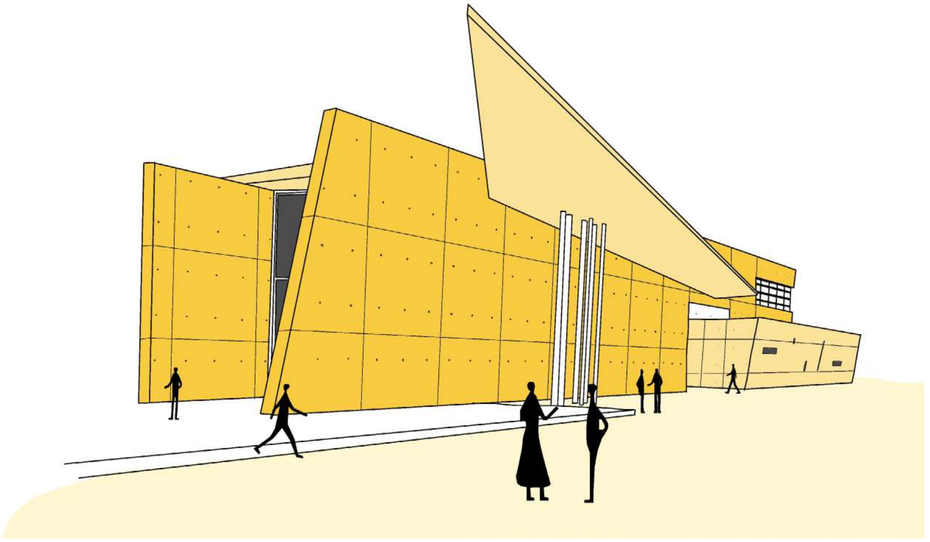
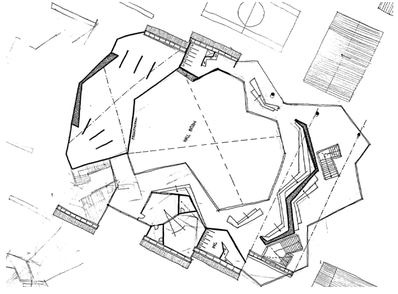


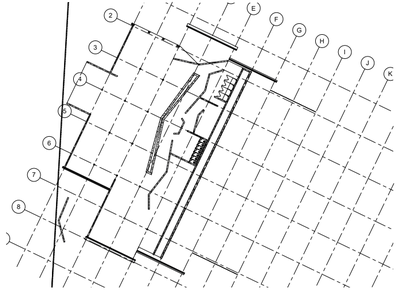
Fig. 122: Vitra Fire House by Zaha Hadid (Author 2020)

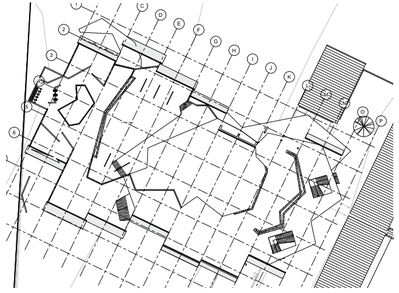


Iteration 8: November

This iteration fully embraced the concept of an explosion of expression across the site. The fragmented elements, although seemingly random, started following a direction of impact, in a rather "staccato" fashion (Codesign session 2). These created their own network of architecture, affecting the quality and quantity of potential physical, social and audible interactions. From separating spaces, to guiding or hindering movement, creating adaptable gathering spaces or creating white noise to audibly separate programmes (Dovey & Dickson 2002, Hillier 1996, Lawson 2005). The functions of each fragmented intervention are temporary and determined by the need of the users. These constantly change and inform or enhance the overall architectural network across the site and Music Network (Kozikoglu & Cebi 2015). The intricacy of the design started allowing the separate elements to come together, becoming a whole made up of components (Lynn 1993), a network of its own. This is further designed into the interrelation and networking of the systems (solar energy, water and ventilation). The interrelations between the existing and the proposed was developed in a form of "dynamic stability" (Lynn 1993: 26). This concept is further elaborated on in Chapter 7: Techné.

(Photographs) Fig. 123: Expressive symbolism throughout the site (Author 2020)
(Drawings) Fig. 124: Site plan and plans with expressive architectural language integrated with orthogonal language of school (Author 2020)





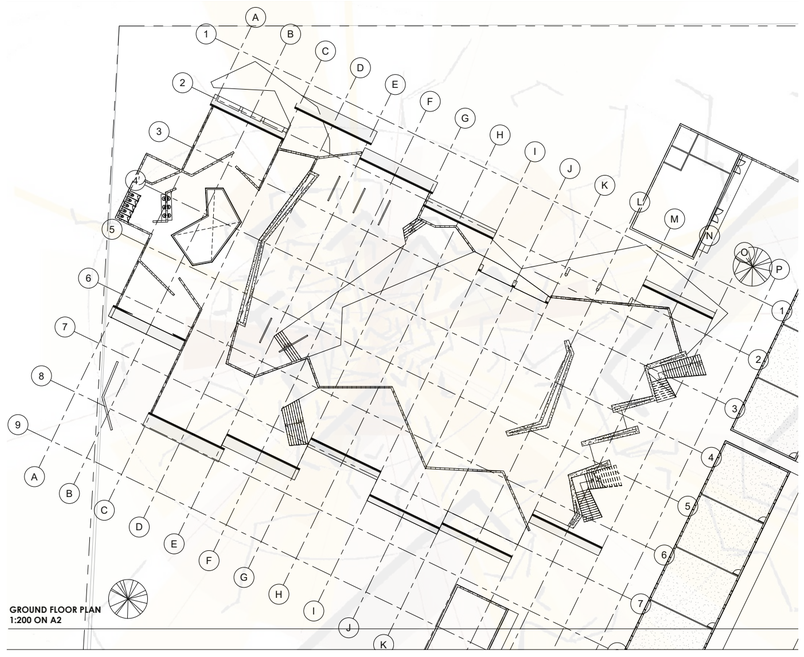
(Photographs) Fig. 125: Model development without the roof (Author 2020)
(Drawings) Fig. 126: Lower ground floor and first floor digital development (Author 2020)

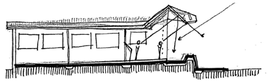
Iteration 9: December

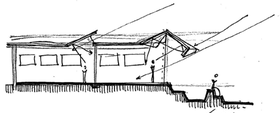
The roofs started becoming more functional than purely aesthetic. The first stage of this iteration saw the Northern façade begin to open up to the field and outdoor seating spaces, allowing light and movement to flow between the spaces. The Southern façade allowed large openings for light to enter the functional spaces within. The columns and roof do the majority of the work of the structure, similar to that of Mies van der Rohe's Barcelona Pavilion (1928). Leaving the freedom for walls to weave in and out of the structure and express themselves. In hindsight, this concept is similar to that of the music that was abstractly analysed through *music as method* (Capanna 2009, Tayyebi 2013, Young *et. al* 1993) within the proposed Mamelodi Music Network. As seen in both the *Amapiano* style and the world-renowned jazz music of Philip Tabane, there is a relationship between the solid structure of the music (the beat and the main vocals) and the freer elements that are used to emphasize the emotion and expression of the music (the melody and backups).

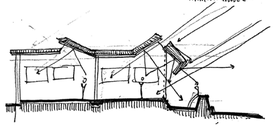
The roofs spanned across the great distance of the centre, touching down on either end. It was a struggle to work out the practicality of the roofs meeting the ground and allowing for openings to occur. Although, seemingly logical and controlled, the flatness of the roofs still hid the exciting and expressive design beneath their structures.

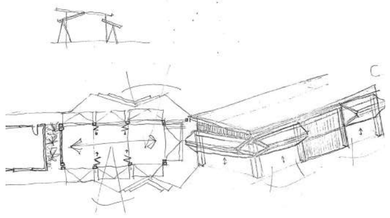
(Photographs) Fig. 127: Roof development model (Author 2020)
(Drawings) Fig. 128: Ground floor plan development with concept diagram underlay(Author 2020)

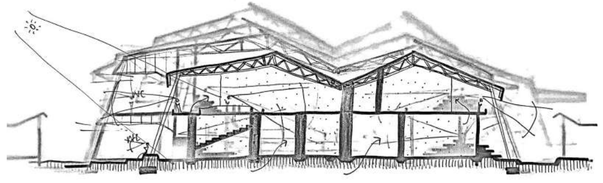


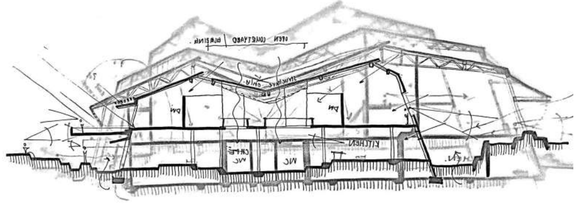












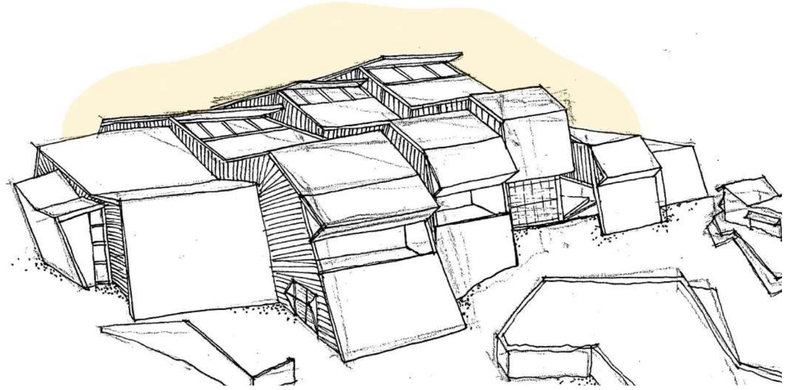
The second stage of this iteration shows how the expressive roof of the Performance Centre was enthusiastically explored, largely influenced by the results from Co-design session 2: the "roofs are energetic" and the "beams have emotions". The height levels of the roof no longer allow harsh light from the East and West, but rather provide acoustic and aesthetic properties. Functionally, the roofs also provide space for the ventilation fans to run, powered by the collected solar energy. The structure of the roofs were proved possible through the author's visit to the Cradlestone Mall in Johannesburg (see Chapter 7 *Roof Precedent*). Technically, this assisted with the development of the beams and trusses spanning the great distances at different angles across the hall. Visually, the roofs bring across the ripple effect of the epicentre of expressive explosion with certain geometries repeating themselves so as to not appear random. These forms are similar to the earth forms of sedimentary rock and are also distributed throughout the site in a controlled manner. As developed in previous iterations, these fractured forms are multi-functional, based on the appropriation brought to them by the user. Some have been specifically designed to be only used as stairs, others include seating and viewing platforms, while some open up to create smaller platforms that can be appropriated for interaction and self-expression on a smaller scale than the main stage. Further developed were the roof openings to the South in order to allow a constant soft amount of light to enter the main hall and backstage change rooms.

The different elevations (North and South) were developed to serve different functions. The Northern elevation opens up to the sports field and outdoor stage and seating to allow for a larger spill out event to take place. This is done through the use of bi-fold doors that are manually opened and closed, either fully or partially. This technology is further used throughout the site and especially for the opening up of the STEAM classrooms. The bi-fold doors allow the visual representation of the ripple effect through the fracturing and folding of the facades.

The Southern elevation is more functional in terms of programme, and therefore does not require this manipulation of the façade as much as the Northern elevation. The few bifold doors here allow for Southern light to naturally light the interior spaces of the Performers' Entrance, rehearsal space and sound studio.

(Opposite page from top left to right)
Fig. 129: Site plan with rippling effect (Author 2020)
Fig. 130: STEAM classroom roof development with ripple effect (Author 2020)
Fig. 131: Performance Centre roofs developed in sections and overlayed (Author 2020)

(This page) Fig. 132: Overall form concept sketch with expressive roofs (Author 2020)



07_TECHNE

Logos and Techne

Roof Precedent

Roof and Detailing Development

Roof Structural Model

Systems: Acoustics

Systems: Water

Sustainability

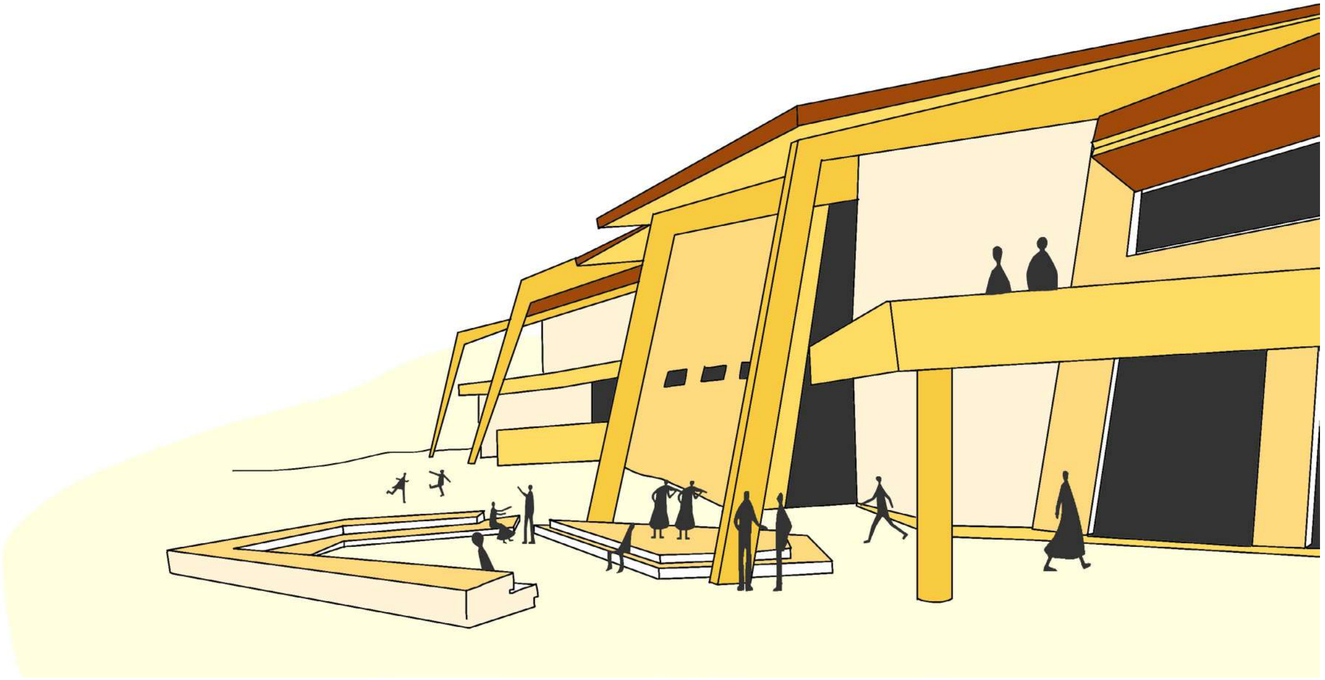


Fig. 133: Graphic representation of Performance Centre (Author 2020)

Fig. 134: Mies van der Rohe's Barcelona Pavilion (Author 2020)

07_TECHNÉ

This chapter explores how the overall concept of expression and performance can be brought through to the structural intentions, materiality, building systems, services and sustainability.

Logos and *techné*

It is imperative for the building to be dynamic and have energy: an explosion of expression providing inspiration (Capanna 2009) and a "cup of that vision" (Memory 2020). This assists in achieving the intention of an inclusive and celebratory architectural intervention within the proposed Music Network by providing a flagship of identity through expression. In order to achieve this, a "dynamic stability" (Lynn 2013:26) is created between the integration of the new with the existing.

The *stability* is constructed through the main structural elements of the Performance Centre. The columns and beams are ordered according to a 5x7m grid, influenced by the existing built structure and orientation of Tsako Thabo Secondary School. The *stability* elements are stereotomic and hold the necessary servant spaces, as according to Louis Kahn (Slunecko 2018), where they meet the ground. As seen in the linear layout of **Uytenbogaardt's Steinkopf Community Centre** (1978-80), these elements create a structural order that allows secondary and tertiary architectural elements to be freely integrated (Beck 1985, Bosman 2017). Mies van der Rohe's **Barcelona Pavilion** (1929) expresses the same structural concept. The columns follow an underlying grid and act as the only structural elements within the building. The rest – the roof, walls, doors, glazing, etc. – fill in the voids, create spaces and influence circulation (Mies van der Rohe Architects 2011) in a free and unconstructed manner. These freer elements of the Pavilion are also visually emphasized through the use of elaborate cladding materials, such as marble.

The *dynamic* guides, stops, frames, celebrates and creates space within the overall design. These elements are responsive, incorporating, fluent and adaptable (Lynn 2013:30) to the existing, the main structure and the context of expression. They consist of platforms, walls, openings and coverings, defining and designing spaces according to their expressive programme. The Performance Centre exists at the epicentre of this musical explosion, followed by ripples of influence throughout the site and Music Network. These elements are the details of the interrelationship between music and architecture (Capanna 2009, Tayyebi 2013, Young *et. al* 1993:39), creating an intricate network of expression and identity (Lynn 2013). This interaction and relationship between the *stability* and the *dynamic* bring together the tangible and intangible aspects of architecture (Frascari 1984). The walls and ceilings within this category are largely influenced by and impact the acoustic qualities of the designed spaces, impacting the overall social and built performance. The openings welcome natural lighting into the space while the layering of seemingly unpredictable platforms, floors and walls create a continuous flow of movement and form. The lightweight expressive roof covering falls a part of the *dynamic* as well. Each layer and material associated with this category are celebrated for their best structural performance, including the heavier rammed earth walls grounding and holding the Centre.

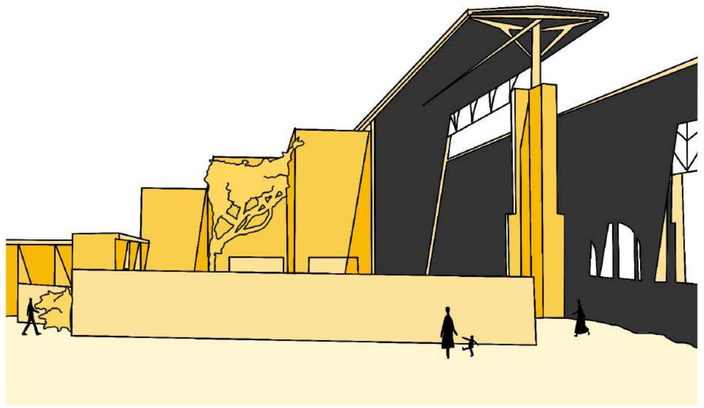


Fig. 135: Uytenbogaardt's Steinkopf Community Centre (Author 2020)

ROOF PRECEDENT: CRADLESTONE SHOPPING MALL, JOHANNESBURG (BENTEL & ASSOCIATES 2013)

This relatively new shopping mall in Johannesburg is situated on the edge of the UN World Heritage site, the Cradle of Humankind. The roof of the shopping mall takes its formal inspiration from the layering of strata in the earth, as found at the Cradle (Bentel 2013). The ceiling reflects this same concept through the contours of its jagged armadillo shape (LAD 2013), bringing light to both acoustic and aesthetic qualities. The roof touches down on its neighbouring flat roofs, hidden behind three-dimensional geometric bulkheads. The design of the roof allows the flooding of Southern light into the space.

From on-site and desktop analysis, the researcher attempted to understand the basic structure of the roof (Fig. 136). The main structure is a series of slanted beams, held together and support by trusses with glazing. Covering this is standard metal roof sheeting. The ceiling elements below are of Saint-Gobain's Gyproc high performance ceiling board (LAD 2013). These are constructed as individual elements, leaving an air space between the structure of the roof and the ceiling itself. Similar to the Exeter Roof (See *Systems: Acoustic precedent)*, this could be done to allow sound to be absorbed by a system above it.

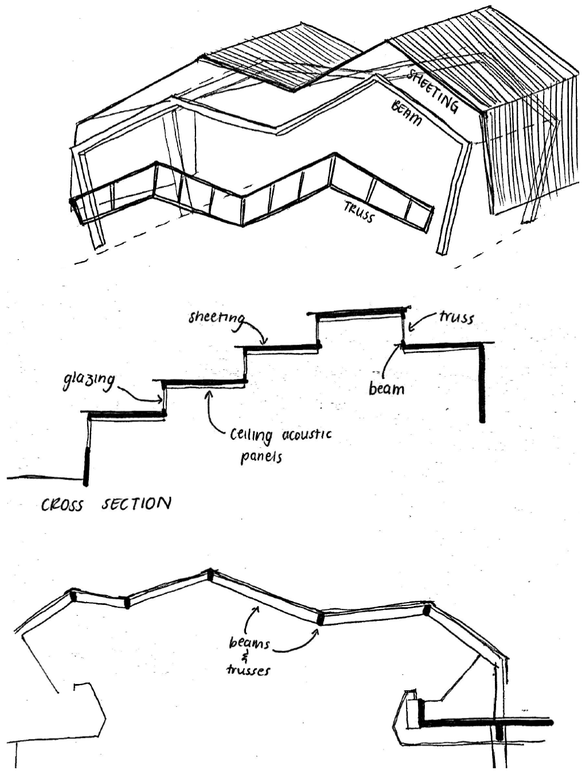


Fig. 136: Trying to understand the structure of the roof (Author 2020)

Fig. 137: Aerial photographs (Google Maps 2020)

Fig. 138: The roof of Cradlestone Mall shown from the inside (Author 2020)

ROOF & DETAILING DEVELOPMENT

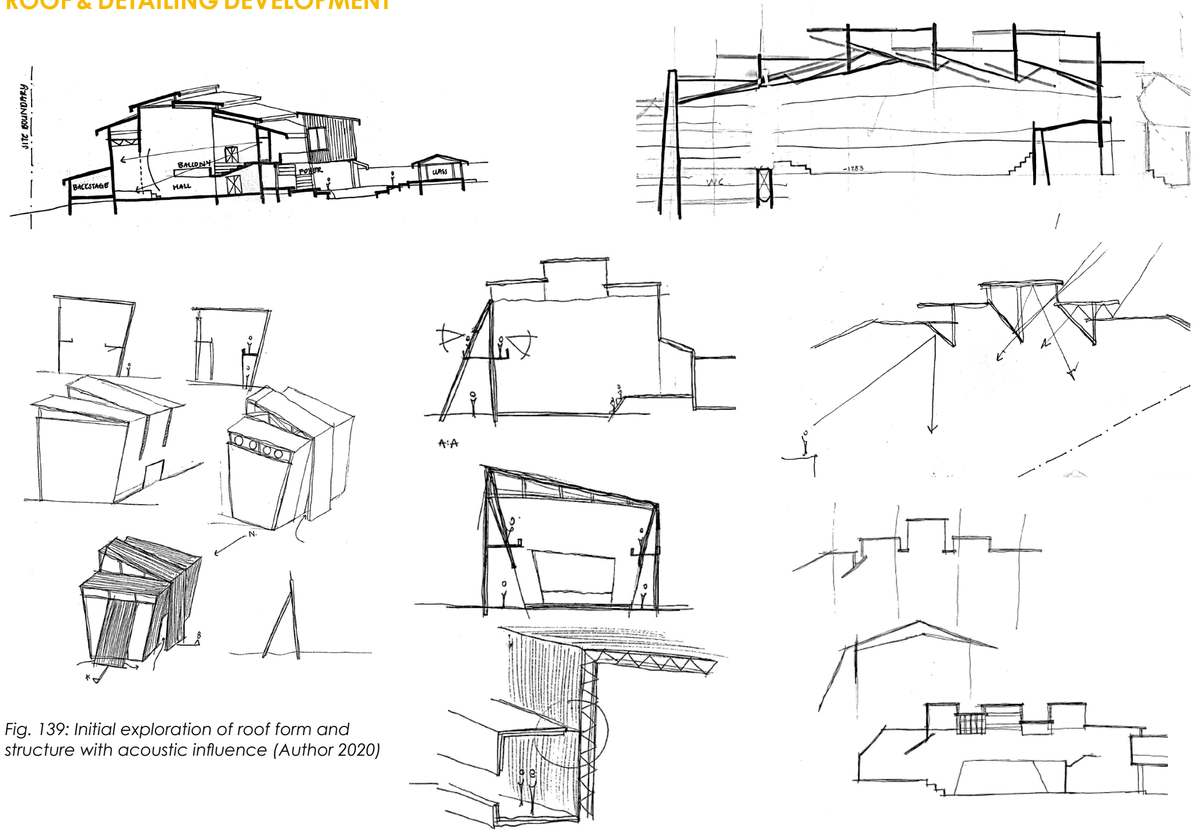
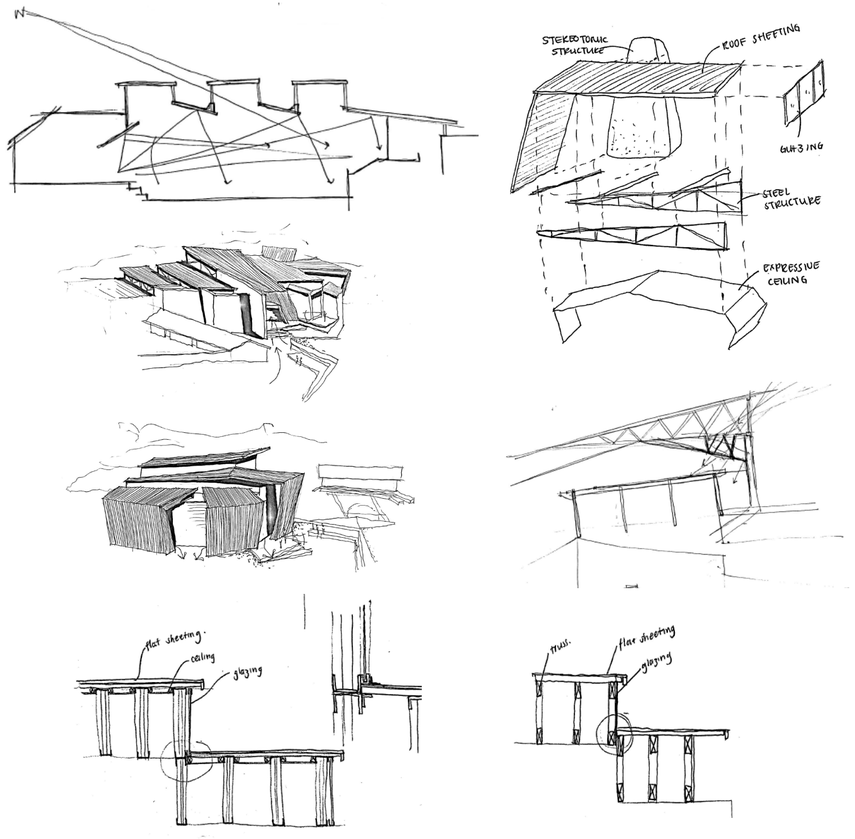


