



Marco Rainho
1847461

UNIFYING LINES

COMMUNITY COHESION THROUGH THE INTEGRATION OF **SPORT & EDUCATION FACILITIES**

I, Marco Rainho 1847461 am a student registered for the course Master of Architecture (Professional) in the year 2024. I hereby declare the following: I am aware that plagiarism [the use of someone else's work without permission and/or without acknowledging the original sources] is wrong. I confirm that the work submitted for assessment for the above course is my own unaided work except where I have stated explicitly otherwise. I have followed the required conventions in referencing thoughts, ideas, and visual materials of others. For this purpose, I have referred to the Graduate School of Engineering and the Built Environment style guide. I understand that the University of the Witwatersrand may take disciplinary action against me if there is belief that this is not my unaided work or that I have failed to acknowledge the source of the ideas or words in my own work.

Date: 20/02/2025

Signed: 

This document is submitted in partial fulfilment for the degree: Master of Architecture (Professional) at the University of the Witwatersrand, Johannesburg, South Africa, 2024.

Football is the most popular sport in South Africa with an estimated 2 million people playing the sport (South African Tourism, 2024). The sport was first introduced to the country by the British colonizers and was organized by racial segregation. Once Apartheid came to an end and with the introduction of a democratic government, the segregation regime was demolished and all races were allowed to play competitively against each other (South Africa Sports, 2024). The sport thereafter became very popular in the black community as it represented an opportunity for the underprivileged to make a living despite their lack of education, it opened up a new field of work as now all races could play the sport professionally, and it is a sport that doesn't require expensive equipment to play (in the townships bins are placed to create goals and newspaper and elastic bands are formed into balls). Today, professional football in South Africa is made up of predominantly black players and supporters - "this demographic is predominantly composed of black individuals (87%)" (Eighty20, 2024) - which gives the underprivileged youth hope that they can become professional footballers. Amateur football clubs have many underprivileged children traveling from townships all across Johannesburg to develop their football skills in the hope of one day playing professional football. Unfortunately, it is extremely difficult to make it professionally in the sport, and the majority of players don't end up making it. Due to many children have dedicated their lives to making it professional, their education is often put on the sidelines - thus affecting their grades and leaving them with poor marks to fall back on.

The issue of poor grades or lack of education leads to one of the most prominent issues in the country at the moment which is the unemployment. The project looks at integrating sport and education to create a facility that increases the opportunities for the underprivileged children in South Africa. With the addition of an education centre on an existing football club - Linhill Celtic FC - the football club can promote education and instill the values of education to its players, as well as provide the underprivileged players at the club with the facilities to receive extra lessons from volunteer tutors and students and provide the children with resources for research and homework. There is a large education gap between government and private schools, and most children attending government schools cannot afford extra lessons to help them with work they are struggling with, and many children fail because they don't have the same resources as the children in private schools. If we can provide the underprivileged with resources that will help them get through their schooling, we can bridge the gap between the public and private education sectors and increase the educational success rates in the country - which in turn will decrease the unemployment rate.

Key Words: Football, Amateur Football Clubs, Education, Unemployment, Education Gap, Resources, Values, Opportunity

Declaration	i
Abstract	ii
Contents	1-2
1. Chapter 01: Introduction	3
1.1 Introduction	4
1.2 Research Aims and Objectives	5
2. Chapter 02: Methodology	6
2.1 Methodology	7-8
3. Chapter 03: Analysis/Diagrams	9
3.1 Site Analysis	10-14
3.2 Analysing Linhill Celtic FC	15-24
3.3 Program Around Linhill Celtic FC	25-26
3.4 Analysing at a Larger Scale	27-31
4. Chapter 04: Case Studies	32
4.1 Shappa Soweto Training Centre	33-44
4.2 Nike Experience Hub	45-50
4.3 UVA Sol de Oriente	51-58
4.4 Le Grand Parquet	59-67
4.5 Green School South Africa	68-79
5. Chapter 05: Theories	80
5.1 Social Theory	81
5.2 Place-Making Theory	82
6. Chapter 06: Context/Site	83
6.1 Linhill Celtic FC (Site) History	84-86
6.2 Site Information	87
6.3 Linmeyer History	88
6.4 The Hill History	89

7. Chapter 07: Brief/Program	90
7.1 Brief	91
7.2 Program	91-95
8. Chapter 08: Viability Report	96
8.1 Site Selection	97-98
8.2 Feasability	99-100
8.3 Viability	100-103
8.4 Implementation	103-104
8.5 Conclusion	105
9. Chapter 09: Design Development	106
9.1 Charette	107-108
9.2 Conceptual Mapping	109-112
9.3 Conceptual Sketches	113-115
9.4 Review 3	116-121
9.5 Technical Workshop	122-126
9.6 Design Development	127-134
9.7 Materiality	135-137
10. Chapter 10: Design Drawings	138
10.1 Design Drawings	139-153
11. Chapter 11: Technological Details/Systems	154
11.1 Technological Details	155-158
12. Chapter 12: Conclusion	159
12.1 Conclusion	160
References	161-162
List of Figures	163-168

01

1.1 INTRODUCTION:

A large issue we face as South Africans is the high unemployment rate in the country. The youth of the country questions their futures from a young age and wonder how they are going to get a job once they have finished their education period, if they have the opportunity to receive an education. Research shows that the unemployment rate in the country as of the fourth quarter of 2023 is 32,1 percent (Stats SA, 2024), which is an extremely concerning figure. When breaking down the unemployment figure it shows that 51,3 percent have less than a matric, 38,5 percent have a matric, 7 percent have other tertiary education and 2,4 percent are graduates of tertiary educations (Stats SA, 2024). What this data shows is how important it is to receive a good education that will allow you acceptance into the tertiary education sector, as graduates of the tertiary education sector form a small part of the unemployed in comparison to the other groups in the comparison. However, what is more concerning is that 34,2 percent of young people aged between 15 and 24 years old are not in employment, education, or training (Stats SA, 2024). How can we aim to decrease the unemployment rate of the country if the next generation of the workforce are not receiving the basic tools they need to learn or work?

My project looks at integrating sport and education, focusing on the link between mind and body. Both sport and education play an important role in the development of children and teach us skills and lessons that we will use in the workspace. Sport teaches us discipline, leadership, teamwork, people skills, problem solving, communication and hard work. Sport also allows us to grow networks with people we meet through the game, as well as potentially a job related to the sport. Education develops our knowledge, problem solving, time management, social skills, creativity, and focus. Development through sports and education can provide many skills and opportunities for when the youth join the workforce.

The concept of my project is to take an existing football club in Johannesburg and redevelop the image of a typical football club, with the addition of an education centre to the facilities, to develop the link between mind and body. Sport and education can exist together as both football clubs and schools are places people go to learn and get better at specific skills. The two programs working together can be extremely successful in the development of children and future opportunities. If someone has the resources to do something, there should be no excuse as to why it could not be done. In addition to the new sport and education facilities my project will add a public interface to the football club to bring the community together and promote interaction between the public and the private. The link between public and private is an important theme in my project and a grey area when it comes to designing in the South African context. How can we bring people in and promote community interaction, while providing safety and security at the same time. The threshold needs to function as a barrier that separates spaces but also allows passive/indirect interaction.

1.2 RESEARCH AIMS AND OBJECTIVES:

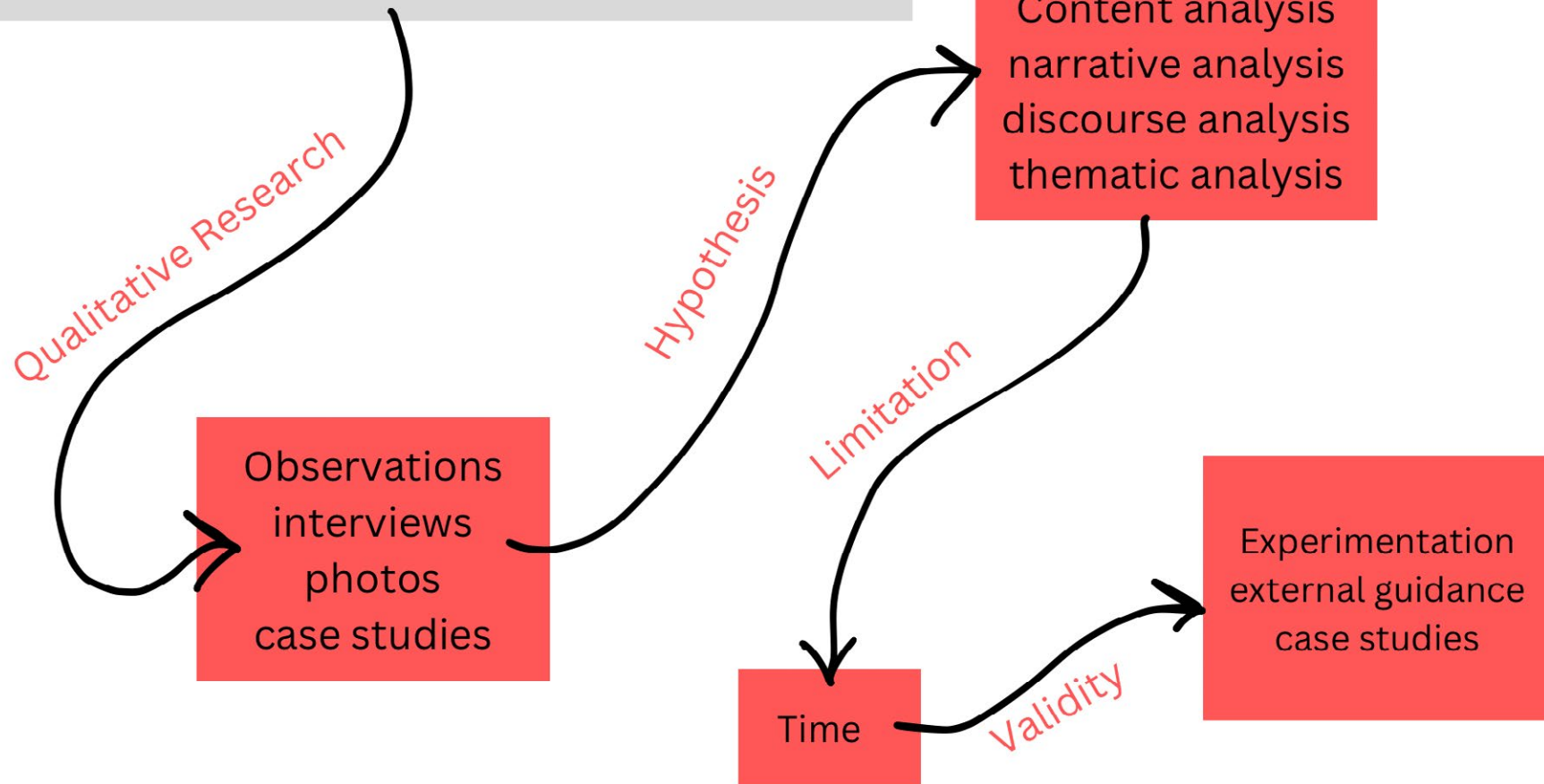
The aim of the research is to get a better understanding of the site, Linhill Celtic FC, and its surrounding context. This is going to be done through extensive analysis of the site, its direct surroundings, as well as its neighbouring context. The analysis will be done through mapping, images, observation, and climatic conditions. In addition to the site analysis, it is important to understand the history of the football club and its location. Through this understanding of the site and its history i can make design decisions that will integrate my building into its environment. It is important to design for the context as different conditions require different design strategies. What makes a building successful is how it blends into its context and surroundings, as well as how the building is perceived and used by the public and its users.

Furthermore, the research is also aimed at studying precedents to see how different examples of buildings with the same/ similar program and use function in their respective environments. Through this analysis and observation i can understand why certain decisions were made, what design strategies were used to create a specific feeling, movement or engagement, and how that building fits into its context by understanding the concept of the building. Theories will also be explored to understand functional and technical solutions that have arisen from questions in the field of architecture. Theories are a set of ideas that have been researched and tested to come up with a potential design decision or technical design decision. By understanding architectural theories will help me question different components of my project and context, and look at how existing theories can be used or how they can be developed to fit directly into my project.

The objective of the project is to create an institution that promotes child development through sport and education. The project aims at questioning the structure of a typical football club in Johannesburg by showing the potential opportunity that is present in linking sport with education. Football is a sport that brings people together, and is part of the culture of South Africa, yet when analysing a typical football club in the country it is a closed off space that doesnt promote interaction between the game being played on the fields and the public, there is limited interaction between the club and its context - as it is a private fenced off facility. The goal is to achieve a football club that promotes interaction by sharing the culture of the game with its context through reimagined thresholds. In addition to the footballing culture, the project aims at creating an environment that instills the value of education into children, and offers them resources to achieve great results in school.

02

How can we link sport and education to create a facility focused on skill and knowledge development to create opportunity for the youth of the country?



2.1 METHODOLOGY:

The project will develop an existing football club in Johannesburg - Linhill Celtic FC - by redesigning the football facilities to allow growth within the football club and provide the facilities to promote player development, but also allow the club to run more efficiently and increase the appeal for players to join. In addition, an education centre and public interface will be added to the football club to further develop the skills of children with research centres and extra lesson facilities, and the public interface will promote social activities in and around the club and bring the surrounding context together by breaking the separated facades. How can we link sport and education to create a facility focused on skill and knowledge development to create opportunity for the youth of the country?

Qualitative research will be done to examine the experiences, behaviours, and movements of people around the football club.

The data will be collected through observations, interviews, case studies, and photographs taken on and around the site. A hypothesis will thereafter be developed through content analysis, narrative analysis, discourse analysis, and thematic analysis.

The reason for selecting this methodology is that my project focuses on experience, relationship, and links - so in order to design for the previously listed items I need to understand how the users currently use the space to be able to develop the site to further promote better use of the site. The research limitations will be time, as there is limited time to do extensive research to get the best understanding of the site and its users. The validity and reliability of the research will come from experimentation of multiple scenarios created to address the issues being observed, as well as external guidance to bring in a new view of the same observations. In addition, the case studies researched are built examples of similar research project that will add to the reliability of my research. The ethical considerations came through the submission of a ethics clearance that required approval before beginning any research for the project.

03

3.1 SITE ANALYSIS

The site for my intervention is Linhill Celtic Football Club in Linmeyer, the south of Johannesburg. The site is owned by the City of Johannesburg Metropolitan Municipality and is zoned as public open space (COJ, 2024).

Currently the only buildings on the site are a car wash on the corner of South Rand Road and East Road, and Linhill Celtic FC which is accessed off East Road. The surrounding context is primarily made up of residential buildings, schools, and small businesses. There are many schools in close proximity of the site; 2 well established private schools and 17 government schools. The site is surrounded by areas of very different economic status', from very poor areas to middle class areas, which are extremely separated – the middle-class areas have implemented secured boom gates to close off their houses from the surrounding areas. The new proposed public interface will allow people of different backgrounds to connect and interact with each other, as in their everyday lives they are shut off and disconnected. The context around my site also has a shortage of public space, while there are areas of open land and a few tennis courts available to public use, none of these spaces were intentionally designed for public interaction and social activities, so they are not being used and have been left to deteriorate. In addition, open public land often promotes crime and illegal activity, so calling a piece of open land a park is not effective planning in community integration as this space will never be used for fun activities by the public due to safety concerns, it is also going to be something that is not maintained as the municipality is uninterested in using its funds to maintain open land which often leads these spaces to become overgrown and polluted.

The diverse social and cultural population, together with the direct access to private schools and movement through the area due to its large residential and retail footprint make the site the perfect location for a project that is focused on community interaction, social development, and educational access. The site is also framed by 2 streets, East Road and South Rand Road. South Rand Road is a very busy main road which would provide perfect access for the public intervention, while the football club and education facilities can be accessed off the quieter East Road.



Figure 1: Map of site and important connections (M Rainho, 2024)



Figure 2: Photograph of clubhouse (M Rainho, 2024)



Figure 3: Photograph of A field (M Rainho, 2024)



Figure 4: Photograph of A field (M Rainho, 2024)



Figure 5: Photograph of B and C fields (M Rainho, 2024)



Figure 6: Photograph of open space off South Rand Rd (M Rainho, 2024)



Figure 7: Photograph of parking off East Rd (M Rainho, 2024)



Figure 8: Photograph of entrance off East Rd (M Rainho, 2024)



Figure 9: Photograph of entrance off East Rd (M Rainho, 2024)



Figure 10: Photograph of East and South Rand intersection (M Rainho, 2024)



Figure 11: Photograph of retail on South Rand Rd (M Rainho, 2024)



Figure 12: Photograph of South Rand Rd (M Rainho, 2024)



Figure 13: Photograph of South Rand Road (M Rainho, 2024)



Figure 14: Photograph of open space off South Rand Rd (M Rainho, 2024)



Figure 15: Photograph of open space off South Rand Rd (M Rainho, 2024)



Figure 16: Photograph of open space off South Rand Rd (M Rainho, 2024)



Figure 17: Photograph of car wash next to site (M Rainho, 2024)



3.2 ANALYSING LINHILL CELTIC FC

Figure 18: Analysis of site map (M Rainho, 2024)

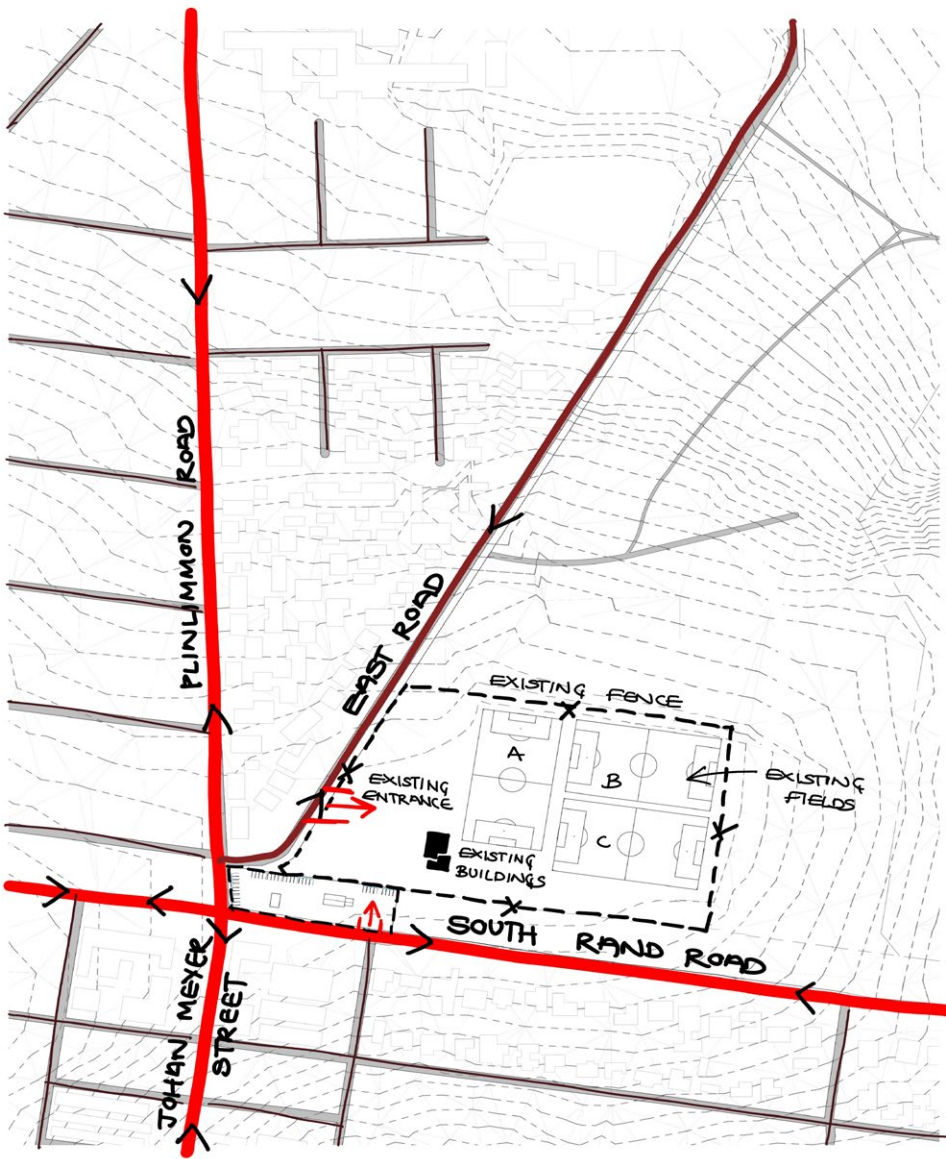


Diagram showing the streets running next to Linhill Celtic FC as well as the existing layout on and around the site, South Rand Road is a busy main road while East Road is a quieter road.

