DPD 801 Design Document
Sharing the Cathedral
Moreleta Park, Pretoria

Andelle Kotze
U17037892

Supervisor
Dr C Combrinck

Course Coordinator
Dr Jan Hugo

Department of Architecture
Faculty of Engineering, the Built Environment and Information Technology
University of Pretoria
South Africa

10 November 2023

Declaration of Originality

I declare that this design document, *Sharing the Cathedral* which has been submitted in fulfillment of part of the requirements for the module of DPD 801, at the University of Pretoria, is my own work and has not previously been submitted by me for any degree at the University of Pretoria or any other tertiary institution.

I declare that I obtained the applicable research ethics approval in order to conduct the research that has been described in this design document.

I declare that I have observed the ethical standards required in terms of the University of Pretoria's ethical code for researchers and have followed the policy guidelines for responsible research.

Signature: ....

Date: 10/11/2023

Sharing the Cathedral

Sharing the Cathedral (Dyal-Chand 2013) looks at sharing rather than exclusion as the preferred outcome of property disputes with the goal of navigating the issue of tenure in an informal settlement context. It aims to address the impasse between policy and implementation, providing an underprivileged community with access to education and healthcare, through faith based and NGO intervention. The project is situated within the theory of Public Interest Design; design that serves the public good. It seeks to provide the best of the best for the poorest of the poor, in this instance, the Plastic View informal settlement residents.

The project caters for the Plastic View informal settlement in Moreleta Park, which is home to roughly 15 000 residents, with about 1200 children between the ages of 0 and 6 years (Mohlomi 2020). The residents have no access to service delivery and the access to quality education is extremely limited due to geographical and financial limitations.

Building on existing initiatives within the community, I am proposing an educational precinct that will service these residents and the surrounding Moreleta Park community.

The precinct will be situated on an unused portion of the Moreleta Park church's grounds, and will house: a school, providing daycare, occupational therapy services, as well as extra-curricular activities, a clinic, an urban agriculture facility and kitchen, and a multi-purpose community hall. The precinct will cater for and be run by the SA Cares for Life NGO, the Pure Hope school, and the Moreleta Park church. No permanent structure is allowed to be built in the settlement, so the project looks to share the cathedral to aid an underprivileged community.

Key Words: Public Interest Design, 'Sharing' as property outcome, WASH rights, access.

Project Description

The Plastic View informal settlement, in Moreleta Park, is home to roughly 15 000 residents, with about 1200 children between the ages of 0 and 6 years (Mohlomi 2020). The residents have no access to service delivery and electricity. The settlement borders the Moreleta Park church, to the South.
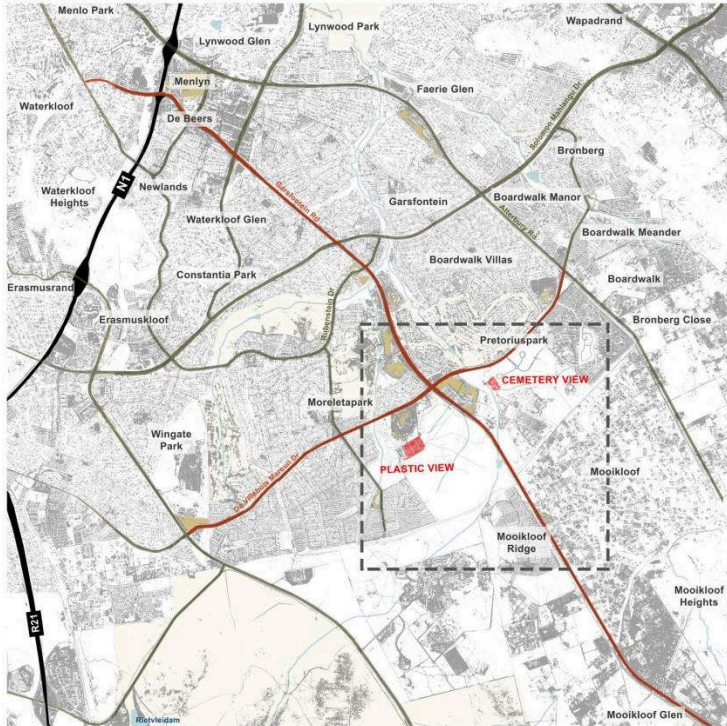
(Figure 1: Moreleta Park map) (Urban Citizen Studio 2020)

There exists currently in the settlement, a creche school run by the NGO SA Cares for Life, offering daycare, preschooling and food to children from the settlement (SA Cares for Life, no date). The creche school is located on a small site in the South-Western corner of the Plastic View settlement.

(Figure 2: Plastic View aerial photo) (Kruger 2022)

A four year long legal battle was fought by SA Cares For Life, after which the municipality ceded this plot of land to be used by the creche school.

Due to the volatile nature of building in the settlement (nothing permanent is allowed to be built and will be demolished by the police), the school cannot

(Figure 2: SA Cares for Life creche school aerial photo 1)

extend beyond the borders of this small plot without risking demolition. And because of this limited space, only about 300 of the 1200 children in Plastic View attend the creche school. It goes without saying, there is a very big need for a bigger school.

It is this need that the proposed project will aim to address.

Figure 3: SA Cares for Life creche school aerial photo 2)