Fig. 139: Initial exploration of roof form and structure with acoustic influence (Author 2020)



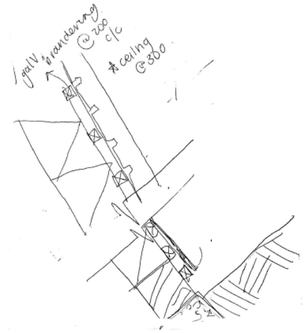


Fig. 140: Exploring the effect of the structure on the design (Author 2020)

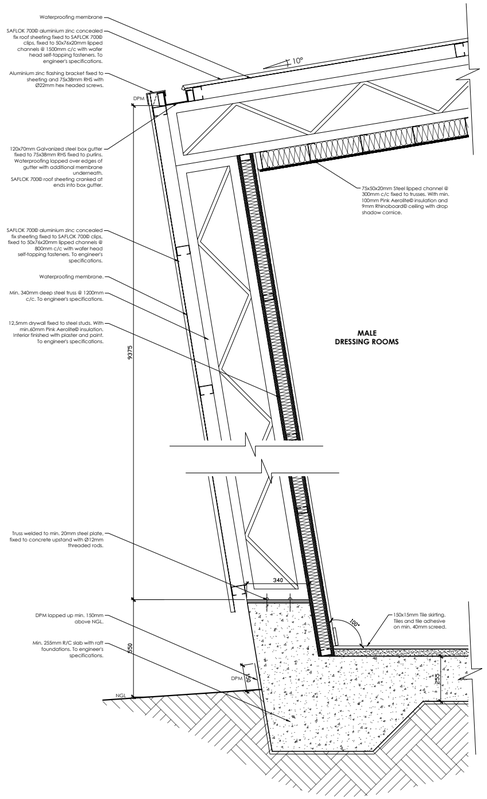


Fig. 141: Roof/wall detail prepared for the Tech Crit in September (Author 2020)

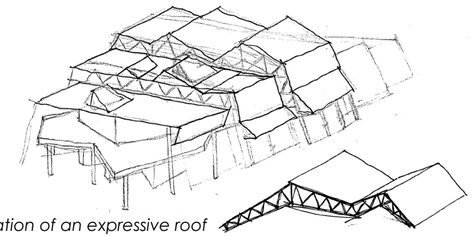


Fig. 142: Exploration of an expressive roof structure (Author 2020)

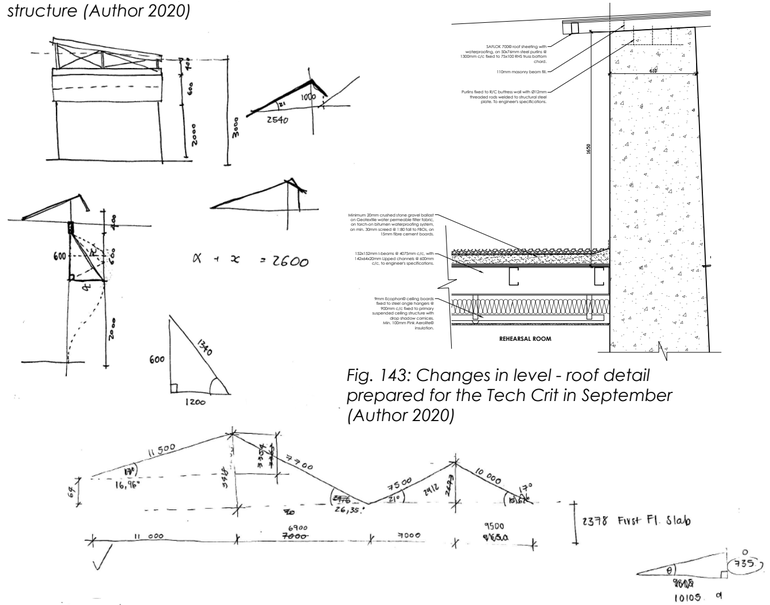
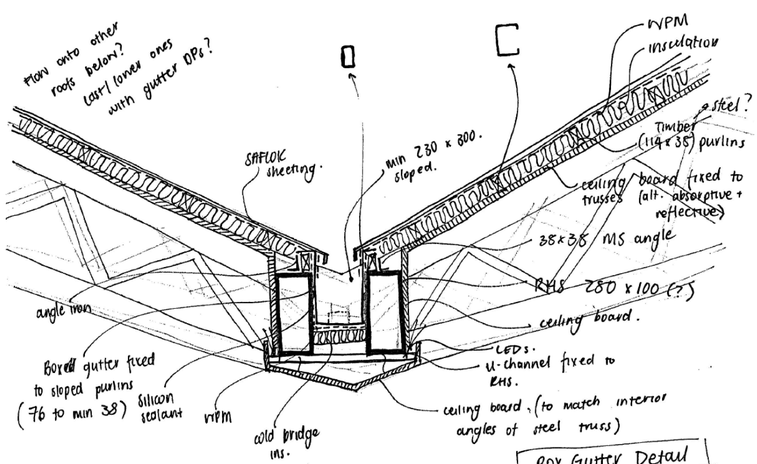
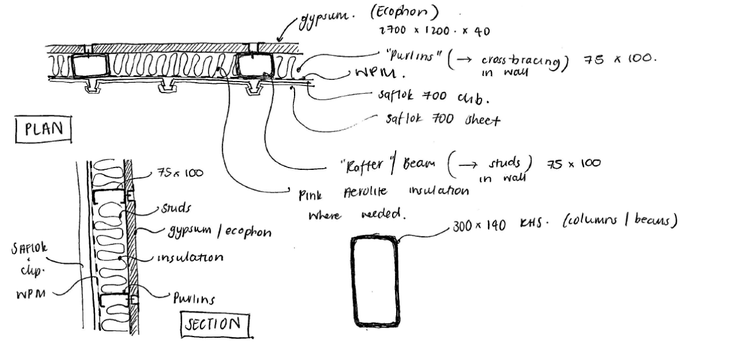


Fig. 143: Changes in level - roof detail prepared for the Tech Crit in September (Author 2020)





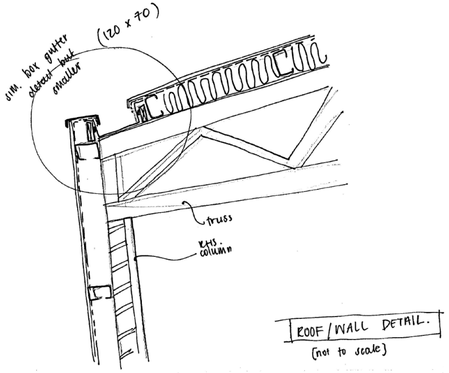
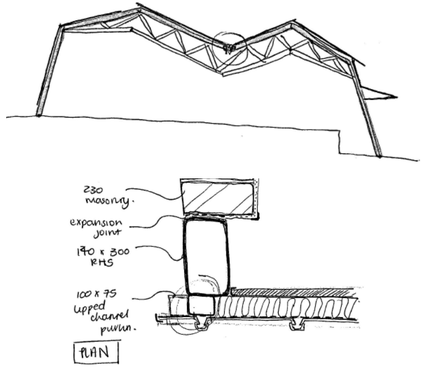


Fig. 144: Detailed development of different roof components (Author 2020)



ROOF STRUCTURAL MODEL

This model shows the main structure of the roof design. At first glance the roof seems complex, however, it is simply constructed of long spanning beams and trusses with roof coverings. This simple support structure allows for the freedom of the walls below to create exciting spaces as needed.

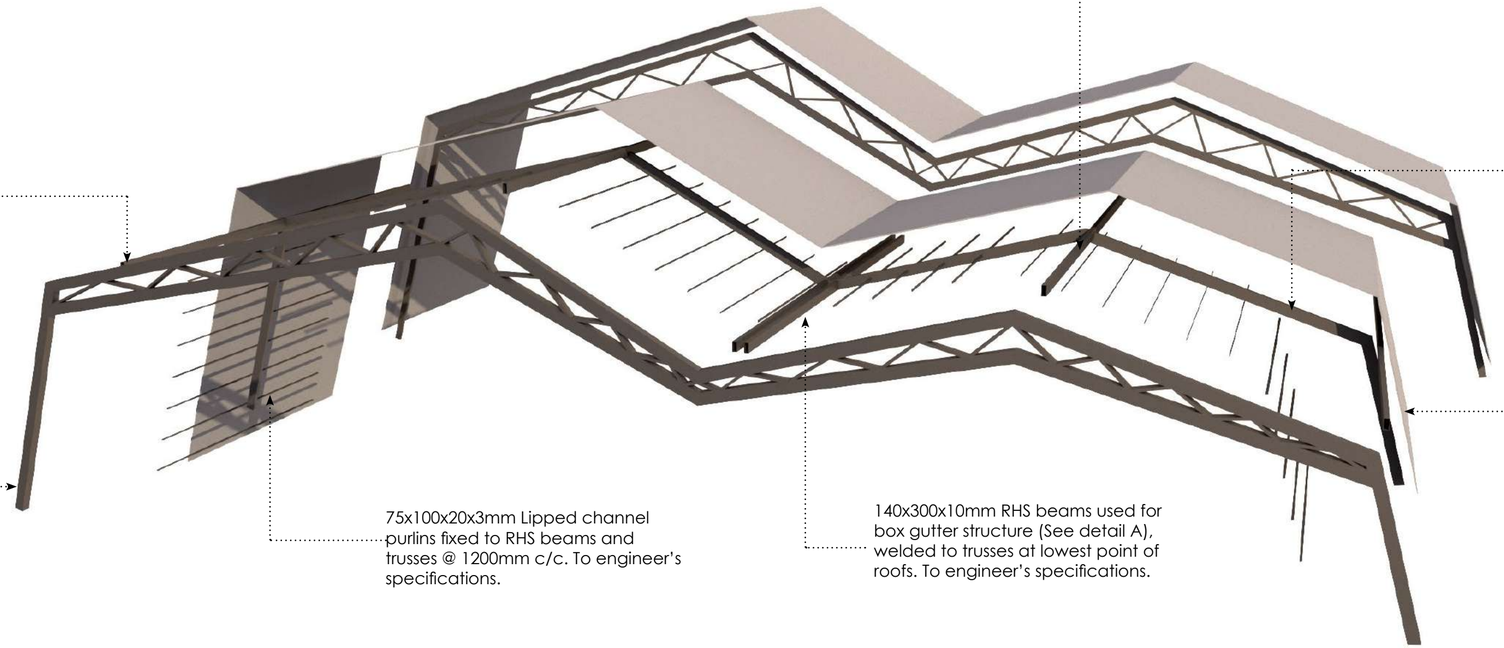


Fig. 145: 3D diagram of the roof structure (Author 2020)

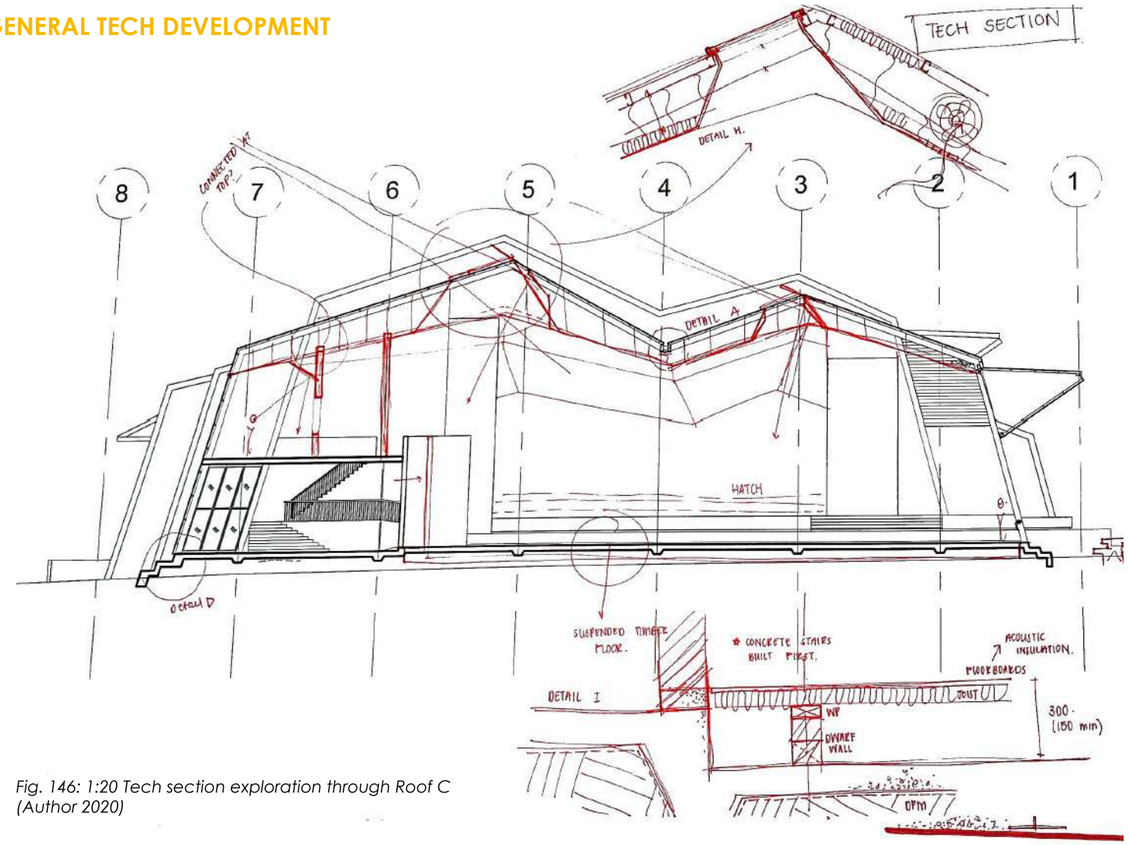
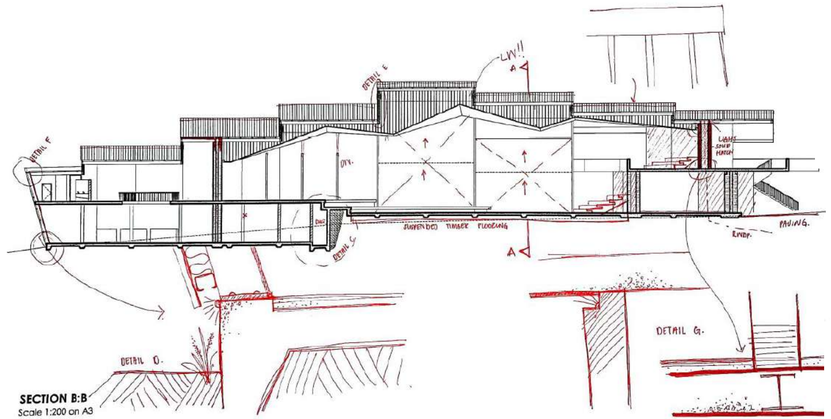


Fig. 146: 1:20 Tech section exploration through Roof C (Author 2020)



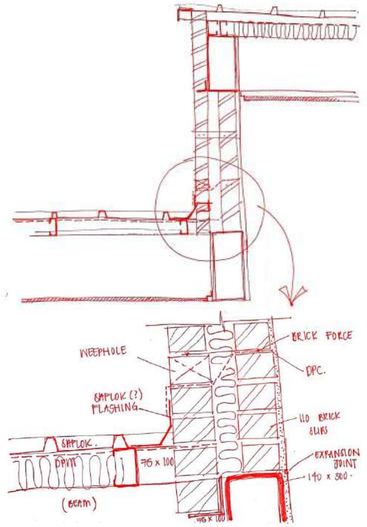
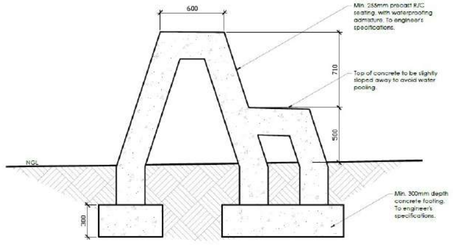
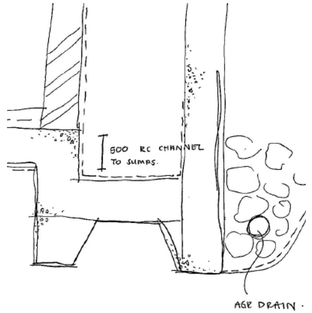
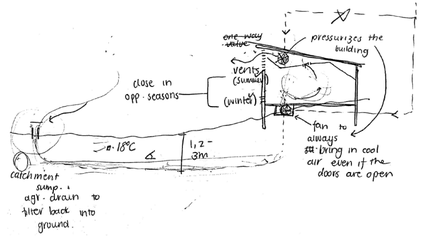


Fig. 147: General tech notes and detailing explorations (Author 2020)



OUTDOOR SEATING DETAIL
Scale 1:20 on A1





SYSTEMS

As already analysed, the conditions of the school hall and classrooms are poor and have a negative effect on its users. This is a similar condition across most schools within the area and needs serious re-consideration (Honours 2019). In order to create a comfortable and less-stressful interior environment for learners and teachers, considerations such as acoustic conditions, daylighting and ventilation need to be carefully designed. Taking these conditions into the design of the building can largely enhance the users' wellbeing and performance (Ecophon 2018).

Systems: Acoustics

Due to programme and main focus of this dissertation, the first system that needs to be addressed is acoustics. In order to calculate and have a proper understanding of the acoustic qualities of a space, one needs to consider the activity within the space, the people performing this activity and the overall space itself (Ecophon 2018). This is used when assessing the overall Activity Based Acoustic Design of the building and is analysed using the Ecophon acoustics calculator (Available for online use at: http://www.ecophon.ua/en/about-ecophon/e-tools/ecophon-acoustic-calculator/).

The following three parameters are assessed in this calculator (Ecophon 2018):

1. **Reverberation Time:** how fast does sound energy disappear within a space? It is preferred for the reverberation time to be as short as possible in order to avoid chaotic and disturbing echoes.
2. **Speech Clarity:** how clear is speech perceived in the space? The higher the value, the more improved speech clarity there is.
3. **Sound Strength:** how does the sound reflect on all the surfaces within a room, and how does this contribute to the sound level? If the value is lower, this means the sound level is also lower.

In order for a good room design, there needs to be a good balance between these three parameters that supports the room's activity and people.

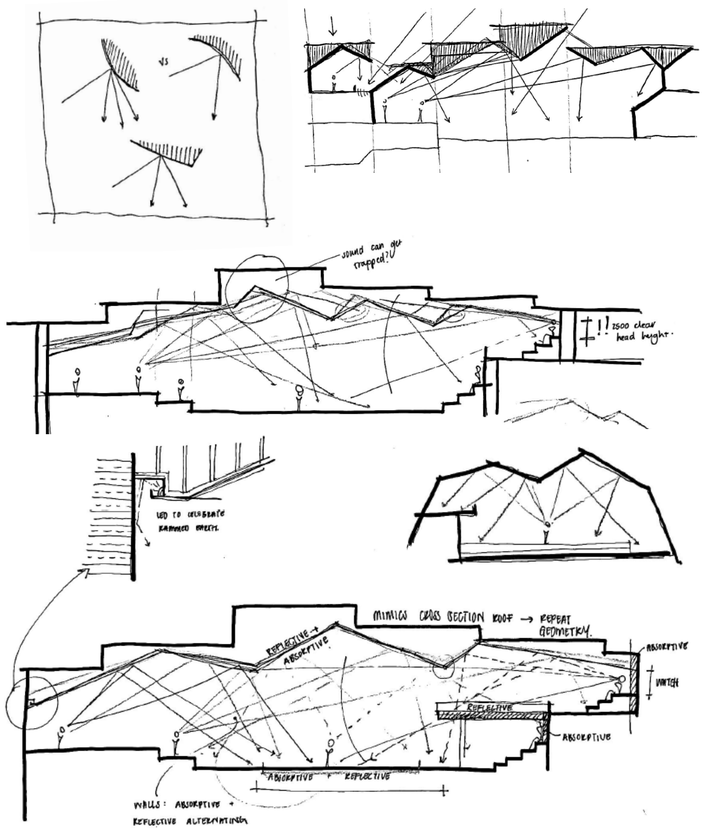


Fig. 147: Acoustic development (Author 2020)

The **existing classrooms** have been assessed and recommendations have been made for implementation in the soon stage of this project (Hamdi 2010). This will benefit the learners and teachers within the classrooms by increasing the comfort levels within the space, allowing more successful learning to take place. As seen in Fig. 149, the reverberation time, speech clarity and strength of sound all fall below the recommendations from Ecophon. Iterating this, alternating reflective and absorptive wall panels were added to facing walls with a total area of 12m² on each wall. This largely increased the acoustic quality of the classroom (Fig. 150), meeting the minimum recommendation values from the base model. Anything added beyond this would only increase the sound quality of the space.

The **existing hall** was analysed in a similar way. Again, the acoustic qualities of the hall were far from what is recommended (Fig. 151). The calculated reverberation time was too long, as well as the speech clarity being too low. Therefore, for the iteration and design of the **proposed Performance Centre hall**, a ceiling absorber with a high sound absorption coefficient and wall absorbers positioned to reduce reflections were added to the calculations. This resulted in both the reverberation time and speech clarity reducing to as close to the recommended values as possible (Fig. 152). Due to the simplicity of the calculator only analysing walls at right angles, the values calculated can only be estimates. Following Ecophon's recommendations and the precedent analysis of the Exeter School Multipurpose Space, the acoustic design for the Performance Centre Hall developed (Fig. 157).

CLASSROOM

EXISTING

Reverberation time T20 (s)	Speech clarity C50 (dB)	Strength G (dB)
Sabine calculation 0.50 RAC calculation 0.76 Ecophon recommendation ≤ 0.5	Sabine calculation 4.84 RAC calculation 3.09 Ecophon recommendation ≥ 6	Sabine calculation 19.59 RAC calculation 19.09 Ecophon recommendation ≤ 19

Fig. 149: Results and recommendations for the existing classroom (Ecophon 2020)

PROPOSED

Reverberation time T_{20} (s)	Speech clarity C_{50} (dB)	Strength G (dB)
Sabine calculation 0.39 RAC calculation 0.48 Ecophon recommendation ≤ 0.5	Sabine calculation 7.27 RAC calculation 6.26 Ecophon recommendation ≥ 6	Sabine calculation 18.42 RAC calculation 17.29 Ecophon recommendation ≤ 19

Fig. 150: Acoustic results of the classroom meeting the recommendations through added wall panels (Ecophon 2020)

HALL

EXISTING

Reverberation time T20 (s)	Speech clarity C50 (dB)	Strength G (dB)
Sabine calculation 0.54 RAC calculation 1.02 Ecophon recommendation ≤ 0.5	Sabine calculation 4.21 RAC calculation 2.13 Ecophon recommendation ≥ 6	Sabine calculation 14.00 RAC calculation 11.31 Ecophon recommendation ≤ 19

Fig. 151: Results and recommendations for the existing school hall (Ecophon 2020)

PROPOSED

Reverberation time T20 (s)	Speech clarity C50 (dB)	Strength G (dB)
Sabine calculation 1.30 RAC calculation 1.61 Ecophon recommendation ≤ 1.6	Sabine calculation -1.26 RAC calculation -0.99 Ecophon recommendation ≥ 0	Sabine calculation 5.80 RAC calculation 3.54 Ecophon recommendation ≤ 10

Fig. 152: Estimated acoustic results for the proposed Performance Centre hall (Ecophon 2020)

The ceiling of the Performance Centre hall is used to reflect and direct sound from the stages to the audience below. Similarly, the reflective panels on the angled walls create the same effect with sound from the centre of the hall. Alternating these panels are absorptive panels that help reduce the reflections and ensure short to zero reverberation. This ensures the sound is crisp and clear, with no echoes or overlapping noise that can disrupt audience members and onlookers during any of the activities that may take place within the space, including cultural events and a volleyball match.

