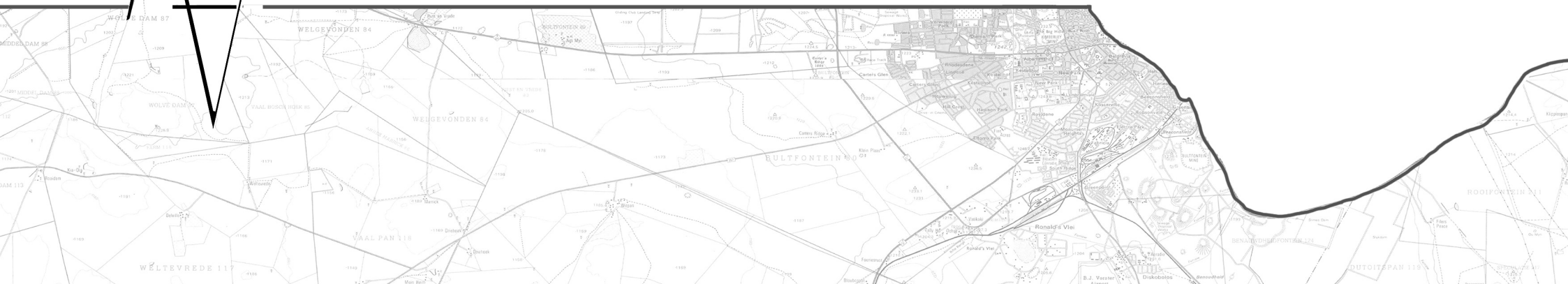


Alternative Jewellery School in Kimberley:
Exploring the impact of poiesis.

Nicole S. Vivier







Alternative
al-ter-na-tive | \ l - t r - n - t i v
Adjective

Available as another possibility or choice or relating to activities that depart from or challenge traditional norms (Lexico, 2019).

Alternative Jewellery
Manipulating unconventional materials to convey a message and meaning through wearable art.

Declaration

This dissertation is submitted in partial fulfilment of the requirements for the degree M. Arch. (Prof.) at the University of the Free State. All the work contained in this document is my own, unless otherwise acknowledged.

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The work contained in this dissertation
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Wessels, A. Wagener



Preamble

The proposed project is an Alternative Jewellery School and Tourist Centre in Kimberley, South Africa. The dissertation was founded in a personal interest in jewellery design and started as a conventional jewellery school. However, research has shown the immense impact that traditional jewellery practices have on the environment, and a new-found passion began, transforming the proposed project into an Alternative Jewellery School. The school will teach young artisans fundamental jewellery techniques while encouraging the use of sustainable materials. An exhibition centre will inform tourists and the public about the impact of conventional jewellery practices and provide alternative jewellery options.

The selected site is located opposite the Big Hole on the threshold between the CBD and the residential community of Galeshewe. The site has the potential to become an attraction along the existing tourist tram route from the Big Hole Mine Museum to Market Square. The location provides the opportunity to expose the students' work to a broader audience while enriching the tourists' experience. An abandoned mine Rock Shaft ruin still occupies the site, embedding it in the rich history of Kimberley, while forming part of the discourse in creating alternative jewellery. The aim of this dissertation is to create an awareness regarding the impact of jewellery production; converting the deserted ruins into a building that fosters alternative jewellery practices while rejuvenating the Kimberley CBD.

The project explores the poesis of jewellery production and its relation to the built environment through the design of a jewellery school. The dissertation identifies various challenges and aims through three main design drivers: the client, the site and technical exploration, leading to a conceptual and theoretical framework to establish a design methodology. The design methodology will inform the design development and design resolution, concluding with the technical report and a reflection piece.



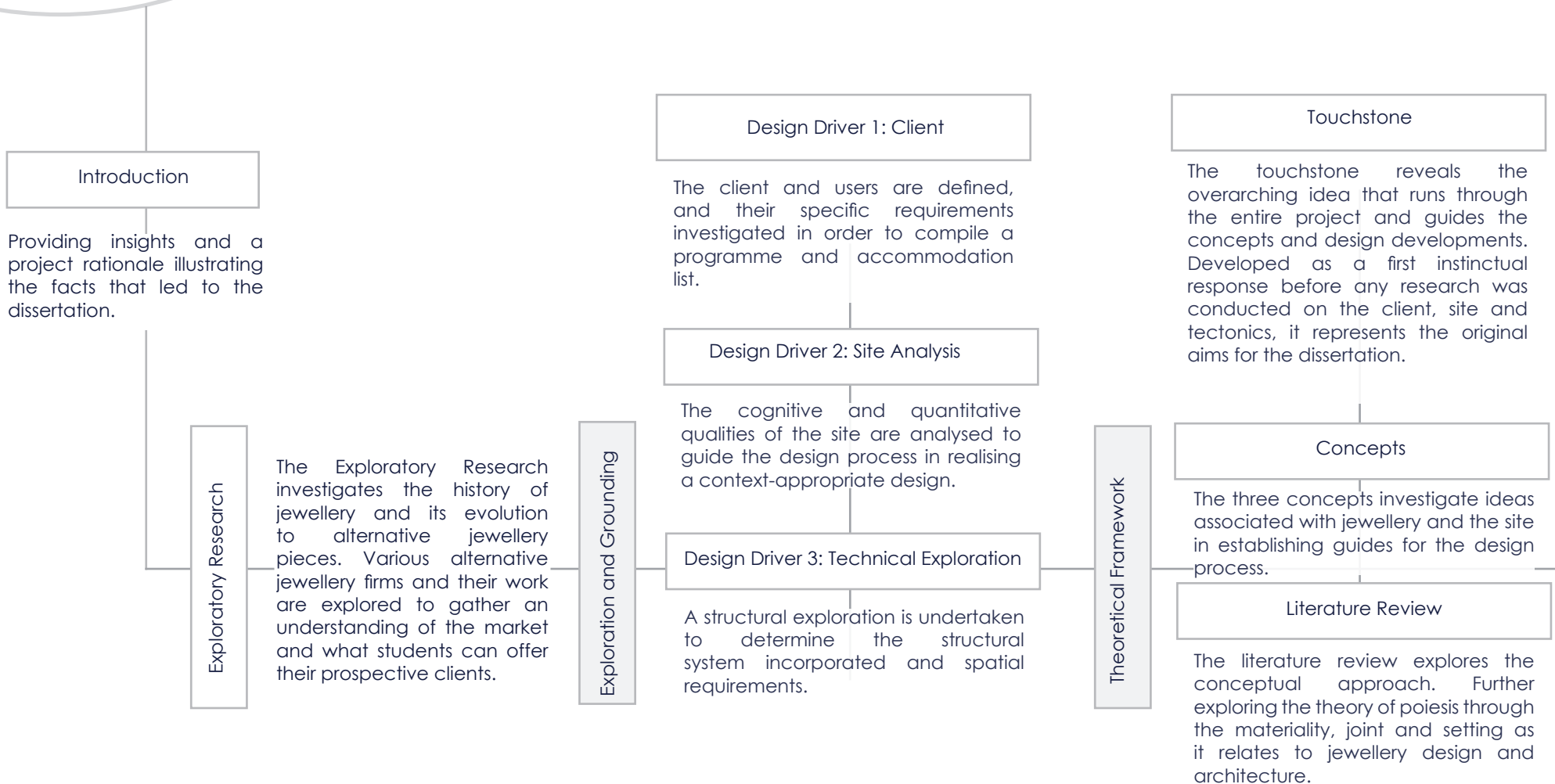
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Research Methodology

The research is structured according to the main design drivers: the client, the site investigation, technical exploration and the theoretical framework.



Design Methodology

The Design Methodology is the conclusion of the design drivers and theoretical framework to determine guidelines that can lead to the final design resolution.

Design Process & Resolution

This section of the project explores and details the design development process and how previous exploratory stages informed it, concluding with the latest design.

Technical Analysis & Reflection

The technical report details the technical resolution of the design. A critical reflection will be undertaken to determine the project outcomes -good and bad - to improve future projects.

Introduction

Contemporary jewellery, as defined by the Cambridge Dictionary (2019: Online), is: "decorative objects made from **gold**, **silver** and **precious stone**." These materials are all sourced through the mining industry, which has various harmful effects on the environment and the people involved (see Figure 1).

Mining practices have various negative effects on miners and their families. The impact on people has been addressed through various mediums such as the movie Blood Diamond, thesis projects and organizations such as the Kimberley Process (KP). This dissertation attempts to address the environmental effects of the mining industry that has not yet been addressed quite so publicly.

The project rationale illustrates the impact of the mining industry. Figure 2 shows the destruction caused to the environment.

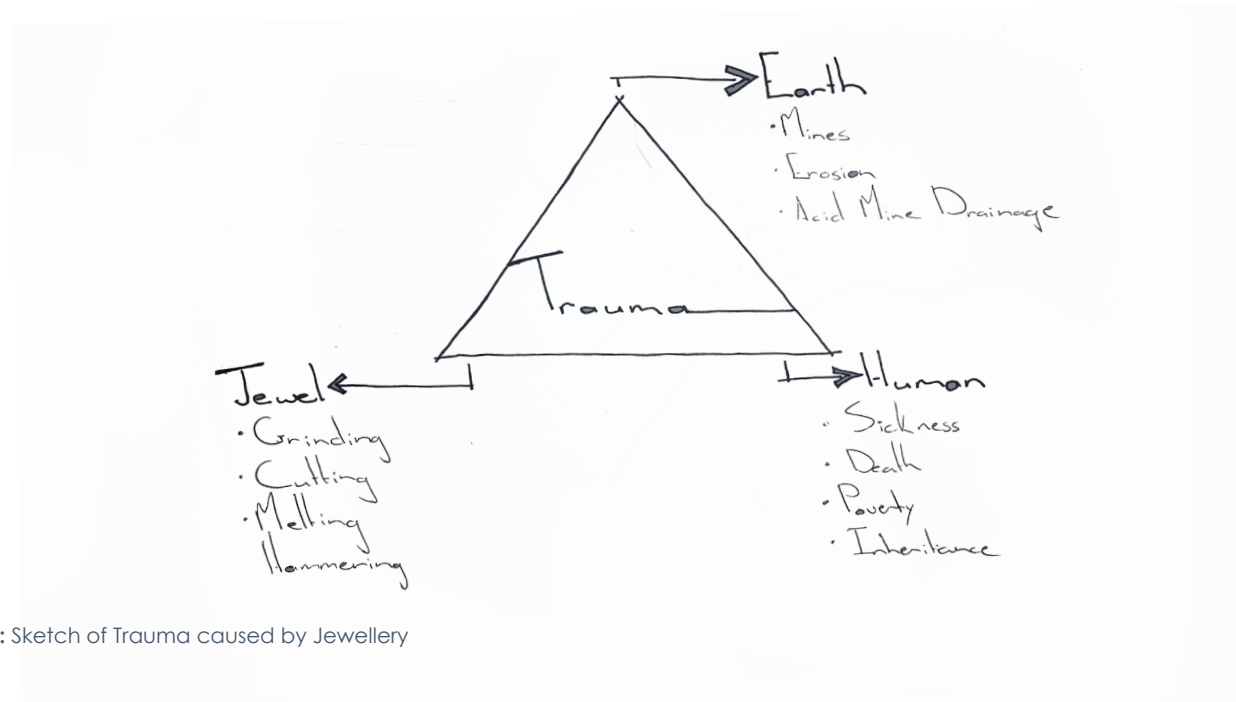


Figure 1: Sketch of Trauma caused by Jewellery

Project Rationale

This year alone, **9140** people died from mining-related causes. (The World Counts, 2019:Online)

Companies mining for gold and other metals dump at least **180 million** tons of toxic waste into rivers, lakes, and oceans each year (Enji Studio Jewelry, 2017:Online).

There is a high risk of spills from the **3500** dams that have been built to hold toxic mine waste (Brilliant Earth, 2019:Online).

In 2014, **25 million** cubic meters of cyanide-laden waste was spilt into lakes and rivers in British Columbia (Brilliant Earth, 2019:Online).

Artisanal mining releases **35%** of the man-made mercury pollution (Brilliant Earth: Online).

Every year, **1000 tons** of mercury is released into the environment every year (Brilliant Earth, 2019:Online).

There is an apparent inequality in diamond sales, as Africa only receives **\$8.5 billion** in diamond sales each year while the global diamond jewellery sales **\$72 billion** (StudyMoose, 2016:Online).

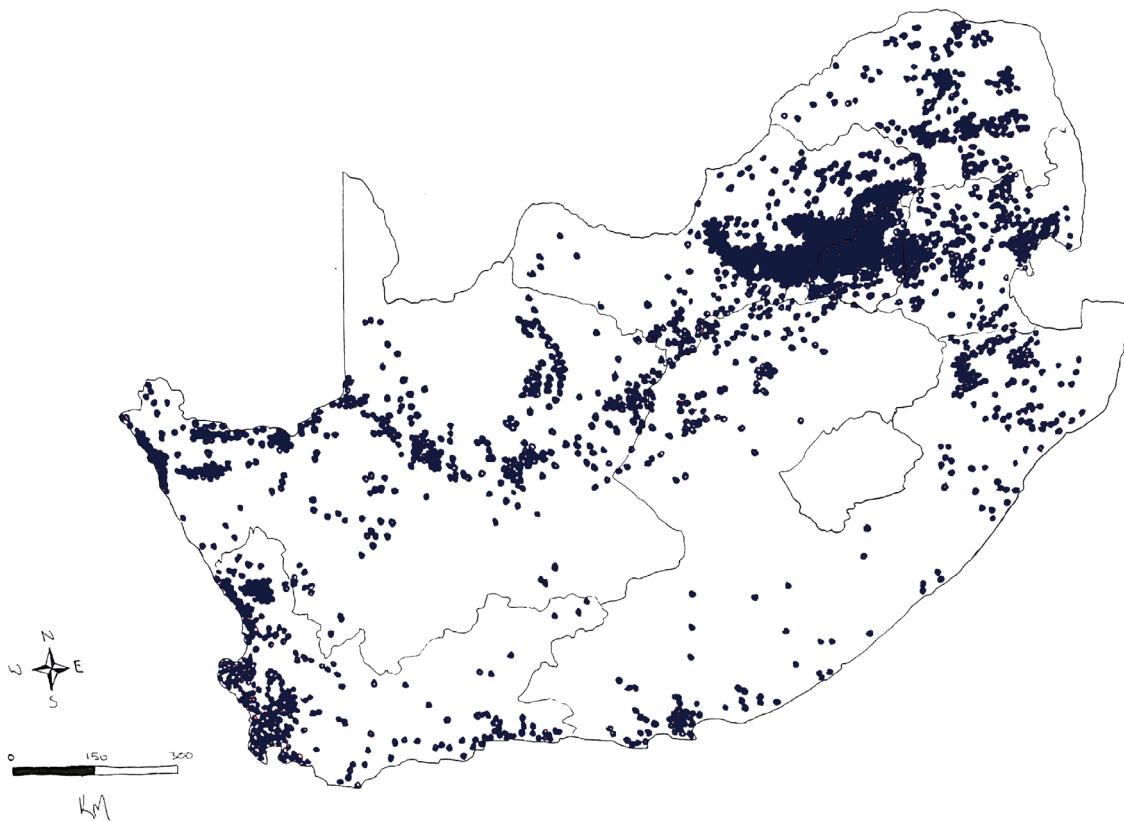
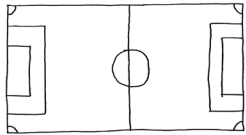


Figure 2: **5906** Abandoned Mines in South Africa

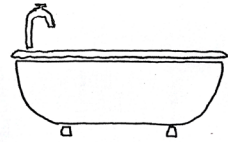
Project Rational

Diamond

The negative effects of jewellery use in an era of consumption



The amount of destruction and unrehabilitated land left behind in the wake of De Beers and spans the equivalent of approximately **2000** football fields (Matthews, n.d.: Online).



The production of a single carat diamond wastes **17** bathtubs or roughly **2535L** of water (Shah, 2014: Online).

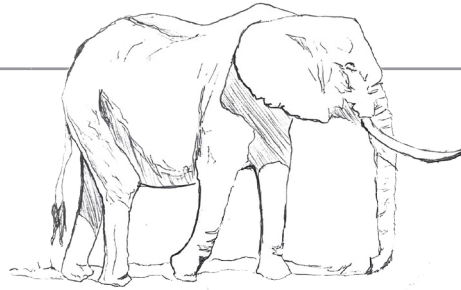


A 1-carat diamond needs **8.9L** of fuel during production (Shah, 2014: Online).



Gold

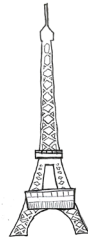
The weight of **7** African Elephants or approximately **26 Tons** in ore and waste are created to produce a single 18-Karat gold wedding band. (Rastogi, 2010:Online)



Tons of cyanide is used daily in the extraction of gold. A dose of cyanide (the size of **1 grain of rice**) can kill a person (The World Counts, 2019: Online).



Gold mining produces the weight of the Eiffel Tower in waste every **42 seconds** (The World Counts, 2019: Online).



It is evident from these statistics that the mining industry has been a primary contributor to the ruination of the environment for the sake of humanity's greed and vanity. There is a dichotomy in the jewellery industry; consumers are only presented with the shiny product and never informed of the environmental impact of mining practices.

The dissertation aims to bring to light the impact of conventional jewellery design and production while fostering a generation of jewellery designers that are critical thinkers. The school will educate students to be more responsible in choosing and sourcing their materials.

An Alternative Jewellery School situated on a site previously used for mining will attempt to change the tourists' narrative of the site. Furthermore, exhibiting the damage done to the earth through mining, on the same route as the mine museum, will provide an alternative narrative that unveils the dichotomy that exists in the jewellery industry.

Research Question:

“How can architecture foster an awareness towards the impact of poiesis?”



Figure 3: Left: Top Star Photograph taken in 2010 „Tales from the City of Gold, a photographic essay by Jason Larkin (Curtis, 2013: Online)

Figure 4: Right: Breaking Down The Dump photograph taken in 2013, Tales from the City of Gold, a photographic essay by Jason Larkin (Curtis, 2013: Online)



Exploratory Research:

The History of Jewellery



Figure 5: Eagle Talons Necklace (Gray, 2015: Online).

The oldest piece of jewellery dating back 135 000 years, was discovered in Croatia. Pieces of eagle talons were found to have marks and holes that correlate to necklace design.



Figure 6: Sea snail shells necklace (Ancient Facts, 2015: Online)

Sea snail shells were used to make beads, found in Skhul Cave in Israel, and dates back approximately 110 000 years.



Figure 7: Mollusc shell (Evans, 2018: Online)

75 000 year old mollusc shell beads found in a cave in Blombos South Africa.



Figure 8: Ostrich shell necklace (Ancient Facts, 2015: Online).

Drilled ostrich shells on a string form a necklace found in Enkapune Ya Muto the Twilight Cave in Kenya. These beads are said to correlate to the era in which a shift in human cognitive abilities occurred allowing imagination and abstract thought (Ancient Facts, 2015: Online).



Figure 9: Stone bracelet (Ancient Facts, 2015: Online).

This stone bracelet was discovered in Siberia dates back 40 000 years (Ancient Facts, 2015: Online).



Figure 10: Varna jewellery (Ancient Facts, 2015: Online).

The Varna civilization in Bulgaria were one of the first civilizations to develop goldsmithing. This Varna grave and discoveries are estimated to date back 4560-4450 BC (Ancient Facts, 2015: Online).



Figure 11: Stained glass necklace (Ancient Facts, 2015: Online).

This stained glass necklace was discovered in Egypt dating back 5000 years. Other jewellery from Egypt includes necklaces and head dressings made from gold and silver.

Conclusion:

The oldest jewellery in the world was made from natural, found objects such as shells, bone, talons and stone. Eagle talons were used in the designing of necklaces while snail shells were transformed into beads. Stones were turned into bracelets and beading was made from glass. Most of the material was sourced above ground having a minimum impact on the environment.

Exploratory Research: The History of Jewellery



Figure 15: Mollusc shells (Evans, 2018: Online)

75 000 year old mollusc shell beads found in a cave in Blombos South Africa.



Figure 12: Ostrich egg necklace (Evans, 2018: Online).

Palaeolithic African jewellery were made from found objects such as shells, bone, wood, ivory, nuts etc. This ostrich egg bead necklace discovered in Sudan is now housed in the Pitt River Museum.



Figure 13: Sea snail bracelet (Evans, 2018: Online).

Cowrie bracelets made from sea snails, symbolises female fertility.



Figure 14: Turkoman (Evans, 2018: Online)

This turkoman pendant necklace is made from Nigerian agate and Ethiopian tselsum beads.



Figure 16: Zulu bead jewellery (African Facts, n.d.: Online).

Zulu bead jewellery communicate a specific meaning and message. Zulu jewellery is used as a form of communication between genders with regards to marital status and sexual intention.



Figure 17: Tribal Jewellery (Evans, 2018: Online).

Traditional jewellery found in a market in Senegal.



Figure 18: Collier Necklace (Evans, 2018: Online).

This collier necklace was made from recycled material in African beading style.

Conclusion:

African jewellery through the ages consists mainly of beadwork. The earliest beadwork was made from shells and stone while most recent beads are made from timber, glass and sometimes even recycled materials. The form and colour of the beadwork convey a specific message and meaning.

Exploratory Research:

The History of Jewellery

Pre-historic Egypt



Figure 19: Broad Collar Egyptian Necklace (Roan, n.d.: Online)

Early Roman and Greek



Figure 20: Greek Crown (History Of Jewellery, 2019: Online)

Middle Ages



Figure 21: Gold Ring (History Of Jewellery, 2019: Online)

Renaissance



Figure 22: Brooch (History Of Jewellery, 2019: Online)

16th Century



Figure 23: Museum no. 724-1871. © Victoria & Albert Museum, London (2019: Online)

Materials Used

Gemstones, bones, shells animal horns, feathers, gold.

Stones, shells, clay and bone, gold

Stones and metals

Pearls, emeralds, rubies, imitation stones

Gemstones, gold

Technique Used

Set in gold, beading

Beading

Inlay, forging

Inlay, forging

Stone cutting, bevelling, enamel, set in gold

Predominant Use

Necklaces, bracelets, rings

Earrings, necklaces, plaques with metal filigree,

Necklaces, brooches

Crown Jewels, rings, chains hidden compartments, bracelets, earrings

Chains, necklaces, rings

Symbolism

Wealth, communication, religious and marital status

Body adornment

Religious status, Used as currency

Wealth, religion, cultural belief

Wealth, religion,

17th Century



Figure 24: Necklace with Sapphire Pendant, bow circa 1660, Europe. Museum no. M.95-1909. © Victoria & Albert Museum, London (2019: Online)

Diamonds, gold

Allowing flowers bows and animal shapes necklaces

Rings necklaces

Mourning jewellery, Social status

19th Century



Figure 25: Bodice ornament in the form of a floral spray, about 1850, possibly made in England. Museum no. M.115-1951. © Victoria & Albert Museum, London (2019: Online)

Diamonds, gold, silver, gemstones

Factory production

Medals, hair jewellery, brooch, earring, cameos

Personal expression, fashion statement

20th Century



Figure 26: Brooch, designed and engraved by Malcolm Appleby, made by Roger Doyle, 1975, England. Museum no. M.314-1977. © Victoria & Albert Museum, London (2019: Online)

Diamonds, gold, precious stones, titanium

Mass production and artisans

All types of jewellery produced

By the masses for self expression and specific pieces by the wealthy

Conclusion:

The evolution of western jewellery through the ages reveals how the materials and techniques have evolved. Natural materials changed to gemstones and precious metals, while hand-made beading transformed to mass-produced items.

Exploratory Research:

Alternative Jewellery

Matter of Material is an exhibition curated by Madeline Courtney, showcasing the work of artists who work with alternative materials. The exhibition engages in discourse on the functionality and ethics of materials used in jewellery design. According to Courtney (Shih, 2015: Online), artists choose alternative materials for practical, ethical or poetic reasons and preciousness does not necessarily align with the cost of the material. Checha Sokolovic was one of the artists chosen to exhibit her work with alternative materials in the Matter of Material exhibition. Sokolovic has a former background in architecture and explores the beauty in construction materials by creating jewellery from concrete. Slovic says, "I find inspiration in polished concrete floors, board-formed concrete walls, old concrete pavements, and sidewalks. Through the simplicity of geometric shapes, I wish to reveal a hidden beauty and elegance found in the construction materials. I think of my jewelry as my miniature architecture." (Shih, 2015: Online)



Figure 29: Jennifer Merchant, Blaze, 2015, brooch, acrylic, paper, 23-karat gold leaf, 14-karat gold, 64 x 64 x 13 mm. Photograph by Jennifer Merchant (Shih, 2015: Online)



Figure 27: Kirk Lang, Stella Chasma, 2015, earrings, titanium, cognac, diamonds, meteorite, 32 x 12 x 16mm each. Photographed by Stella Chasma (Shih, 2015: Online)



Figure 28: Kirk Lang, Stella Chasma, 2015, earrings, titanium, cognac, diamonds, meteorite, 32 x 12 x 16mm each. Photographed by Stella Chasma (Shih, 2015: Online)

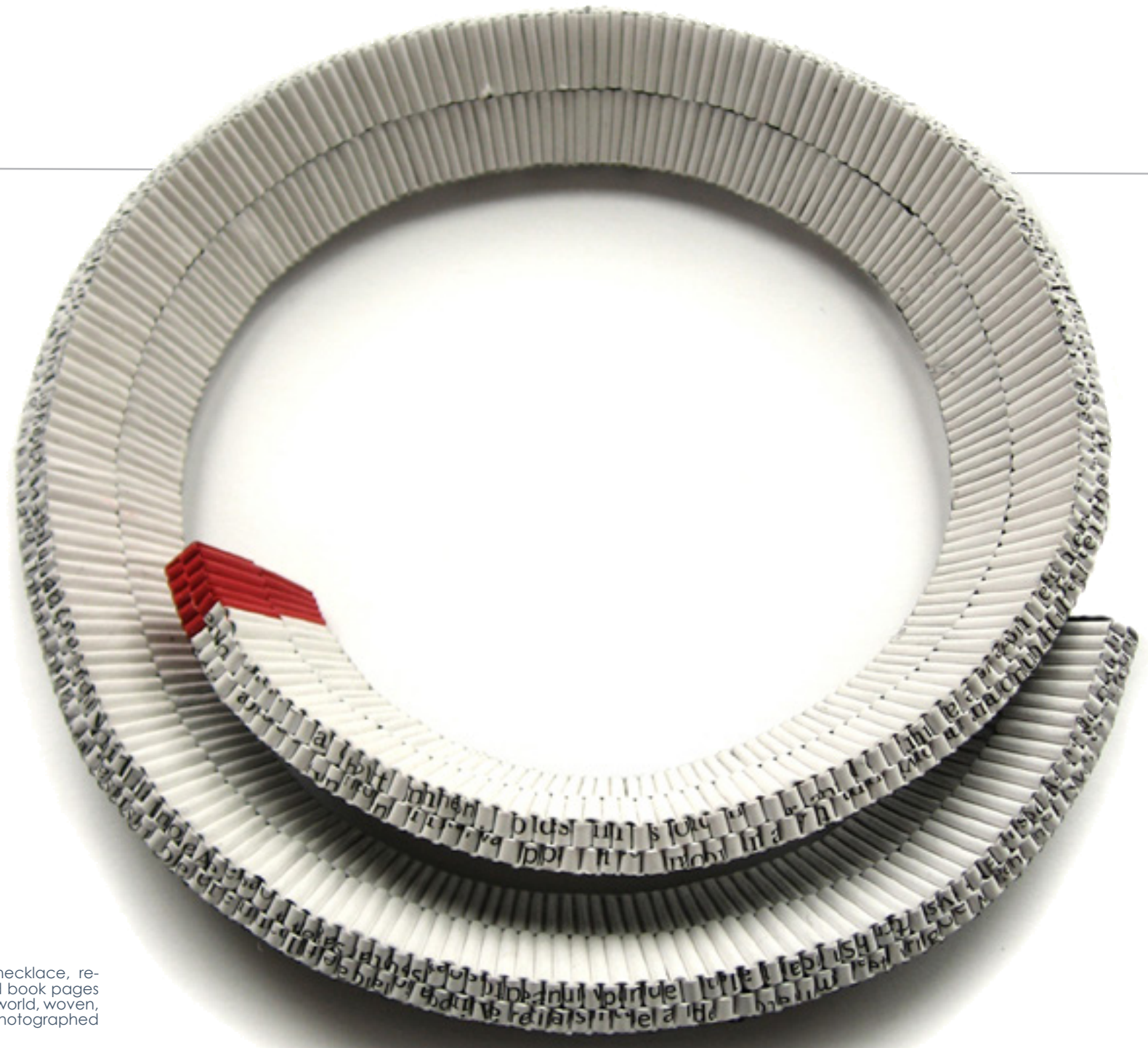


Figure 30: Francesca Vitali, Untitled, 2015, necklace, re-purposed black and white paper, recycled book pages from the book *Speeches that changed the world*, woven, 622 x 25 x 6mm, 178mm inside diameter photographed by Francesca Vitali. (Shih, 2015: Online)

Exploratory Research:

Alternative Jewellery



Figure 31: Cement necklace by Terhi Tolvanen (Kane, 2018: Online).

Dutch jewellery designer, Terhi Tolvanen design alternative jewellery that uses pearls wood and cement to bring her designs to life. Items are collected in nature and translated in to jewellery. Nature is the inspiration and material (Kane, 2018: Online).

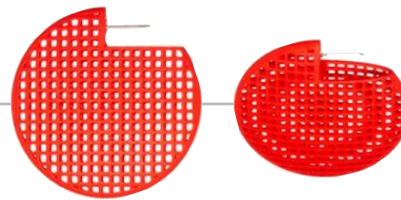


Figure 32: 3D printed earrings by Lynne MacLachlan (Kane, 2018: Online).

Lynne MacLachlan creates 3D-printed jewellery which are bold and colourful. She pushes the boundaries between technology and jewellery exploring digitally created pieces (Kane, 2018: Online).



Figure 33: Resin and Fibre rings by Mariko Kusimoto (Kane, 2018: Online).

Mariko Kusimoto designs and create jewellery made from fibre, resin and metal. She walks the fine line between jewellery and sculpture as not all of her work is wearable (Kane, 2018: Online).



Figure 35: Gold and shell ring by Matter of Fakt (LIONESSES OF AFRICA , 2015: Online).

Matter of Fakt is run by Mary Anne Grobler, who creates chunky jewellery from raw materials and stone (LIONESSES OF AFRICA , 2015: Online).



Figure 34: Jewellery made from recycled precious metals by Ashley Heather (Lioness of Africa, 2015: Online)

Ashley Heather creates jewellery made solely from recycled precious metals found on circuit boards.

"I knew the only way to bring together my dual passions of sustainability and crafting precious metals was to go it on my own - and so, ashley heather jewellery was born." -Ashley Heather (Lioness of Africa, 2015: Online)

Conclusion:

Alternative jewellery is made from various found and altered materials. These materials can include concrete, resin, 3D printing and recycled metals. These unconventional materials are manipulated to create wearable art. The work represented exhibits the diverse materials that can be used. Most of these jewellers choose one style or a few materials to work with and specialise in.

Exploratory Research:

Alternative Jewellery



Figure 36: Christina Toros Brooch: Triple, Dribble 1, 2, 3, 2017 Resin, silver, steel. 3.9 x 2.7 x 2.4 cm From series: Triple Dribble (Klimt02.net, 2019: Online).



Figure 37: Corlia Baard Ring: Untitled, 2018 Silver, thread, salt crystals, steel wire. Photo by: Hjalmar Bekker (Klimt02.net, 2019: Online).

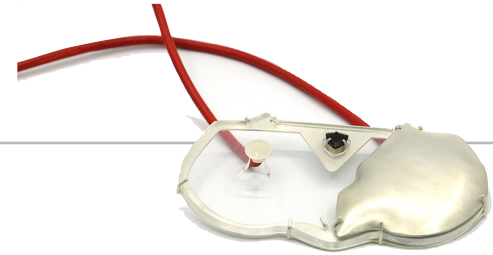


Figure 38: Grace Goss, Neckpiece: Untitled, 2018 Perspex, leather, garnet, silver, steel. 3.9 x 2.7 x 2.4 cm Photo by: Hjalmar Bekker (Klimt02.net, 2019: Online).

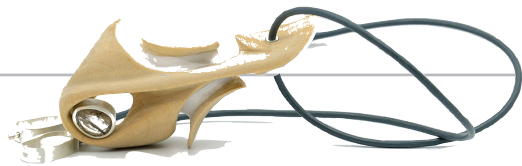


Figure 39: Bongani Mashange Neckpiece: Hybrid Pendant 4, 2018 Wood, resin, leather, quartz, silver. 10 x 7 cm Photo by: Hjalmar Bekker (Klimt02.net, 2019: Online).



Figure 40: Katuska van Heerden Neckpiece: Untitled, 2018 Concrete, leather, silver, steel. 14 x 14 x 2 cm Photo by: Hjalmar Bekker (Klimt02.net, 2019: Online).

Conclusion:

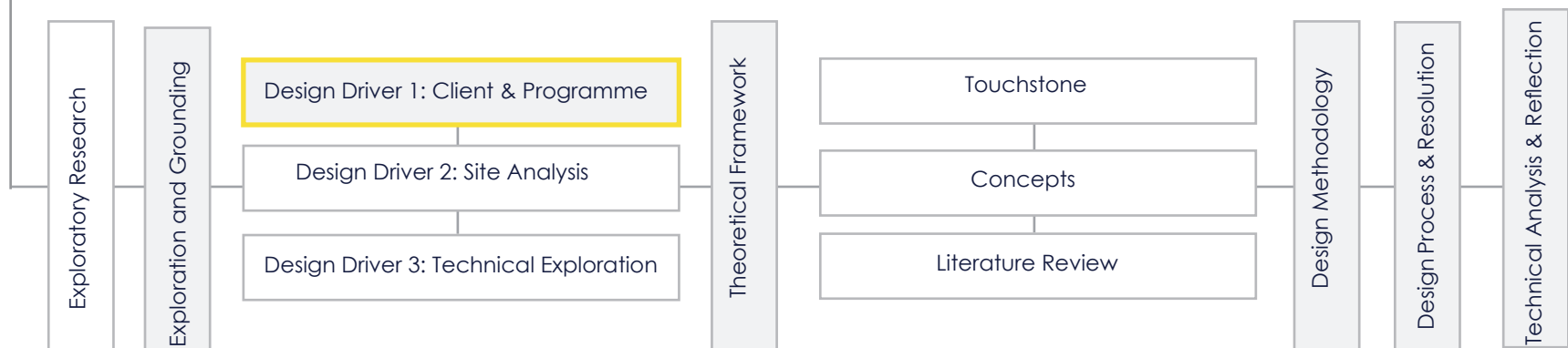
The innovative work presented is the alternative pieces created by the students of Stellenbosch University. It showcases the ingenuity of students and the diversity of materials used. The pieces serve as an example of the type of jewellery that can be produced by the proposed Alternative Jewellery School in Kimberley.

02

Client And Programme

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	-SU Jewellery Department	
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This section of the dissertation explains, investigates and extrapolates the clients' needs and the distinct functions of the programme as it relates to the typology of the proposed project. Challenges and aims pertaining to the client and the function will be presented as well as precedent studies that address similar challenges. This chapter also investigates the two primary users of the building: the tourists and the students. Both users will require different experiences and circulation routes to be designed specifically for their use.



Challenges & Aims

Initial Brief

The brief for the project is to design a hybrid building which is both a jewellery school and tourism centre.

The tourism centre will inform tourists about the adverse effects of contemporary jewellery and offer them alternative options for sale. A flexible exhibition area will allow students to sell their jewellery while a permanent exhibition will inform tourists of the damage done to the environment. A multifunctional space should also be provided for short courses offered to the public or seminars held in the jewellery industry. A restaurant will provide tourists and the public with a quick break along their journey.

The jewellery school functions will include studios, classrooms, workshops, offices and a restaurant for relaxation and recreation. There should be five studios: three for the undergraduate degree and two post-graduate studios for masters and honours students. Workshops that facilitate alternative material processing should be provided to allow spaces for woodwork, glassblowing, casting and laser-cutting. Supporting the teaching facilities are lecture halls, a library and a CadLab.

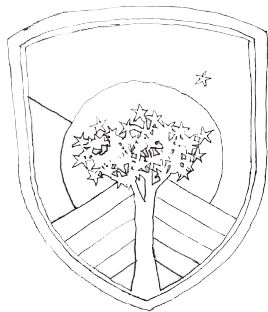
An administrative wing should be provided that supports both the public and student activities together with sufficient storage and refuse areas.

Clients

SPU & JCSA

The project is a joint venture between Sol Plaatje University (SPU) and the Jewellery Council of South Africa (JCSA). Both these entities hope to grow the jewellery industry and economy in the Northern Cape.

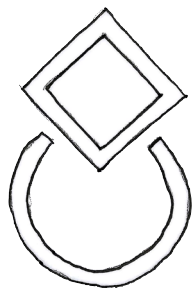
Sol Plaatje University



SPU is the first university established post-apartheid, with a focus on specific skills development in line with the unique characteristics of the Northern Cape (Sol Plaatje University, 2019: online). The university is currently looking at developing future programmes with a focus on sustainability and has laid out the following architectural drivers to be undertaken in the design of a new structure (Sol Plaatje University, 2019: online):

- The campus integration with its host city
- Shared space as a driver for the campus plan
- Accommodating students
- Student and staff mobility
- Collaboration and exchange of ideas
- Environmental sustainability

Jewellery Council South Africa



The JCSA regulates and serves all facets of the jewellery industry and aims to uplift and grow the jewellery industry. The global move towards sustainable and ethical jewellery making has inspired the JCSA to develop a sustainable approach to jewellery making in South Africa. The JCSA (2017: Online) intends to: "make sure our 1580 members act with integrity, responsibility and sustainability in mind". The jewellery school will allow the Council to support and foster accountable jewellers who are able to shape the future of jewellery in South Africa.

Users

Students & Tourists

Students

As this is first and foremost a jewellery school, the students are the most important users. According to SPU, students' spaces need to allow for the 4R's: rest, relaxation, recreation and respite; these spaces should encourage chance meetings that stimulate ideas and creativity (Sol Plaatje University, 2019: online). Forty students are expected for each year group in the first three years of study and 30 students for the honours and masters levels, resulting in a total of 180 students each year.

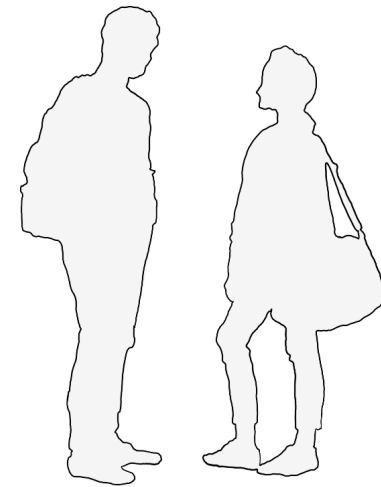
Staff

There will be a Head of School and three degree co-ordinators who need their own offices. Nine additional lecturers will be teaching the various subjects and year groups, resulting in a 1:15 student to lecturer ratio. There need to be at least one receptionist and a curator, together with at least two workshop managers, a librarian and a CadLab technician. An office or space should be provided for the cleaning manager as well as the restaurant staff.

Tourists

Tourists are essential users of the Alternative Jewellery School, and the exhibition centre should be designed as a space that both informs and incites. As the school is situated on the tourist route, it is an additional tourist attraction for the economy of Kimberley while showcasing the work of students to a broader public.

"In South Africa a new tourism is required that would boost other sectors of the economy and create entrepreneurial opportunities for the previously neglected groups and be kind to the environment; that will bring peace, prosperity and environment for all South Africans." - Nazila Najafi (2014: Online)



Accommodation List

Education

Studios 5 @ 60m ²	=300m ²
Workshops area in studio X5 @15m ²	=75m ²
Workshops X3 @ 60m ²	=180m ²
Library	=150m ²
Exhibition space	=150m ²
Classrooms 3 @ 70m ²	=210m ²
CadLab	=60m ²
.....	=1125m ²

Administrative / Support Facilities

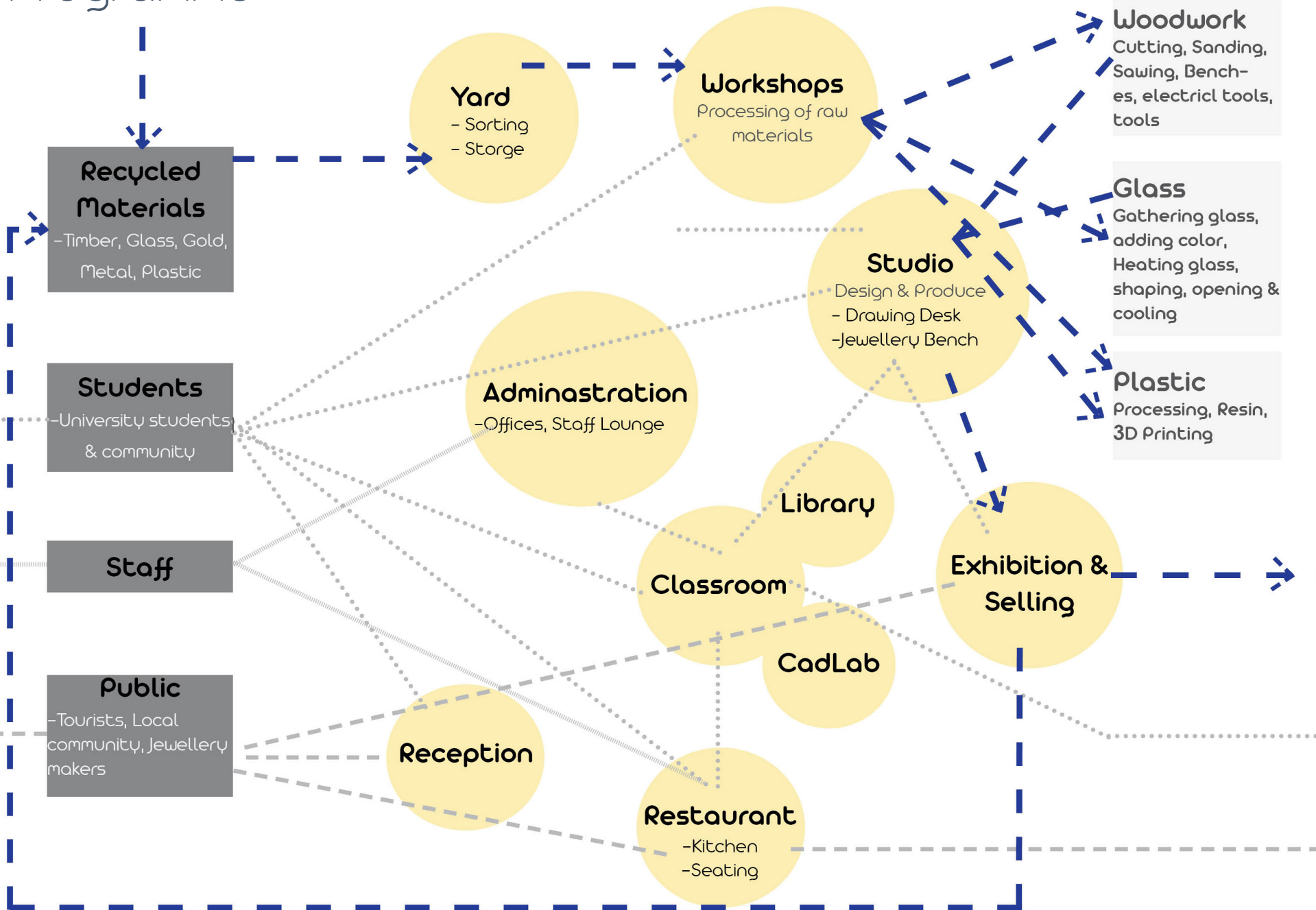
Reception	=20m ²
Offices X8 @ 15m ²	=120m ²
Staff Lounge.....	=80m ²
Storage.....	=30m ²
Student Ablutions	=50m ²
Staff & Public Ablutions	=30m ²
Student Seating	=150m ²
.....	=570m ²

Tourist

Restaurant	=70m ²
Exhibition	=120m ²
Ablutions.....	=30m ²
.....	=220m ²

TOTAL	=1915m ²
-------------	---------------------

Programme



Precedent Studies

Alex Monroe Studio

Architects: DSDHA
 Location: London, UK
 Area: 310m²

The building features a three-storey addition to an existing Edwardian style shopfront on the ground floor. The existing ground floor facade was left mostly untouched while the addition of the three floors has vertical cladding. Openings in the vertical cladding line up with the window heights on the street (see Figure 45). The cladding is a subtle grey-brown colour that fits in with the context of the street (DSDHA, 2013: Online).

Figure 41 shows the vertical distribution of the functions, from the most public functions on the ground level to the more private functions such as the student social spaces on the roof terrace. The ground floor has a shop that sells jewellery to the public. The first and second floors are studios and workshop spaces that are situated near the ground floor and basement for distribution purposes. The third floor and roof terrace are separated from the public ground floor by the studio and workshop floor, allowing a quiet meeting space. The roof terrace allows the jewellers a relief from the production process and a view of the city.



Figure 42: Alex Monroe studio photographed by Dennis Gilbert (DSDHA, 2013: Online).



Figure 43: Alex Monroe studio photographed by Dennis Gilbert (DSDHA, 2013: Online).

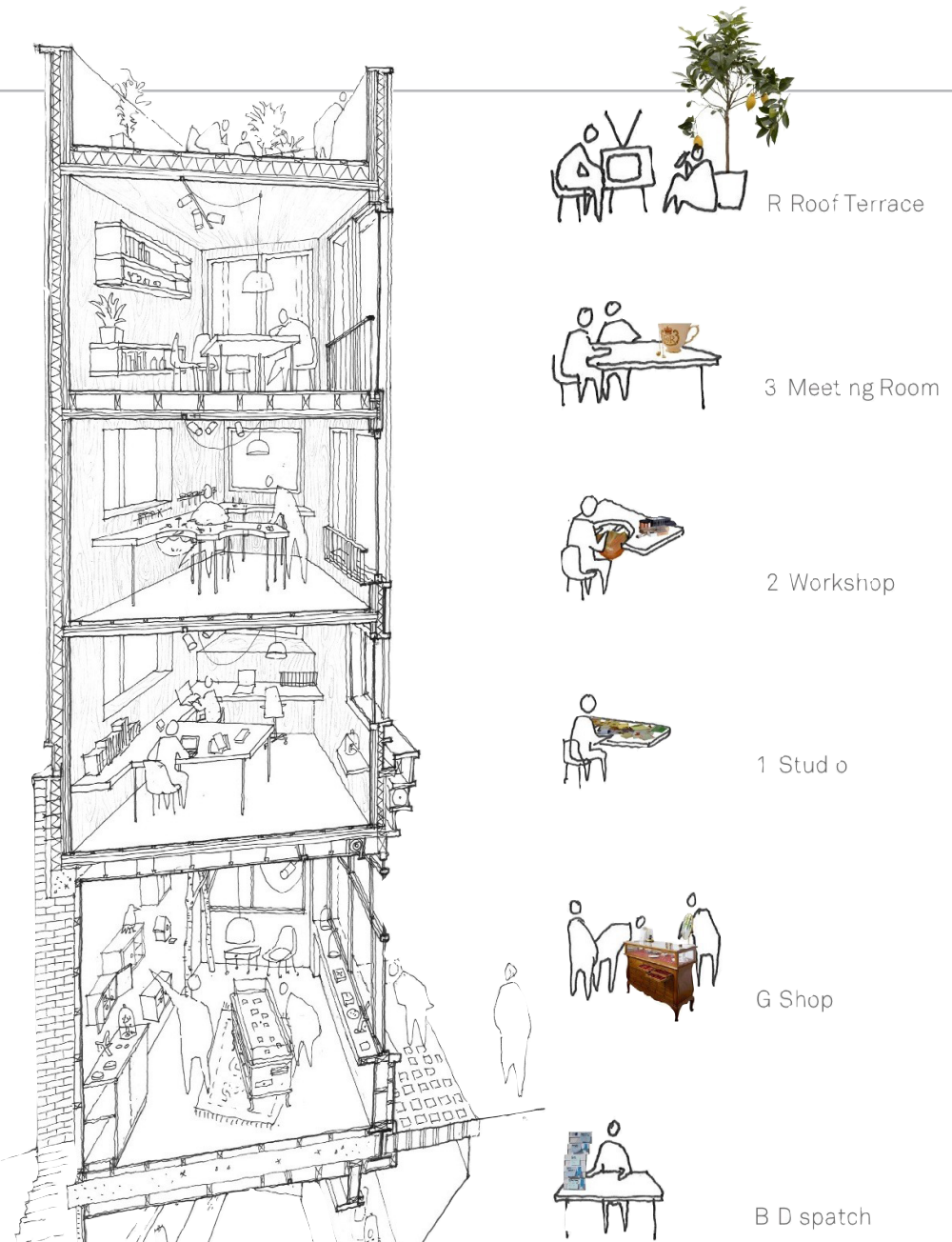


Figure 41: Hand drawn section by the architect (DSDHA, 2013: Online).

Lessons Learnt

- Placing the most private places further away from the street.
- Different lighting options in the studio allow students to use the most appropriate lighting for a specific task.
- Openings in the new structure, line up to existing window heights in the street.
- The colour of the new structure aligns with the tone of the street elevation.

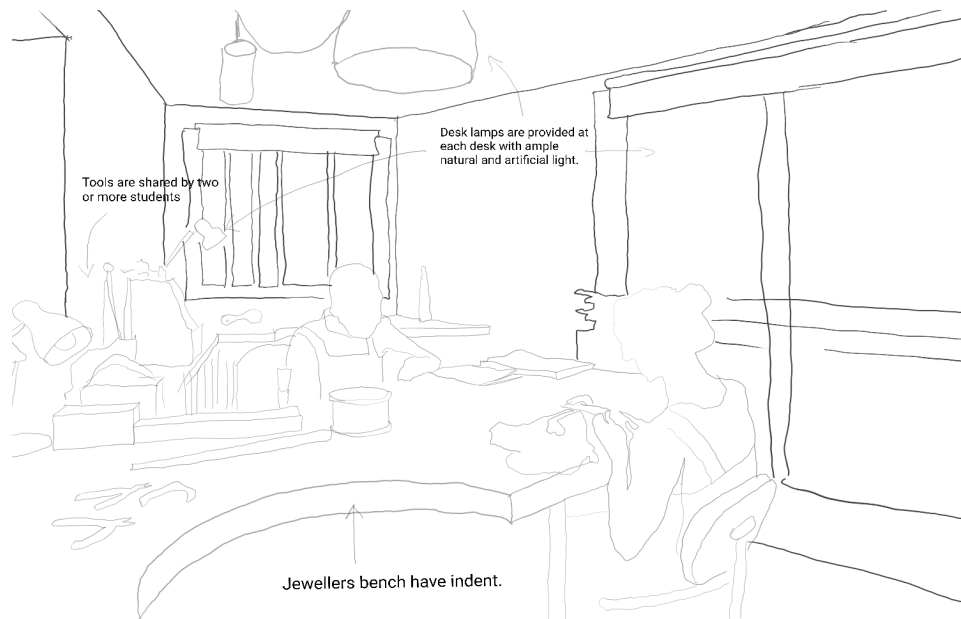


Figure 44: Skets of jewellers studio (DSHA, 2013: Online).



The street level facade especially the age of the

Figure 45: Skets of Alex Monroe Studio. (DSHA, 2013: Online).

Case Studies

Stellenbosch University (SU) Jewellery Department

SU is currently the only University in Southern Africa that offers undergraduate and postgraduate degrees in Creative Jewellery and Metal Design.

“The Division focuses on the development and innovation of contemporary and conceptual jewellery, as well as engendering critical academic discourse. Within this framework, design is understood as sensitive to both new contemporary trends and the historic roots of jewellery manufacture. Age-old techniques are continuously re-interpreted in the light of new concepts, thereby feeding into the ever-evolving realm of contemporary jewellery so as to provoke, critique, record, and transmit.” -SU (Klimt02.net, 2019, Online)

The undergraduate degree is a four-year course that combines theory with technical and conceptual training. 2D, 3D drawing and conceptualising skills are taught to establish innovative jewellers that will stimulate a diverse discourse in the jewellery industry.

Techniques taught in the first year:

Fly press forming, hollow form construction, texture rolling and printing and etching.

Techniques taught in the second year:

Cold joint utilisation, chasing and repoussé, toolmaking, smithing and intricate square wirework.

Techniques taught in the third year:

Enamelling, wax carving, lost wax casting, die-press forming, smithing, patination, oxidisation, cold mould production, fold forming and an introduction to platinum bench work.

Fourth year students work on personal designs where they interpret and utilise learned techniques.

The master's programme offers students the opportunity to do independent research that makes a creative contribution to the discipline of visual art. The course consists of practice and theory research. The programme is strictly an independent study with no prescribed work, very similar to the master's program in the architecture department.



Figure 46: Student Workshop (Klimt02.net, 2019: O



Figure 47: Smithing Workshop (Klimt02.net, 2019: O



online)



Figure 48: Postgraduate Studio (Klimt02.net, 2019: Online)

Challenges

The project houses two very different functions, of which one is public (tourism), and one is semi-private (school). Aligning these two functions in a building will need to address the thresholds and edges between the spaces. The two functions should be able to operate separately. There will be instances when students need to work late nights in the studios and other instances where events will be held in the multifunctional hall at night. The planning should allow for the separation of functions but also allow them to be used in conjunction for school events. Awareness should be maintained of the processes occurring within the studios and workshops to allow optimal functioning.

Aims

The workshops should be able to facilitate all the processes involved in contemporary jewellery making. The school should further integrate with the CBD, becoming a mediator for chance encounters between students, tourists and the community. Designing liminal space in which students and tourists can interact in a safe space might be achieved by using the restaurant as a shared function. The design should implement security features or edges that deter the public from entering the private spaces when needed.