Building on existing initiatives within the community (SA Cares for Life, no date, 'About us – Pure Hope School', no date), I am proposing an educational precinct that will service the residents of Plastic View, as well as the surrounding Moreleta Park community.
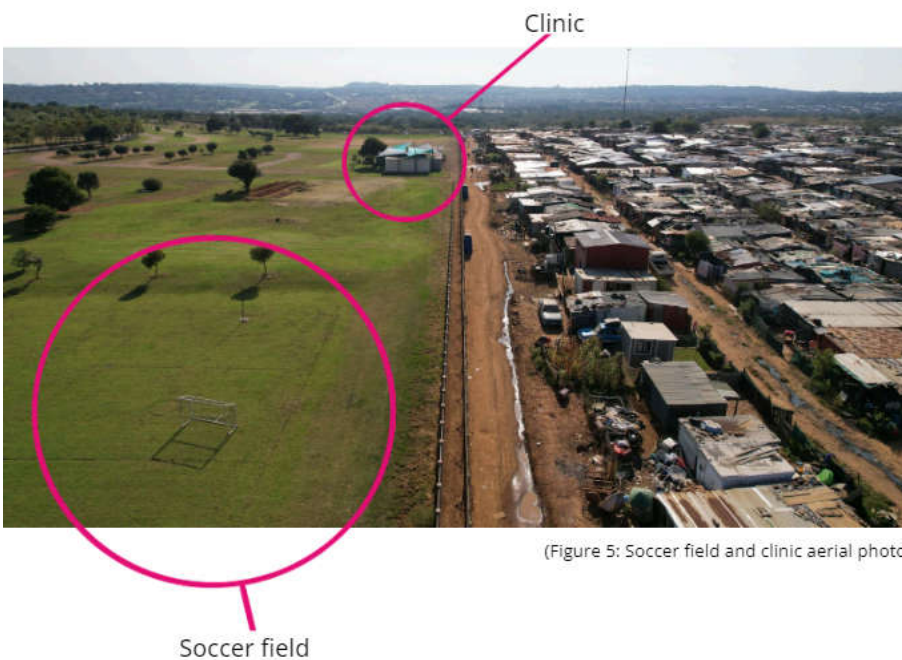
The precinct will house a school (grade 1-7), providing daycare, occupational therapy services, clinical therapy services, as well as extra-curricular activities (sport, art classes, dancing, music lessons,.); a clinic, providing access to healthcare and sanitation facilities; an urban agriculture facility and kitchen, with food growth, production, processing and distribution, providing food for the children at the school as well as the Plastic View residents; and a multi-purpose community hall. The precinct will cater for and be run by the SA Cares for Life NGO, the Pure Hope school, and the Moreleta Park church. The SA Cares for Life NGO provides daycare and schooling for the Plastic View residents' children. The Pure Hope school also offers schooling, from preschool to matric and situated on the church grounds, occupying some of the church's facilities during the week.

The project is situated on the Moreleta Park church's grounds, on the portion of the site neighboring the Plastic View settlement.

(Figure 4: Site location map 2)

(Figure 5: Soccer field and clinic aerial photo)

The site directly borders the main road in Plastic View used by cars, water trucks and pedestrians and is relatively unused, except for a grass soccer field and a small clinic that services the Plastic View community (Figure 5). The main reason that drove the choice of situating the project on the Moreleta Park church's grounds is the sensitive situation with regard to tenure in Plastic View. The Plastic View settlement is situated on municipal land (City of Tshwane). Due to the unlawful attempted eviction by police of the settlement residents in 2006, the Plastic View settlement received squatters' rights (Mashika 2019). As it is an informal settlement, no permanent structure is allowed to be built, without running the risk of demolition and eviction by the local authorities (Mahlokwane 2020). This sensitive situation with regard to tenure makes it very challenging

to propose a project of the size that I am proposing. This is why it was considered and decided to propose the project on the Moreleta Park church's grounds as it will allow for a final project outcome with full tenure, thus sharing the church's property.

With regards to property law, there exists a precedent that supports the notion of sharing as an outcome of property disputes, rather than exclusion.

A system of property law that relies on exclusion orients attention toward the question of which one party has formal title, and away from an inquiry into what interests underlie any given dispute over property (Dyal-Chand 2013). Sharing the Cathedral (Dyal-Chand 2013) proposes a model for enhancing property outcomes and, in particular, for promoting sharing as a preferred outcome. As fair use is the exception to copyright law, sharing is the exception to the rule and right of exclusion. Sharing the Cathedral (Dyal-Chand 2013) proposes an approach that looks at Interest-Outcome approach that prioritizes outcome before ownership. It is within this theoretical approach to property law that this project is situated, in a legal sense.
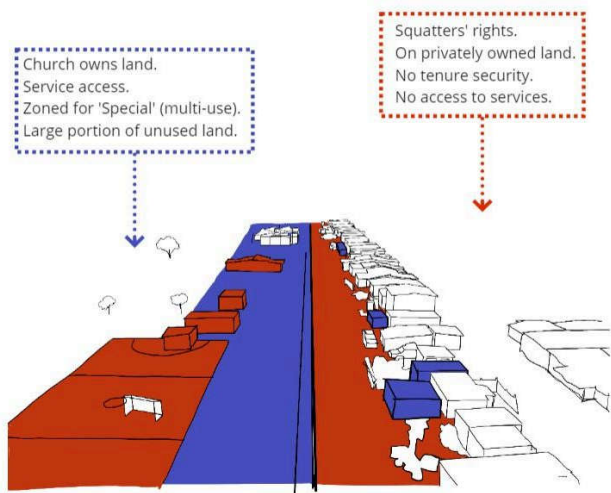
(Figure 6: 'Sharing the Cathedral' for Plastic View)

This project's theoretical framework is situated within the theory of Public Interest Design. Otherwise known as *community design, socially responsible design,* and *design that serves the disadvantaged* who have no access to architectural and related professional services (Smith 2007, 2011, Kim 2018). Joongsub Kim (2018), in the chapter *Understanding Public Interest Design: A Conceptual Taxonomy,* in *Routledge Companion to Architecture and Social Engagement,* proposed nine models of Public Interest Design. It is a combination of two of these models that the proposed project finds itself, namely *Design as Political Activism* and *Grassroots Design Practice* (Kim 2018).

Through developing or building on existing programmes that aim to benefit

underprivileged communities, it relates to *Grassroots Design Practice.* Through providing access to education and healthcare to an underprivileged community deemed to illegally occupy the settlement, it relates to *Design as Political Activism.*

Growing up in a clean and safe environment is every child's right (Water, Sanitation and Hygiene (WASH) | UNICEF no date). According to UNICEF, every day, more than 700 children under the age of 5 lose their lives to diarrheal diseases because of the absence of suitable WASH services (Water, Sanitation and Hygiene (WASH) | UNICEF, no date). This is also made provision for in chapter 2 of the Constitution of South Africa that provides that: *Everyone has the right to have access to sufficient food and water* (Constitution of the Republic of South Africa 1996). Even though it is the right of every child to have access to WASH rights, there seems to be an impasse between this right and its application for the Plastic View community. This proposed project aims to navigate the impasse between policy and implementation through NGO and faith based intervention.