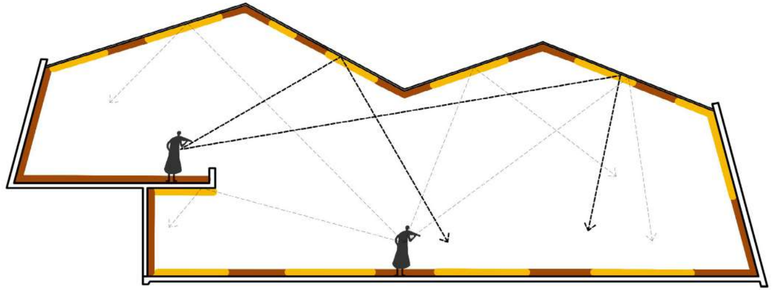
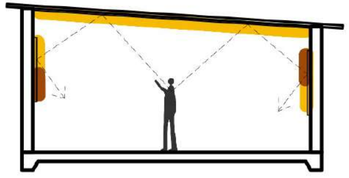


Fig. 153: Acoustic diagram through cross section of the Performance Centre hall (Author 2020)



Reflective panels

Absorptive panels

Alternating absorptive & reflective panels

Fig. 154: Acoustic diagram through a typical classroom (Author 2020)

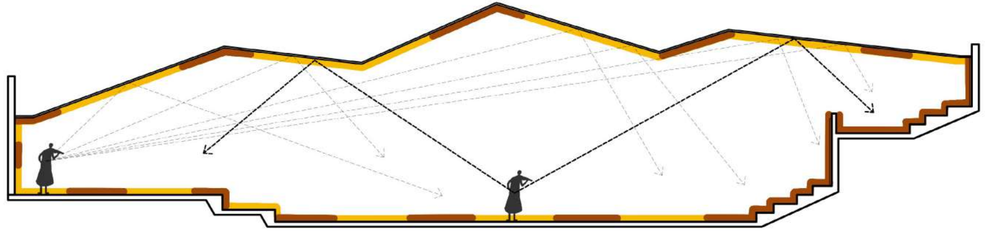


Fig. 155: Acoustic diagram through the long section of the Performance Centre hall (Author 2020)

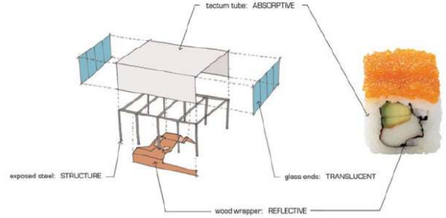


Fig. 156: The structural concept of a sushi roll (Dake Wells 2015)

Fig. 157: Interior view of Exeter multipurpose hall (Author 2020)

ACOUSTIC PRECEDENT: EXETER SCHOOL MULTIPURPOSE SPACE, USA

(Dake Wells Architecture 2009)

The addition to the school building repurposes an existing interstitial space to provide a social, performance and sport centre for the small community of Exeter. Natural daylighting and acoustics are great influencers of the design. The ceiling and roof structure is made up of folded timber elements designed to control and optimize the acoustics within the multipurpose hall. The folded timber reflects and directs sound to the audience below, while surrounding materials on the floor and walls absorb sound and eliminate reverberation (Schwab 2015). This structure was inspired by a sushi roll with layers of varying absorptivity (Schwab 2015). The reflective suspended timber ceiling is attached to an exposed steel structure, leaving a void for the sound to travel through and be absorbed by tectum tubing above. Skylights penetrate this system, allowing the flooding of natural lighting into the hall.

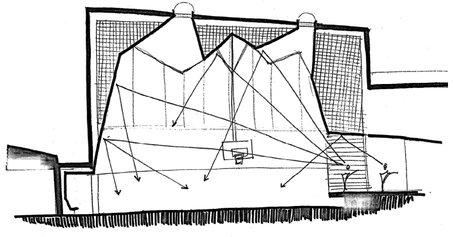


Fig. 158: Acoustic analysis of the ceiling (Author 2020)

Systems: Water

Water is a visual, aural and environmental aspect that can be sophisticatedly designed into architecture to enhance the overall functionality and experience of the building. Water possesses architectural elements relevant to this project such as rhythm, movement and sound (Songabau 2019). It can be used as an acoustic camouflage for unwanted noise with the pleasant sound that moving water emits (Brown & Rutherford 1994, Pouya 2017). According to a recent study done, water is the second highest natural sound that relates to a "positive perception of the urban soundscape" (Jeon *et al.* 2012: 2101). Acoustically, still water bodies, such as lakes, ponds, pools and puddles, reflect noise and often carry the sound across the water body (Rådsten 2015). Moving waters, such as waterfalls, fountains, cascades and rivers can create a natural music that can be manipulated and designed in terms of rhythm, pitch, volume, sharpness and harmony (Rådsten 2015). Pairing moving water with vegetation significantly improves the absorption and masking of unwanted sounds (Rehan 2016). *(diagram of water as road traffic noise mask)*

It is important to consider the intricate design of moving water interventions as the loudness of the natural sound may negatively impact some programmatic functions, for example, being unable to talk and teach in a classroom due to the deafening loudness of a water fountain outside the window. Therefore, the types of water implementations have been considered closely according to both the slope of the site, collection points and programmatic layout.

Water interventions have been used as a guiding element within the site, as well as a physical and aural threshold between the site and the street. In some cases, the reflection of light on the water intervention displays a performance of this system onto a nearby built surface, once again tying back to the original concept of celebrating expression and performance.

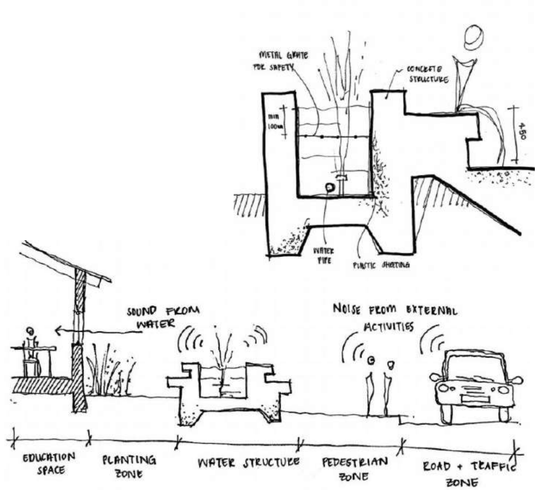
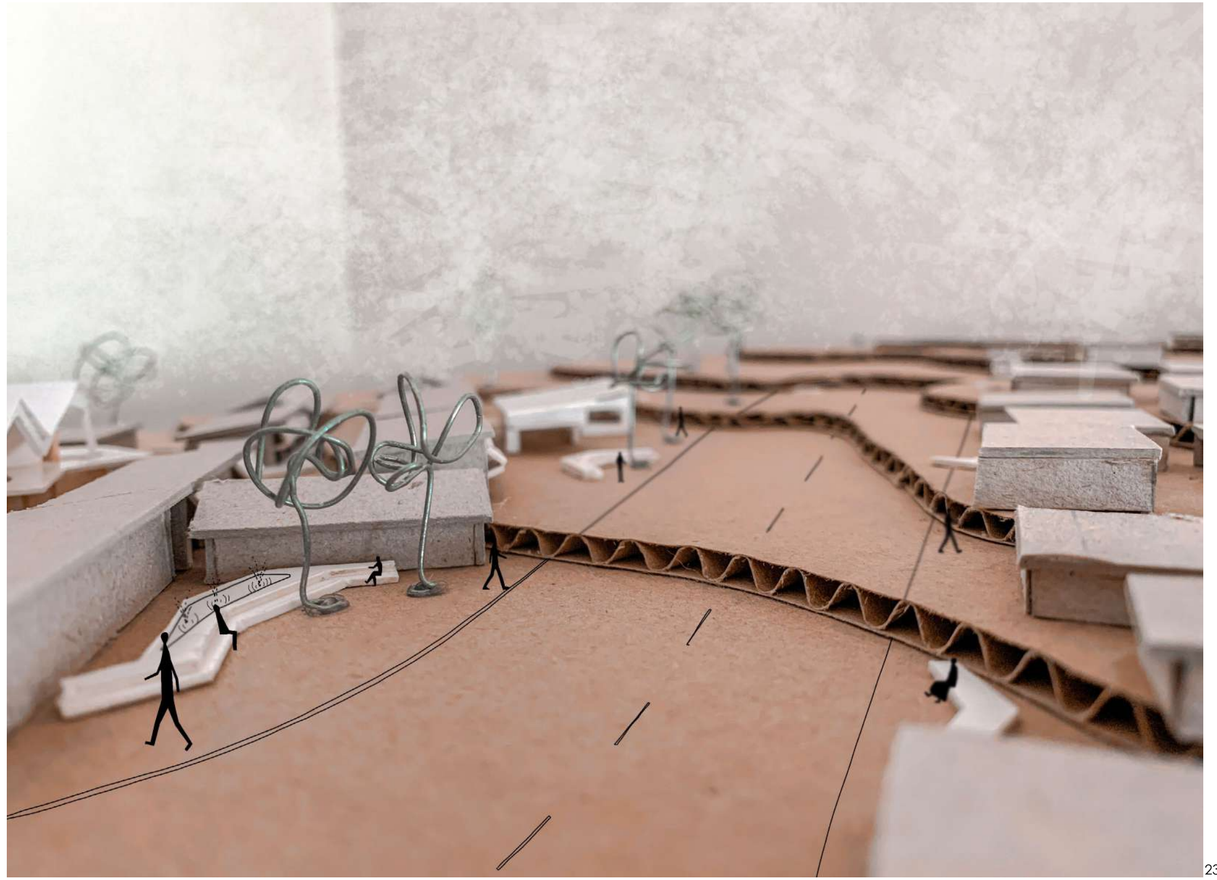


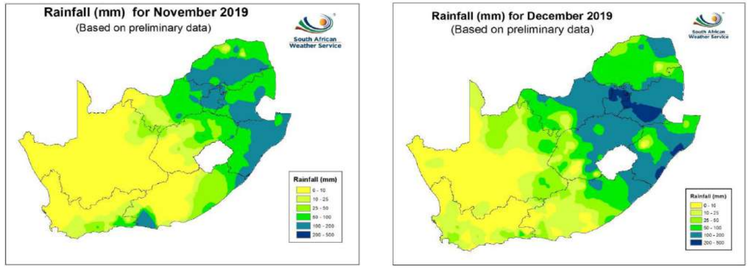
Fig. 159: Water and sound diagrams (Author 2020)

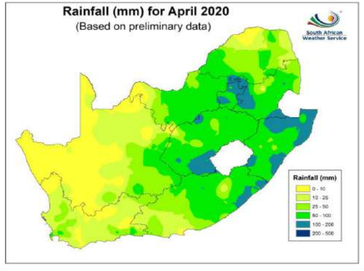


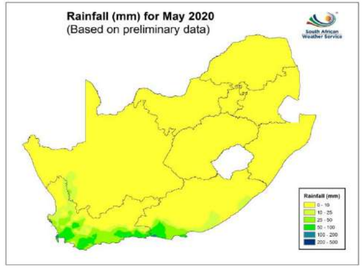
Rainwater Catchment

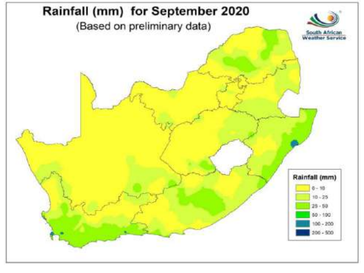
The large roof of the Performance Centre provides the opportunity for water catchment that can be filtered and used for maintaining the landscaping as well as feeding back into the building for the flushing of toilets in the Performance Centre. The water storage is vital to consider as Pretoria has a series of 4-5 months that receive less than adequate to zero rainfall consecutively. The water needed for these dry Winter months can be collected during the Summer months with a large amount of rainfall and thunderstorms (Napier 2000).

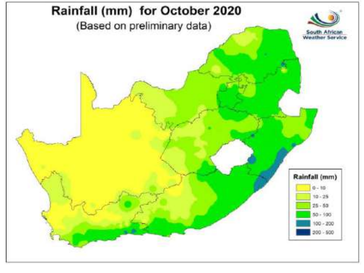
Initially, the calculations determined the water catchment from the Performance Centre roofs only. This proved to be insufficient yield for the total water demand. The existing roofs and courtyard run-offs were added into the system calculations and an excess of water yield was determined. This determined the decision to install a 5 000 litre storage tank that stores the majority of the water. The water fountains implemented throughout the site for acoustic purposes are used as additional water stores to collect any water above and beyond the estimated amount.

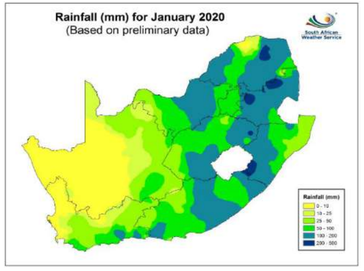


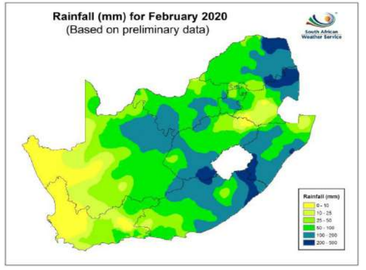


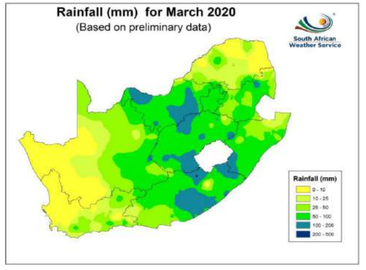


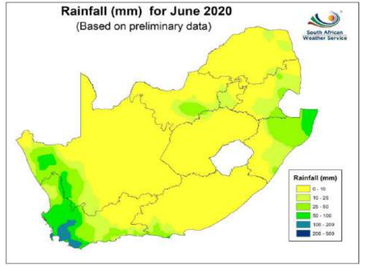


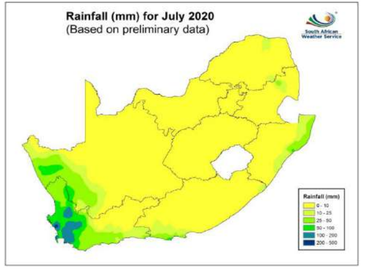












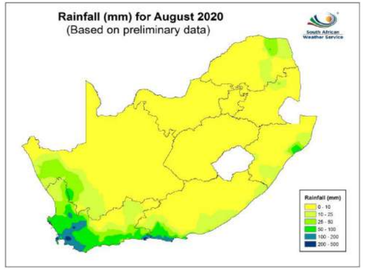


Fig. 160: Rainfall averages for Nov 2019 - Dec 2020 in South Africa (SAWS 2020)

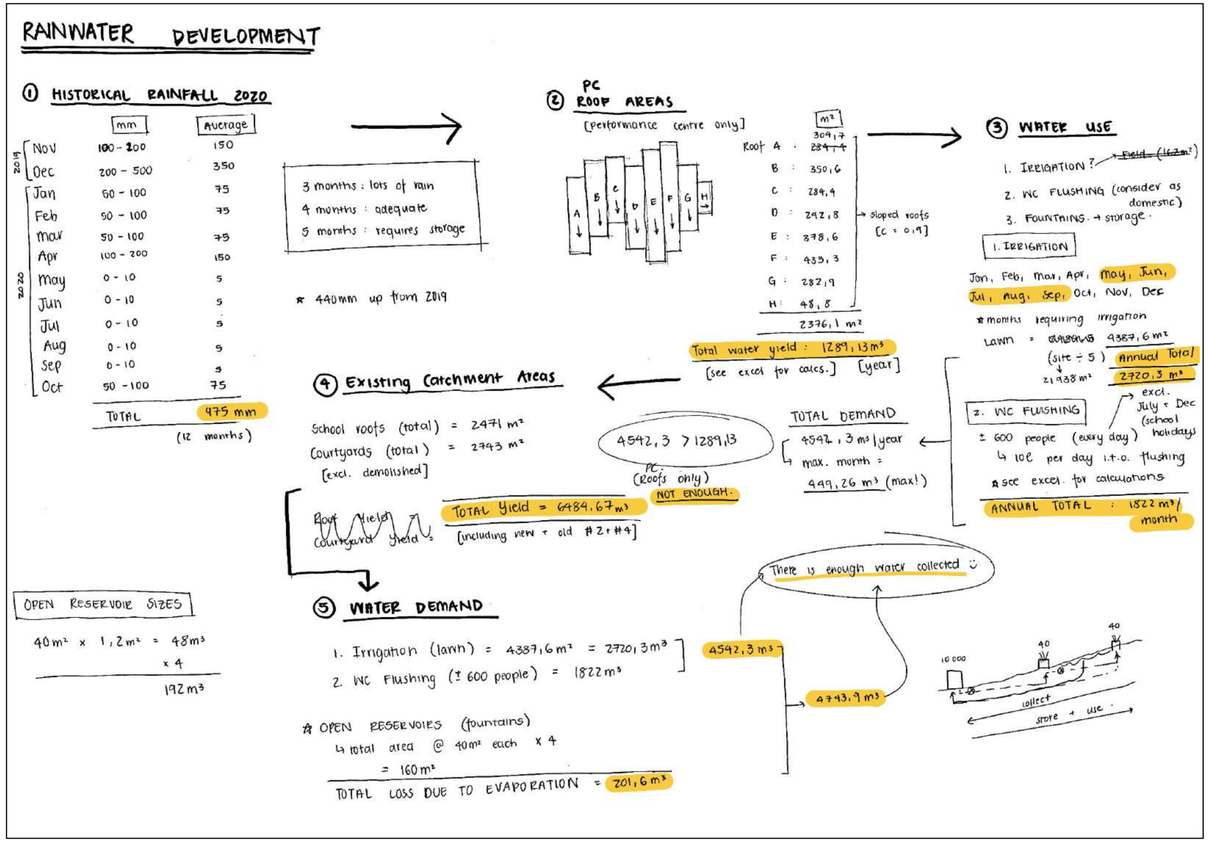


Fig. 161: Rainwater Catchment rough calculations (Author 2020)

1. WATER YIELD

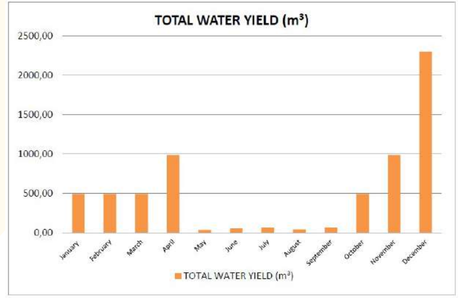
Rainwater Harvesting Data

DESCRIPTION	AREA (m²)	RUNOFF COEFF. (C)
Roof A (solar roof)	304,7	0,9
Roof B (solar roof)	350,6	0,9
Roof C (solar roof)	284,4	0,9
Roof D (solar roof)	292,8	0,9
Roof E (solar roof)	378,6	0,9
Roof F (solar roof)	433,3	0,9
Roof G (solar roof)	282,9	0,9
Roof H (solar roof)	48,8	0,9
School roofs (Solar roof)	2471	0,9
Courtyards (paving)	2743	0,8
TOTAL AREA (A)	7590,10	
WEIGHTED C		0,86

Performance Centre Roof Diagram

Total Water Yield

MONTH	AVE RAINFALL , P (m)	CATCHMENT YIELD (m³) (Yield = PxAxC)	ALTERNATIVE WATER SOURCE (m³)	TOTAL WATER YIELD (m³)
January	0,08	491,76	0,00	491,76
February	0,08	491,76	0,00	491,76
March	0,08	491,76	0,00	491,76
April	0,15	983,52	0,00	983,52
May	0,01	32,78	0,00	32,78
June	0,01	52,45	0,00	52,45
July	0,01	65,57	0,00	65,57
August	0,01	39,34	0,00	39,34
September	0,01	65,57	0,00	65,57
October	0,08	491,76	0,00	491,76
November	0,15	983,52	0,00	983,52
December	0,35	2294,88	0,00	2294,88
ANNUAL AVE.	0,99	6484,67	0,00	6484,67



2. MONTHLY WATER DEMAND

Landscaping & Irrigation Demand

DESCRIPTION:	LAWN (m²):	4387,6	AGRI (m²):	0	PLANTING (m²):	0	
MONTH	WEEKLY IRR. (m)	MONTHLY DEMAND (m³)	WEEKLY IRR. (m)	MONTHLY DEMAND (m³)	WEEKLY IRR. (m)	MONTHLY DEMAND (m³)	TOTAL MONTHLY IRR. DEMAND (m³)
January	0,01	175,504	0,025	0	0	0	175,504
February	0,01	175,504	0,025	0	0	0	175,504
March	0,015	263,256	0,025	0	0,005	0	263,256
April	0,01	175,504	0,025	0	0	0	175,504
May	0,015	263,256	0,025	0	0,005	0	263,256
June	0,015	263,256	0,025	0	0,005	0	263,256
July	0,015	263,256	0,025	0	0,005	0	263,256
August	0,015	263,256	0,025	0	0,005	0	263,256
September	0,015	263,256	0,025	0	0,005	0	263,256
October	0,01	175,504	0,025	0	0	0	175,504
November	0,015	263,256	0,025	0	0,005	0	263,256
December	0,01	175,504	0,025	0	0	0	175,504
ANNUAL TOTAL		2720,312		0		0	2720,312

WC Demand

MONTH	PERSONS/DAY	WATER/ CAPITA/ DAY (l)	DOMESTIC DEMAND (m³/month)
January	600	10	186
February	600	10	168
March	600	10	186
April	600	10	180
May	600	10	186
June	200	10	60
July	200	10	62
August	600	10	186
September	600	10	180
October	600	10	186
November	600	10	180
December	200	10	62
ANNUAL TOTAL			1822

Water loss (Open Reservoirs)

AREA OF RESERVOIR (m²): 160

MONTH	EVAPORATION RATE (m/week)	EVAPORATION RATE (m/month)	TOTAL LOSS (m³/month)
January	0,04	0,16	25,6
February	0,035	0,14	22,4
March	0,025	0,1	16
April	0,02	0,08	12,8
May	0,015	0,06	9,6
June	0,01	0,04	6,4
July	0,01	0,04	6,4
August	0,02	0,08	12,8
September	0,03	0,12	19,2
October	0,035	0,14	22,4
November	0,035	0,14	22,4
December	0,04	0,16	25,6
ANNUAL TOTAL	0,32	1,26	201,60

Total Loss & Demand

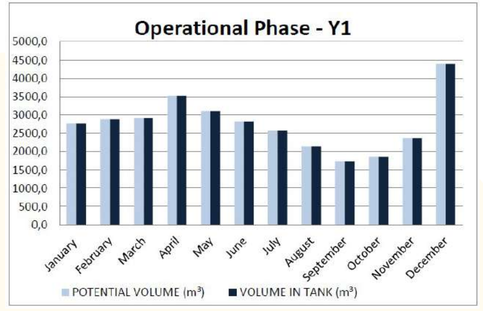
MONTH	TOTAL DEMAND (m³/month)
January	387,10
February	365,90
March	465,26
April	368,30
May	458,86
June	329,66
July	331,66
August	462,06
September	462,46
October	383,90
November	465,66
December	263,10
ANNUAL TOTAL	4743,912

3. WATER BUDGET

TANK CAPACITY (m³): 5000
MIN VOLUME (m³): 0

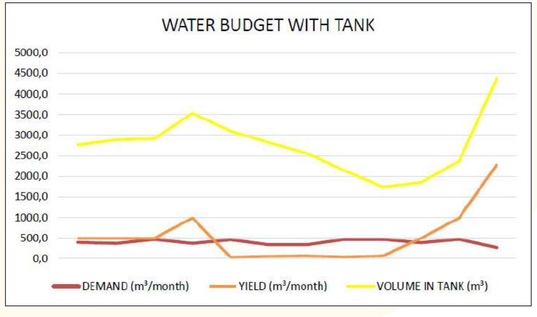
Initiation Phase

MONTH	YIELD (m³/month)	DEMAND (m³/month)	MONTHLY BALANCE	POTENTIAL VOLUME (m³)	VOLUME IN TANK (m³)
Sept	65,6	462,5	-396,9	0,0	0,0
Oct	491,8	383,9	107,9	107,9	107,9
Nov	983,5	465,7	517,9	625,7	625,7
Dec	2294,9	263,1	2031,8	2657,5	2657,5
	3835,7	1575,1	2260,6		



First Operational Year

MONTH	YIELD (m³/month)	DEMAND (m³/month)	MONTHLY BALANCE	POTENTIAL VOLUME (m³)	VOLUME IN TANK (m³)
January	491,8	387,1	104,7	2762,1	2762,1
February	491,8	365,9	125,9	2888,0	2888,0
March	491,8	465,3	26,5	2914,5	2914,5
April	983,5	368,3	615,2	3529,7	3529,7
May	32,8	458,9	-426,1	3103,6	3103,6
June	52,5	329,7	-277,2	2826,4	2826,4
July	65,6	331,7	-266,1	2560,4	2560,4
August	39,3	462,1	-422,7	2137,6	2137,6
September	65,6	462,5	-396,9	1740,8	1740,8
October	491,8	383,9	107,9	1848,6	1848,6
November	983,5	465,7	517,9	2366,5	2366,5
December	2294,9	263,1	2031,8	4398,2	4398,2
ANNUAL AVE.	6484,7	4743,9	1740,8		



Ventilation

In order to ensure a comfortable yet sustainable interior environment within the school hall, natural ventilation is required. Due to the intervention sitting within the temperate climate of Pretoria, overheating due to the outside air temperature is quite likely. Therefore, cooling of the outside air before releasing it into the interior of the building is necessary. This is achieved through the implementation of a ground cooling/earth tubes system.