Online)



Figure 49: Casting Room (Klimt02.net, 2019: Online)

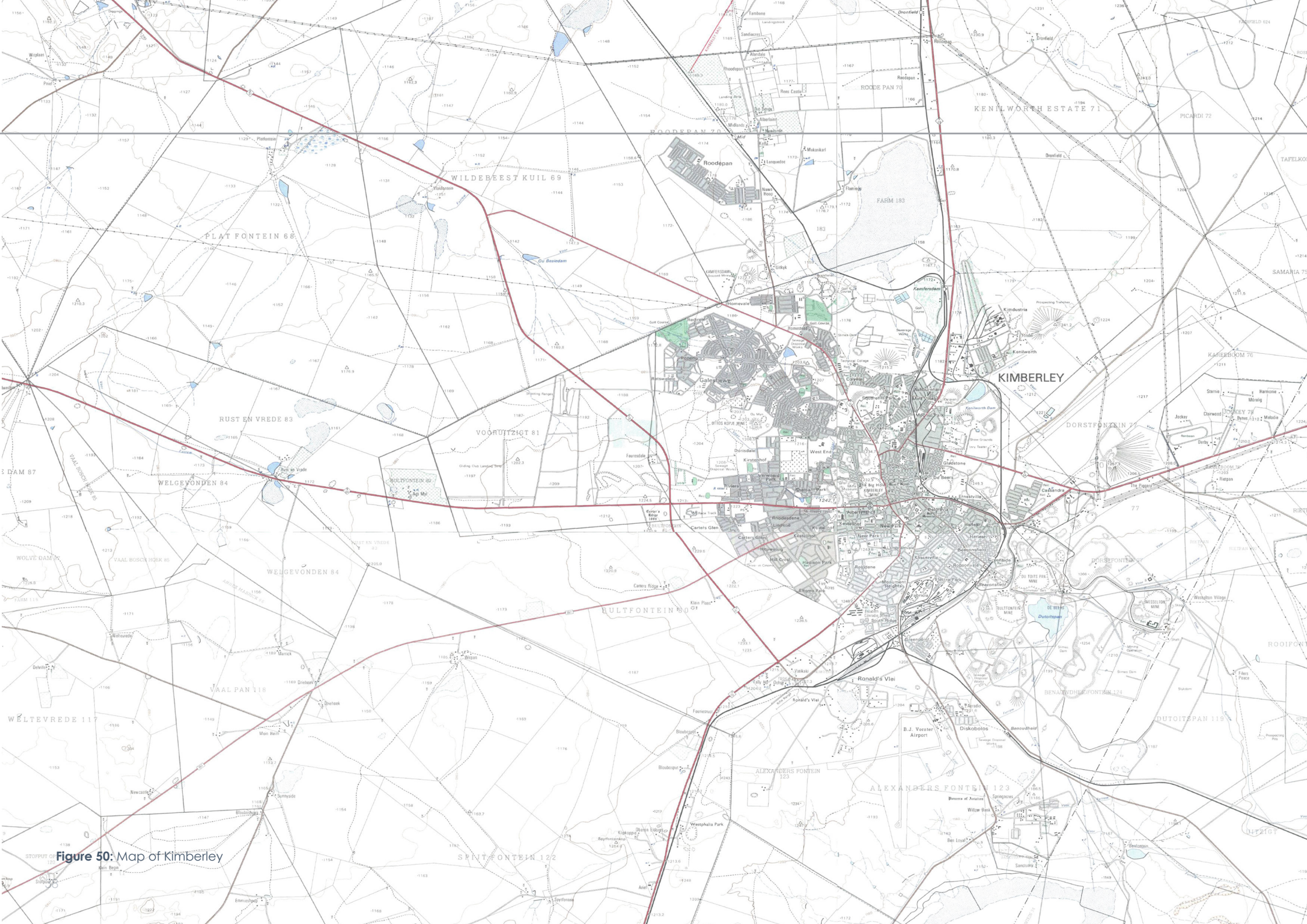
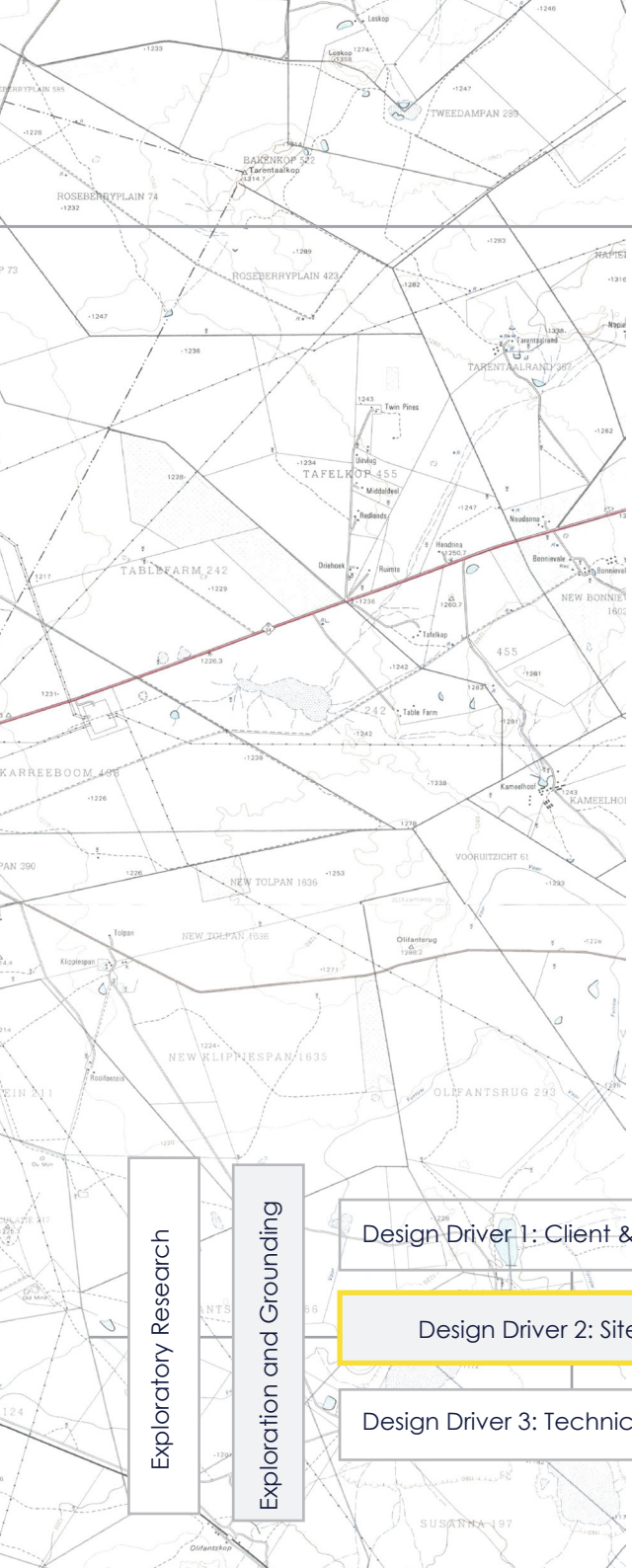


Figure 50: Map of Kimberley

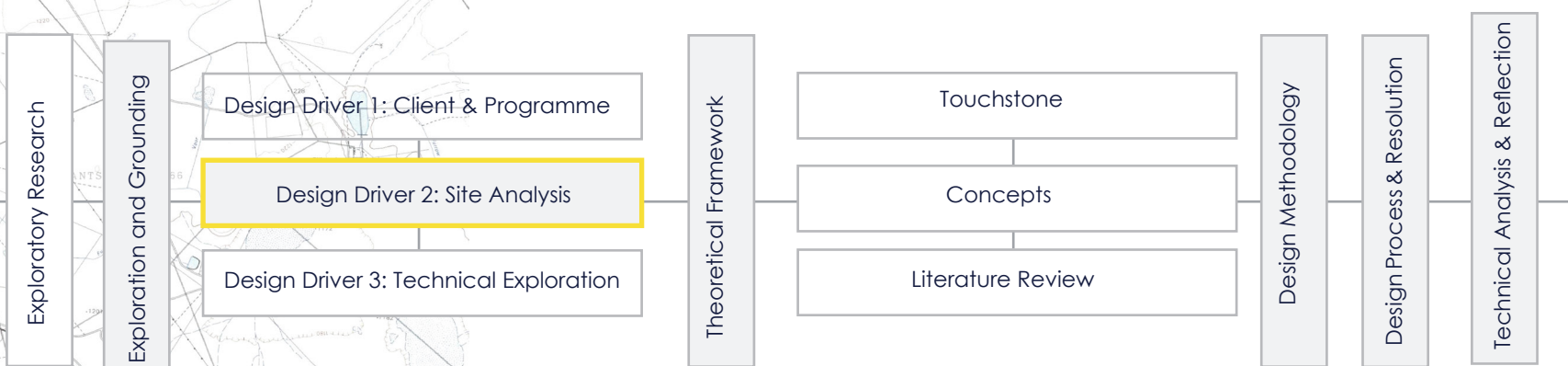


03

Site Investigation

3.1	Location	p40
3.2	Kimberley History	p42
	Macro Analysis	p46
	Meso Analysis	p48
	Micro Analysis	
3.3	Cognitive Analysis	p56
3.4	Motivation for Site	p60
3.5	Climate	p62
3.6	Challenges and Aims	p63
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	-SPU Resource Centre	

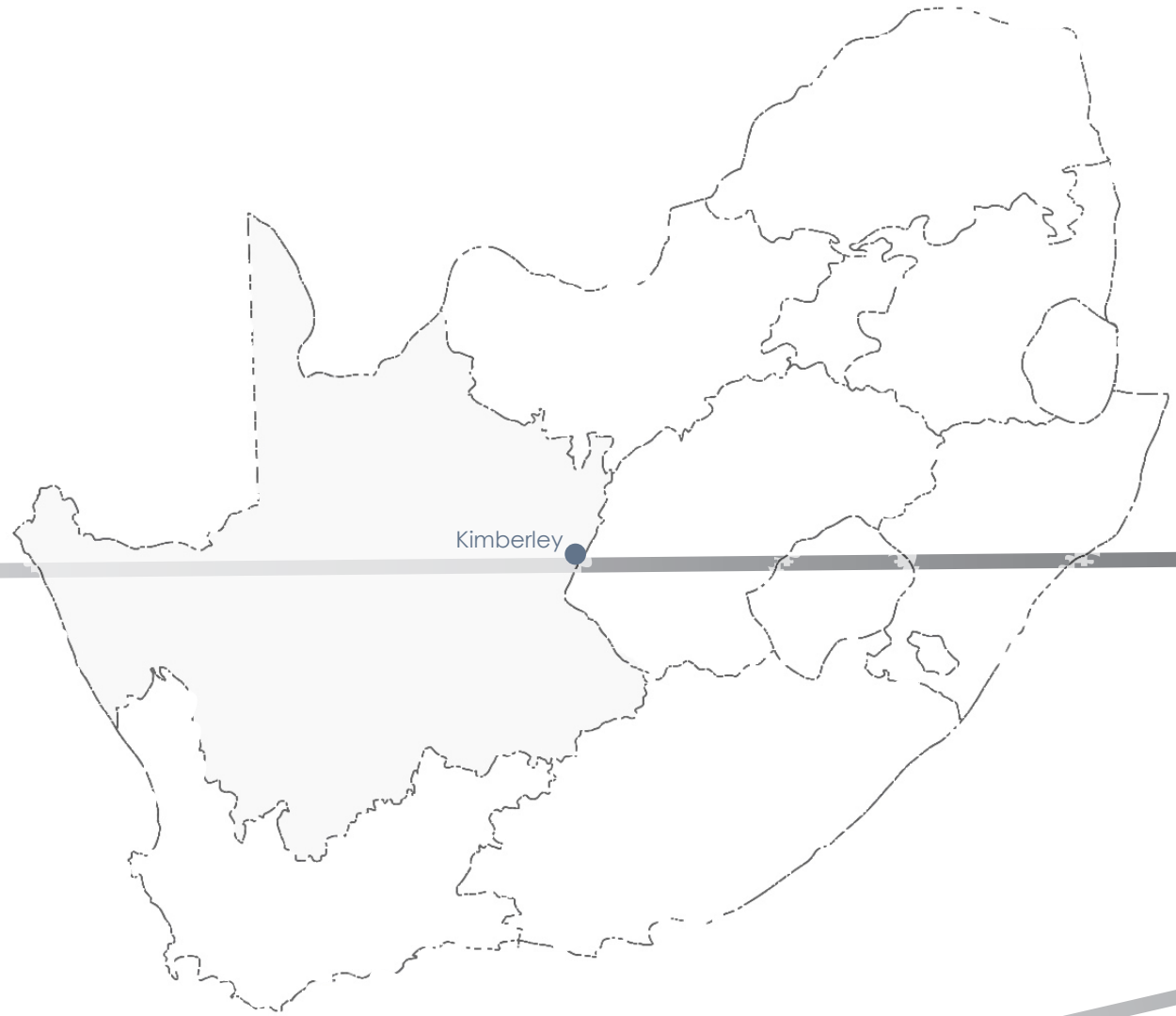
The chapter investigates the influence of the site and context on design decisions and the reasons behind the site decision. The site was analysed by investigating a brief history, the macro-, meso- and micro-scale as well as the quantitative and cognitive site analysis.

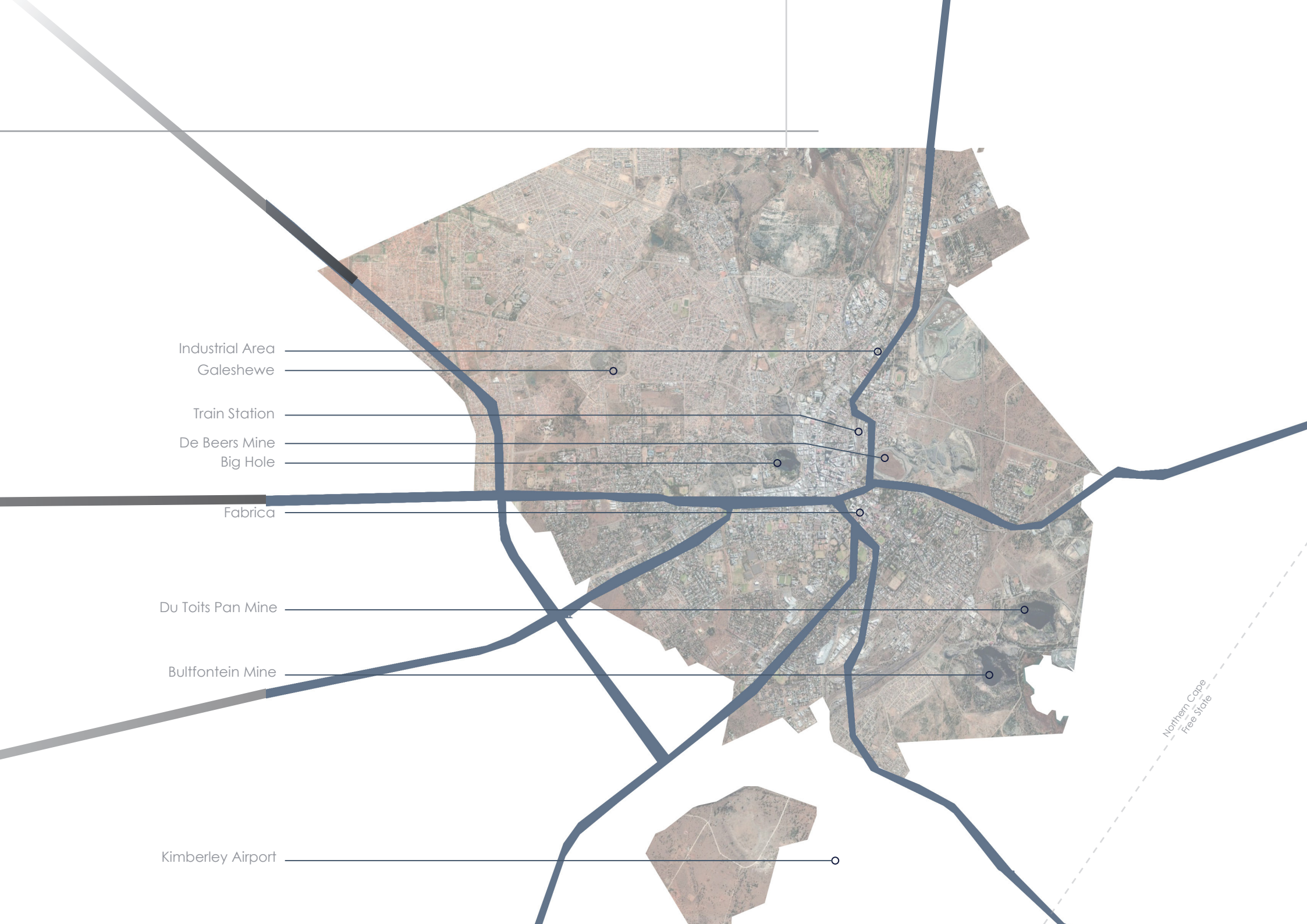


Site Location

-Macro

Situated on the eastern border of the Northern Cape province, Kimberley is 479 km from Johannesburg and 954 km from Cape Town, located 1230m above sea level. It is most famous for its diamond mining. The biggest hand-dug diamond mine, the Big Hole, is located in the heart of Kimberley.





Industrial Area
Galeshewe

Train Station

De Beers Mine
Big Hole

Fabrica

Du Toits Pan Mine

Bullfontein Mine

Kimberley Airport

Northern Cape
Free State

Kimberley History

In the 1800s diamonds were discovered incidentally in the riverbanks of the Vaal and Orange Rivers. Shortly thereafter, miners also found diamonds on the Du Toits Pan and Bultfontein farms. These farms were initially used as a stop-over for diggers on their way to the Orange River panning sites until one traveller stumbled upon a diamond on Bultfontein farm which sparked a flurry of diggings in and around the area. Kimberley grew fast and haphazardly around the mining sites with buildings rising overnight to support the diggers from across the world. The CBD formed haphazardly between the Big Hole and the De Beers Mine. The development of the town supported the operations of the mines, and in turn, the mines supported the growing CBD. The history of the city is evident to this day in the street layout of Kimberley. The streets between the Big Hole and De Beers Mine are as irregular as the rise of the town.



Figure 51: Drawing of the Diamond Fields (Lunderstedt, 2008, p.3)



Figure 52: Diamond market area Kimberley mine (Graham Leslie McCallum, 2014: Online)



Figure 53: Kimberley mine 1873 (Graham Leslie McCallum, 2014: Online)

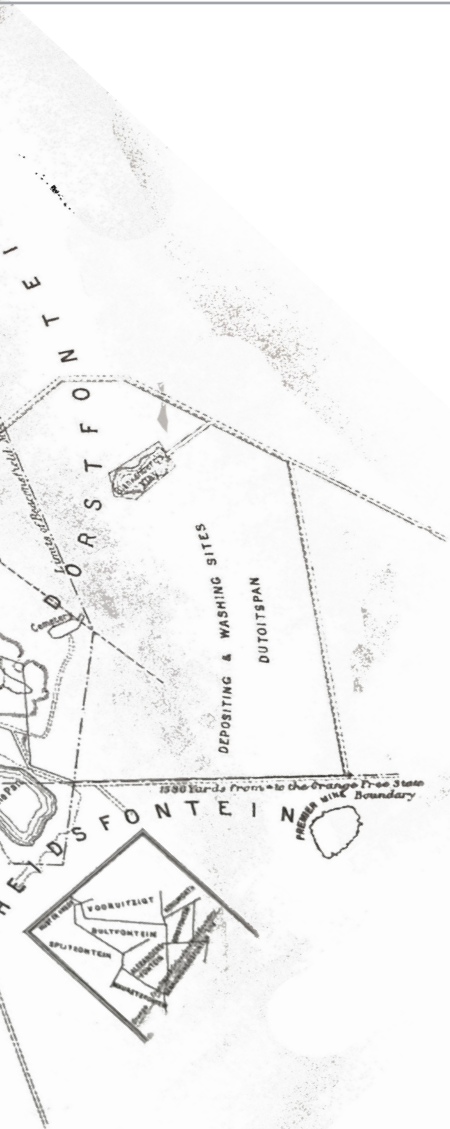


Figure 54: Kimberley Mine 1871 (Graham Leslie McCallum, 2014: Online)



Figure 55: Kimberley Mine 1871 (Graham Leslie McCallum, 2014: Online)



Time-line of the Big Hole

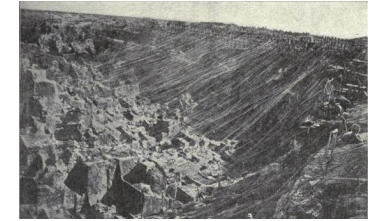
1866 The Eureka diamond discovered by Erasmus Jacobs.



1870 The second gold rush triggered by dry diggings at the Bultfontein and Du Toit's Pan farms.

1872 Kimberley population rises to 13 590.

1877 50 000 people encamped at all mines surrounding Kimberley at the peak of the diggings.



1869 First diamond rush triggered by 'The Star of South Africa' an 83.5-carat rough diamond discovered by a Griqua Herdsman.



1871 Kimberley mine discovered in July.



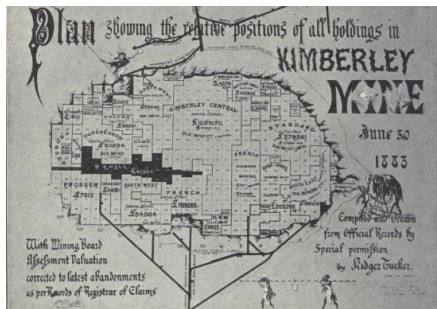
1876 Diamond prices drop by 30%



1882 Kimberley is the first town to install electric street lighting.

1887 De Beers gain full control of Kimberley Mine.

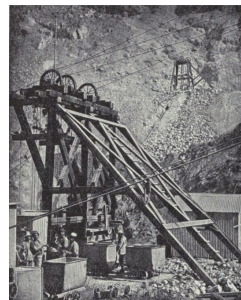
1914 Kimberley Mine closed



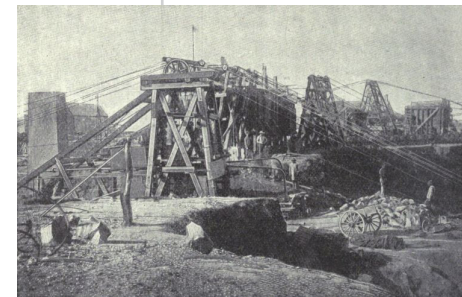
Five years after Jacobs found the Eureka diamond, the Kimberley Mine (the Big Hole) was discovered. In only 13 years the largest hand-dug mine was excavated, from a small hilltop until 230m below ground. In 1884 underground digging began reaching depths of 1097m below ground by the close of the mine in 1914. A total of 14 504 566 carats were extracted.



1878 The 287.42 carat Tiffany diamond discovered.



1884 Underground digging begin at the Kimberley Mine.



1889 Headgear constructed at Kimberley Mine.

Site Location

Kimberley is situated in the Northern Cape province. The N8 connects Bloemfontein to Kimberley; while the N12 connects Cape Town to Johannesburg and runs through Kimberley. The N8 that passes through Kimberley, connects to Bultfontein Road and becomes Pniel Road. The Big Hole and the site lies to the left of the Pniel Road.

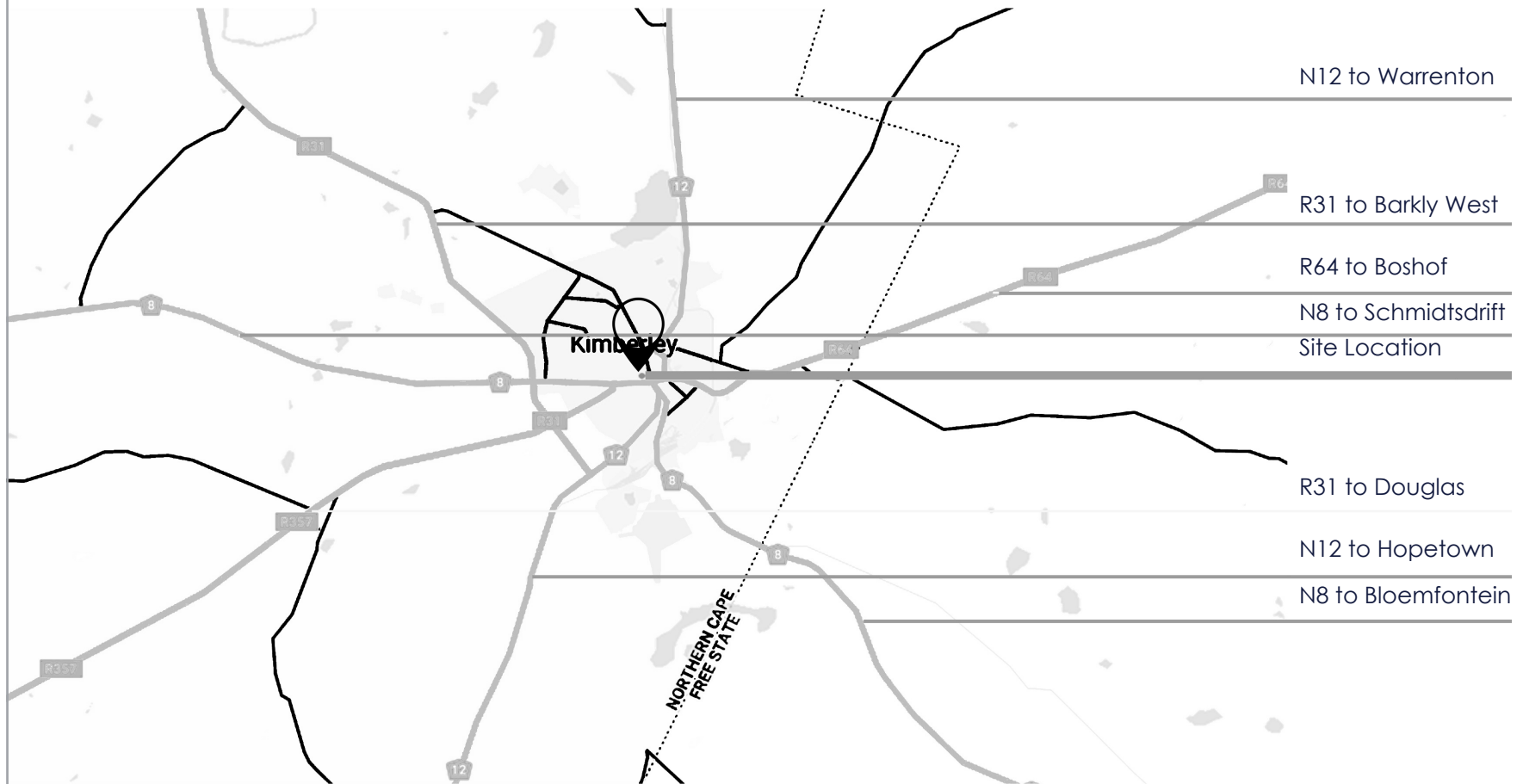
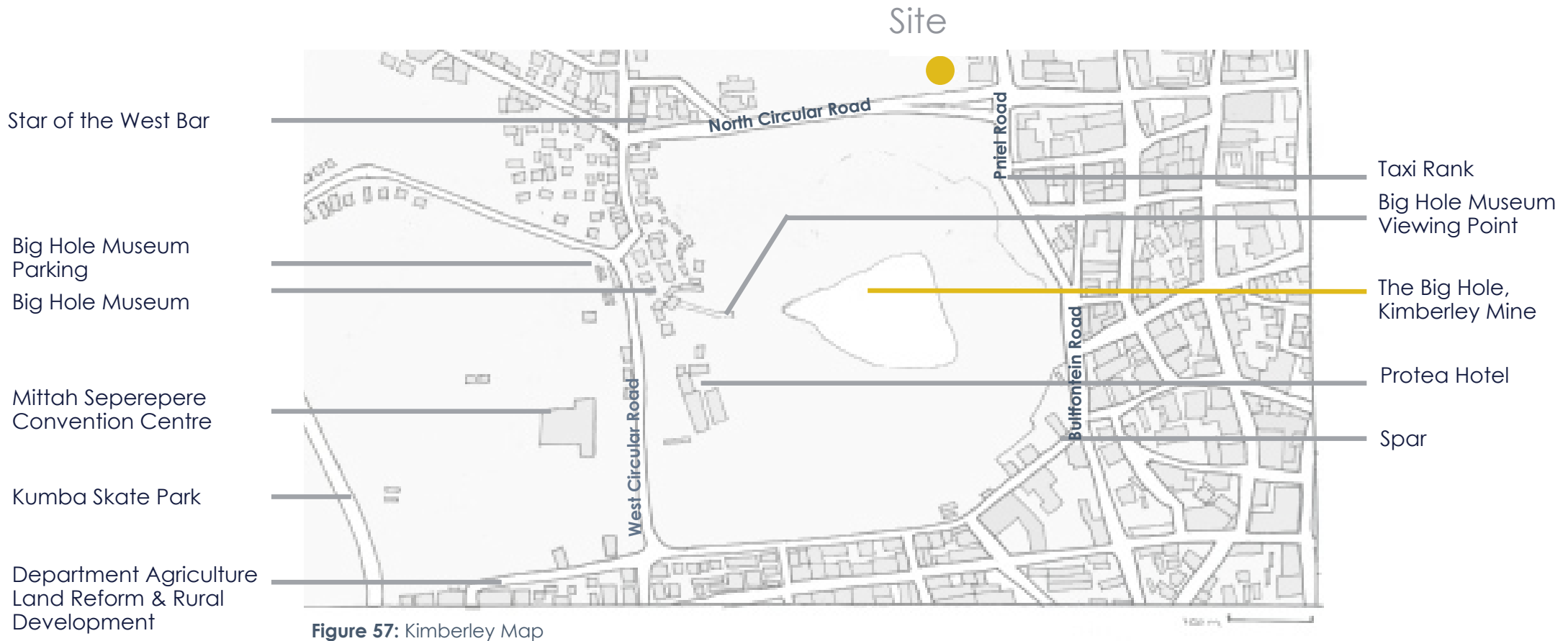


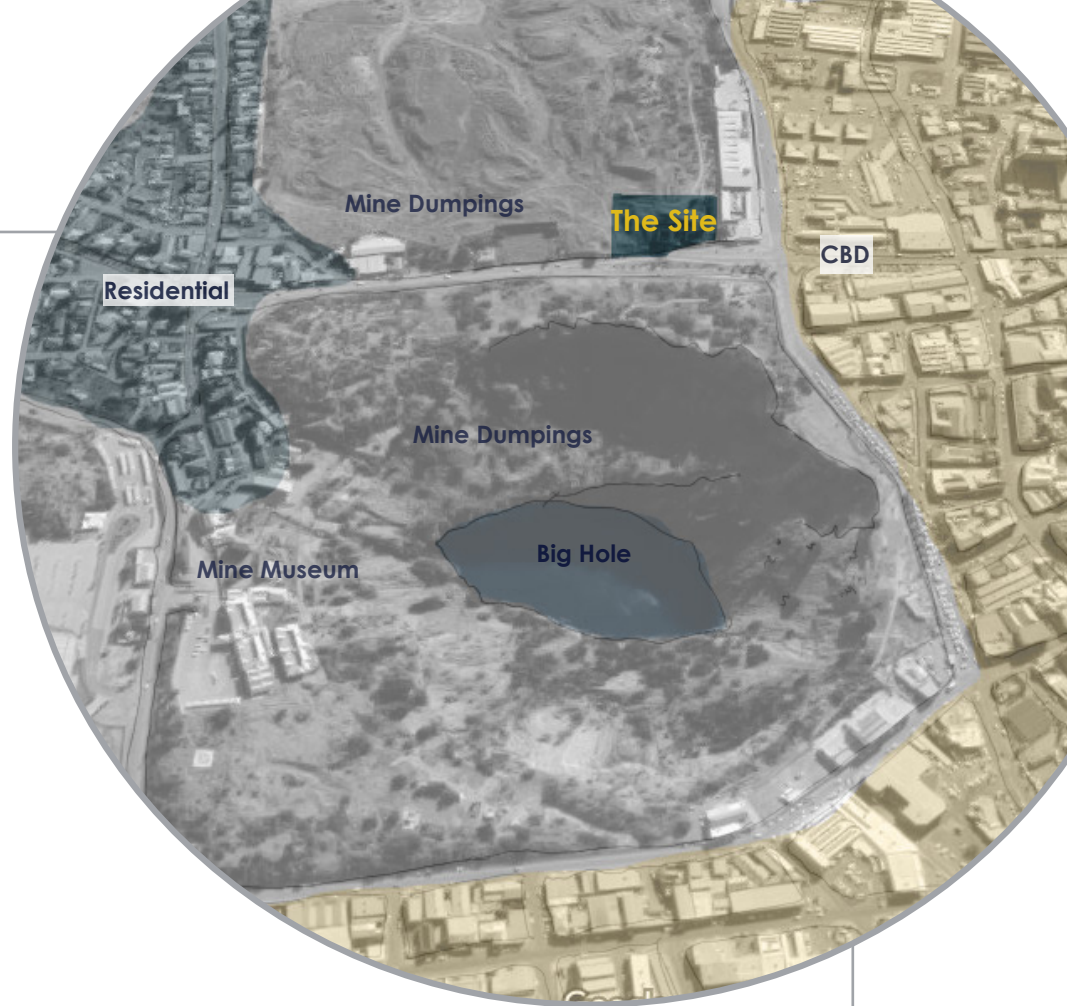
Figure 56: Kimberley Map



Site Analysis

-Messo





The selected site lies to the north of the Big Hole on North Circular Road. The Big Hole is on the edge of the CBD and lies to the left of Pniel Road. The industrial zone is located towards the north-east and east of the CBD. Towards the north-west are the communities of Galeshewe, Gemdene and West End. The new Sol Plaatje University is located towards the south.

The Big Hole Mine Museum is situated west of the Big Hole with a large convention centre opposite the road. The Star of the West is a well-known bar situated in the North-West corner of the Big Hole. The site is situated towards the north-east corner of the Big Hole. As seen in Figure 58, the site is located between the commercial buildings of the CBD and the residential developments of Gemdene.

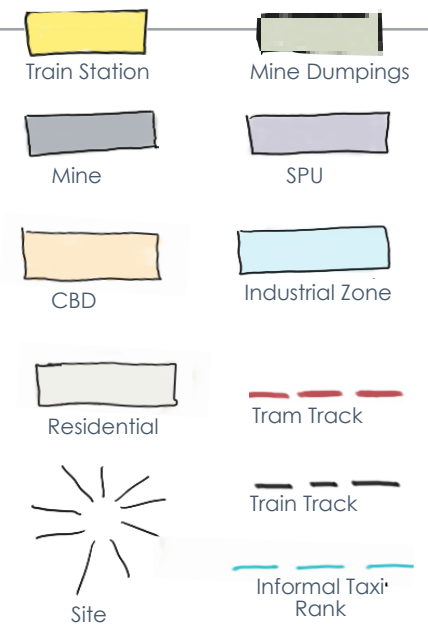


Figure 58: Kimberley Map

Soil

The soil condition surrounding the Big Hole was a concern as the surrounding infrastructure shows signs of wear and erosion. Research has since shown that the selected site is safe for development as monitoring and prevention techniques ensure the least amount of wall break to occur (see Geotechnical Analysis p132 for a more thorough analysis of soil conditions).

Transportation

Due to the soil conditions, Bultfontein Road adjacent to the south-east corner of the Big Hole has been disintegrating and exhibiting significant cracks. It has been closed for public use and has since become an informal taxi rank. This informal public transport node is a mere 150m away from the site, allowing ease of access for students.

A tram track has been built from the Big Hole to Market Square during the peak of mining activity in 1887 (Kimberley City Portal, n.d.: Online). It is still in working condition and allows tourists to take a 20-minute ride around Kimberley, past historical sites such as the Star of the West bar, De Beers Consolidated head office and the abandoned mine Rock Shaft, which is the selected site for this project. As the tram track is already in place, an opportunity exists to utilise it for public transportation.

Central Business District

The CBD was the life force behind the mining activities. However, in recent years, development has been to the south of the CBD. Decentralised developments such as the Diamond Mall and the SPU draw activity away from the CBD, resulting in a neglected CBD, which lacks investment and economic support. Most of the mines around Kimberley have closed down, resulting in a significant drop in the economy. The Mine Museum was De Beers' attempt to rectify the damage done to the economy, when the mines closed, by replacing a mining economy with a tourism economy.

The Sol Plaatje Municipality has developed an integrated development plan that strongly encourages inner-city development, as a "vibrant and viable CBD is critical to the future development of Kimberley." (Sol Plaatje Municipality, 2008, p. 21).

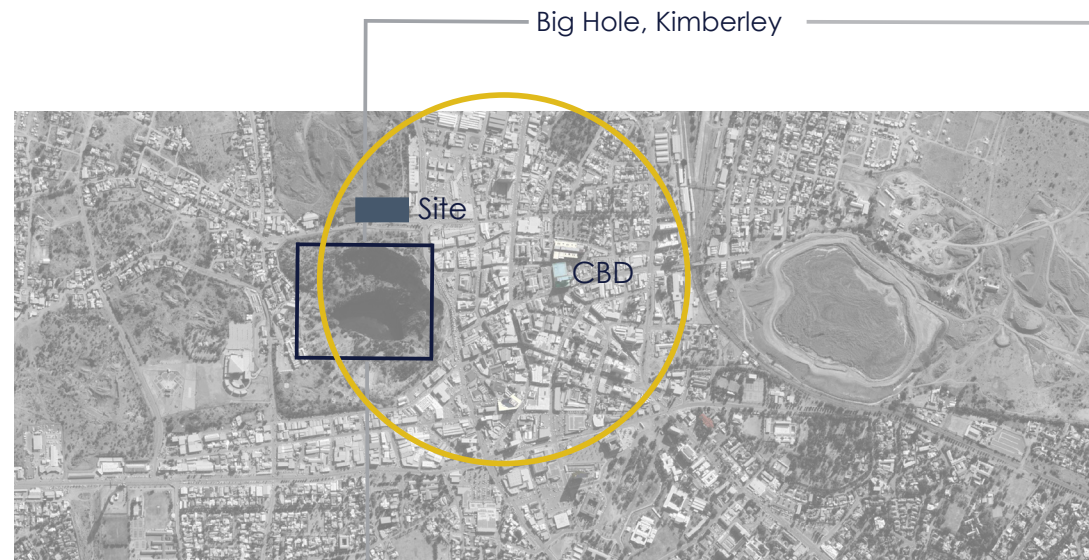


Figure 59: Kimberley Map

Site Analysis

-Micro

The existing structure on the site is the ruin of the Mine Rock Shaft and is the last remaining built structure used for mining the Big Hole. It was built in 1889, and although this structure is approximately 130 years old, it has not been listed as a heritage site.

During operation, the building was used to hoist workers and waste rock in and out of the Big Hole utilising steam-powered engines and headgear. This building was, in essence, the heart of mining at the Big Hole; it has since been abandoned and left to decay. It is currently derelict and overgrown with plants after De Beers abandoned the structure and moved the headgear and steam-powered engines, placing it within the complex of the Mine Museum as part of their exhibition.

The Mine Rock Shaft was a building of immense importance to the mining activities during the peak operation of the Big Hole. The miners would have been unable to dig as deep as they did without it, and the Big Hole would possibly not be as significant as it is today. The dissertation proposes the use of a building that was instrumental in the problem to be the first to affect change towards a solution.

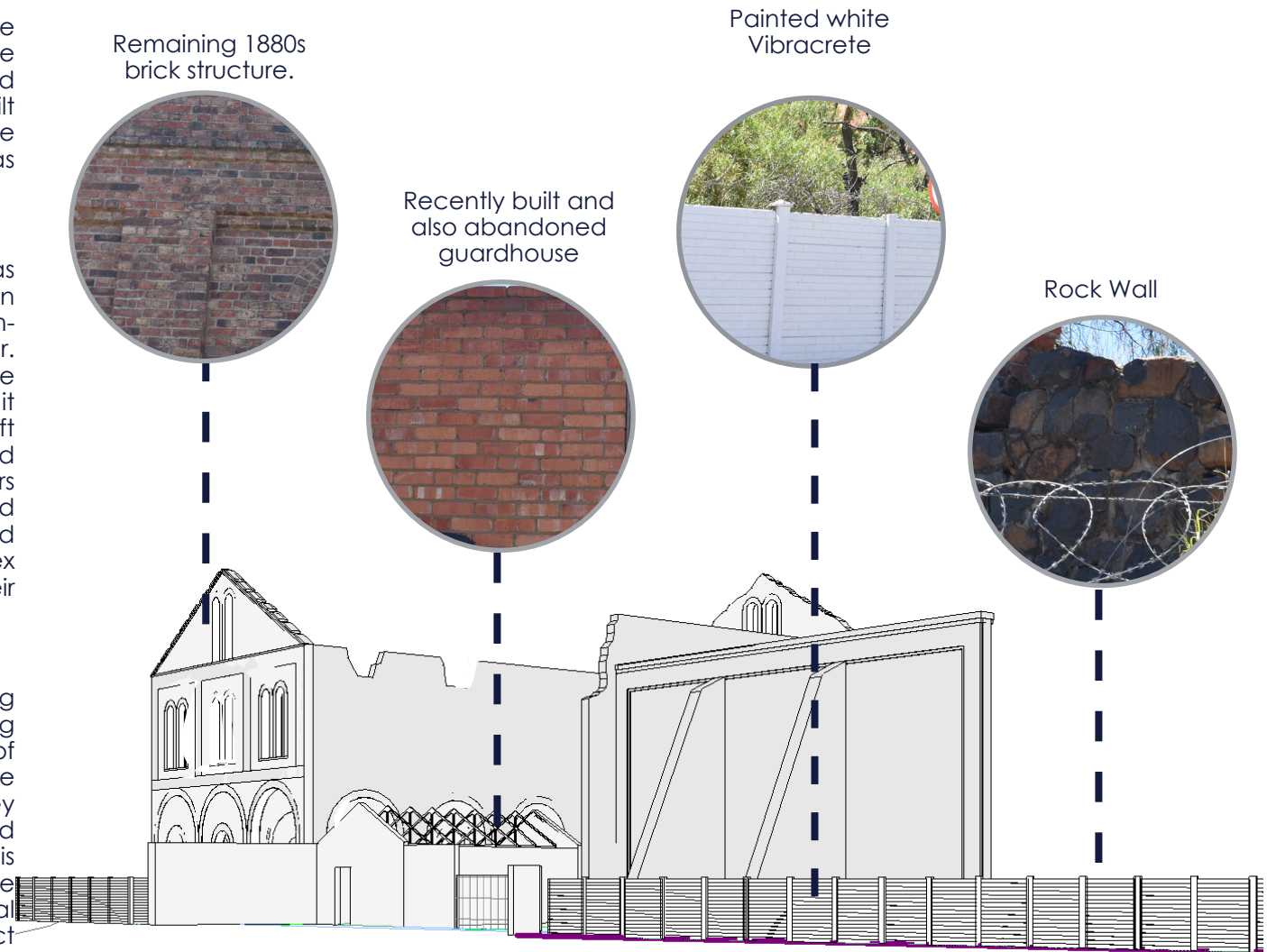


Figure 60: Photographs of the Mine Rock Shaft

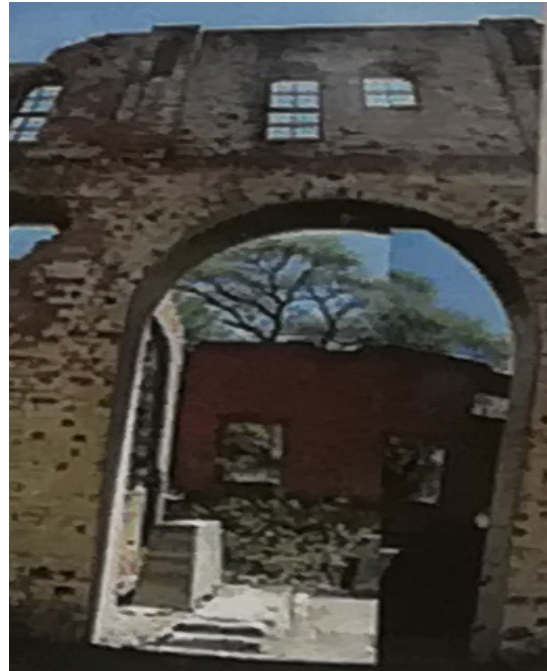


Figure 62: Photographs of the Mine Rock Shaft by M. Lotz (2013)



Figure 61: Photographs of the Mine Rock Shaft

The site and the Mine Rock Shaft face the Big Hole. However, the hole is not visible from the site as a man-made synthetic landscape of mine dumping has completely obstructed any views. Further mine dumpings can be observed to the north and west of the site, giving the impression of a natural landscape rather than an urban setting. The site becomes the mediator between the urban fabric to the west and the synthetic landscape to the east

To the east of the site is a youth development centre located in a building built in 1901. This is the only building adjacent to the site.

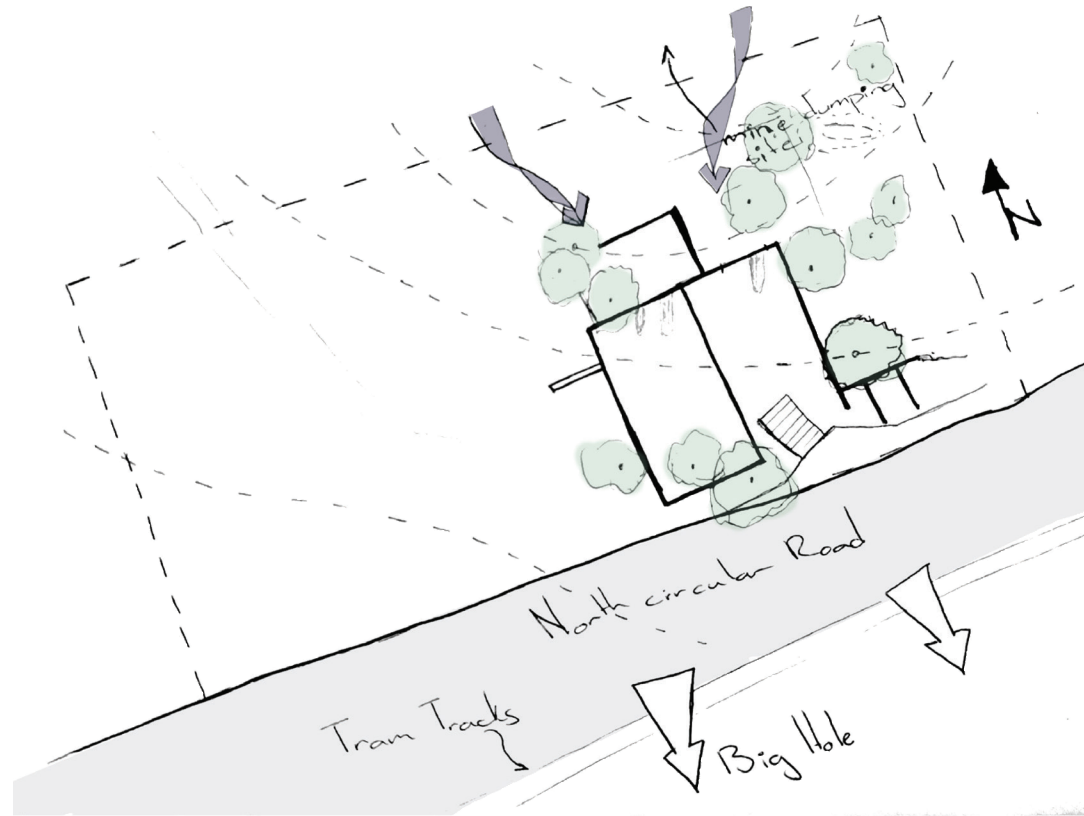


Figure 65: Sketch of the Site



Figure 64: View from site towards the Big Hole.



Figure 63: Youth Development Centre to the East of the Site

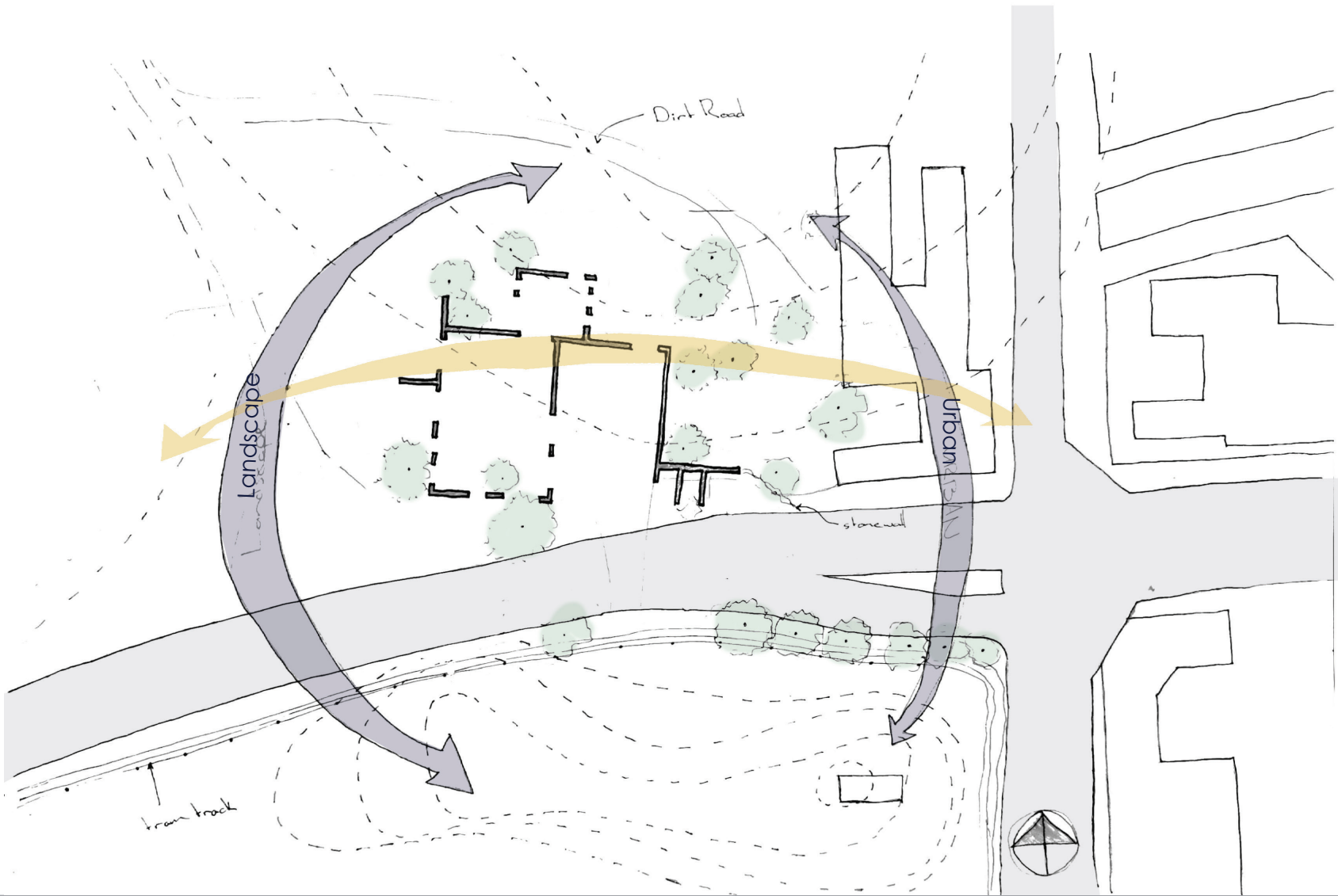


Figure 66: Sketch of the Site

Cognitive Analysis

Mine museum entrance from parking lot

The parking and the pedestrian entrance are situated across the road from the Big Hole and are only accessible through the parking lot and underpass. The environment around the Big Hole has not been made pedestrian-friendly by either providing seating, shade or an aesthetically pleasing view.

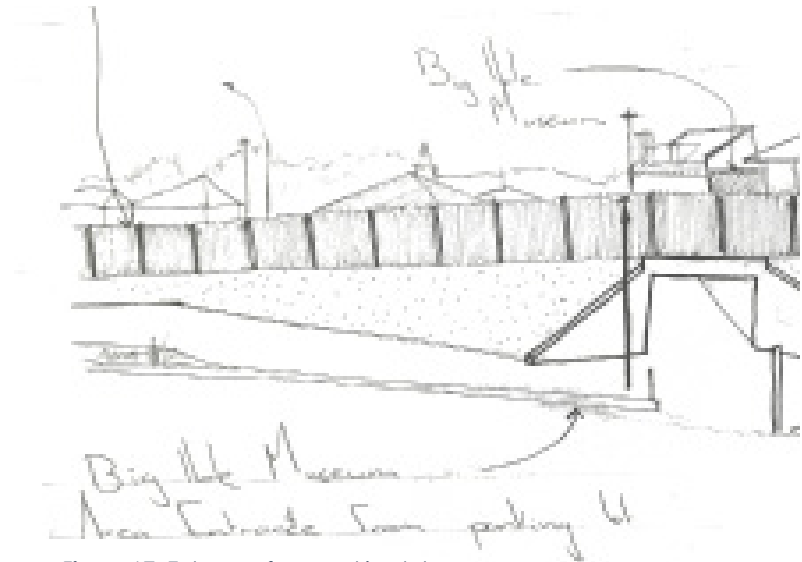


Figure 67: Entrance from parking lot

Historic Tram Station on the corner of North Circular Road and Tucker Street

The old seemingly desolate tram station building is perched on the outskirts of the Big Hole. This was once the centre point of all activity in town, now barely visible behind fences and barbed wire.

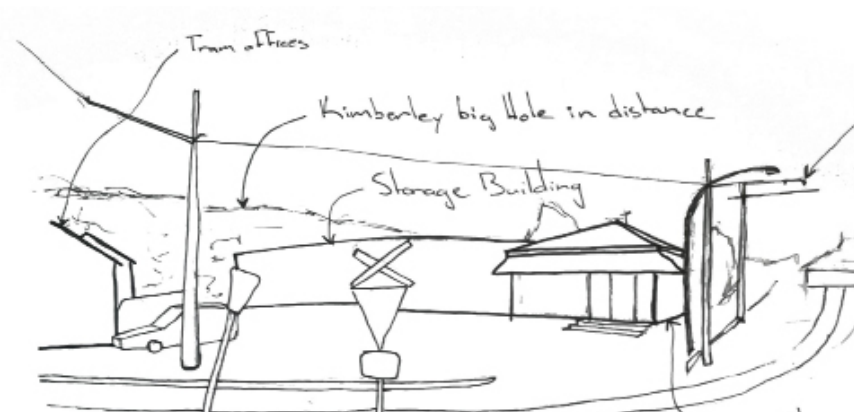


Figure 68: Old Tram station

North Circular Road

The fence around the Big Hole is a stark uninviting devil's fork palisade topped with barbed wire. The street and surrounding areas are dry, abandoned and unkind towards the passing pedestrian.

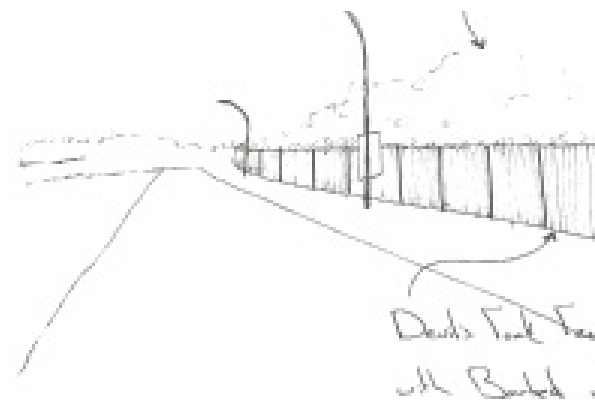


Figure 69: North Circular Road

Tram Station corner of North Circular Road

The tram tracks are still intact and are situated opposite a stark field, acting as another barrier between pedestrians and the Big Hole. The tram track offers endless possibilities, which could become part of pedestrian transport.