Figure 19: Analysis of site map (M Rainho, 2024)

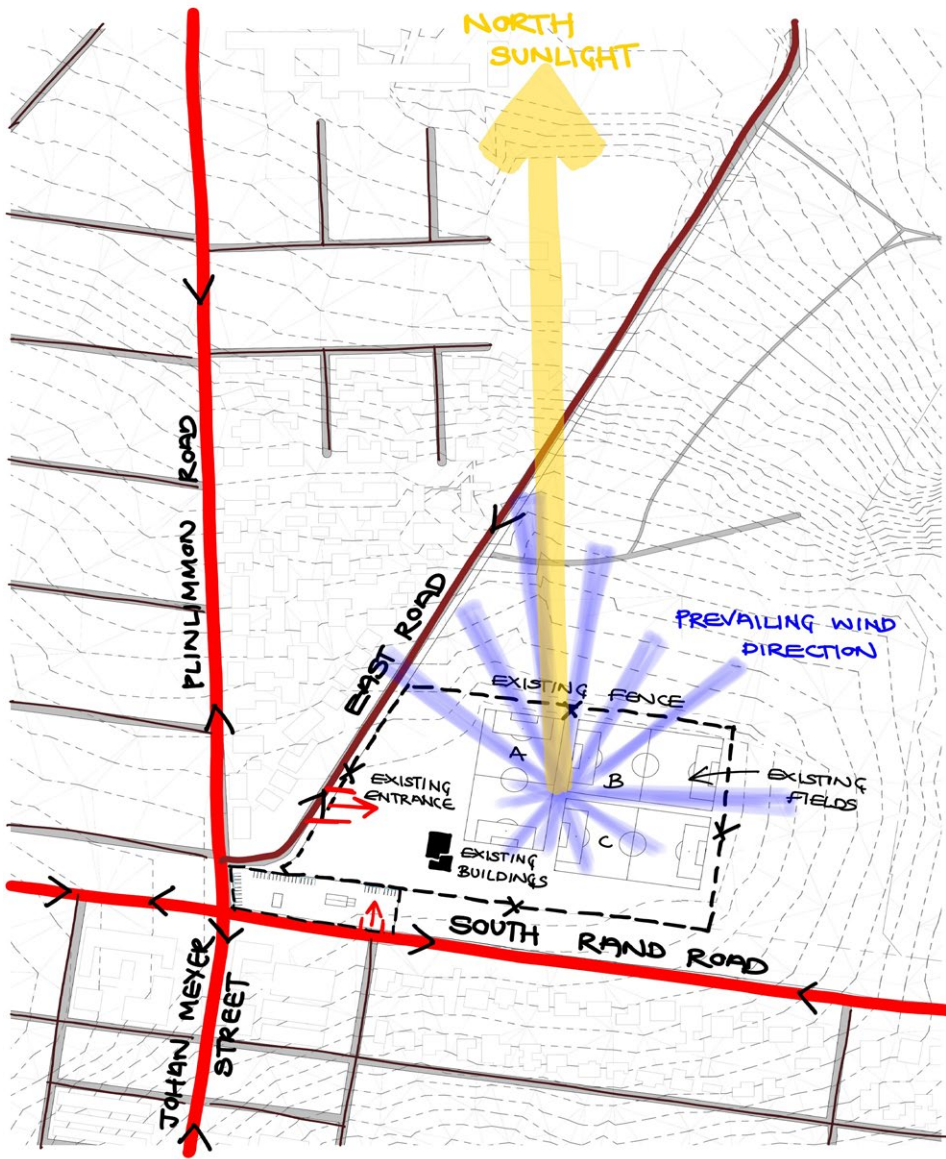


Diagram showing the climatic conditions on the site, specifically prevailing wind direction and North sunlight which form important factors in sustainable design techniques.

Figure 20: Analysis of site map (M Rainho, 2024)

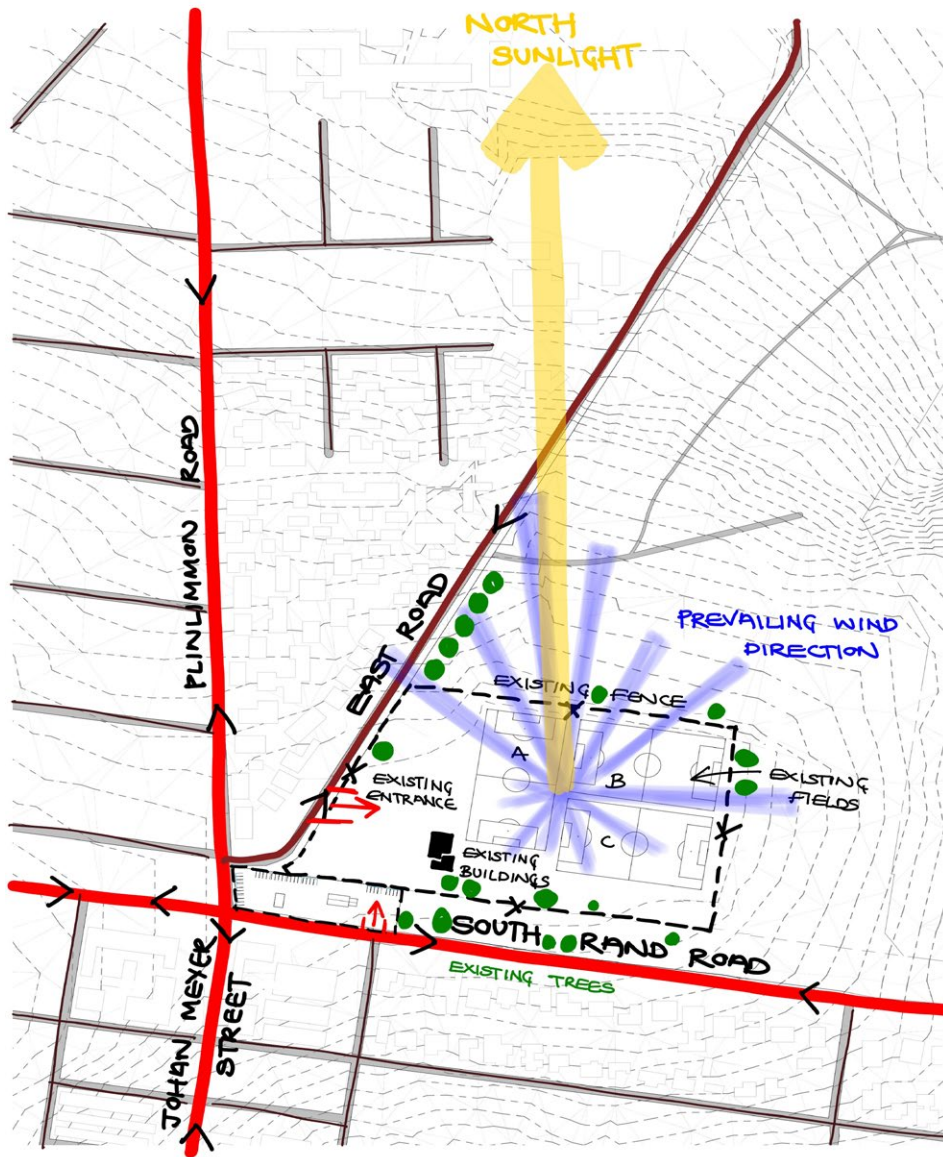


Diagram showing the existing trees on and around the site, this may restrict where buildings are placed or influence design decisions using the existing trees as a placemaker.

Figure 21: Analysis of site map (M Rainho, 2024)

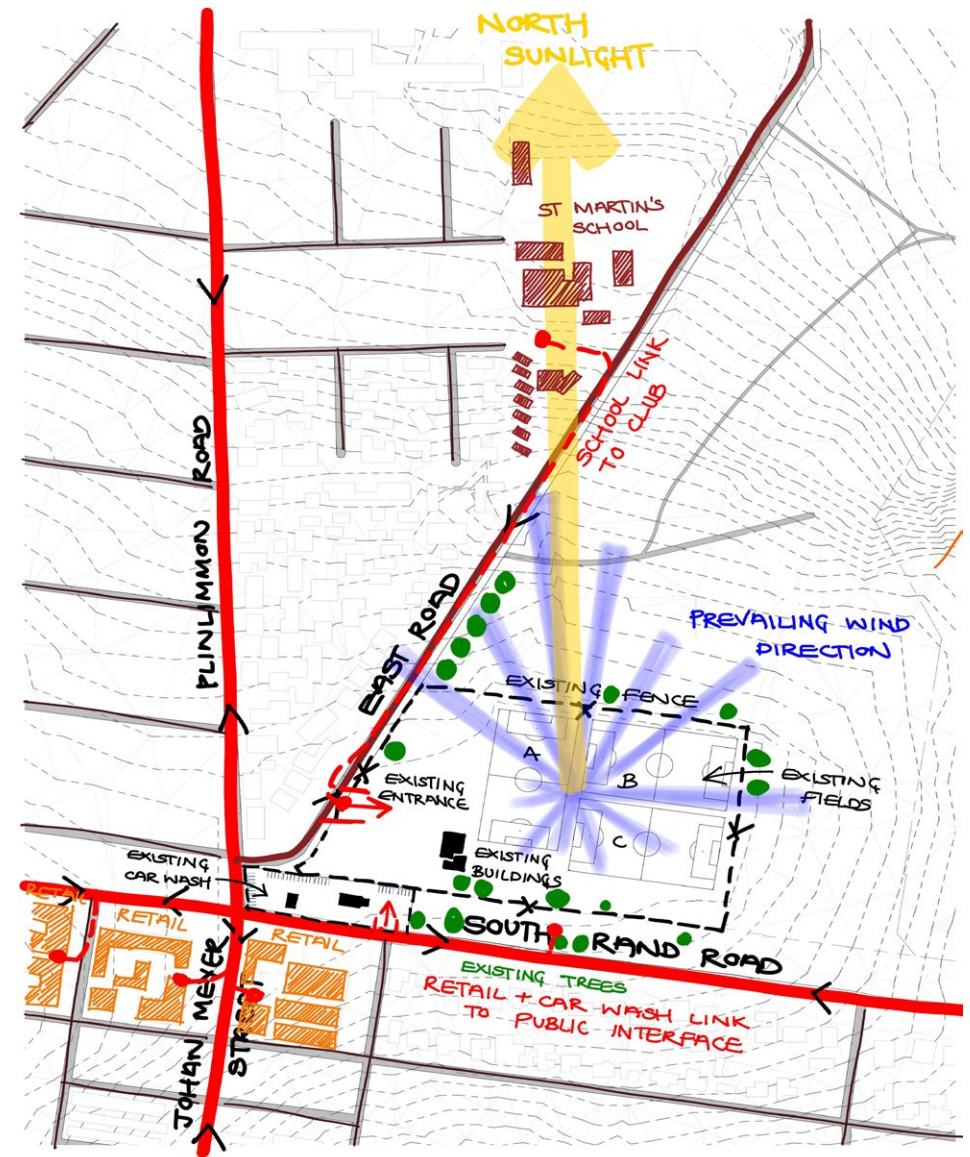


Diagram showing the connection of the site to St Martin's School and existing retail and the car wash around the site, this link will be an important connection in my design.

Figure 22: Analysis of site map (M Rainho, 2024)

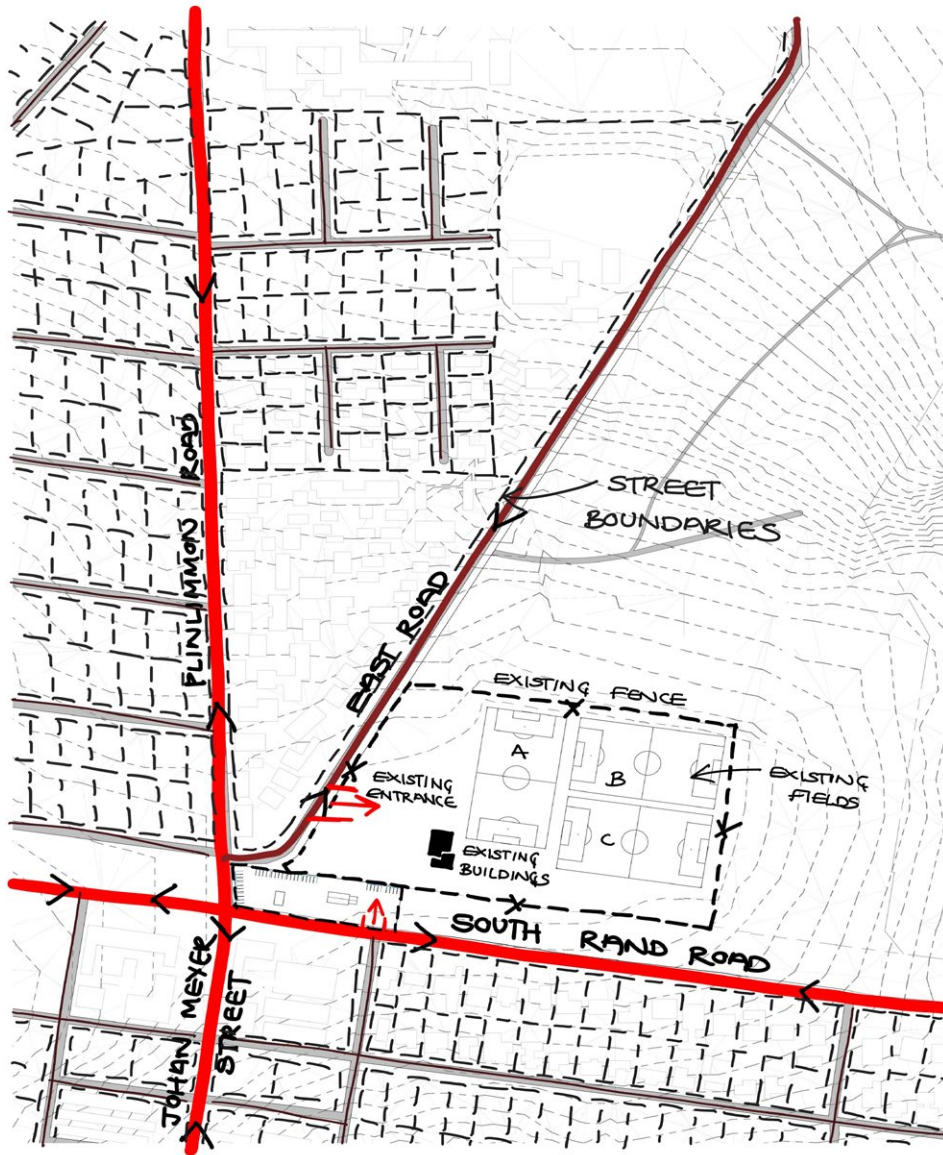


Diagram showing the existing street boundaries, highlighting public vs private space. The community is very closed off from each other and the public through high boundary wall separations.

Figure 23: Analysis of site map (M Rainho, 2024)

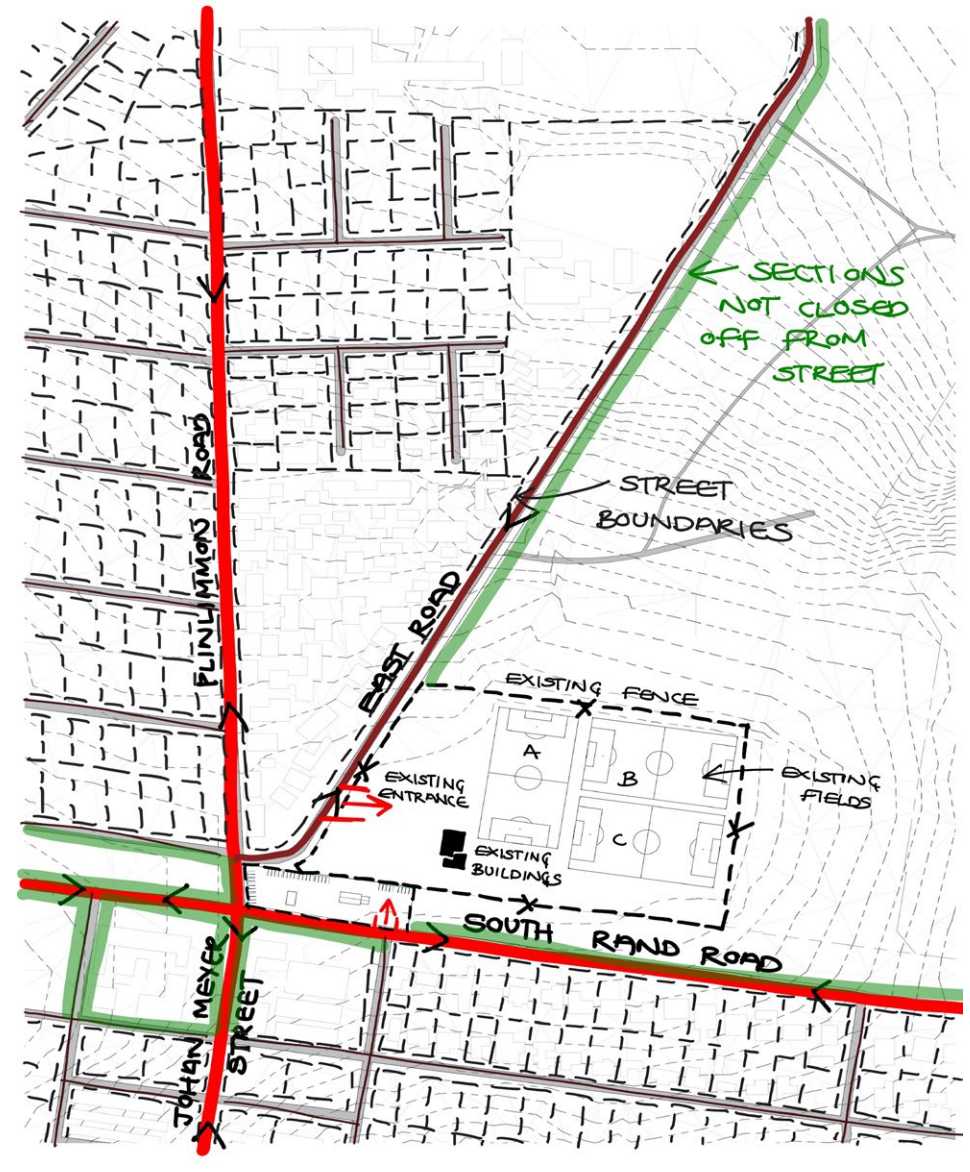


Diagram showing the sections around the site that are not closed off by boundary walls, showing the limited space given to public activity and interaction, and the potential to develop a public interface.