The air is brought in from the outside through vents in the ground beyond the building. These vents are situated lower than the building in order to allow the pipes to slope up towards the building. This ensures no water leakage into the building due to the condensation build up inside the pipes (Milligan 2013). The excess water built up in the pipes flow down to a catchment sump and is released back into the ground through an agricultural drain. The hot air (Summer) flows through these pipes under the ground. The cool earth, with a temperature of 16.5 - 21°C (Zaki & Almssad 2007) in Summer then cools the hot air in the tubes and causes condensation to build up. This condensation further assists with cooling the air as well as dehumidifying it before it enters the building (Milligan 2013). In winter, the warm earth surrounding the tube heats up the cold air. The adjusted air is then sucked into the building through a fan and floor vents. The cool air flows through the building, warming up and eventually rising to the ceiling. This hot air is then released outside through vents situated in the stepped roofs. In winter, these roof vents are closed while vents in the wall close to the floor are opened, allowing the sinking cold air to escape to the outside. Situating the fan in the floor allows for a constant flow of air into the building from the earth tubes, pressurizing the interior even when doors and windows are open.

Photovoltaic Energy

The new roof also provides the opportunity for solar energy to be collected on the most Northern facing slopes. This solar energy is used to power the Performance Centre at night, the ventilation fans in the floor and to provide electricity for the water pumps to operate between the storage tanks, open reservoirs/fountains and through the building to the bathrooms.

Daylighting

The roofs of the Performance Centre are sloped to open up towards the South in order to allow for natural daylighting to enter the hall. This has been assessed using Sefaira (Fig. 164).

Landscape Reuse

The design intent considered the slope of the land, allowing an opportunity for the landscape material to be reused for the cut and fill of the site beneath the Performance Centre.

Additional Considerations

The above-mentioned sustainable aspects are also proposed to be achieved with the renovation and upgrading of the rest of the existing school buildings.

Within the proposed Hall, there are large stereotomic elements constructed of rammed earth. Using this technology, above and beyond the beautiful aesthetics, the sustainability of the building is increased. Rammed earth walls have a very low environmental impact in terms of materiality as only the subsoil is used (FIA 2018)., leaving the top soil for agricultural purposes. This soil, however, needs to be low in clay. Due to Mamelodi having a high content of clay in the soil, it will mean the soil needs to be sourced elsewhere. This increases the carbon footprint due to transportation. Rammed earth construction doesn't require highly skilled labourers and the formwork can be reused multiple times, all saving on costs and energy.

The rammed earth walls on the West and East of the hall provide excellent thermal mass from these harsh directions, adding to the creation of a comfortable interior environment. In order to celebrate these elements, the other components (walls, ceilings etc.) are kept 'separate' through visual and physical gaps between technologies. This can be clearly seen in the plans and sections.

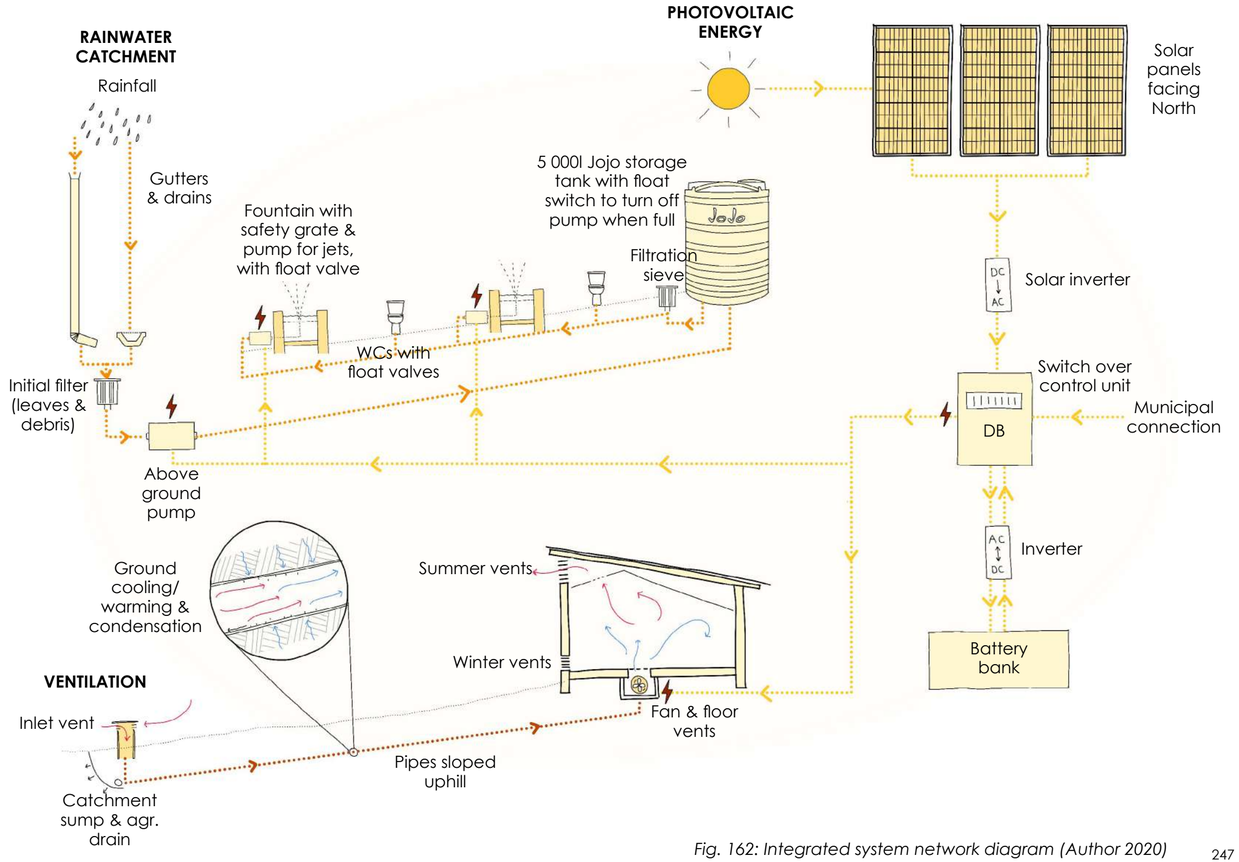


Fig. 162: Integrated system network diagram (Author 2020)

DAYLIGHTING DEVELOPMENT

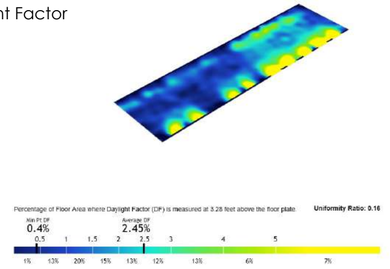
The following analyses were run using Sefaira.

1. EXISTING SCHOOL HALL

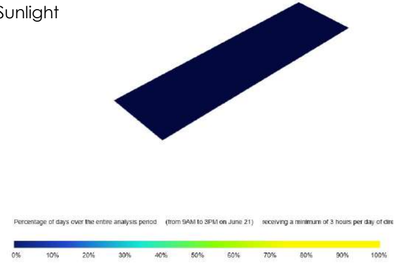
The existing school hall as a daylight factor of 2.45%. This is an adequate amount of daylighting, falling within the recommended scope of 2-5%. However, the space receives zero direct sunlight and therefore relies on reflective surfaces and large openings to allow indirect light in. The materiality of the current hall, is reflective, but as 97% of the space receives daylight according to the Spatial Daylight Autonomy (sDA), this results in 35% Annual Sun Exposure (ASE). This suggests that there may be glare and unwanted solar heat gain within the classroom. This results in an uncomfortable interior for activities that include more than 400 people within the small space.

Fig. 163: Existing school hall from the outside courtyards (Greyling 2019)

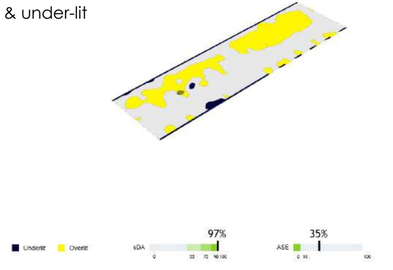
Daylight Factor



Direct Sunlight



Over-lit & under-lit

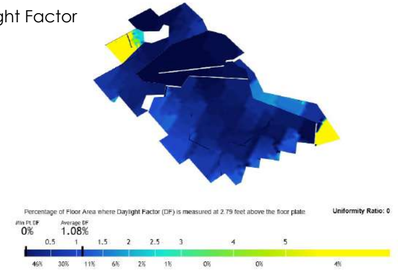


2. ITERATION 8 ANALYSIS

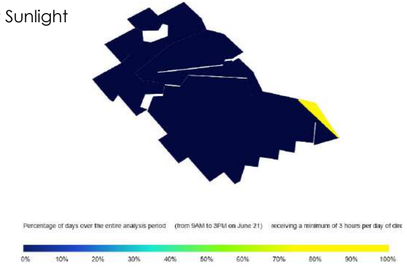
This iteration of the proposed Performance Centre has a daylight factor value of 1.08% which is inadequate and therefore has a dark interior space. Similarly, there is no direct sunlight except for the outside seating area which is not covered from the sun. The SDA of 46% is also not within an acceptable zone for a comfortable area, resulting in the majority of the space is underlit. As a result, the ASE value is extremely low (2%), which would usually be considered good as there would be no glare nor unwanted solar heat gain. However, due to the darkness of the interior space, mechanical lighting will be required daily throughout the year for the space to be operational. This, however, will decrease the sustainability of the overall building significantly and will not be acceptable.

Fig. 164: Process model of Iteration 8 (Author 2020)

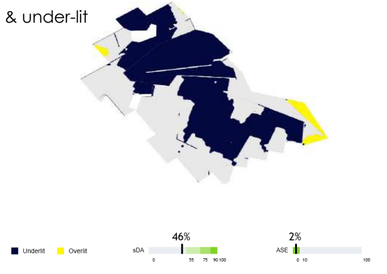
Daylight Factor



Direct Sunlight



Over-lit & under-lit



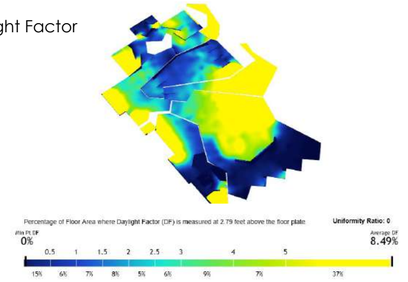
3. FINAL DESIGN ANALYSIS

This iteration takes into consideration the opening and closing of the bifold doors on the Northern facade. The images shown are of the bifold doors all completely open.

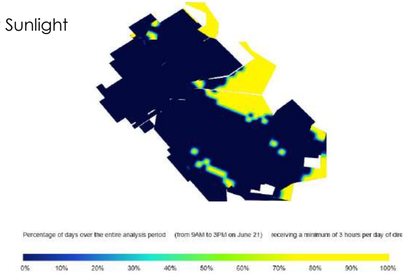
When the bifold doors are fully open, the space has a daylight factor of 8.49%. This is above the recommended amount and may result in the adjustment between exterior and interior light to be uncomfortable for users. This number decreases to 3.1% when the bifold doors are closed, therefore resulting in a well daylit interior due to the South-facing openings in the roofs. Most of the exterior seating and balconies on the Northern facade receive direct sunlight. This slightly enters the main hall when the doors are fully open. This results in most of the hall being overlit with a slightly high ASE value of 45% which may result in glare. When the doors are fully closed, this value drops to 5% which is acceptable for the interior space. It is recommended then for a simultaneous interior and exterior event for the bifold doors to only be half open, which should decrease the SDA value of 82% slightly, still resulting in a well day-lit interior with little glare.

The hall foyer is underlit due to little openings. This is acceptable as a part of the threshold between the school and the performance space, providing an exciting experience for users when entering into the large open hall - the calm before the storm.

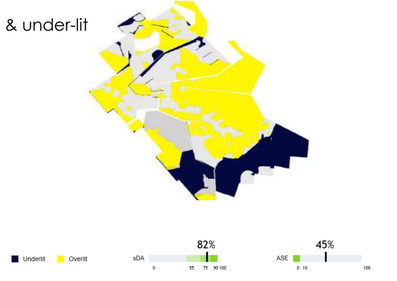
Daylight Factor



Direct Sunlight



Over-lit & under-lit



SUSTAINABLE BUILDING ASSESSMENT TOOL

	Achieved
SB SBAT REPORT	**4,0**

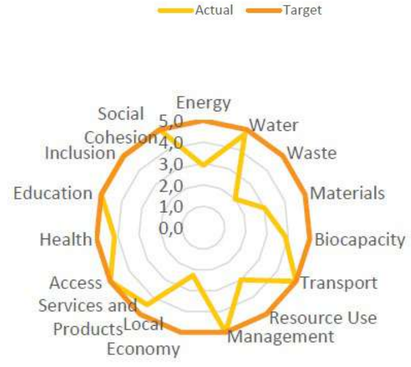
SB1 Project

Mamelodi Performance Centre

SB2 Address

Tsamaya Avenue, Mamelodi

SB3 SBAT Graph



SB4 Environmental, Social and Economic Performance	Score
Environmental	3,3
Economic	4,9
Social	3,8
SBAT Rating	4,0

08_CONCLUSION

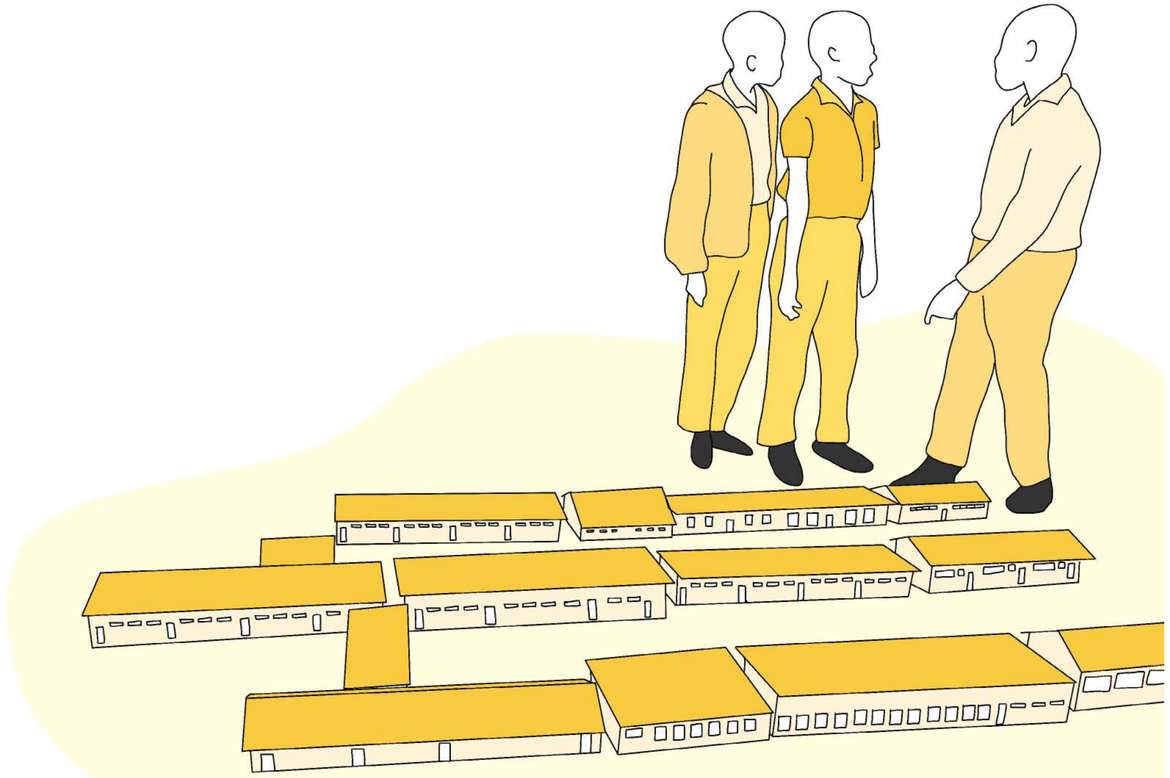


Fig. 165: Learners investigating a scale model of the school (Author 2020)

Fig. 166: Photograph of 1:500 site model (Author 2020)

08_CONCLUSION

The proposed Performance Centre is an inclusive and interactive celebration of life. It inspires school learners, teachers, aspiring musicians, community members and the like. Music was used as the "leap vehicle" (Young *et. al* 1993:39) for the initial urban design concept, while developing into an inclusive form of performance and expression. By opening up the school and redesigning the classrooms, alternative and STEAM education can be fully implemented, providing every learner with a chance for success. Acting as the flagship for the Music Network, the Performance Centre connects with other schools in the surrounding community, sharing their facilities of learning and in turn providing a place for celebration and performance. Additionally, it provides an opportunity for international collaboration and support with UNESCO's Creative Cities of Music, uplifting the community through ownership, pride and support. Both the school of Tsako Thabo and Mamelodi East have new identities, founded in the heritage of the Mother of Melodies (van der Wall 2000).

As an answer to the research question of the decentralization of music-making providing a platform for positive self-expression for school learners and enhancing the collective community identity of Mamelodi East, the Performance Centre enables the community and Tsako Thabo school with an exciting and positive communal experience for music and performance, the reliance on a centralized institution and authority is relaxed. Providing this platform for positive self-expression empowers the people to make a direct and immediate change in their individual lives and the collective community (Ndeneche 2011). The proposed Performance Centre and research successfully answers the research question.

This dissertation focused on one node of the proposed Music Network. A future investigation could explore the possibilities of expanding the network through different programmes and functions, beyond Mamelodi East. As a whole, music was only one opportunity for change uncovered in Tsako Thabo Secondary School. Recreational activities, routes, school typologies and other aspects mentioned in Volume One (Konstantinou, Naidoo & Smith 2020) of this dissertation would all provide a researcher with immense depths to unpack.

This dissertation went through many trials and errors, specifically with the methodology application. Due to the COVID-19 nationwide lock-down, the participatory research and co-design needed to be adapted and modified to work within the restrictions of the lock-down circumstances. Not only did this provide alternative ways to the participatory methodology, but it also brought to light severe issues that need to be addressed regarding the educational ecosystem of South Africa in general and the research intentions. This research reaches far beyond the proposed Performance Centre by challenging the way people address issues and find solutions. The dissertation itself is a prime example of finding opportunities amongst difficulties, turning obstacles into ideas and focusing on the fundamentals of community architecture – the relationships between people and productive, energising spaces.