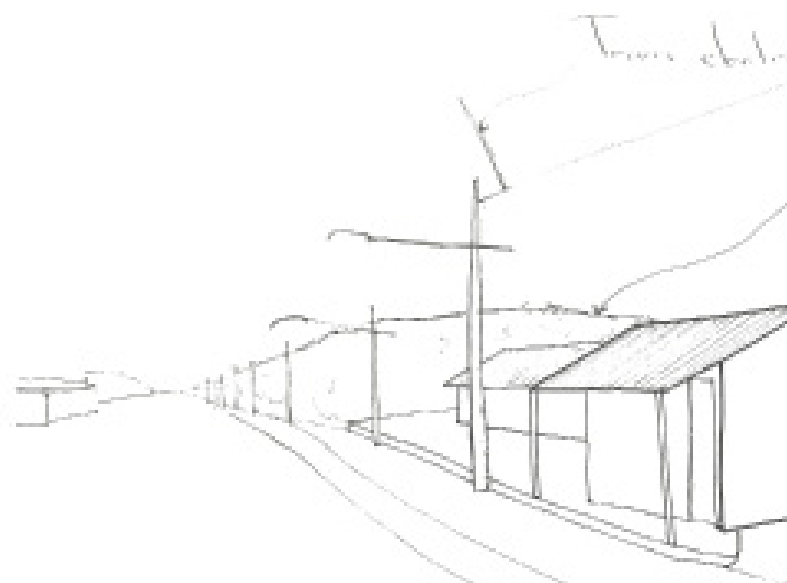


Figure 70: Old tram station

Mine Museum Experience

The initial approach to the museum is slightly arbitrary as the parking is situated across the street from the museum. A single sign indicates parking, and upon first approach, one drives into what is assumed to be the convention centre parking. It is only after walking through an underpass that one enters the Big Hole Museum area. The first structure is a tram ticket office with no directions to the museum entrance. Upon finding the entrance, visitors can buy a tour encompassing a 20 minute video of the history of Kimberley and the Big Hole, a view from the platform and a walk-through of a reconstructed mine tunnel ending in an exhibition hall. The platform provides a stunning elevated view of the Big Hole, and individual buildings are visible above the horizon of surrounded mine dumpings. While the exhibition is comprehensive of the history, comprised of a timeline, legends, diamonds on exhibition and artefacts; the story omits the damage done to the miners and the environment.



Figure 72: Sketch of the Kimberley Big Hole Museum Entrance

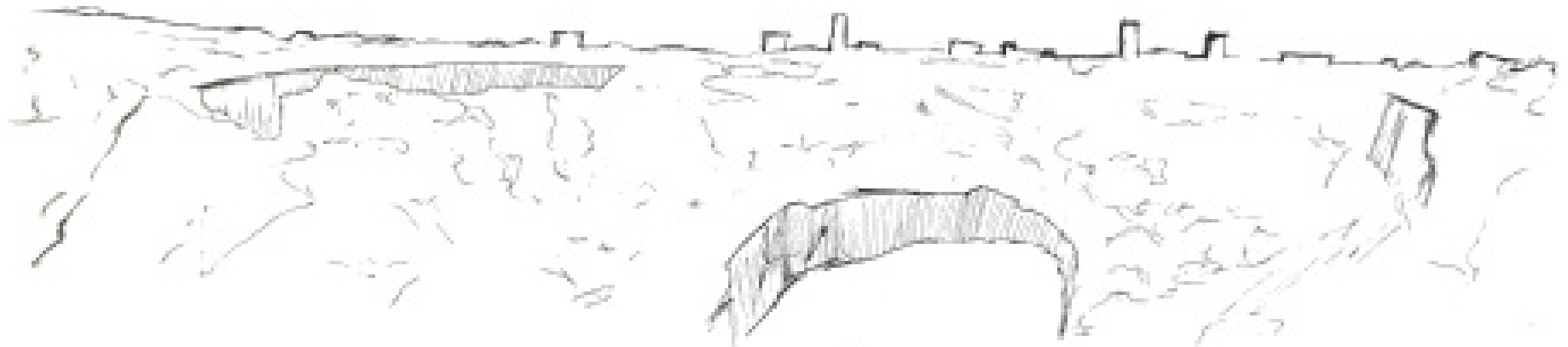


Figure 71: Panoramic sketch of the vista from the Kimberley Big Hole viewing point



Figure 73: Photograph of the Big Hole



Figure 76: Steam machines

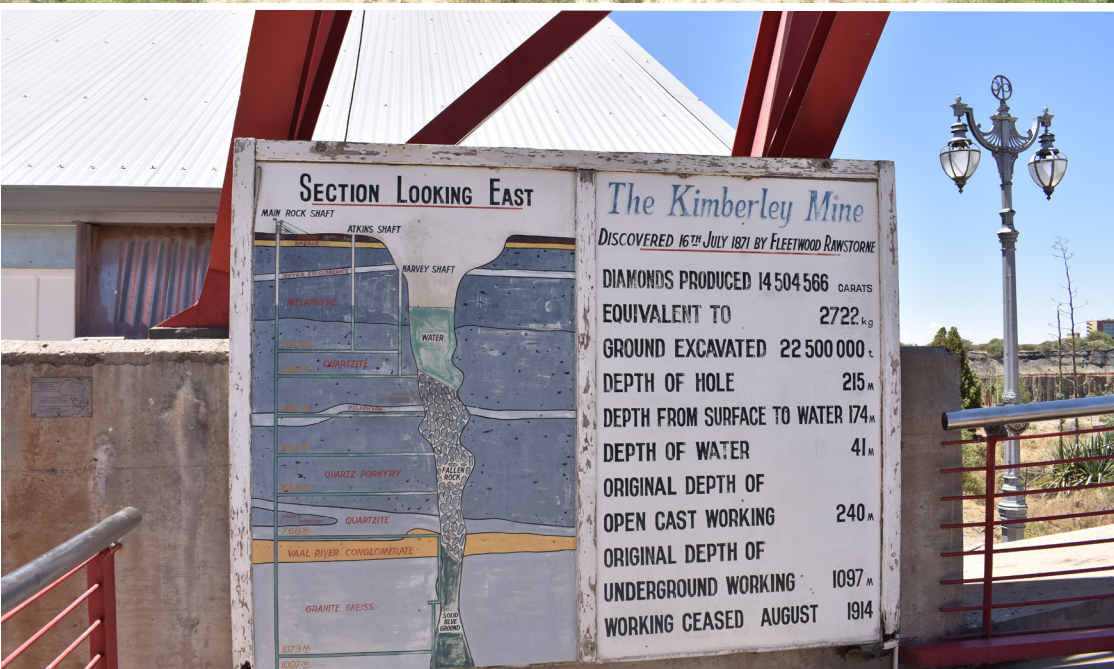


Figure 74: Photograph of Information Board



Figure 75: Kimberley Mine Headgear

Motivation for Site Decision

After considering various sites around the Big Hole and the Sol Plaatje University, the abandoned Mine Rock Shaft was ultimately chosen as the most appropriate site for the proposed project.

Stellenbosch University is currently the only University in Southern Africa to offer a degree in jewellery design, and a need for a jewellery school to the north of South Africa was evident. Furthermore, Kimberley was a clear choice for an Alternative Jewellery School as it has a rich history in the jewellery and mining industry. It is also one of the first universities built after apartheid, offering tremendous opportunities for growth.

SPU aims to be a campus integrated with the host city, in and attempts to foster chance meetings and exchange of ideas. An integrated university has the potential to rejuvenate the city through economic development. The development of an Alternative Jewellery School closer to the CBD increases the need for a more vibrant city and accommodation in the CBD, resulting in development opportunities that could feed the economy of Kimberley.

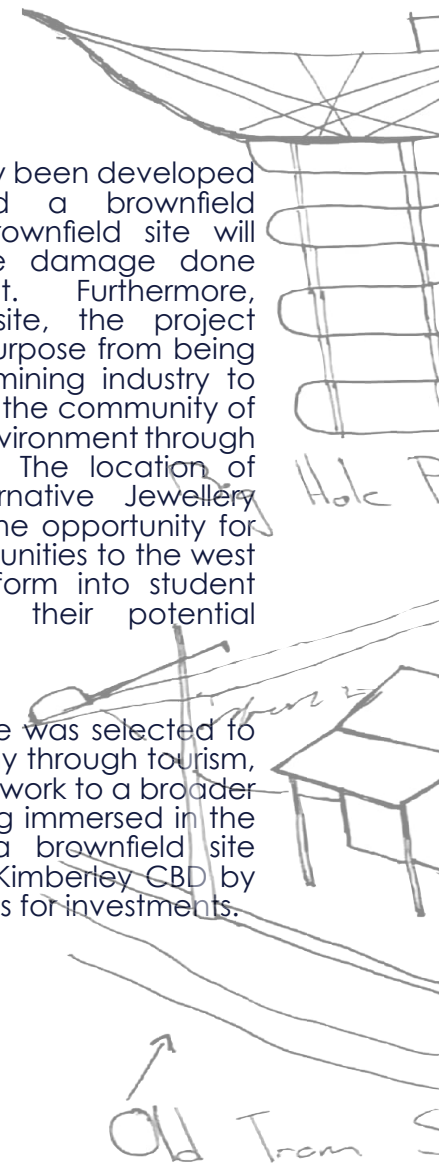
The University of Cape Town is an excellent example of how an

integrated University campus can uplift the economy while site-specific campuses create enhanced learning environments. For example, the medical campus is situated at the Groote Schuur Hospital while the business school is situated in the Central Business District of Cape Town. Situating the alternative Jewellery School of the SPU at the Big Hole will allow students to learn from the history and context on a daily basis. The site and the architecture can become a learning opportunity.

Being situated on an existing tourist route holds numerous advantages for the University, the city and the students. The students will have a platform to exhibit and sell their work to a broader audience that they would not have been exposed to otherwise, allowing them the opportunity to earn a small income while being able to network with foreign investors and potentially gain international recognition. The University will also be able to gain awareness and prestige from a larger audience while being able to contribute to tourism in Kimberley. There will be a permanent exhibition that will bring awareness of the damage caused by contemporary jewellery and a temporary, ever-changing exhibition of students' work for sale. The temporary exhibition will encourage return visits from tourists and the public.

The site has previously been developed and is considered a brownfield site. Selecting a brownfield site will inherently lower the damage done to the environment. Furthermore, by choosing this site, the project inverses its original purpose from being instrumental in the mining industry to instead give back to the community of Kimberley and the environment through creating awareness. The location of the proposed Alternative Jewellery School will provide the opportunity for the residential communities to the west of the site to transform into student housing, increasing their potential rental income.

In conclusion, the site was selected to improve the economy through tourism, expose the students' work to a broader audience while being immersed in the history, redevelop a brownfield site and rejuvenate the Kimberley CBD by creating opportunities for investments.





Climate

Kimberley is situated within the temperate interior climate of Southern Africa but borders the arid interior. The region experiences scorching summer temperatures with summer rainfall. The average rainfall equates 420mm per annum. The winters are cold and dry, and night temperatures can easily reach below zero (SAExplorer, 2017: Online).

Passive design strategies implemented during the design phase can manage the extreme heat in the summer and preserve heat in the winter to maintain comfortable air temperatures.

- Cold Interior
- Temperate Interior
- Hot Interior
- Temperate Coastal
- Sub-Tropical Coastal
- Arid Interior



Figure 78: Climate Map of South Africa

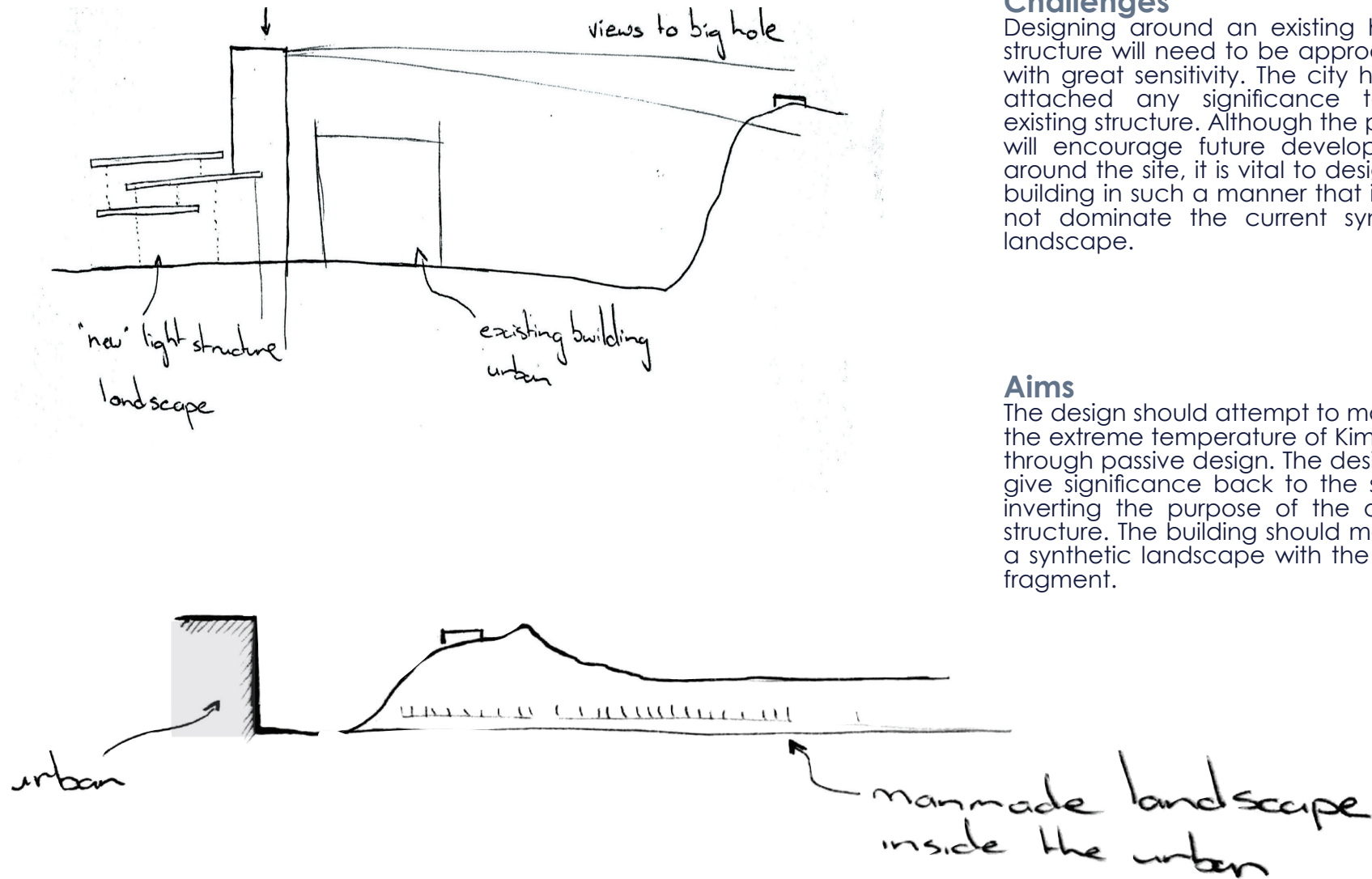


Figure 79: Sketch of site aims

Challenges

Designing around an existing historic structure will need to be approached with great sensitivity. The city has not attached any significance to the existing structure. Although the project will encourage future developments around the site, it is vital to design the building in such a manner that it does not dominate the current synthetic landscape.

Aims

The design should attempt to manage the extreme temperature of Kimberley through passive design. The design will give significance back to the site by inverting the purpose of the original structure. The building should mediate a synthetic landscape with the urban fragment.

Precedent Studies

Sol Plaatje University Student Resource Centre

Architects: Designworkshop
Location: Kimberley
Area: 6364 m²

As SPU is one of the first new universities built within the new democratic South Africa, it is of immense importance that the building speaks of the new democratic era which aims to include the entire nation and all its languages and cultures.

The building, therefore, aims to extend the public arena into the building by drawing the pavement into the building. In doing so it creates a sheltered courtyard to the east that could function as an extended 'stoep' shading students from the harsh summer sun (González, 2018:Online).

Inside the building, large extended stairs create an informal auditorium that functions as a student forum where chance meetings and gatherings can take place. The back of the stairs can hide the ablutions facilities.

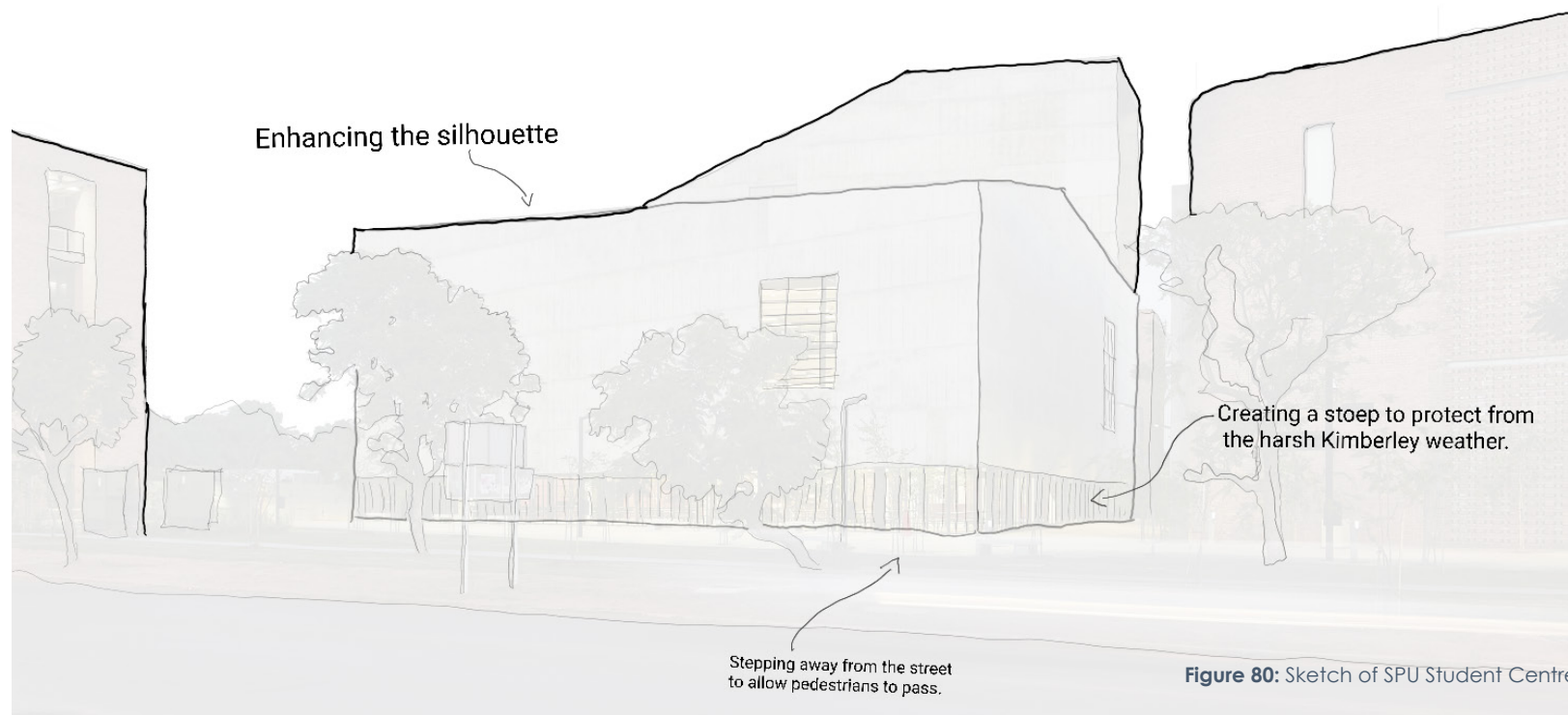


Figure 80: Sketch of SPU Student Centre

Lessons Learnt

- A courtyard shades against the harsh Kimberley weather.
- Informal auditorium allows chance meetings to occur.
- Ablutions can be hidden behind stairs.

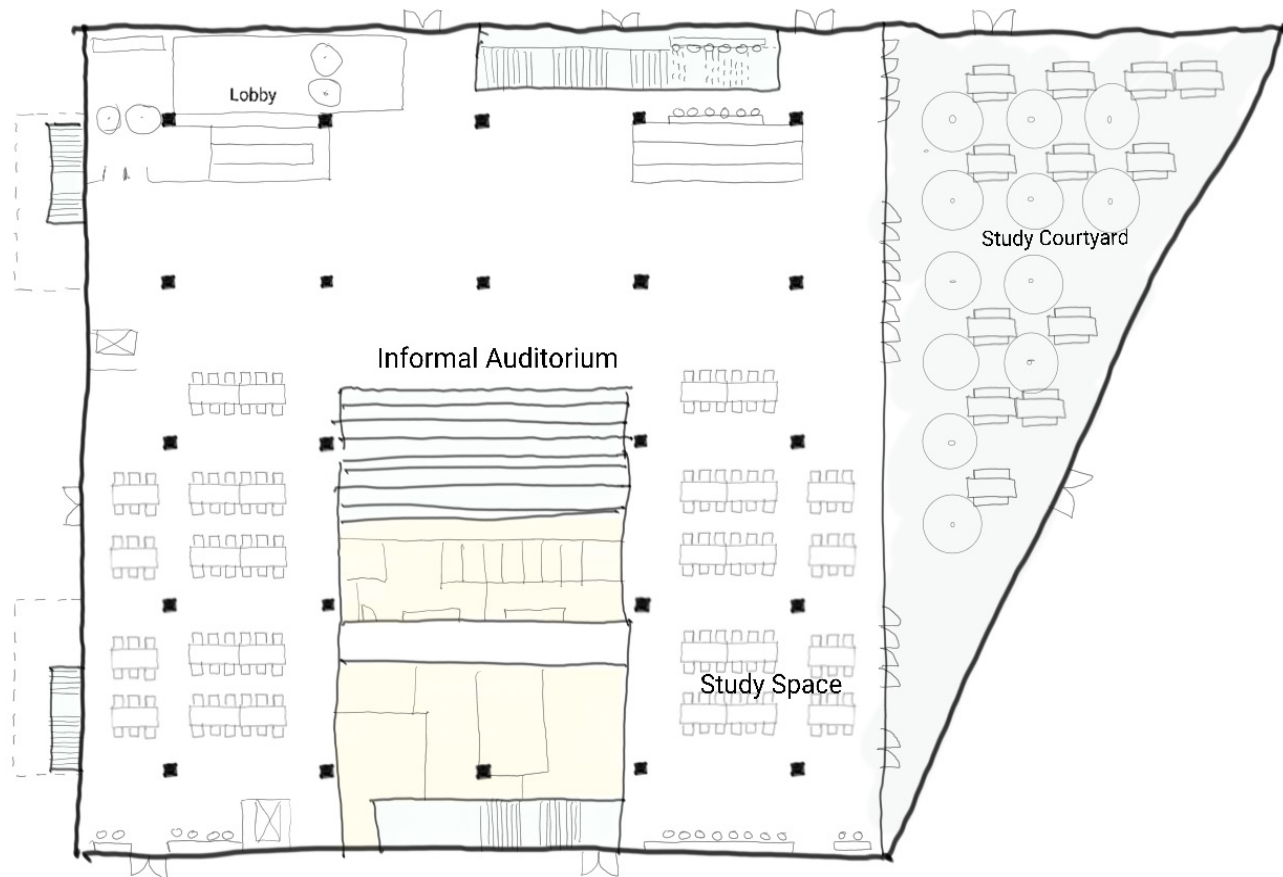
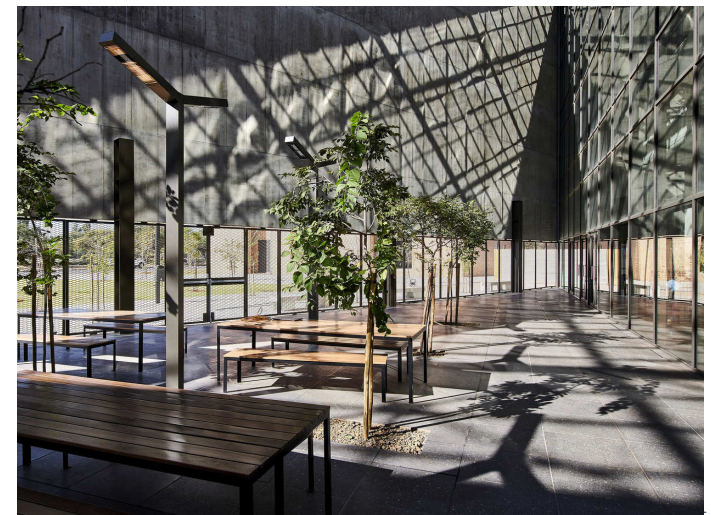


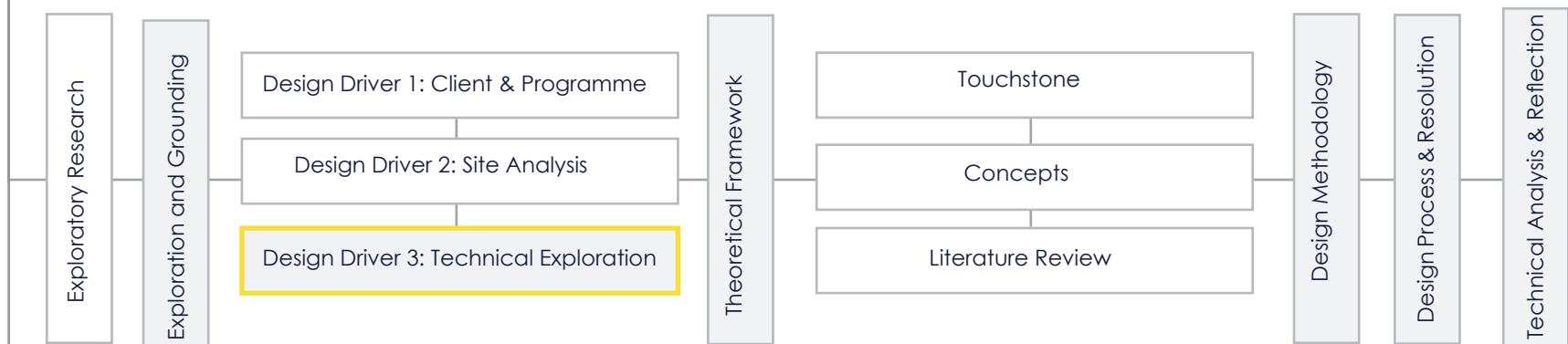
Figure 81: SPU Student Centre Plan

Figure 82: SPU Student Centre (González, 2018:Online)

04 Tectonic Exploration

- 4.1 Adaptive Re-use Precedent Studies
- 4.2 Project specific requirements
- 4.3 Lighting requirements
- 4.3 Materiality
- 4.4 Precedent Studies
- 4.5 Challenges & Aims

This chapter investigates various technical aspects, possible challenges and aims. The existing structure on site requires investigating adaptive re-use precedent studies. This chapter considers the specific space requirements of a jewellery school and the particular lightning condition required. Lastly, the chosen materials and investigated precedent studies are addressed, concluding with the challenges and aims associated with the tectonic exploration.



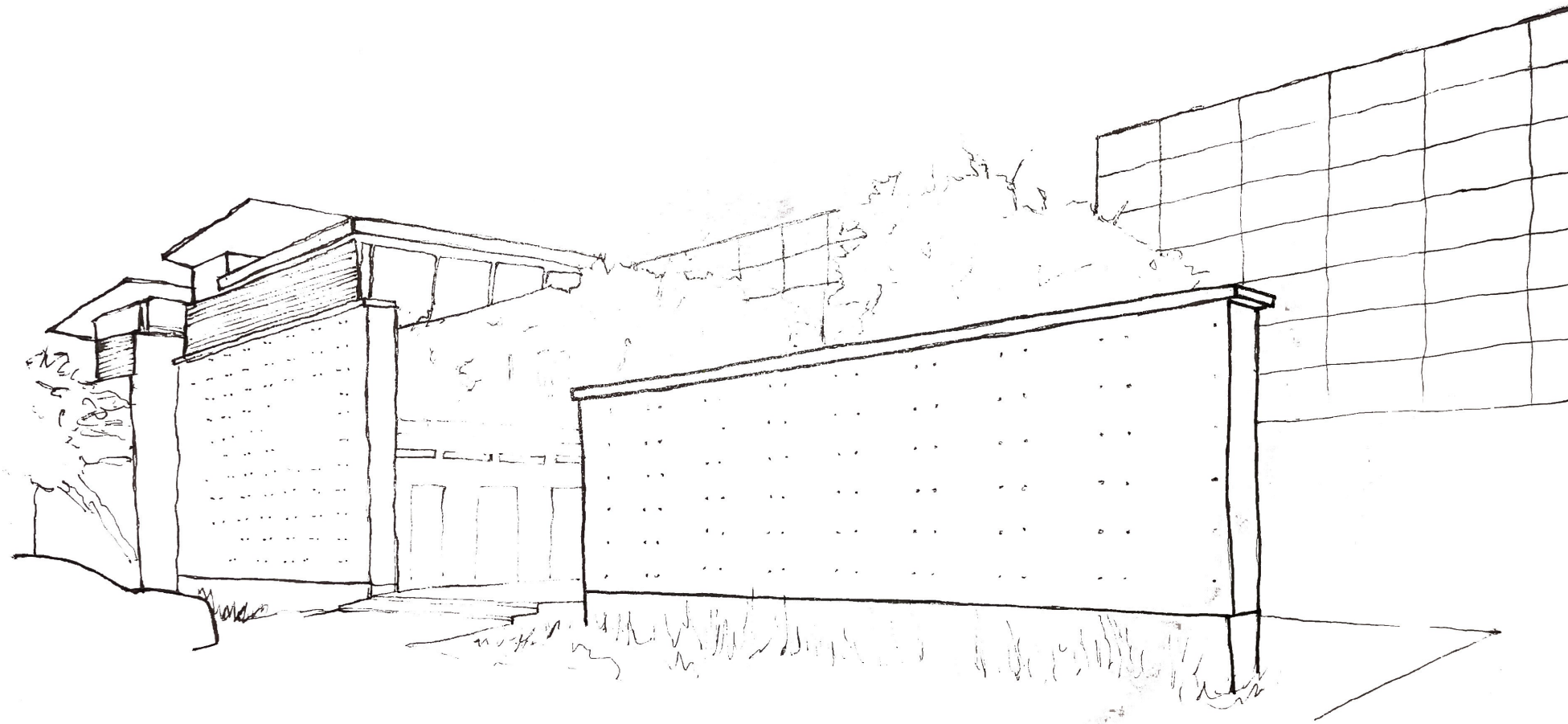


Figure 83: Sketch of Office Building, Kathu by Cube Architects

Precedent Studies

Adaptive Re-Use Studies

Convent de Sant Francesc

Architects: David Closes
Location: Spain
Area: 950 m²

David Closes has transformed an old church into a contemporary cultural facility through innovative adaptive re-use strategies (Closes, 2012: Online). By preserving the existing damage to the structure, the architect manages to celebrate the building's scars and wounds. The integrity of the structure is preserved by creating no damage or openings in the existing structure.

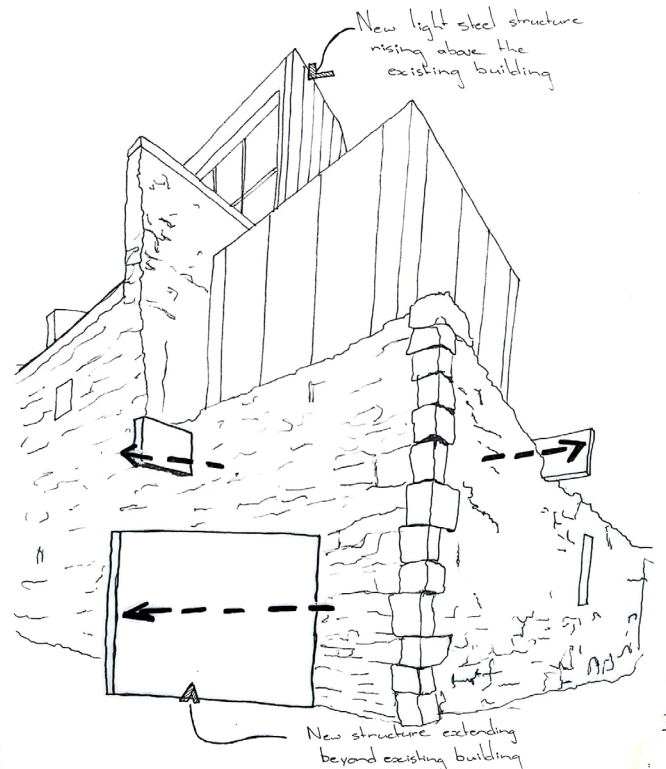


Figure 84: Sketch of the new structures protruding past the existing structure

Lessons Learnt

- The new structures are sleek and smooth in contrast with the rough stone of the existing structure.
- The new structure never lines up with the existing and always ends short or extends beyond the structure.

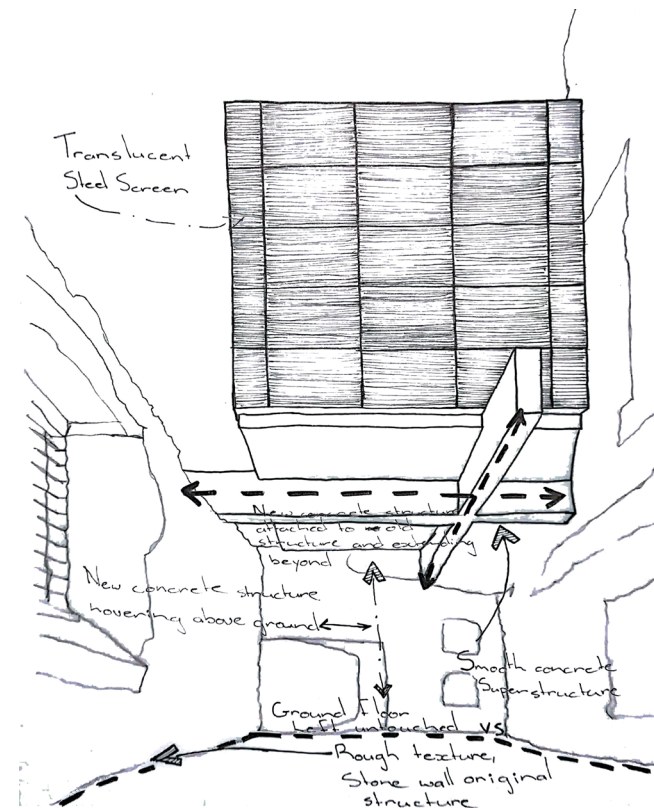


Figure 85: Sketch of the new structures protruding past the existing structure

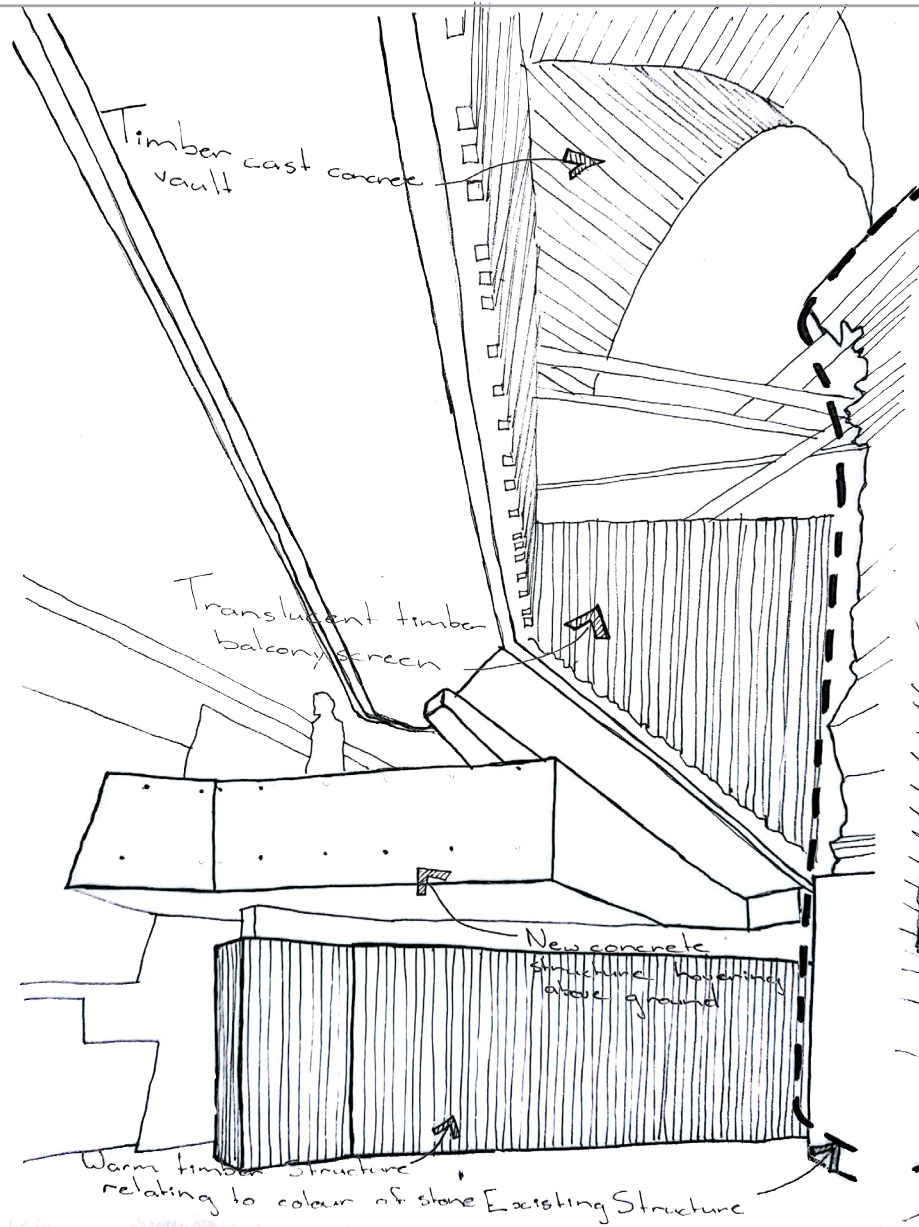


Figure 87: Sketch of new stair in the interior of the covenant.



Figure 86: Exterior of Covenant Photograph by Jordi Surroca (Closes, 2012: Online)

Precedent Studies

Adaptive Re-Use Studies

Felix Nussbaum Museum

Architects: Studio Libeskind
Location: Germany
Area: 1890 m²

The Nussbaum Museum extension forms a connection between two parts of the existing building by placing a new lobby and hallway between the two (Libeskind, 2011: Online). The connections between the old and new structures are treated with the utmost sensitivity, retreating before it attaches to the existing structure. The existing structure is always visible as glimpses behind the new addition.

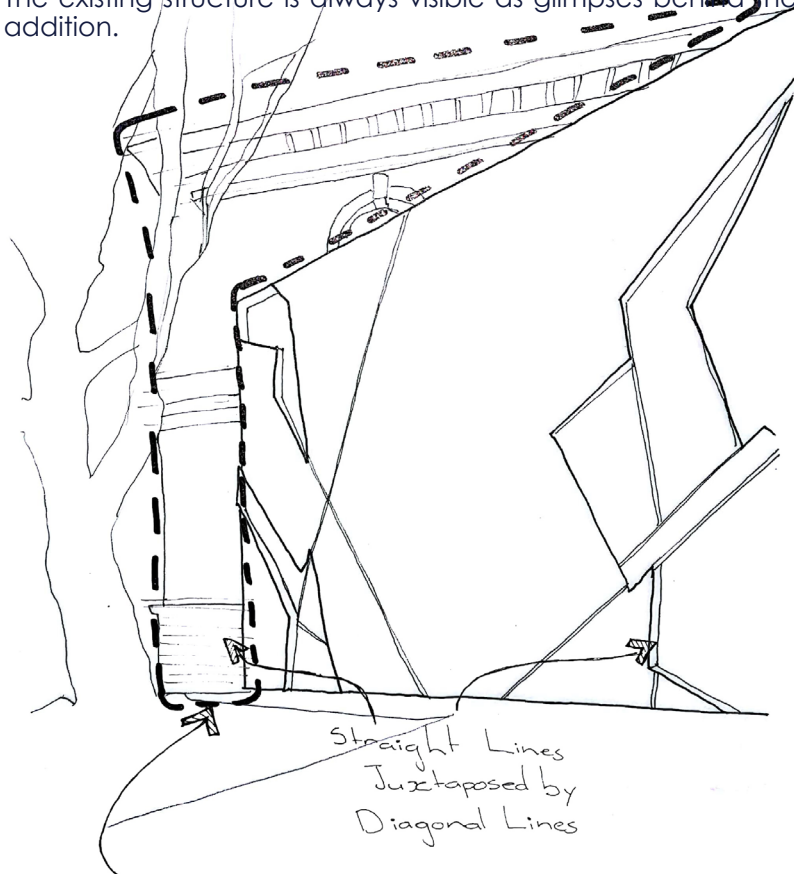


Figure 88: Sketch of the new addition in front of existing structure

Lessons Learnt

- The new structures are placed in opposition to the existing structures.
- The new structure pulls back before connecting to the existing structure.
- An additional wall inside of the existing structure allows services to be hidden from the public without damaging the existing structure.

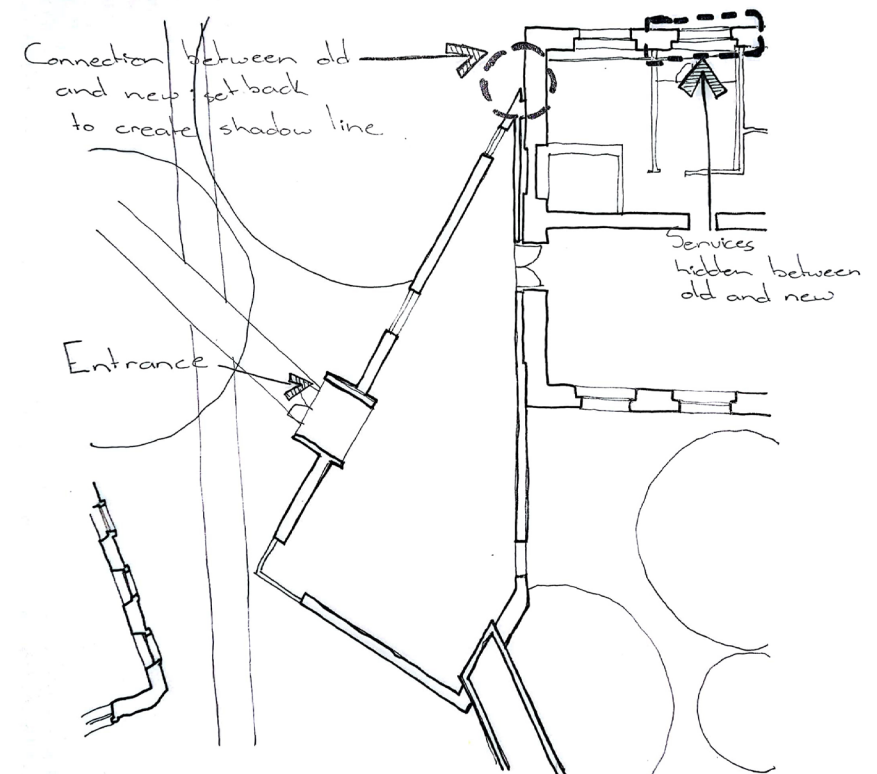


Figure 89: Sketch Plan of addition

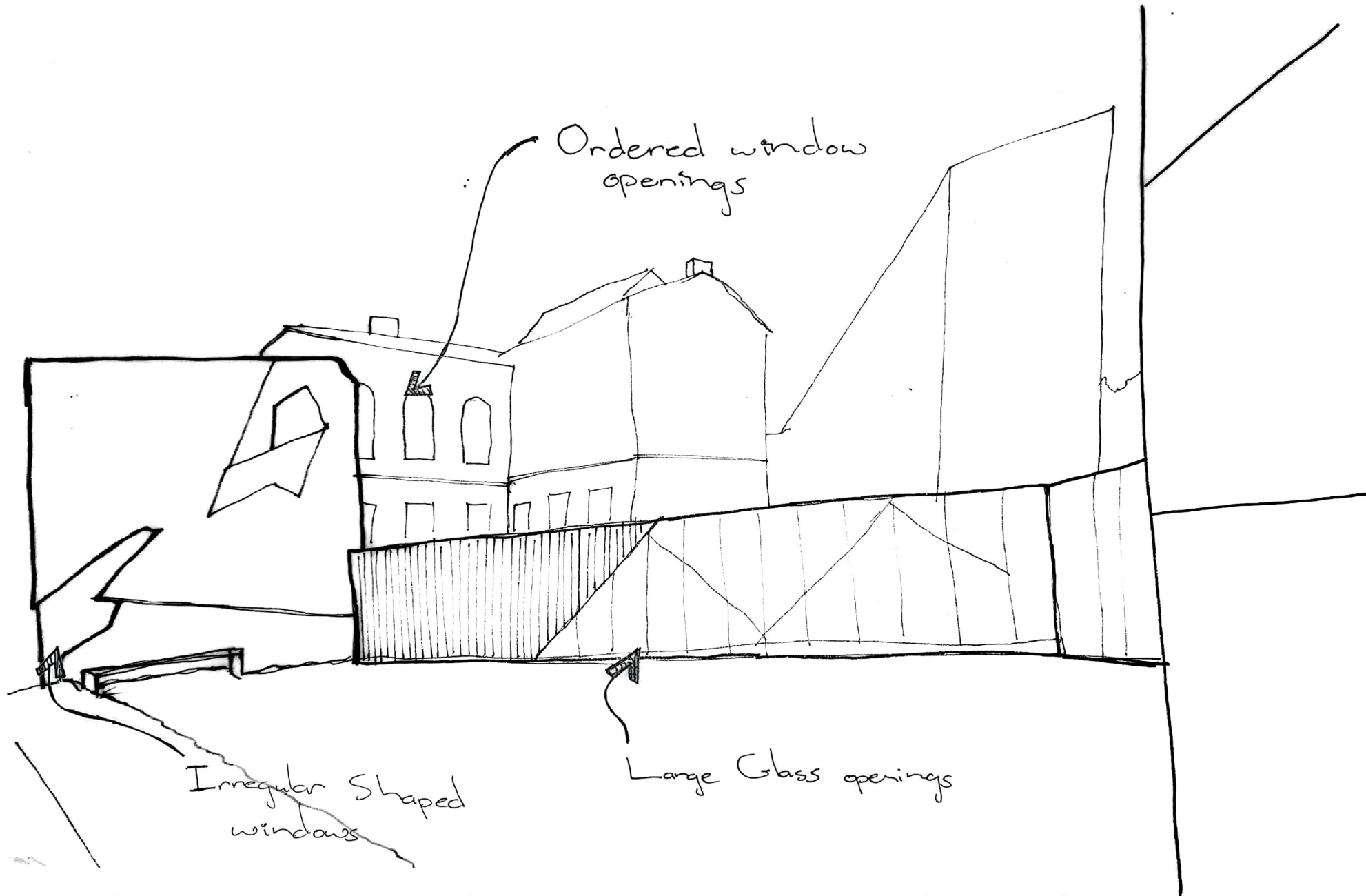


Figure 90: Sketch of the new addition in front of existing structure

Precedent Studies

Adaptive Re-Use Studies

Empire Stores

Architects: S9 Architecture

The Empire Stores was an industrial powerhouse that has been adapted for mixed re-use. The adaptive re-use of the building celebrates the enormity of the building while improving the ground floor circulation. The building is located between the park and the neighbourhood while facilitating the connection between the two (Castro, 2018: Online).

Lessons Learnt

- All new structures are smooth polished steel placed in opposition to the existing brick structure.
- The existing window edge is not touched. An additional frame, placed inside the structure allows a clear view through the opening.



Figure 91: Courtyard View of Empire stores photographed by Imagen Subliminal (Castro, 2018:Online)

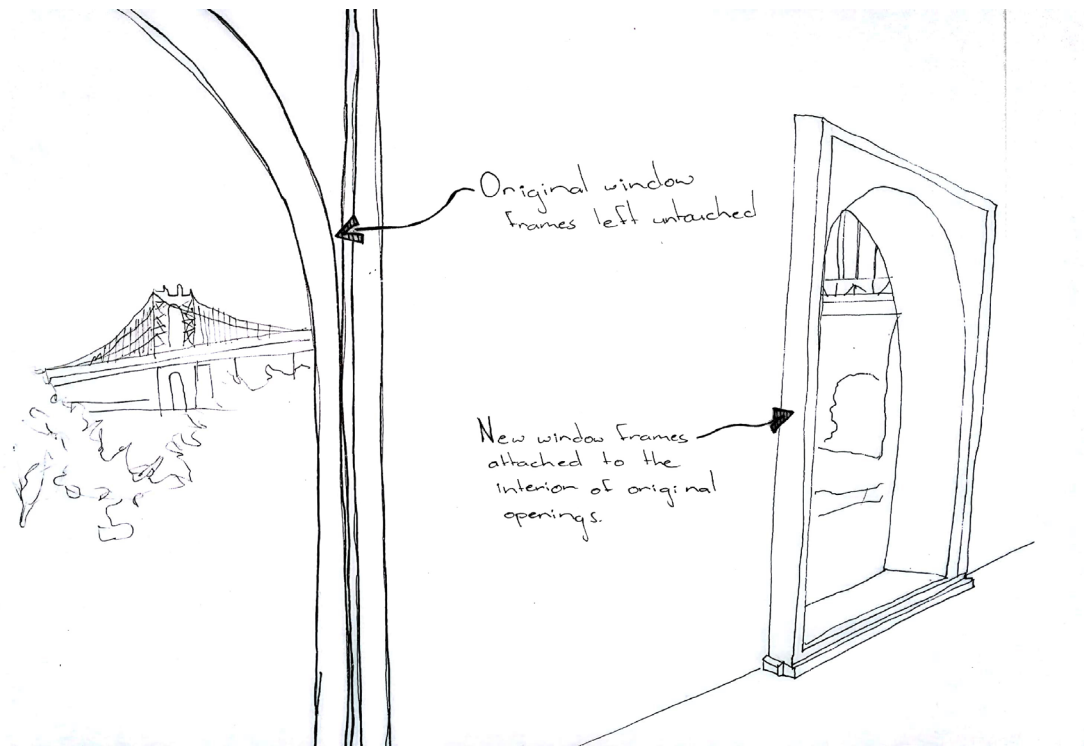


Figure 92: Sketch of Empire stores window frames

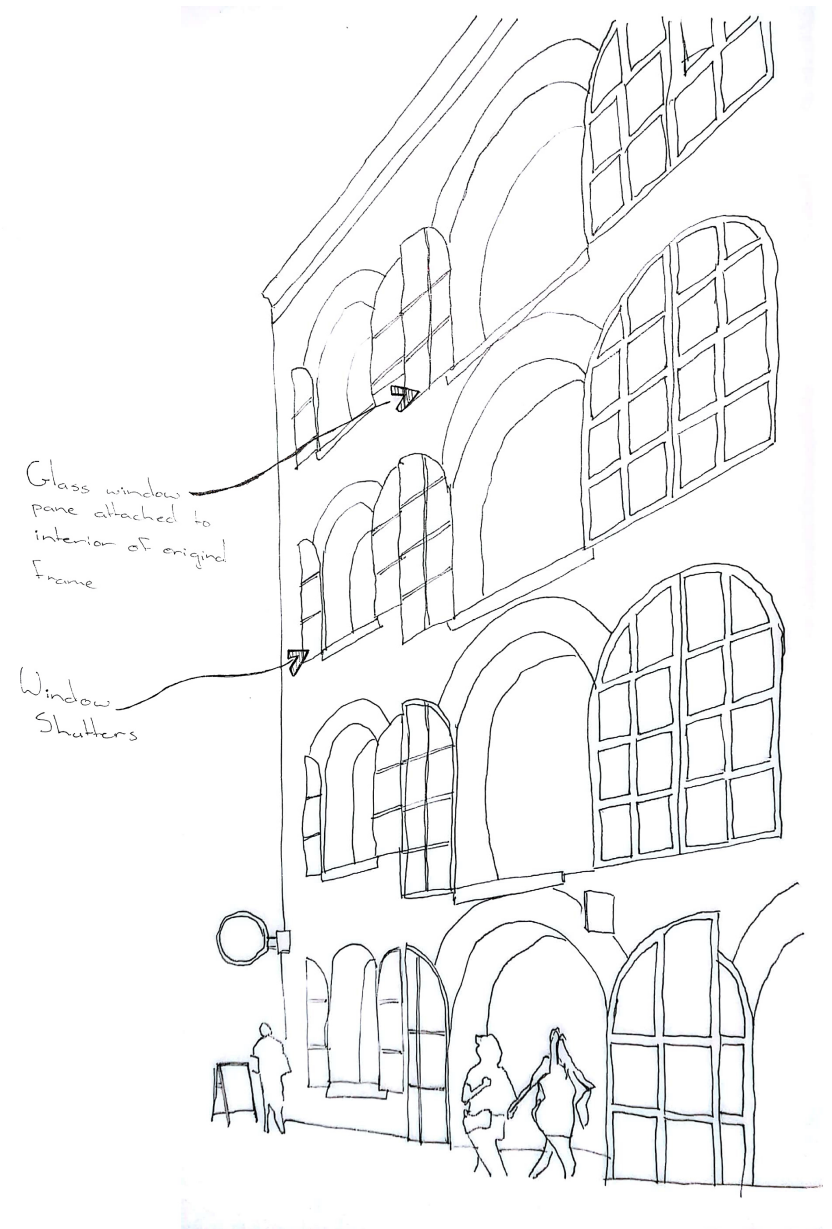


Figure 93: Sketch of Empire stores new louvres on facade

Spatial Requirements

Jewellery Machinery



Figure 94: Dear Rae Jewellery Studio (Dear Rae, 2016:Online)

The jewellers' bench and pin are at the centre point of creation in the jewellers' studio. Without these two objects, it is virtually impossible to create jewellery.

The jewellers' bench should be sturdy and able to hold various machinery and hand tools. Specific task lighting that can be controlled and moved will be attached to the bench. The jewellers' pin tells the narrative of the creation of jewellery pieces. It has scratches, dents and bents, a reminder of the work that came before and the ideas of work still to be done. The jewellers' pin is attached to the bench and can be removed and replaced if it becomes too damaged.

Together with the pin, each desk has a flex shaft attached which assists in cutting, drilling and polishing jewellery pieces. The jewellers' bench should include a fire retardant skin that catches all debris as students are working.



Figure 95: Dear Rae Jewellery Bench and pin (Dear Rae, 2016:Online)



Archemedial Drill



Charcoal Block



Soldering Pad



Planishing Hammer



Bezel Roller



Copper Tongs



Pliers



Small Bench Vice



Brass Mallet



Crucible Tongs



Draw Tongs



Soldering Tweezers



Buff Rake



Crucibles



Gas Cylinder



Steel Dividers



Butane Torch



Crucibles



Honey Comb Ceramic Block



Titanium Soldering Pick



Centre Punch



Ring Mandrel



Pitch Bowl



Tubing Cutter



Band Saw Machine



Pickling Pot



Stamping Machine



Belt & Disc Sander



Polishers



Rotary Tumbler



Bench Grinder



Precision Weighing



Ultrasonic Cleaner



Bench Shear



Rolling Mills



Vacuum Cast



Drill Press



Sand Blaster System



Vibratory Finishers

Lighting Requirements

Lighting requirements are always a significant aspect to consider in every architectural design and even more so in a studio space where students design and work with sculpting physical objects. How lighting falls and bounces off the jewellery pieces that students work on has a tremendous effect on the final product. The ambience in the school will also affect the feeling experienced in the building.