It is also to note that the chosen programmes of the project are informed by the research conducted for mini Masters dissertation. For the dissertation, I researched the two community projects done by Collectif SAGA architects in Gqeberha. One of the results of the research into the practices that led to the success of the projects relates to the question of ownership. Instead of thrusting a solution onto the community, Collectif SAGA became involved with already existing initiatives, where ownership had already been taken of the problem and solution. They bolstered already existing initiatives and projects by providing a physical answer to the needs of these initiatives (Kotze 2023).

Reflecting on this outcome, it was decided to bolster existing projects and initiatives. There already exists a precedent for a school within the SA Cares for Life creche school, as well as the Pure Hope school. The Pure Hope school is a school catering for the Plastic View community, operating within the church's children's church classrooms, some church

offices and a small school building to the North of the church's property (SA Cares for Life 'About us – Pure Hope School', no date). There also exists a precedent to a healthcare facility in the small clinic bordering Plastic View, on the church's grounds. Furthermore, there are various examples of small-scale urban agriculture within the settlement itself. This proposed project seeks to bolster existing initiatives that aim to provide access to WASH rights for the Plastic View community, with a specific focus on education.

Key Theory and Design Informants:

(Figure 7: Boundary fence between church and Plastic View)

The boundary between Plastic View and the Moreleta Park church acts as a major design informant, in a tangible and intangible way.

In a tangible way, the boundary exists as the 2 and at some places, 3 layered fence with a single, small entrance gate, allowing people to access to the clinic and children access to the Pure Hope school. The settlement meets the boundary in a very immediate way, with only a 6 meter dirt road between the boundary and the first row of densely packed units.

In an intangible way, the boundary exists as the social gap between the settlement residents and the surrounding Moreleta Park community, of which a lot attend the Moreleta Park church.

(Figure 8: Existing boundary)

(Figure 9: Proposed new boundary)

It was decided to respond to the tangible boundary by moving it into the site, and using the proposed project's buildings as barriers between the precinct and the rest of the Moreleta Park church's grounds, inviting the settlement onto the land, with some parts of the

boundary being permeable at certain times. Responding to the intangible boundary means to address the social exclusion that the existing boundary perpetuates. It was decided to respond to this through looking at architecture in an intangible or symbolic way (Khaled 2022). This ultimately influenced the 'tangible' design of the building.

The healthcare/clinic facility of the portion of the precinct that immediately touches Plastic View, thus it has the opportunity to either include or exclude the Plastic View community. In Figure 10, a section through the clinic, it illustrates how the building reaches over (right) and punctures through (left) rammed earth walls. This is symbolic of inviting the Plastic View residents in and leading them through to the rest of the site.
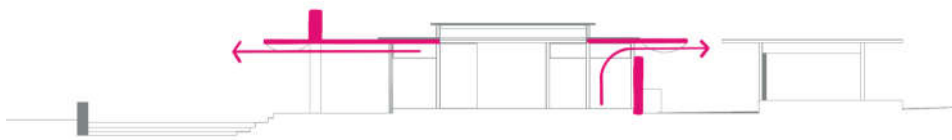
(Figure 10: Section through clinic)

It is in-between these two solid elements (the two rammed earth walls) that the clinic's functions are located, this speaks to mitigating the aforementioned boundary in a symbolic way: It is in the middle ground between these two contrasting social groups where people find aid, service delivery and healthcare.

There exists quite a stark contrast between the scale of the Moreleta Park church building and the Plastic View informal settlement. One of the main intentions of this project is to act as a middle ground between the two. To achieve this, it was decided to make use of the site's natural slope. The roof line for the clinic stays the same, but as the slope increases, the building's height increases as well. This brings the urban scale from the small scale of the buildings in Plastic View, gradually, up to a scale that is more comparable to the church building.
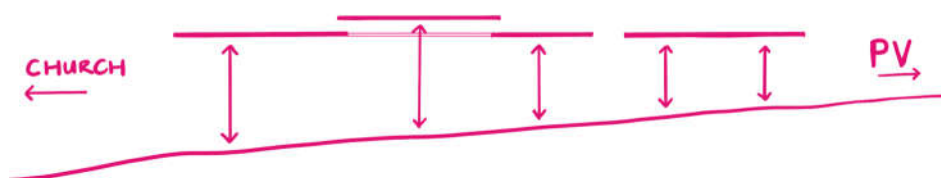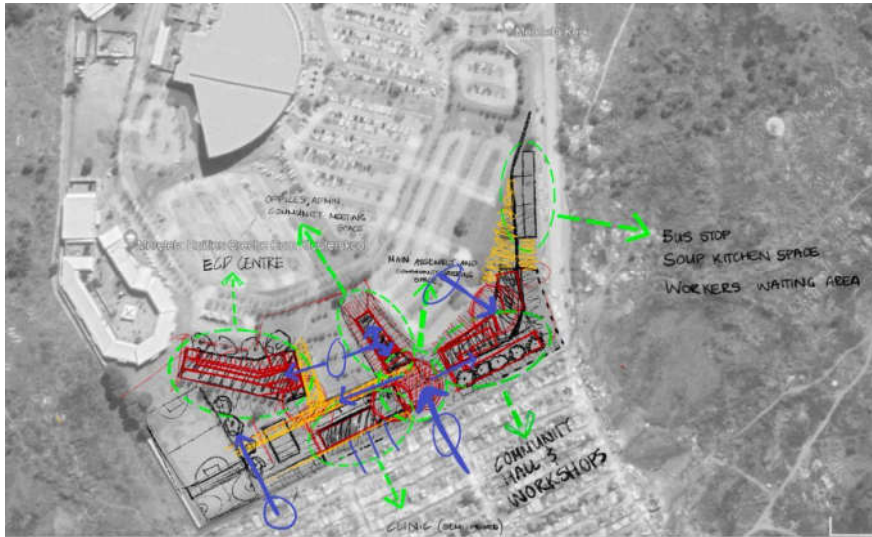

(Figure 11: Urban scale connection)

When exploring the layout for the classrooms, the main design informant was a consultation session that I had with a few of the teachers who work at the Pure Hope school. This was done in the effort to co-design a project brief with the teachers at the Pure Hope school. The notion of *Co-Design* or *Participatory-Design* recognises that *those who do a particular activity know most about how it gets done* (Robertson and Wagner 2013:82). Thus, I thought it best suited to consult the teachers at the school about the desired programmes of the proposed school. The teachers requested that grade groups be placed together to lessen the chance of older children bullying younger grades. They also expressed a desire for a storeroom and staff toilets near the classrooms. They also indicated that there is a great need for playground and sports facilities, as well as space for an occupational therapist and an on-site psychologist. I also conducted a consultation session with a staff member involved with the clinic. She expressed the specific programmatic needs of the clinic.