09_FINAL DRAWINGS

Plans

Elevations

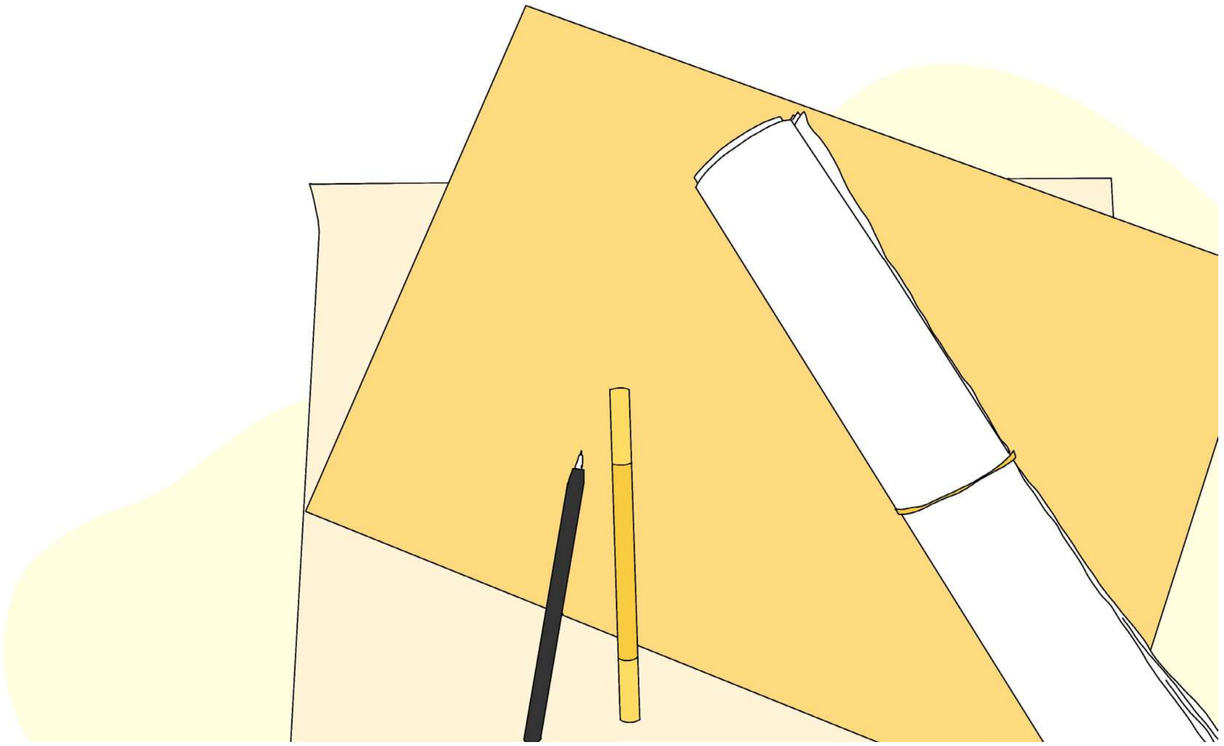
1:20 Tech Section

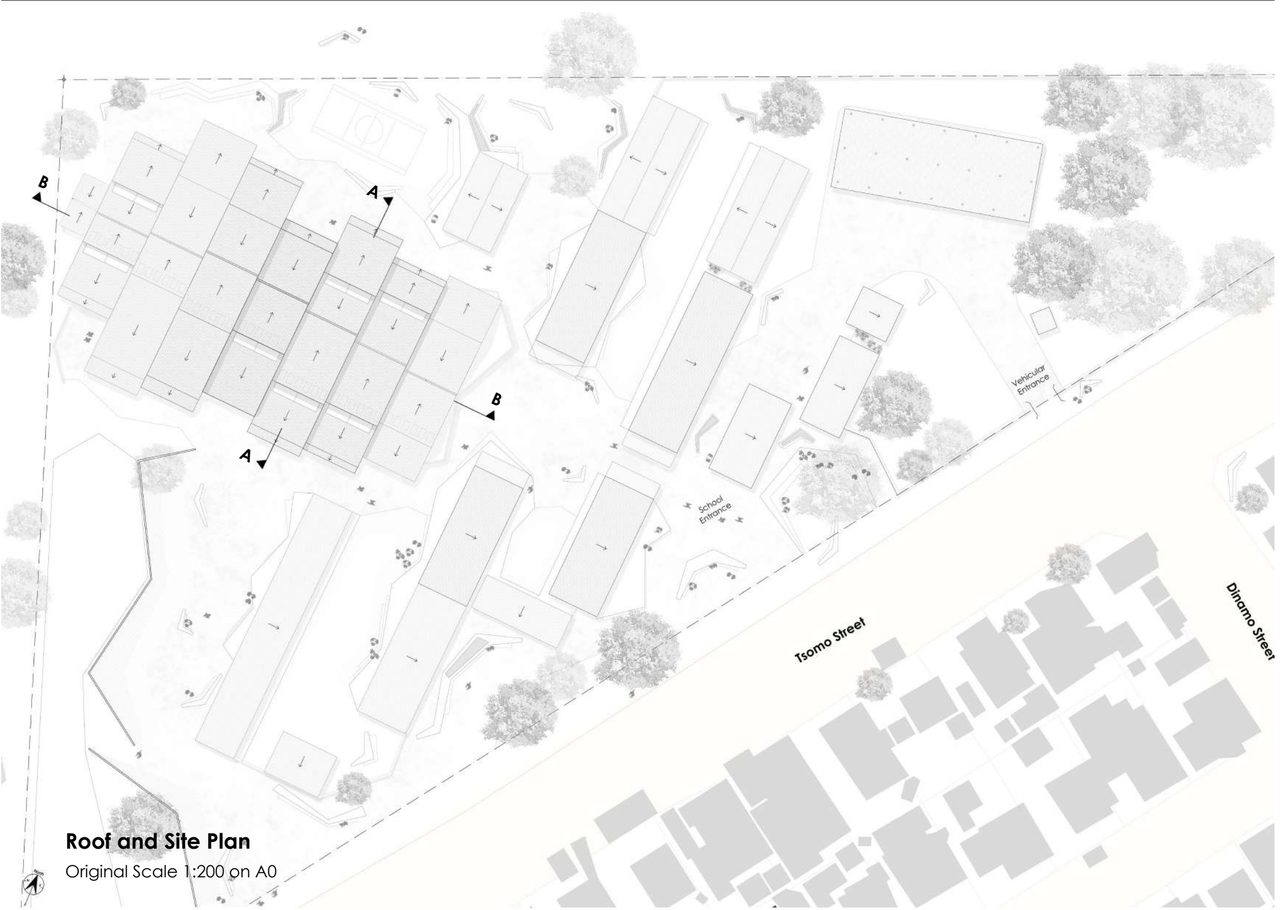
Section

Details

Graphic Visualizations

Model Photographs



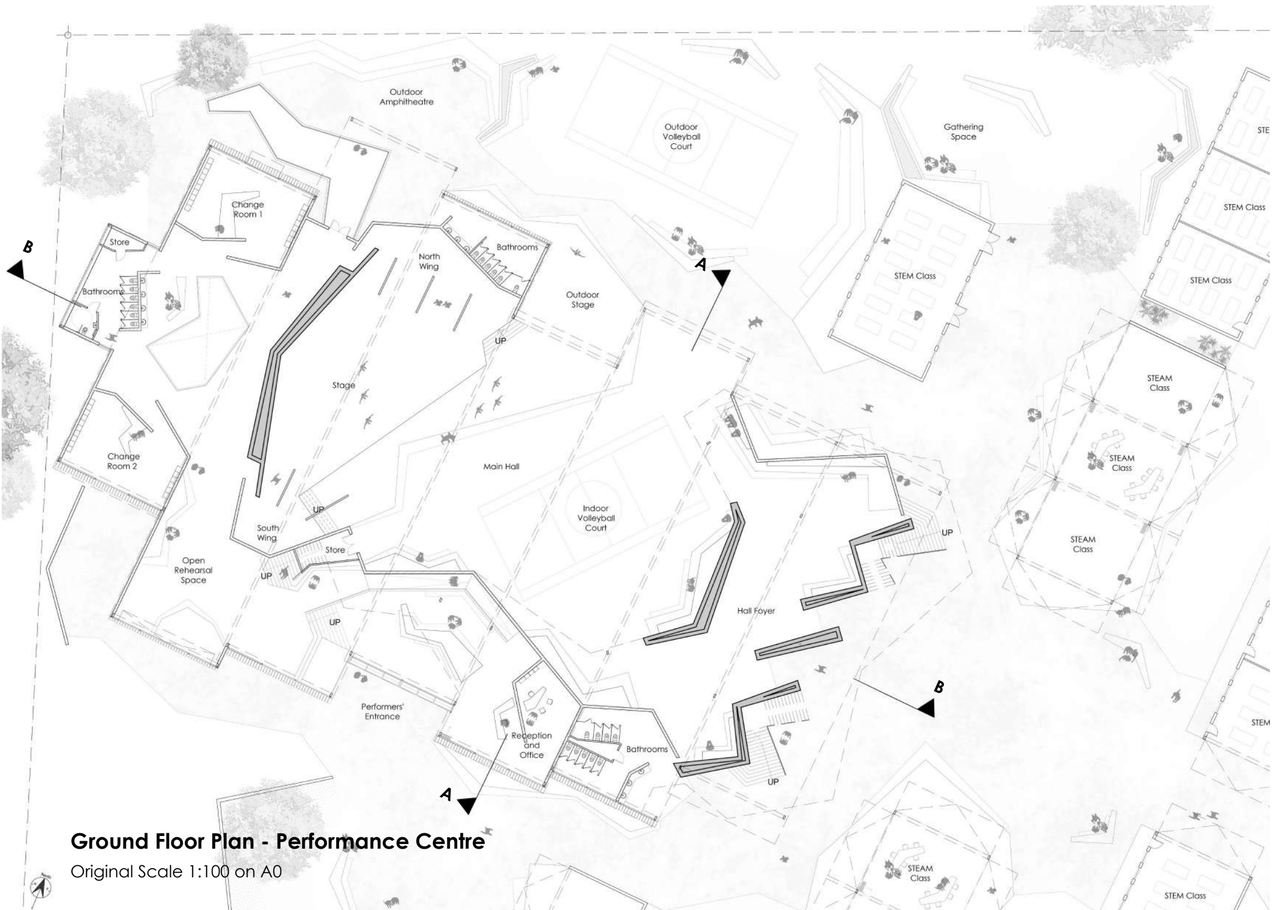


Roof and Site Plan

Original Scale 1:200 on A0

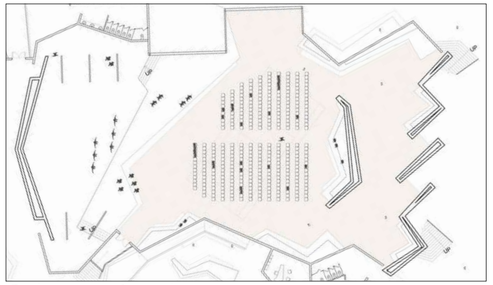
Ground Floor Plan - School Entrance

Original Scale 1:100 on A0



Ground Floor Plan - Performance Centre

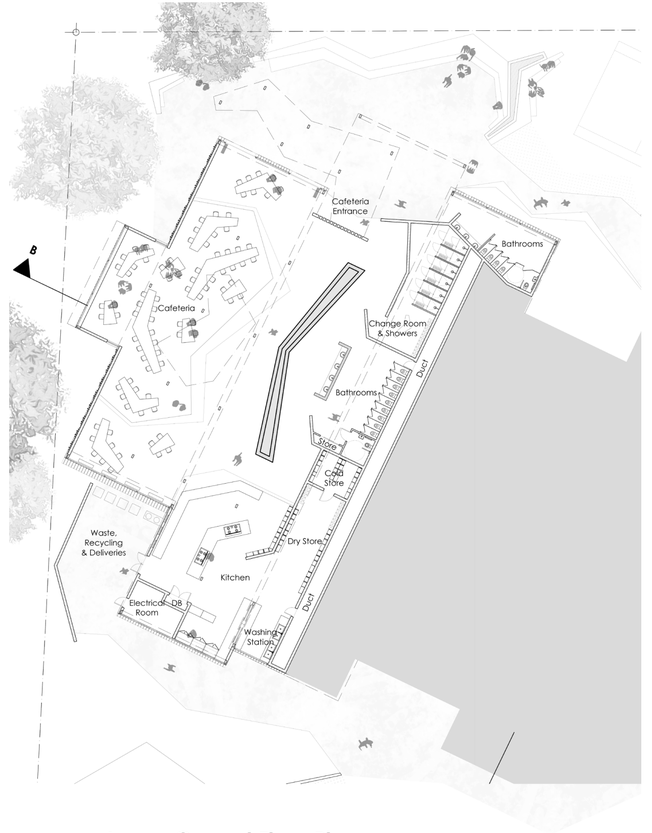
Original Scale 1:100 on A0



Performance Layout

Assembly Layout

Volleyball Match Layout

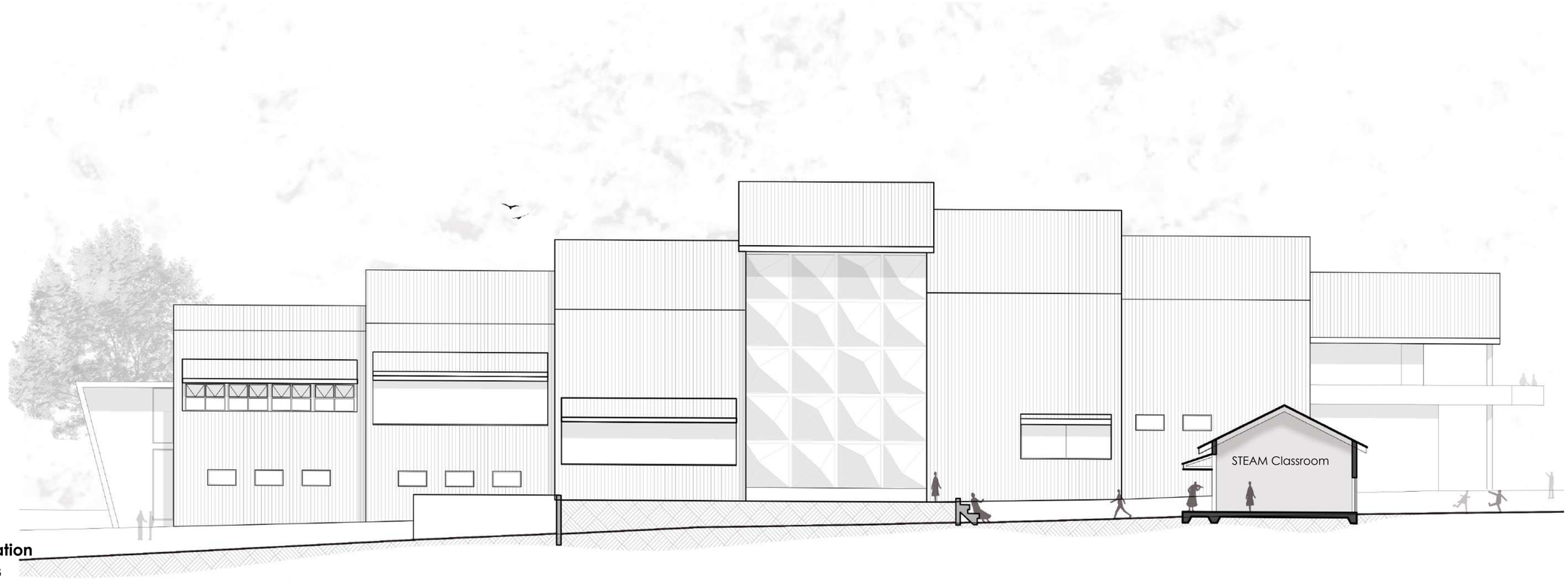


Lower Ground Floor Plan

Original Scale 1:100 on A0

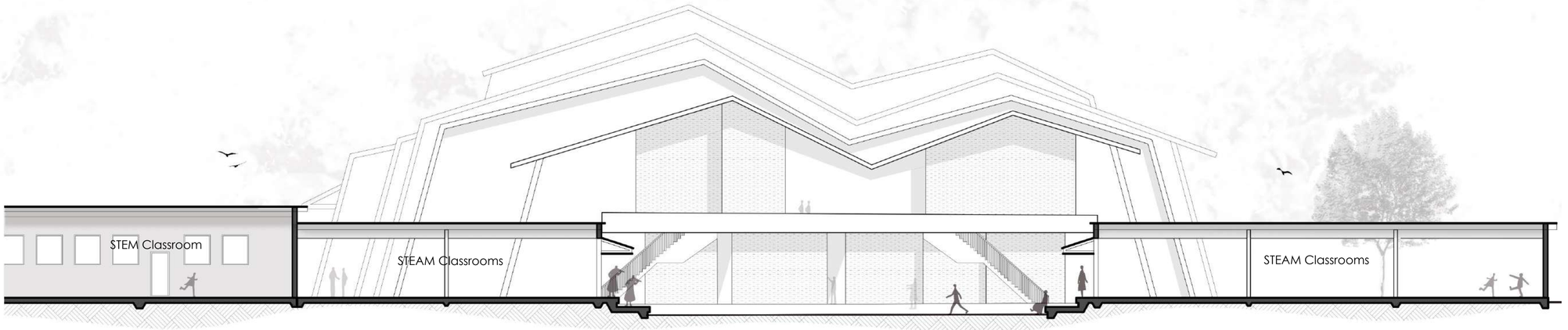
First Floor Plan

Original Scale 1:100 on A0



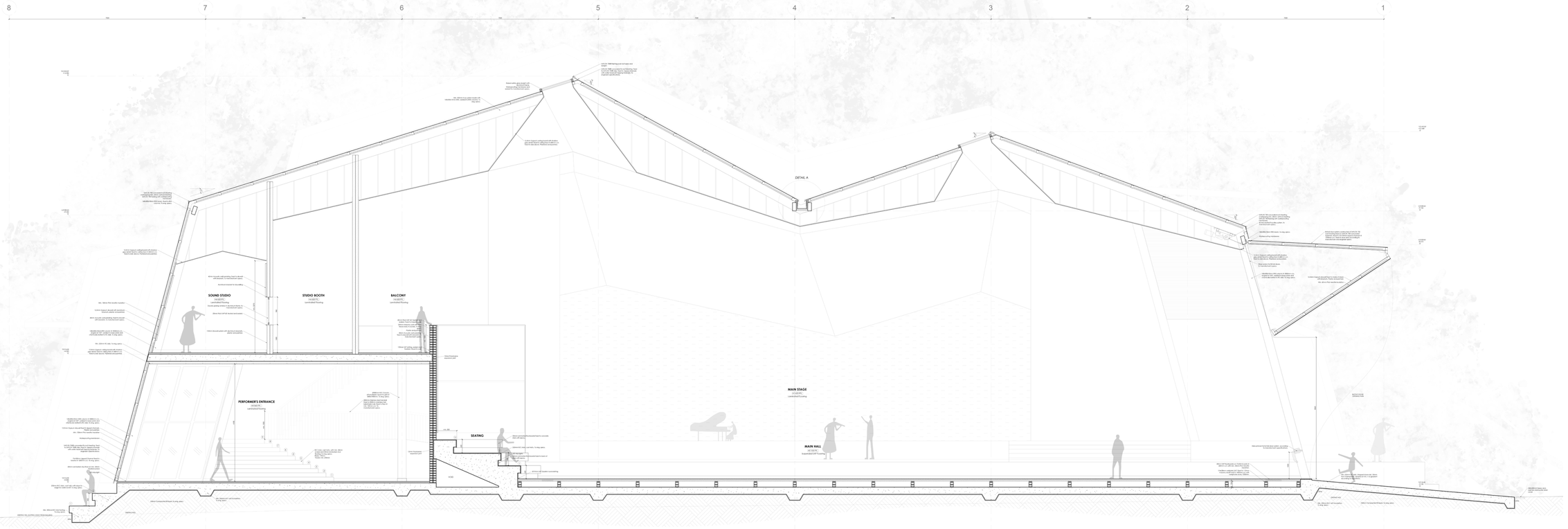
South Sectional Elevation

Original Scale 1:200 on A3



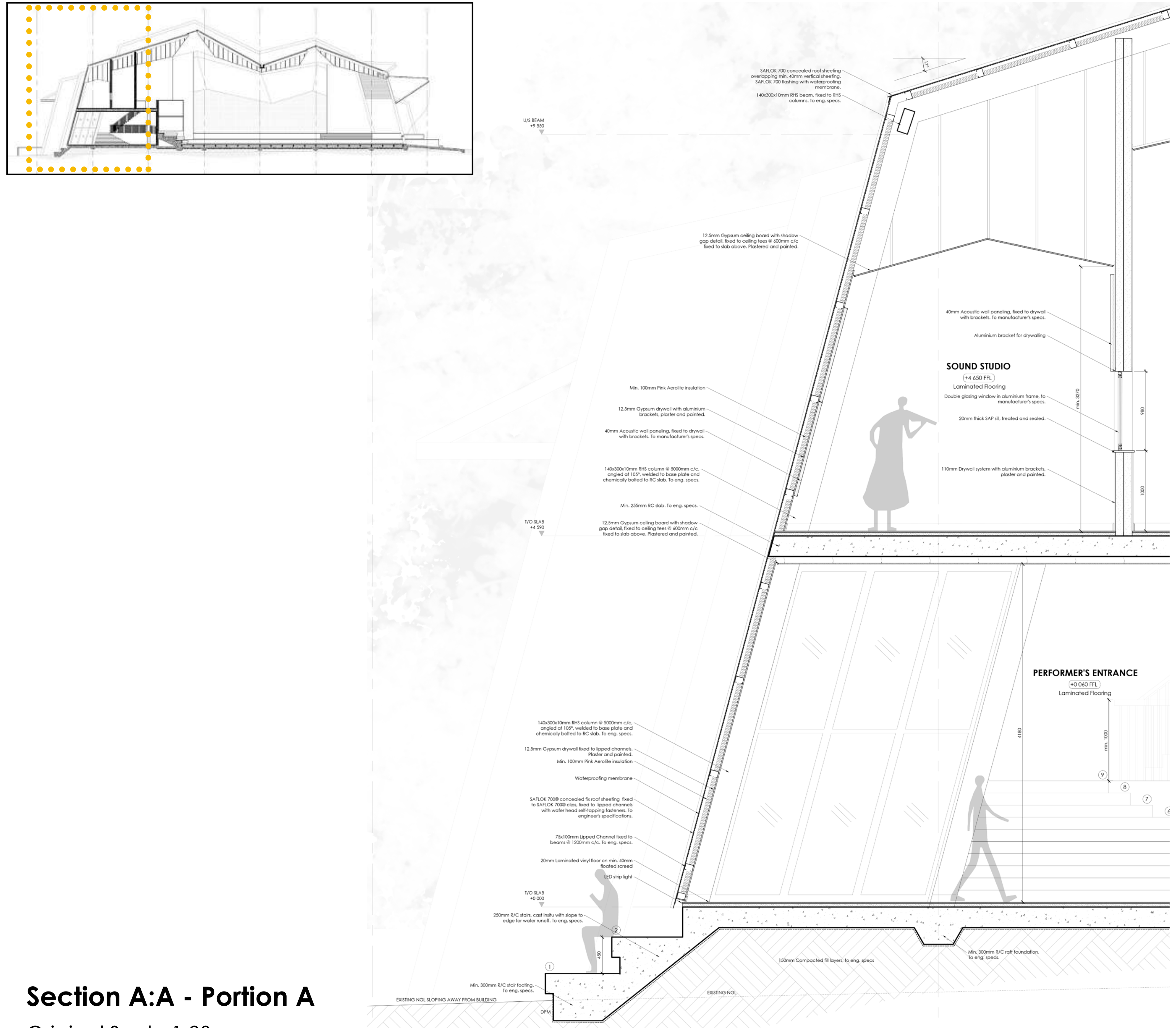
East Sectional Elevation

Original Scale 1:200 on A3



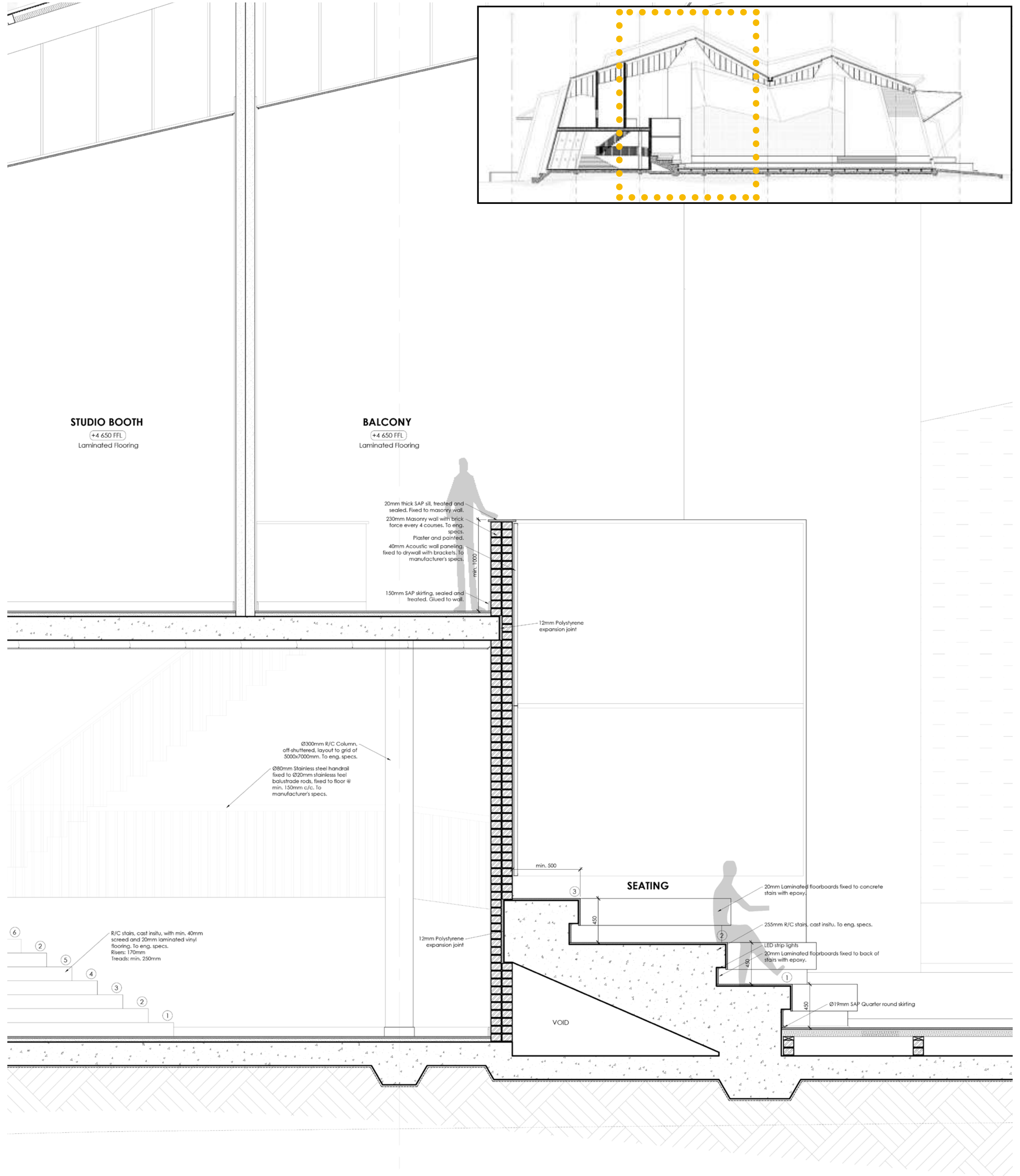
Section A:A

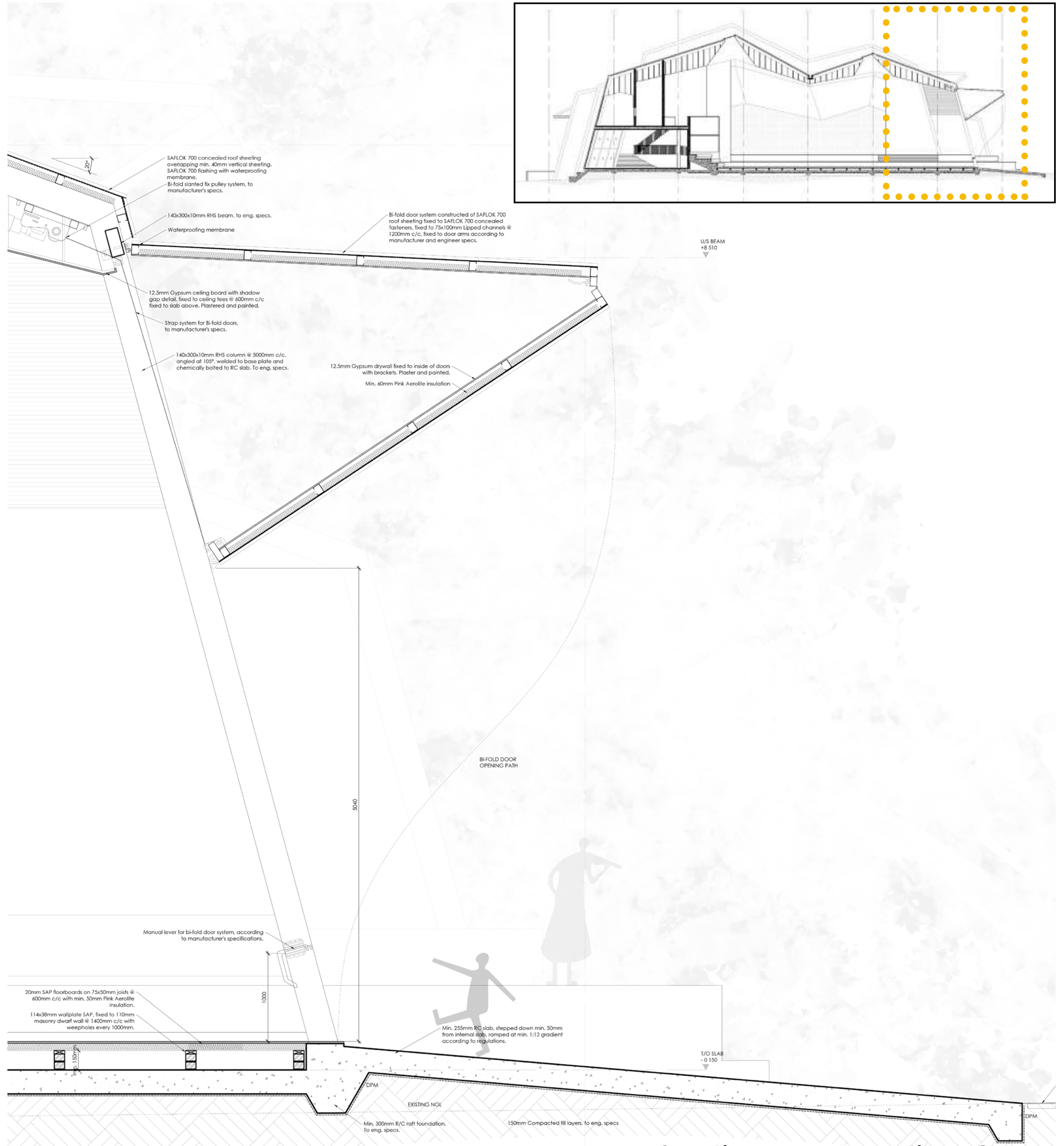
Original Scale 1:20



Section A:A - Portion A

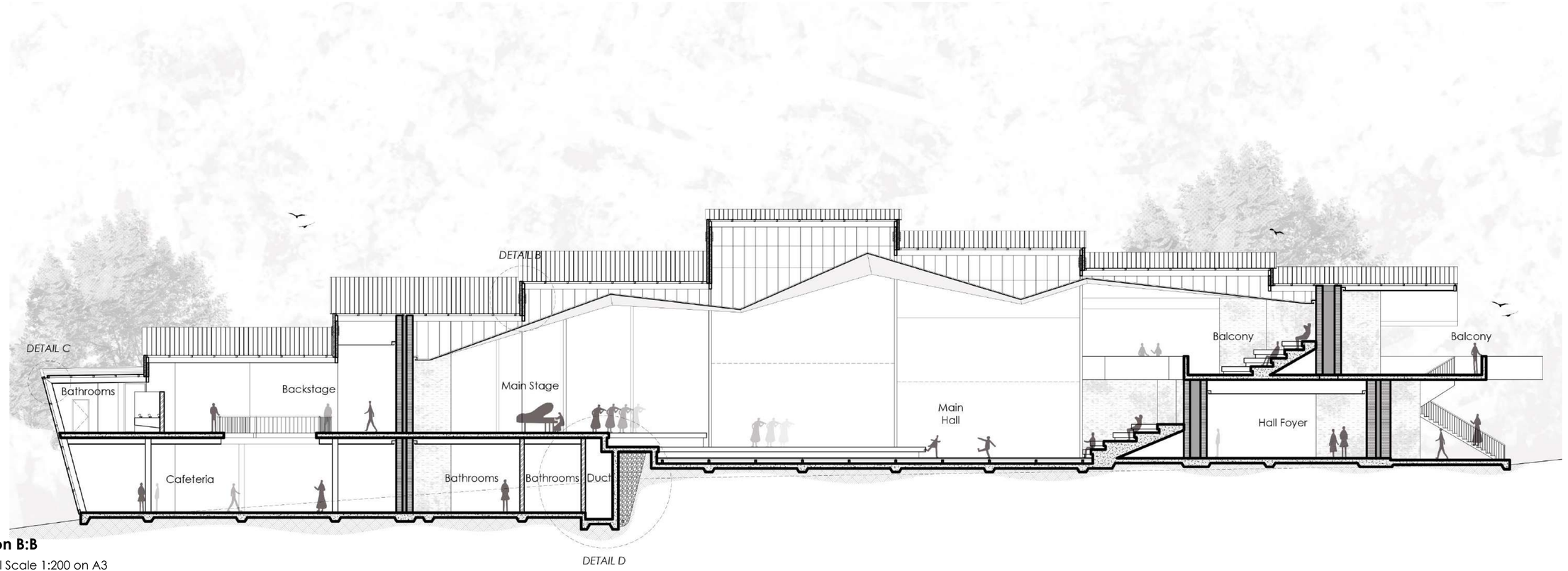
Original Scale 1:20





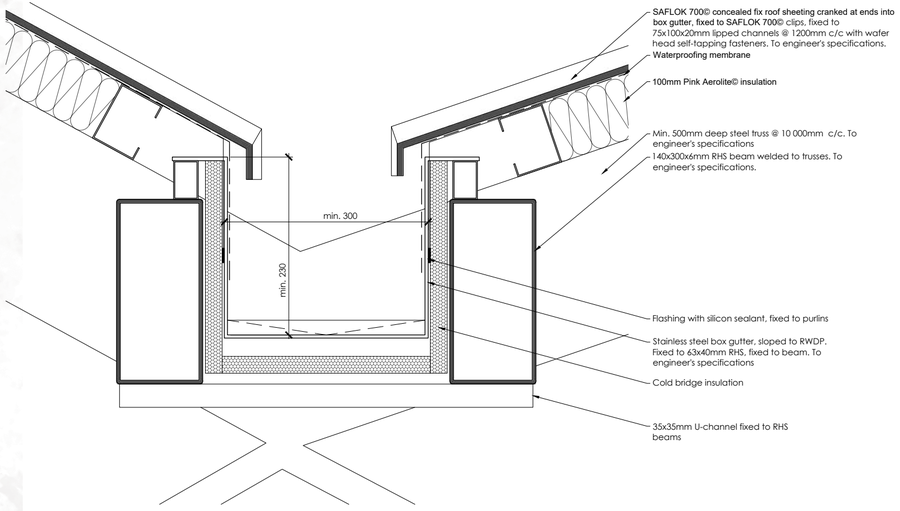