Various aspects determine the environmental quality in any space. Contributing factors include the rate of blinking, level of glare, light blindness, representation of colour and low reflection (Franco, 2019:Online). There are two main aims with lighting. Functional lighting allows users to safely, accurately and comfortably use the building and move around it. Amenity lighting ensures space is pleasant and stimulating. "Lighting for visual amenity is as important as task lighting and depends on the balance and composition of light and shade." – DEE (1999, p.5)

Task Lighting

Various tasks and functions within a building require specific lighting to ensure optimum visual comfort and functionality in every space. General teaching spaces require uniform illuminance over most areas (DEE, 1999, p. 3).

In workshops or art rooms where work is intricate, the desire arises for higher illuminance through adjustable localised task lighting (DEE, 1999, p.4).

Multi-directional lighting is essential when working with three-dimensional objects (such as jewellery pieces), to prevent casting dark shadows that could hide object flaws.

Libraries require general ambient lighting and different lights for studying and browsing. For reading and studying purposes, ambient lighting from overhead luminaires works best while directional light is preferred to illuminate bookends while browsing.

Figure 96 shows the relationship between the light source and light distribution, acting as a quick indication of which window shapes might be appropriate for a particular space. Luminaires that create an upward distribution of light will generally produce the effect of light ceilings and provide shadowless lighting (DEE, 1999, pp. 13-14).

For calculation on energy efficiency and heat conductance, refer to technical report pg 143.

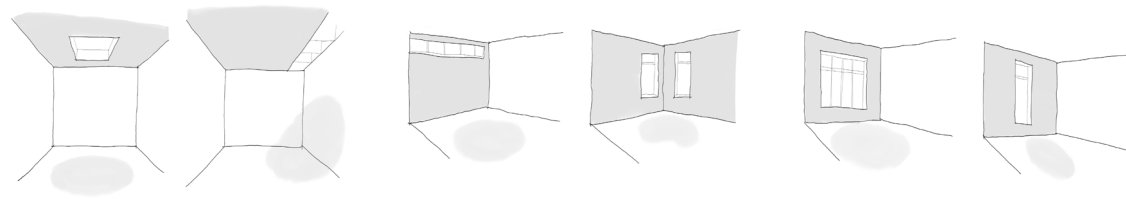


Figure 96: Light source relationship to light distribution

Materiality

The dissertation explores the use of alternative materials in the poiesis of jewellery and architecture. The materials selected are, therefore obtained from sustainable sources and their unique characteristics amplified by the design conclusion. Furthermore, a dichotomy exists in the jewellery industry as mined stones have been termed gemstones. The word 'gem' refers to a noble stone that represents honesty, decency, worthiness, ethics and unselfish intentions (Lexico, 2017: Online). The mining techniques used to mine these stones are everything except moral and selfless. With this knowledge in mind, it is essential in a dissertation that opposes environmental damage to select materials that are sustainable and encourage responsible use. The two primary materials chosen to construct the new structure is rammed earth and timber. The character of the materials are significantly different. The rammed earth walls are grounded heavy structures that speak of a stereotomic quality while a timber structure is a lighter material speaking of a tectonic quality.

The materials are discussed further in the technical report on page 136 of this document.

Precedent Studies

SOIC_CDT CENTRE

Architect: Cube Architects
Location: Kathu
Year: 2010

The building offers long-term rental income for SIOC-CDT while addressing the harsh Kathu climate. Passive design strategies, such as 400mm earth walls help to control the extreme weather. The construction of the earth walls provides the opportunity to offer skills development for the local community (Olivier, 201, p.20). The materials consist of the reddish-brown earth walls, corten steel plates and tree-like steel structures supporting the roof and taking the strain away from the rammed earth walls. Although these materials seem similar in colour, the building appears layered as the finish of both materials is significantly different. The sun reflects off the Corten steel while being absorbed by the earth walls.

The earth walls, to the north of the site, assist in controlling the interior air temperature. The trees in the courtyard prevent the walls from heating up too much in the summer. The trees are deciduous plants that allow the winter sun to heat the walls and release heat slowly into the building. The earth walls to the west provide privacy from the shopping centre across the road.

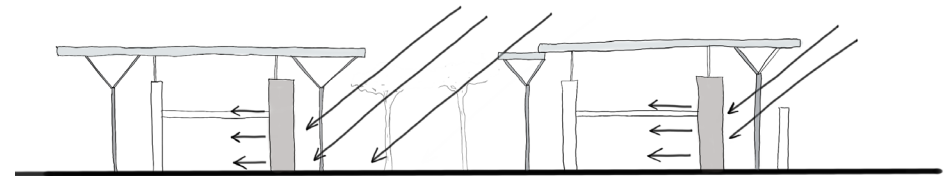


Figure 97: Sketch section showing winter sun

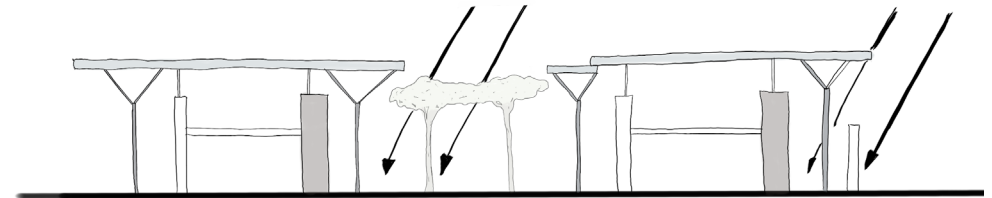


Figure 98: Sketch section showing summer sun

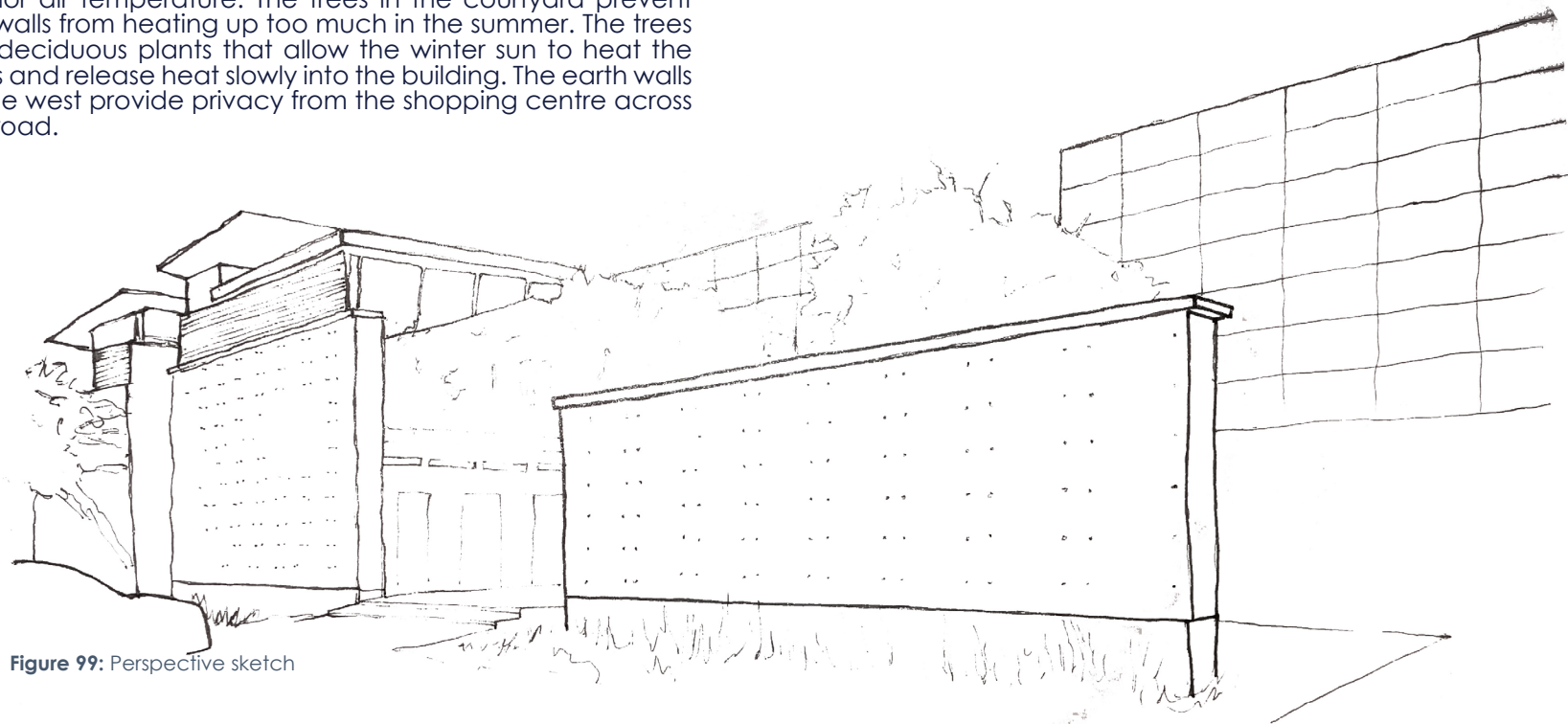


Figure 99: Perspective sketch

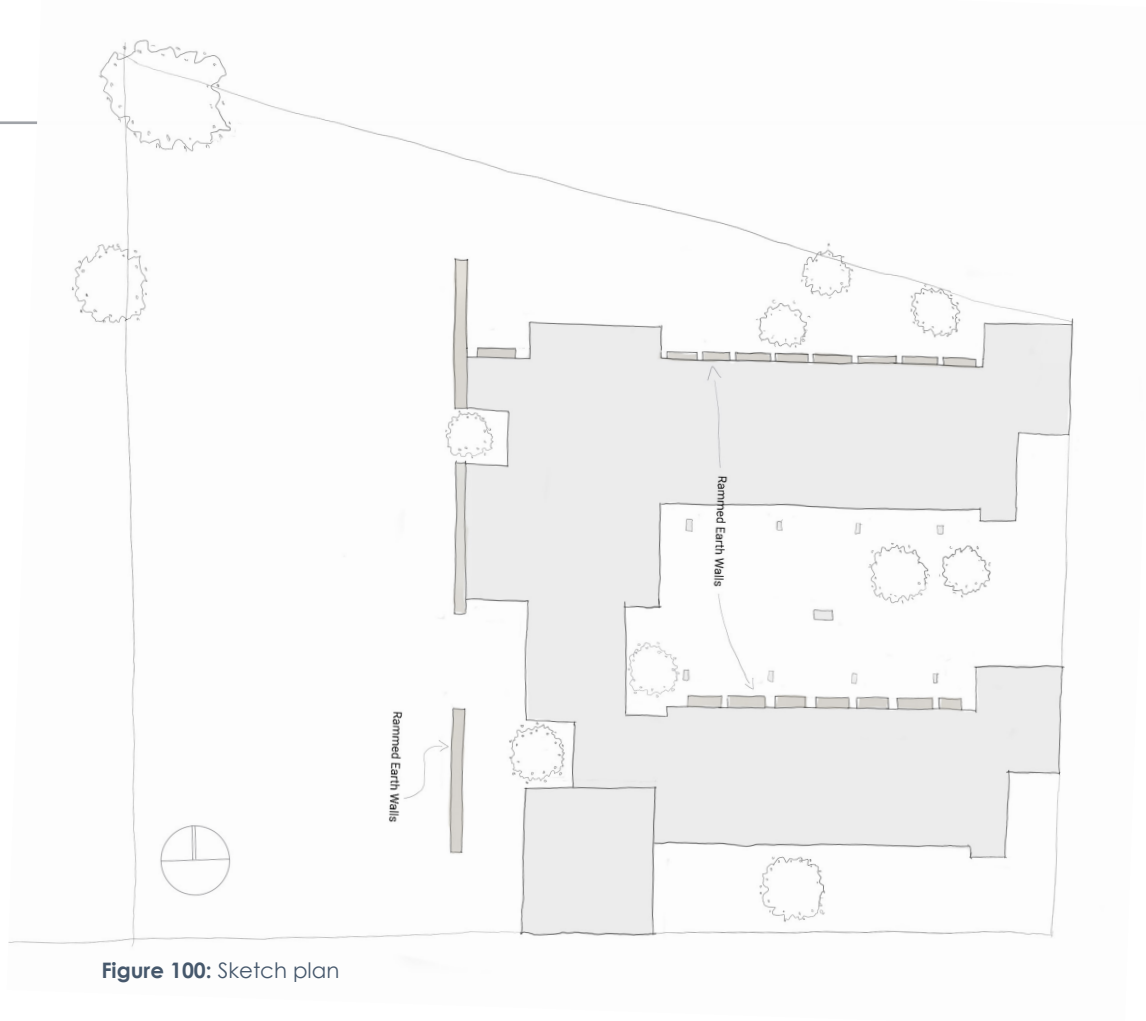


Figure 100: Sketch plan

Lessons Learnt

- Earth walls release heat in the winter and protect against heat in the summer.
- Walls with different reflectance levels provide contrast even in monotone colours.
- Earth walls protect from unsightly views.
- Deciduous trees provide shade in the summer and allow the sun through in the winter.



Figure 101: SOIC-CDT Courtyard Photograph by Cube Architects (Cube Architects, 2019: Online)



Figure 102: SOIC-CDT Entrance Photograph by Cube Architects (Cube Architects, 2019: Online)



Figure 103: SOIC-CDT Street Perspective Photograph by Cube Architects (Cube Architects, 2019: Online)

Challenges

It is important to remember the diverse needs of all the functions and their tectonic implications when designing. A new structure will need to be attached to an existing building in a sensitive manner that respects and celebrates the existing structure. The alternative building methods chosen might also pose new challenges.

Aims

Incorporate the new building with the existing structure in a respectful manner. The various spaces should receive the correct lighting to enhance the functions. The project aims to use materials that are primarily reusable, recyclable and for the most part, sustainable. The alternative building methods offer opportunities such as passive design strategies that could add additional value to the design process.

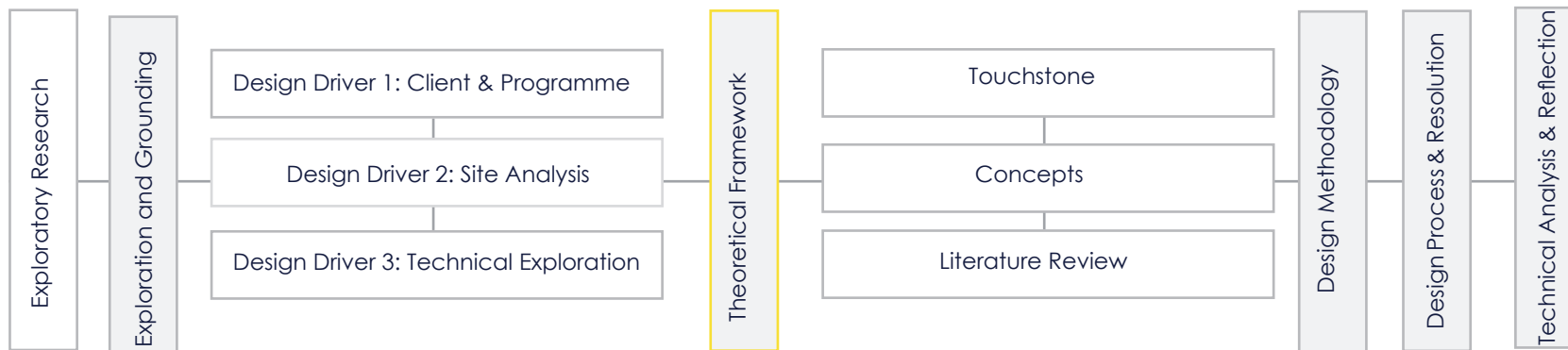


05

Theoretical Framework

- 5.1 Touchstone
- 5.2 Concepts
- 5.3 Literature Review

This chapter investigates the entire theoretical framework from the touchstone, to concepts and the literature review, which, together with the design drivers and aims determined were used to inform the design resolution and tectonic synthesis.



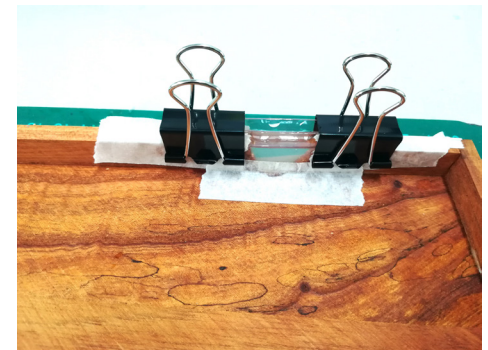
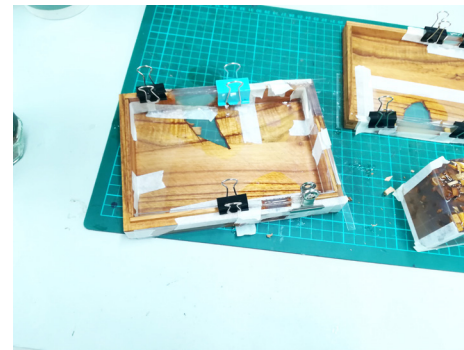
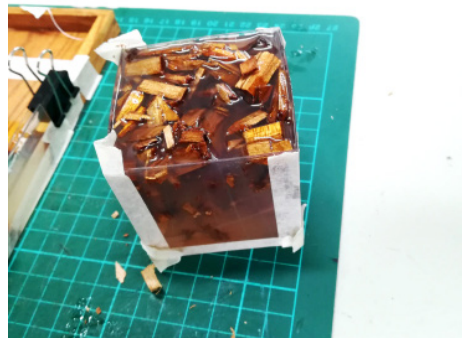
Touchstone

In essence, the project focuss on healing the earth and returning to an era in jewellery making where found objects were used. By using found objects and alternative materials, the project attempt to bring awareness to the impact of the mining industry on the environment.

Research has determined that tremendous damage was caused to the environment (see p10 of this document). This project aims to bring awareness to the damage inflicted on the earth through investigating poiesis. The touchstone is a jewellery box that was broken and subsequently fixed with resin inlay. The pieces broken out of the box was cast into a resin cube.

The timber jewellery box in its broken state represents the earth as we find it now with all its abandoned mines. A jewellery box was chosen to represent the earth as it usually holds our personal belongings save and represents what we hold dear and precious. Just as the jewellery box holds our belongings safe, the earth used to protect most of our resources before mining activities started. The jewellery box is repaired with resin to represent the repair that this project attempts to achieve. Resin was used as it is a man-made material that stands in contradiction to the natural material of the timber jewellery box.

The resin cube that in-cases the broken timber pieces showcases how the damage done to the earth can never be undone. The pieces can never be removed from the resin cube and used to fix the timber box. The cube is, therefore, a representation of what we have now and the box represents where we aim to be.



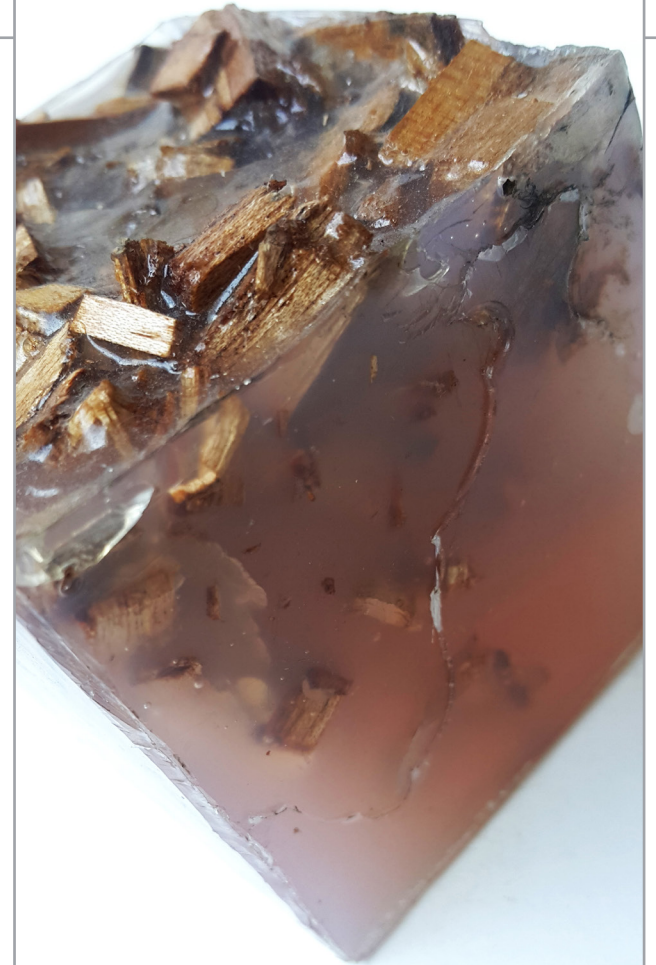


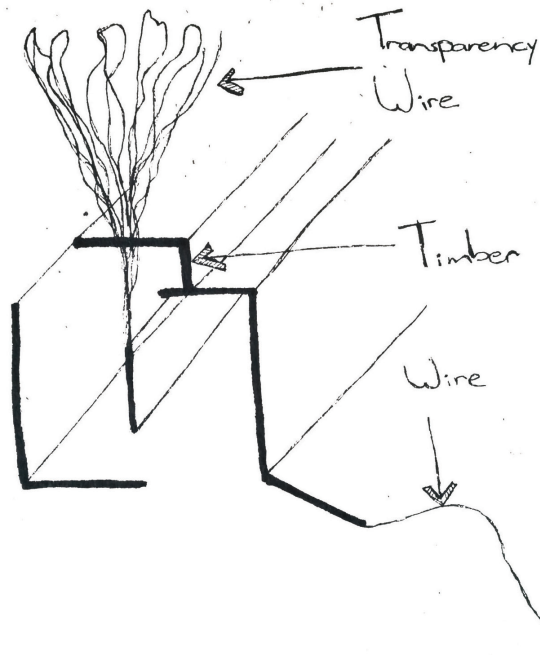
Figure 105: Touchstone

Concepts

Sculpting Delicacy from Mass

Jewellery is fragile. Its creation begins by mining deep below the surface of the earth. Small pieces of valuable gold, silver and gemstones are extracted from mining rock and stone. From these pieces, delicate pieces of wearable art are sculpted.

As jewellery is fragile, so too is the site and its surroundings. A fragile, abandoned Rock Shaft sits perched on the edge of the slowly eroding Big Hole. The hole was once upon a time a hilltop but has through human intervention become the inverse of its original state, turning from a hill to a hole in a mere 13 years.

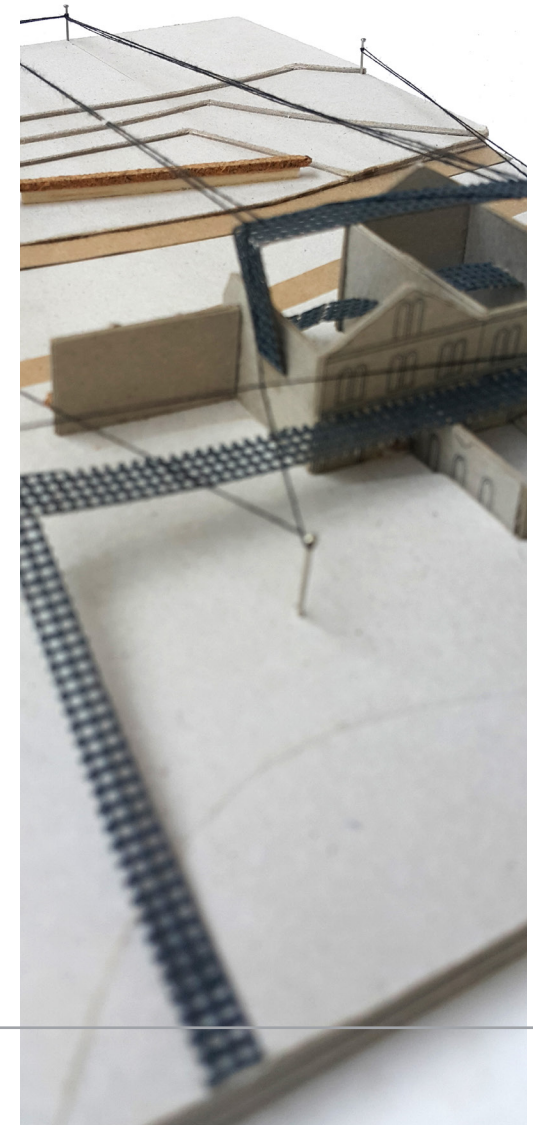
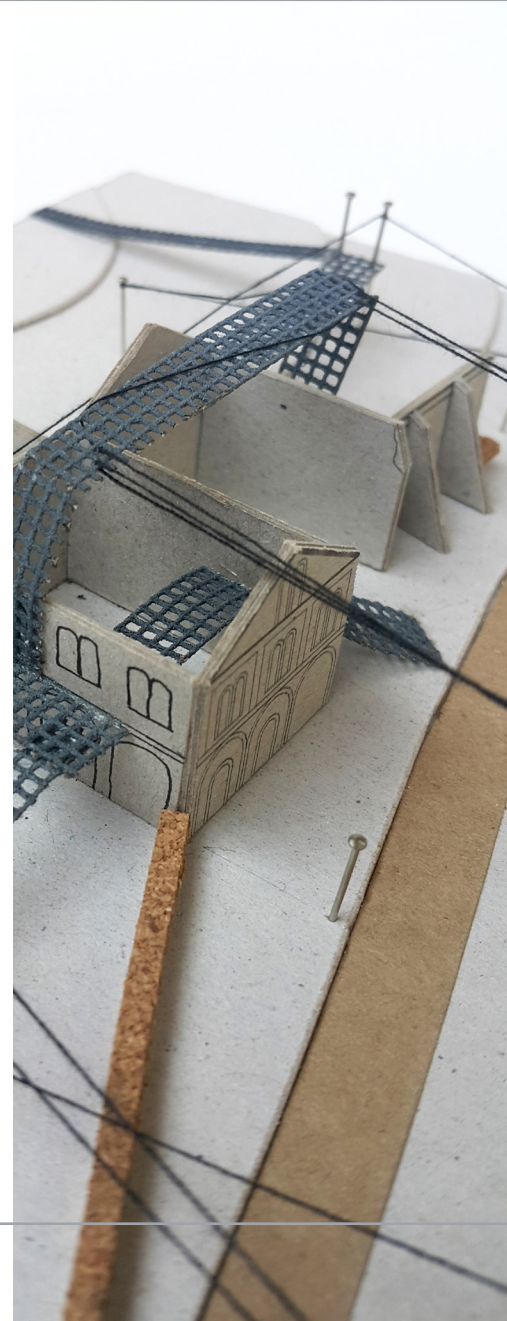
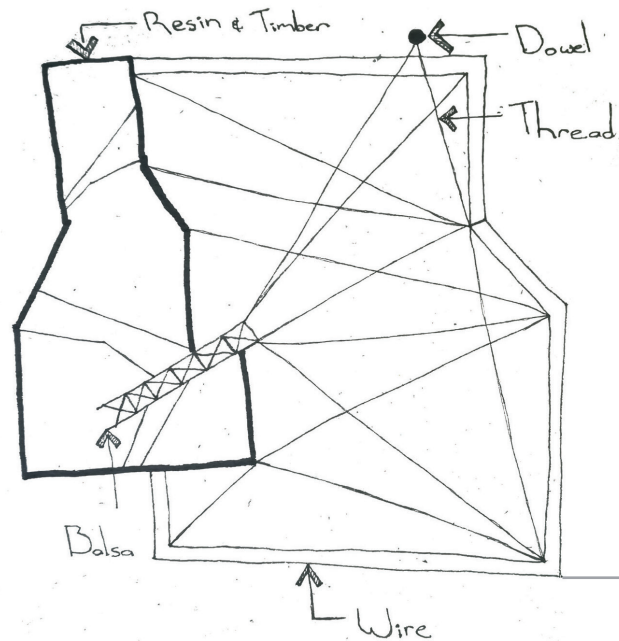




Concepts

Stitching the wound

Mining activities have caused various scars on the environment, with the Big Hole being only one of them. The scars affect not only the earth and the ground but also society. Since the decline in mining activities, Kimberley has been left with a tremendous amount of people that have no income resulting in illegal mining activities. The site around the Big Hole has also become scarred by cracks in the roads. The project aims to start a process of restoration around the Big Hole and Kimberley CBD by closing the wounds left by the mine

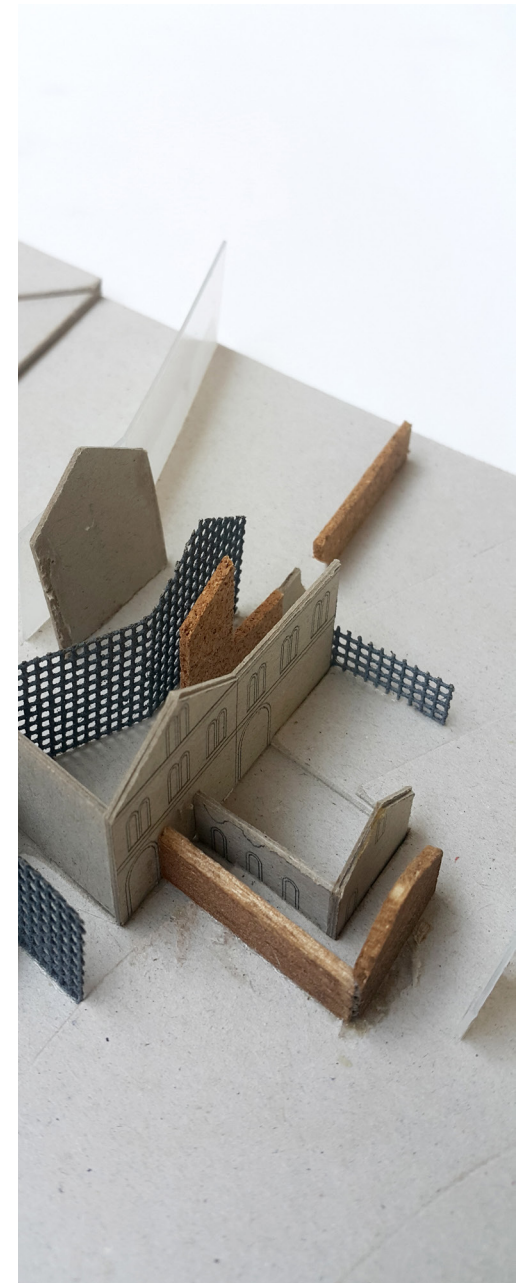
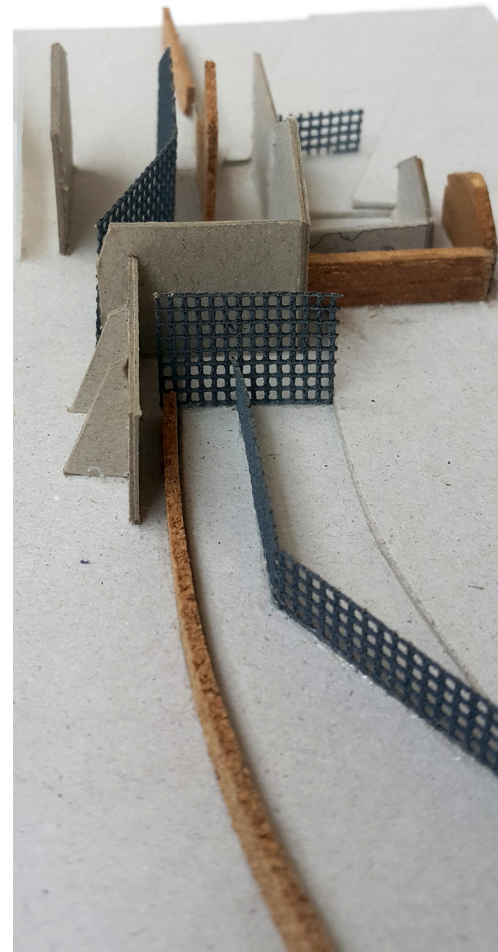
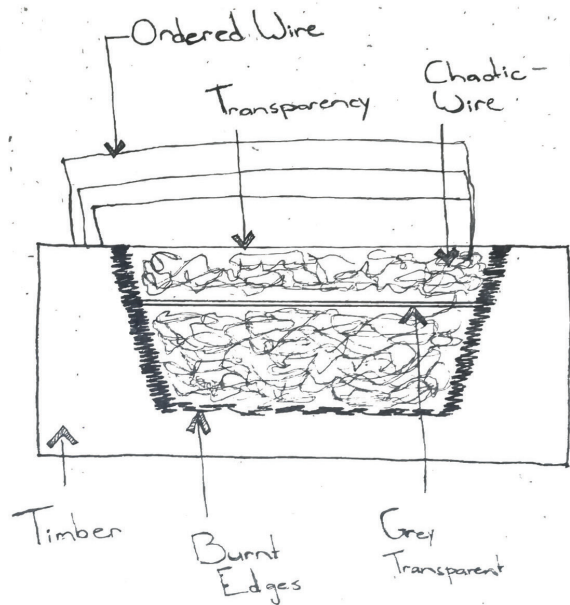




Concepts

Adorning True Identity

Jewellery is an expression of the self and the image people wish to portray. Jewellery speaks to the identity of the wearer and their innermost self. Fashion, jewellery, make-up and tattoos portray a particular image to the world. The Big Hole mine museum does the same; by representing the hole as a tremendous achievement, it fails to acknowledge the damage that mining activities have done to the earth and society.





Literature Review

The literature review explores the relationship between jewellery and architecture through the poesis of both. They are both the manipulation of materials to bring new elements (jewellery pieces and buildings) into being; the only difference is the function for which it is created. Madeline Courtney (Shih, 2015: Online) states: "... we see that people were wearing their surroundings and creating meaning through material before they could write, read, and maybe even talk. While material is not a new language, it continues to be a powerful one." The material selection and manipulation by jewellers and the relation of these to the adverse effects of mining are explored.

This section of the dissertation explores the link between jewellery and architecture: the materials. In addition, the nature of the joint is explored as it relates to the site, the nexus between old and new structures and between vernacular knowledge and new technologies. Furthermore, the setting is explored, specifically the relationship between the site, the existing structure and new developments.



The first commonality: Respecting the Materiality

Architecture and jewellery share a commonality through their material use. The dissertation is centred around materiality; more particularly, how it is sourced and the possible adverse effects thereof. An Alternative Jewellery School in Kimberley offers students a daily reminder of the impact of past mining activities while teaching them how to use alternative materials for producing jewellery that is authentic to the South African culture and ethos.

Materiality in Jewellery

The materials of jewellery have evolved from natural, found objects to the contemporary precious stone, gold and silver items that we regularly find in jewellery stores (for a detailed description of the history of jewellery of see p16). The evolution of jewellery was primarily due to evolving technology, allowing deeper mining. Other factors that played a considerable role was extensive marketing strategies that portray diamonds as 'a girl's best friend' and a scarce commodity. Diamonds are, however, anything except scarce as an approximate 180 million carats are mined annually (Diamond Foundry, 2018: Online).

It is only in the recent past that alternative materials are being considered by jewellers and artists exploring various mediums (for a detailed exploration of alternative jewellery see p. 22). Madeline Courtney, an artist and curator in Washington, talks in an interview with Olivia Shih (2015: Online) about the reasons behind choosing alternative materials and the importance of materiality in creating meaning through perceived value. She further states that: "Choosing to work in alternative materials can be practical, ethical, poetic, or tied to personal affinity. It can also be all

of these things at once. The idea of preciousness itself can mean many different things, and is not necessarily tied to concepts of expensive or inexpensive." (Shih, 2015: Online). Jewellery made from conventional materials such as gold, silver and gemstones is intrinsically considered as precious because of its market value. Alternative jewellery does not share the same intrinsic value and is seen as art; making the value almost impossible to quantify and based on the subjectivity of the seller and buyer.

Materiality in Architecture

The architecture industry has gone through a similar progression as construction techniques and materials evolved from vernacular, context-specific materials to the modern steel, concrete and glass structures. The production of buildings has changed from elements handled with care for detail, finish and meaning to mass-produced elements attached on-site. The mass-production approach undermines the vast potential of materials. Nicos Agapiou (2018: Online) beautifully states that "Natural materials can tell us the history and the age of a place. They let our gaze penetrate their surface so as to see their truth, the veracity of the material. They interact with our senses evoking emotions and memory." It is not only natural materials that can have this effect as contemporary materials possess the same potential for evoking meaning; it all depends on how it is used. Materials are always in dialogue with our senses (Agapiou, 2018: Online).

The selected materials affect what we hear and smell in a room while the textures interact with our senses of sight and touch. This dialogue between our senses and materials determine the spatial experience we encounter in any structure. It remains the privilege and responsibility of the architect to curate this experience for the user.

Peter Zumthor (2010: p10) states: "I believe that they (materials) can assume a poetic quality in the context of an architectural object, although only if the architect is able to generate a meaningful situation for them, since materials in themselves are not poetic." The materials chosen should enhance the experience of the user and if used correctly, will portray the veracity of the material. An earth wall is heavy and rises from the earth speaking of permanence while a light timber structure speaks of the transient and fragile material quality. Kenneth Frampton (1990, p24) expands on this point of view by saying:

"framework tends towards the aerial and the dematerialization of mass, whereas the mass form is telluric, embedding itself ever deeper into the earth. The one tends towards light and the other towards dark. These gravitational opposites, the immateriality of the frame and the materiality of the mass, may be said to symbolize the two cosmological opposites to which they aspire: the sky and the earth."

By merely respecting the intrinsic characteristics of materials, the design can illuminate and reveal the veracity of the materiality.

The second commonality: Detailing the Joint

The joint is the primordial tectonic element that acts as a nexus between materials in the process of bringing a building into being. Placing materials together in a defined manner can articulate the essence of the materiality (Frampton, 1990, p24). By merely placing two materials together, a joint is created; by articulating the joint, details are created in architecture and jewellery. Marco Fascari (1996, p2) states: "details are the possibilities of innovation and invention, and it is through these that architects can give harmony to the most uncommon and difficult or disorderly environment generated by culture." The column is the detail of the structure, the structure a detail to the building and the building a detail in the city. Fascari (1996, p2) continues to state that architectural elements defined as details are always also a joint and always an expression of the structure. The detail and the joint therefore mediates between parts of the building, the building itself and the city.

"Architecture is an art because it is interested not only in the original need for shelter but also in putting together spaces and materials, in the meaningful manner. This occurs through formal and actual joints. The joint, that is the fertile detail, is the place where both the construction and the construing of architecture takes place." - Marco Fascari (1996, p11)

Mediating Between Existing and New

The nexus between the old and new structure is determined by the narrative the architecture seeks to articulate. Carlo Scarpa is a master at celebrating the existing structure of historic Venetian monuments in his architectural projects. Scarpa has three main approaches, his interpretation of the history, highlighting the architectural value of the original components and complying with the requirement that initiated the project (RAB:n.d, p444). In Carlo Scarpa's design of the Castelvechio, he creates new forms by looking at the historical significance of the structure. He articulates a curated route for the visitor through the existing structure

allowing the new to celebrate the narrative of the existing. Scarpa does this by: "paving (the) edge by separating the old walls by a tiny cascade of levels formed from white Prun stone." (RAB:n.d, p448) By doing this, he both connects and separates the new and the existing. This illustrates the dichotomy of the joint as an element used for connecting and separating, and the two functions cannot be separated from one another. The detail is where the new and the old come together or break apart.

Mediating Between Vernacular Knowledge and New Technologies

As the nexus of the project revolves around establishing more sustainable jewellery practices that refer back to historical ways of making, the construction of architecture should refer back to vernacular knowledge. Hasan-Uddin Khan (2015, p5) states: "Today, some architectural projects, based on ethical concerns, are beginning to reconnect contemporary architectural projects to the wisdom of the past in order to produce solutions for a sustainable built environment." Khan states that vernacular architecture uses the indigenous knowledge of a region and should not be confused with traditional knowledge which is the normative architecture of a region (Khan, 2015, p9). A new typology is created by joining vernacular knowledge with new technologies to produce the vernacular of today. It embodies the stewardship of caring for the environment, including passive strategies with contemporary technology such as photo-voltaic cells and monitoring systems.

Joints have the innate quality to separate and connect elements simultaneously. If joints are designed to be celebrated and emphasised, it draws attention to the two elements that are being connected. This allows the viewer to experience the characteristics of the two elements more distinctly. The phenomenon can be experienced in all details; for instance, the connection between a roof canopy and a column or the setting of a ring. The detail designed between two elements can strengthen the respect shown for the individual elements.

The third commonality: Finding the Setting

The passive strategies inherent in the vernacular knowledge relies heavily on the sitting and orientation of a building. The third commonality explores the setting of a building in the landscape, which can be compared to the setting of a stone within jewellery.

By setting a stone into a jewellery piece, the stone is protected, and its importance is emphasised. It is important to investigate how the proposed project could implement these strategies.

Framing the Existing

A frame supports the painting within by emphasising its importance. While it might be considered an edge condition, it also has the potential to open up possibilities. Edward Cassey (2008, p1) explains this phenomenon by defining two edges of a painting. The first is the mental space and second the canvas of the painting. The edge of the mental space is where the line between body and mind blurs while the edge of the painting is where the edge of the image bleeds out to the contexts around it. An edge is therefore always in duality as it is the end of one object and the start of another. It is never just one or the other. Casey (2008, p6) states: "Without edges, there is no in-between; without an in-between, edges would not be able to distinguish one object or event from another." The edge condition of a building protects the interior while it can open up possibilities of connecting beyond the site.

Mediating the In-between

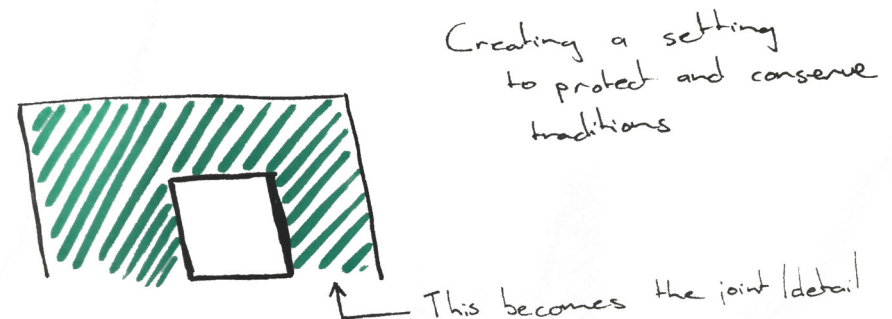
The in-between in this project becomes the mediated space between the existing structure and the new building. Mediation is an agreement between two extremes, that become better acquainted by means of a third party. As all details are joints that connect two parts; the detail can

be seen as the mediator, that simultaneously connects and separates two distinct parts. The existing and the new act as two edges, with the in-between acting as a detail, joining the new to the existing.

The setting in architecture relates to how the new structure is placed on the site, where it faces and how it relates to its context. Through heeding the placement of the structure on the site, the setting will, in turn, accentuate the detail and the individual elements.

Conclusion

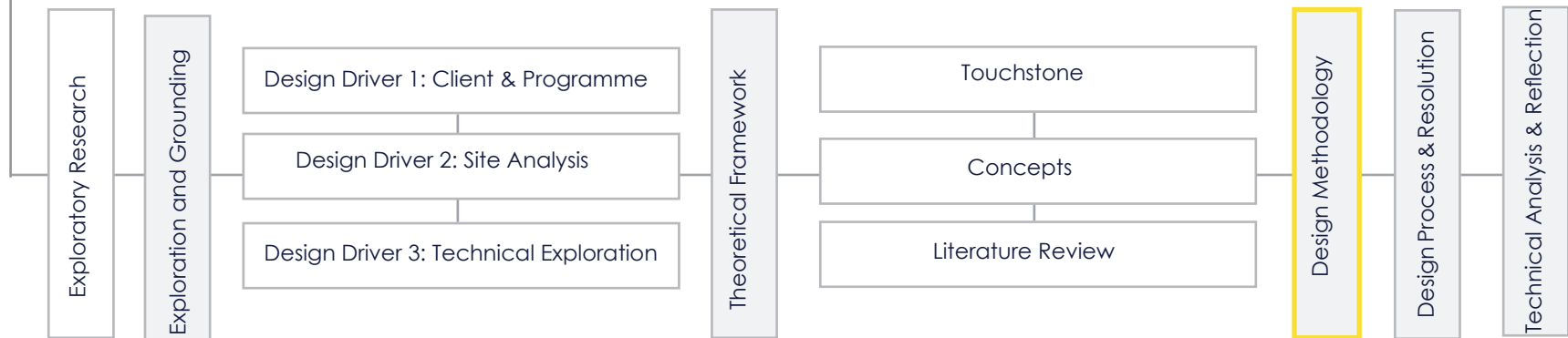
In conclusion, the dissertation explores the shared attributes between architecture and jewellery and how it relates to the specific project and site. The materials chosen support a more sustainable architecture while it builds on the vernacular knowledge of the area. Accentuating the setting of new structures and celebrating the joints allows the architecture to respect the materials.



06

Design Methodology

The design methodology is the extrapolation of all the influences and information gathered during the process of exploring the design drivers and formulating the conceptual framework.



The client and the programme suggest a hybrid of two building types with the restaurant as the connection point between the two. Liminal space can be used to support spontaneous encounter between students and tourists. Situated at the intersection of the urban and synthetic landscapes, the building should be a mediator between these two extremes while merging the new structures with the existing structure in a respectful manner.

Passive design strategy implementation will be essential to mediate the Kimberley climate by using materials that are primarily recycled, recyclable, and for the most part, sustainable.

The concepts suggest a combination of stereotomic and tectonic elements, a stitching element that runs through the design (the rammed earth walls) and unveiling the identity of the materials used.

The literature review suggests a certain level of respect for the materiality celebrating the joints and accentuating the setting.

The design should ultimately be an exploration of the design drivers and the literature review while referring to the ideas generated in the concepts.

06

Design Process

For the purpose of this document, the design process has been divided into the six most significant phases that led to the design resolution. Each built model represents a phase; however, there was always significant design changes between these stages. No model was built precisely from the plan as the design was constantly evolving through plans, drawings, sections and model building.



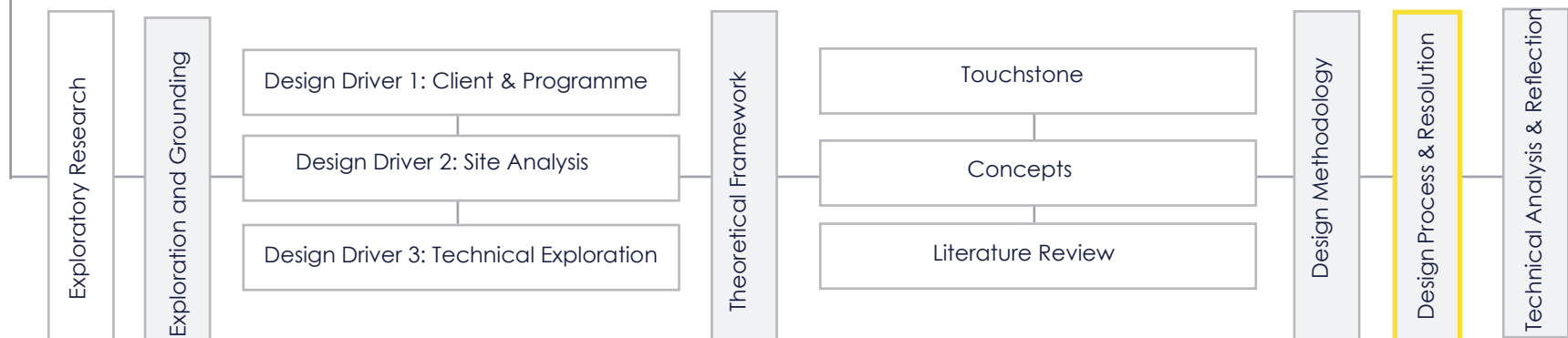
Phase 1



Phase 2



Phase 3

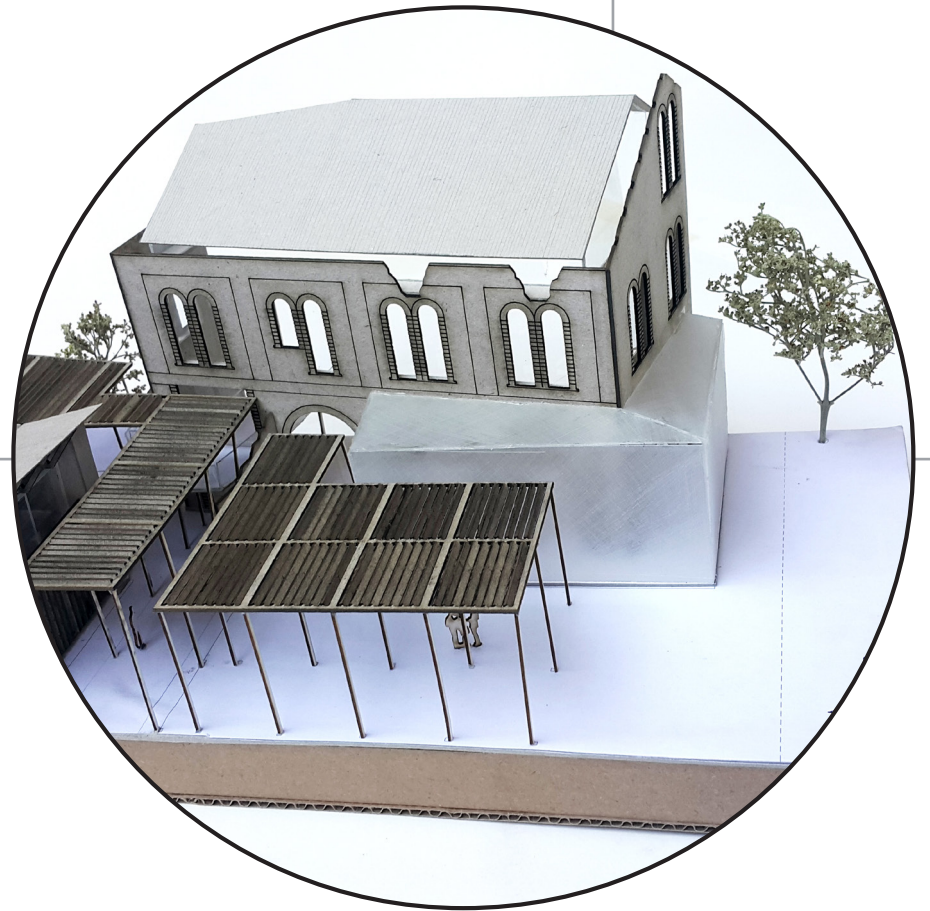




Phase 4



Phase 5



Design Resolution

Design

Phase 1

Phase one and two was a reaction to the concept and the accommodation list in conjunction with the existing structure on the site. Unsuccessfully the design attempted to fit the majority of the functions within the existing structure. After the unsuccessful design of the first two design phases, the project aims were reinvestigated and the materiality and literature review explored in order to extrapolate a design strategy.

Problems Identified:

There is no differentiation between the existing structure and the new building. The new structure did not celebrate the existing structure. There was no design strategy that connected the overall site planning resulting in a disordered grouping of functions.