All of the aforementioned was considered in the design exploration of the clinic and school precinct.

Documentation of iterative design process

Figure 13 shows the initial Master plan exploration; it included additional programmes that have since been foregone. It included a school/ECD center, sports fields, urban agriculture space, a clinic, a community liaison office and
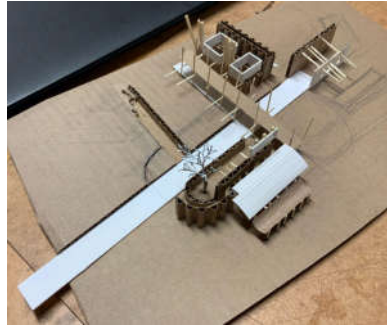
(Figure 12: Initial Master Planning layout)

meeting space, a community hall and workshop spaces, and a bus stop/temporary soup kitchen space.
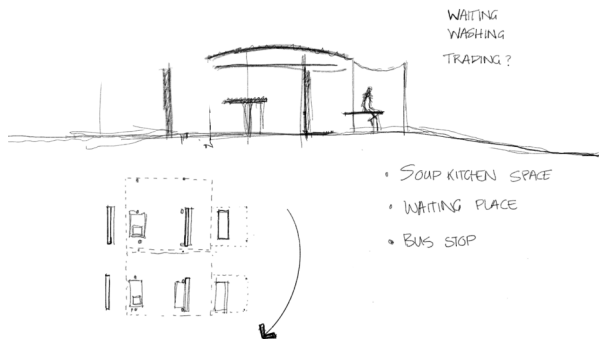
(Figure 13: Bus stop and soup kitchen space section)

Following critical reflection and upon further consideration, it was decided that the scale of the Master Plan is too large with too many unnecessary programmes, as it can run the risk of certain spaces and buildings becoming mono-functional.
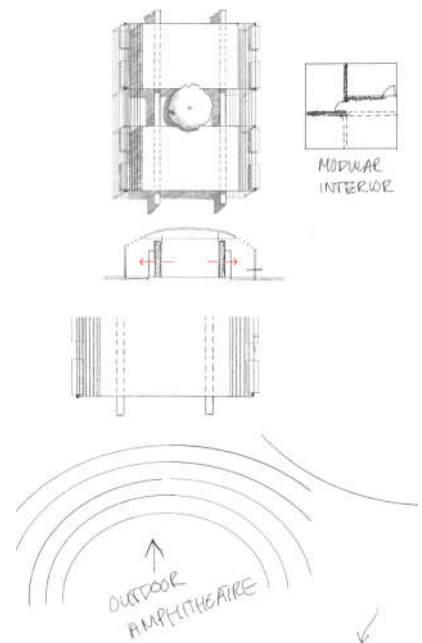
(Figure 14: Community office exploration)
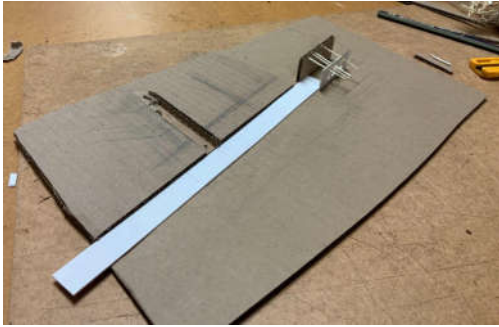
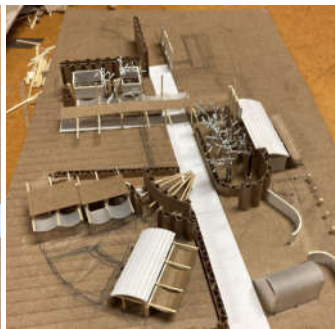(Figure 15: Maquette building process 1)   (Figure 16: Maquette process 2)   (Figure 17: Maquette process 3)
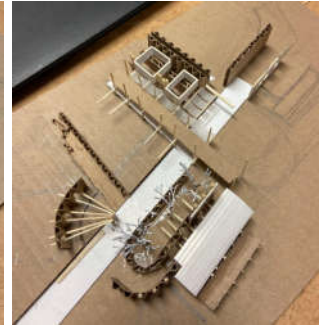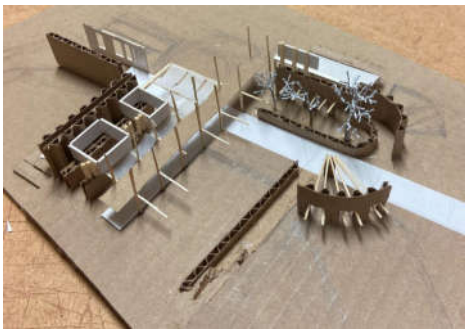
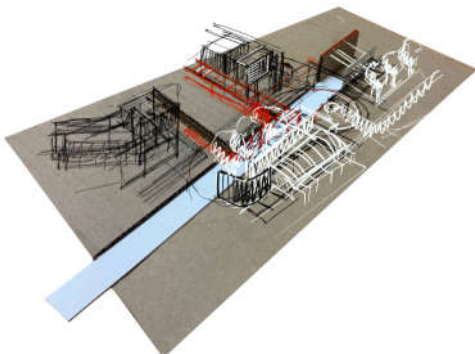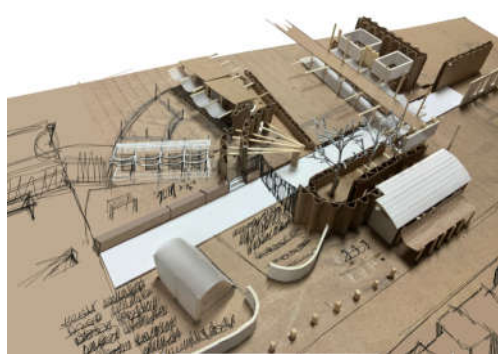(Figure 18: Maquette building process 4)   (Figure 19: Maquette process 5)   (Figure 20: Maquette process 6)
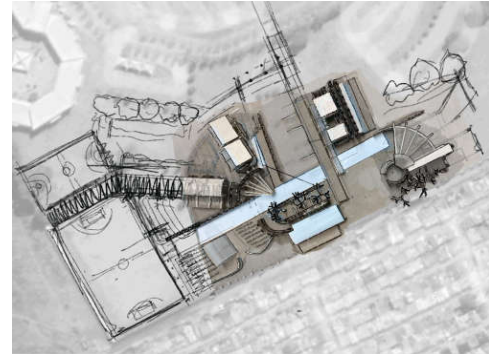
Following the first master planning exploration, a process of maquette building to place to lay out and test the rough placement and form of the chosen programmes and buildings.