Section A:A - Portion C

Original Scale 1:20



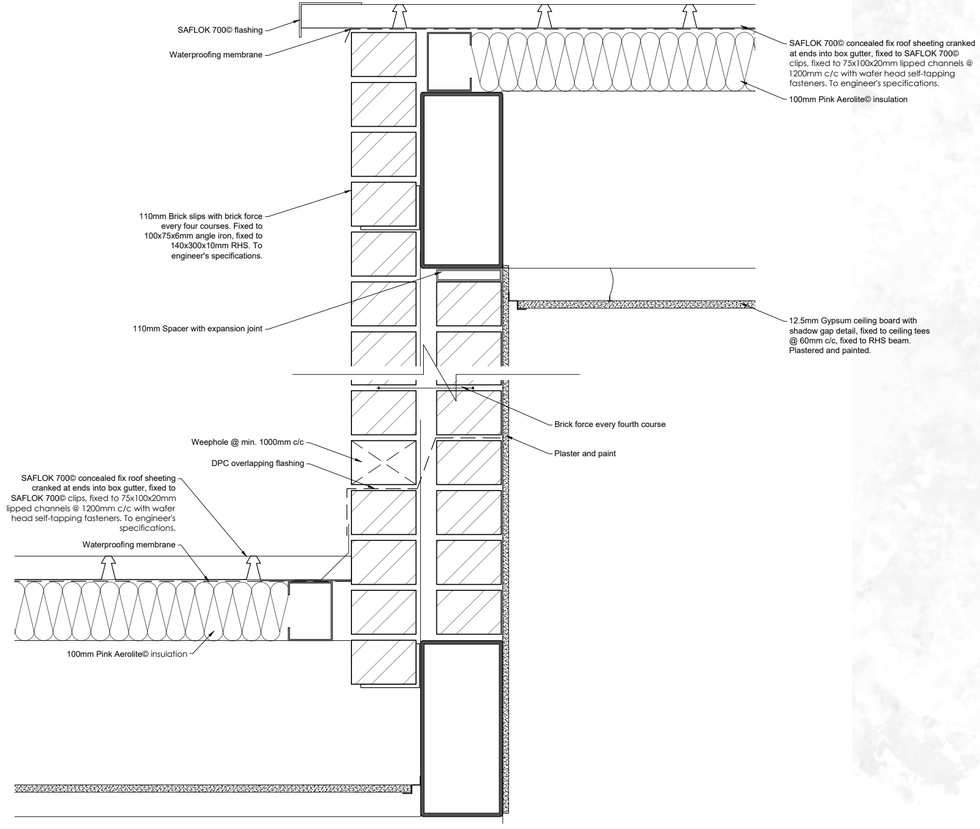
Section B:B

Original Scale 1:200 on A3



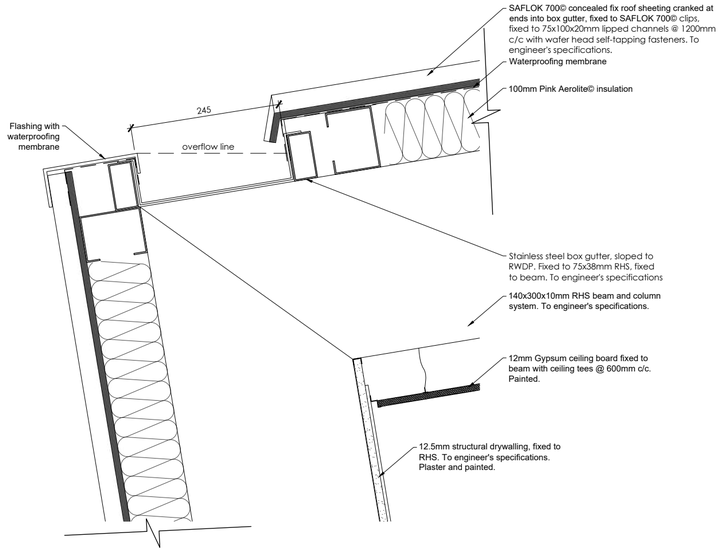
Detail A

(Original Scale 1:5)



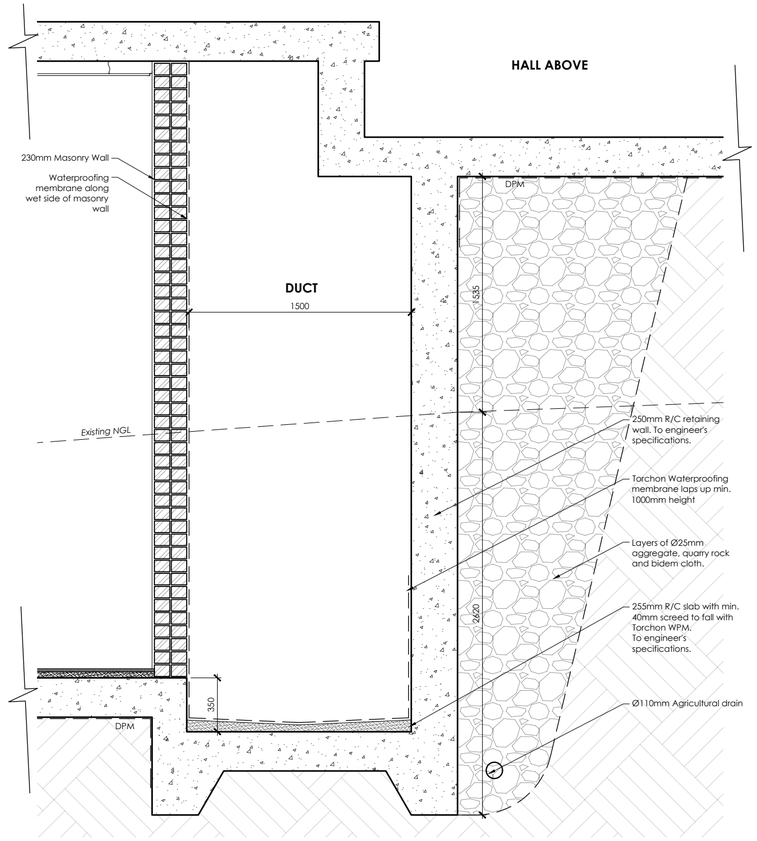
Detail B

(Original Scale 1:5)



Detail C

(Original Scale 1:5)



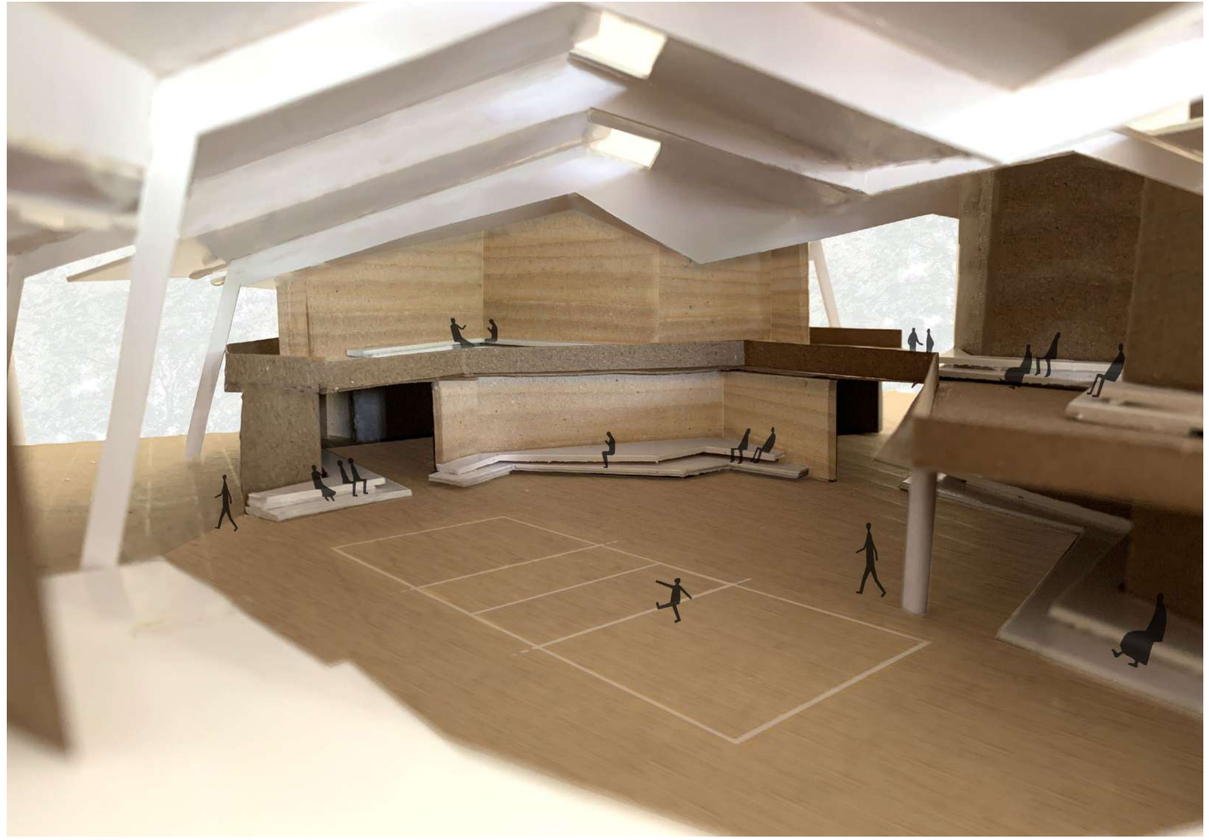
Detail D

(Original Scale 1:20)

Northern Visualization

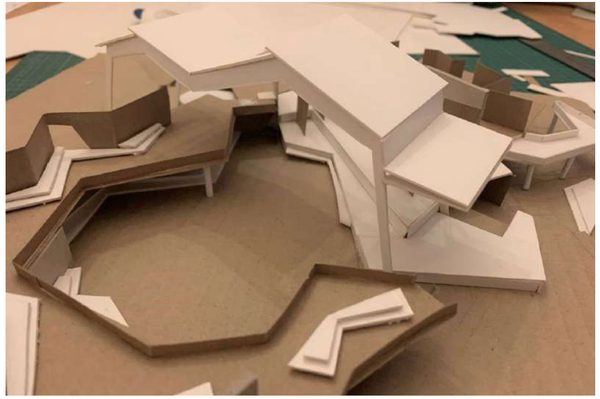
Southern Visualization

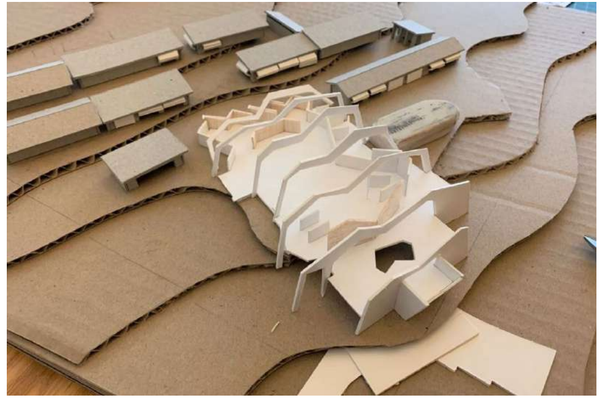
Eastern Visualization

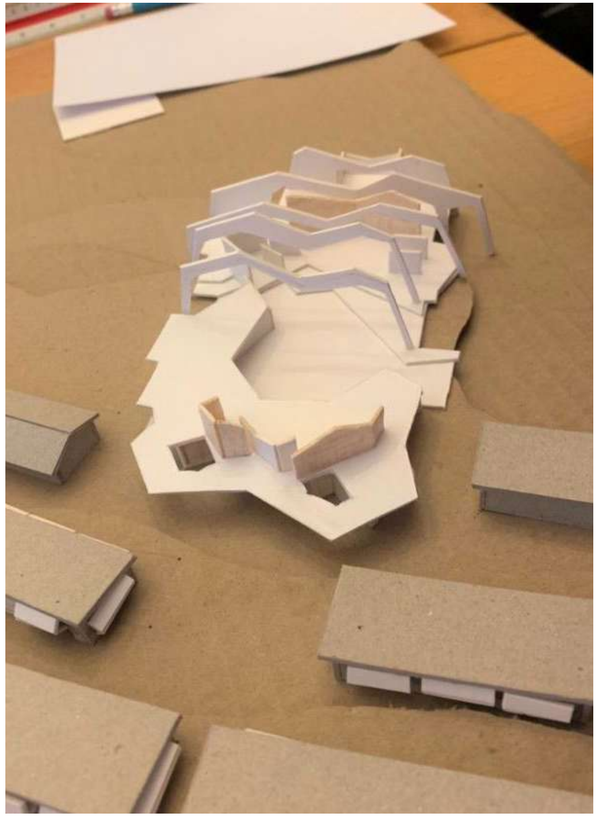


Main Hall Interior Visualization

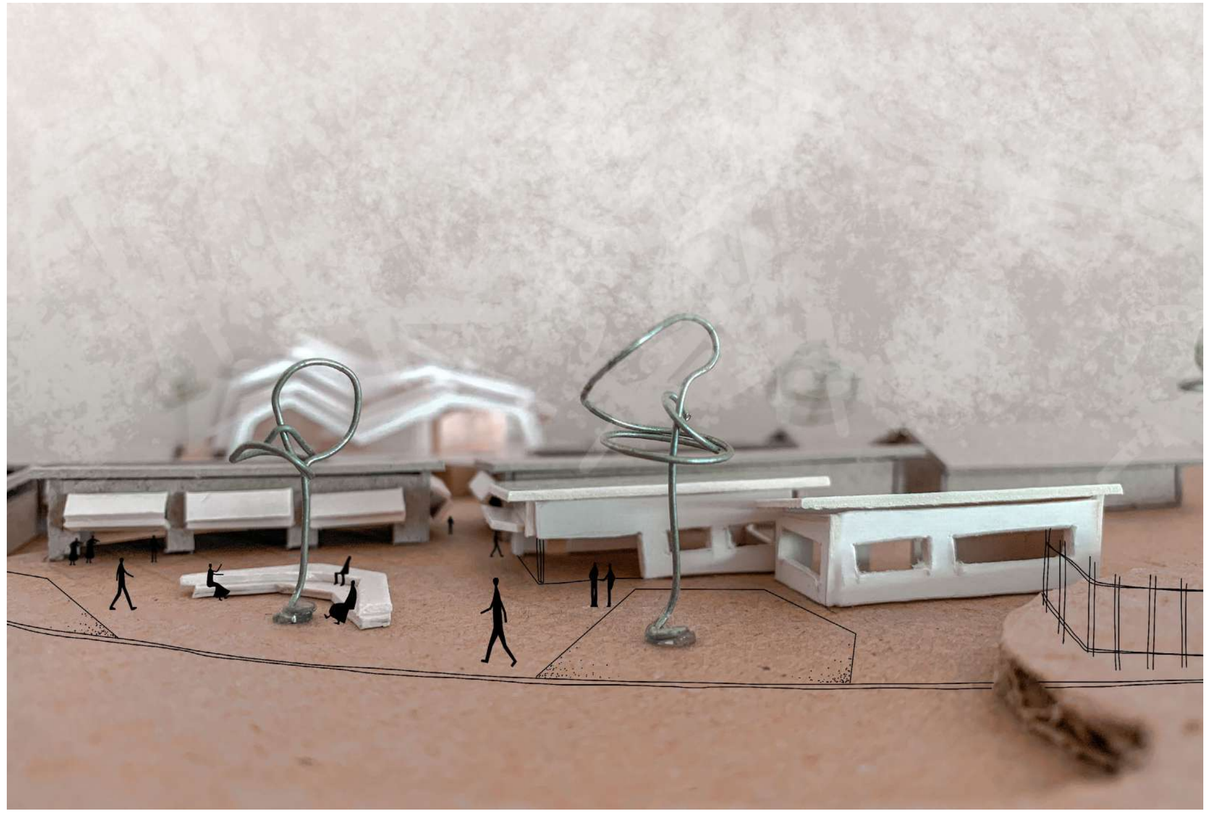
MODEL BUILDING







FINAL 1:500 MODEL



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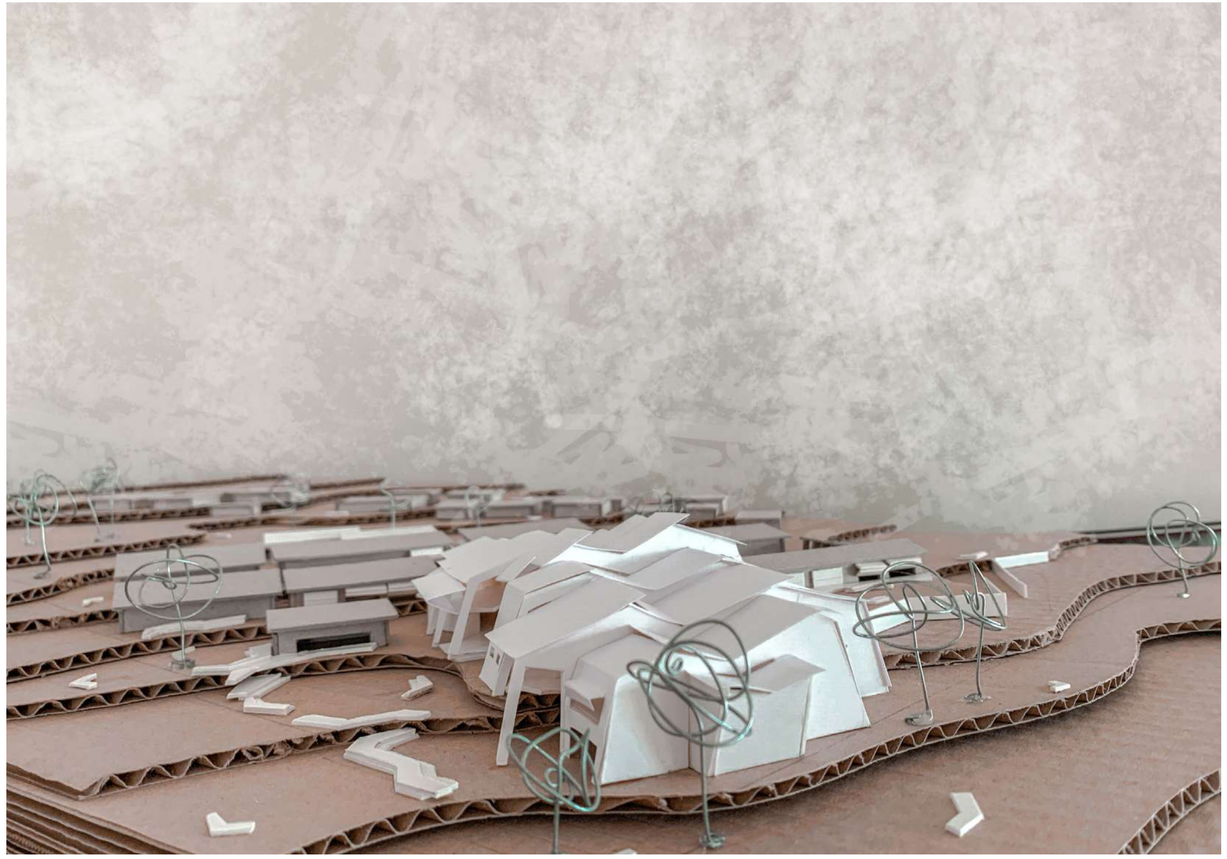


VOLUME ONE: APPENDICES

Lauren Konstantinou

Purll Naidoo

Kelsey Smith

THE UNIT FOR URBAN CITIZENSHIP STUDIO: MAMELODI GROUP INTRODUCTION

Involvement in NRF Research Project “Stitching the City”

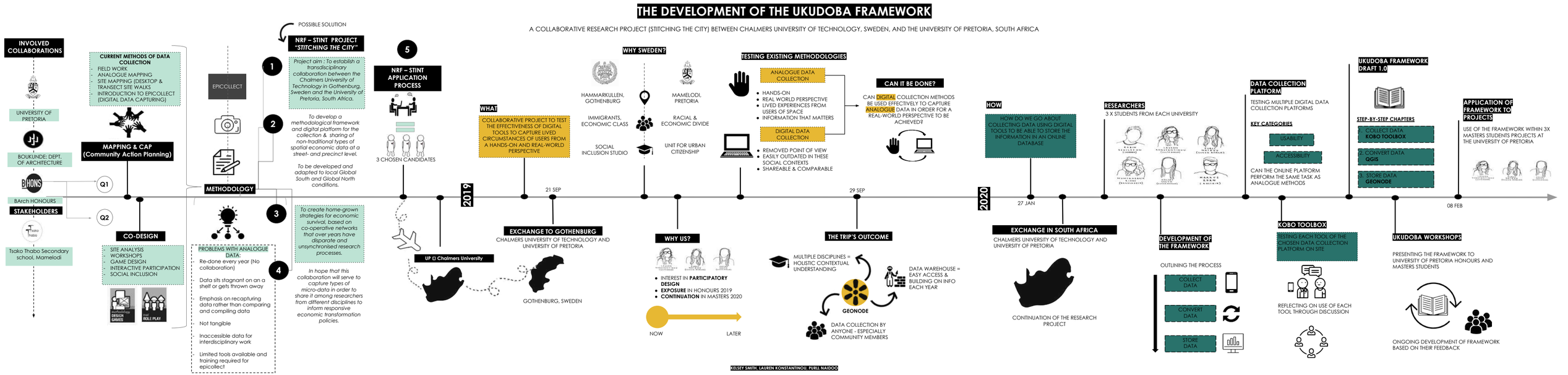
Lauren Konstantinou, Purll Naidoo and Kelsey Smith are personally involved in an ongoing NRF Research Project, titled ‘Stitching the City”.