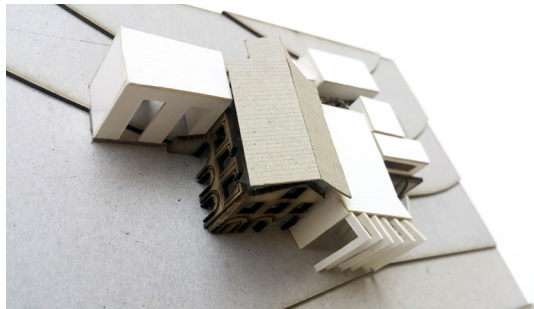


Figure 106: Photograph of phase 1 model



Figure 107: Photograph of phase 1 model

Concept Plan 1

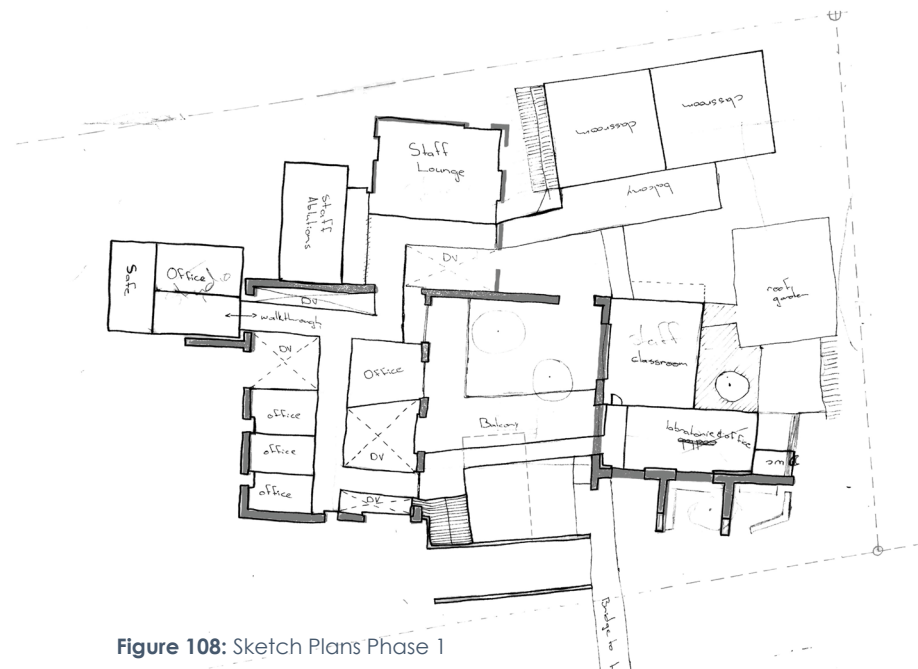
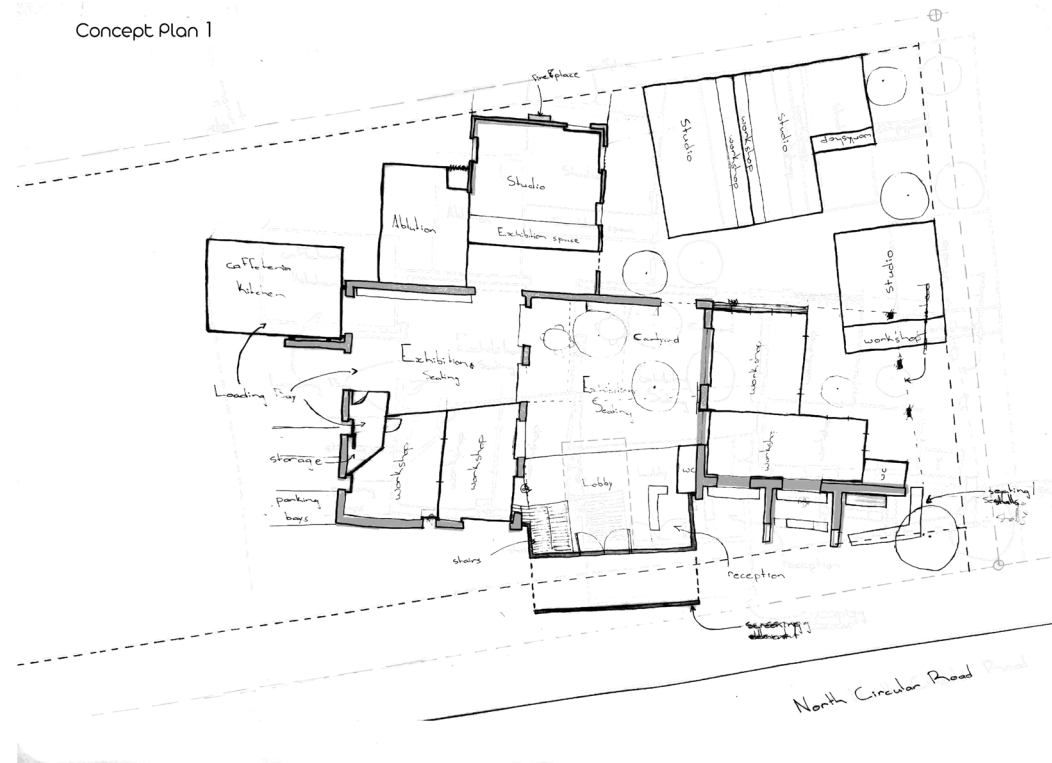


Figure 108: Sketch Plans Phase 1

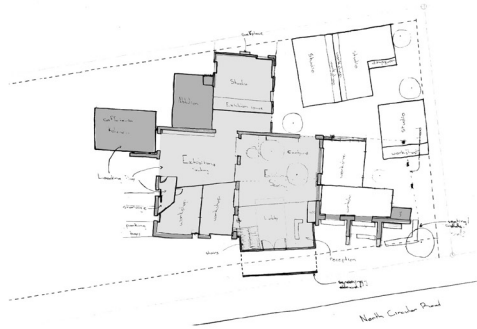


Figure 111: Sketch Plan Phase 1

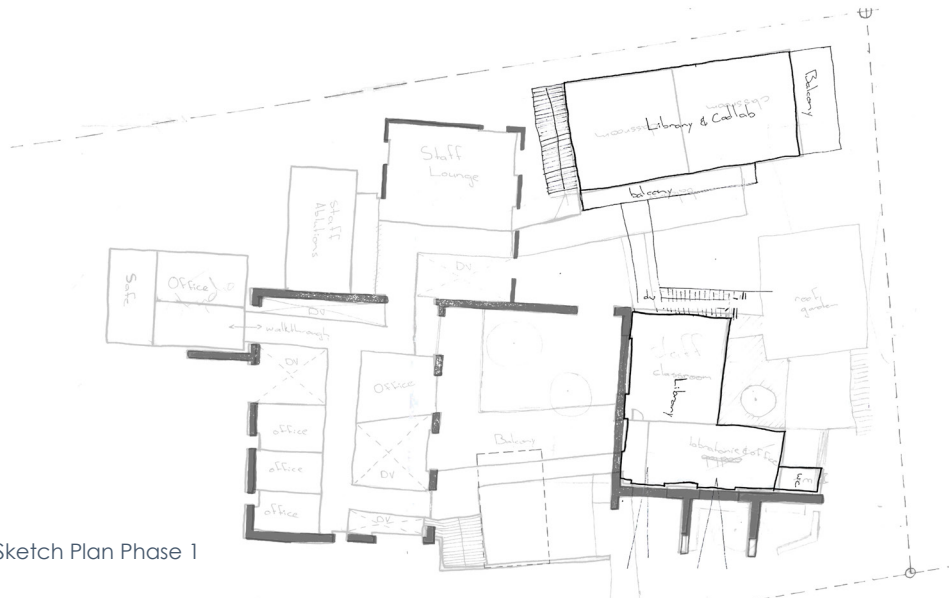


Figure 109: Diagrams Phase 1

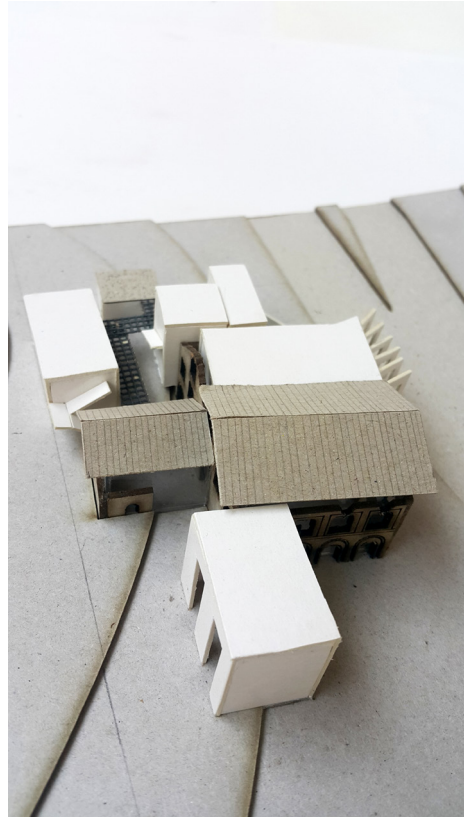
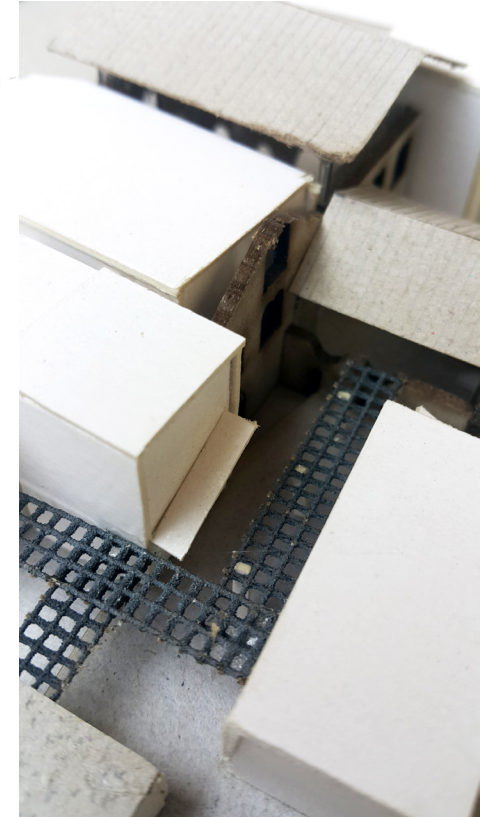


Figure 110: Photographs of Phase 1 model



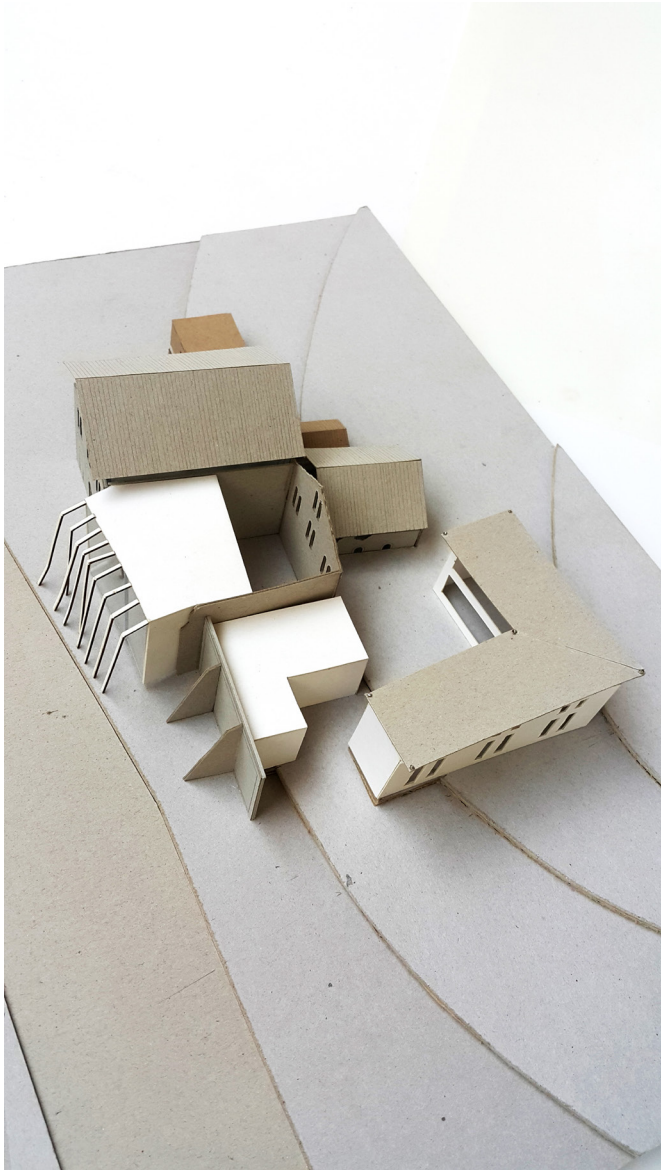


Figure 114: Photographs of Phase 2 model

Design

Phase 3

Phase three was the result of a 180-degree turn in the design process; after re-examining the project rationale, aims and concepts leading to further investigations into the literature review in order to form a design strategy.

The design strategy looked at accentuating the setting by placing most of the functions around the existing structure, acting as an edge that holds the fragile structure in place. This allowed the Rock Shaft building to be used as an exhibition hall. The structure was left mostly untouched except for the addition of a roof and a new facade to the right. The structure to the north was left untouched as a ruination courtyard.

The south-west and north-east corner of the site on ground floor allowed for public access with the restaurant situated in the middle of the site to the north and function as the connection between the public and the students. The masters' studio is situated adjacent to the public square to allow them to interact with the public and tourists.

The earth walls act as a connecting element which runs through the entire design. Organic lines were introduced in an attempt to relate the design more closely to jewellery design which is usually more organic.

Problems Identified:

The organic lines were decisions based upon arbitrary reasons with no relation to the concepts or literature review. The separation between private and public on the north-east corner is achieved very poorly through a fence.

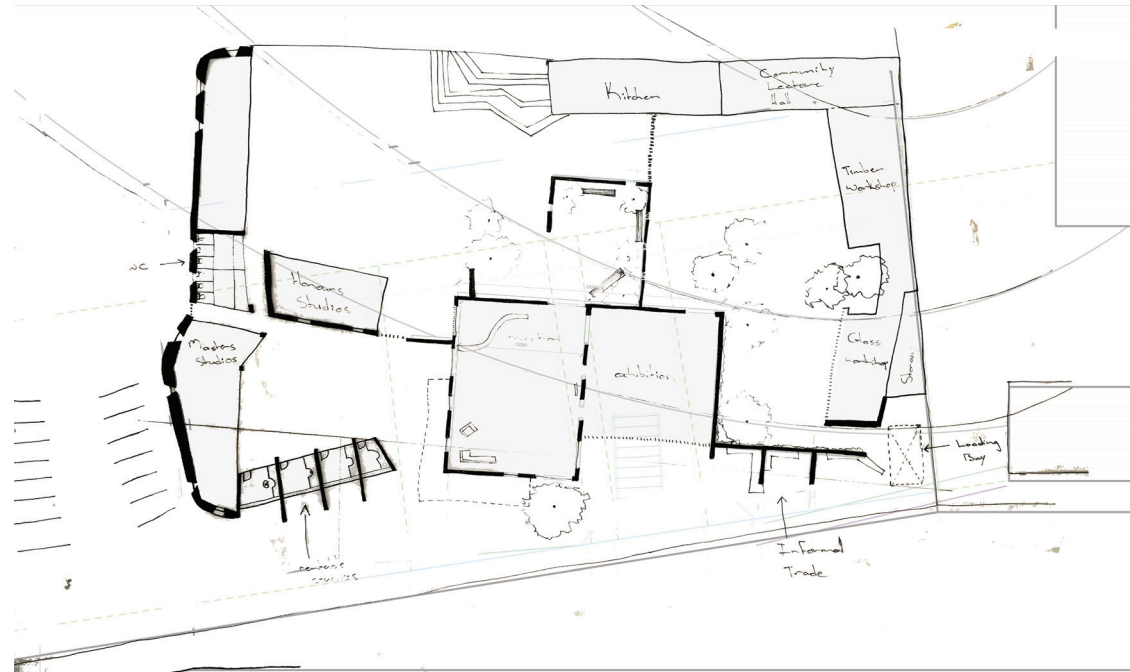


Figure 115: Sketch Plans: Ground Floor Phase 3



Figure 116: Photograph of model Phase 3

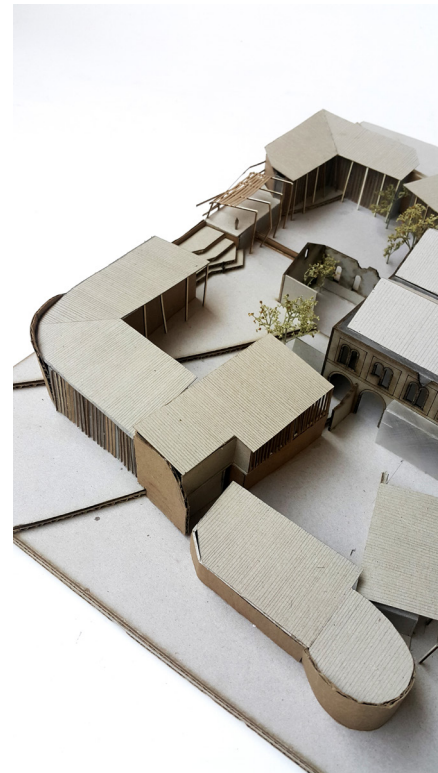


Figure 117: Photographs of model Phase 3

Design

Phase 4

Phase 4 of the design development resulted in the removal of the organic lines and explored the skewed lines in the design more by placing the restaurant on the same skewed line as the timber workshop. Most of the services were placed to the east and west with the studios facing north with a bridge connecting the north and south wings. The public courtyard was opened up more to the street and importance placed on the entrance from the parking area.

Problems Identified:

The skewed lines were placed on various grids that do not make sense together; the lines of the restaurant and workshop, the grid of the existing structure and the grid of the city.

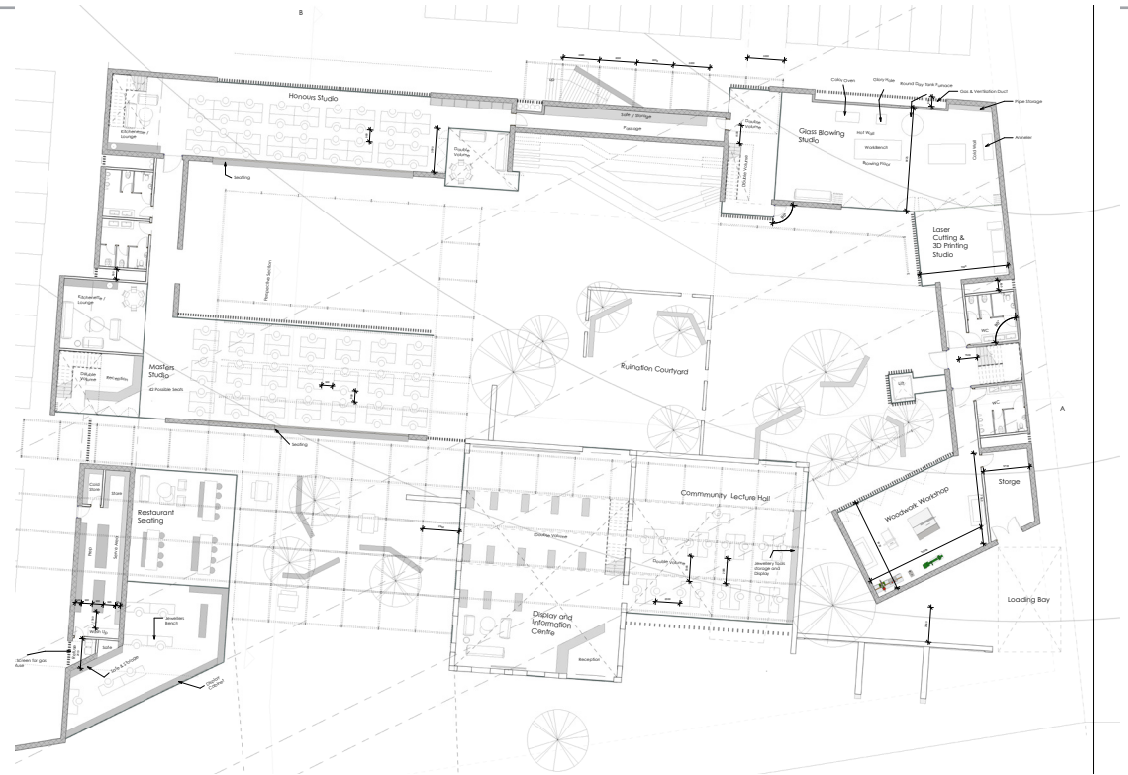
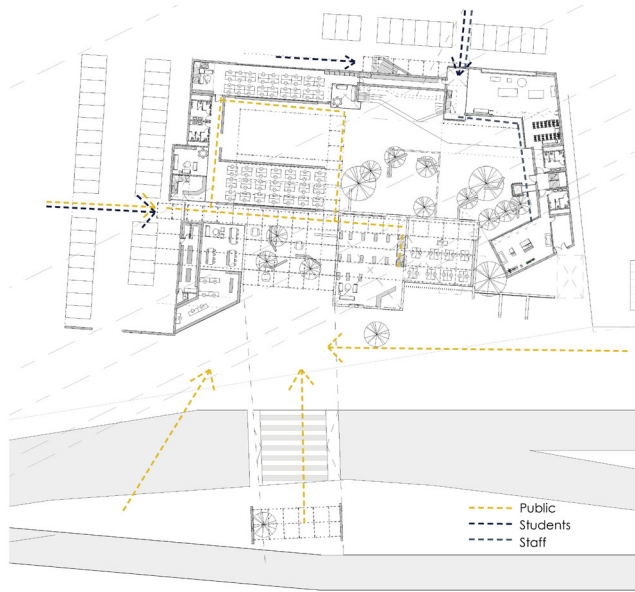


Figure 118: Ground Floor Plan Phase 4



Figure 119: Renders Phase 4





Main Entrance & Circulation

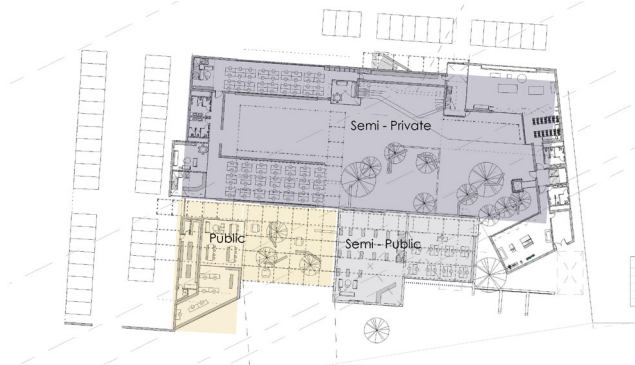
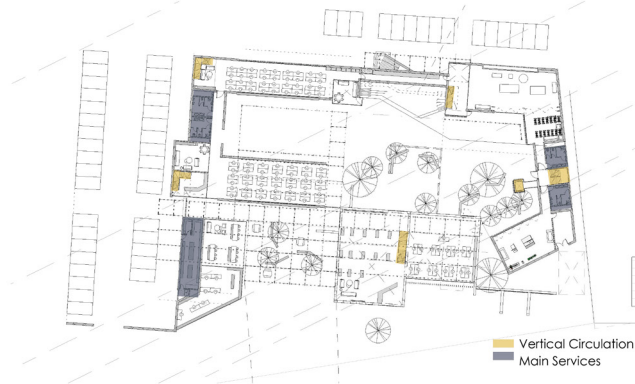


Figure 120: Circulation, Access, Services and Function Diagrams Phase 4



Figure 121: Photograph of model Phase 4



Figure 123: Renders Phase 4



Figure 124: Renders Phase 4

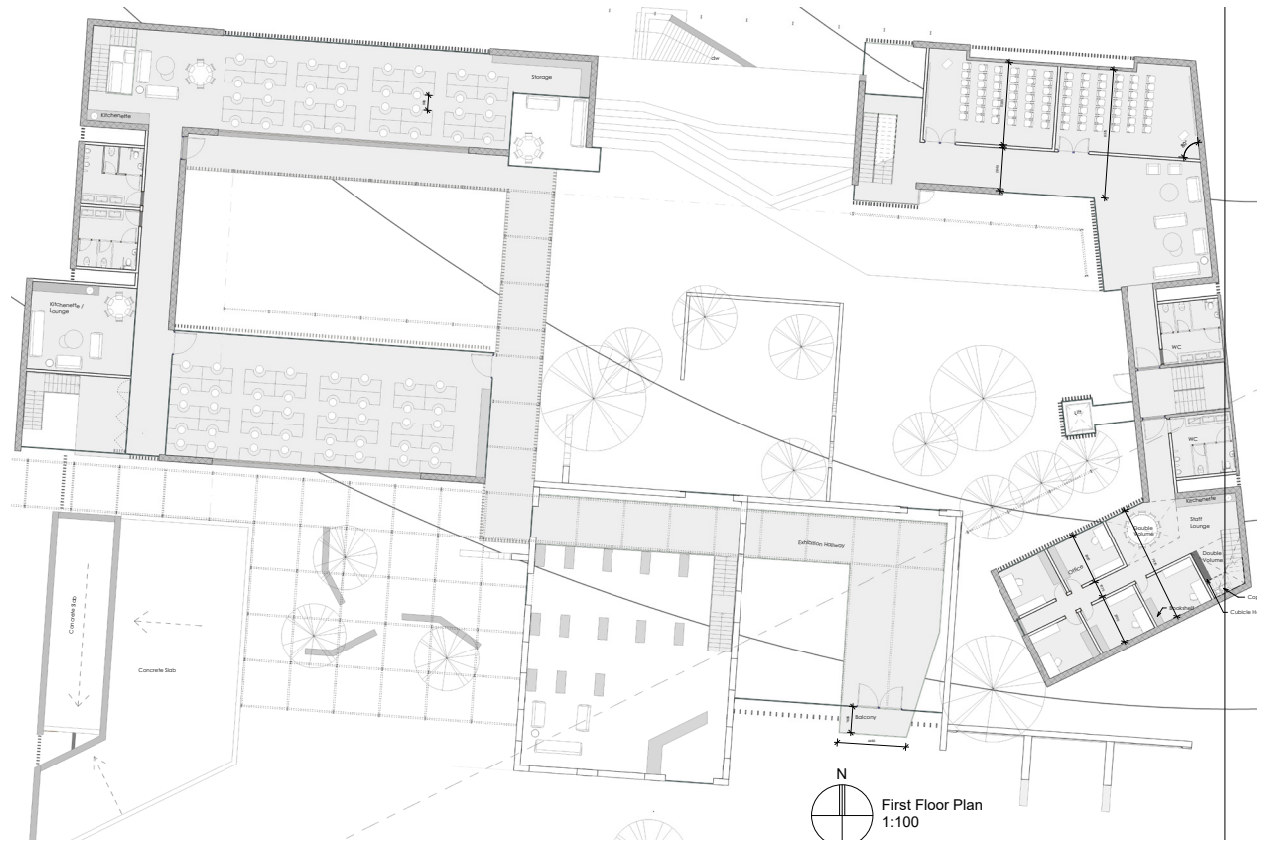


Figure 125: First Floor Plan Phase 4



Section B
1:200

Figure 122: Section Phase 4



Figure 126: Photographs of model Phase 4

Design

Phase 5

The fifth phase in the development established only two grids. All new buildings and structures align with the primary grid in line with the city grid, while the secondary grid is all the existing structures. The roof design was explored through a space frame structure and creating a separation between the walls and roof. The new building was cut into the contours allowing students to enter the building on the first floor from the north. The interior functions were moved around to place the glass blowing workshop in closer relation to the exhibition hall.



Figure 127: Ground Floor Plan Phase 5



Figure 128: Photographs of model Phase 5

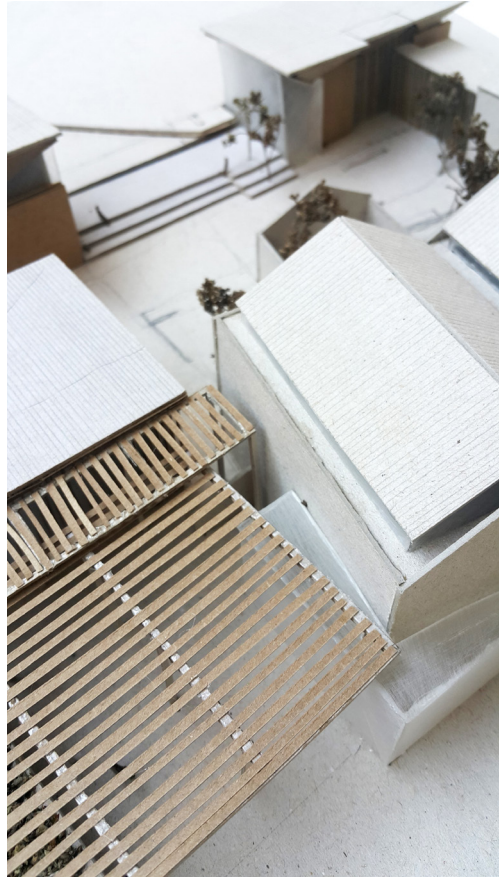


Figure 129: Photographs of model Phase 5

Design Resolution

Phase six is the last step towards a design resolution and explored a roof design that could allow sun in from the north while opening up to the social spaces in the south, and capture rain water. This resulted in a butterfly roof over the three studio buildings. The truss is celebrated by exposing on the interior and exterior. The workshop and restaurant had to be addressed differently as they face west and not north. A mono-pitched roof was placed over these functions and the roof trusses were rather hidden from public view.

For a project analysis refer to the technical report, p140 of this document

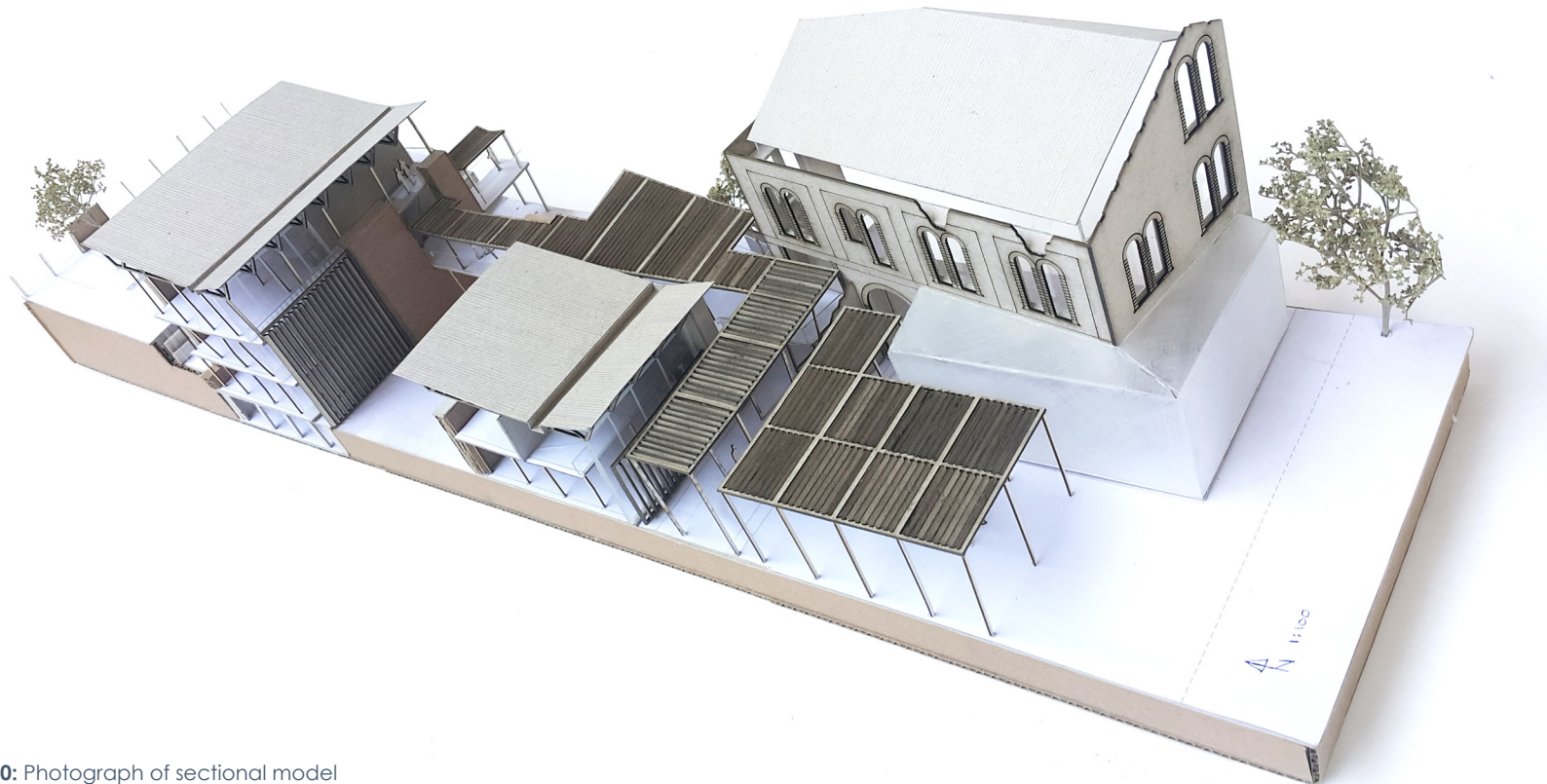
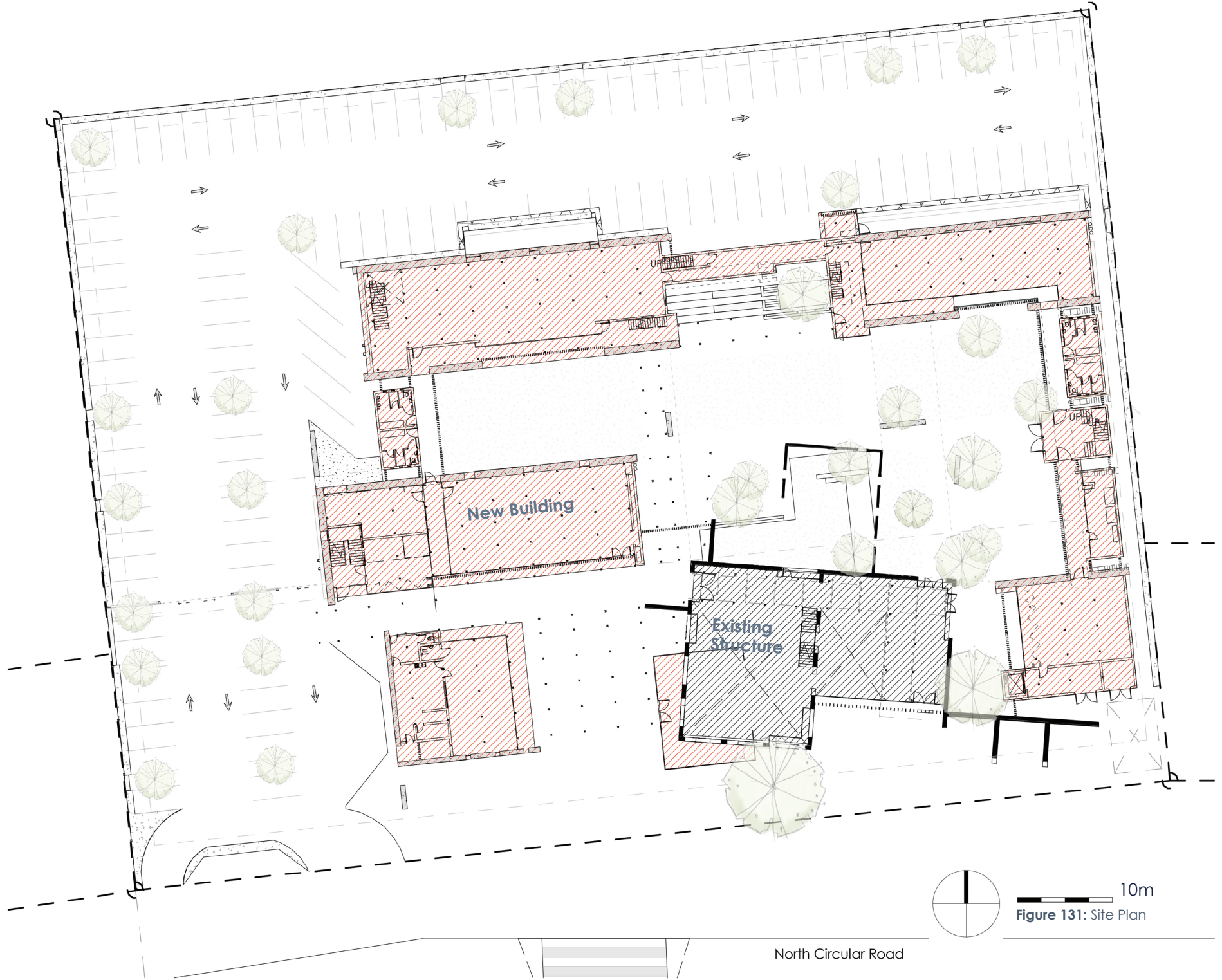
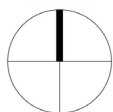


Figure 130: Photograph of sectional model



New Building

Existing Structure



10m
Figure 131: Site Plan

North Circular Road

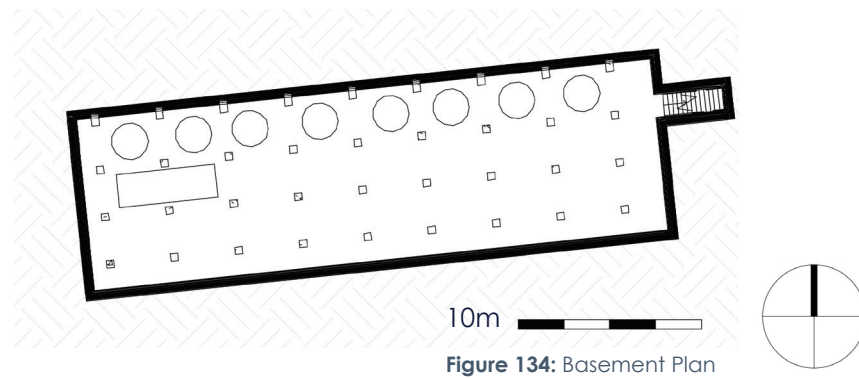


Figure 132: South Elevation



Figure 133: North Elevation

- 1 Restaurant
- 2 Master Studio
- 3 Reception
- 4 Ablutions
- 5 First Year Studio
- 6 Honours Studio
- 7 Lasercutting
- 8 Glassblowing Studio
- 9 Storage
- 10 Refuse
- 11 Exhibition Hall
- 12 Multi-functional Hall
- 13 Ruination Courtyard
- 14 Public Courtyard



Design Presentation 05

Design Presentation 05

10m
Figure 135: Ground Floor Plan

- 4 Ablutions
- 9 Storage
- 11 Exhibition Hall
- 13 Ruination Courtyard
- 14 Public Courtyard
- 15 Office
- 16 Second Year Studio
- 17 Class Rooms
- 18 Casting Room
- 19 Wood Workshop

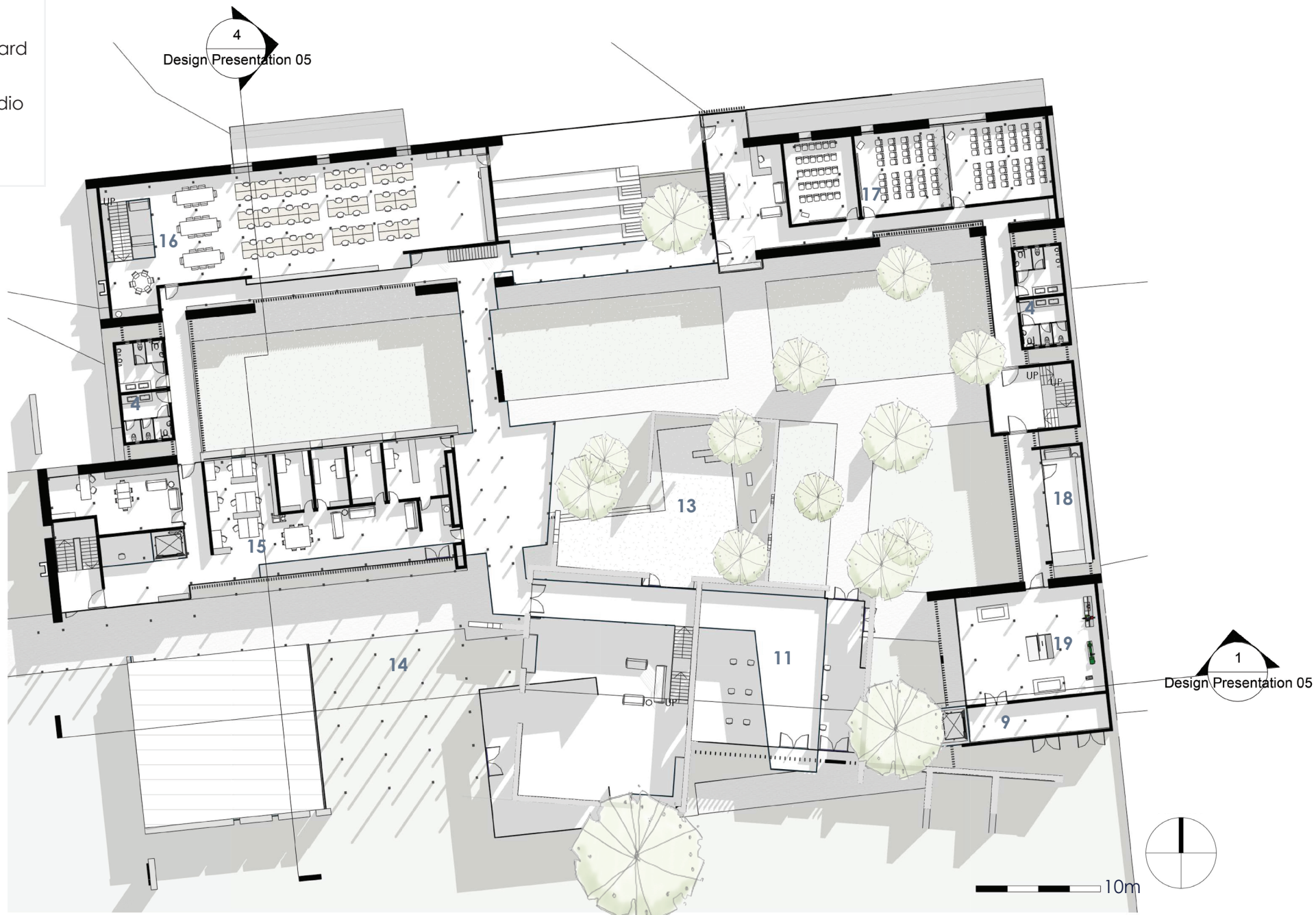


Figure 136: First Floor Plan

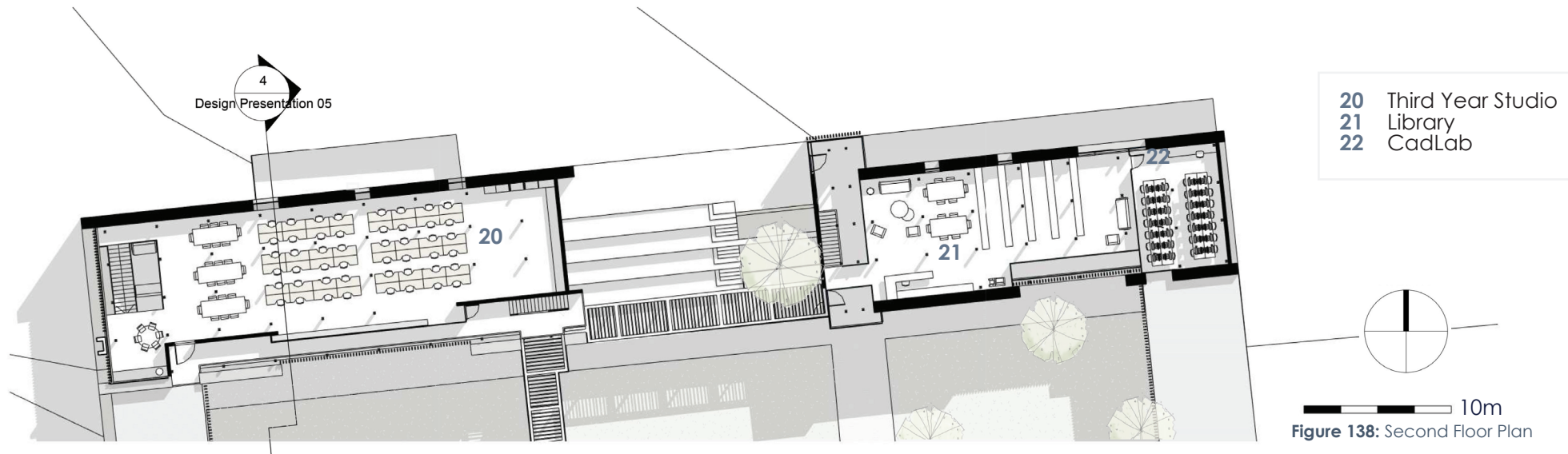
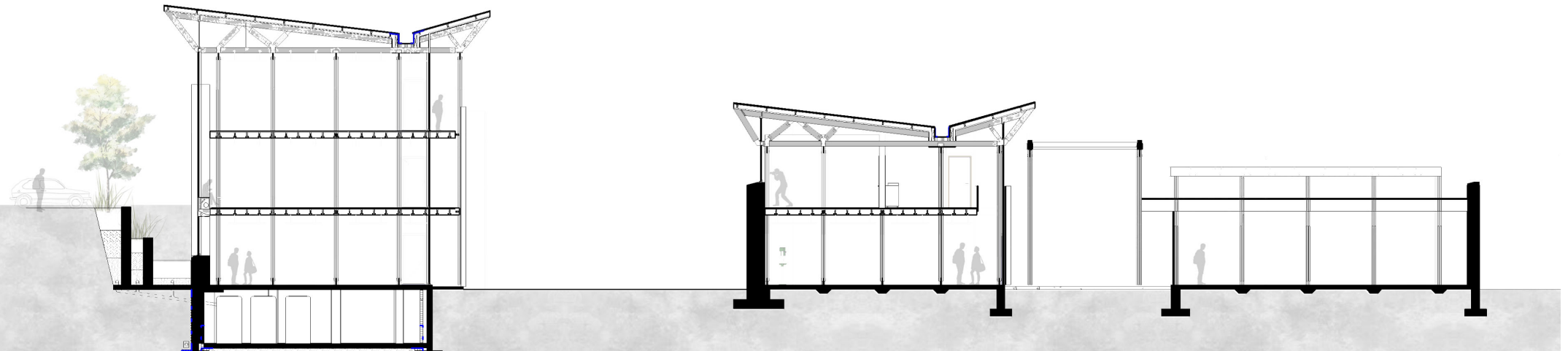


Figure 137: Western Elevation



10m
 Figure 139: Section AA



10m
 Figure 140: Section BB





Figure 143: Perspective from street



Figure 142: Perspective render from parking space.



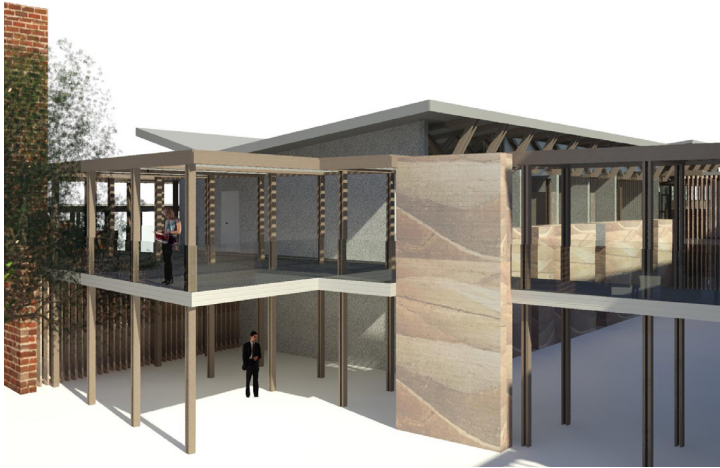


Figure 144: Perspective towards administrative offices on first floor



Figure 145: Render of bridge connecting the two northern buildings



Figure 146: View towards western services with ruination courtyard in view



Figure 147: Photograph of Sectional Model



Figure 148: Photographs of Sectional Model



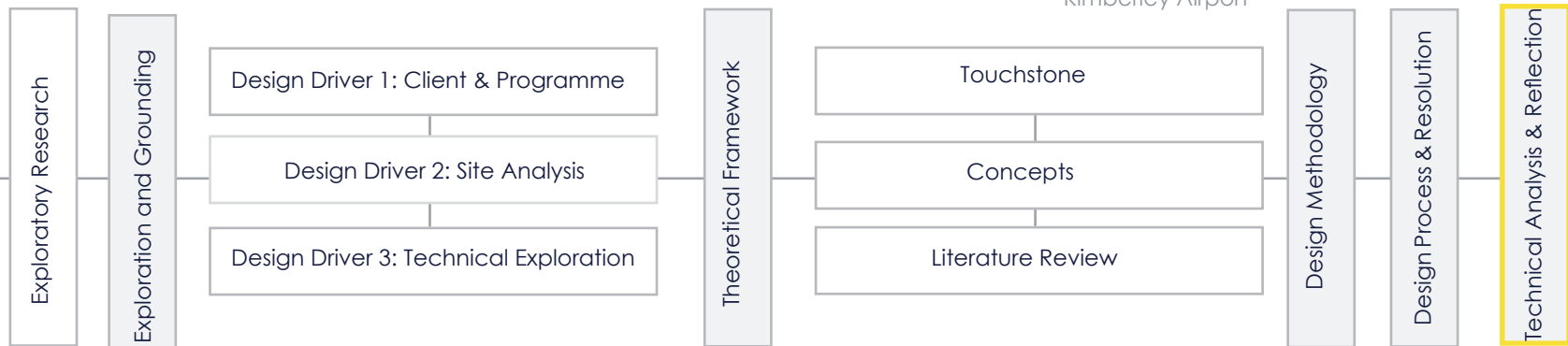
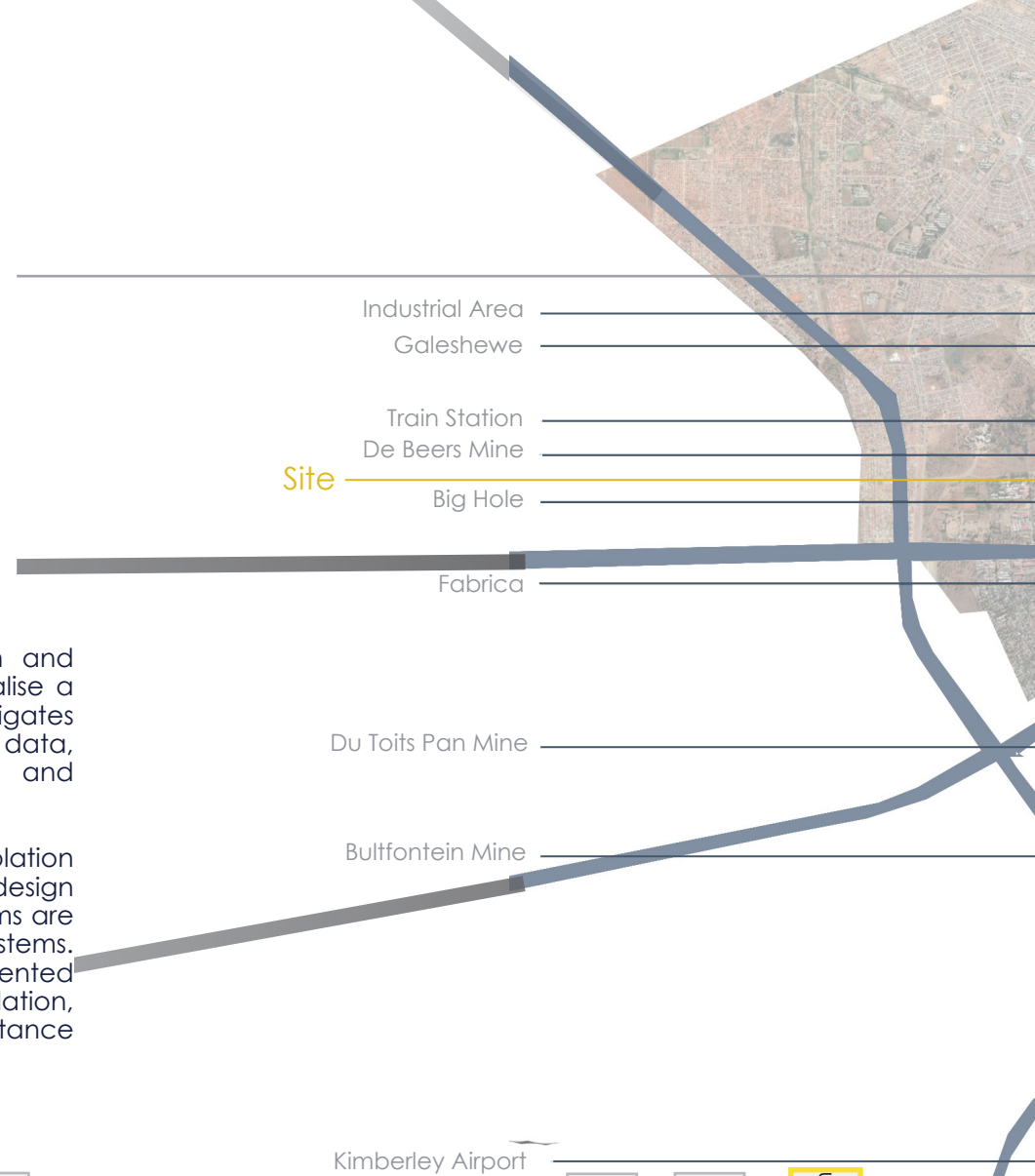
Figure 149: Photographs of Sectional Model

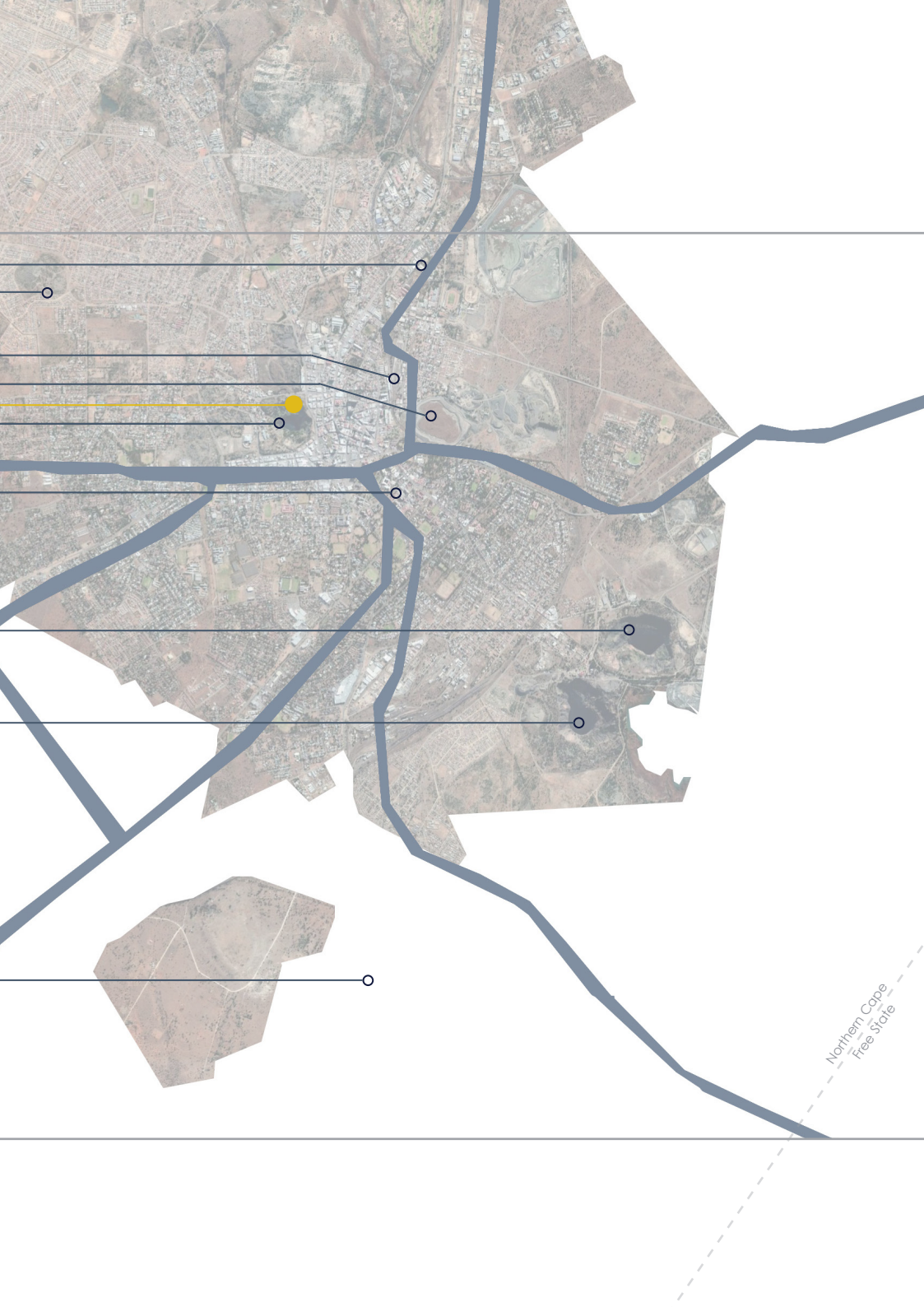
07 Technical Report

- 7.1 Introduction
- 7.2 Site Analysis
- 7.3 Materiality
- 7.4 Structural Investigation
- 7.5 Project Analysis
- 7.6 Sustainability Analysis

The technical report investigates the exploration and implementation of various technical systems to realise a favourable design resolution. This chapter investigates the technical design drivers such as cadastral data, development rights, building lines, topography and geotechnical analysis.

Additionally, this chapter demonstrates the extrapolation and implementation of this information during the design process. The selected materials and structural systems are analysed after the exploration of various structural systems. A technical analysis illustrates how the implemented systems function, including the site planning, circulation, services, fenestration compliance and a fire-resistance strategy.





7.1 Introduction

The proposed project is an Alternative Jewellery School and Tourists Centre located in Kimberley, South Africa. Alternative jewellery is the manipulation of unconventional materials to convey a message and meaning through wearable art (for a detailed analysis of alternative material refer to page 22). These unconventional materials, chosen for practical, personal or ethical reasons, are usually obtained from sustainable sources. Conventional jewellery, on the other hand, is made from gold, silver and stones that are sourced through mining practices that harm the environment (refer to page 10 of this document).

Situated across from the Big Hole (also known as the Kimberley Mine, the world's largest hand-dug diamond mine) the project can potentially highlight harmful mining practices.

An abandoned Rock Shaft ruin currently occupies the site and was used to enable the mining activities in the 1800s. The dissertation aims to convert and incorporate the deserted ruins into a building which fosters alternative jewellery practices while rejuvenating the Kimberley CBD through increased tourist activities.

This dissertation investigates the environmental impact of materials used during the poesis of jewellery and architecture. It is by honouring of the materials and celebrating the joint where the poetics of the project lie.