Figure 24: Analysis of site map (M Rainho, 2024)

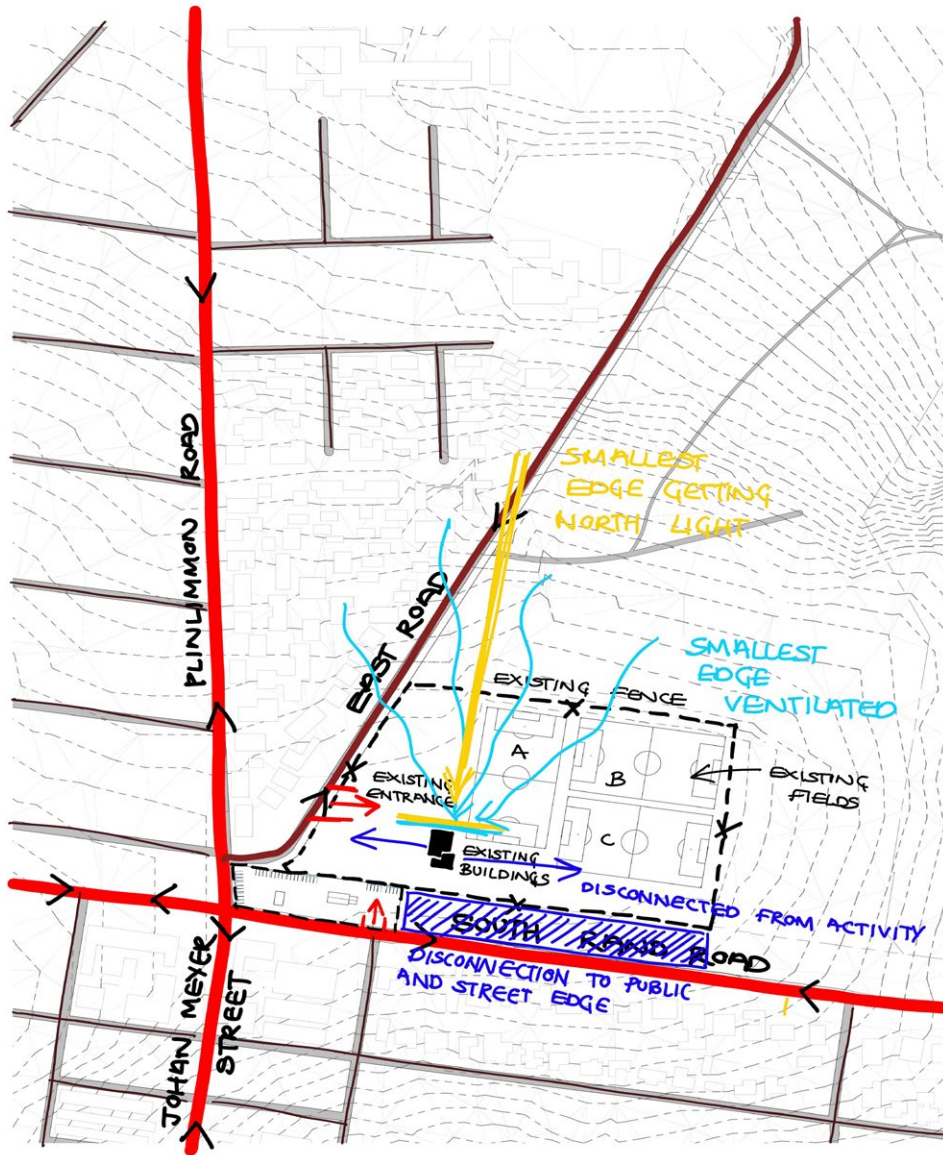


Diagram showing the missed opportunity in the design of the existing infrastructure on site, and lack of consideration to sustainable design.



Figure 25: Analysis of site map (M Rainho, 2024)

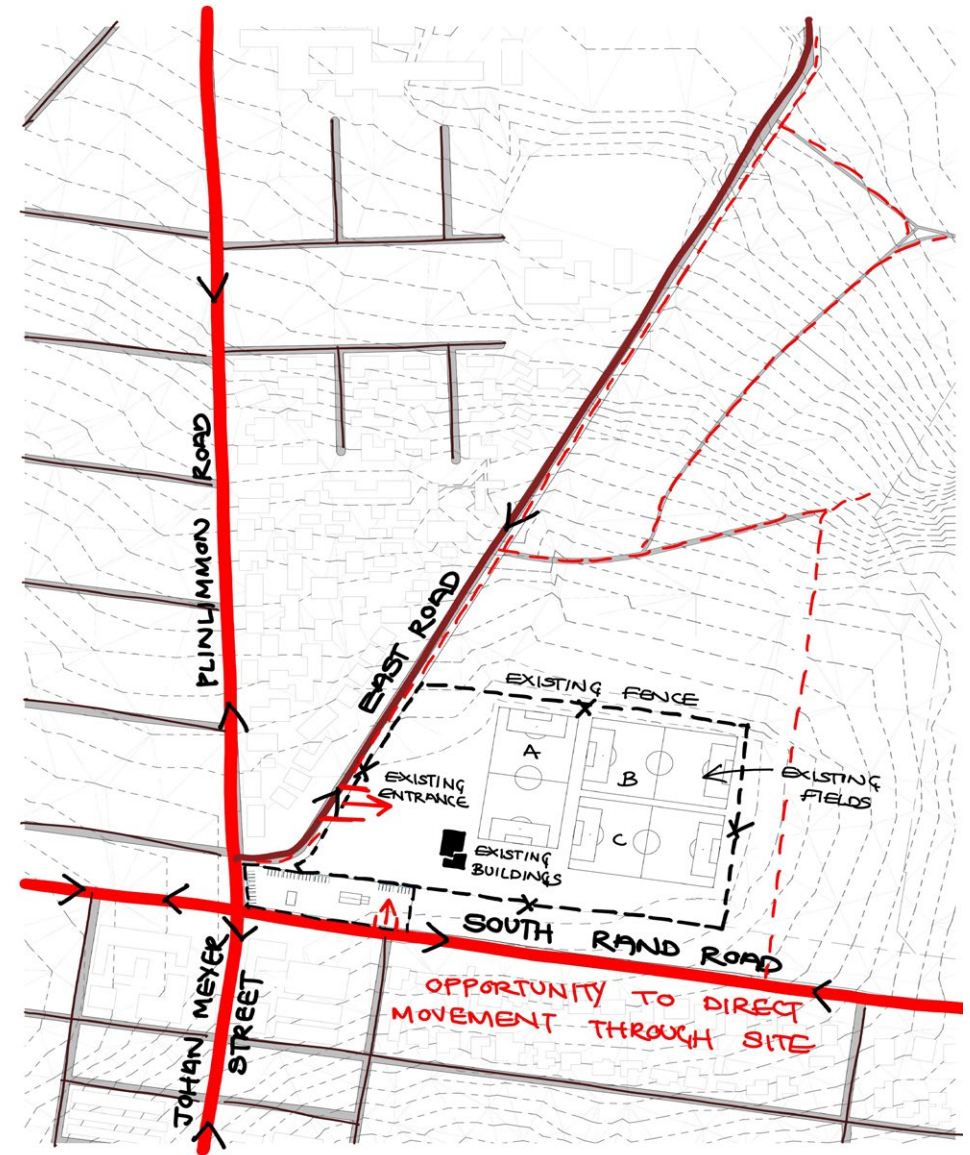
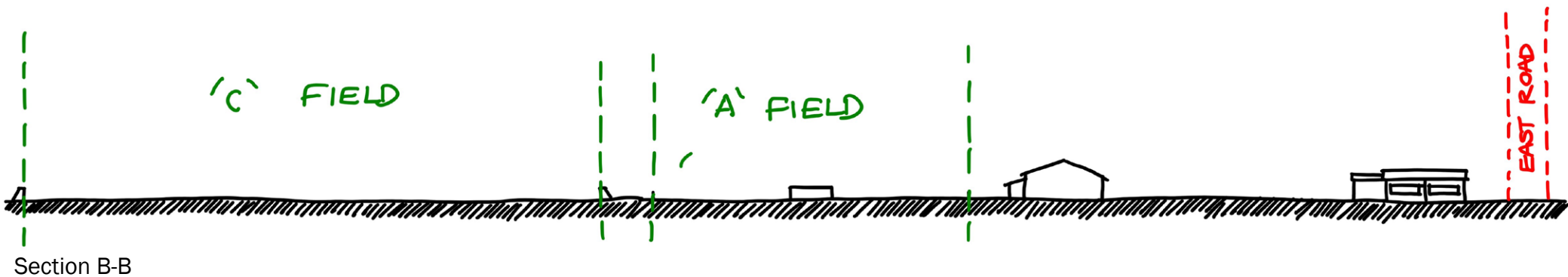
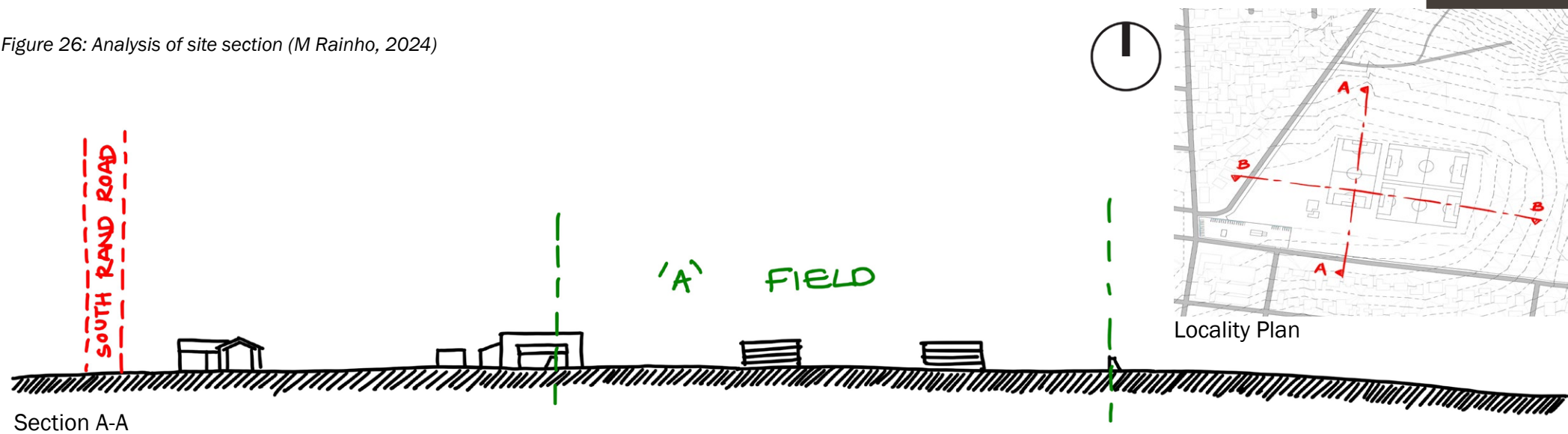


Diagram showing the movement around the site and disconnection of the site to the public, how can this movement be redirected to promote circulation through the site rather than around it?

Figure 26: Analysis of site section (M Rainho, 2024)



Section through the site showing the existing fields and built forms and their link to the streets.

Figure 27: Analysis of site section (M Rainho, 2024)

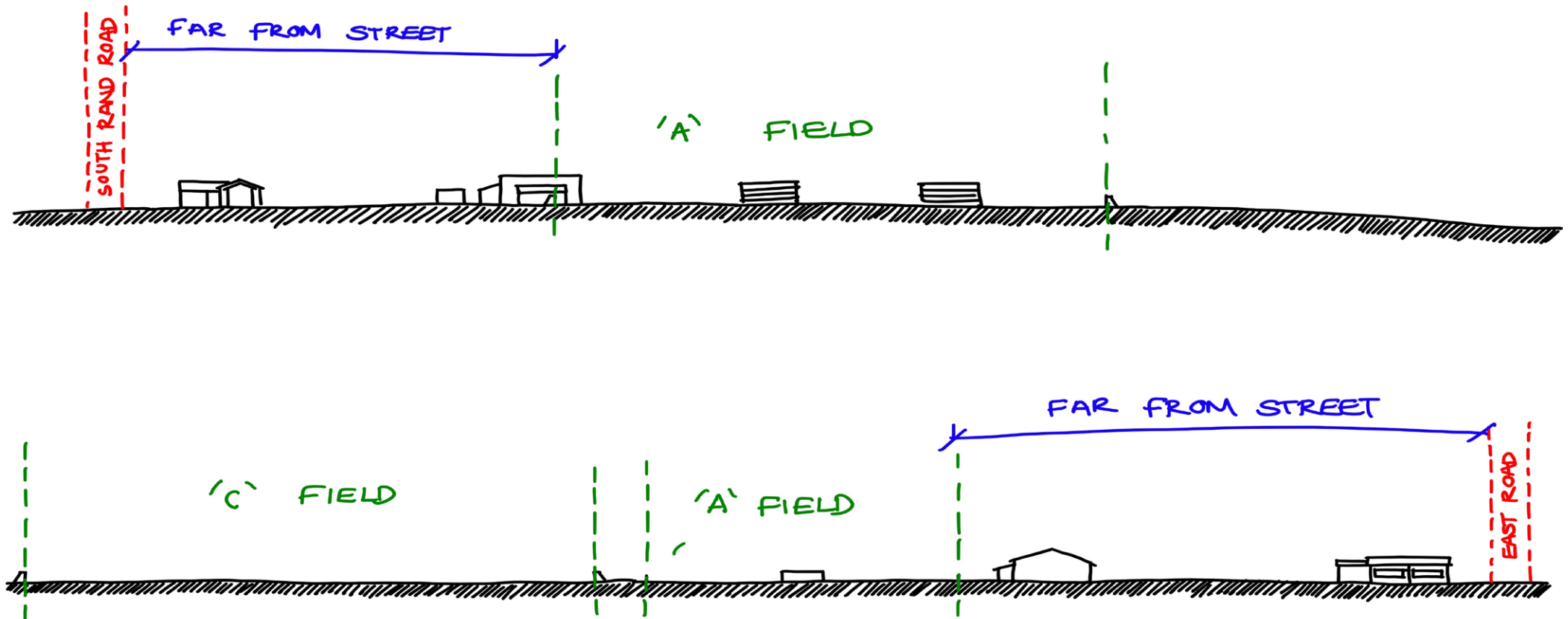


Diagram showing the distance between the street and activity on the site, the program is very far from the street which creates a disconnection between the football club and the public.

Figure 28: Analysis of site section (M Rainho, 2024)

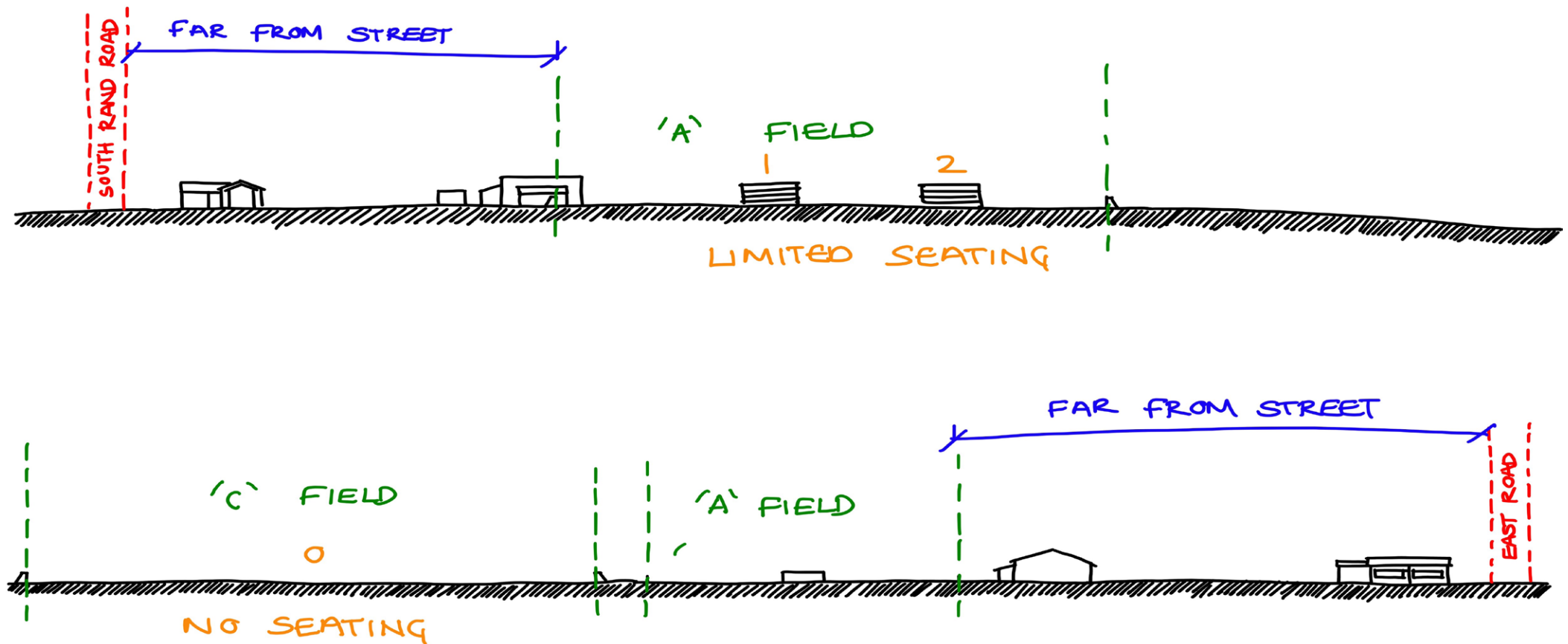


Diagram showing the limited seating available to watch football matches, not only is the practicality and functionality of the football club affected by this, but it also makes it difficult to promote spectating and cultural development.

Figure 29: Analysis of site section (M Rainho, 2024)

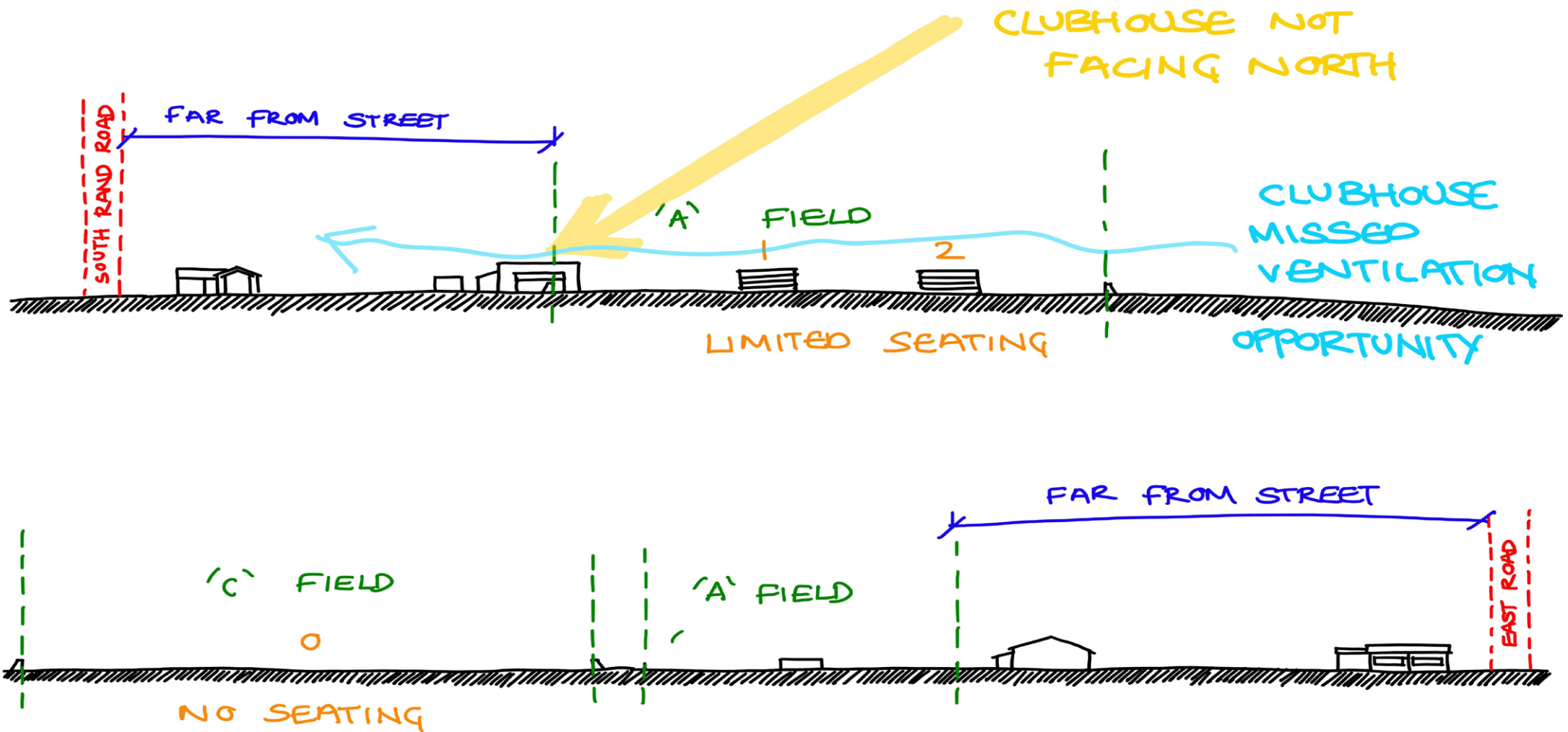


Diagram showing the disconnection of the existing buildings to sustainability, the lack of consideration to North sunlight and prevailing wind directions.