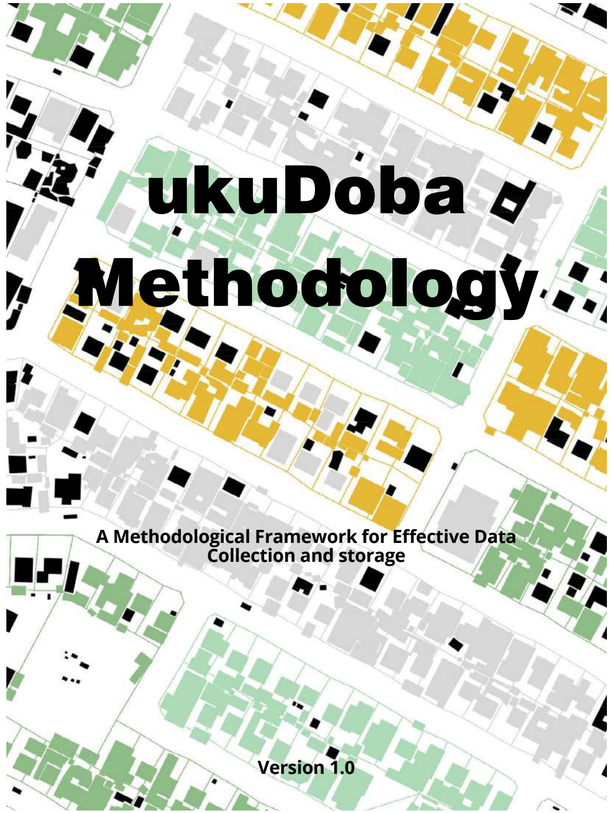
The research project involves a collaboration between the architecture departments of Chalmers University of Technology, in Sweden, and University of Pretoria, in South Africa.

The intention of the project is to develop a data collection methodology that results in efficient storage of collected information in an online data warehouse. This data warehouse allows for layers of information to be accumulated each year and easily accessed.

As part of our dissertation outcome, we have contributed to the creation of the ukuDoba Method, which we have applied to our individual dissertations as a research methodology.

APPENDIX A: TIMELINE





Preface

The ukuDoba handbook is the outcome of the Swedish-South African project "Stitching the City" that integrates education and research. The project aims at developing a method and digital library of geolocated data for knowledge facilitation to support data re-use in architectural courses. It also aims at establishing a collaboration between the University of Pretoria, South Africa, and the Chalmers University of Technology in Gothenburg, Sweden.

"Stitching the City" has been hosted by the course Planning and Design for Social Inclusion in Gothenburg (2019 and 2020) and the Urban Citizen studio in Pretoria (2020). Many thanks Emilio and Carin!

ukuDoba has been tested in field studies by students in two areas: Mamelodi-East in the City of Tshwane and Hammarkullen in Gothenburg and the handbook has been developed by the six master students in an iterative process. Thank you, Robin, Lauren, Purll, Mumtaheena, Kelsey and Markus for your invaluable work! Without you, no handbook.

A special thank you goes also to Cameron and Victoria for development of the GeoNode structure to store and share our data. Finally, thank you Marco, Monica, Serena for your support and constructive input.

Liane & Chrisna
October 2020

Preface

Swedish team - Chalmers University of Technology:
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The research has been financed by The Swedish Foundation for International Cooperation in Research and Higher Education (STINT) and South Africa's National Research Foundation (NRF).

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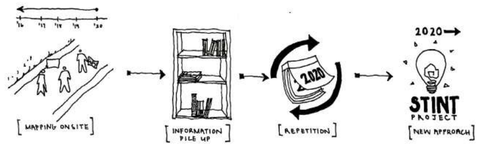
The ukuDoba methodology was created from a collaboration between three Master of Architecture students from Chalmers University of Technology, Sweden and three Master of Architecture students from the University of Pretoria, South Africa. All authors are actively involved in the 'Stitching the City" research project and have a background in participatory design, social inclusion and urban citizenship within architecture. This background influenced their interest in the creation of the ukuDoba Method.

Contents

Over time, physical maps and folders are being stacked in bookshelves. This format of data collection is difficult to access and build upon. Year, after year, these research processes are repeated, by both universities, leaving layers of rich data disjointed.

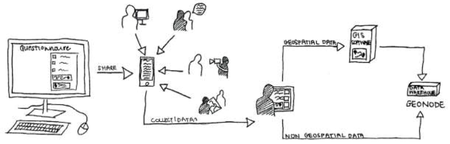
ukuDoba - the methodological framework, has been developed for the collection and sharing of non-traditional types of spatial economic data at a street and precinct level in an online platform. These cross-disciplinary micro-data can be layered and easily accessed by researchers from different disciplines as well as students and community members.



The methodological framework, ukuDoba, and online platform, Geonode, are currently being tested in two study areas: Mamelodi East in Tshwane, South Africa and Hammarkullen in Gothenburg, Sweden.

Here, we present a step by step guide to follow the ukuDoba methodology of how to effectively digitally collect, convert and store data in an online platform, GeoNode.

In Zulu the word ukuDoba means ‘fishing’. With this booklet, we hope to help users ‘fish’ for the data they need for their project.



The ukuDoba Methodology

Data Collection

Data Conversion

Data Warehouse

KoBo Toolbox

QGIS

Geonode

1 Data Collection

Data Collection

KoBo Toolbox

What?

- Kobo Toolbox is an open access Digital data collection tool that allows you to create a questionnaire that can be downloaded to your mobile device, filled in on the ground, offline, and geo-referenced on site. You can take photographs, record video and voice clips, or write text.
- After fieldwork, you can then upload the data to the internet over WiFi and access the data via your computer. This data can then be shared with others and they can then use it or edit it.
- Other tools used for similar data collection are: Maptionnaire, FieldPapers, EpiCollect5 etc.

Why?

- Communities to share their knowledge.
- To digitally store data in a Digital platform (easier to access and use).
- To geolocate collected data

Data Collection

How?

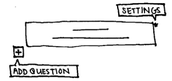
- Always collect data in groups of three people.
- The first person is in charge of taking notes and should focus on gathering data using the data collections tool.
- The second person is in charge of leading the interview and can have the questions open on their phone as a guide.
- The third person is in charge of documentation of the process and takes pictures, video and audio records.

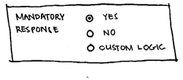
Getting started

1. Use your computer to start. You will only use your phone when filling out the form on site.
2. https://www.kobotoolbox.org/ > Scroll down > **Researchers, Aid Workers and Everyone Else** > Create an Account > Verify in email

Creating a questionnaire

1. Open KoBo Toolbox on your computer browser > **New** > Build from Scratch > Fill in
2. Project Name > Use a set format (e.g. **2020_ Location_Project Name**) > **Create Project**
3. "+" > types of questions (see glossary for types of questions)
    - Question 1: select **Acknowledge** question (digital consent for interview). See example below:
    - Question 2: select **Point** question (current location of interview).
    - Question **Settings** > Mandatory Response > **Yes** (Question 1 and Question 2)
4. Layout and Settings > Select Start Time and End Time
5. Save & Preview
6. Return to List (top left corner)





I hereby voluntarily grant permission for participation in this project, as explained to me by the researcher. I am aware that the results of the investigation may be used for the purposes of publication. I will remain anonymous: my comments may be used without giving any geographic or personal references (name, address, ID, occupation, age, income etc) that may accidentally imply my identity.

Glossary: question types & examples

Point: tracks your current location*

Acknowledge: gives consent to the interview*

Text: add in between questions for additional notes

Quantitative Tools examples:
How many children do you have?
Which ones are applicable to you?

Qualitative Tools examples:
How would you rate this park?
When did the music festival happen?

Media: captures images, sounds and videos

Line and Area: highlights a route or area

* Make these questions mandatory to fill in.

Note: Some tools present challenges in application due to internet access and device compatibility.

Calculate tool example:

"How many girls?" > Settings > Data column name > "girls"

"How many boys?" > Settings > Data column name > "boys"

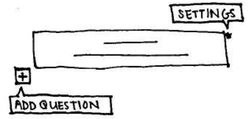
${girls} + ${boys} > Settings > Data column name > "total_children"

"There are ${total_children} in this room."

Carry-on question example

"Which colour is your favourite?"
- Blue
- Red
- Yellow
- Other

"If other, explain."



Settings of question > **Skip Logic** > **Add a Condition** > **Select a Question** > "Which colour is your favourite?" > "Other"
Now the text box question will only pop up if "other" is selected.

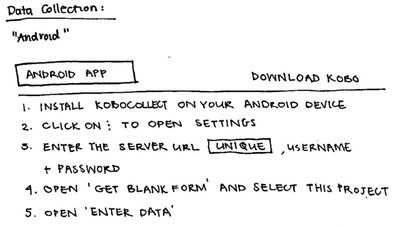
To use your questionnaire

1. Menu > **Draft** > Your Project > **Deploy**
2. To share with others: Hover over project name > ***share icon*** (right hand side)

Data collection

There are two ways to collect data. Follow the relevant steps:
Collect Data > dropdown options

Android Users: "Android Application"
Download KoboCollect > Follow instructions on KoBo Toolbox to open form (enter given unique URL) > To fill in form on your phone: **Fill in blank form**



iOS Users: "Online-Offline (multiple submission)"
Click **Open** > copy **URL of form** > Open https://www.the-qrcode-generator.com/ in a new tab > select URL > paste URL of form > Save > scan QR Code on phone to open form

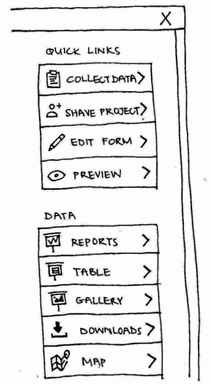
1. Internet access needed to open form on phone
2. No internet access needed when using form in field

Note: Save form as **Draft** if editing needs to be done after the interview.

After collection

1. Edit data **before** uploading forms.
2. **Android Users:**
   To Edit = **Edit Saved Form**
   To Upload = **Send Finalized Form** > Select All > Send Selected

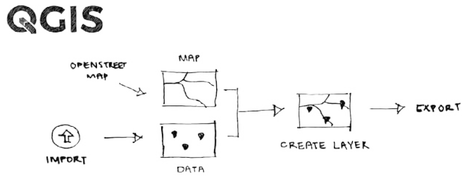
   iOS Users:
   To Edit = Save form as **draft** > Select form in side menu > edit it
   To Upload = Open side menu > Select Forms > **Upload** (iPhone will automatically upload forms when connected to internet if not saved as draft)
3. Desktop PC > Kobo website > Deployed > Your Project
4. Summary of data collected > Data > **Reports**
5. Downloads > Export Type > **CSV (Legacy)** > New Export > Pending > **Click to Refresh** > click the file link to download



Step 1 Complete

2 Data Conversion

Data Conversion



What?

A geographic information system (GIS) is a framework which provides a platform for users to engage with spatial data, through analysis and editing. There are alternative platforms that can perform this function, however we will use QGIS as it is a free service, making it more accessible to a wider range of people.

Why?

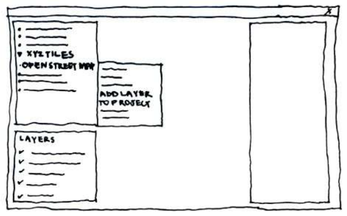
For the purpose of this framework, QGIS will be used to convert the data into a usable file type that can be imported and stored in the data warehouse GEONODE.

Getting started

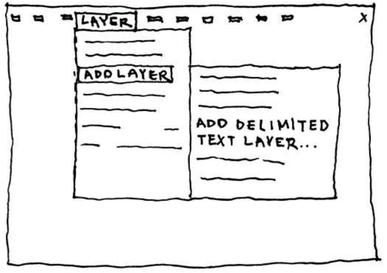
Download QGIS Standalone Installer Version 3.10 (64 bit) > Install QGIS > Run QGIS

Importing CSV Legacy files

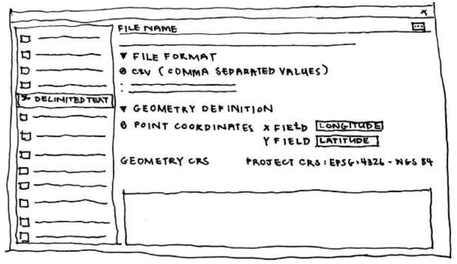
1. Open QGIS application on your computer > Project tab > New
2. Side Browser Menu > Drop down tab **XYZ Tiles** > Right click on **Openstreetmap** > **Add Layer to project**



3. Main menu > **Layer tab** > **Add Layer** > **Add Delimited Text layer**



4. File name > Click (...) to browse > Select your **CSV (Legacy) File** > **Ope**n

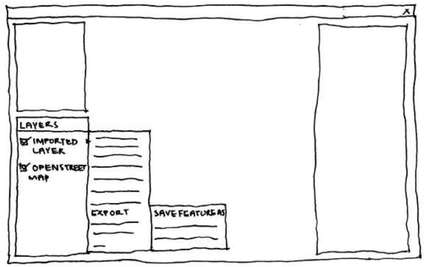


5. Drop down tab > **File Format** > select **CSV (comma separated values)**
6. Drop Down tab > **Geometry definition** > Select **Geometry CRS = Project CRS: EPSG:4326-WGS 84** > Select **X field = Longitude** and **Y field = Latitude** > **Add** > Close window

Note:
Once editing the X and Y fields, if the points appear on a blue screen then delete your imported CSV (legacy) layer, re-import it and let X field= Latitude and Y field = Longitude.
If you do not use a CSV legacy file, you will not have the option to select the x and y fields.

Exporting ESRI shape files

1. Layers Menu > Insure Openstreetmap layer is below your Layer
2. Right click on your layer > **Export** > **Save feature as**
3. Create a new folder on your computer with your project name to export your shapefiles to
4. Drop down tab **Format** > Select **ESRI Shapefile** > **File Name** > Click (...) to browse > Write your file name > Drop down tab **CRS** > Select **Project CRS: EPSG:4326 - WGS 84** > **Ok**
   (There should be 6 shapefiles exported)



Notes

There is no need to save QGIS files as the only files that are required are the ESRI Shapefiles that you export.

Tips

To learn more check the Youtube tutorial:
https://www.youtube.com/watch?v=sQ2z-D8TN2E

Step 2 Complete

3 Data Warehouse

Data Warehouse

What?

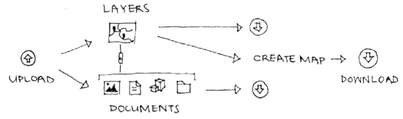
GeoNode is a web-based application and platform that facilitates the creation, sharing and collaborative use of geospatial and non-geospatial data.

The Geospatial data can be stored as Layers, formats that GeoNode supports:
Shapefiles & its associated files (.cpg, .dbf, .prj, .qpj, .shp, .shx)
GeoTiffs (.tiff, .tif)
American Standard Code for Information Interchange (ASCII)
The Non-geospatial data can be stored as Documents, formats that GeoNode supports:
Microsoft Word (.doc & .docx), Powerpoint (.ppt & .pptx), Excel (.xls & .xlsx)
Image Formats (.gif, .jpg, .jpeg, .png, .tiff, .tif)
OpenDocument File Formats (.ods, .odt,. odp)
Portable Document Format (.pdf)
Compressed Files (.rar, .zip, .gz)
Markup Languages (.sld, .xml, .qml)
Text documents (.txt)

Both of these could be linked with each other. Also documents that are non-spatial in nature can still be uploaded to GeoNode and then linked to a spatial file afterwards.

You are able to take all other files that are not individually supported and create a .zip file in order to upload them.
(Cheat file : .zip file)

Data Warehouse



Why?

To store and share the data we collectected with geolocation in an open source platform.
To manage and catalogue geospatial data and keep track of metadata. Each dataset in the system can be shared publicly or restricted to allow access to only specific users.
To manage and share data if the project is occurring over several years such as a longitudinal study so that the data can be used for numerous years after the date of collection as long as it is labelled and managed correctly.

Getting started

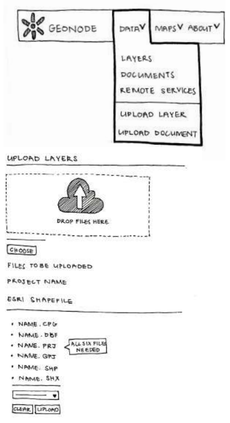
Please refer to **The Stitching the City GeoNode** link and not the GeoNode demo when the document refers to geonode.

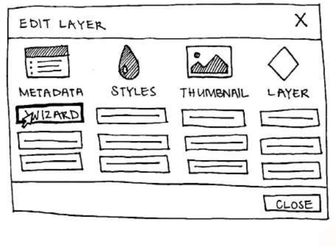
Open **GeoNode** (https://geocatalogue.co.za/)
Register > Wait for approval > **Sign In**
Main Menu > **About** > **People** > Find other users and yourself
(Edit your profile to include your contact information)

(Stitching the City QR Code)

Uploading layers

1. Main Menu > **Data** > **Upload Layer**
2. Drag the shapefiles and its associated files in **Drop files here**.
   (Exported from previous tool, eg: QGIS/Kobo, make sure all six file types are there - .cpg, .dbf, .prj, qpj, shp, shx. and avoid duplicates.)
3. Permission > Select **Users** and **Groups** in all tabs > **Upload Files**
   (To control who you want to share the collected data with.)
4. **Inspect Data** > **Next**
   (Recheck the list of data uploaded and edit if needed. Leave **Advanced tabs** on default.)
5. Layer uploaded.
   (Find the preview window, **Infos, Attributes**. You can **Share, Rate, Comment or make it Favourite**)
6. Editing tools > **Styles** > **Edit** > Edit if needed





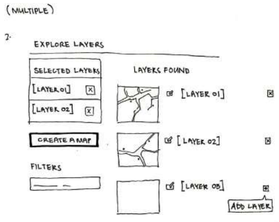
7. Editing tool > **Metadata** > **Wizard**
8. Edit > Fill in **Basic Metadata** > Fill in **Location and Licences** > Fill in **Optional Metadata** > Fill in **Dataset attributes**
   (Make sure you go through all the mandatory boxes as everything you input here is important for documentation accuracy and for other users who will be looking for data.)
9. Preview > Check.
10. Settings > Edit if needed, or leave it default.
11. Update > **Return to Layer**

Uploading documents

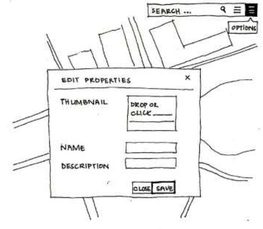
1. Main menu > **Data** > **Upload Document.**
2. Create a **Title** > Browse the File > Add **URL**, if needed.
3. Permission > Select **Users** and **Groups** in all tabs
   (To control who you want to share the collected data with.)
4. Link to > Choose Layer/ Map > **Upload**.
5. Edit **Metadata** (Follow the same steps as **Layer**.)
6. Document uploaded.
   (Find the **Infos**. You can **Share, Rate, Comment** or make it **Favourite**)

Creating map

1. (Single layer) Go to your **Layer** > **Create a Map**
   Or, (Multiple layers) Main menu > **Data** > **Layers** > Click **(+)** and select the Layers > **Create a Map**

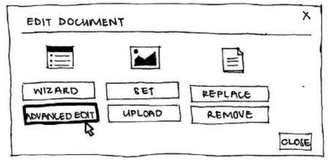


2. Layers > Edit if needed
3. Options > **Save as** > **Edit Properties** > Fill in > **Save**
4. Map added



Linking documents to layer/map

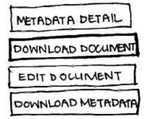
1. Go to your **Document** > **Edit Document** > **Metadata** > **Advanced Edit** (You can use the **Wizard**)



2. Link to > Choose Layer/ Map > **Update**
3. Document Linked.
   (Check in your Layer page if the document is there)

Downloading layer/ documents

1. (Layer) Go to your **Layer** > **Download Layer** > Select File type/ format.
2. Or, (Document) Go to your **Document** > **Download Document.**



Tips

- Select appropriate file names when renaming Layers, Maps and Documents to ensure that data is kept clean.
- Fill out the metadata as best as you can, be as descriptive as possible as that will help identify files later. If you are unsure of anything you can fix it later.
- Set permissions for each layer, this is important for data security. The default is set to 'Anyone', meaning that anyone who can log in can edit the data.
- Use all the tagging and legend options to make the data filter process convenient for users.
- For linking multiple files as Documents to one Layer or Map, upload them as a zip folder rather than uploading separate files.

To learn more visit the 'CDL wiki' page.
(https://github.com/CamGreen/NRF-STINT_Wiki/blob/master/README.md)

Step 3 Complete

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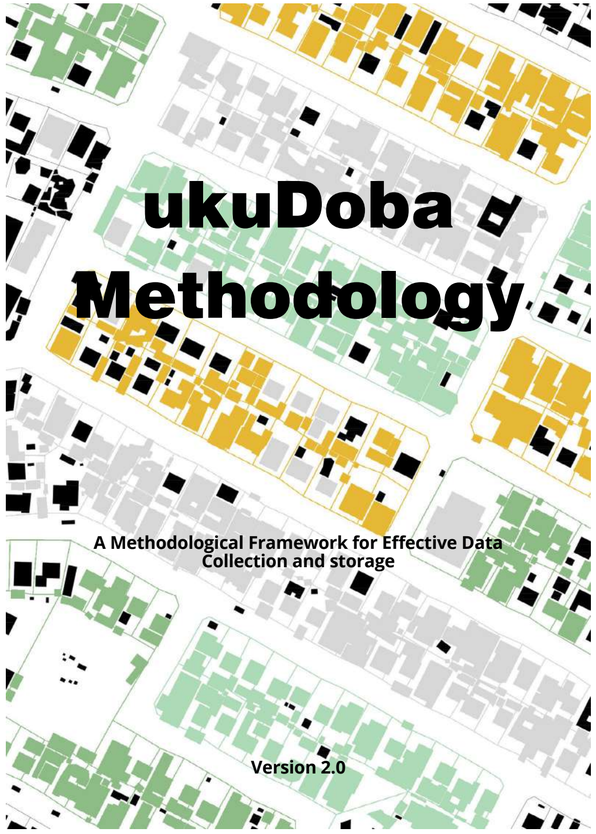
September 2020



Preface

The ukuDoba handbook is the outcome of the Swedish-South African project “Stitching the City” that integrates education and research. The project aims at developing a method and digital library of geolocated data for knowledge facilitation to support data re-use in architectural courses. It also aims at establishing a collaboration between the University of Pretoria, South Africa, and the Chalmers University of Technology in Gothenburg, Sweden.

“Stitching the City” has been hosted by the course Planning and Design for Social Inclusion in Gothenburg (2019 and 2020) and the Urban Citizen studio in Pretoria (2020). Many thanks Emilio and Carin!

ukuDoba has been tested in field studies by students in two areas: Mamelodi-East in the City of Tshwane and Hammarkullen in Gothenburg and the handbook has been developed by the six master students in an iterative process. Thank you, Robin, Lauren, Purll, Mumtaheena, Kelsey and Markus for your invaluable work! Without you, no handbook.

A special thank you goes also to Cameron and Victoria for development of the GeoNode structure to store and share our data. Finally, thank you Marco, Monica, Serena for your support and constructive input.

Liane & Chrisna
October 2020

Preface

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The research has been financed by The Swedish Foundation for International Cooperation in Research and Higher Education (STINT) and South Africa’s National Research Foundation (NRF).