Figure 150: Perspective render from street

7.2 Site Analysis

Programme and Function Requirements

The proposed project consists of two main functions: the school and the tourist centre. The school's design includes various teaching facilities such as classrooms, studios and workshops. The tourist centre consists of an exhibition hall, and a multifunctional space used for community classes or jewellery conferences. A restaurant serves as a shared space between the two main functions (for a detailed account of the users, programme and accommodation list, refer to p32 of this document).

Location

The selected site lies across from the Big Hole on the threshold between Kimberley CBD and the West End residential community see Figure 151. Its proximity to the main tourist attraction of Kimberley provides many opportunities for the proposed school complex into the tourists' route and thereby revitalising the CBD.

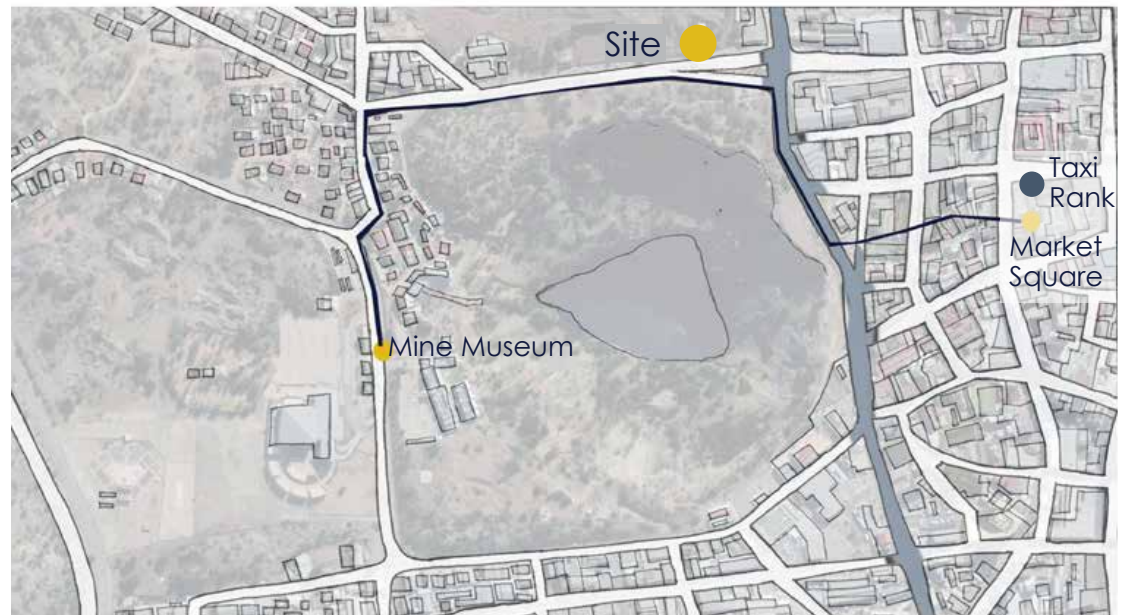


Figure 151: Kimberly Maps: Transport and Function

Topography

A forlorn ruin, the Rock Shaft, that currently occupies the site, was built concurrently with the initial sinking of the shaft in March 1889 (Vertue, 1991). The ruin sits between a 1901 building (to the east) currently used as a youth developmental centre, and the planes of a synthetic landscape sculpted by mine dumps to the west. The site therefore, act as the mediator between the urban fabric to the east and synthetic landscape to the west. The site slopes gradually to the road on the south with a total fall of 3m across the entire site. Various barriers inhibit visual and physical connection between the site and the Big Hole. These barriers include north circular road, tram tracks, mine dumps and a devils-fork fence.

The Rock Shaft ruin was once used to enable mining activities. During its operation, the building was used to hoist workers, and waste rock in and out of the Big Hole utilising steam-powered engines and headgear. The headgear and steam-powered engines have since been placed at the Big Hole Mine Museum forming part of their exhibition. During the 1800s when the Rock Shaft was constructed, the miners' needs increased rapidly, resulting in Kimberley developing haphazardly between the Big Hole and De Beers Mine.

This rapid development resulted in buildings being constructed faster than town planning strategies could be implemented. The SG diagrams of the erfs, in this area, was drawn up in 1973 eighty-four years after the Rock Shaft construction. The results being that seven erven were drawn up over the existing footprint, entirely overlooking the entire structure. The blatant disregard for the existing structure is a poignant statement of its historical insignificance in the eyes of town planners. In addition, the site has not yet been classified as a heritage site, although the development of the land will require a Heritage Impact Assessment as the building is older than 60 years.



Figure 152: Photograph of the Rock Shaft ruin

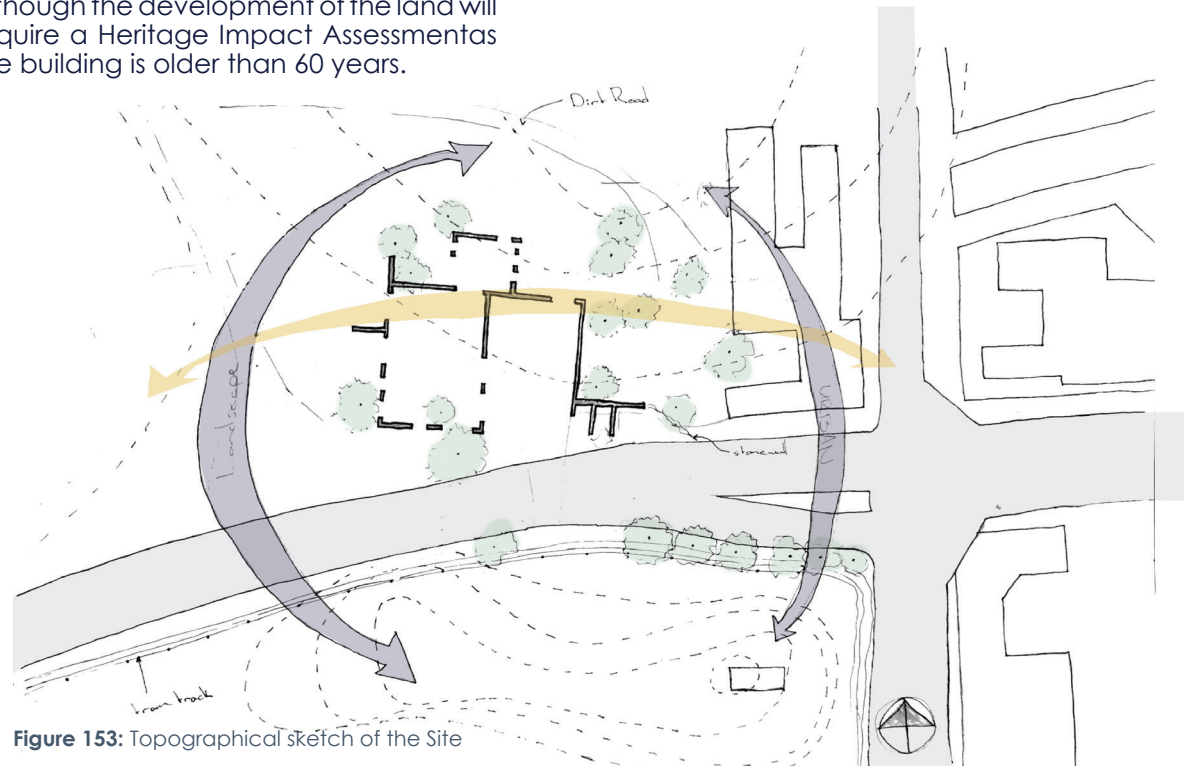


Figure 153: Topographical sketch of the Site

Cadastral Information

In order to make any amendments or additions to the existing structure, the erven should be consolidated. The proposed consolidated erf would allow the entire structure to be situated over one erf. See appendix A for the SG diagrams of the current unconsolidated erf.

Erf Nr: New erf number to be assigned after consolidation
Address: 3 North Circular Road Kimberley 8300

Applying for a consolidated erf should be reasonably straightforward as CBD development is encouraged by the current town planning scheme. According to the Integrated Development Plan: "the CBD is critical to the future development of Kimberley... Sites such as the caravan park as well as possible development around the Big Hole present exciting possibilities and, if developed in a complementary fashion to the CBD, could result in renewed vitality to the central areas of the city." (Sol Plaatje Municipality, 2004, p. 46)

Access to the newly consolidated erf (Figure 155) will remain from North Circular Road. There are various access points to site 5024, and therefore, no new access points through the consolidated erf would be required.

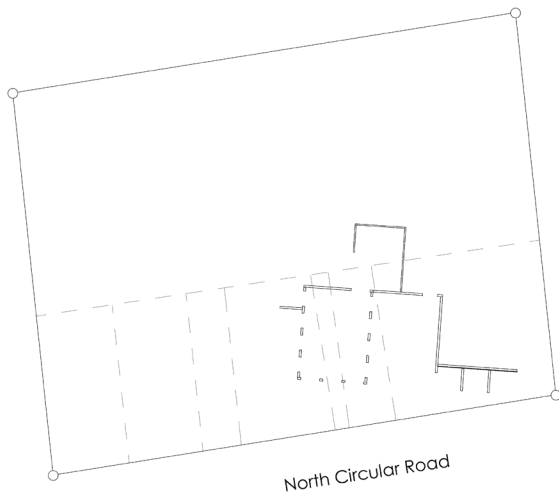
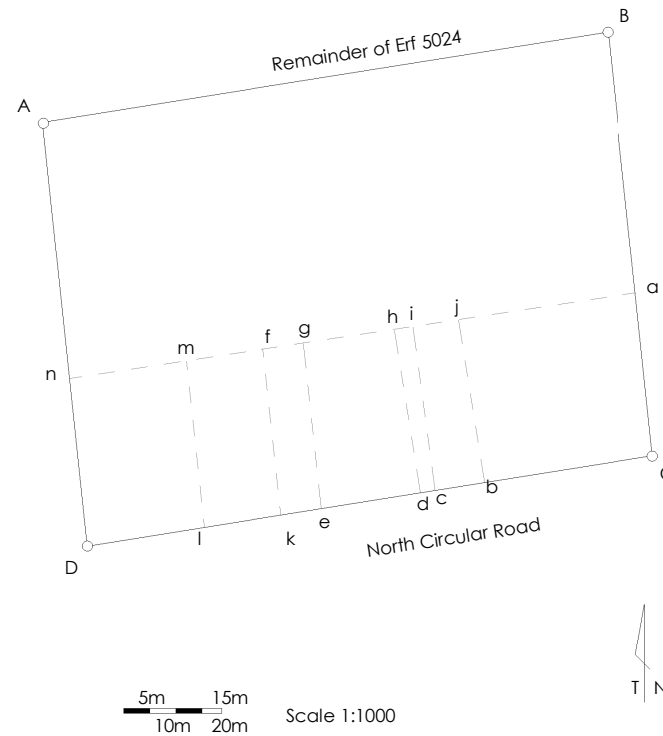


Figure 154: Diagram showing the existing over seven erven

Components:

- 1.) The figure ABfa represents subdivided portion of Erf 5024 Kimberley
- 2.) The figure mDn represents Erf 7342 of Kimberley
- 3.) The figure fklm represents Erf 7343 of Kimberley
- 2.) The figure fgk represents Erf 7344 of Kimberley
- 3.) The figure ghde represents Erf 7345 of Kimberley
- 4.) The figure hicd represents Erf 7346 of Kimberley
- 5.) The figure ijbc represents Erf 7347 of Kimberley
- 6.) The figure jaCb represents Erf 7348 of Kimberley

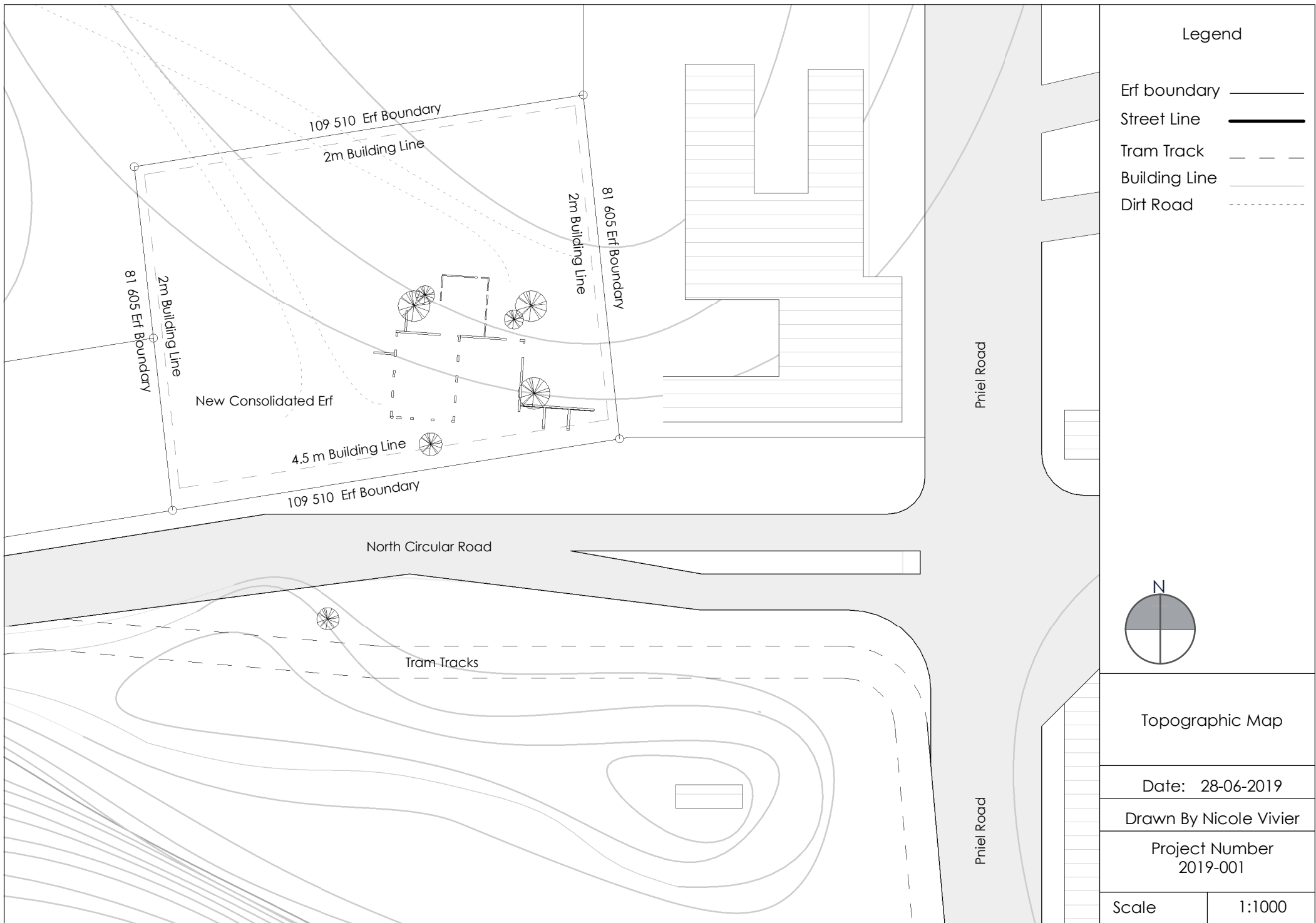
Sides in Meters		Angle Of Direction	
AB	109.510	A	92
BC	81.605	B	87
CD	109.510	C	93
DA	81.605	D	87



The figure ABCD represents 8829 square meters of proposed land to be consolidated and to obtain new erf number situated in the Kimberley Municipality.

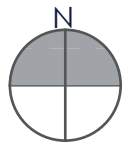
This diagram is compiled in March 2019 by Nicole Vivier and is annexed to the Land Use Management plan for consolidation and rezoning.

Figure 155: Proposed consolidation diagram



Legend

- Erf boundary
- Street Line
- Tram Track
- Building Line
- Dirt Road



Topographic Map

Date: 28-06-2019

Drawn By Nicole Vivier

Project Number
2019-001

Scale	1:1000
-------	--------

Figure 156: Topographic Map

Development Rights

An application will be made to rezone the site as it is currently zoned as Industrial II refer to figure 157 (Sol Plaatje Municipality, 2008, p. 21). The proposed zoning is educational, permitting places of instruction, social hall, and places of worship. Additionally, with municipal consent dwelling units, institutions, places of refreshments and special buildings may be allowed (Sol Plaatje Municipality, 2008, p. 21).

Building Lines

The street building line is 4.5m while the side and rear building lines are 2m. According to the Sol Plaatje, Land Use Management scheme application may be submitted to relax 50% of the street building line if such development is an improvement and it is subject to the site development plan (Sol Plaatje Municipality, 2008, p. 15)

Additional Height Restrictions

Additional height restrictions pertain to developments around the "Big Hole Provincial Heritage Site" to ensure the view from the Big Hole pivot point remains uninterrupted. The Land Use Management scheme illustrates how to calculate the height restriction (Figure 156). No building between the pivot point towards the northern mine dump may exceed a height above the incline of 0° 12'52" or exceed a height above the incline of 0° 57'20" towards the southern dump.

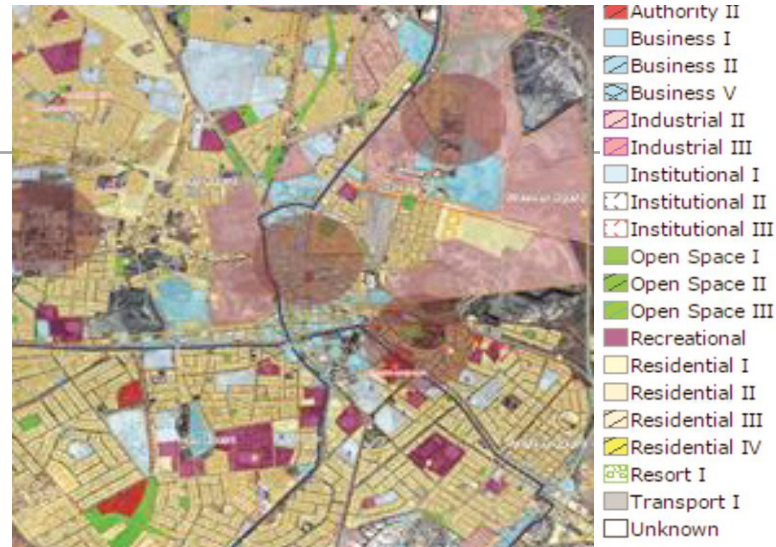


Figure 157: Land Use Management Scheme (Sol Plaatje Municipality, 2017, p. 48)

Schedule of Rights			Area Schedule	
Erf: New Consolidated Erf Nr			Restaurant:	143m ²
Site Area: 8737m ²			Exhibition Space:	395m ²
Township: Kimberley			Studio Spaces:	1274m ²
Zoning Information			Workshops:	288m ²
Town Planning Scheme:			Lecture Halls:	215m ²
Sol Plaatje Municipality: LUM 2008			Library :	142m ²
Use Zone: Educational			Cad Lab:	73m ²
Developmental Control Measures			Offices:	242m ²
			Services, Reception & Circulation:	408m ²
Control	Permissible	Actual	Total:	3180m²
Floor Area Ratio	2	0.44	Footprint:	1411m ²
Height	4 Storeyes	3 Storeyes	Site:	8737m ²
Coverage	50%	16%	Coverage:	16%
			FSR:	0.44

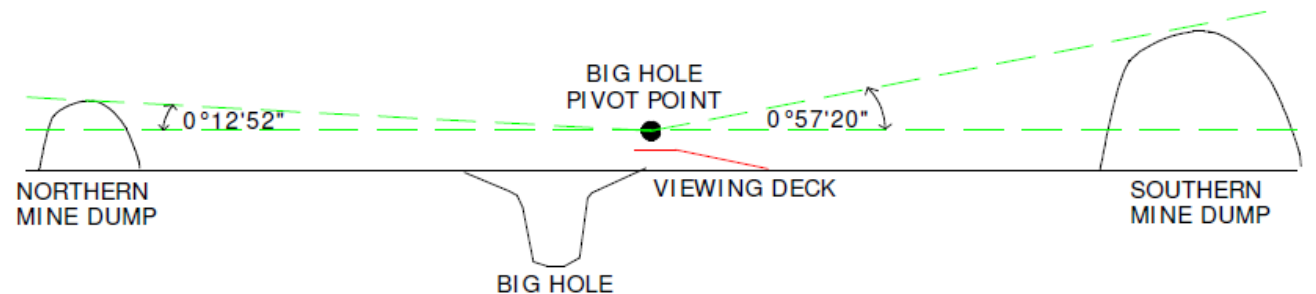


Figure 158: Height Restriction Diagram

Climate

Kimberley is situated within the temperate interior climate of Southern Africa but borders the arid interior. The region experiences scorching summer temperatures with summer rainfall. The average rainfall equates 420mm per annum (see Figure 160). The winters are cold and dry, and night temperatures can easily reach zero degrees (SAExplorer, 2017: Online).

Passive design strategies implemented during the design phase can manage the extreme temperatures to ensure maintain comfortable air temperatures.

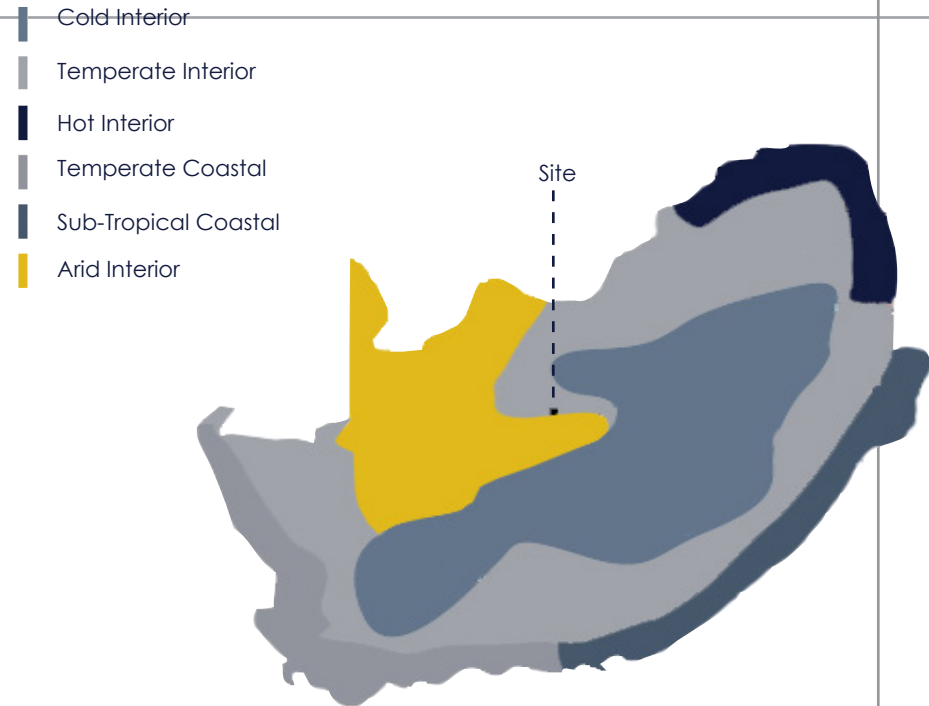


Figure 159: Climate Map of South Africa

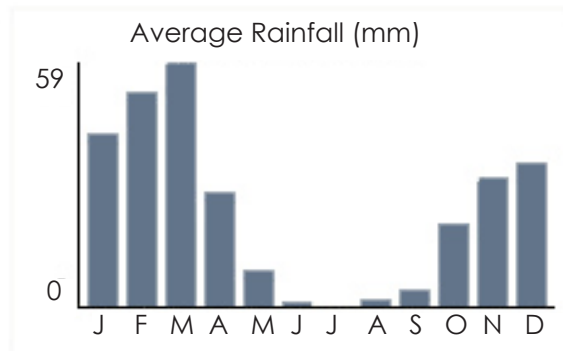


Figure 160: Climate Graphs (SAExplorer, 2017: Online)

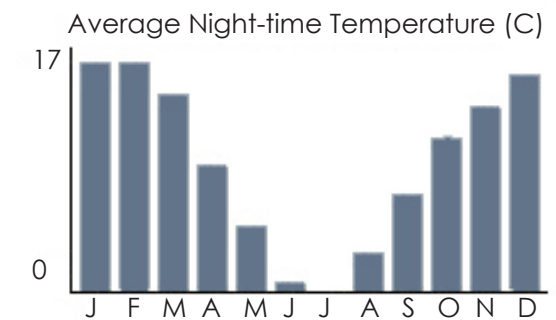
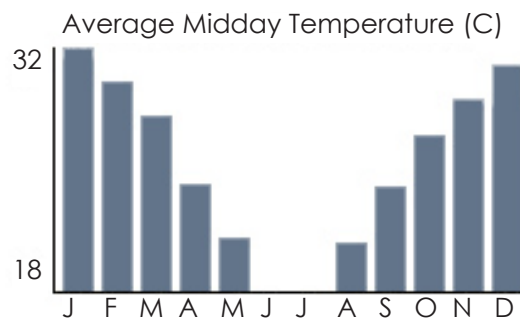


Figure 160 indicates the Kimberley mine soil conditions. The soil is composed of a 1 to 5m deep Red Topsoil followed by a 6 to 20m dolerite sheet also known as intrusive dolerite and black shales or Kimberley Shales with an approximate thickness of 60 to 90m. The shales start of yellow, pink or brown in colour and transition towards black to the bottom. The next layer is the Dwyka conglomerate, which consists of "rounded pebbles and stones firmly cemented together" (Maree, 2017) followed by approximately 120 meters of Melaphyre more commonly known as hard rock (Figure 161).

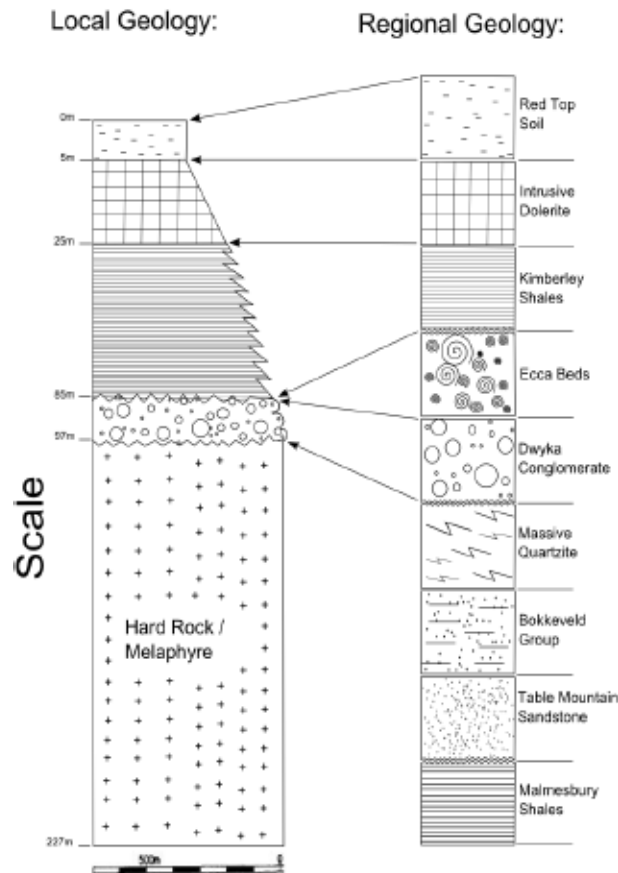


Figure 162: Geology of Kimberley Region

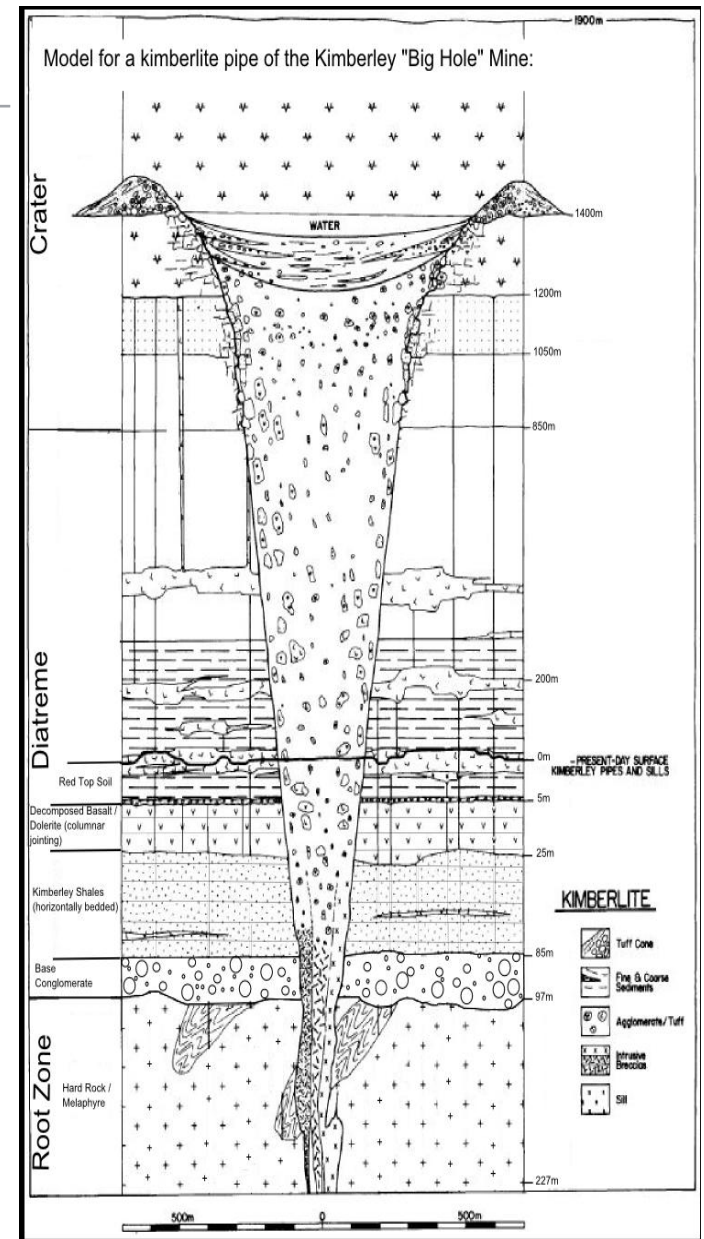


Figure 163: Geology of Kimberley Mine

The Big Hole has experienced various topplings and landslides that have led to severe cracks in Priel Road; endangering the adjacent infrastructure and businesses. The mine was initially hand-dug in a frenzy without planning for the mine walls' future stability. Over time, the Kimberley Mine has taken on an oval shape which is not optimum. Maree (2017, p19) states that: "the most stable (open) mine pit configuration is circular, due to the fact that a circular pit will always create the most stable regional stress regime around the outer perimeters of the mine." The oval shape of the hole is stretched out from east to west with its closest point a mere 22 meters away from Bultfontein Road on the east (Maree, 2017, p. 41).

The other significant influence on the collapsing side walls is the weather conditions and the exposed shale. Kimberley experiences high day temperatures while night temperatures in the winter can reach below freezing point (refer to p 62). Infrequent rainfall results in severe thunderstorms that contribute to the deterioration of the shale rock, resulting in the edges of the Big Hole mine to migrate outward (Maree, 2017). Any rock exposed to water can be saturated and desaturated, resulting in swelling and shrinking of the clay (Maree, 2017).

Figure 165 indicates several Kimberlite dykes which illustrate the tension exercised in the mine walls. Kimberlite Dyke, according to the free dictionary is: "A long mass of igneous rock that cuts across the structure of adjacent rock." (The Free Dictionary, 2019). Two sheer cracks are visible in the south-west of the hole with cracks visible in the road. Figure 166 illustrates the limits for potential mine pit breaks that could affect Bultfontein road.



Figure 164: Photographs of mine damage (Maree, 2017)

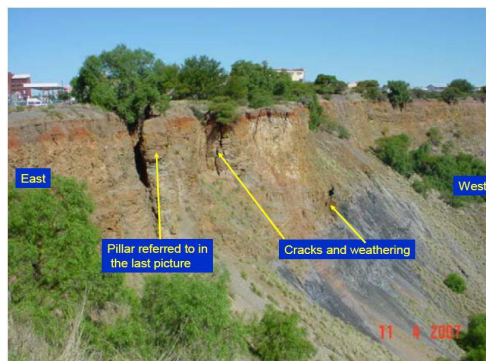


Figure 165: Photographs of mine damage (Maree, 2017)

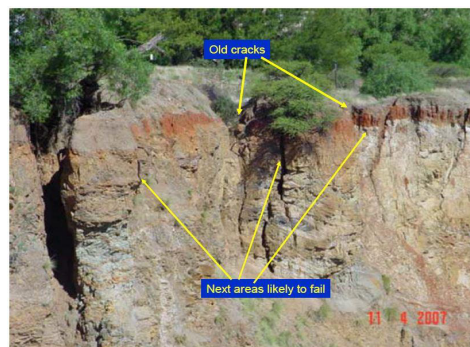


Figure 166: Photographs of mine damage (Maree, 2017)

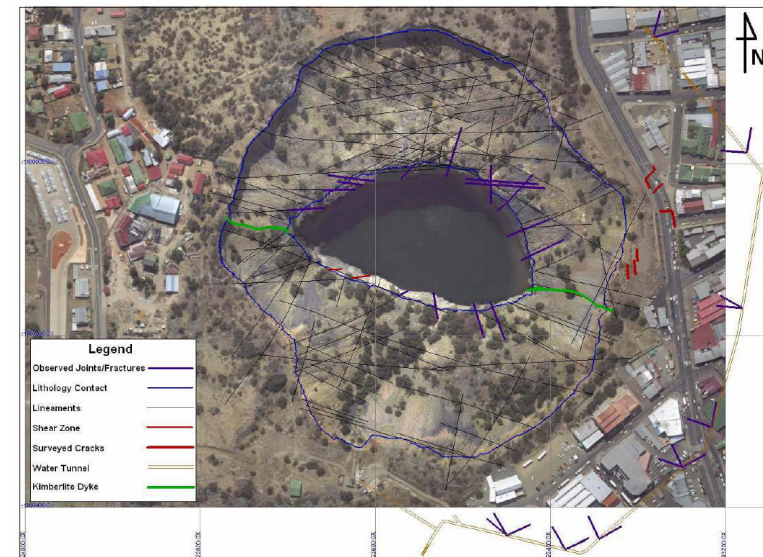


Figure 167: Map of Kimberley Dyke (Maree,2017)

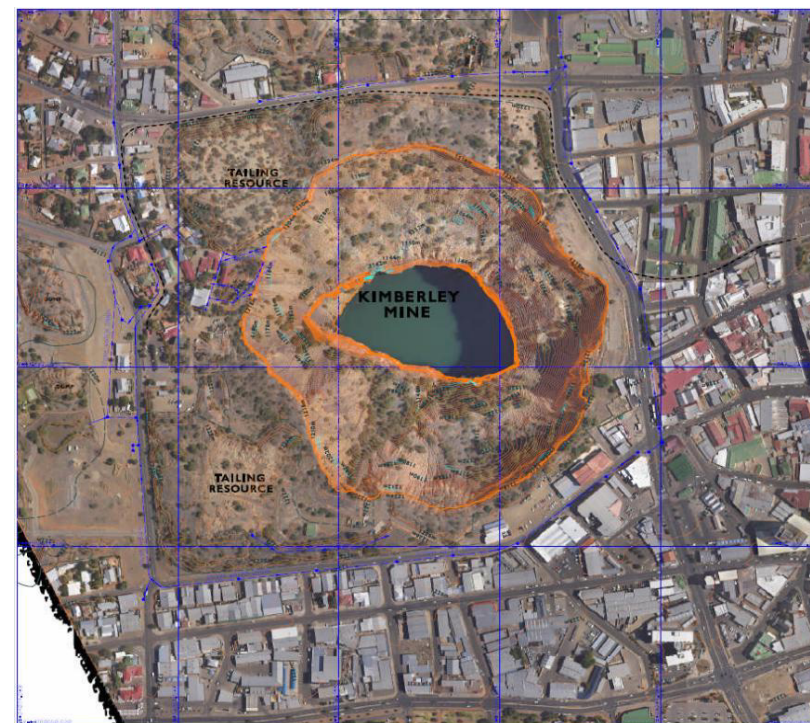


Figure 168: Map of Tailing Resource (Maree,2017)

In order to combat the disintegration of the mine walls stability, De Beers has implemented various monitoring strategies that include weekly visual inspections (for the opening of old cracks or the development of new cracks), installation and maintenance of geotechnical monitoring systems, quarterly reviews and aerial view studies. See figure 167 example of the geotechnical monitoring system.

Currently, De Beers has two systems in place to ensure the stability of the mine walls: maintaining dewatering tunnels around the pit and monitoring the ground movement (Maree, 2017).

To minimise the waters impact on the degradation of shale in the mine (Maree, 2017, p. 42) De Beers installed water tunnels, 60m below the surface and approximately 200m away from the edge of the hole. Studies have found suitable solutions that are non-invasive and can prevent further deterioration of the mine walls. These studies by Maree in 2017 have concluded that DECL products (dust and erosion control liquid) can be applied to increase the weatherability of the exposed shale. Constant monitoring and prevention techniques have been implemented to ensure that the least amount of mine wall break occurs.

In conclusion, various studies have been done with regards to the mine walls to find the best techniques and systems to ensure the least amount of mine wall break occurs. The area predicted to be affected by the deterioration is towards the south-west and approximately 150 meters away from the proposed site.



Figure 169: Geotechnical Monitoring Systems (Maree,2017)

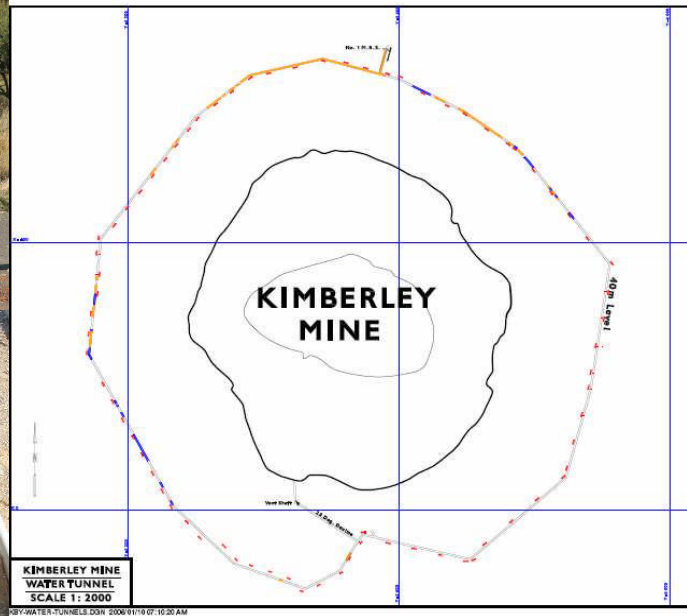


Figure 171: Kimberley "Big Hole" Water Tunnel Layout (Maree, 2017, p. 42)

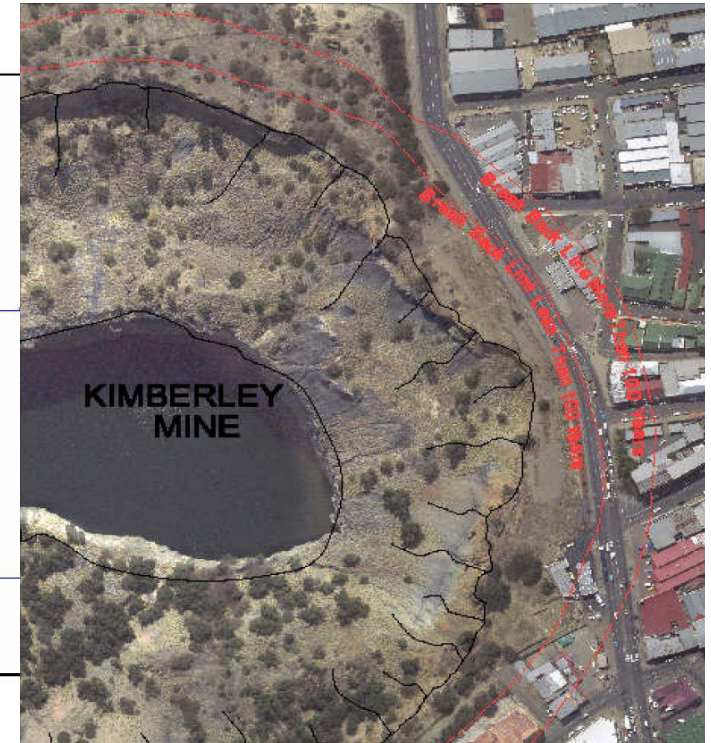


Figure 170: Predicted Deterioration Diagram (Maree,2017)

7.3 Materiality

The dissertation explores the use of alternative materials in the poiesis of jewellery and architecture. The materials selected are, therefore obtained from sustainable sources and their unique characteristics amplified by the design conclusion.

Primary Materials

Rammed Earth Walls

Rammed Earth construction was selected for its various environmental, social and passive design advantages.

The soil needed for the rammed earth walls could be obtained from the site, although further testing by geotechnical engineers will be required to ensure that the soil meets the requirements of rammed earth construction. Obtaining the majority of the soil from the site allows the minimum amount of logistical expenses for the transporting of building materials. The ideal soil should be free from organic material and any other substances and consist of 50-70% gravel, 15-30% silt and 5-15% clay (Southern Africa Development Community Cooperation in Standardisation, n.d. p6). A stabiliser can be added to achieve the correct proportions. The stabilisers added can be cement, lime or various combination of the two with fuel ash. The wall thickness can be estimated by using the width to height to length ratio of 1:8:12. The precise ratio of the wall will rely on the soil characteristics and its construction; either restrained or stabilised and should be determined by an engineer.

The rammed earth has a 70% lower embodied energy than that of conventional brick (ASADURU, 2019: Online). There is no firing involved in construction as with brick resulting in no kilns used, no harmful emissions

or greenhouse gasses released. The contractors can reuse the timber formwork used during construction in other projects or as in the case of this project in the construction of the timber structure.

The thickness of the rammed earth walls allows for the use of passive design strategies that assist in controlling the interior air temperature in the harsh Kimberley climate.

The construction methods provide the opportunity for skills transfer and job creation in the Kimberley community.

Timber

Timber was selected for its sustainable properties as it can be regrown if harvested from a sustainable source. The placement of timber should be well considered and maintained as the severe Kimberley weather can damage exposed timber. All timber should either be protected from the weather by overhangs, used as interior features or treated effectively.

The earth construction is somewhat particular to ensure maximum stability and longevity. The SADC recommends in clause 15 that earth walls should have a good hat, coat and boots. A good hat refers to a roof that does not leak with deep overhangs at least a third of the wall length. The boots refer to a splashback which should be on ground level to ensure rain does not erode the ground level. The splashback should be at least 150mm high. If the rainfall is more than 1000mm per year (Southern Africa Development Community Cooperation in Standardisation, n.d. p6) the splashback needs to be at least 300mm high. The coat refers to the main surface of the earth wall, which should either be rendered or coated as detailed in clause 20. (Figure 173)

Roof fixing (Figure 172) can be done by embedding a nail attached to the wall plate with a galvanized wire into the wall as it is being constructed and it uses the wall weight for security. Good detailing of joints should avoid windows and doors pivoting on a corner.

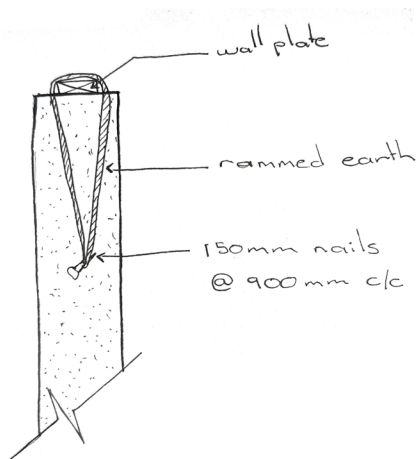


Figure 172: Sketch of Roof Fixing

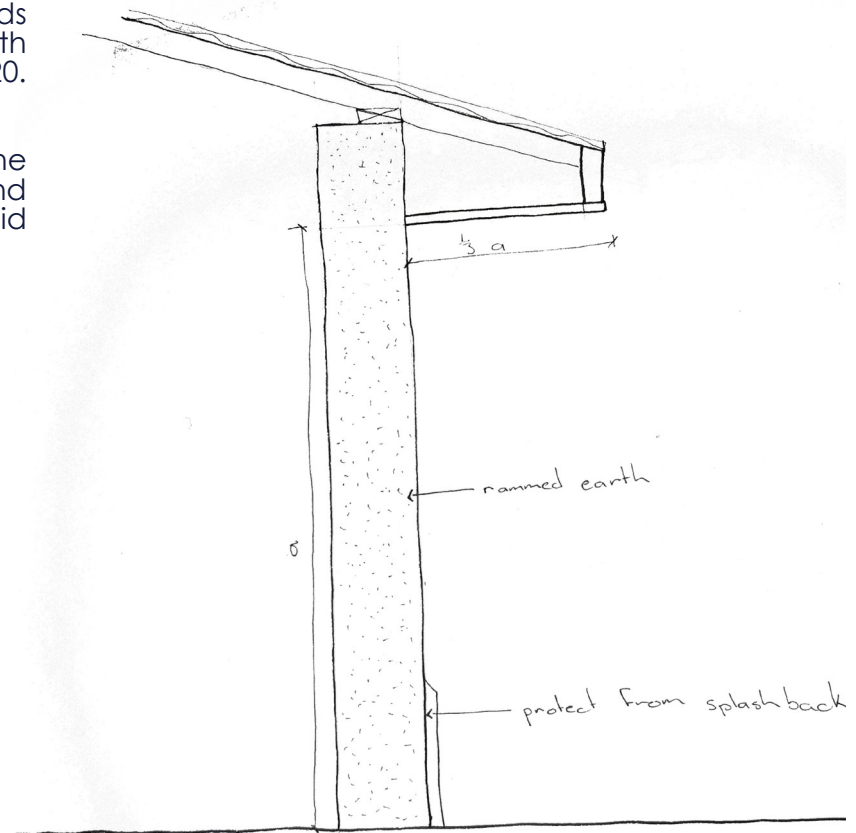


Figure 173: Sketch of Rammed Earth Wall

7.4 Structural Investigation

Concrete Slab

There are various opportunities provided with a concrete slab. The slab can sit on top of the rammed earth wall, acting as a ring beam. The soffit can either be plastered, or a suspended ceiling can be installed to provide a shadow line. A concrete slab also provides the opportunity to design a planted roof that further insulates the interior (see figure 174).

Curved Space Frame

The space frame can be used to form the roof structure on an independent grid from the earth walls. The space frame allows for a clean look from the exterior, presented as a flat roof with a hidden gutter (Figure 175). These frames can extend far beyond the existing structure and act as a canopy. The Toi o Tāmaki Auckland Art Gallery serves as a visual guide for the roof typology (Figure 176). A possible extended canopy can be used to protect the earth walls.



Figure 176: Toi o Tāmaki Auckland Art Gallery (Gollings, 2003)

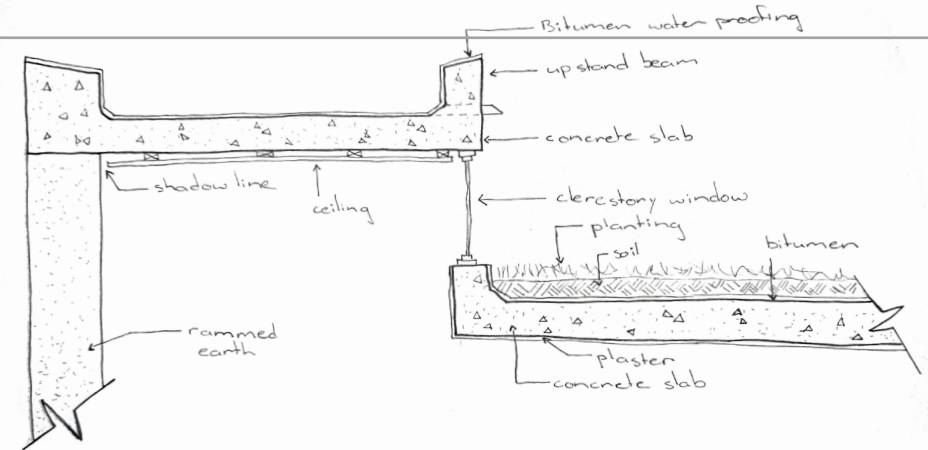


Figure 174: Sketch of Concrete Slab Detail

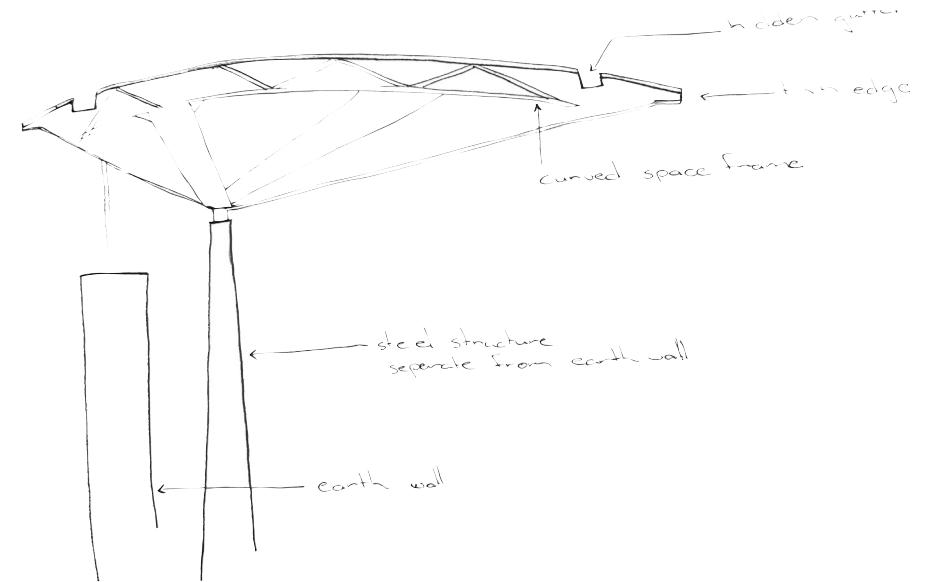


Figure 175: Sketch of Space Frame

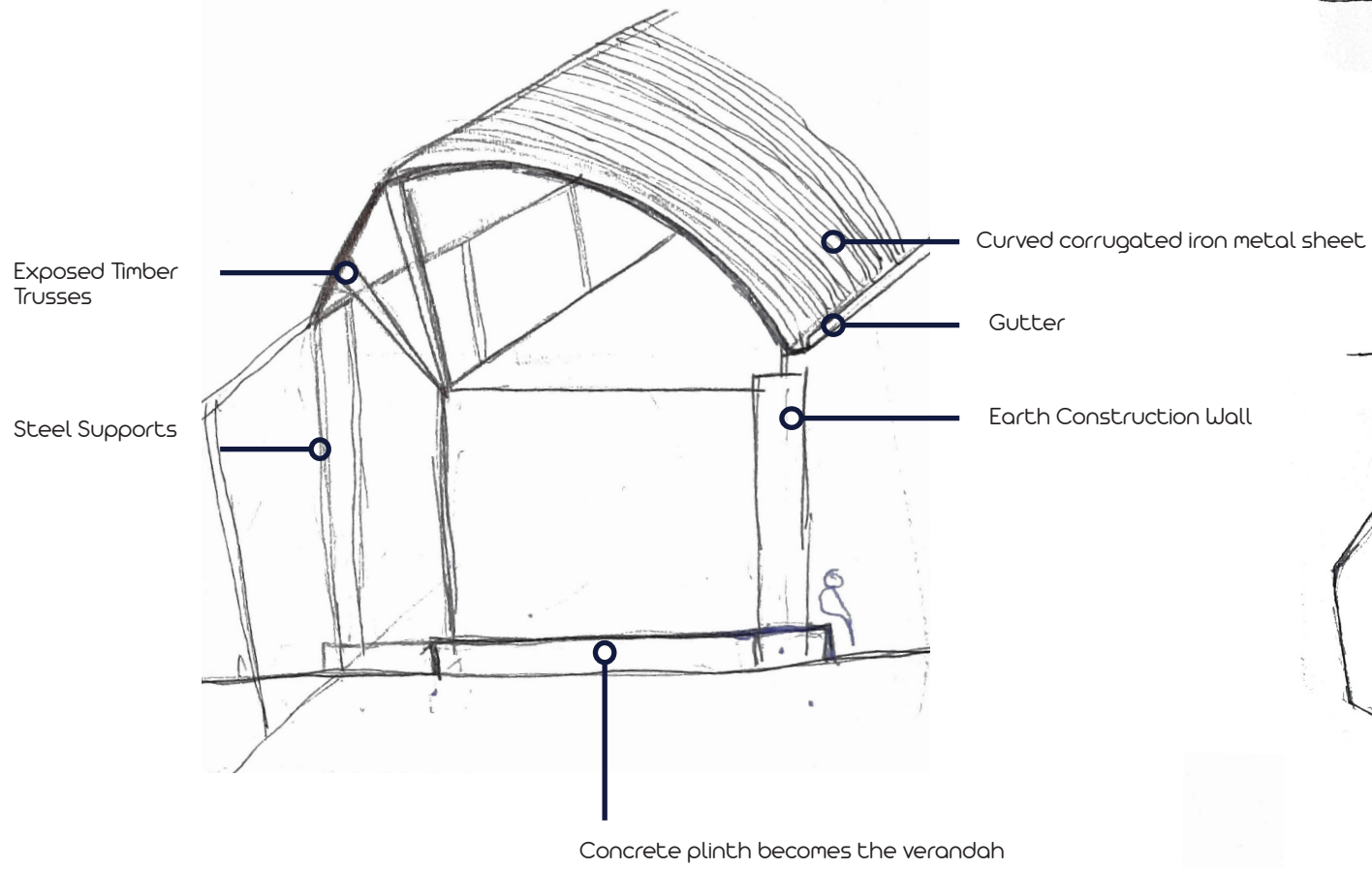


Figure 178: Sketch of Curved Roof

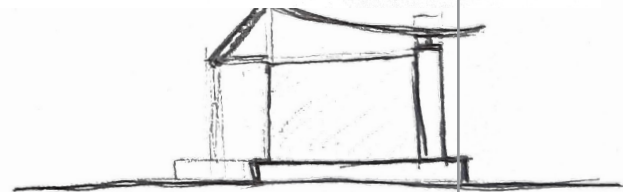
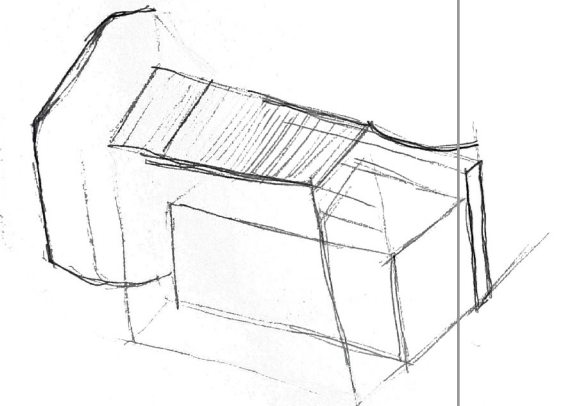
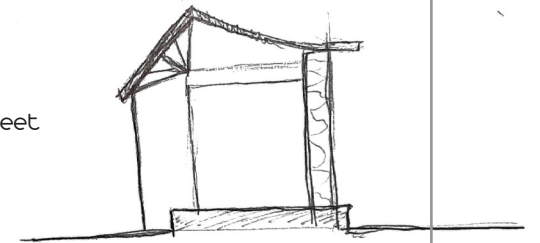
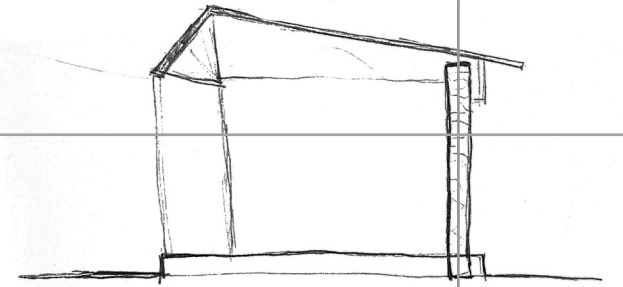


Figure 177: Sketches of alternative roof typology

7.5 Project Analysis

Master Site Development Plan

Various site layouts were considered throughout the design process (refer to p96 of this document). The studios mainly face north with the services located to the west and east. The new structure was placed to the right of the site to form a U-shape around the existing structure. This allows for parking to the west and north of the building. The rammed earth walls are mostly situated to the north to assist passive design strategies. It is mainly used to the west of the site to achieve a level of privacy from the parking area and to the south as an aesthetically pleasing element in the student courtyard.