(Figure 21: Sketching over maquette 1)   (Figure 22: Sketching over maquette 2)   (Figure 23: Reworked master plan)

Upon the feedback received from our first milestone review, it was decided to rework the masterplan presented (Figure 12). The placement of certain buildings was reconsidered as well as the building form, pedestrian axes and how the intervention meets the boundary of Plastic View.

Following this, I had consultation sessions with stakeholders from the Pure Hope school (teachers) and from the clinic. This gave valuable insight into the specific sub-programmes,
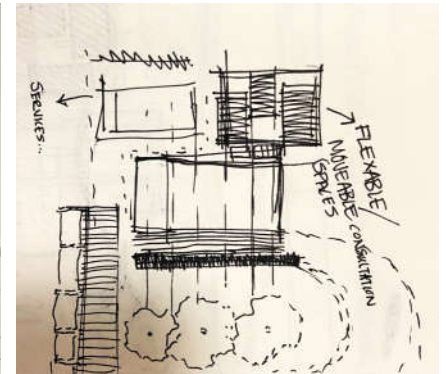
spaces and services they would like to have in their 'dream' school or clinic. Taking this feedback, an iterative process to refine the layout and design of the clinic took place.
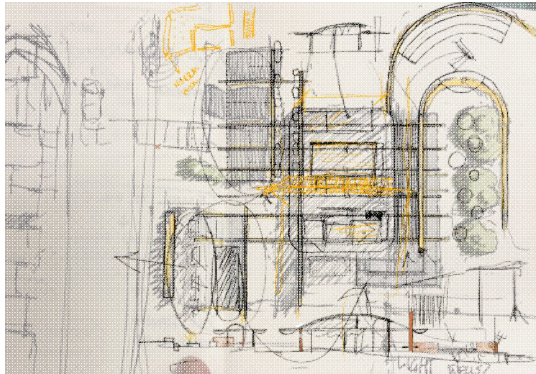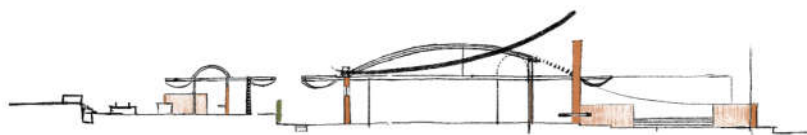

(Figure 24: Clinic sketch 1)
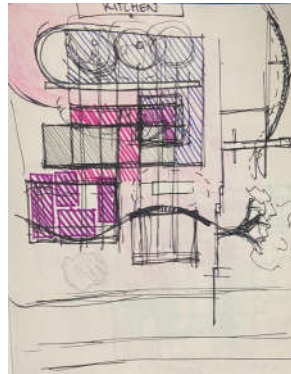

(Figure 25: Clinic sketch 2)

(Figure 26: Clinic sketch 3)

(Figure 27: Clinic section exploration)

There was also consideration made as to the materiality and construction technology for the clinic. It was decided to use a steel framed structure to support the roof, freeing up floor space and allowing for an open plan layout. It was also decided to use masonry walls as infill between steel columns, where needed. This is a relatively low-tech building technology, and was chosen for that (it will allow local Plastic View residents to take part in the construction process, as many of them are familiar with masonry construction). Rammed earth was chosen for feature walls as it is made from locally sourced, natural materials, which means that it has a low impact on the environment. It is also a highly energy-efficient building material due to its high thermal mass, which allows it to absorb and store heat (Filipeboni 2023).
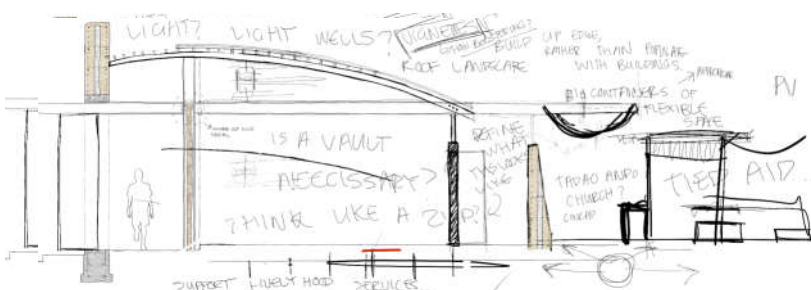
(Figure 28: Clinic material and technology exploration)

The rough sketches were taken into 3D modelling software, and further refined. Feedback was received on the first iteration of sketch plans and it was decided that the building was too small to accommodate all the programmes and spaces needed to provide
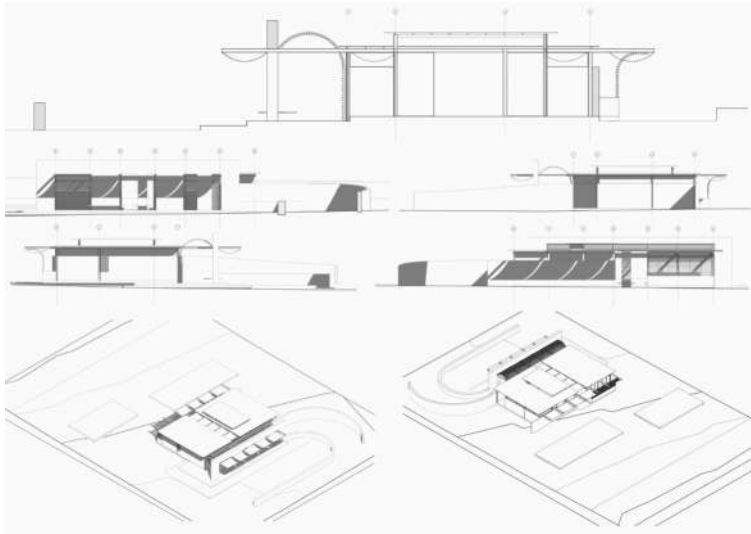
(Figure 29: CAD Sketch Plans first iteration)

adequate healthcare facilities for a community the size of Plastic View. The design was reworked and expanded. More consultation rooms were added, as well as a bigger multi-use educational hall. There are also some rough sketches done, exploring classrooms for the preschool portion of the precinct (Figures 33 and 34).
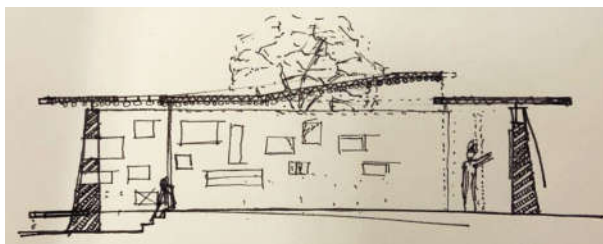