Figure 30: Analysis of site section (M Rainho, 2024)

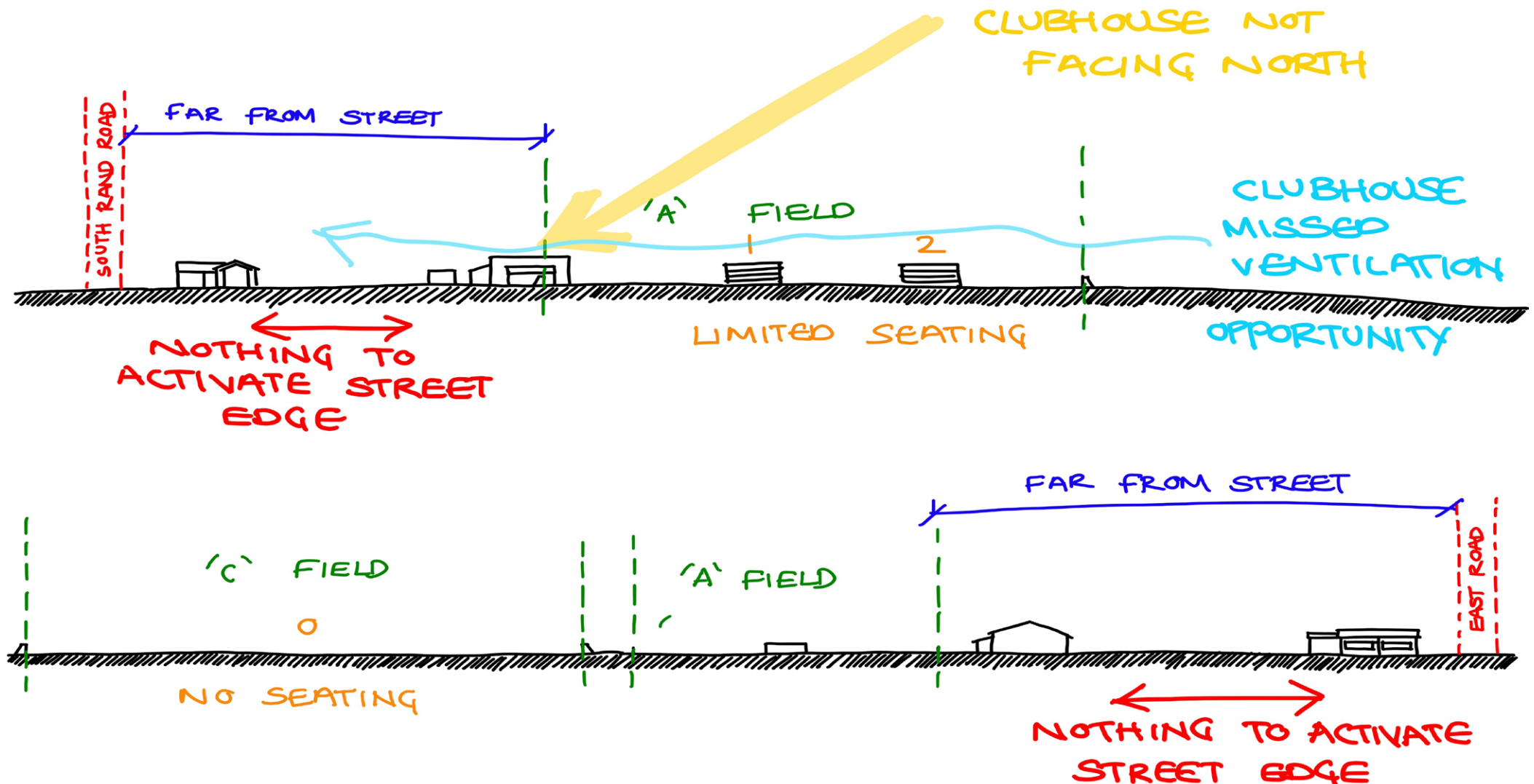


Diagram showing the space between the street and program and the disconnection of the club to the street and the public, by adding program off the street will promote interaction between the football club and public as they can engage with the activity taking place, whereas currently the activity is happening too far away for engagement.



3.3 PROGRAM AROUND LINHILL CELTIC FC

Figure 31: Analysis of program map (M Rainho, 2024)

Legend:

● Freestanding Residential ● Complex Residential ● Private School ● Public School ● Retail ● Park ● Business ● Hospital ● Waste Drop off (dump)

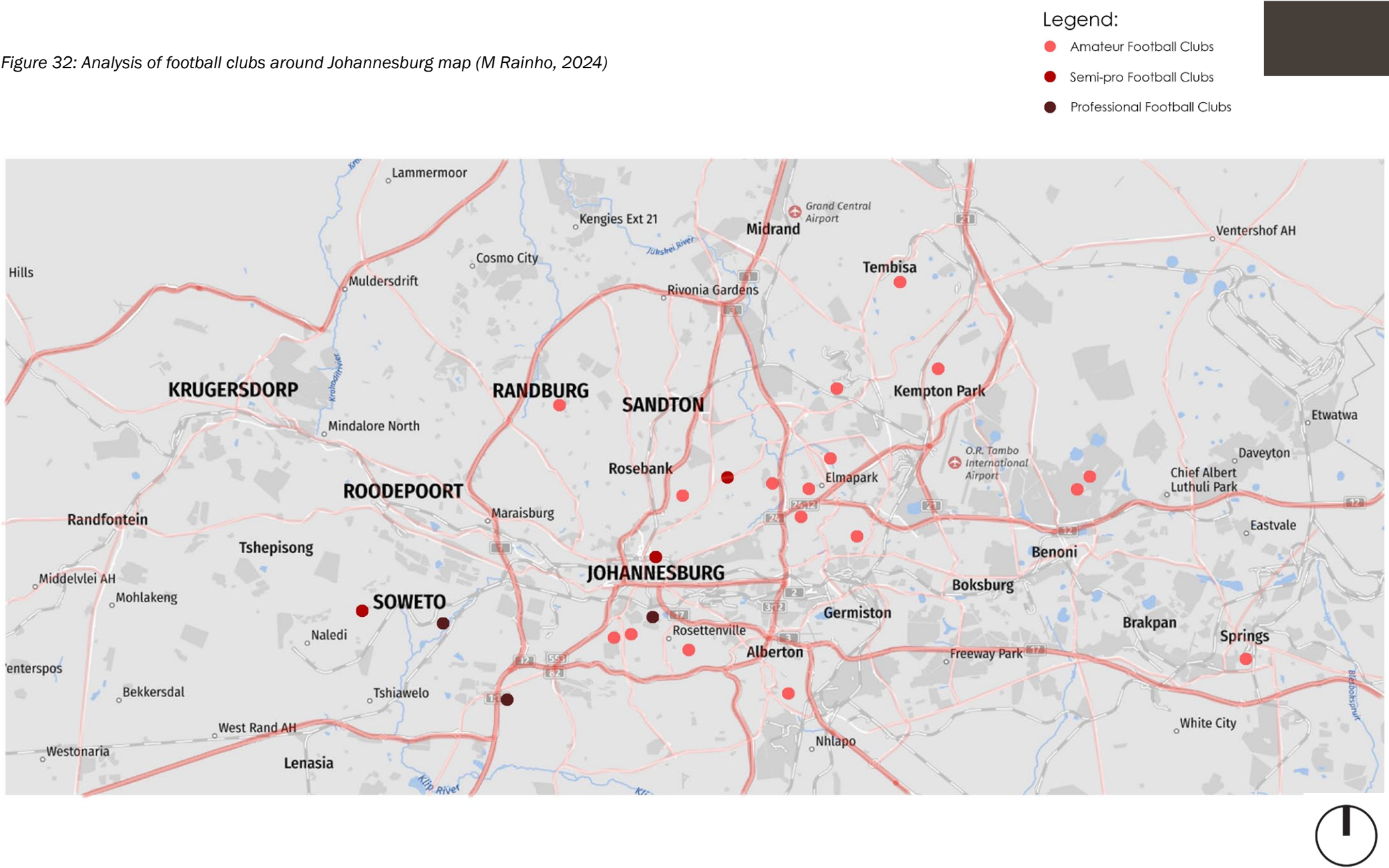


Site image showing the program around the site, and highlighting the pros and cons of the program which my project intervention will address. There is a clear lack of public facilities and retail, meaning residents in the area are travelling for recreation rather than being able to do it where they live. The project will aim to address this issue through its new public interface.



3.4 ANALYSING AT A LARGER SCALE

Figure 32: Analysis of football clubs around Johannesburg map (M Rainho, 2024)

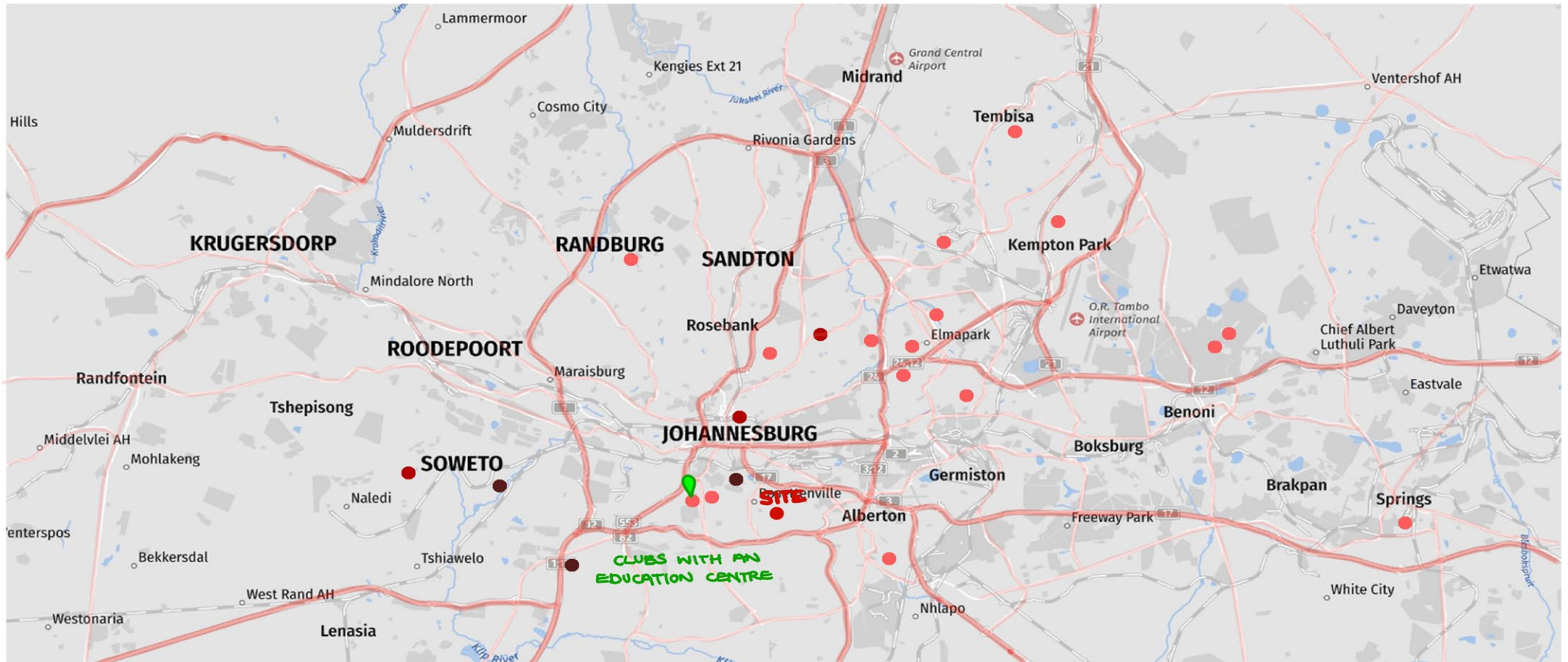


Map showing the existing football clubs around Johannesburg, from the amateur football clubs to professional football clubs. The map shows how popular the sport is in Johannesburg as there are a lot of registered football clubs, this does not include the large number of informal football fields and unregistered clubs.

Figure 33: Analysis of football clubs with an education centre around Johannesburg map (M Rainho, 2024)

Legend:

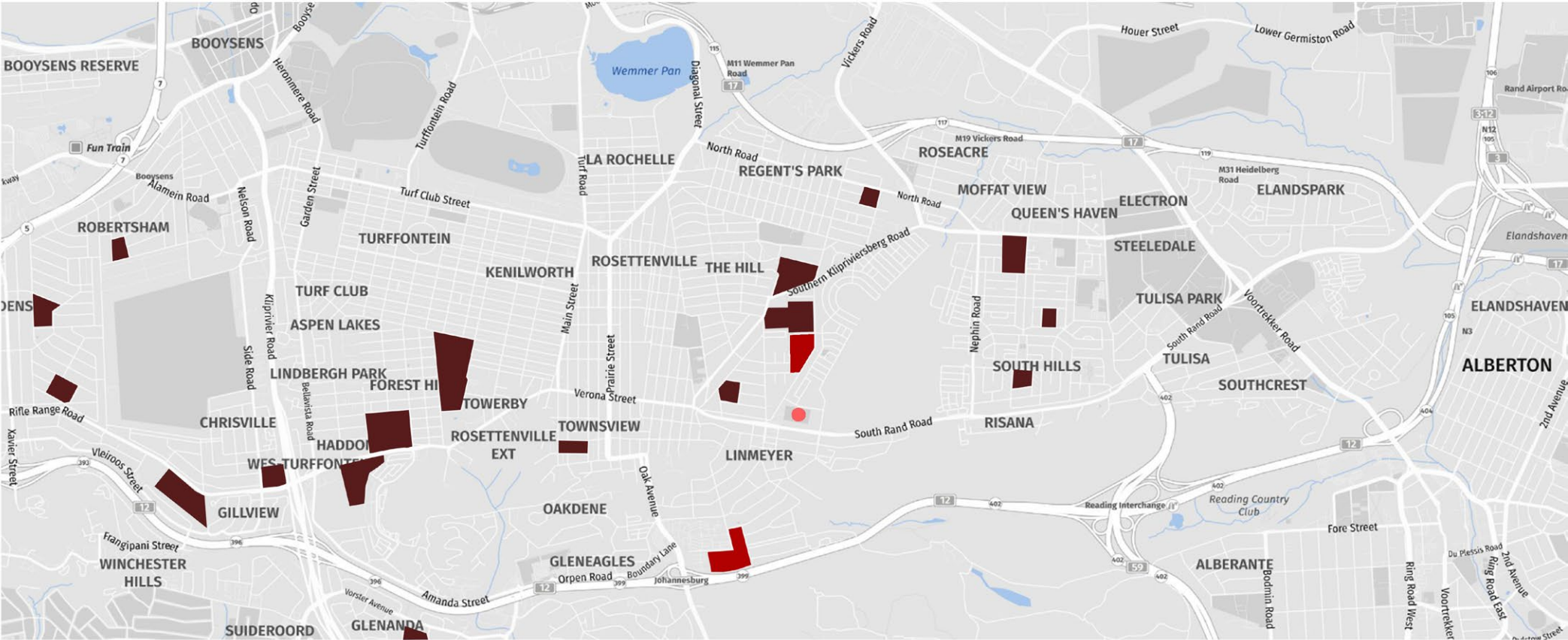
- Amateur Football Clubs
- Semi-pro Football Clubs
- Professional Football Clubs



Map showing the football clubs around Johannesburg that feature an education centre, the only club being Robertsham Callies FC. With the number of clubs around Johannesburg there is potential to redevelop the image of a typical football club to promote education in South Africa.

Figure 34: Analysis of public and private schools in the context map (M Rainho, 2024)

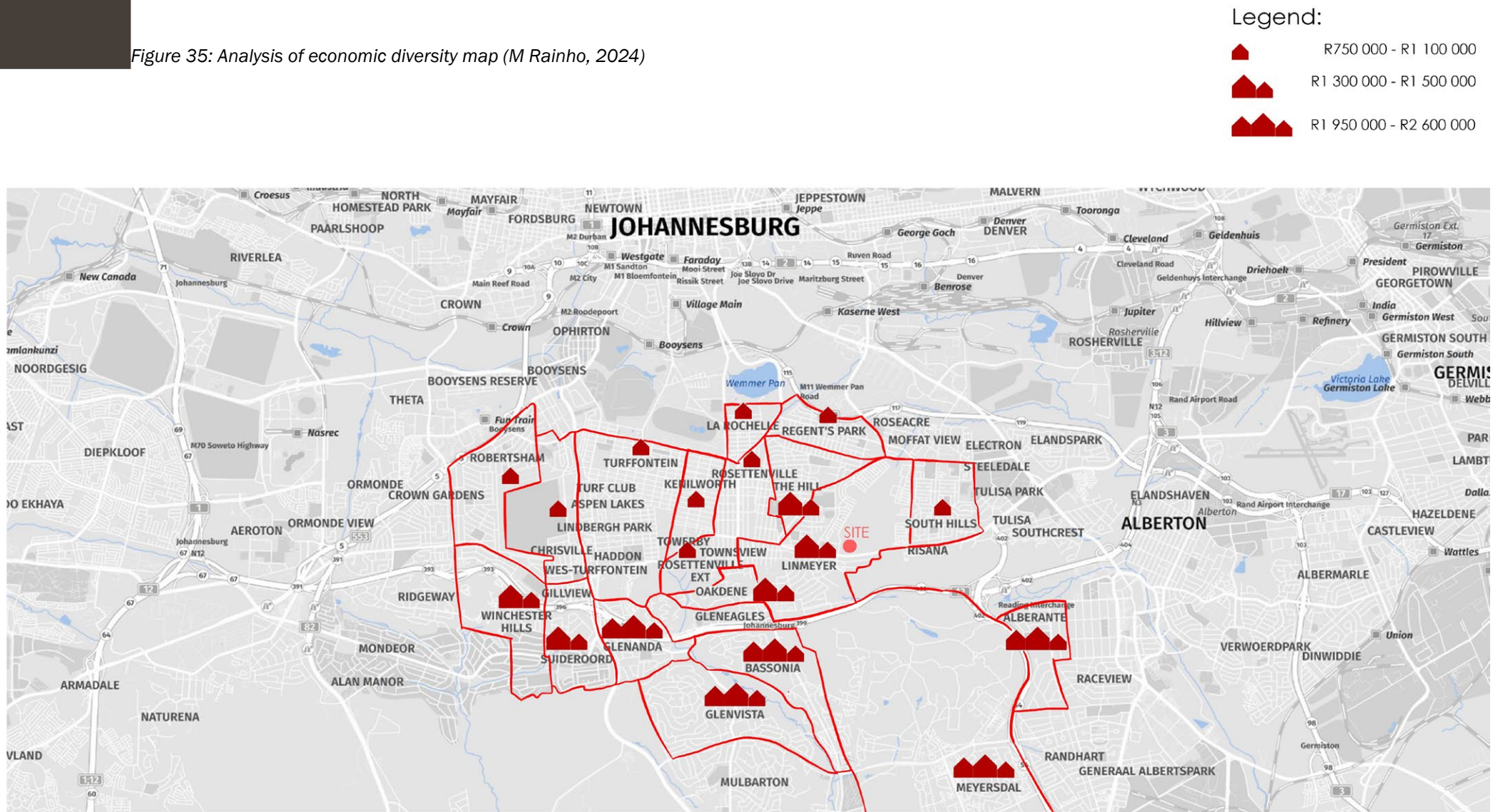
- Legend:
- Site
 - Private Schools
 - Government Schools



Map showing the schools around the site, there is a large number of government schools around the site as well as 2 well established private schools. The need for extra lessons for government school children can be addressed on my sites education centre with the potential private school resources to combat the education gap between private and government schools.