Parking

108 parking spaces are required and have been calculated from the SANS regulations. The site planning allows for 108 parking bays, two loading docks and an additional handicapped parking bay. The two loading bays are situated at opposite ends of the site. One at the restaurant and one to the east at the main refuse yard and storage facility.

Refuse

A standard regulation 18m² refuse yard is provided at the southeast corner of the site for weekly refuse removals. Smaller refuse spaces are provided around the perimeter of the building to ensure ease of access during daily use. The bins in the smaller refuse spaces will then be moved to the main refuse yard once a week for municipal removal.



Area Schedule	
Restaurant:	143m ²
Exhibition Space:	395m ²
Studio Spaces:	1274m ²
Workshops:	288m ²
Lecture Halls:	215m ²
Library :	142m ²
Cad Lab:	73m ²
Offices:	242m ²
Services, Reception & Circulation:	408m ²
Total:	3180m²
Footprint:	1411m ²
Site:	8737m ²
Coverage:	16%
FSR:	0.44

Parking Requirements			
Function	Area	Occupancy	Parking
Restaurant:	143m ²	A1	8
Exhibition Space:	395m ²	C1	16
Studio Spaces:	1274m ²	A3	50
Workshops:	288m ²	A3	12
Lecture Halls:	215m ²	A3	8
Library :	142m ²	A3	2
Cad Lab:	73m ²	A3	2
Offices:	242m ²	G1	10
Services:	408m ²	N/A	
Total Requirements			108
Parking Spaces			
Parking Spaces			108
Disabled Parking			1
Loading Bay			2

Access

Access are gained through three main entrances. The first is for pedestrians and tourist to enter the public courtyard from the street or across the road from the new proposed future development tram stop. From the public courtyard visitors can either visit the restaurant, exhibition hall or go to the reception where they will be directed further. Visitors can also access the public courtyard from the parking to the west of the building and students can enter from the northern parking on the first level and walk directly into their lectures.

Circulation

There are three fire escapes; two are enclosed and located in the service spaces on the east and west respectively while the third one is open and located at the studio spaces. A passenger lift is located in the main reception for universal access while a goods lift is located at the storage facility in the southeast corner to lift heavy timber pieces, concrete bags and resin liquid to the workshops on the first floor.

Fire Plan

An emergency assembly point together with fire escape routes, fire extinguishers and hose reels ensure optimum safety for the users and the longevity of the building. The rammed earth walls can have a fire rating of up to 4 hours (ASADURU, 2019: Online). Portable fire extinguishers are stored in the studios under a timber seat.

Gas Services

Gas bottles should be stored as per the diagram below. At least 1m away from any opening to the side, 300mm away from a window to the top if a cover is provided, otherwise 3m away. The gas should be at least 2m away from any gully or AC inlet and at least 5m from any DB board, pump or electric motor (Figure 155).

Mechanical Ventilation

The restaurant, workshops and workshop space in studios will need to be ventilated mechanically to ensure optimal air quality.

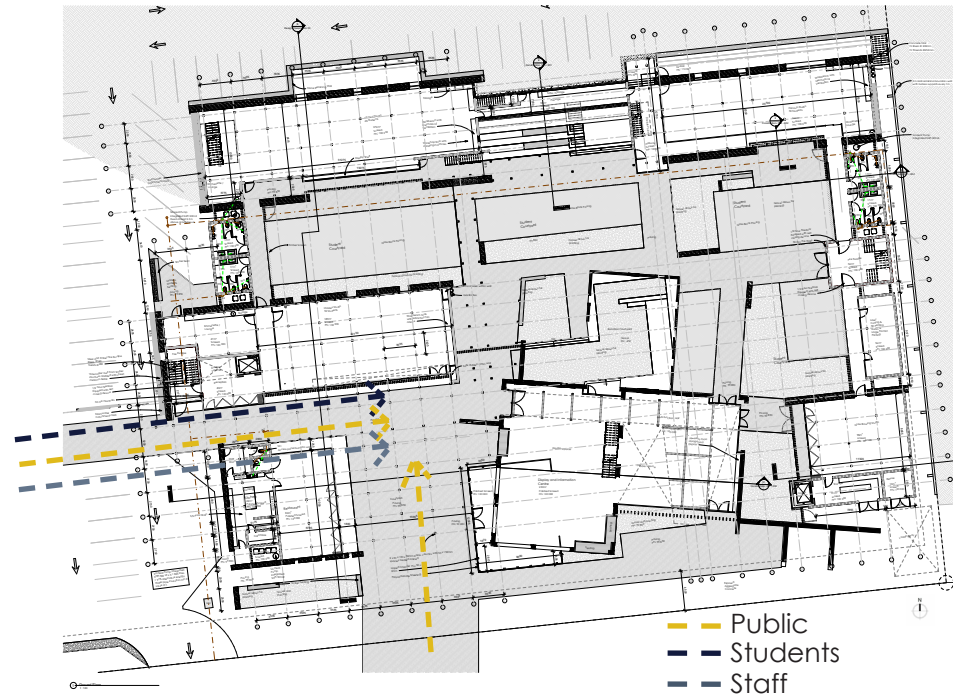


Figure 179: Access

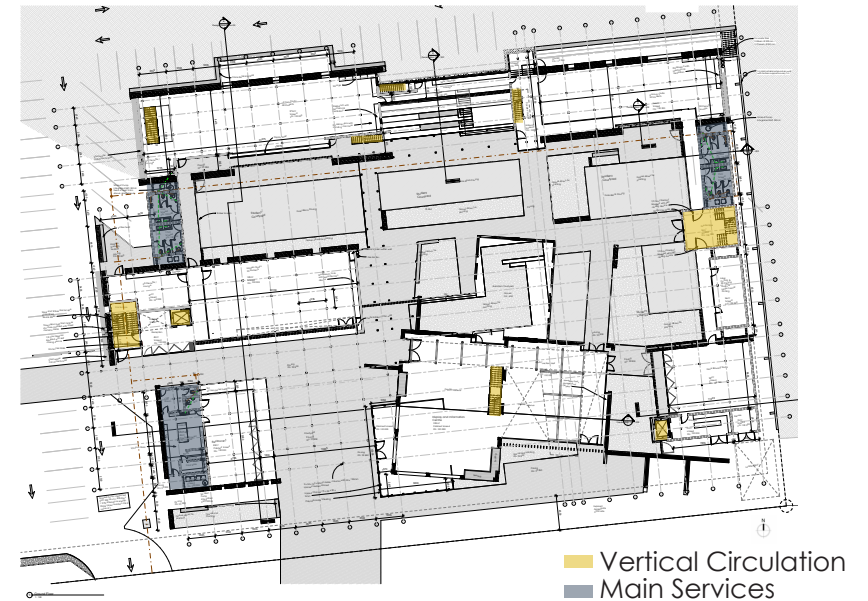


Figure 180: Services & Vertical Circulation

7.6 Sustainability Analysis:

The Materials

As discussed above the specific materials selected were because they can be obtained from sustainable sources and have a relatively low impact on the environment during the production of these materials.

The site:

The site is considered as a brownfield site as it has been previously developed. Choosing a brownfield site will inherently lower the damage done to the environment. Furthermore, by choosing this site, the project inverses the original purpose of the site; from being instrumental in the mining industry to instead give back to the community of Kimberley and the environment (through creating awareness).

Water:

Stormwater and rainwater will be collected through catchment pits that filter the water before it is stored in water tanks in the basement for reuse. The recycled water can be used for irrigation and servicing the water closets. The TreeWell system a biological waste water treatment system will be implemented to further reduce effluent sewage. TreeWell treats waste water through principles of biomimicry by simulating the natural processes of a wetland (ASADURU, 2019: Online).

Average rainfall in Kimberley is 23mm per month with March being the month with the most rainfall at 59mm. The roof area 2214m² therefore can catch an average of 50 945L of rainwater per year.

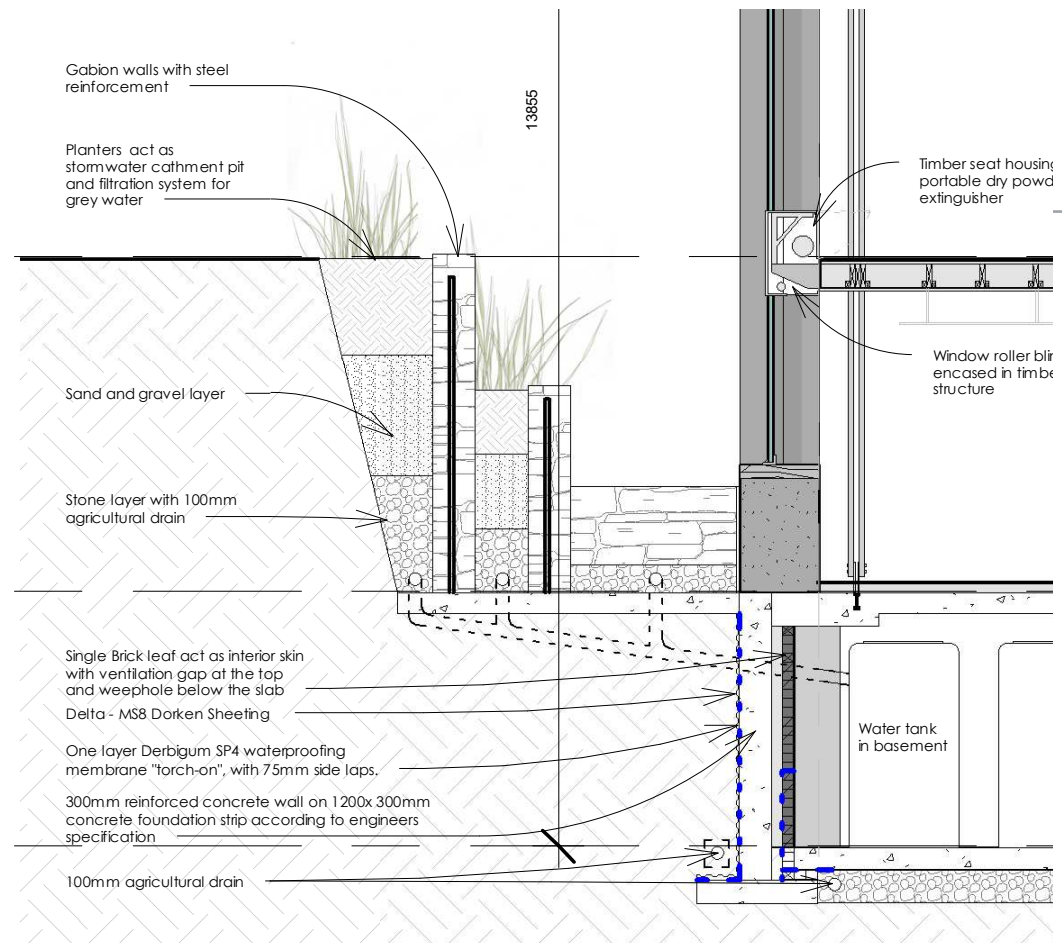


Figure 181: Section AA Detail of Bioswales and Stormwater Treatment

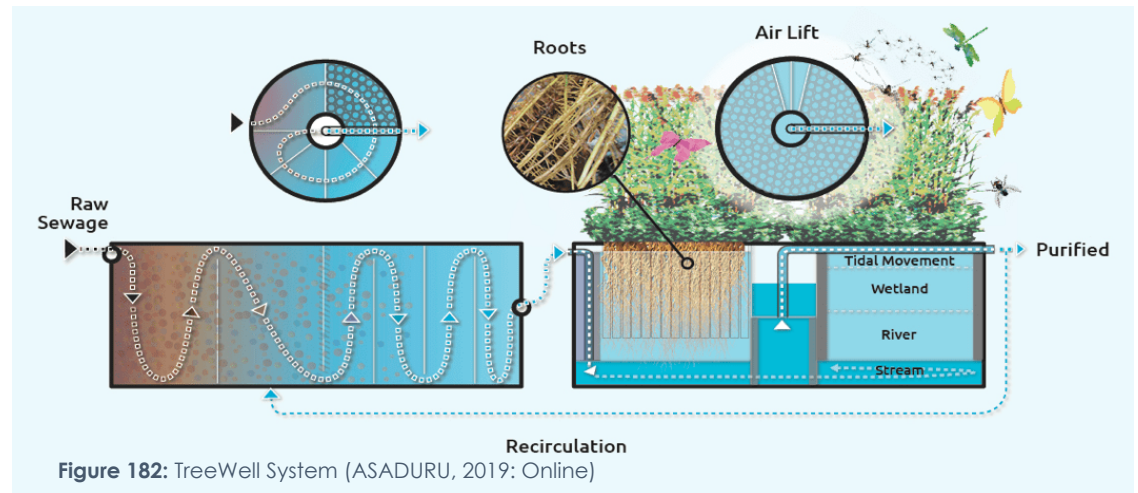


Figure 182: TreeWell System (ASADURU, 2019: Online)

Photovoltaic Panels

The butterfly roof provides the opportunity to place photovoltaic panels on roof panels facing north. The roof panels facing north is approximately 310m². It will not cover the energy demand of the entire building but will provide emergency lighting and lower the energy demand from the national grid.

Environmental Sustainability: Fenestration and Energy Usage

The fenestration and solar heat gain of any building is extremely important to consider and calculate when designing as it determines interior air temperature and therefore also energy usage from air conditioning. Calculations determined that the fenestration to floor area percentage (for each of the floors) are higher than the 15% permissible by the SANS regulation. A rational design strategy and additional calculations were undertaken to ensure permissible fenestration, which confirmed the need for screens. Additionally, some glazing to the west will need to be Low-E glass. The calculations also established that 450L of water should be heated by means other than municipal electrical supply. See appendix B for fenestration and energy calculations.

Economic and Social Sustainability

Together with the initial proposal to the client future developments around the site will be encouraged. In order to ensure the maximum student comfortability a student housing complex is proposed to the west of the site and an additional tram stop to increase its attraction to tourists and increased student transport opportunities.

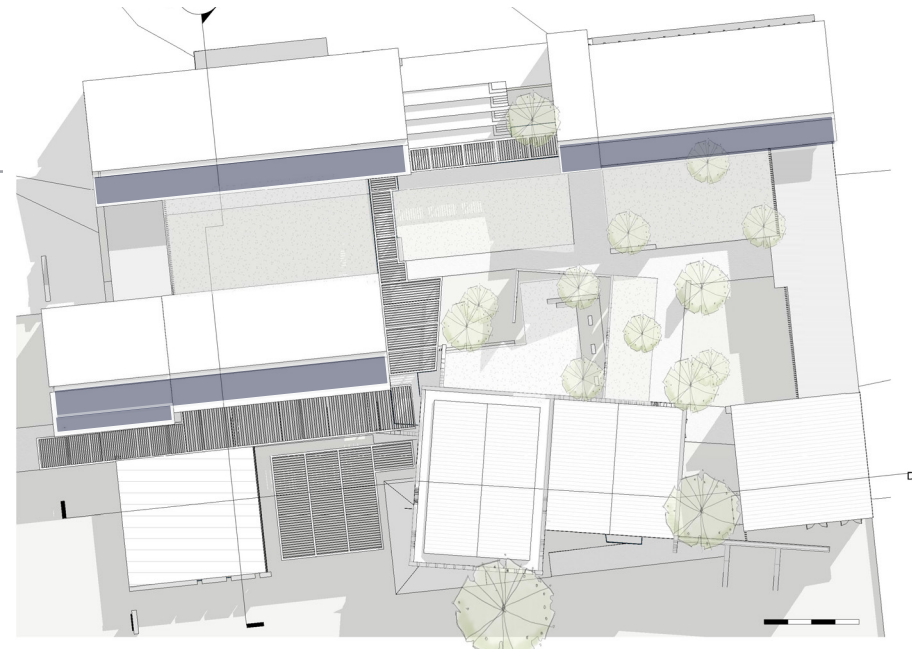


Figure 183: Roof plan showing position of solar panels

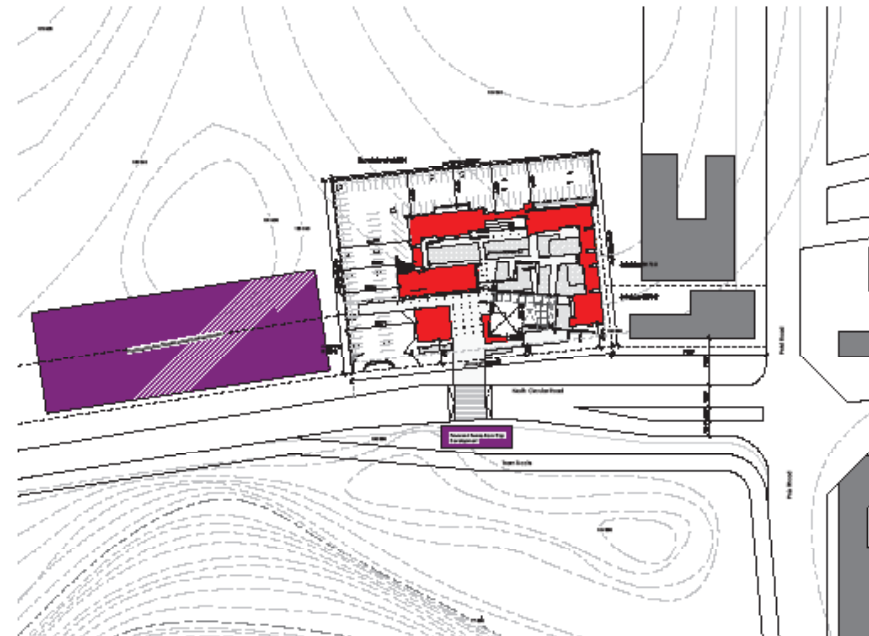


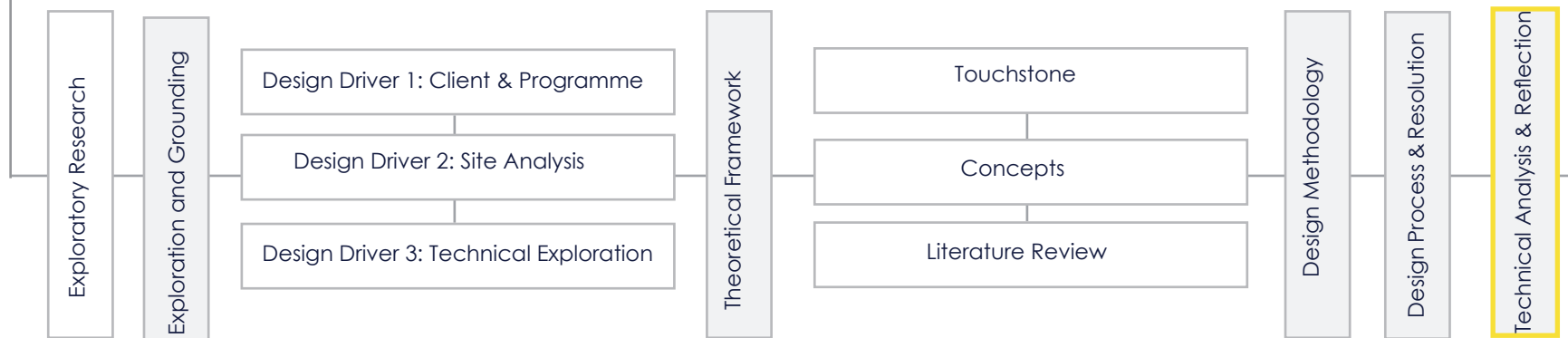
Figure 184: Proposed Future Developments

03 Reflection

Through various campaigns such as 'Reuse, Reduce and Recycle' we are made acutely aware of what happens to products after we use them and the manner in which we discard them. I have always been very conscious about sustainability and the impact of the waste I produce but this dissertation opened my eyes to realise there is another part of the consumer process that we often disregard; the production phase.

As designers we are aware of the production phase but through this dissertation, I have become more aware of the production of everyday objects and the impact of the production processes on the environment.

Through this project I have become passionate about jewellery design and its relation to architecture. I began exploring the 'making of' that we are constantly engaged with in architecture and how jewellery has inspired me to have a more 'hands-on' approach to designing. Simply selecting materials and their configuration in architecture is not enough for me anymore. I want to know the processes used to manufacture these materials and the construction process of the building itself.





I have questioned my site and program through the year. Through the year I have realised that everyone has their own outlook and opinion of jewellery use, production and significance. This made it extremely hard to start the design process as I was flooded with opinions and ideas of 'what jewellery is'.

Looking back, I realise the concepts illustrate this confusion of what jewellery represents. The concepts were based on general ideas about jewellery. It is only after the literature review that I had the epiphany that what jewellery means to different people is not important but rather how it comes into being. The concepts became an underlying influencer of the design and the literature review the driving force.

The site and the existing structure posed various challenges discussed throughout the document, which had me doubting my site. I ultimately believe that by selecting such a delicate site with an existing structure, I gained an unmeasurable amount of experience that will follow me right through my career.

I have also learned a tremendous amount about my own design process and how I make decisions. Looking back, I wish the design strategy established in phase three of the project occurred earlier in the year to allow me enough time to develop the project as thoroughly as possible but I am generally pleased with the outcome of the project and the knowledge I gained.

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- Klimt02.net, 2019. Universiteit Stellenbosch University. [Online] Available at: <https://klimt02.net/institutions/schools/universiteit-stellenbosch-university> [Accessed 13 August 2019].
- African Facts, n.d. Zulu Bead Jewelry. [Online] Available at: <https://interesting-africa-facts.com/African-Jewelry/Zulu-Bead-Jewelry.shtml> [Accessed 12 August 2019].
- Agapiou, N., 2018. Sensing Architecture. [Online] Available at: https://www.academia.edu/35983737/Sensing_Architecture?auto=download [Accessed 05 July 2019].
- Ancient Facts, 2015. 7 OLDEST PIECES OF JEWELRY IN THE WORLD. [Online] Available at: <https://www.ancientfacts.net/7-oldest-pieces-jewelry-world/> [Accessed 12 August 2019].
- Brilliant Earth, 2019. Gold Mining and the Environment. [Online] Available at: <https://www.brilliantearth.com/gold-mining-environment/> [Accessed 11 August 2019].
- Cambridge Dictionary, 2019. Jewelry. [Online] Available at: <https://dictionary.cambridge.org/dictionary/english/jewelry> [Accessed 29 January 2019].
- Casey, E. S., 2008. Phaenex.uwindsor.ca. [Online] Available at: <https://phaenex.uwindsor.ca/index.php/phaenex/article/view/643/557> [Accessed 22 July 2018].
- Castro, F., 2018. Empire Stores / S9 Architecture. [Online] Available at: <https://www.archdaily.com/895040/empire-stores-s9-architecture> [Accessed 23 June 2019].
- Closes, D., 2012. Convent de Sant Francesc / David Closes. [Online] Available at: <https://www.archdaily.com/251389/convent-de-sant-francesc> [Accessed 23 June 2019].
- Cube Architects, 2019. SIOC COMMUNITY DEVELOPMENT TRUST. [Online] Available at: <https://rocketpad.co.za/sioc-community-development-trust/> [Accessed 15 August 2019].
- Curtis, E., 2013. Tales from the City of Gold. [Online] Available at: <https://www.newyorker.com/culture/photo-booth/tales-from-the-city-of-gold> [Accessed 30 January 2019].
- Dear Rae, 2016. Studio. [Online] Available at: <https://dearrae.co.za/studio/> [Accessed 13 August 2019].
- DEE, 1999. Lighting Design for Schools. First Edition ed. London: The Stationery Office.
- Diamonds Foundry, 2018. ARE DIAMONDS RARE?. [Online] Available at: <https://diamondfoundry.com/blogs/the-foundry-journal/are-diamonds-rare-1> [Accessed 5 July 2019].
- Enji Studio Jewelry, 2017. Negative Global Impacts of Traditional Gold and Diamond Mining. [Online] Available at: <https://enjistudiojewelry.com/blog-64/2017/8/28/negative-global-impacts-of-traditional-gold-and-diamond-mining> [Accessed 28 February 2019].
- Evans, B., 2018. African Jewelry. [Online] Available at: <https://www.contemporary-african-art.com/african-jewelry.html> [Accessed 12 August 2019].
- Fascari, M., 1996. Theorizing a new agenda for architecture : an anthology of architectural theory : 1965-1995. New York: Princeton Architectural Press.
- Frampton, K., 1990. RAPPEL À L'ORDRE: THE CASE FOR THE TECTONIC. [Online] Available at: <https://suw.biblos.pk.edu.pl/downloadResource&mld=213385> [Accessed 02 July 2019].
- González, M. F., 2018. Sol Plaatje University Student Resource Center / Designworkshop. [Online] Available at: https://www.archdaily.com/905850/sol-plaatje-university-student-resource-center-designworkshop?ad_medium=gallery [Accessed 23 June 2019].
- Graham Leslie McCallum, 2014. Kimberley Mine- A Chronological Pictorial of the Big Hole. [Online] Available at: <https://grahamlesliemccallum.wordpress.com/2014/07/03/a-chronological-pictorial-of-the-kimberley-mine/> [Accessed 13 August 2019].
- Gray, R., 2015. Mail Online. [Online] Available at: <https://www.dailymail.co.uk/sciencetech/article-2990149/Did-Neanderthals-invent-BLING-World-s-oldest-jewellery-eagle-claws-worn-human-relatives-130-000-years-ago.html> [Accessed 29 January 2019].
- History Of Jewellery, 2019. Jewelry History. [Online] Available at: <http://www.historyofjewelry.net/jewelry-history/> [Accessed 12 August 2019].
- Jones, H., 2011. heatherjonesportfolio. [Online] Available at: <http://heatherjonesportfolio.yolasite.com/resources/The%20art%20of%20jewelry%20throughout%20the%20timeline%20COMPLETE.pdf> [Accessed 12 August 2019].
- Kane, A., 2018. 11 Fascinating Jewelry Artists to Share with Your Students. [Online] Available at: <https://theartofeducation.edu/2018/11/28/11-fascinating-jewelry-artists-to-share-with-your-students/> [Accessed 8 June 2019].
- KHAN, H.-U., 2015. Ingenta. [Online] Available at: [10.1386/ijia.4.1.5_1](https://www.ingenta.com/10.1386/ijia.4.1.5_1) [Accessed 26 July 2019].
- Libeskind, D., 2011. Felix Nussbaum Museum / Studio Libeskind. [Online] Available at: https://www.archdaily.com/135002/felix-nussbaum-museum-daniel-libeskind?ad_medium=gallery [Accessed 23 June 2019].
- Lioness of Africa, 2015. Ashley Heather - The startup story of an innovative jewellery designer reclaiming precious metals from computer circuit boards as source materials. [Online] Available at: <http://www.lionessesofafrica.com/blog/2015/5/7/the-startup-story-of-ashley-heather> [Accessed 12 August 2019].
- Lunderstedt, S., 2008. The Big Five Mines of Kimberley. 2nd ed. Kimberley: Kimberley Africana Library.
- Matthews, H., n.d. Diamond Mining In South Africa. [Online] Available at: <https://hayleymatthews-diamondmining-southafrica.weebly.com/environmental-impacts.html> [Accessed 31 January 2019].
- Najafi, N., 2014. African Journal of Hospitality, Tourism and Leisure. [Online] Available at: http://www.ajhtl.com/uploads/7/1/6/3/7163688/article_34_vol._3_2_july_2014.pdf [Accessed 12 August 2019].

- Olivier, J., 2013. Office building, kathu. *journal of the south african institute of architects*, Issue 62, pp. 21-23.
- Rastogi, N. S., 2010. Production of gold has many negative environmental effects. [Online] Available at: <http://www.washingtonpost.com/wp-dyn/content/article/2010/09/20/AR2010092004730.html?noredirect=on> [Accessed 31 January 2019].
- Roan, P., n.d. Ancient Egyptian Jewelry. [Online] Available at: <https://www.ancient-egypt-online.com/ancient-egyptian-jewelry.html> [Accessed 12 August 2019].
- Shah, V., 2014. Environmental cost of Mined Diamonds is alarming. [Online] Available at: <https://betterdiamondinitiative.org/environmental-cost-of-mined-diamonds-is-alarming/> [Accessed 31 January 2019].
- Shih, O., 2015. MATTER OF MATERIAL. [Online] Available at: <https://artjewelryforum.org/galleries/matter-of-material-curated-by-madeline-courtney> [Accessed 5 July 2019].
- Sol Plaatje University, 2019. About SPU. [Online] Available at: <https://www.spu.ac.za/index.php/about-spu/> [Accessed 29 January 2019].
- StudyMoose, 2016. The Social, Economical, and Environmental Impacts of Diamond Mining in Africa.. [Online] Available at: <https://studymoose.com/the-social-economical-and-environmental-impacts-of-diamond-mining-in-africa-essay> [Accessed 11 August 2019].
- THE Big Hole, n.d. The Big Hole. [Online] Available at: <http://www.thebighole.co.za> [Accessed 26 January 2019].
- The World Counts, 2019. Tons of waste produced from gold mining. [Online] Available at: http://www.theworldcounts.com/counters/environmental_effect_of_mining/environmental_effects_of_gold_mining [Accessed 29 January 2019].
- Victoria & Albert Museum, 2019. Ancient world jewellery. [Online] Available at: <https://www.vam.ac.uk/articles/a-history-of-jewellery> [Accessed 12 August 2019].
- Zumthor, P., 2010. *Thinking Architecture*. Second, expanded edition ed. Basel: Birkhauser.



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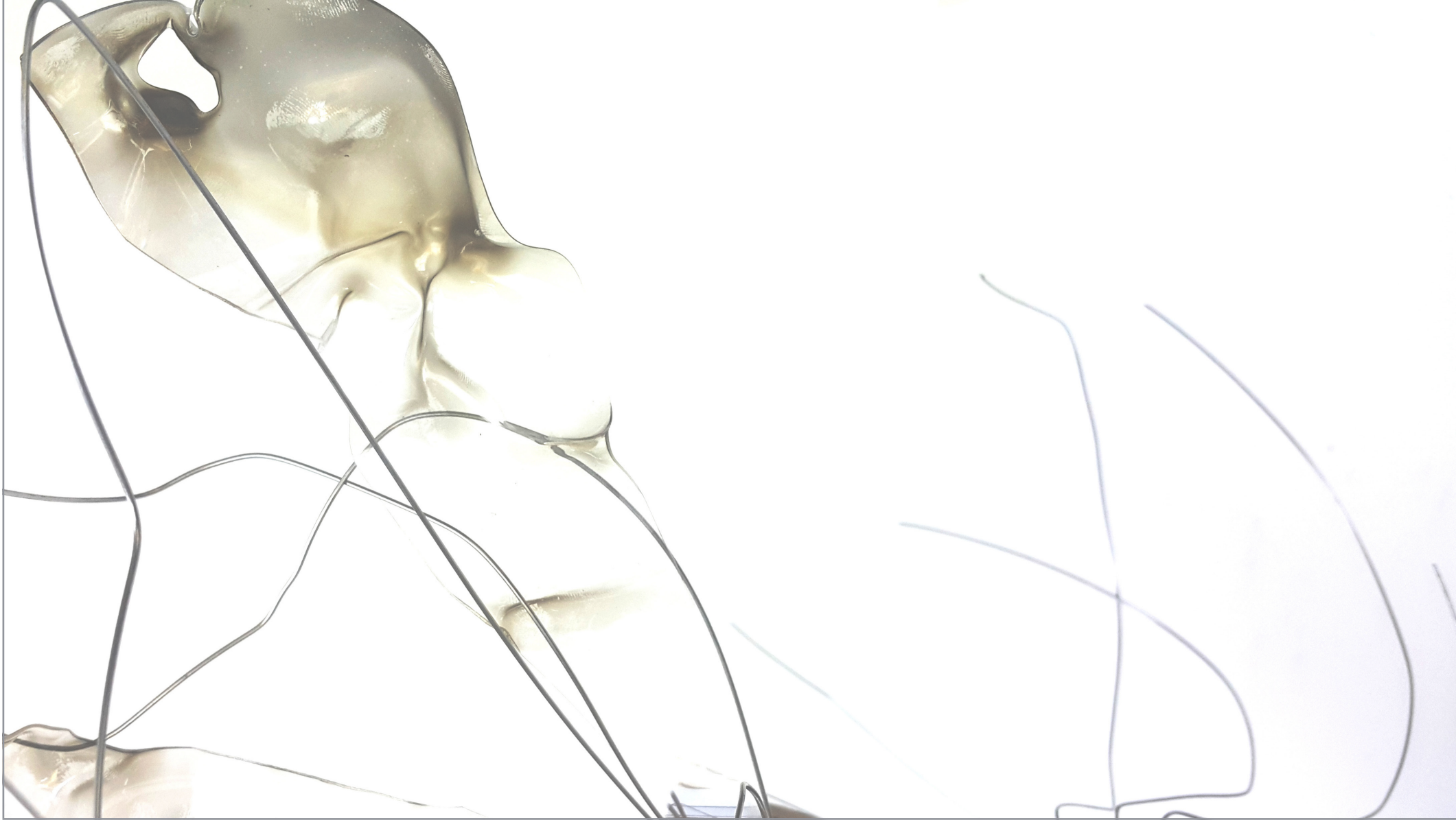
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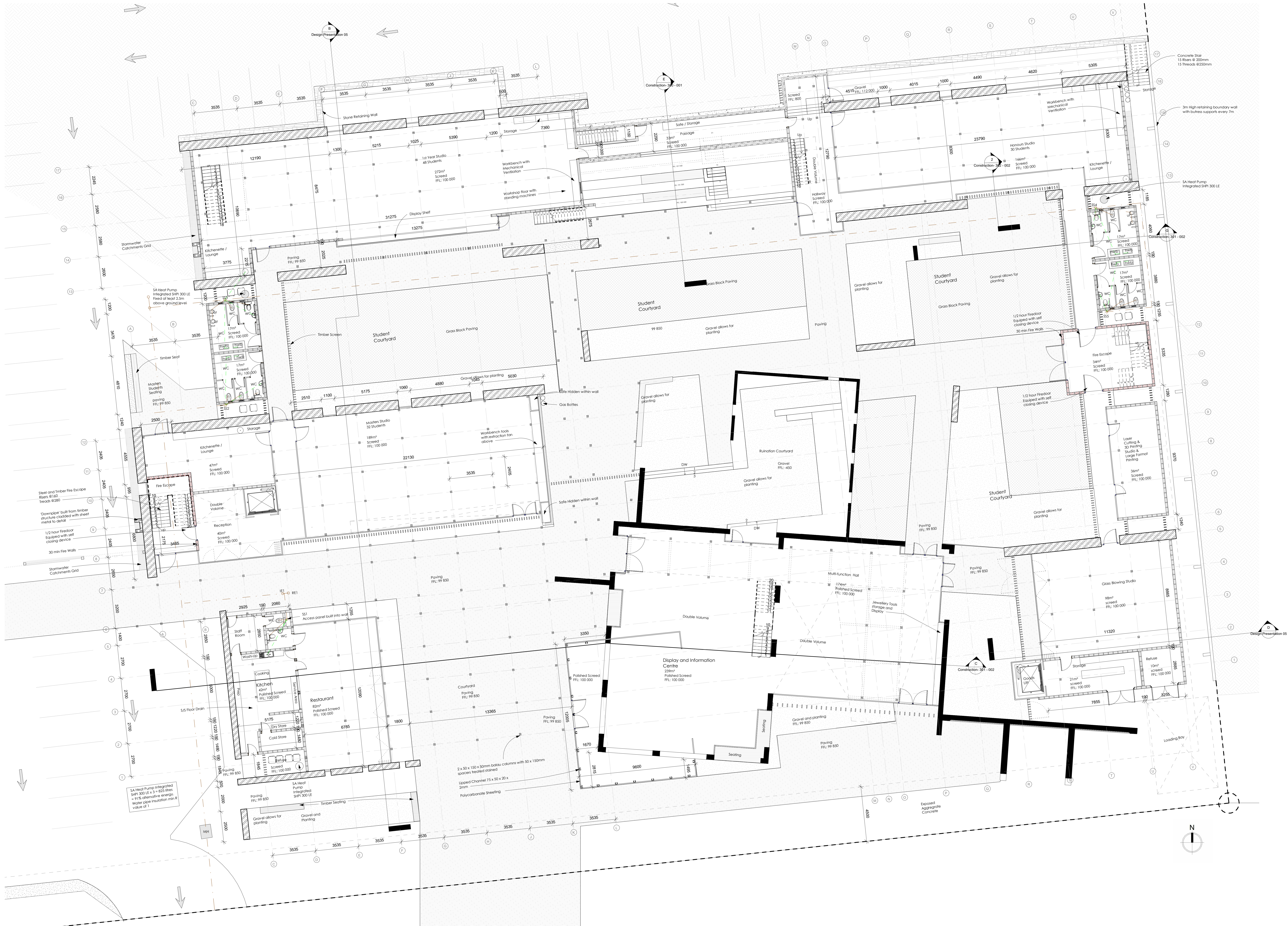
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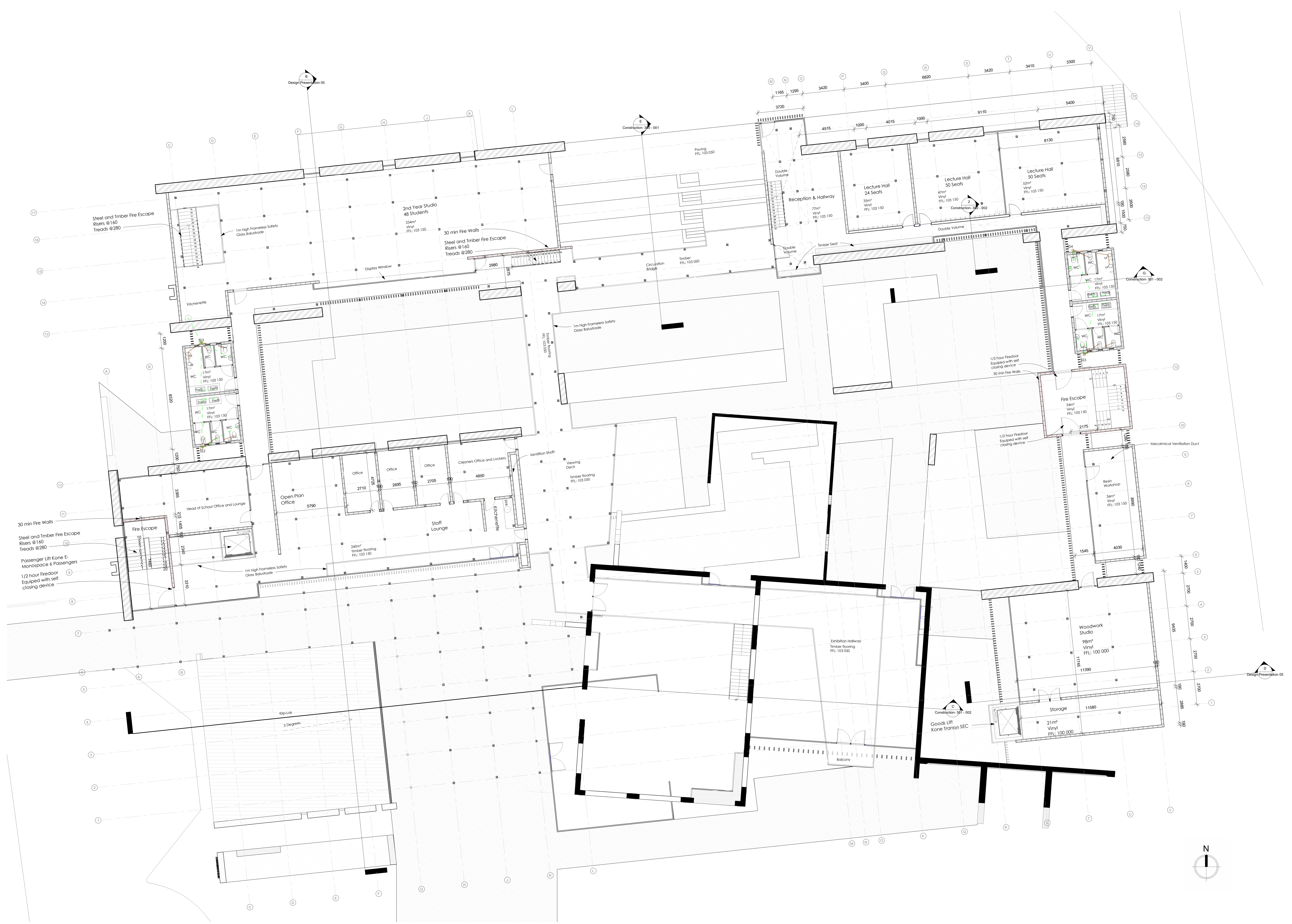
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 - All cavities below floor level to be filled with concrete and EPDM covered.
 - Building works to be strictly according to the latest and applicable NBRC regulations.

1 Ground Floor
1:100

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Alternative Jewellery School
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Construction- 102-002
Ground Floor Plan
Project number 19001-10-14
Date 18-11-19
Drawn by Nicole Vivier
Student Nr 2017091592

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 5. All glass areas bigger than 1m² and at height less than 500mm from FFL to be firm safety glass.
 6. All cavities below floor level to be filled with concrete and DPC's spaced.
 7. Building works to be strictly according to the latest and applicable NBRC regulations.



1 - First Floor
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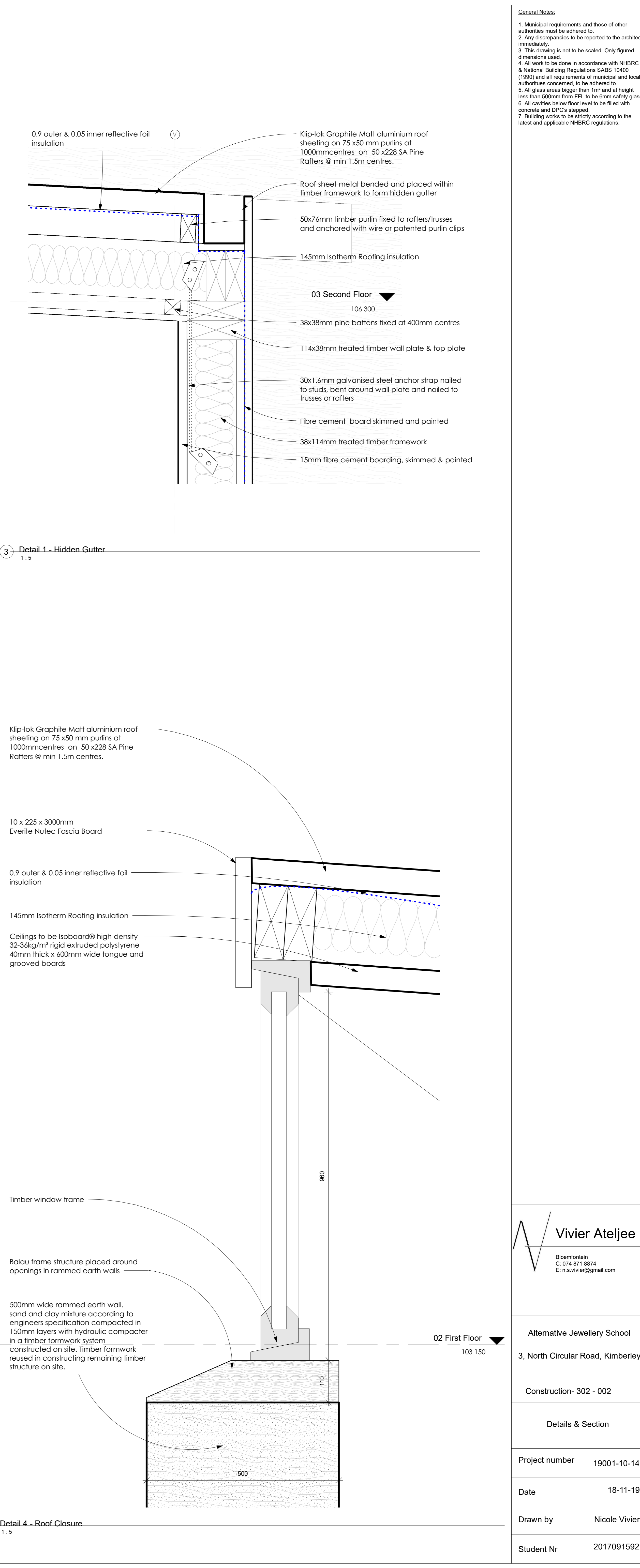
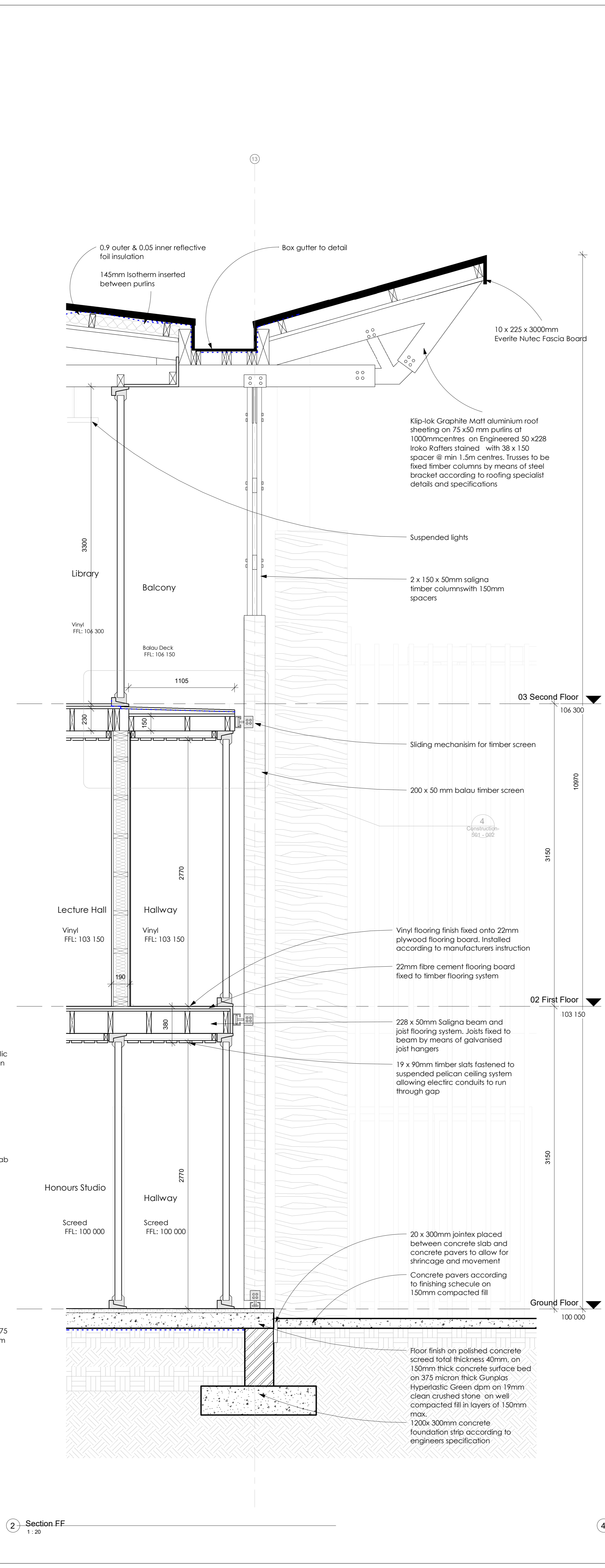
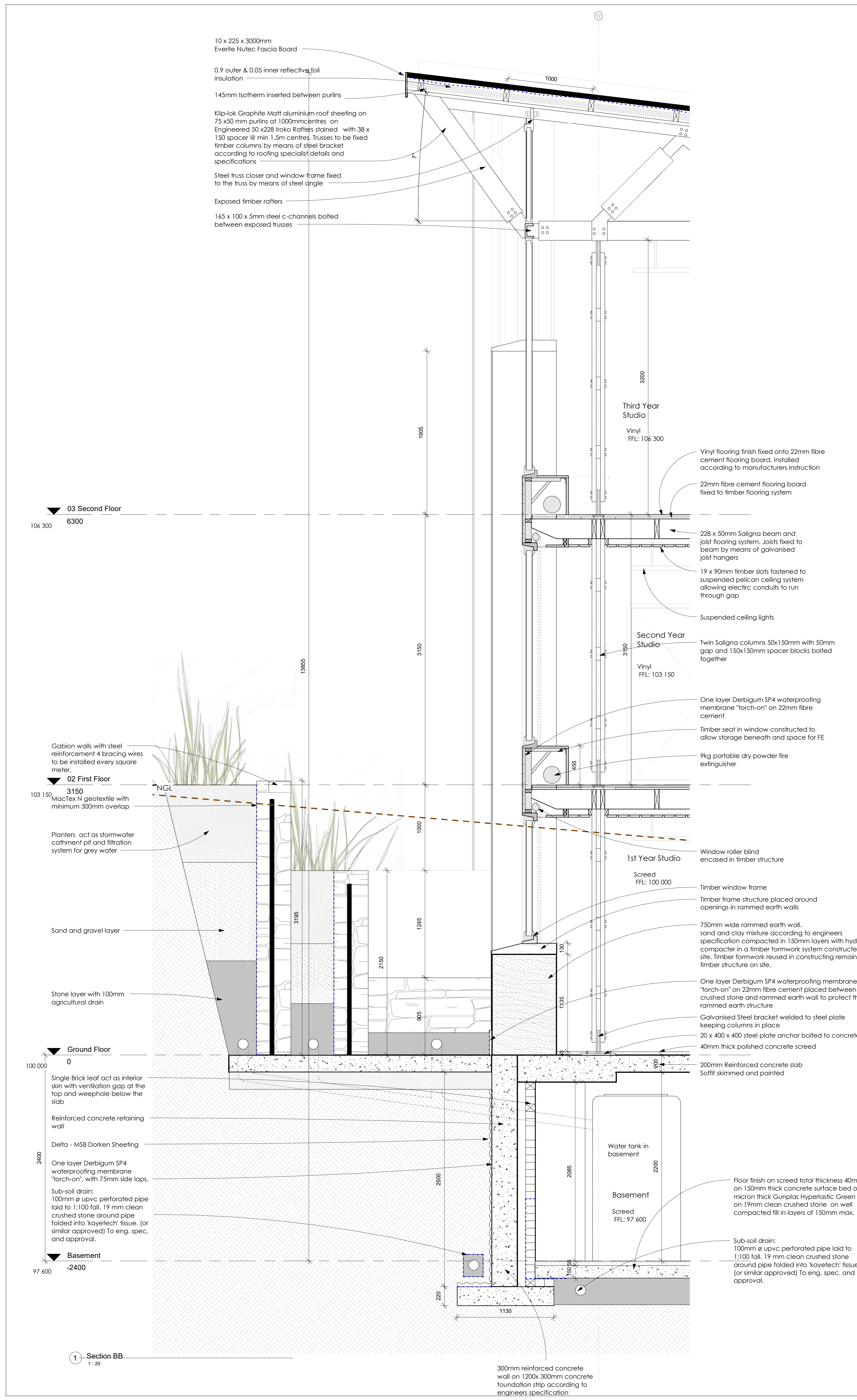
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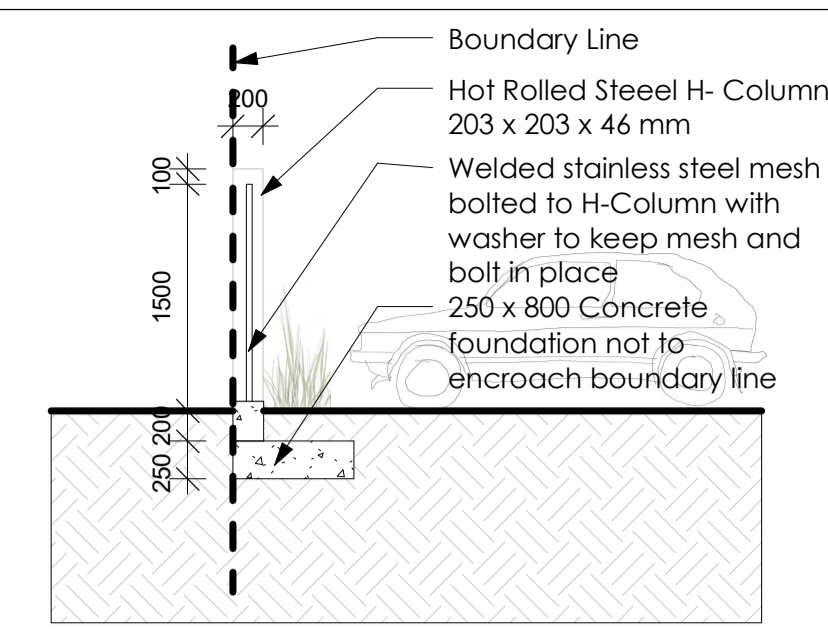
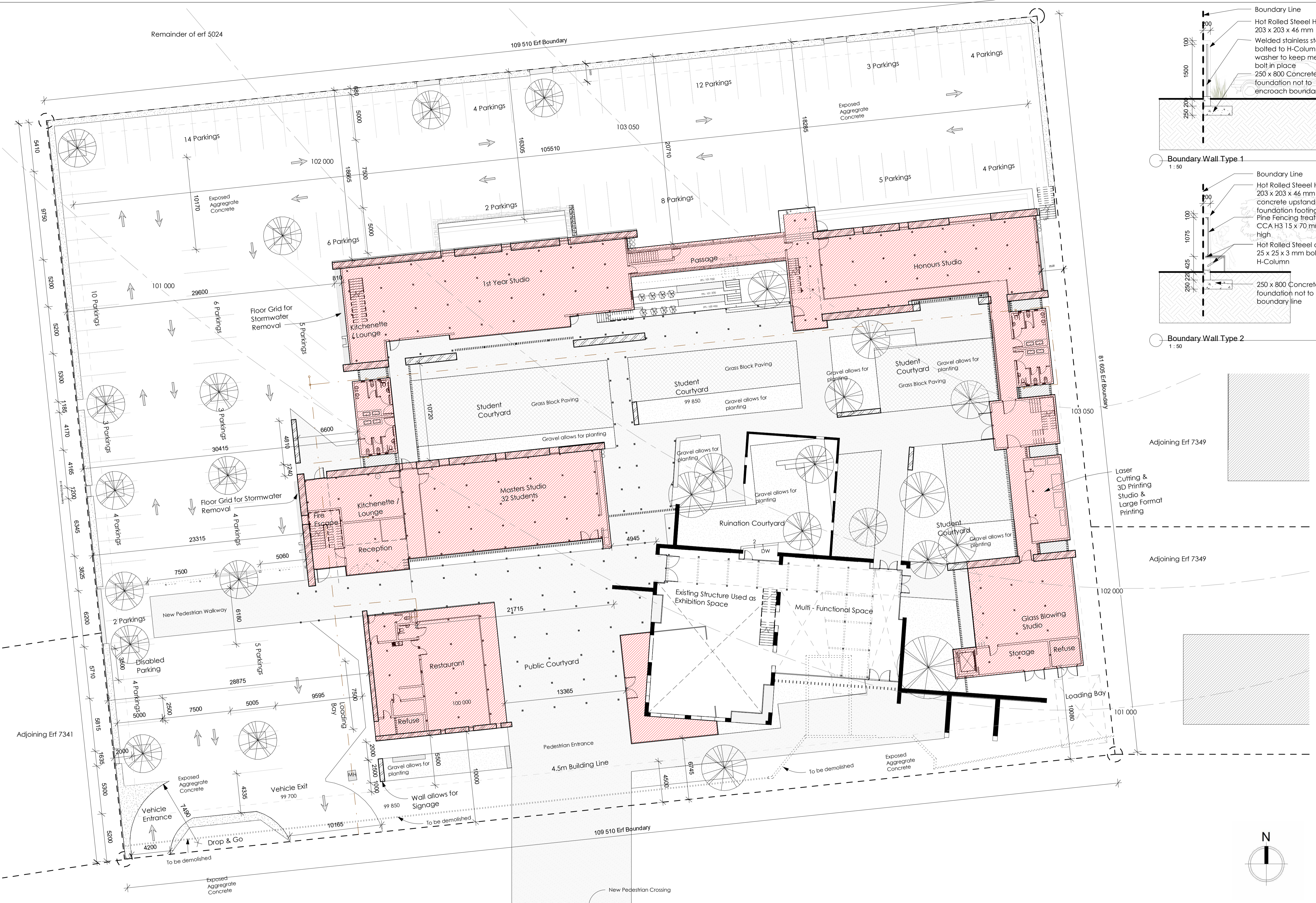
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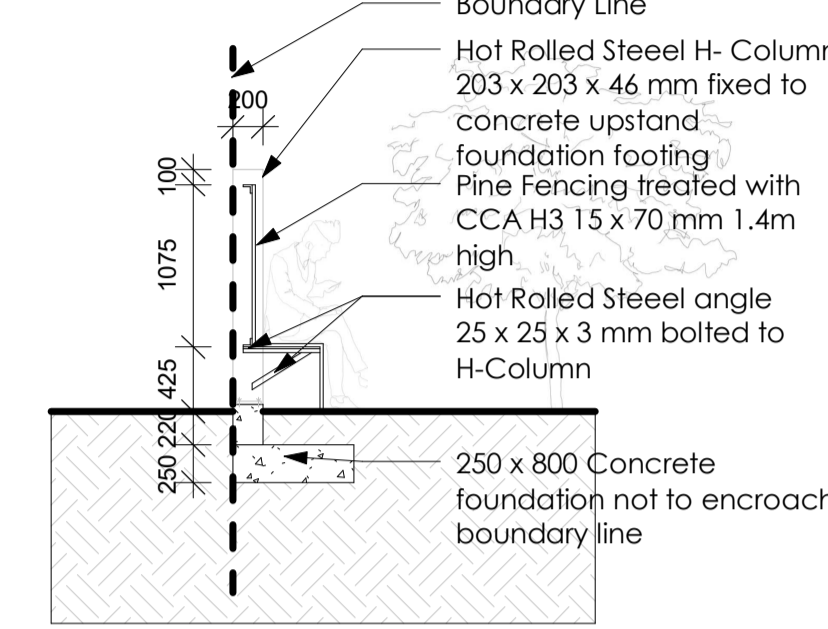
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Boundary Wall Type 1
1:50



Boundary Wall Type 2
1:50

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 7. Building works to be strictly according to the latest and applicable NHBC regulations.