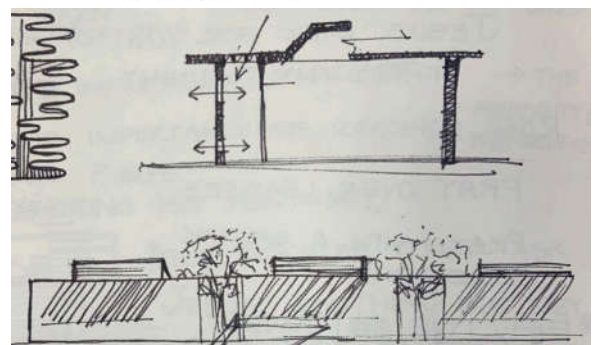(Figure 30: Clinic floor plan)
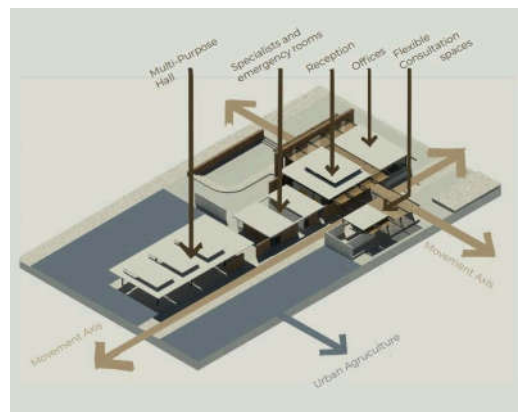
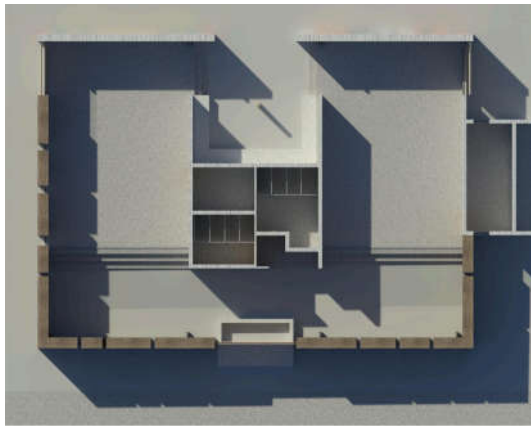(Figure 31: Clinic programme diagram)

(Figure 32: Clinic section)

(Figure 33: Classroom exploration sketches 1)

(Figure 34: Classroom exploration sketches 2)

(Figure 35: Classroom iteration 1)

Figure 35 shows the initial classroom iteration. Two classrooms catering for the same grade group are placed together, sharing an ablution facility and washroom space, as informed by consulting the Pure Hope teachers. The addition of the wash space was considered after being informed that many of the children show up to school with dirty uniforms, not having had the having had the opportunity to wash at home. It was decided to include a private wash space for each grade group.


(Figure 36: Classroom final iteration)

The entrances are stepped back, creating a courtyard space, intended for the children to wait and place their bags before school. This created a very enclosed 'feel' and limited passive surveillance opportunities along the main walkway to the North of the classrooms. This initial iteration also doesn't have significant Northern light, limiting natural light within the classroom.

Figure 36 shows an updated layout, with glass sliding doors, lining the inner courtyard and a portion of the Northern wall. Various layout iterations were explored for the school, until the final layout was decided upon.
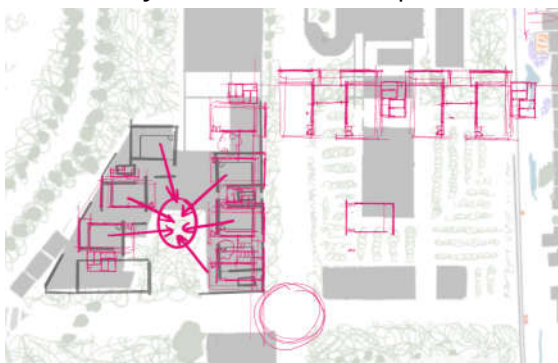
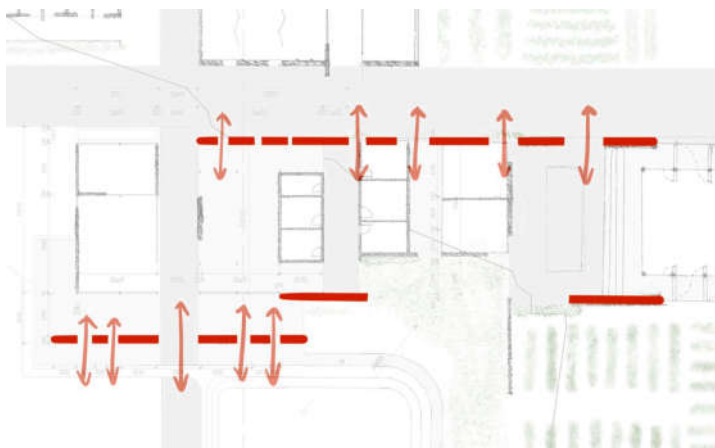(Figure 37: Wash facilities final iteration)

(Figure 38: Final school layout)

Summary of Integrated Design and Technical Investigation

As mentioned before, the inclusion of rammed earth walls as symbolic devices is significant to the project. The material choice lies behind the visual impact it makes; it provides a physical and intangible 'solid feel'.

These rammed earth walls lie parallel to the boundary bordering Plastic View.