Figure 35: Analysis of economic diversity map (M Rainho, 2024)



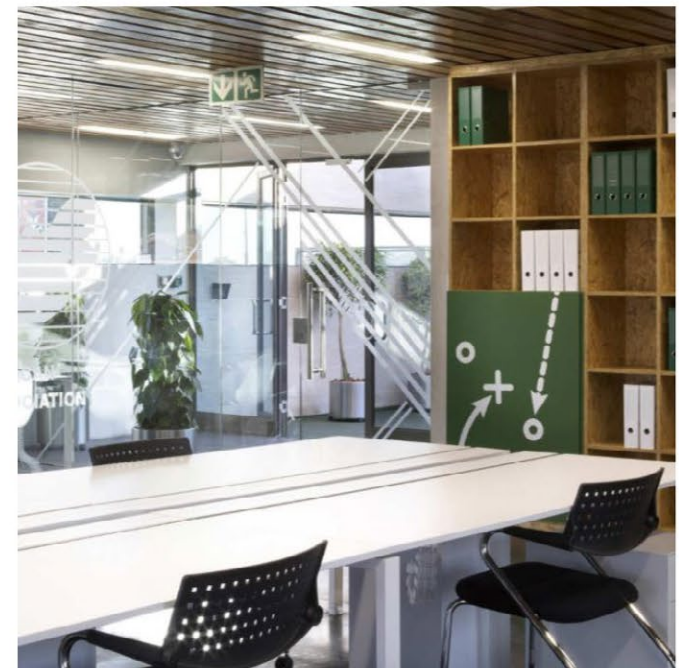
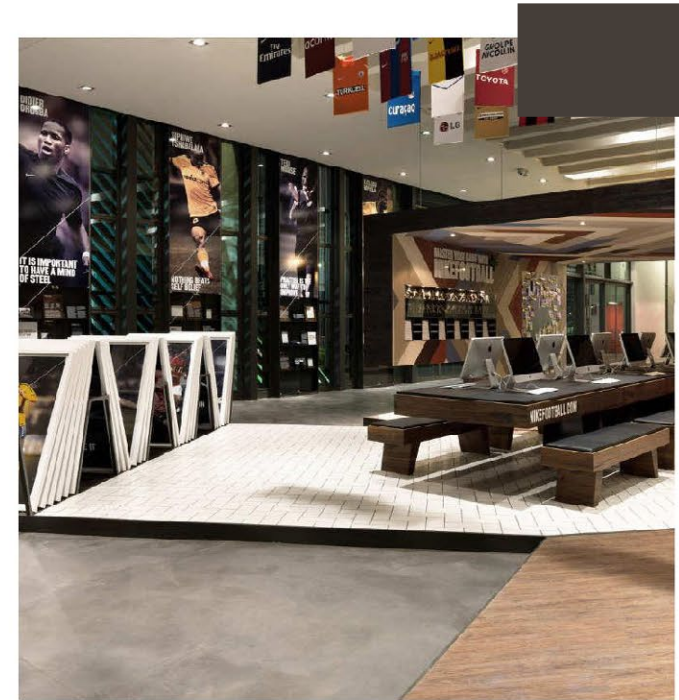
Map showing the diverse economic status's around the site, there are low income areas bordering middle and high income areas. This diversity means that there is a need for the free educational facilities and public activities for the people in the low income areas that cannot afford it, as well as potential resources and financial backing from the people in the middle and high income areas that have a relationship to the football club. The football club will become a central community hub that will host people of different cultural and economical backgrounds.

04

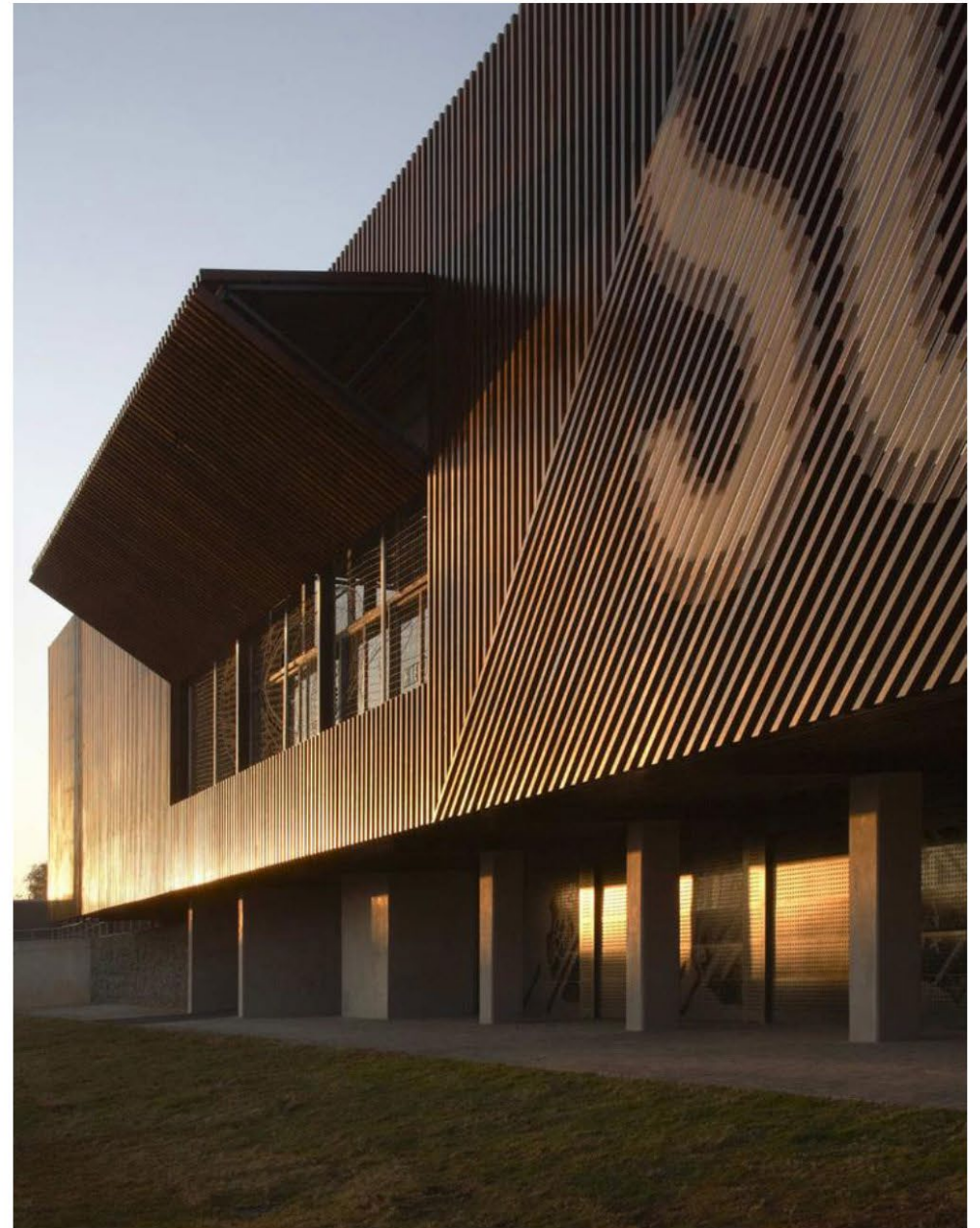


4.1 SHAPPA SOWETO TRAINING CENTRE

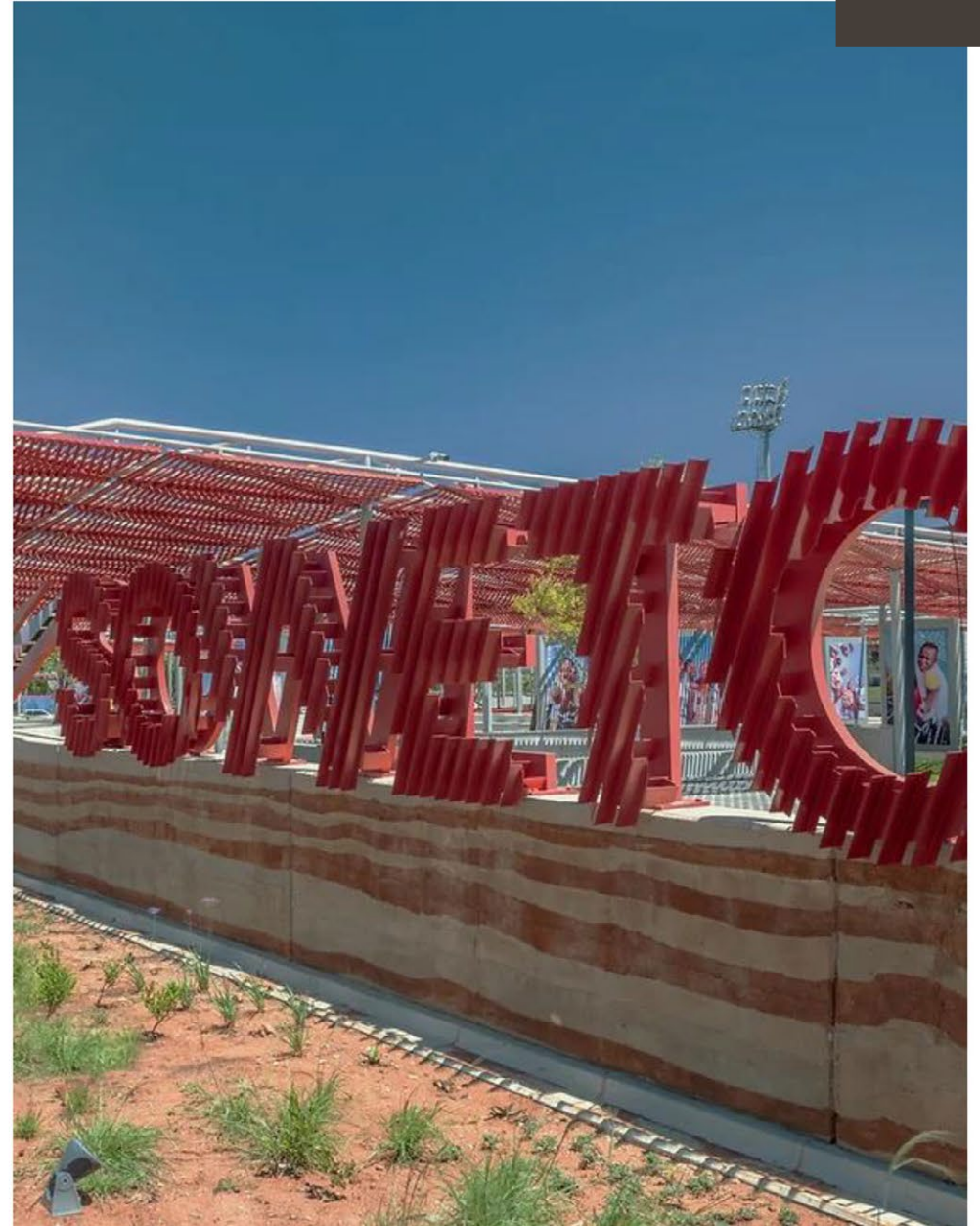
the relationship between public and private



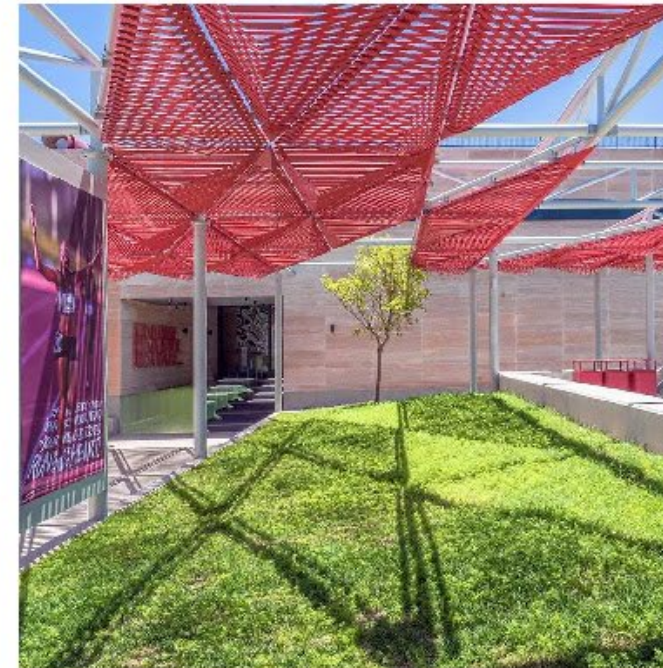
Figures 36 (top left), 37 (top right), 38 (bottom left), 39 (bottom right): Shappa Soweto Training Centre (Adsttc, 2024)



Figures 40 (top left), 41 (right), 42 (bottom left), 43 (bottom middle): Shappa Soweto Training Centre (Adsttc; Architizer, 2024)



Figures 44 (top left), 45 (right), 46 (bottom left), 47 (bottom middle): Shappa Soweto Training Centre (Architizer; Living Spaces, 2024)



Figures 48 (left), 49 (top middle), 50 (top right), 51 (bottom middle), 52 (bottom right): Shappa Soweto Training Centre (Living Spaces, 2024)

Shappa Soweto training centre is a multi-disciplinary sports centre that aims at inspiring the next generation of athletes in South Africa. The facility is based in Soweto off Chris Hani Road and includes 2 full-sized FIFA accredited astroturf football fields, 2 5-side football courts, a 400m running track, skate park, basketball court, gym, dance studio, changerooms, and administration. The facility, originally known as Nike Stadium, was built for the 2010 FIFA World Cup in South Africa and as a result focused only on football. The facility was perceived as being exclusive and inaccessible by the surrounding community, and after the FIFA World Cup the facility never had a need by the immediate context, which brought about questions of the importance of Nike Stadium. C76 Architects were thereafter approached to revamp the facilities by giving the space back to the community in the form of a multi-sport facility and vibrant local community hub that acts as a safe and freely accessible asset that is not currently found in the area. Comprehensive community research was done for the design of the new public facility, as well as workshops with local entrepreneurs, students, and athletes. Through this research came the design; the colour palette mimics the built environment of Soweto, the shaded covering over the public space comes from the patterns and structure of a football formation, the relocation of the entrance to Chris Hani Road promotes public engagement, and moving away from traditional high boundary walls that disconnect the public from private have been avoided by keeping a light and open threshold between inside and outside (Livinspaces, 2024).

I am interested in this precedent for its public and private relationship and community interaction. I explored the design techniques that promoted the above interests I had in the project. The project although having a clear boundary line separation between the inside and outside of the site has avoided using tall solid wall separations which would create a disconnect from the public, the site has used clear-vu fencing around the perimeter of the football fields to allow people passing by on the multiple streets that surround the site to engage with the activity that is happening on the fields. In addition, the new public interface off Chris Hani Road is covered by a lightweight steel structure that uses its form to promote interaction and also uses very low walls with a transparent break between the inside and outside. The design also extends onto the public sidewalk, a stepped and designed pathway is taken from the site directly to the street parking, this directs you into the facility straight from the street to make accessibility from the street easy for its users but also starts the story/narrative of the public space before you enter into it. Another way of bringing the narrative to the outside is with interactive sculptures and landmarks being placed on the sidewalk of Chris Hani Road. People walking the streets still get to interact with the space without entering into the space, it promotes the idea of community integration as you don't have to directly participate with the site to understand and engage with the facility. The shaded covering around the space was cleverly designed to direct movement around the facility through strategic cut outs that lets natural light penetrate through considered points to light up pathways and areas that the facility wants people to engage with. Another design technique I am interested in is the use of levels around the site. The site contains multiple programs situated in the same open vicinity, rather than separating these programs through direct solid breaks, they have used levels to create the soft thresholds. From the pathway organically moving between programs you need to step down or step up to access a specific activity. Circulation all happens on the same level, but activity is dropped down or raised up which separates the pathway from the activity without the need for a solid break. This maintains visual connect around the whole site and doesn't close you off from a specific activity if you are accessing a different activity on the site. There are no visual breaks between Chris Hani Road and the football fields, yet there are many activities and programs separating Chris Hani Road from the football fields. "With thoughtfully placed entries and exits, traditional ideas of enclosure, safety and the standard South African typology of high boundary walls creating separation and disconnection are rejected rethinking the status quo" (Architizer, 2024).

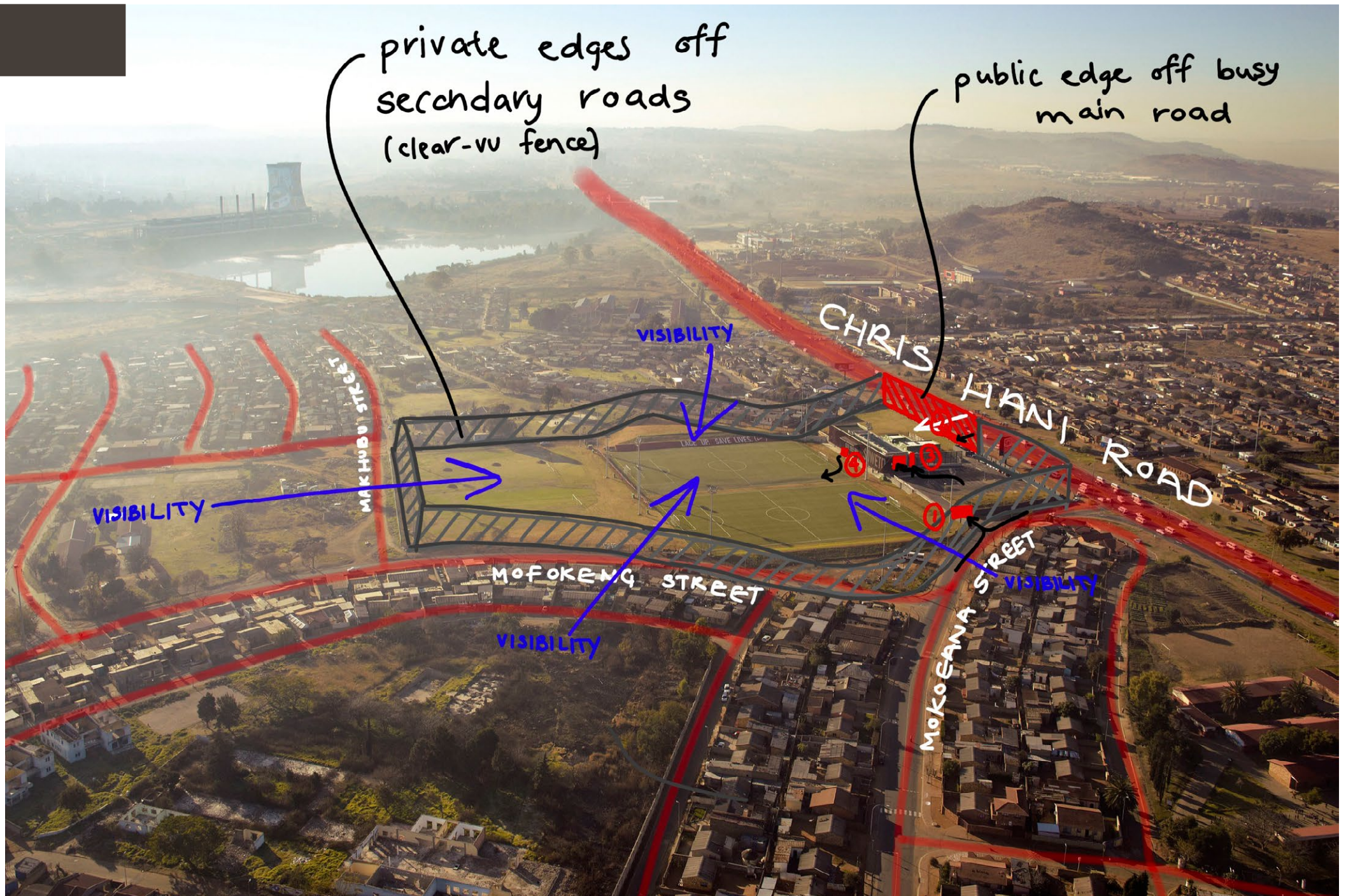


Figure 53: Image of Shappa Soweto Training Centre (Square Space, 2024)