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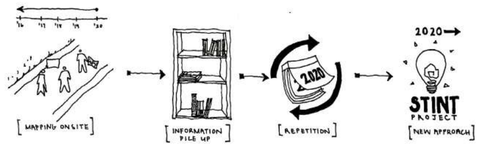
The ukuDoba methodology was created from a collaboration between three Master of Architecture students from Chalmers University of Technology, Sweden and three Master of Architecture students from the University of Pretoria, South Africa. All authors are actively involved in the ‘Stitching the City” research project and have a background in participatory design, social inclusion and urban citizenship within architecture. This background influenced their interest in the creation of the ukuDoba Method.

Contents

Over time, physical maps and folders are being stacked in bookshelves. This format of data collection is difficult to access and build upon. Year, after year, these research processes are repeated, by both universities, leaving layers of rich data disjointed.

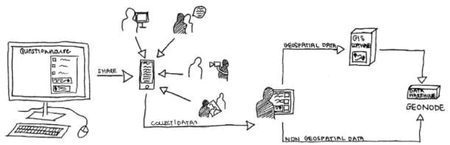
ukuDoba - the methodological framework, has been developed for the collection and sharing of non-traditional types of spatial economic data at a street and precinct level in an online platform. These cross-disciplinary micro-data can be layered and easily accessed by researchers from different disciplines as well as students and community members.



The methodological framework, ukuDoba, and online platform, Geonode, are currently being tested in two study areas: Mamelodi East in Tshwane, South Africa and Hammarkullen in Gothenburg, Sweden.

Here, we present a step by step guide to follow the ukuDoba methodology of how to effectively digitally collect, convert and store data in an online platform, GeoNode.

In Zulu the word ukuDoba means ‘fishing’. With this booklet, we hope to help users ‘fish’ for the data they need for their project.



The ukuDoba Methodology

Data Collection

Maptionnaire

Data Conversion

QGIS

Data Warehouse

Geonode

1 Data Collection

Data Collection

maptionnaire

What?

- Maptionnaire is a paid subscription based service that allows you to create questionnaires that can be sent out to participants or be filled in out on the field by yourselves. It is georeferenced and supports multiple types of media.
- After fieldwork, you can access the data via your computer. This data can then be shared with others and they can use it or edit it.
- Other tools used for similar data collection are: Kobo Toolbox, FieldPapers, EpiCollect5 etc.

Why?

- Let communities to share their knowledge
- To digitally store data in a Digital platform (easier to access and use)
- To geolocate collected data

Data Collection

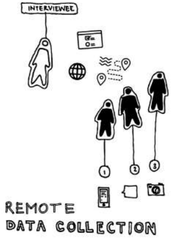
How?

On-site collection

- Always collect data in groups of three people.
- The first person is in charge of taking notes and should focus on gathering data using the data collections tool.
- The second person is in charge of leading the interview and can have the questions open on their phone as a guide.
- The third person is in charge of documentation of the process and takes pictures, video and audio recordings.

Remote collection

- It is important to have a dialogue between the interviewer and interviewee.
- This could be ensured by sending the questionnaire link online for people to fill up and discussing / having dialogue over the phone or internet with audio calls.
- Filling up the questionnaire together and discussing / having dialogue with video calls, sharing screens options can help.
- If multiple participants need to fill out the same form in the same browser, they have to use incognito mode



Getting started

- Use your computer to start. You can only use your smartphone or tablet for collecting data
- Visit the link below to log in **https://app.maptionnaire.com/en/login/**

Creating a questionnaire

1. **Questionnaire** > **Create new**
2. **Edit** > Fill in **Name and Description**
   (This is the first page people would see, so introduction, background and purpose should be included in the description)
3. **Pages** > **(+)** > Create at least 3 pages
4. Write **Page name**s for all pages
   (Suggested as 'Consent', 'Name of Survey', 'Thanks for Participating')
5. First page > **(+)** > **Multiple choice question** > **Question** > **Choose one** > Type in your consensual agreement in the question box and create two options "**Yes**" and "**No**"
6. Next page > **(+)** > Select the types of questions (see glossary for types of questions) > Click the **Question** to edit
7. Last page > **(+)** > **Paragraph of Text** > Type in a note of thanks with the contact info of your team for further inquiries > **Page settings** > Check **"This is an exit page** (Additional questions could be added such as, asking for reasons if answered no to the consent)

Carry-on
Creating a questionnaire

8. **Branching rules** at the top > **Triggering question** > Select your triggering question > **Triggering answers** > Choose **Yes** > **Choose target page** > Choose *"Name of survey"* > **Save** > Go back to **Edit** (Using branching rules are not recommended to use with individual questions, only pages)
9. **Location at the beginning** under the pages> Set your site area (This is the default background of your questionnaire pages, could be changed for each page in the settings tab)
10. **Maps** > Select the type of map
11. **General Settings** > Edit as per your preferences > Find the link for the questionnaire > Set a **Questionnaire Password** if you want limited access > Go back to **Edit**
12. **Data and Privacy settings** > Edit as per your preferences
13. **Style settings** > Edit the style of your questionnaire
14. **Language settings** > Select the additional language, if needed> Click **Translate** to add all the questions in selected language > **Save**
15. **View** > Check the questionnaire

Note:
Make sure to keep your form clean of unnecessary datapoints before deploying the questionnaire. This will ensure effective collection of data, save you time during analysis, and keep the participants engaged.

Glossary: question types & examples

Drawbutton: mark out points, highlight a route or area, upload a media file

Multiple choice: choose one, choose many, dropdown, priority assessment

Open question: big answer field, small answer field

Number questions: integer numbers, string of digits, decimal numbers, range of numbers

Video & document: link a video from youtube or upload your own to show inbetween questions

Paragraph or text: add in between questions for additional information to participants

Setting up background maps for forms

1. **Location at the beginning** > zoom in to set the viewport > **save**
2. Under **Maps** you tick the boxes you want your participants to be able to toggle between

- If you wish to set a different map for only one of your pages: **Click the page** > Click **settings** > follow the steps above

I hereby voluntarily grant permission for participation in this project, as explained to me by the researcher. I am aware that the results of the investigation may be used for the purposes of publication. I will remain anonymous: my comments may be used without giving any geographic or personal references (name, address, ID, occupation, age, income etc) that may accidentally imply my identity.

Branching questions

Using skip logic in your survey is a great way of controlling the navigation in the form depending on what the answers are.

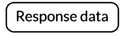
The most important thing to consider is that the target answer is a page and that it is only compatible with multiple choice questions. Be careful with using the branching as it can lead to undesireable outcomes in the collected data.

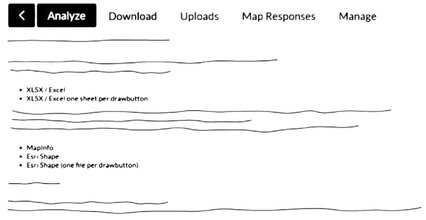
To use your questionnaire

Simply distribute the link to the web-based questionnaire to allow participants to fill it in and start collecting your data!

After collection

1. Find your questionnaire > **Response Data** > **Analyze** > Check and edit if needed
2. Find your questionnaire > **Response Data** > **Download** > Download ESRI Shape file





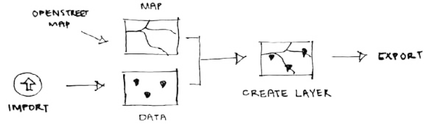
Step 1 Complete

2 Data Conversion

If your chosen data collection tool does not provide a shapefile or if you for some other reason have a csv file that needs to be geolocated, follow this portion of the handbook. Maptionnaire provides shapefiles in the file-format .shp

Data Conversion

QGIS



What?

A geographic information system (GIS) is a framework which provides a platform for users to engage with spatial data, through analysis and editing. There are alternative platforms that can perform this function, however we will use QGIS as it is a free service, making it more accessible to a wider range of people.

Why?

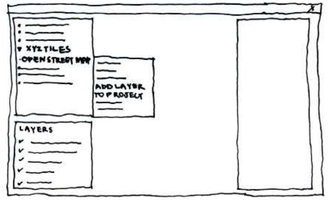
For the purpose of this framework, QGIS will be used to convert the data into a usable file type that can be imported and stored in the data warehouse GEONODE.

Getting started

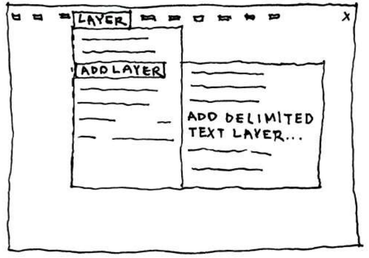
Download QGIS Standalone Installer Version 3.10 (64 bit) > Install QGIS > Run QGIS

Importing CSV Legacy files

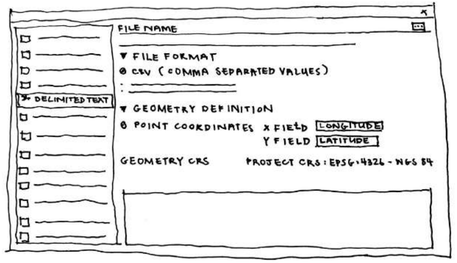
1. Open QGIS application on your computer > Project tab > New
2. Side Browser Menu > Drop down tab **XYZ Tiles** > Right click on **Openstreetmap** > **Add Layer to project**



3. Main menu > **Layer tab** > **Add Layer** > **Add Delimited Text layer**



4. File name > Click (...) to browse > Select your **CSV (Legacy) File** > **Ope**n

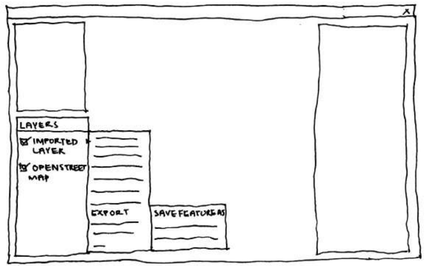


5. Drop down tab > **File Format** > select **CSV (comma separated values)**
6. Drop Down tab > **Geometry definition** > Select **Geometry CRS = Project CRS: EPSG:4326-WGS 84** > Select **X field = Longitude** and **Y field = Latitude** > **Add** > Close window

Note:
Once editing the X and Y fields, if the points appear on a blue screen then delete your imported CSV (legacy) layer, re-import it and let X field= Latitude and Y field = Longitude.
If you do not use a CSV legacy file, you will not have the option to select the x and y fields.

Exporting ESRI shape files

1. Layers Menu > Insure Openstreetmap layer is below your Layer
2. Right click on your layer > **Export** > **Save feature as**
3. Create a new folder on your computer with your project name to export your shapefiles to
4. Drop down tab **Format** > Select **ESRI Shapefile** > **File Name** > Click (...) to browse > Write your file name > Drop down tab **CRS** > Select **Project CRS: EPSG:4326 - WGS 84** > **Ok**
   (There should be 6 shapefiles exported)



Notes

There is no need to save QGIS files as the only files that are required are the ESRI Shapefiles that you export.

Tips

To learn more check the Youtube tutorial:
https://www.youtube.com/watch?v=sQ2z-D8TN2E

Step 2 Complete

3 Data Warehouse

Data Warehouse

What?

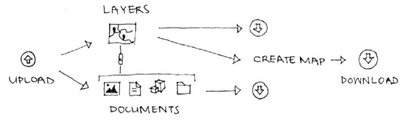
GeoNode is a web-based application and platform that facilitates the creation, sharing and collaborative use of geospatial and non-geospatial data.

The Geospatial data can be stored as Layers, formats that GeoNode supports:
Shapefiles & its associated files (.cpg, .dbf, .prj, .qpj, .shp, .shx)
GeoTiffs (.tiff, .tif)
American Standard Code for Information Interchange (ASCII)
The Non-geospatial data can be stored as Documents, formats that GeoNode supports:
Microsoft Word (.doc & .docx), Powerpoint (.ppt & .pptx), Excel (.xls & .xlsx)
Image Formats (.gif, .jpg, .jpeg, .png, .tiff, .tif)
OpenDocument File Formats (.ods, .odt,. odp)
Portable Document Format (.pdf)
Compressed Files (.rar, .zip, .gz)
Markup Languages (.sld, .xml, .qml)
Text documents (.txt)

Both of these could be linked with each other. Also documents that are non-spatial in nature can still be uploaded to GeoNode and then linked to a spatial file afterwards.

You are able to take all other files that are not individually supported and create a .zip file in order to upload them.
(Cheat file : .zip file)

Data Warehouse



Why?

To store and share the data we collectected with geolocation in an open source platform.
To manage and catalogue geospatial data and keep track of metadata. Each dataset in the system can be shared publicly or restricted to allow access to only specific users.
To manage and share data if the project is occurring over several years such as a longitudinal study so that the data can be used for numerous years after the date of collection as long as it is labelled and managed correctly.

Getting started

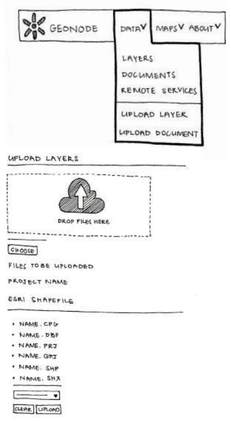
Please refer to **The Stitching the City GeoNode** link and not the GeoNode demo when the document refers to geonode.

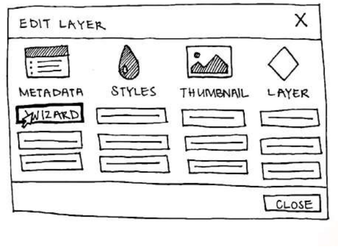
Open **GeoNode** (https://geocatalogue.co.za/)
Register > Wait for approval > **Sign In**
Main Menu > **About** > **People** > Find other users and yourself
(Edit your profile to include your contact information)

(Stitching the City QR Code)

Uploading layers

1. Main Menu > **Data** > **Upload Layer**
2. Drag the shapefiles and its associated files in **Drop files here**.
   (Exported from previous tool, eg: QGIS/Kobo/ Maptionnaire, .cpg, .dbf, .prj, qpj, shp, shx. and avoid duplicates.)
3. Permission > Select **Users** and **Groups** in all tabs > **Upload Files**
   (To control who you want to share the collected data with.)
4. **Inspect Data** > **Next**
   (Recheck the list of data uploaded and edit if needed. Leave **Advanced tabs** on default.)
5. Layer uploaded.
   (Find the preview window, **Infos, Attributes**. You can **Share, Rate, Comment or make it Favourite**)
6. Editing tools > **Styles** > **Edit** > Edit if needed





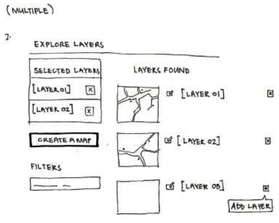
7. Editing tool > **Metadata** > **Wizard**
8. Edit > Fill in **Basic Metadata** > Fill in **Location and Licences** > Fill in **Optional Metadata** > Fill in **Dataset attributes**
   (Make sure you go through all the mandatory boxes as everything you input here is important for documentation accuracy and for other users who will be looking for data.)
9. Preview > Check.
10. Settings > Edit if needed, or leave it default.
11. Update > **Return to Layer**

Uploading documents

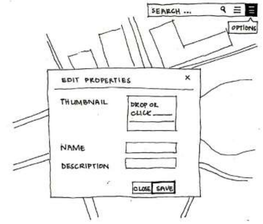
1. Main menu > **Data** > **Upload Document.**
2. Create a **Title** > Browse the File > Add **URL**, if needed.
3. Permission > Select **Users** and **Groups** in all tabs
   (To control who you want to share the collected data with.)
4. Link to > Choose Layer/ Map > **Upload**.
5. Edit **Metadata** (Follow the same steps as **Layer**.)
6. Document uploaded.
   (Find the **Infos**. You can **Share, Rate, Comment** or make it **Favourite**)

Creating map

1. (Single layer) Go to your **Layer** > **Create a Map**
   Or, (Multiple layers) Main menu > **Data** > **Layers** > Click **(+)** and select the Layers > **Create a Map**

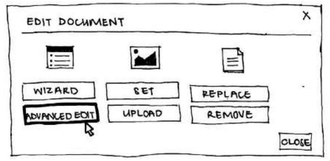


2. Layers > Edit if needed
3. Options > **Save as** > **Edit Properties** > Fill in > **Save**
4. Map added



Linking documents to layer/map

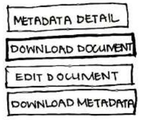
1. Go to your **Document** > **Edit Document** > **Metadata** > **Advanced Edit** (You can use the **Wizard**)



2. Link to > Choose Layer/ Map > **Update**
3. Document Linked.
   (Check in your Layer page if the document is there)

Downloading layer/ documents

1. (Layer) Go to your **Layer** > **Download Layer** > Select File type/ format.
2. Or, (Document) Go to your **Document** > **Download Document.**



Tips

- Select appropriate file names when renaming Layers, Maps and Documents to ensure that data is kept clean.
- Fill out the metadata as best as you can, be as descriptive as possible as that will help identify files later. If you are unsure of anything you can fix it later.
- Set permissions for each layer, this is important for data security. The default is set to 'Anyone', meaning that anyone who can log in can edit the data.
- Use all the tagging and legend options to make the data filter process convenient for users.
- For linking multiple files as Documents to one Layer or Map, upload them as a zip folder rather than uploading separate files.

To learn more visit the 'CDL wiki' page.
(https://github.com/CamGreen/NRF-STINT_Wiki/blob/master/README.md)

Step 3 Complete

Authors
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Kelsey Smith
Markus Zorn
Purli Naidoo

September 2020

VOLUME TWO APPENDICES

APPENDIX C: ETHICS APPROVAL

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

10/03/2020

EBIT FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY
Dear Prof Chan,

ETHICS RENEWAL 2020

In terms of document reference number: EBIT/9/2018

HONOURS STUDENTS, DEPARTMENT OF ARCHITECTURE: "STITCHING THE CITY: FROM MICRO-DATA TO MACRO-VIEWS"

In terms of the conditions of approval granted for research to be undertaken as part of the RFS and RFP modules in the Honours programme, I would like to notify the committee that the research will be ongoing for the 2020 academic year. I understand that all the conditions and responsibilities as stipulated in the approval will remain applicable to the project.

Kindly note that the method of investigation will apply to two distinct geographic areas, namely Mamelodi (specifically centred around the Tsako Thabo Secondary School) and Moreleta East (specifically centred around the informal settlements of Plastic View and Cemetery View). Students will be engaging with ad-hoc members of the affected community as informants rather than subjects.

I would like to declare that the following MArch(Prof) students will be involved with the project as a continuation of their Honours work undertaken during 2019 and will make use of the data for their mini-dissertations:

Student number	Surname	Name
15042482	**du Bois**	Morné
15203329	**Khoswe**	Vitukumbe
15001700	**Konstantinou**	Lauren
12148131	**Matena**	Dipuo
15032371	**Mulder**	Idelette
15362282	**Naidoo**	Purll
15209106	**Simeon**	Aimee
13070330	**Smith**	Kelsey

Yours sincerely,

Dr C Combrinck
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UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Engineering, Built Environment and Information Technology
Fakulteit Ingenieurswese, Bou-omgewing en Inligtingtegnologie / Lefapha la Boetšenere, Tikologo ya Kago le Theknolotši ya Tshedimošo

Reference number: EBIT/119/2020

Miss LM Konstantinou
Department: Architecture
University of Pretoria
Pretoria
0083

Dear Miss LM Konstantinou

FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY

Your recent application to the EBIT Research Ethics Committee refers.

Approval is granted for the application with reference number that appears above.

1. This means that the research project entitled "THE MUSIC-MAKER: AN ARCHITECTURAL NETWORK FOR EXPLORATION OF SELF AND EXPRESSION" has been approved as submitted. It is important to note what approval implies. This is expanded on in the points that follow.
2. This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Code of Ethics for Scholarly Activities of the University of Pretoria, or the Policy and Procedures for Responsible Research of the University of Pretoria. These documents are available on the website of the EBIT Research Ethics Committee.
3. If action is taken beyond the approved application, approval is withdrawn automatically.
4. According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of the EBIT Research Ethics Office.
5. The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.

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

APPENDIX D: DESIGN SUMMARY

THE MUSIC-MAKER
An Architectural Network for Exploration of Self & Expression

Lauren Konstantinou
15001700

Primary Programme: Performance Centre
Site: Tsako Thabo High School, Mamelodi East

Research Field: Unit for Urban Citizenship
Study Leader: Dr Carin Combrinck

DESIGN SUMMARY

RESEARCH QUESTION
How can the decentralization of music-making provide a platform for positive self-expression for school learners, enhancing the collective community identity in Mamelodi East?

01_BACKGROUND

"How is it that music can, without words, evoke our laughter, our fears [and] our highest aspirations?" (Jane Swan)
Within Mamelodi East there are existing music establishments that are small and aren't fully equipped to succeed. The proposed Music Network connects these establishments and allows for integration with surrounding schools that have some association with music. These connections allow for the sharing of skills, facilities and interests, ultimately forming a greater whole together (Castells 2011). Learners from Tsako Thabo School, with a "cup of that vision" (Memory 2020) for their future need a space for their own expression, identity and discovery as they move through their high school journey. This project is **not a simple music school**, but an **inclusive celebration of expression and performance (music, academics, sport, nutrition, daily life...)**.

02_GENERAL ISSUE

The typical school typology implemented here does not allow for freedom of learning and inclusion of many different types of learners. It results in rigid education and the exclusion of learners that do not fit into the prescribed box.

03_URBAN ISSUE

There is a large disconnection between Tsako Thabo Secondary School, the music institutions and the surrounding community due to lack of integration and interaction.

04_ARCHITECTURAL ISSUE

The school's architecture hinders opportunities for positive self expression and development of identity; individually and collectively. The school is rigid and closed in, excluding any interaction with the surrounding community.

05_ARGUMENT

The proposed intervention allows for freedom of expression and celebration of academics, music, sport, nutrition and everyday activities of a learner's life. The architecture celebrates both the school learners and the community, providing a space to belong and to celebrate. This project adds to the existing school infrastructure and serves as a precedent for future school upgrades in Mamelodi.

06_ARCHITECTURAL CONCEPT

This intervention acts as the flagship for the proposed Mamelodi Music Network, feeding into the global project of UNESCO's Creative Cities. This will put Mamelodi on the map and bring inspiration and pride to the community. The Performance Centre stands out from the surrounding community respectfully and inspires its users. The architecture is made up of expressive symbolism: platforms and acoustics driving the overall language, challenging the rigid grid and creating a new identity for both the school and the community.

Each activity of the school is given an opportunity to be celebrated without excluding other activities. The project links the school with the community through economic opportunities, additional learning and celebrating of Mamelodi's rich jazz history.

APPENDIX E: TECH SUMMARY

THE MUSIC-MAKER
An Architectural Network for Exploration of Self & Expression

Lauren Konstantinou
15001700

Primary Programme: Performance Centre
Site: Tsako Thabo High School, Mamelodi East

Research Field: Unit for Urban Citizenship
Study Leader: Dr Carin Combrinck

TECHNICAL SUMMARY

RESEARCH QUESTION
How can the decentralization of music-making provide a platform for positive self-expression for school learners, enhancing the collective community identity in Mamelodi East?

01_BACKGROUND

"How is it that music can, without words, evoke our laughter, our fears [and] our highest aspirations?" (Jane Swan)
Within Mamelodi East there are existing music establishments that are small and aren't fully equipped to succeed. The proposed Music Network connects these establishments and allows for integration with surrounding schools that have some association with music. These connections allow for the sharing of skills, facilities and interests, ultimately forming a greater whole together (Castells 2011). Learners from Tsako Thabo School, with a "cup of that vision" (Memory 2020) for their future need a space for their own expression, identity and discovery as they move through their high school journey. This project is **not a simple music school**, but an **inclusive celebration of expression and performance (music, academics, sport, nutrition, daily life...)**.

02_GENERAL ISSUE

The typical school typology implemented here does not allow for freedom of learning and inclusion of many different types of learners. It results in rigid education and the exclusion of learners that do not fit into the prescribed box.

03_URBAN ISSUE

There is a large disconnection between Tsako Thabo Secondary School, the music institutions and the surrounding community due to lack of integration and interaction.

04_ARCHITECTURAL ISSUE

The school's architecture hinders opportunities for positive self expression and development of identity; individually and collectively. The school is rigid and closed in, excluding any interaction with the surrounding community.

05_TECHNICAL CONCEPT

It is imperative for the building to be dynamic and have energy: an explosion of expression. The overall tectonic concept provides exciting spaces and platforms for users to perform and interact with both the building and other users. Acoustics plays a vital role in this aspect.

06_STRUCTURE

Primary structure: RHS beams and trusses of the roof fixed to a grid, spanning across the proposed hall.
Secondary structure: structural rammed earth elements that ground the overall design with weight and impact. As well as linear & diagonal masonry elements that guide users through the spaces in terms of physical and visual access.
Tertiary structure: much lighter expressive elements filling in the voids between the primary and secondary structure; holding spaces, providing platforms for performance and influencing the acoustical intentions.

07_SYSTEMS

Acoustics is the main influencer of the form, materiality and structure of the project. Not only within the main hall where it is vital for music and sport performances, but as audible barriers between open and intimate programmes. This is achieved through the integration of water systems. The large roof of the centre provides the opportunity for catchment, maintaining the fields and landscaping of the design. Natural daylighting, ground cooling, ventilation and reusing materials as much as possible all play vital roles.

Masters 2020

“It is what it is…”