To still create an opportunity for cross circulation through the clinic, these walls are broken up so as to not create another hard boundary around which the users have to walk, but allowing the user to move through these two lines of broken up, solid, rammed earth walls.
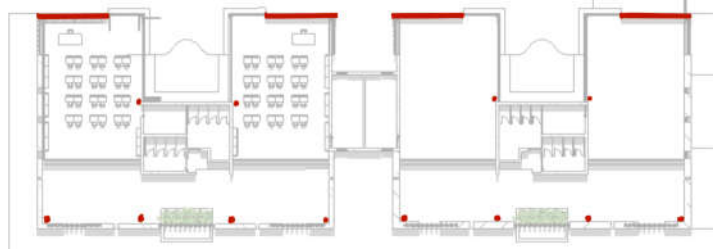
Upon discussion with an architect about these broken up wall sections, questions came up as to the structural soundness of these sections, some being as short as 1,6m in length (on plan).

To mitigate this, it was chosen to add structural reinforcement to these wall segments to ensure

(Figure 39: Diagram of rammed earth wall segments)

its stability. Although this is not common practice, there exists a precedent for this, namely the Engineering Design of Rammed Earth in Canada conference paper, from the International Symposium on Earthen Structures Conference (Krahn, Eng and Dick, 2018).

For the rest of the building's construction language, I wanted to choose something that will stand in complete contrast to the heavy, solid rammed earth walls. An assembly that will allow for as much free open floor space as possible. To achieve this, the decision was made to make use of a mild steel frame column and beam assembly. This will allow for flexible buildings that can change the interior configuration to suit any need that may arise in the future, as well as to accommodate various functions within one space, mitigating the risk of a space becoming mono-functional. Masonry infill walls will be used where needed, as boundaries and room partitions.
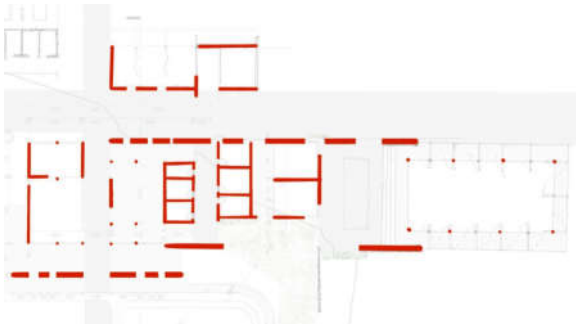
(Figure 39: Diagram of walls and columns)   (Figure 40: School wall and columns)

This assembly was carried through in the design of the school.

In partnership with the Department of Education, Floorworx determined the range of colors best suitable for use in a classroom, according to age groups (FloorworX 2022). These colors were considered and incorporated into the school.

Along the passageways in the school office building and the library, as well as in the outdoor wash space, it was decided to incorporate these colors in a colored glass skylight construction. The reason for choosing to incorporate these colors into an overhead plane, rather than in an eye level plain, is to reduce the amount of eye strain in the pupils and teachers in the classrooms. To rather incorporate these colors along passageways and spaces that the users do not have to spend an increased amount of time in.

Figure 41 shows a 3D assembly of this detail.
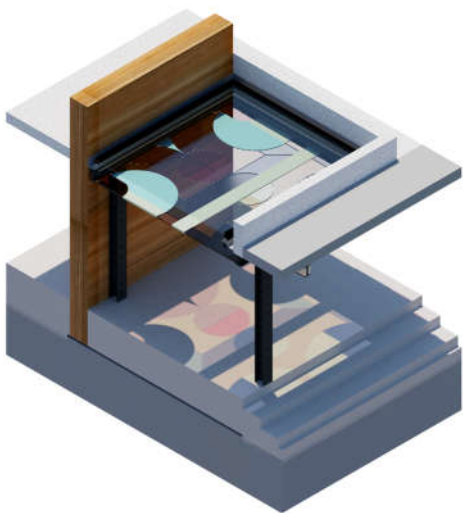
(Figure 41: 3D Skylight detail)   (Figure 42: School office building showing layout of skylight)

3D Images of project

(Figure 43: Aerial view of school precinct)

(Figure 44: Classrooms entrance)

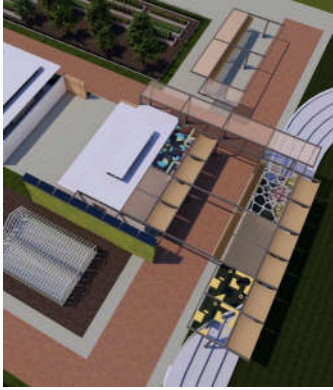(Figure 45: Playground area)

(Figure 46: Aerial view of clinic)

(Figure 46: Clinic exterior 1)

(Figure 47: Clinic exterior 2)

(Figure 48: Kitchen aerial view)


(Figure 49: Kitchen)

(Figure 50: Precinct aerial view)

Critical reflection - Impact of mini-project

The mini-project I presented at the beginning of the year explored the notion of accessible construction. This was inspired by my involvement with the Urban Citizen studio during our Honours year of studies, and my final design exploration that looked at disaster relief architecture for the Plastic View community. The main driving intention was for the intervention to be accessible in its construction, technology and materials. An intervention that can be easily built by members of the community without the need of highly specialized tools, materials or equipment. An intervention that is also 'temporary' as nothing permanent can be built in Plastic View without running the risk of demolition.

I decided to apply this approach to making, on a project of a much smaller scale, making a leather bag. Is there a way I can make a leather bag using materials and tools that I have readily available at home? By using a fabric awl, large eye needles, wax thread, a steel ruler, box cutter, paper hole punch, hammer and cutting mat, I was able to make two iterations. It is to note that I had these materials on hand beforehand.