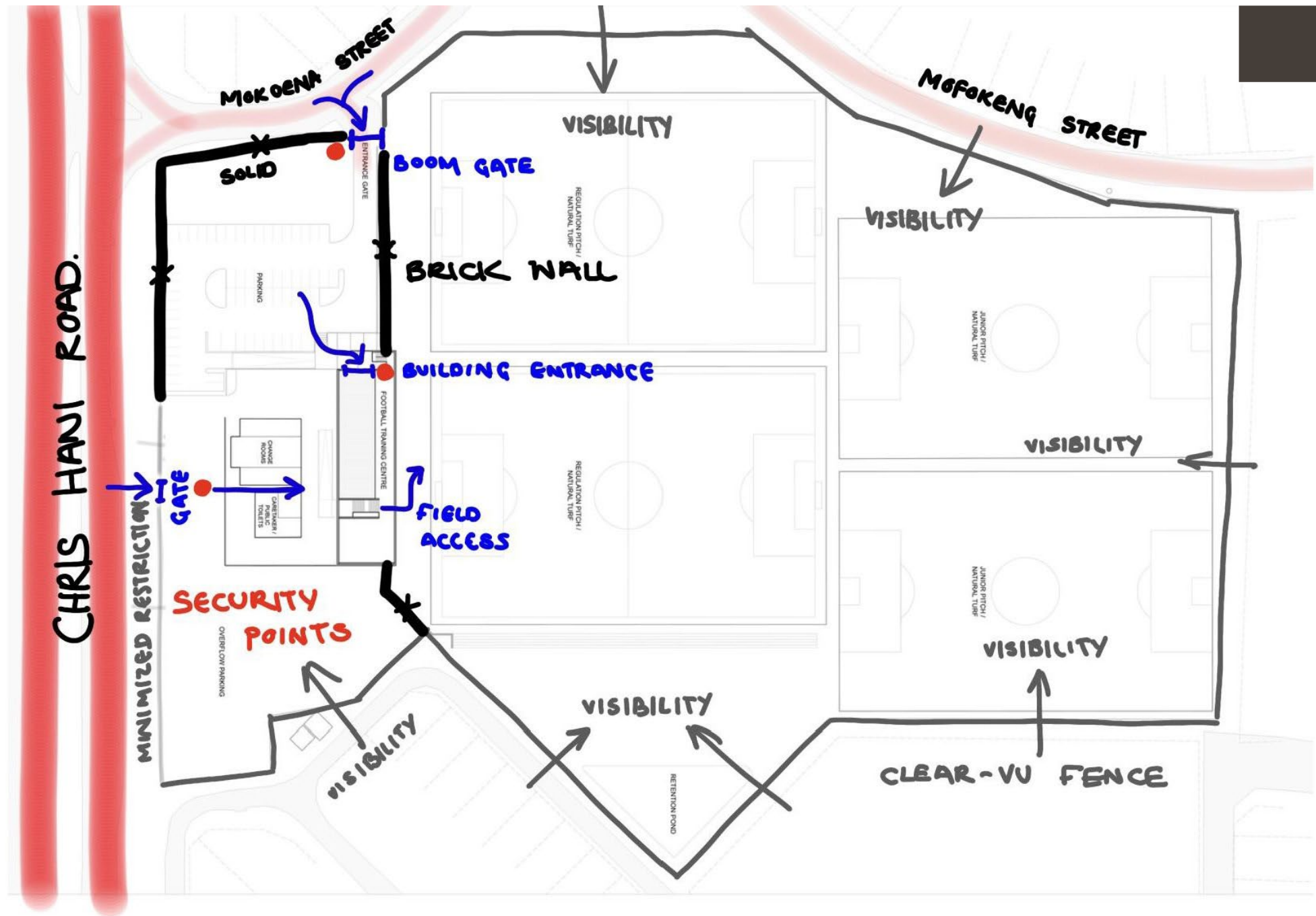


Figure 54: Site plan of Shappa Soweto Training Centre (Square Space, 2024)

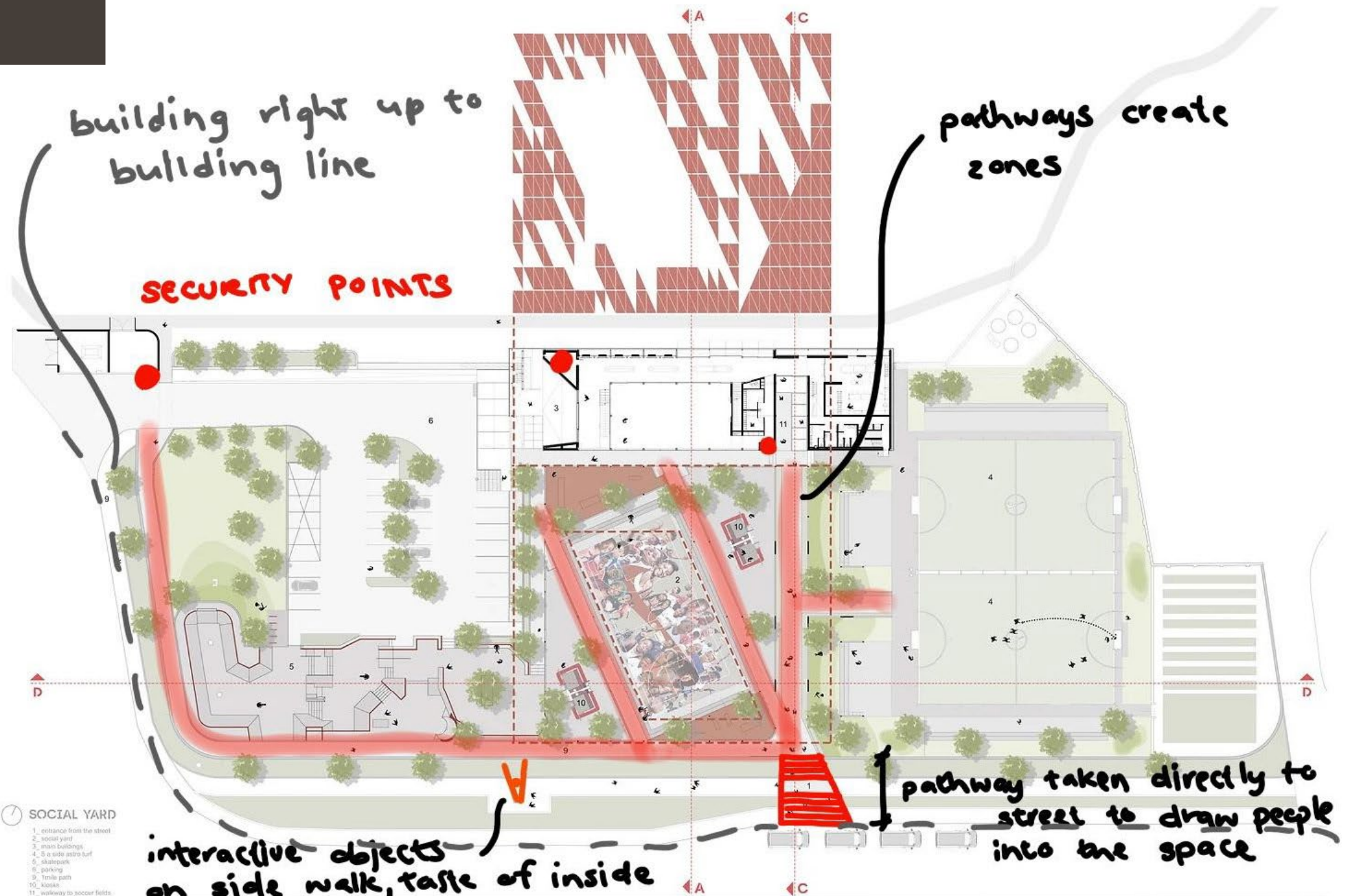


Figure 55: Site plan of Shappa Soweto Training Centre (Square Space, 2024)

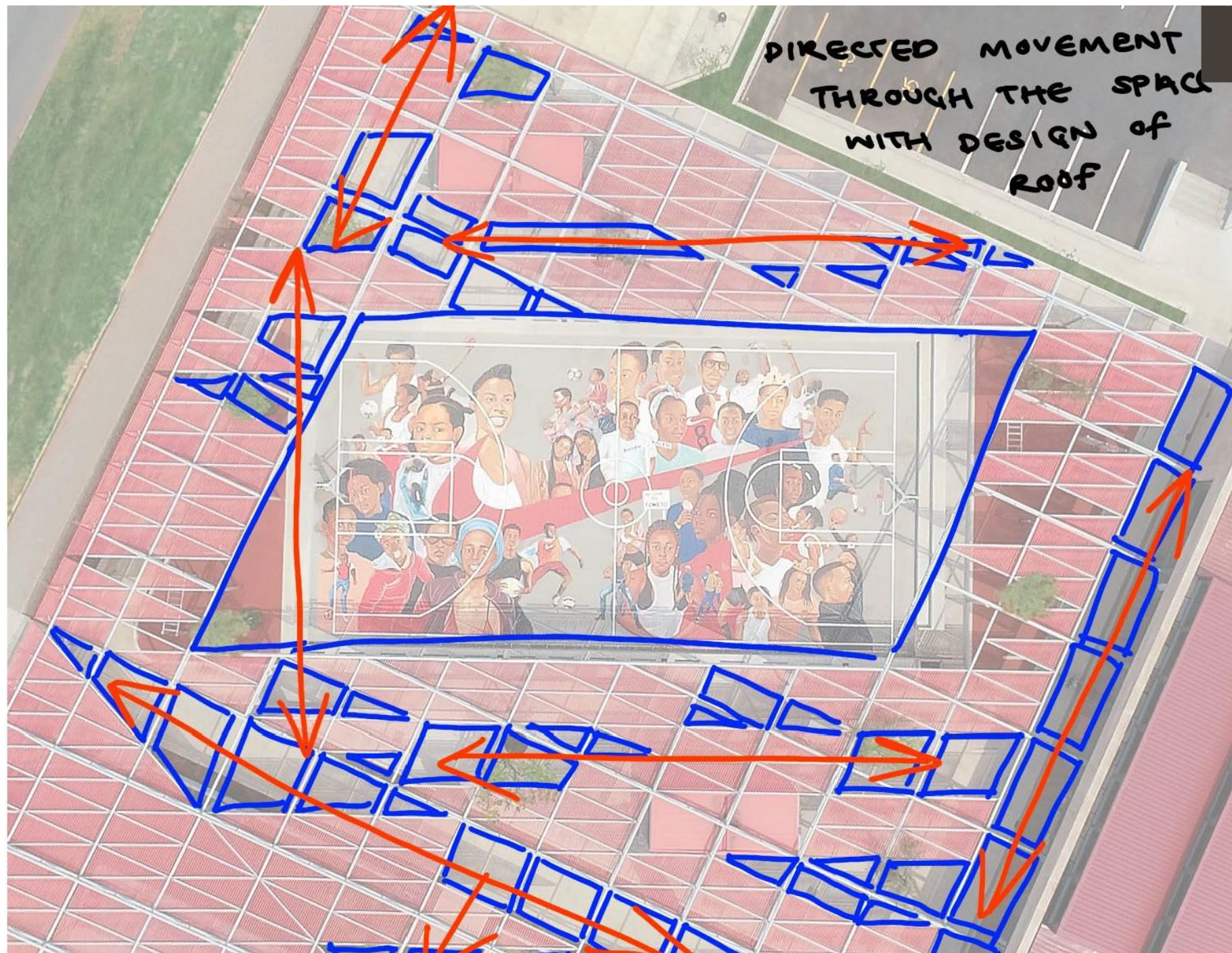


Figure 56: Image of roof design Shappa Soweto Training Centre (Living Spaces, 2024)

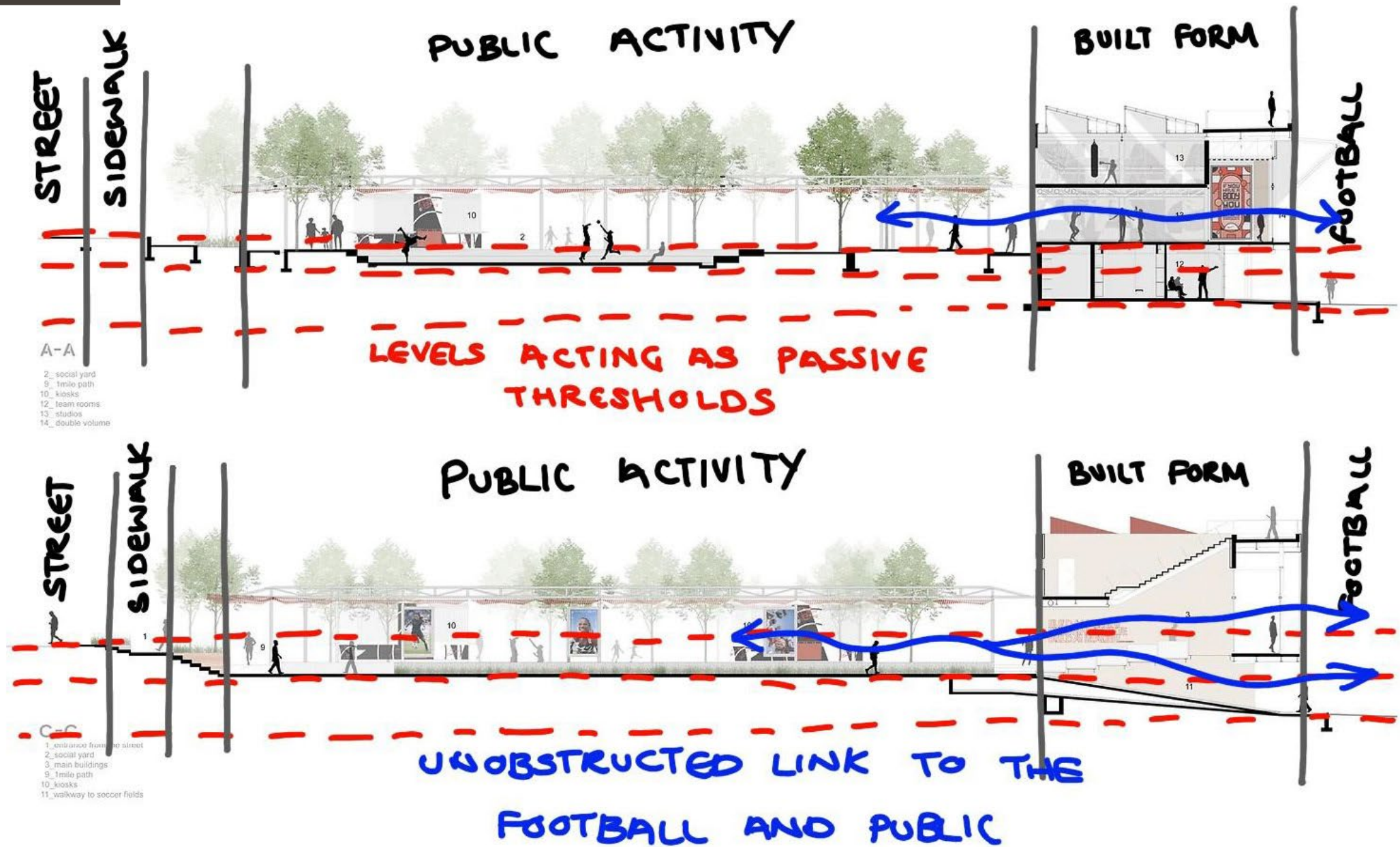


Figure 57: Shappa Soweto Training Centre site section (Living Spaces, 2024)

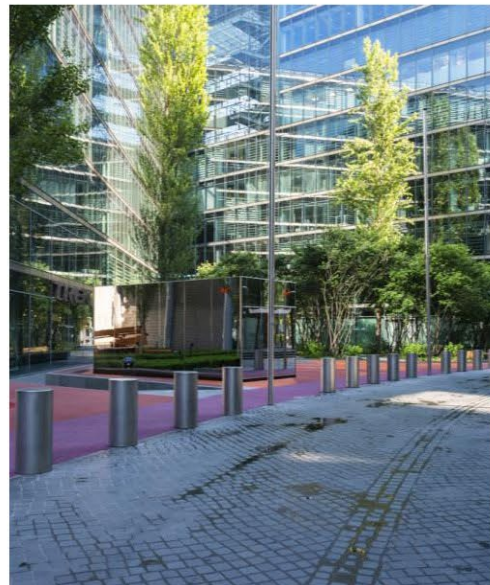
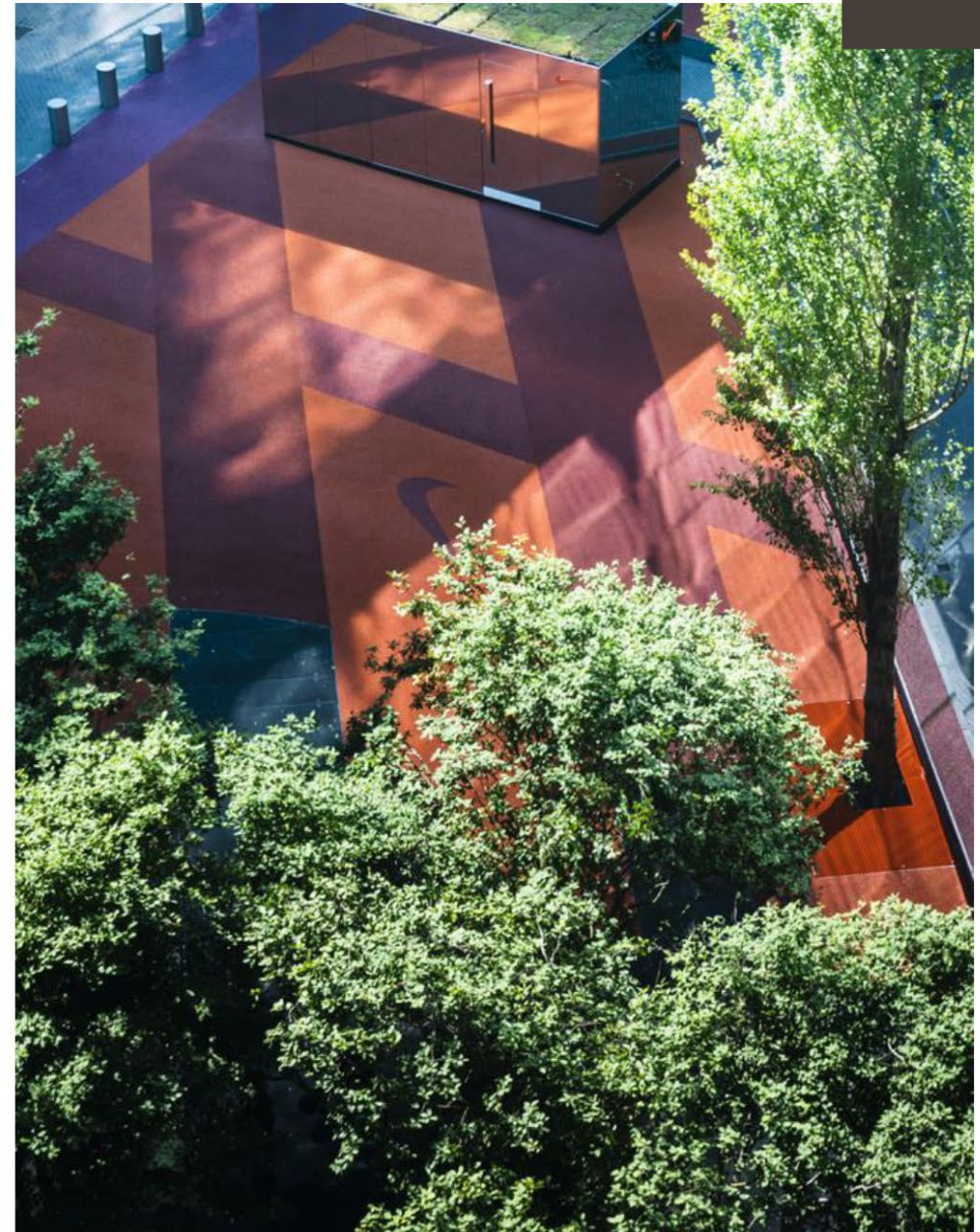


This precedent is directly linked to my project as they are both based around existing football fields and program limited to football only. The idea to open a part of the site and give back to the community through a public interface and creation of activity off the main busy road is the same as my concept – which is to create the public interface off South Rand Road and a separate entrance for the football fields off East Road. The project also promotes education in the form of workshops held on specific weekends that promote learning about the art and culture of Soweto, similarly my project is promoting education that is specifically focused on our education system.



4.2 NIKE EXPERIENCE HUB

rebuilding streetscapes for sport and play



Figures 58 (top), 59 (right), 60 (bottom left), 61 (bottom middle): Nike Experience Hub (Adsttc, 2022)



The Nike Experience Hub building was designed to “rebuild streetscapes as places for sports and play. Beyond the typical competitive sports in fenced ‘court’ settings there is vast potential to make physical movement an integrated part of the daily environments in which civilians live, work, and learn” (Archdaily, 2022). The building is a fully mirrored pavilion on colourful open land in the Sony Centre in Berlin. The mirrored facades blend into the environment by reflecting the surrounding context, but also provides a canvas for activity by putting the athlete centre stage. It provides every person walking by with the platform for activities.