Schedule of Rights

Erf:	New Consolidated Erf Nr
Site Area:	8737m ²
Township:	Kimberley
Zoning Information:	
Town Planning Scheme:	Sol Plaatje Municipality: LUM 2008
Use Zone:	Educational

Developmental Control Measures

Control	Permissible	Actual
Floor Area Ratio	2	2.2
Height	4 Storeys	3 Storeys
Coverage	50%	16%

Area Schedule

Restaurant:	143m ²
Exhibition Space:	395m ²
Studio Spaces:	1274m ²
Workshops:	288m ²
Lecture Halls:	215m ²
Library:	142m ²
Cad Lab:	73m ²
Offices:	242m ²
Services, Reception & Circulation:	408m ²
Total:	3180m²

Parking Requirements

Function	Area	Occupancy	Parking
Restaurant:	143m ²	A1	8
Exhibition Space:	395m ²	C1	16
Studio Spaces:	1274m ²	A3	50
Workshops:	288m ²	A3	12
Lecture Halls:	215m ²	A3	8
Cad Lab:	73m ²	A3	2
Offices:	242m ²	G1	10
Services:	408m ²	N/A	
Total Requirements			108

Parking Spaces

Parking Spaces	108
Disabled Parking	1
Loading Bay	2

Landscaping Legend

	Grass Block Paving
	Gravel allows for Planting
	Paving
	Stormwater Grid
	Trees: Camel Thorn, Karee, Karoo Rhizogum
	Grass & Shrubs: Grey Sour Grass, Finger Grass, Thimble Grass

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Site Development Plan

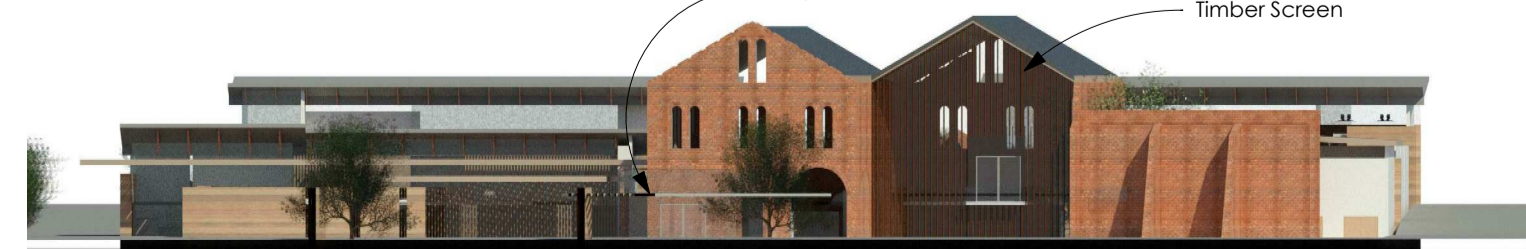
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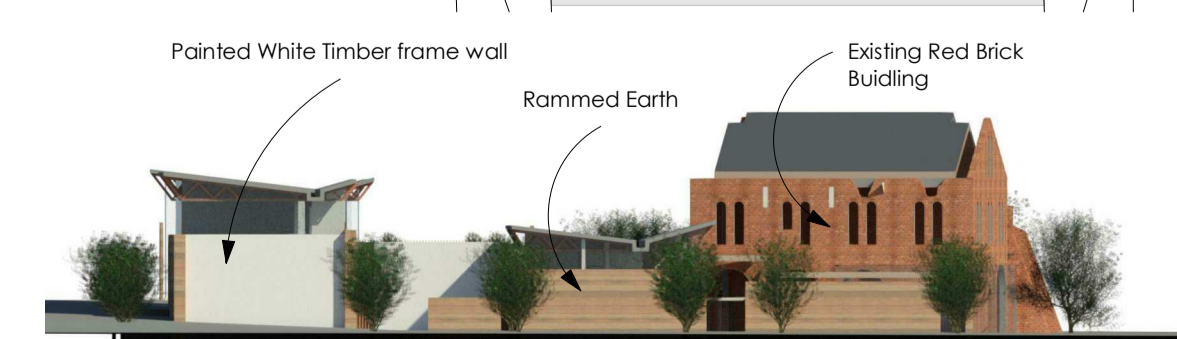
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1 Site Development Plan
1:200



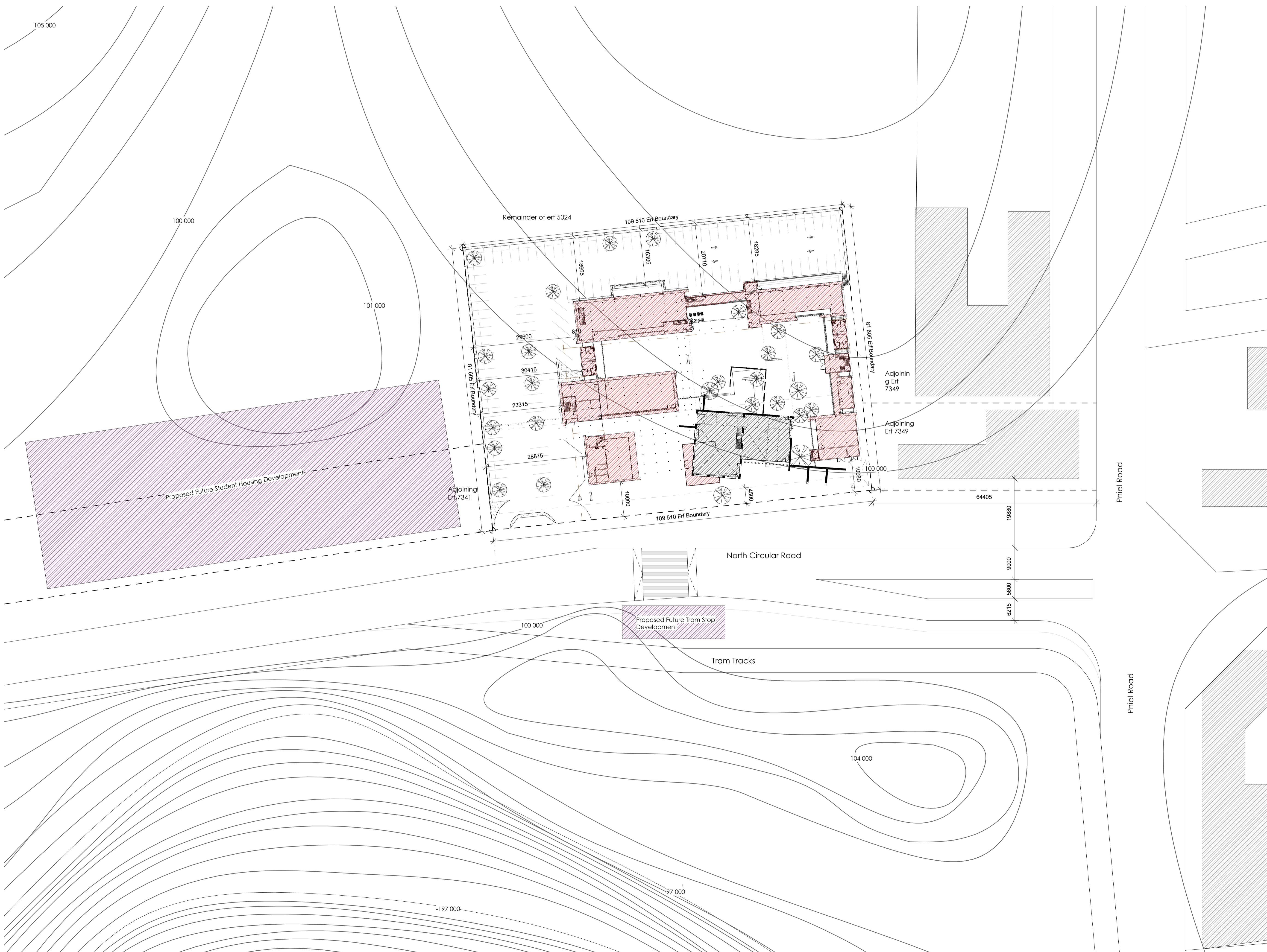
2 South Elevation
1:500



3 Western Elevation
1:1 1:500



4 Northern Elevation
1:500



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Schedule of Rights

Erf: New Consolidated Erf Nr
 Site Area: 8737m²
 Township: Kimberley
 Zoning Information

Town Planning Scheme:
 Sol Plaatje Municipality: LUM 2008
 Use Zone: Educational

Developmental Control Measures

Control	Permissible	Actual
Floor Area Ratio	2	2.2
Height	4 Storeyes	3 Storeyes
Coverage	50%	16%

Area Schedule

Restaurant:	143m ²
Exhibition Space:	375m ²
Studio Spaces:	1274m ²
Workshops:	288m ²
Lecture Halls:	215m ²
Library :	142m ²
Code Lab:	73m ²
Offices:	242m ²
Services, Reception & Circulation:	408m ²
Total:	3180m²

Footprint:	1411m ²
Site:	8737m ²
Coverage:	16%
FSR:	0.44

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Block Plan

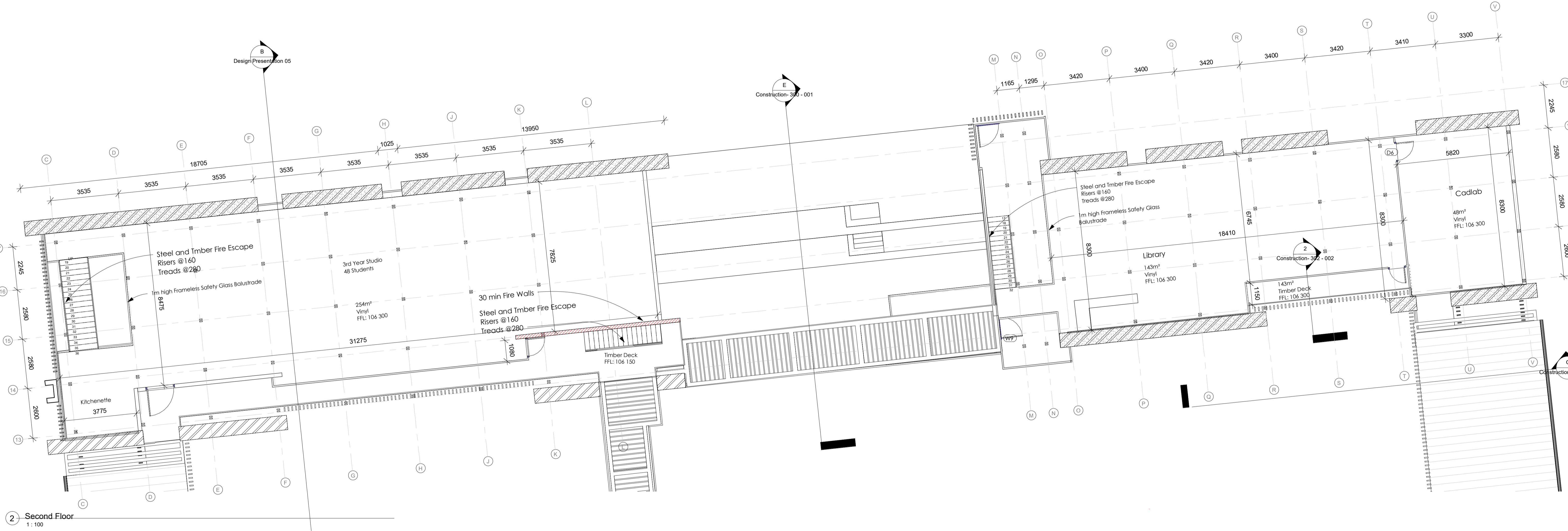
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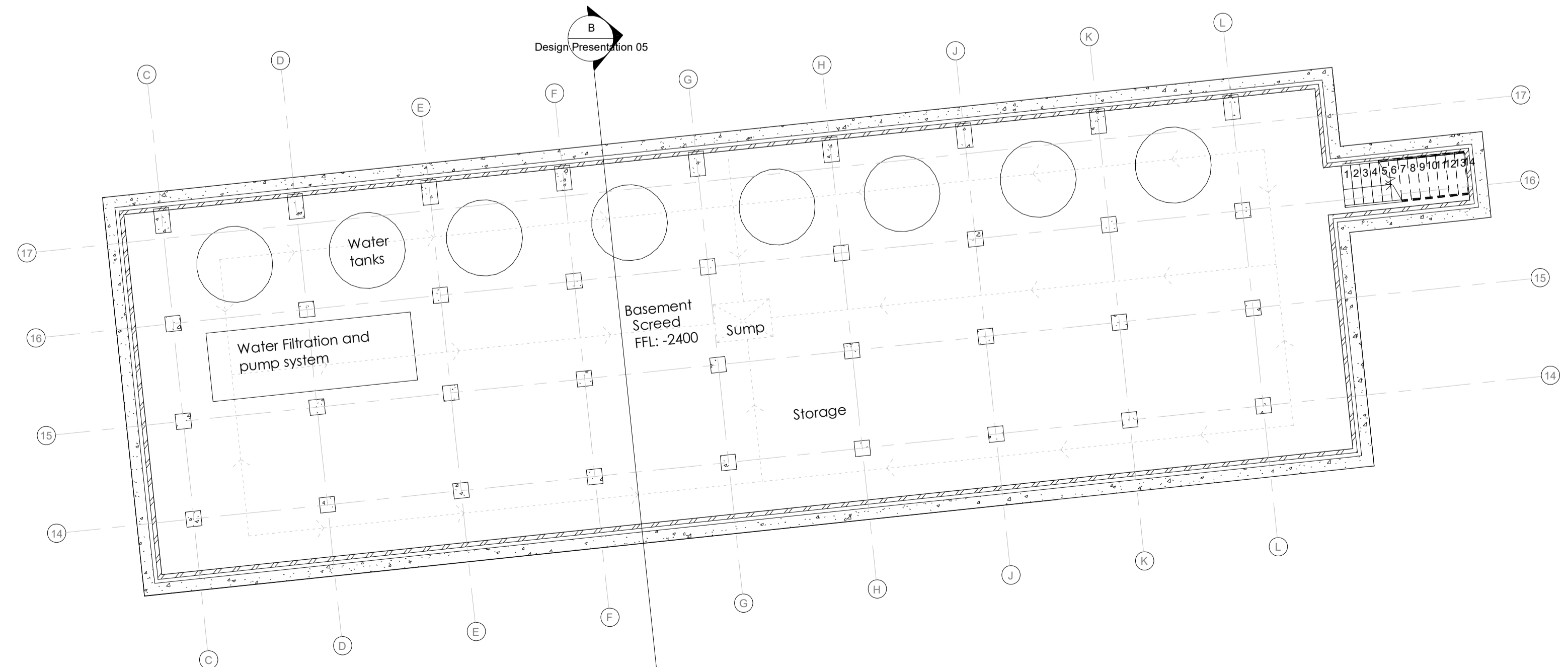
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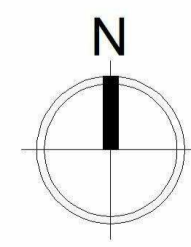
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 7. Building works to be strictly according to the latest and applicable NHBC regulations.



2 Second Floor
1:100



1 Basement
1:100



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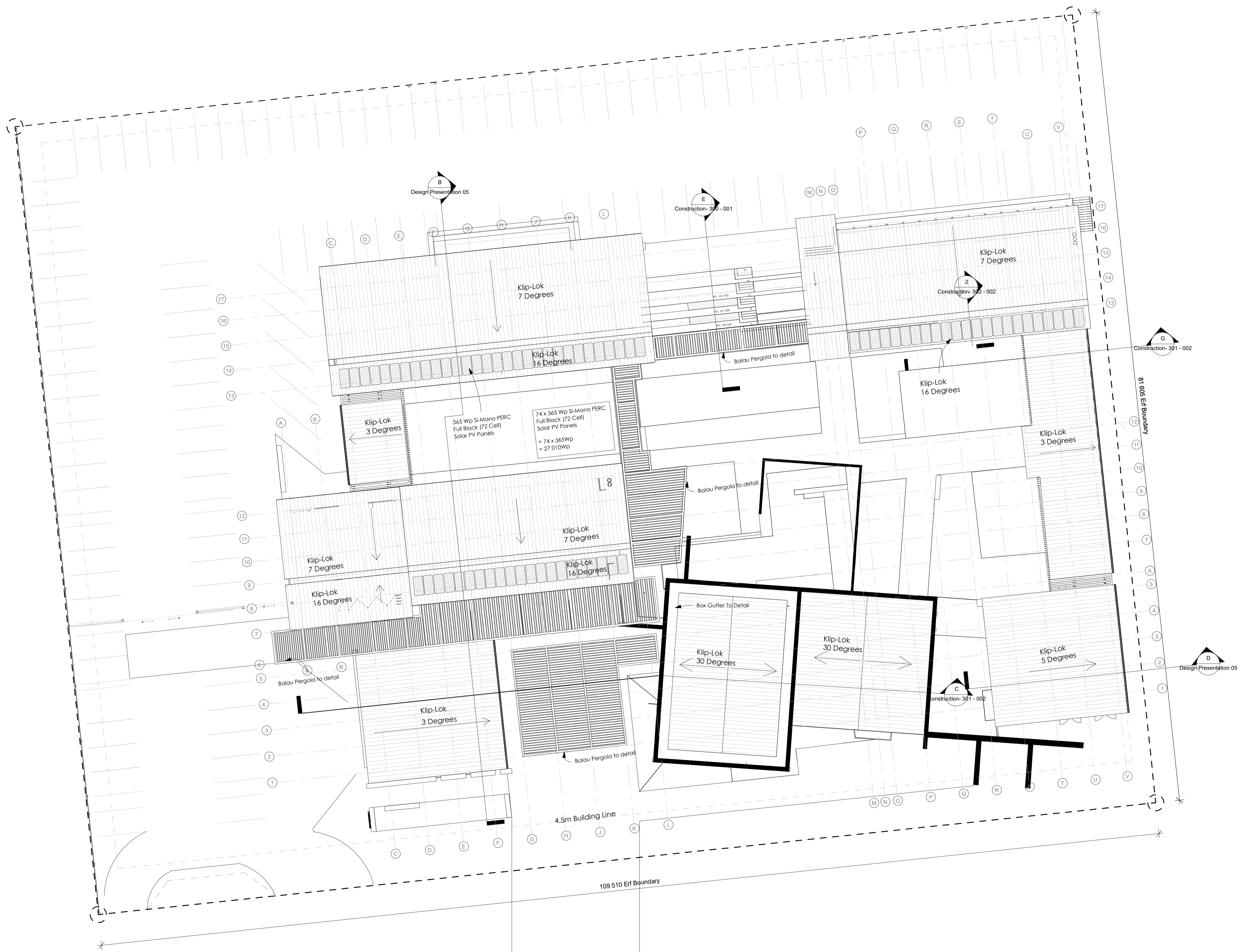
Second Floor, Basement Plan

Project number 19001-10-14

Date 18-11-19

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Student Nr 2017091592



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 3, North Circular Road, Kimberley

Construction- 105 - 002

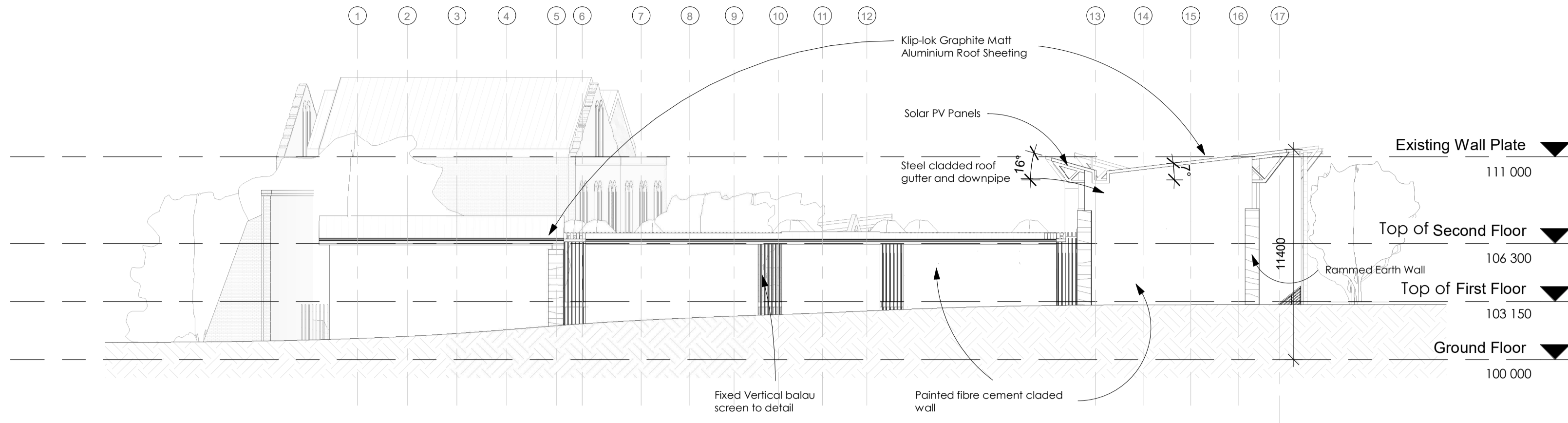
Roof Plan

Project number 19001-10-14

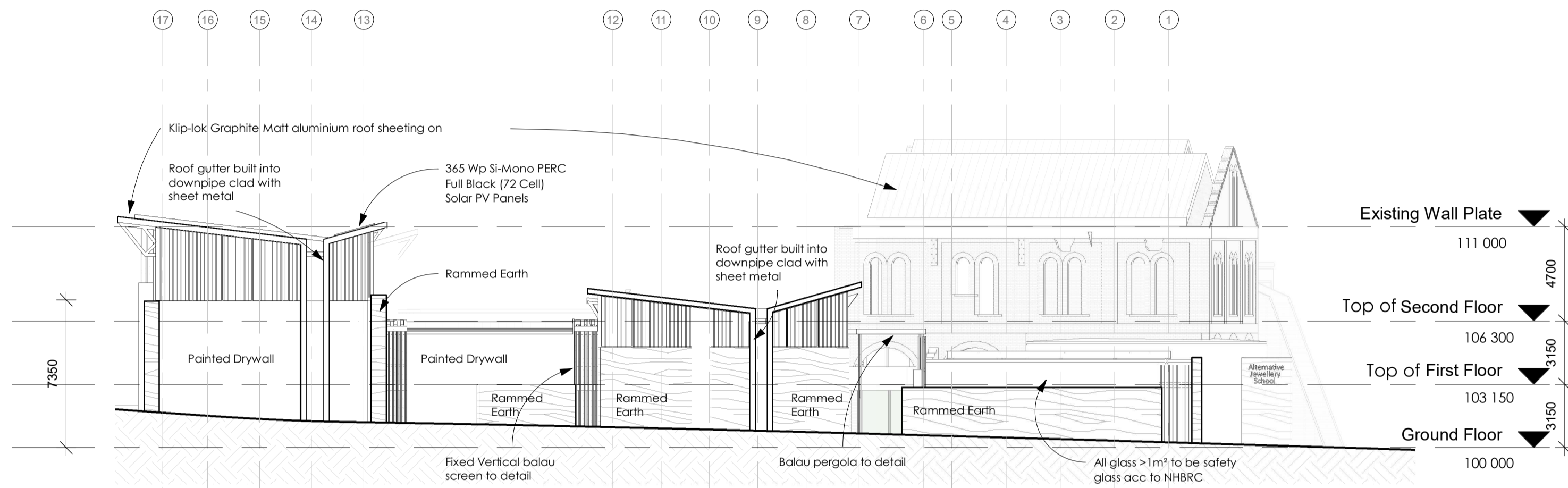
Date 18-11-19

Drawn by Nicole Vivier

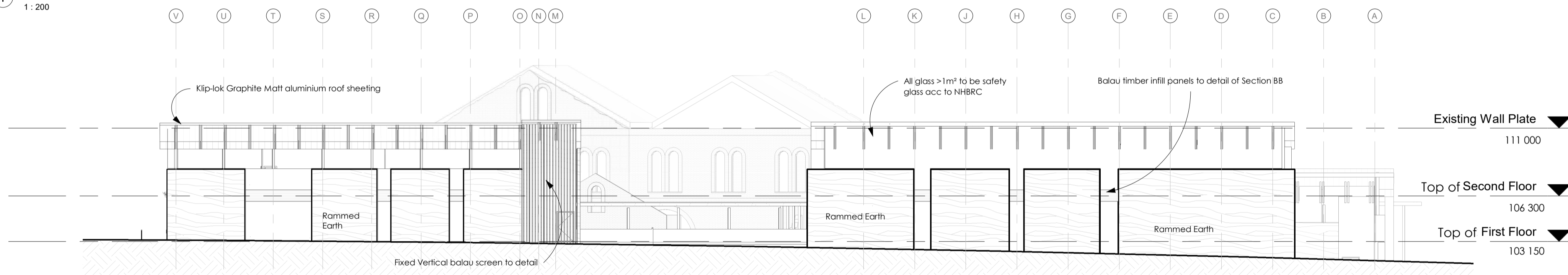
Student Nr 2017091592



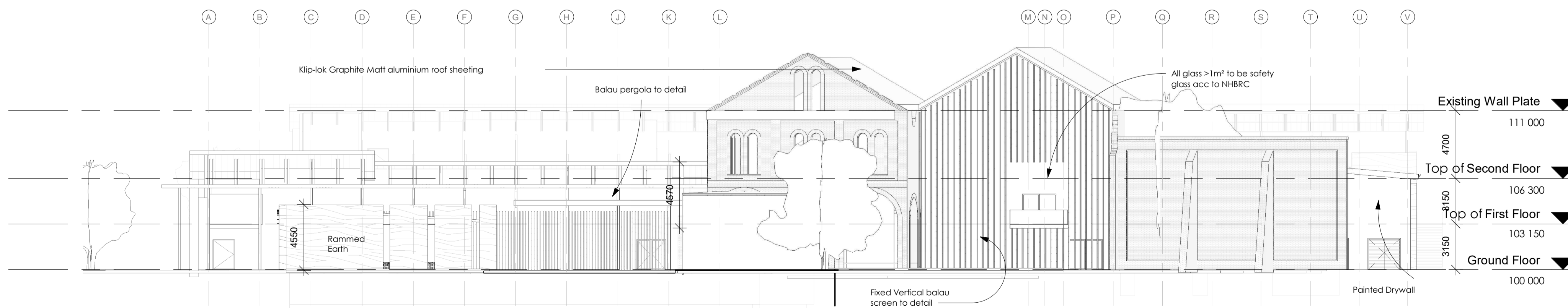
4 East Elevation
1:200



1 Western Elevation
1:200



2 Northern Elevation
1:200



3 South Elevation
1:200

General Notes:

1. Municipal requirements and those of other authorities must be adhered to.
2. Any discrepancies to be reported to the architect immediately.
3. This drawing is not to be scaled. Only figured dimensions used.
4. All work to be done in accordance with NHBRC & National Building Regulations SABS 10400 (1990) and all requirements of municipal and local authorities concerned, to be adhered to.
5. All glass areas bigger than 1m² and at height less than 500mm from FFL to be 6mm safety glass.
6. All cavities below floor level to be filled with concrete and DPC's stepped.
7. Building works to be strictly according to the latest and applicable NHBRC regulations.

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Construction- 200 - 002

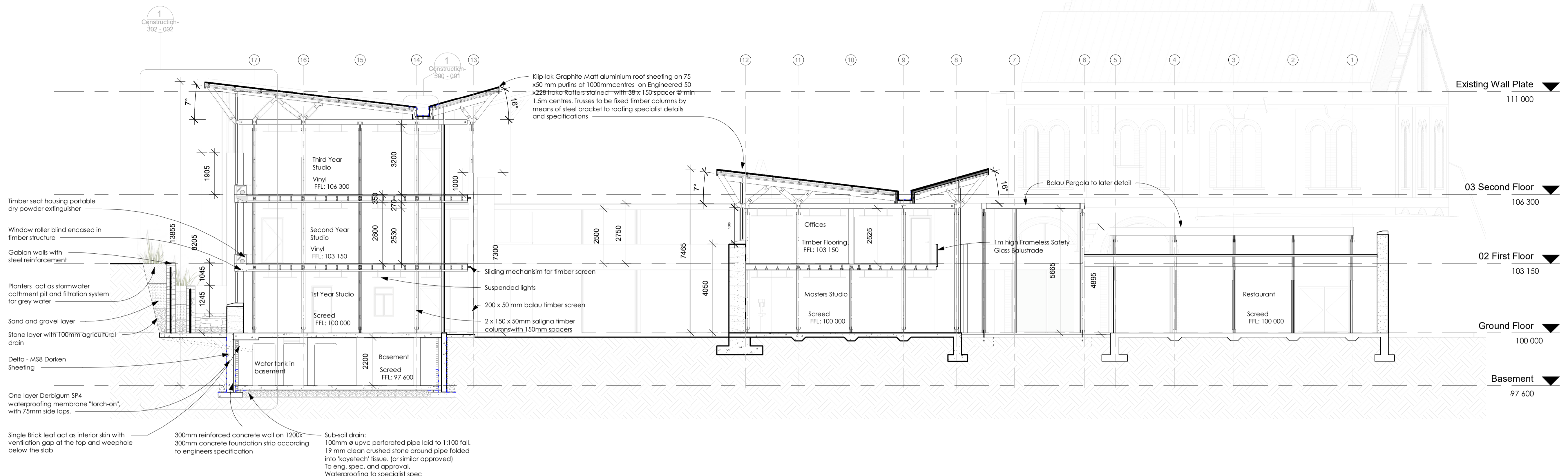
Elevations

Project number 19001-10-14

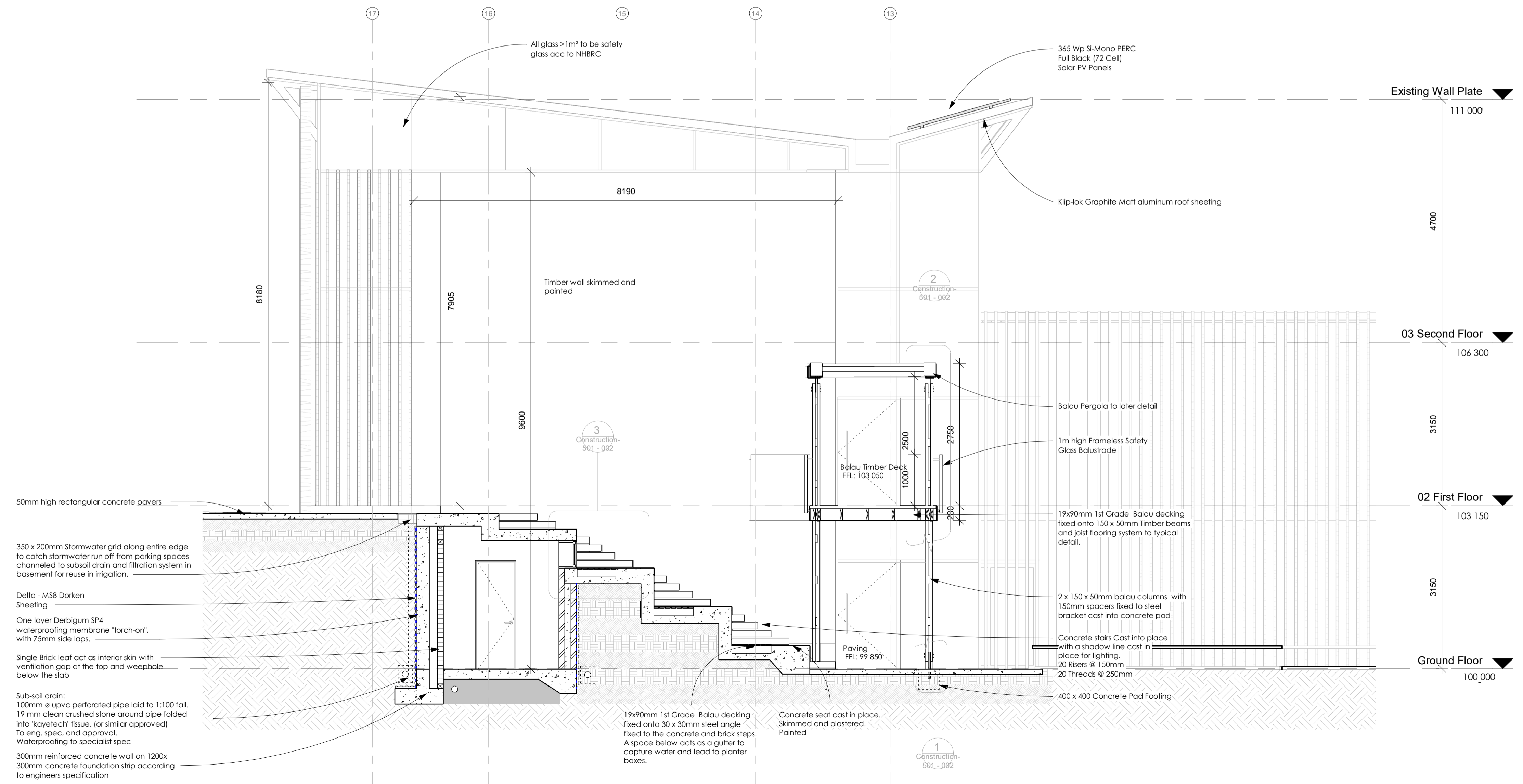
Date 18-11-19

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Student Nr 2017091592



1 Section AA
1 : 100



E Section EE
1 : 50

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Construction- 300 - 001

Sections

Project number 19001-10-14

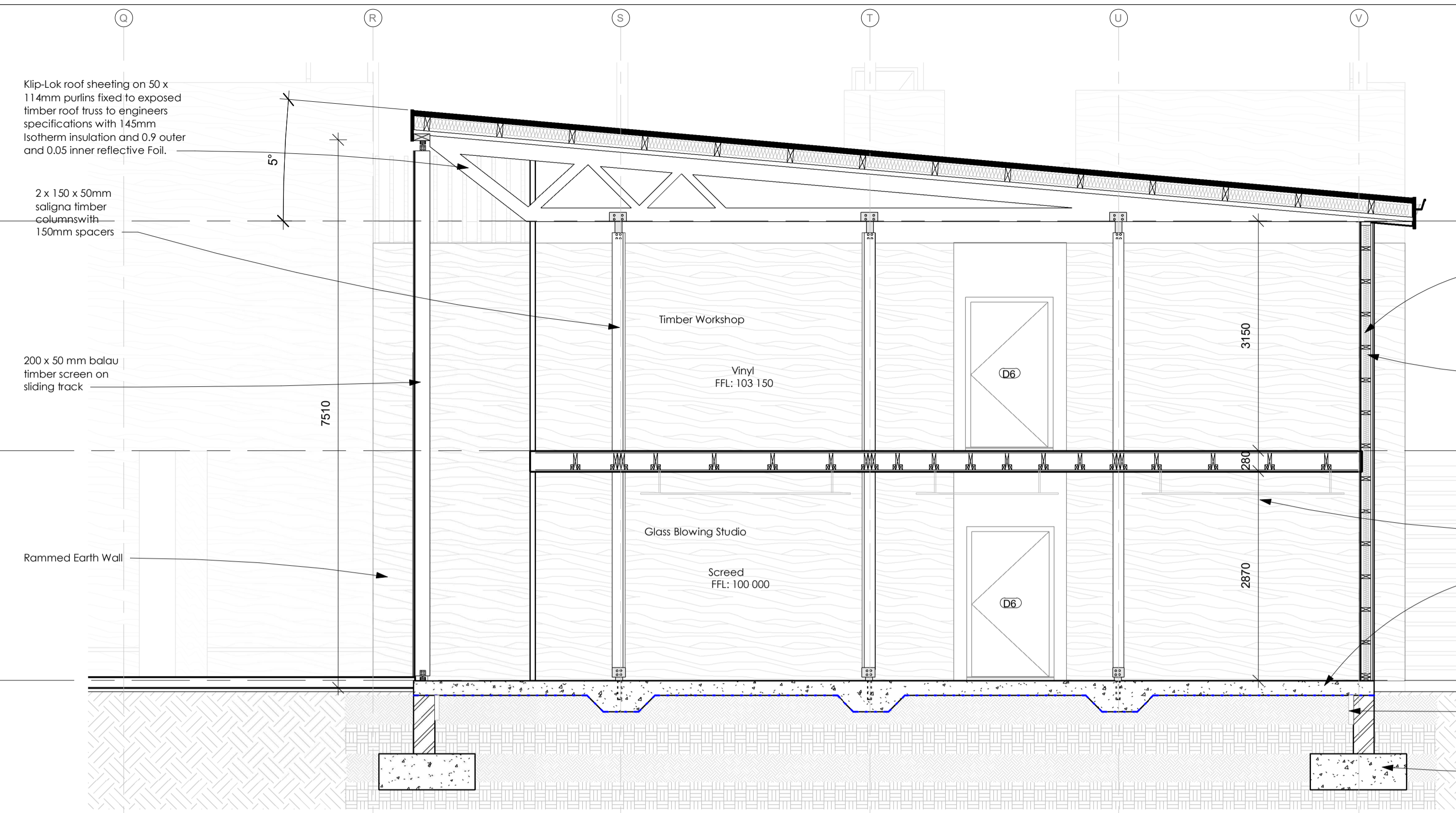
Date 18-11-19

Drawn by Nicole Vivier

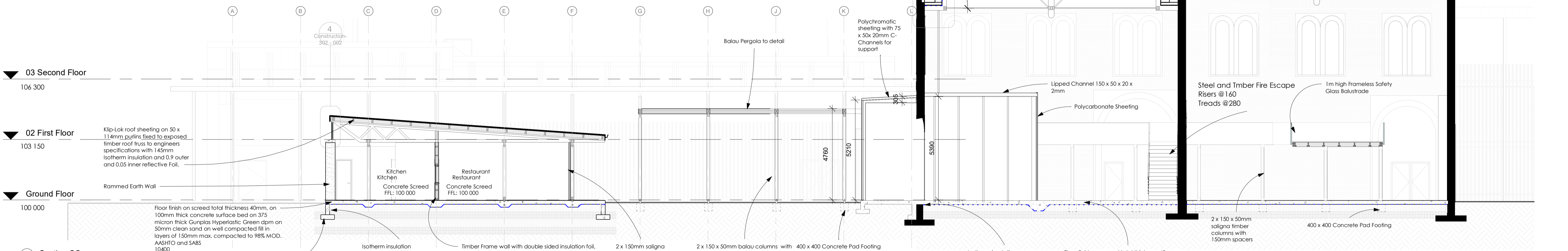
Student Nr 2017091592

General Notes:

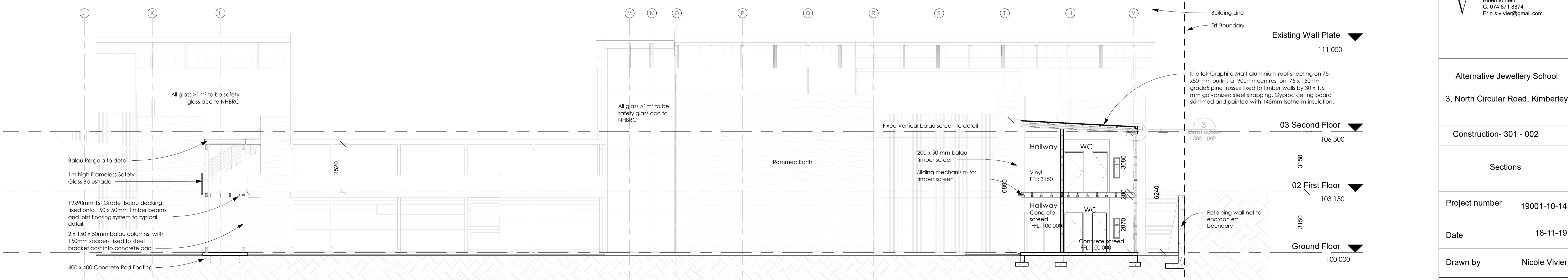
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2 Section DD
1 : 50



3 Section CC
1 : 100



4 Section GG
1 : 100

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Construction- 301 - 002

Sections

Project number 19001-10-14

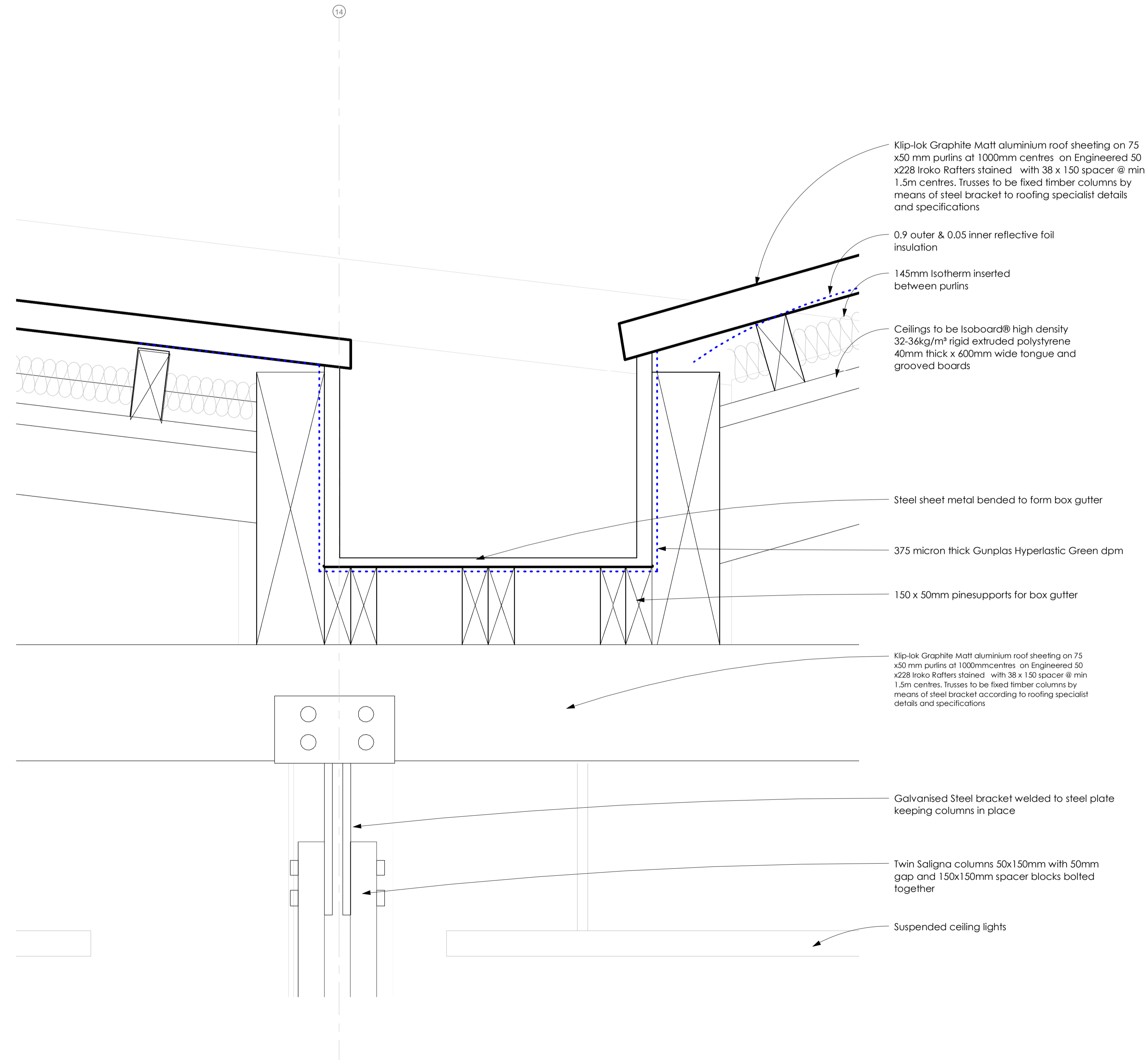
Date 18-11-19

Drawn by Nicole Vivier

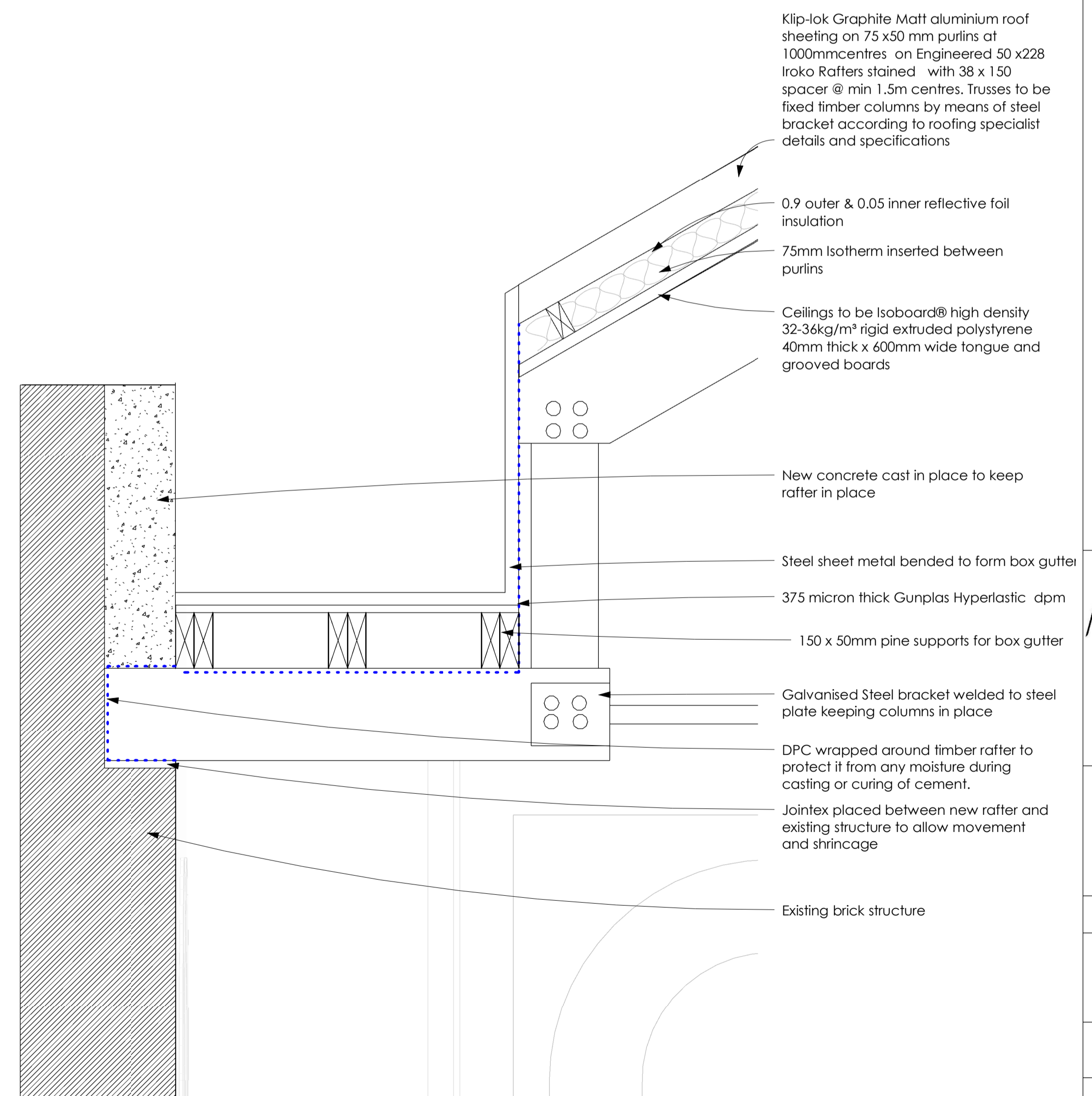
Student Nr 2017091592

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1 Detail 2 - Box Gutter
1:5



2 Detail 3 - New Roof on Existing Structure
1:10

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Alternative Jewellery School
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Construction- 500 - 001

Details

Project number 19001-10-14

Date 18-11-19

Drawn by Nicole Vivier

Student Nr 2017091592

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- 38 x 102mm balau beams hung in galvanised joist hanger fixed to laminated beam.
- 280 x 50mm Laminated balau beam fixed to steel bracket by means of countersunk screws
- Galvanised steel bracket fixed to columns and pergola
- Twin Saligna columns 50x150mm with 50mm gap and 150x150mm spacer blocks bolted together and to steel bracket.

- brick steps built and plastered with 20mm shadow line cast into place with strip led to lighten path
- Concrete seat cast in place. Skimmed and painted. Soffit to be skimmed and plastered

- 19x90mm 1st Grade Balau decking fixed onto 5 x 30 x 30mm steel angle fixed to the concrete. A space below acts as a gutter to capture rain water and lead to planter boxes.

- Retaining walls to Engineered Detail**
Consisting of waterproofing to specialist details on outlayer of 110mm brick skin, 50mm grade 10 concrete infill.

- One layer Derbigum SP4 waterproofing membrane "torch-on", with 75mm side laps.

- Delta - MS8 Dorken Sheeting

3 Detail 6 - Exterior Seating
1:10

- Brushed stainless steel handrail in square profile

- 1m high Frameless Safety Glass Balustrade Fixed to timber deck by means of side mounted glass brackets.

02 First Floor
103 150

- 19x90mm 1st Grade Balau decking fixed onto 38 x 38mm batten at 400mm c/c on 150 x 50mm Timber beams and joist flooring system.
- 5 x 30 x 30mm steel angle

- Vinyl flooring finish fixed onto 22mm plywood flooring board. Installed according to manufacturers instruction

- 40 x 40mm battens fixed to joist and beam system with steel angle at 600mm c/c

- Sisalation® FR 430 Fire retardant industrial grade reinforced aluminium foil insulation double sided, durable, reflective foil with a Class 1 fire rating.

- 145mm Isotherm Insulation

- 228 x 50mm Saligna beam and joist flooring system. Joists fixed to beam by means of galvanised joist hangers

- 19 x 90mm timber slats fastened to suspended pelican ceiling system allowing electric conduits to run through gap

2 Detail 7 - Pergola Detail
1:10

- Twin Saligna columns 50x150mm with 50mm gap and 150x150mm spacer blocks bolted together and to steel bracket.

- Galvanised Steel bracket cast into concrete pad foundation plate.

- Concrete paving DPC underneath on compacted fill.

- 400 x 400 x 400mm reinforced concrete footing

1 Detail 5 - Typical Pad Footing for Pergola
1:10

Lecture Hall
Vinyl
FFL: 103 150

Hallway
Vinyl
FFL: 103 150

Library
Vinyl
FFL: 106 300

Balcony
Balau Deck
FFL: 106 150

03 Second Floor
106 300

- 19 x 90mm Balau deck fixed to plywood board according to suppliers specification

- One layer Derbigum SP4 waterproofing membrane "torch-on" on 22mm plywood overlapped with dpc placed between timber frame and flooring system

- 200 x 50 mm balau timber screen

- Sliding mechanism for timber screen

- 150 x 50mm Saligna beam and joist flooring system. Joists fixed to beam by means of galvanised joist hangers

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Construction- 501 - 002

Details

Project number 19001-10-14

Date 18-11-19

Drawn by Nicole Viver

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4 Detail 8 - Floor Construction
1:5