(Figures 51, 52, & 53: Leather bag, first iteration)
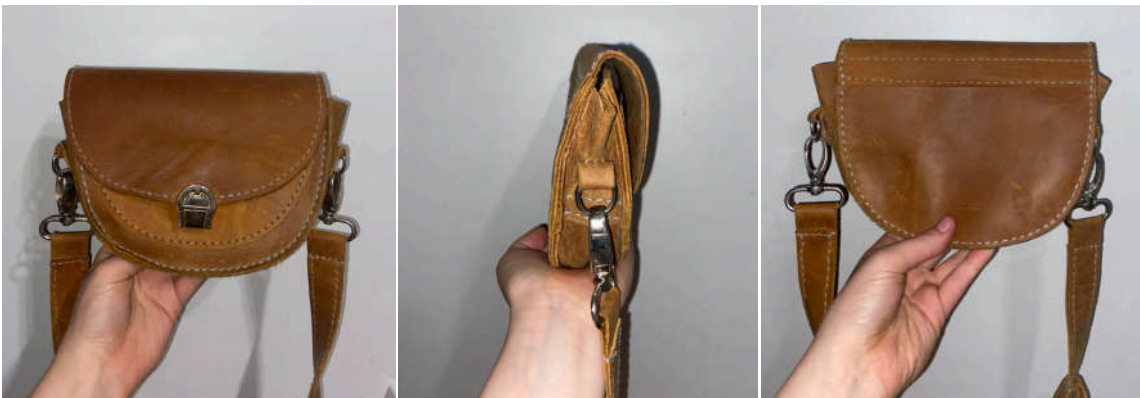
(Figures 54, 55, & 56: Leather bag, second iteration)

I believe the exploration was successful, as the method is easily accessible and replicable for anyone, to create a sturdy, usable leather bag.

This approach to construction and making was not carried through into my final thesis design exploration.

The aforementioned approach was initially intended to respond to a context of disaster relief, and initially, that was the intention of my thesis project as it was proposed to be situated within Plastic View itself.

Upon further research and following some iterative design exploration, the decision was made for the current proposed site, which allows for a permanent intervention with tenure.

<u>Critical reflection - Major project outcome</u>

When critically reflecting on the outcome of the major project, I am pleased with the work produced. I believe it is relevant to a much larger issue within our country namely, service delivery and access to WASH rights in informal settlements.

It addresses issues of land use, sharing and property access. I believe the theoretical underpinning of the project programme and intention is sound and relevant to our South African context.

I do, however, think that portions of the physical design would have definitely benefited from further iterations and design exploration.

In proportion to the size of the development on site, I think a disproportionate amount of time was spent on iterating and exploring the design of the clinic facility, rather than on the school portion of the precinct.

I do not think that the final product of the school is unsuccessful, but I do believe that it could have greatly benefited from subsequent explorations and iterations.

With regards to construction technology, I think there is still room to explore alternative ways of building that are more low-tech and familiar to the residents in Plastic View, so as to allow the residents to participate in a major way in the construction process.

The material choices could also have been reconsidered to maybe incorporate materials and building elements frequently used in Plastic View, elevating 'temporary' building materials to a 'permanent' status.

With regards to the design exploration process, there were consultation sessions held with teachers at the Pure Hope school, as well as with staff involved at the clinic. This allowed the intended users to express their desires and wishes for the future proposed design and gave valuable insights used during the design process. These sessions were of great value, but I think that follow up sessions, allowing for feedback to be given of the design as the exploration continues, would have been of even more value. It would have added to the rigor of the design process.

This unfortunately was not possible, as there were scheduling issues and lack of communication on both sides.

I also believe that more attention could have been spent on the immediate boundary between the precinct and the Plastic View informal settlement. Inquiries could have been

made to hear from the residents what public space amenities they would value to be included along this immediate boundary, providing the settlement with much needed, open, clean, shaded public space. It currently exists as an open, linear park of sorts, but would have benefited more if the residents weighed in to the amenities and features they would have liked to be included in this park.

This is not without value though. I believe this allows an opportunity for the residents to appropriate this space and add features and amenities themselves.

Overall, I do believe that the project is successful in achieving its intention, navigating the impasse between policy and implementation, and providing the community with access to WASH rights (with a focus on education and healthcare).

References

'About us – Pure Hope School' (no date). Available at: https://purehopeschool.co.za/about-us/ (Accessed: 9 November 2023).Dyal-Chand, R.

(2013) 'Sharing the Cathedral', *Conneticut Law Review*, 46. Available at: https://core.ac.uk/download/pdf/302394599.pdf.

'GOOD GROUNDING – The role of colour in education | FloorworX' (2022), 26 January. Available at: https://floorworx.co.za/good-grounding-the-role-of-colour-in-education/ (Accessed: 10 November 2023).

Khaled, N. (2022) '10 Examples of Symbolic Architecture', *RTF | Rethinking The Future*, 21 March. Available at: https://www.re-thinkingthefuture.com/architectural-community/a6471-10-examples-of-symbolic-architecture/ (Accessed: 9 November 2023).

Kim, J. (2018) 'Understanding Public Interest Design, A Conceptual Taxonomy', *The Routledge Companion to Architecture and Social Engagement* [Preprint], (1). Available at: https://doi-org.uplib.idm.oclc.org/10.4324/9781315712697.

Kotze, A. (2023) *How are the principles of community engagement in architecture, within Public Interest Design, relevant to and applied in our South African informal context?* University of Pretoria. Available at: https://docs.google.com/document/d/1huKNSzl90QKsHb136leS0ZZWBL1VBDqfVtuKDu3Ht6Q/edit.

Mahlokwane, J. (2020) *Tshwane curb on Plastic View homes*. Available at: https://www.iol.co.za/pretoria-news/news/tshwane-curb-on-plastic-view-homes-f94daec1-3497-40da-a741-d741 2049d94a (Accessed: 9 November 2023).

Mashika (2019) 'Plastic View: an exploration of the experiences of the poor in an urban informal settlement in Pretoria By Student: Lynette Mashika Student number: 11197562'.
Mohlomi, S.-T. (2020) 'Tshwane's Plastic View "on the edge of the edge"', *Times Live*, 12 July. Available at: https://www.timeslive.co.za/sunday-times/opinion-and-analysis/2020-07-12-tshwanes-plastic-view-on-the-edge-of-the-edge/#:~:text=The%207mx7m%20stand%20where%20he,impossible%20to%20adhere%20to%20here.

Robertson, T. and Wagner, I. (2013) 'Ethics: Engagement, Representation and Politics-in-action', in *Routledge International Handbook of Participatory Design*. London: Routledge, pp. 64–85.

SA Cares for Life, save babies, pretoria, make a difference (no date) *sacares*. Available at: https://www.sacares.website (Accessed: 9 November 2023).

Water, Sanitation and Hygiene (WASH) | UNICEF (no date). Available at: https://www.unicef.org/wash (Accessed: 25 September 2023).