I was interested in this precedent as it is not a typical building in that what happens on the inside of the building is not important, but rather what the building allows on the outside. The user doesn’t interact with the inside of the building but rather the façade of the building. The building hasn’t been designed with a program in mind, in fact the inside of the building just stores equipment, the program happens around the building and is chosen by the user on the day. The mirrored facades can be used for photography, yoga, pilates, dancing, gym or even a stage for performance. The building also becomes a landmark that can help people reference their location or destination, ‘I will be at the park with the mirror building’. The building becomes a landmark of activity rather than a place people go. I am not interested in the design of this building but rather how you can use a built form to bring people together and to create a landmark structure on a site that people engage with. Because my project has a public interface component, I am interested in ways of drawing people in and getting them to engage with the landscape.

Although this precedent is in a busy city centre landscape, the concept is similar to what I want to achieve in my public interface, a space for the public to engage in activities and an activated setting off a circulation route, in the case of my project South Rand Road. I am less interested in the design of the Nike Experience Hub but more interested in how people can engage with a built form, the idea of a landmark structure on a site for interest and reference, and the endless program that can come from a single structure.



Figure 62: Site plan of Nike Experience Hub (Adsttc, 2022)

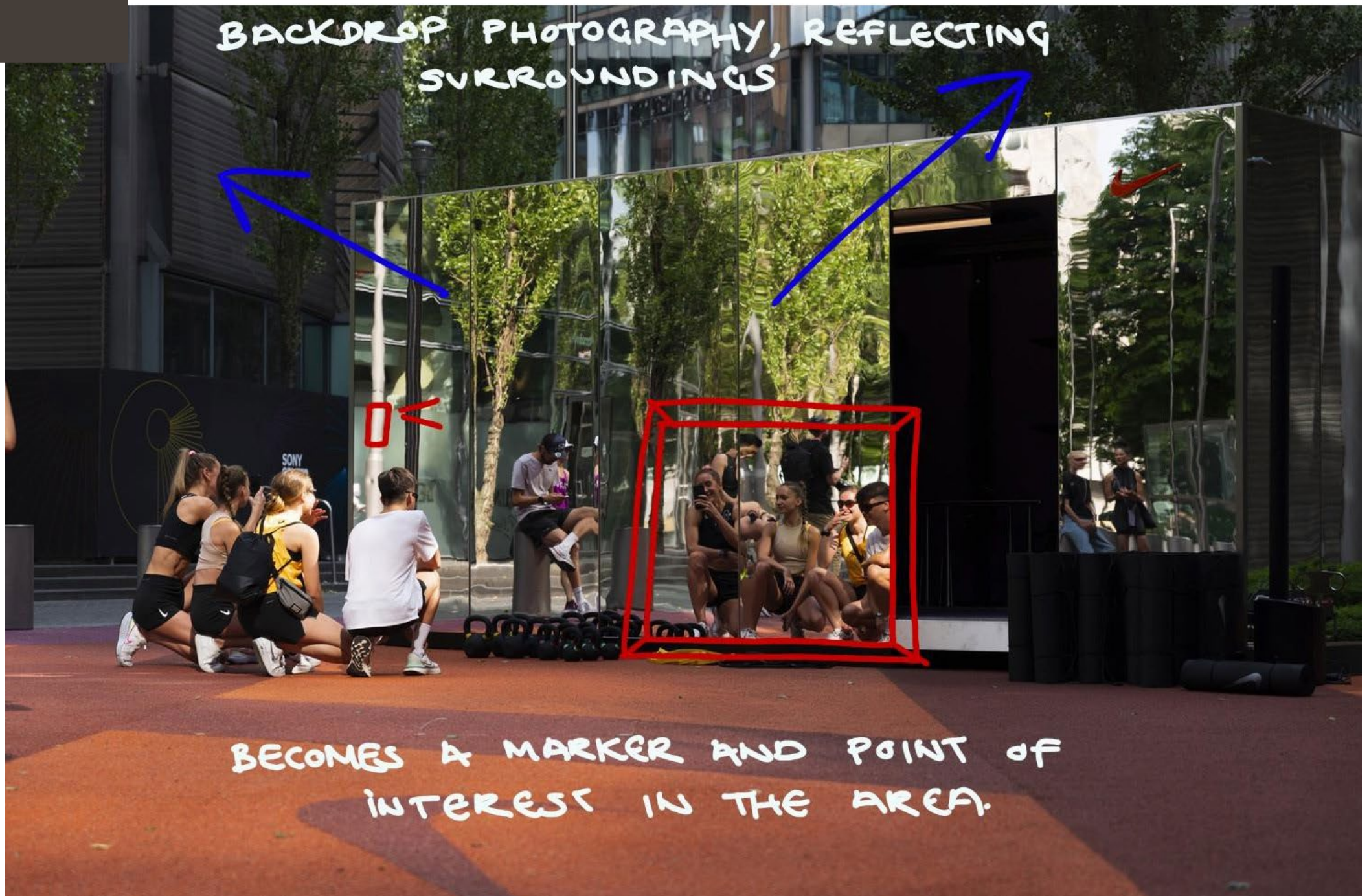


Figure 63: Nike Experience Hub (Adsttc, 2022)

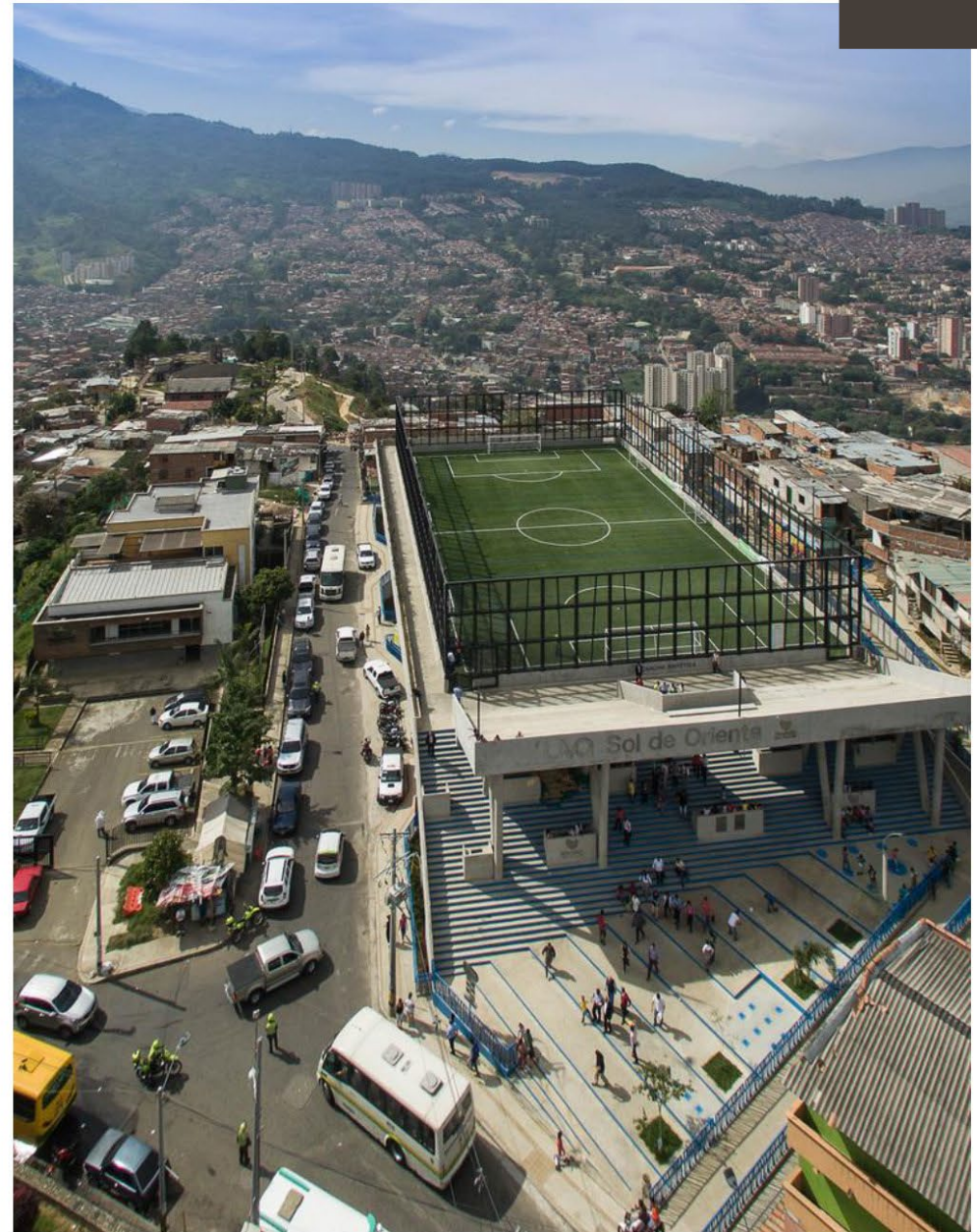


Figure 64: Nike Experience Hub (Adsttc, 2022)



4.3 UVA SOL DE ORIENTE

generating experience and public interaction



Figures 65 (top), 66 (right), 67 (bottom left), 68 (bottom middle): UVA Sol de Oriente (Adsttc, 2016)



Figures 69 (left), 70 (top right), 71 (bottom right): UVA Sol de Oriente (Adsttc, 2016; 2024)
053

UVA Sol De Oriente is a sport, recreation, and football stadium building in Medellin in Colombia. The building promotes public encounters and community participation and reactivating restricted urban spaces into effective public spaces. Medellin is a very densely populated city with highly compressed infrastructure that has a shortage of open land to build. The project was constructed on an old sand football pitch that was used by the community for various sporting matches and events, and the aim of the project was to keep a football pitch while adding many other sporting facilities for the community to have facilities dedicated to the various sports that used to take place on one field. However, it was also important for the building to preserve community interaction with the site and not create a disconnect by a building that is completely cut off to the street and immediate context. “Based on the participation and ideas of the community, an urban transformation is generated that consists of elevating the existing field and folding it to generate a system of stands that in turn fulfils the function of a large, covered access plaza as a public space” (Archdaily, 2016). By elevating the football stadium to form the roof of the building allowed for more program to be inserted underneath the football stadium within the building. The program within includes a sports centre, gyms, dance hall, auditorium, community halls, playrooms, and a commercial premises. “An architecture with open doors, where the act of approaching is welcoming for citizens, pleasant transition spaces between the street and the intimacy of the building connected to daily neighbourhood life” (Archdaily, 2016).

When analysing the building there are many interesting design techniques that aren't typical for a multi-purpose sport and recreation facility. The first interesting analysis is in the design of the building. When standing on the street and looking up at the building it is not obvious that the building is designed around/for sports. This is because the football fields are elevated and not visible from street level. The façade also doesn't have any visual representation of sport; off the street there are retail shopfronts, a shaded plaza to create seating for the public that looks back onto the street and surrounding buildings to keep the public connected to the context, and waterspouts that the children engage with in the hot and humid climate of Medellin. The street façade was given to the community rather than football. The sports facilities are all found within the building behind the buildings 'community façade'. Another interesting design technique of the building is the stadium grandstand. The grandstand is multifunctional in that it creates seating to allow the public to watch the football matches taking place on the field, but also provides shading for the plaza seating area underneath. It visually also frames the plaza from the street and creates this 'photograph' of the public activity in the context. The grandstand also creates the threshold between the plaza and football field in the transition between covered and uncovered. Once you reach the point up the stairs and the covering isn't above you anymore, you get a glimpse of the football and transition from community activity to football. From the analysis of the building it was interesting how the building forces you to engage with the community and interact with the spaces before you approach the football field or other facilities in the building, it is a building that is very social in comparison to the typical multipurpose sports facilities that you would typically arrive and go straight to the sport field without interacting with the building or surroundings on your route. This is important for my project as the design of the space before the football club is equally as important as the design of the football club, the transition space needs to be considered to dictate the user experience.

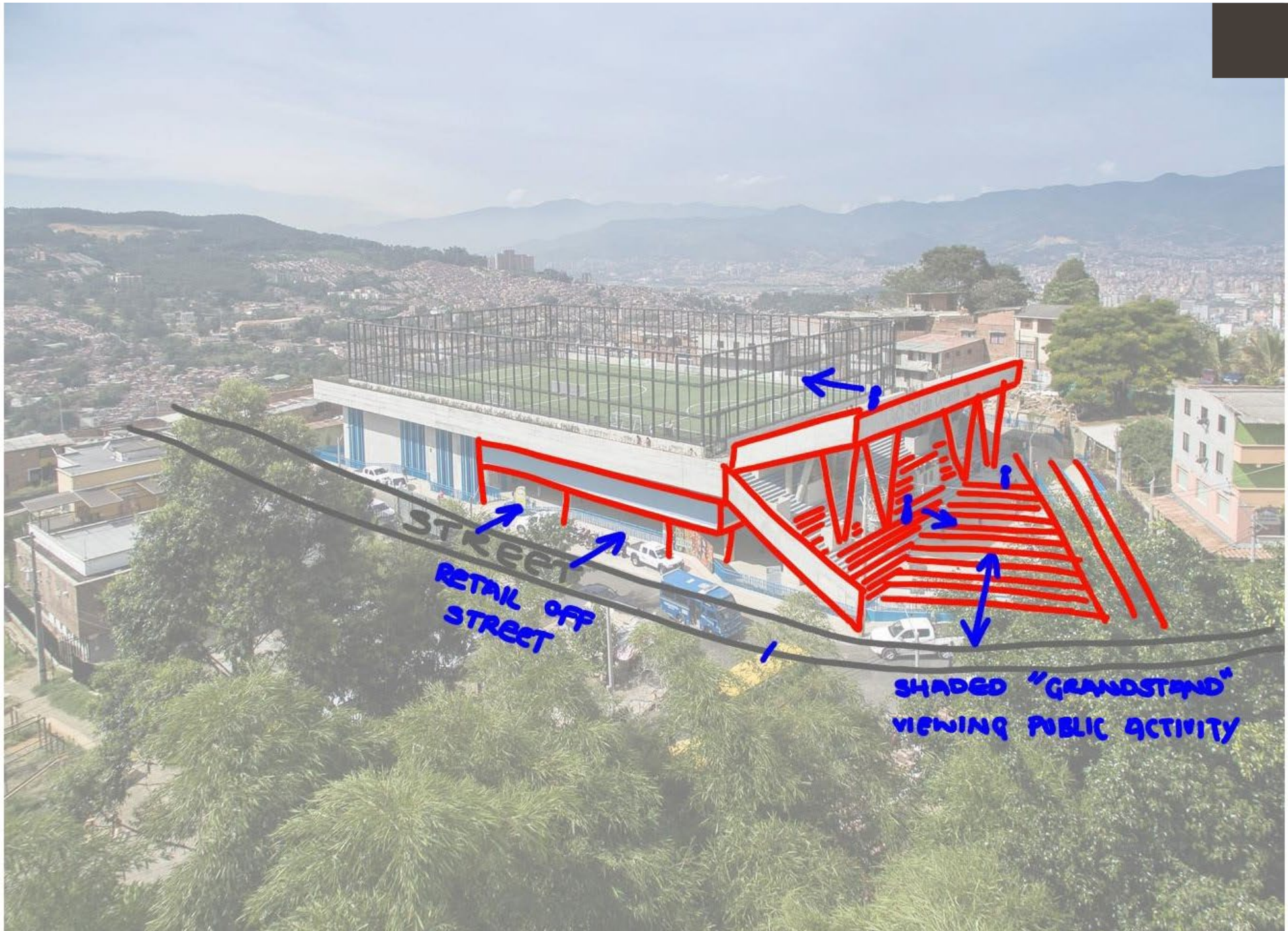


Figure 73: UVA Sol de Oriente (Adsttc, 2016)



I am interested in this precedent as it is a building designed around a football stadium, but also a building that gives back to the community and provides public amenities. Similarly, my project is designed around a football club, its main component is the football fields and generating a stadium-like environment that allows people to engage with the football being played on the fields, but also focuses on community rebuilding and public interaction. It is the spaces designed around the football club's facilities that need to be carefully considered to give back to the community and give the community spaces that are missing in the context.

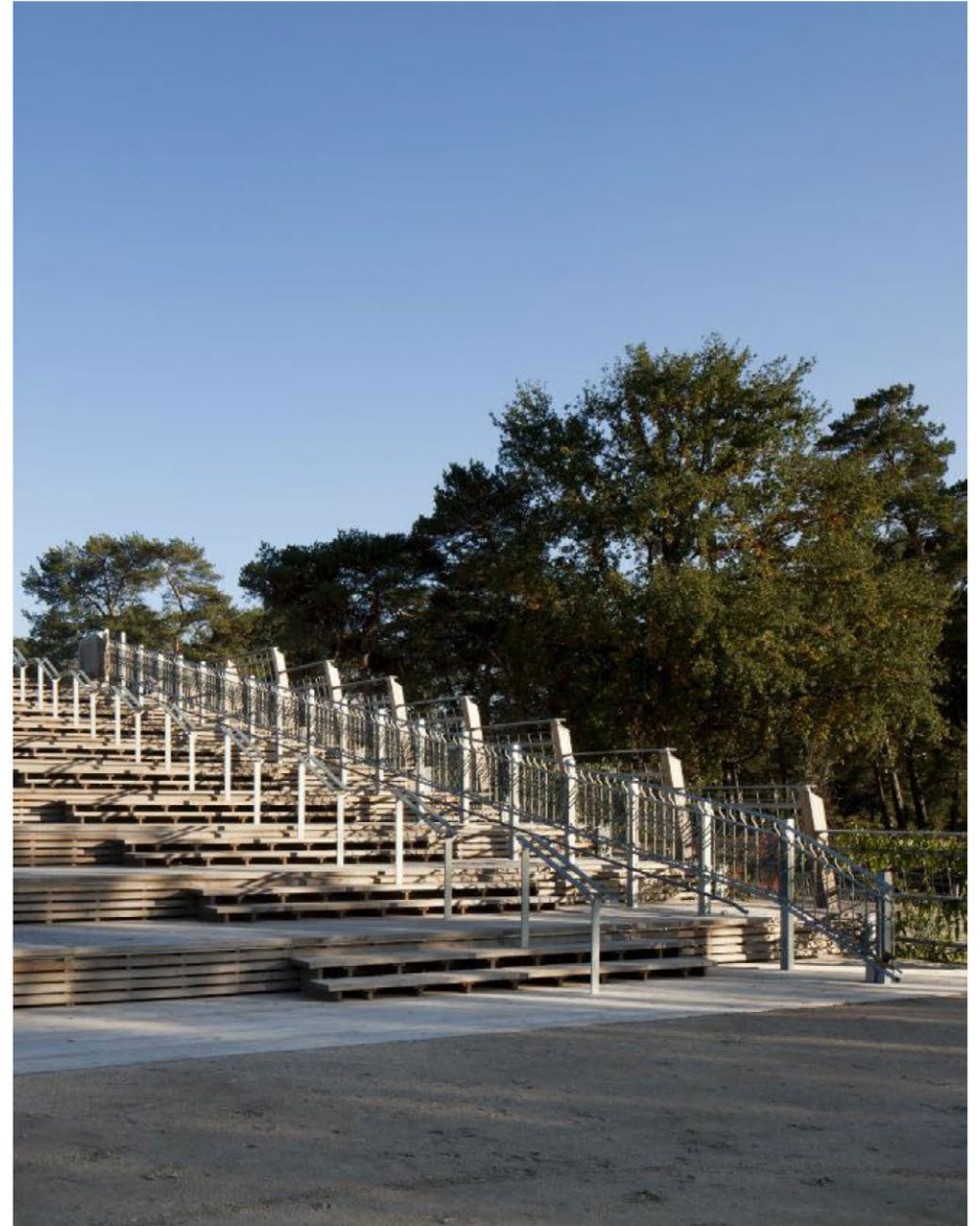


4.4 LE GRAND PARQUET

reimagined grandstand design



Figures 75 (left), 76 (top right), 77 (bottom right): Le Grand Parquet (Adsttc, 2024)



Figures 78 (top left), 79 (right), 80 (bottom left): Le Grand Parquet (Adsttc, 2024)
061

Le Grand Parquet is a grandstand designed to view equestrian events in Fontainebleau, France. The brief for the grandstand design was to include spectator seating, a restaurant, and administration (Archdaily, 2011). The project's setting is a beautifully landscaped scene, so the design was done in a way that makes the grandstand blend into its environment. This was done in the use of materiality. The building is made of wood, the colour of the wood picks up on the tones of the landscape around the building and gives the grandstand a natural feel. The building also has a green wall façade on the back of the covered seating to hide the built form when you are walking on the pathways that lead up to the equestrian field.

I am interested in this precedent for the design of the grandstands, which moves away from the typical image of a grandstand that its only function is to provide seating for spectating. The grandstand has been designed in a way that has many functions and allows viewpoints in multiple directions and distances. The front of the grandstand has the typical covered seating that faces the equestrian field to allow people to spectate on the events taking place, however on the roof behind the covered seating is a pathway with seating to allow the user to view the surrounding landscape and experience a different perspective of the equestrian event. The pathway on the roof gives the user an elevated view to be able to experience the event and surroundings at the same time, whereas walking on the ground level pathways you only experience the landscape or the event, not both at the same time as there is a break coming from the built form separating the inside from the outside. In addition to seating facing two directions, the design of the grandstands allows you to view at different levels to get a different perspective of the event, as well as different distances away from the field. This creates multiple experiences for the users all watching the same event. There is high level seating in the grandstands, which is the furthest away from the field, then there is the seating outside the restaurant on ground level that is closer to the field, and lastly there is a step around the perimeter of the field that can be used as a bench to get a very close view of the event. Designing for different seating and viewing options gives the users the opportunity to choose how they would like to view the event and allows them to interact differently with the activity. The experience is further developed in that there are options of covered and uncovered seating to give further flexibility to the users. In addition to the seating options created, the grandstand design is not a typical grandstand that reads as a large, heavy form that has a brutalist feel when interacting with it. The grandstand looks very delicate and welcoming through the use of a green wall screen to soften the façade of the back of the grandstand, in your approach to the grandstand you are met with the green wall and only once you cross the threshold to the equestrian field do you read the built form as a grandstand. Both façades were considered and designed to respond to the landscapes they are facing; the back faces beautifully landscaped open area with pathways thus the green wall blends into the environment, while the front faces the equestrian field which the seating area responds to by providing seating for spectators to create the atmosphere for events.

This precedent is relevant to my project as grandstands are an essential part of a football match to allow spectators to view the match comfortably and with no view limitations. The upgraded facilities at Linhill Celtic FC will include new grandstands to respond to the lack of seating the club currently has. I will consider seating heights, distances to the fields, covered vs uncovered seating, what program can be created under the grandstands in the void below the stepped seating, and how I am going to treat both grandstand façades based on what program occurs directly in front of the specific façade - in the same way that Le Grand Parquet considered the before mentioned - to generate different user experiences for the same event.

GREEN WALL FACADE AND FRAMED
ENTRANCES MAKES BACK OF GRANDSTAND
A SOFT FACADE



Figure 81: Le Grand Parquet (Adsttc, 2024)
063

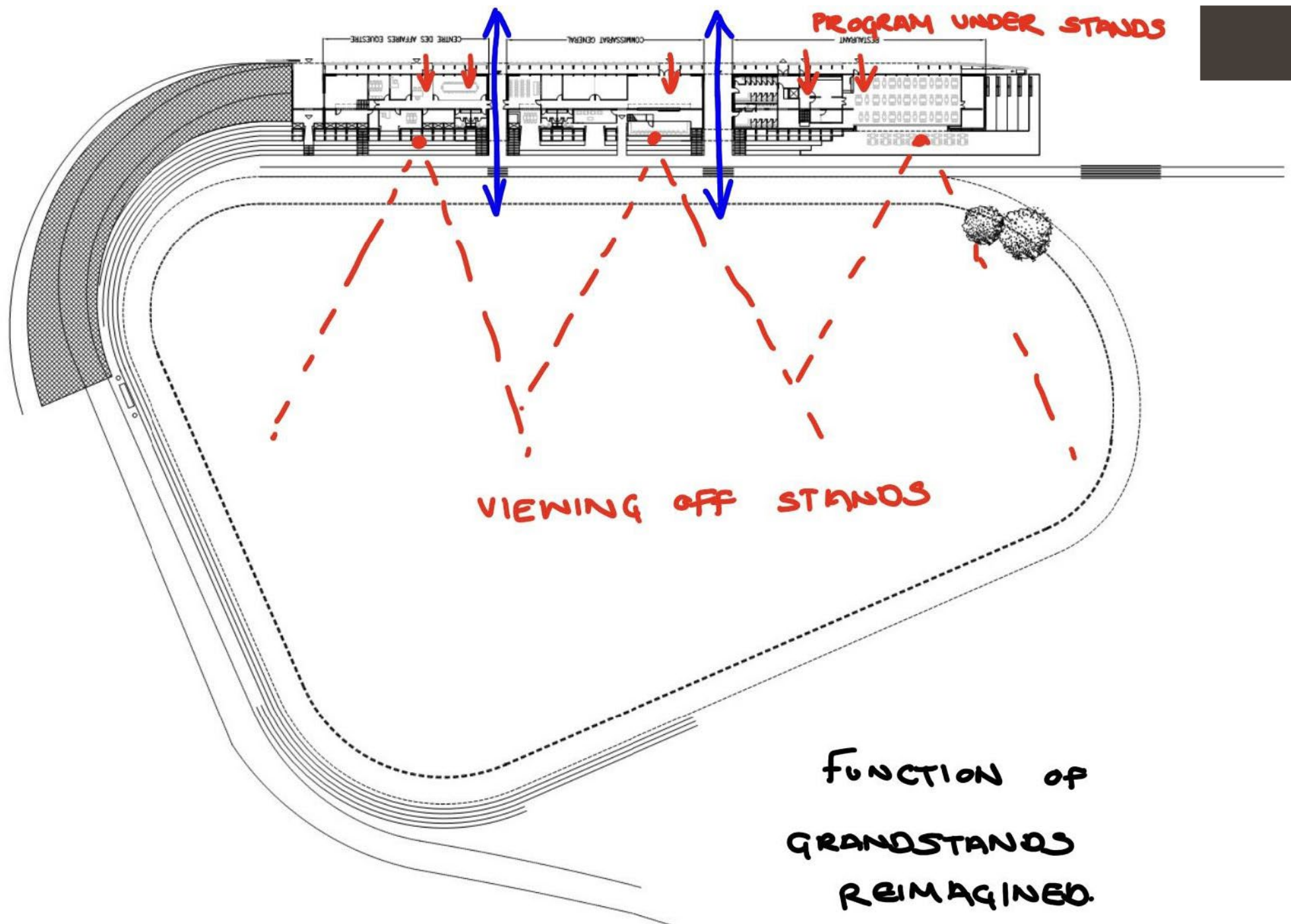


Figure 82: Site plan of Le Grand Parquet (Adsttc, 2024)

DOUBLE SIDED FUNCTION,
COVERED VS UNCOVERED

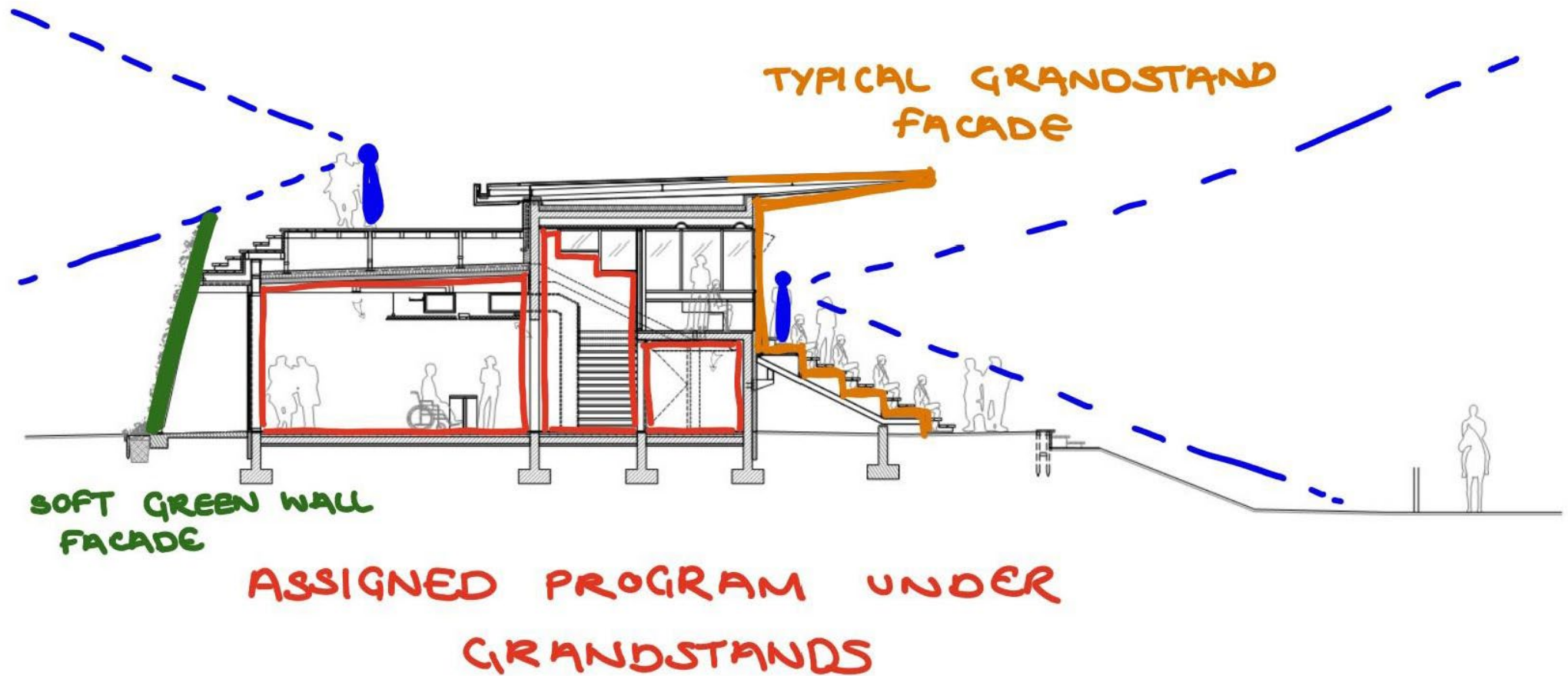


Figure 83: Section of Le Grand Parquet (Adsttc, 2024)
065

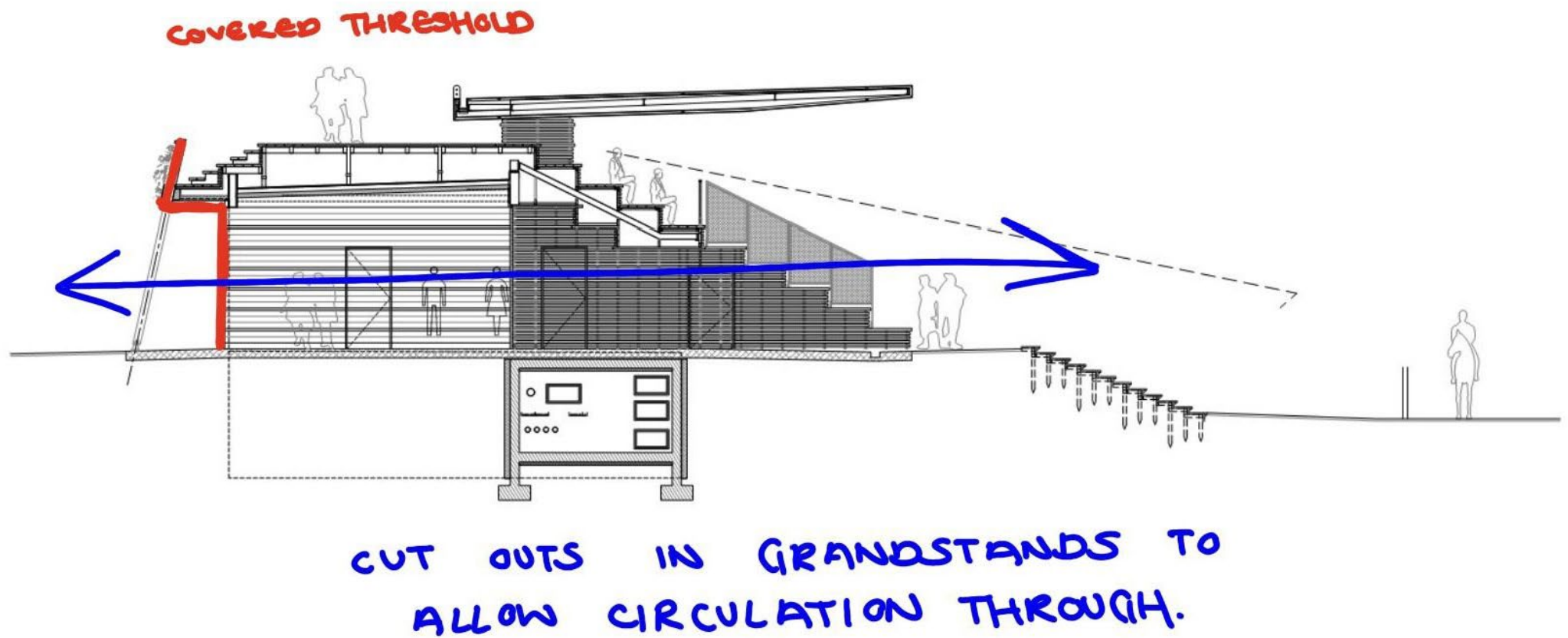
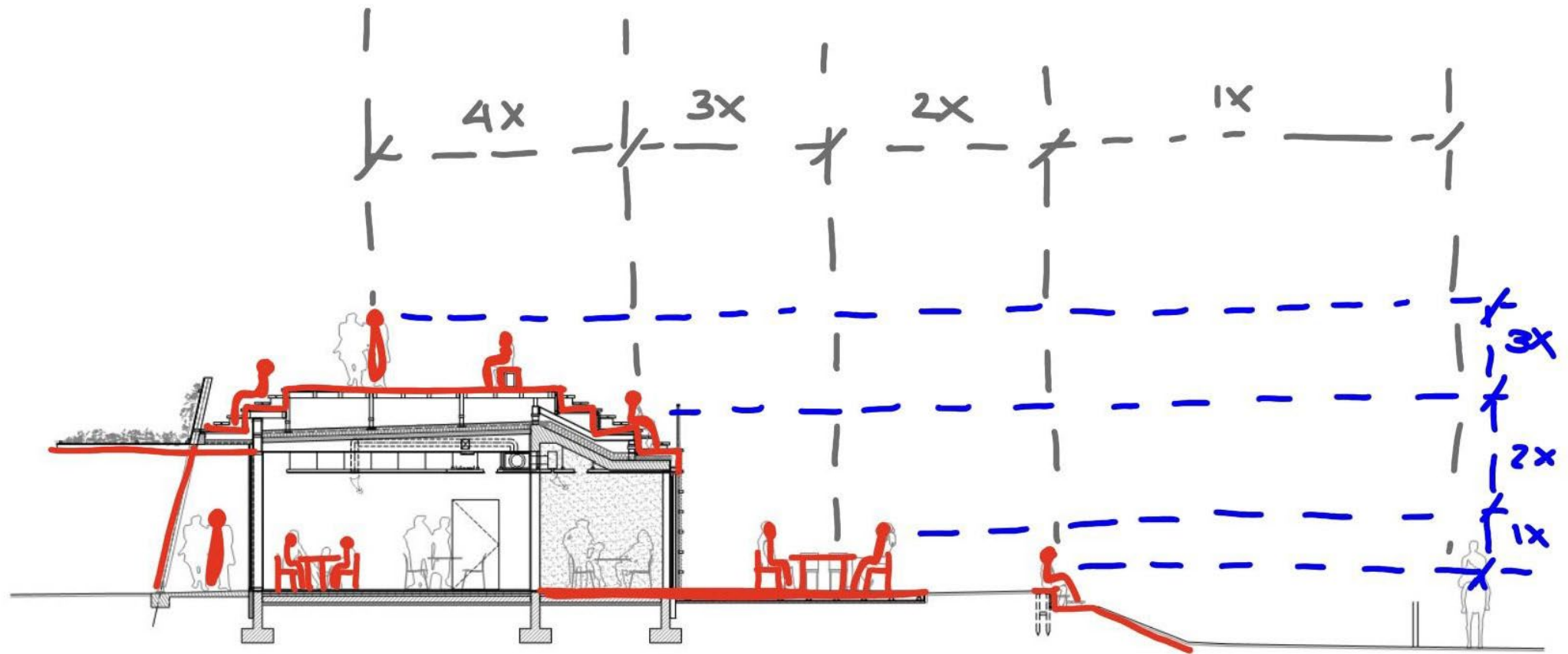


Figure 84: Section of Le Grand Parquet (Adsttc, 2024)

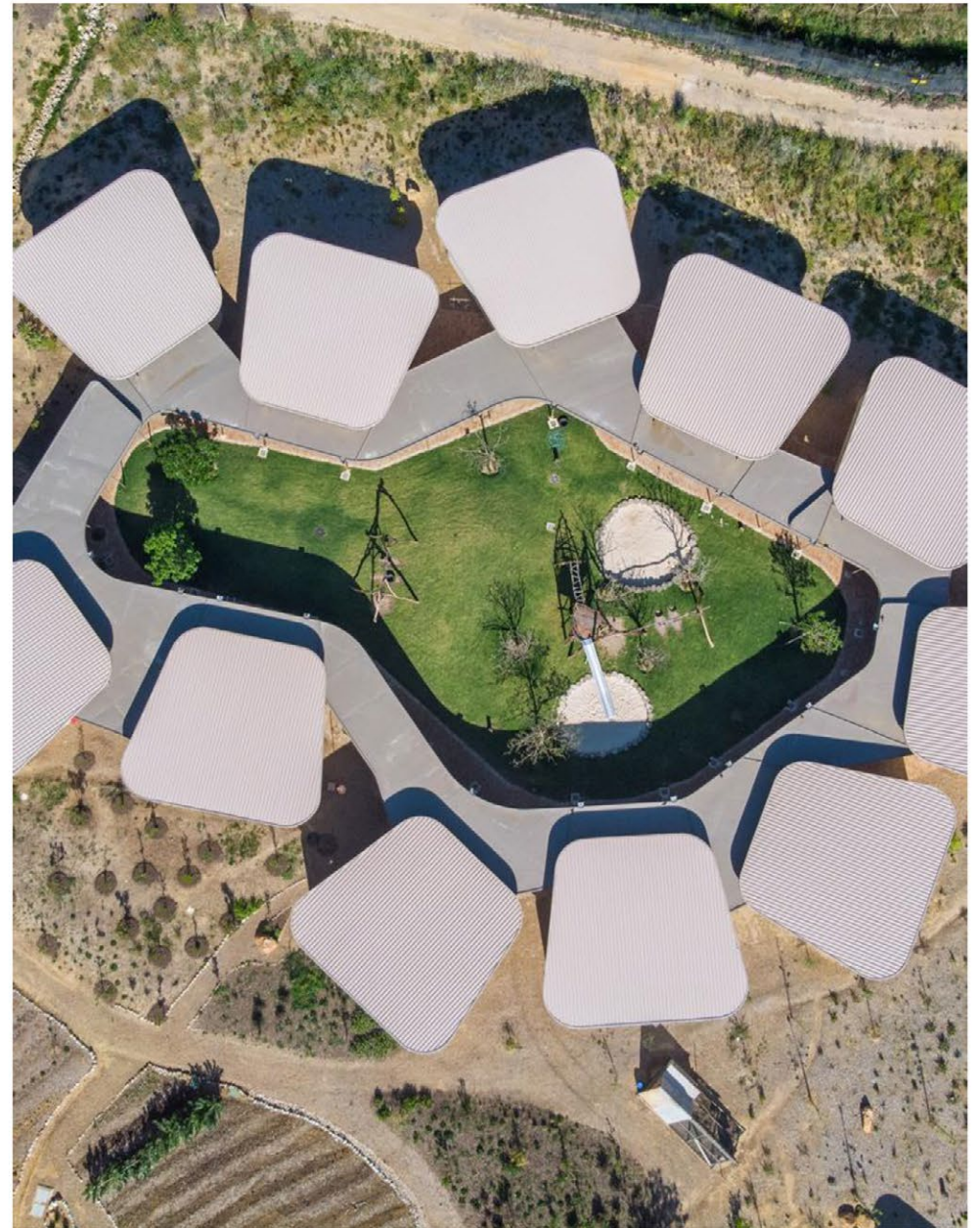


**MULTIPLE SEATING ARRANGEMENTS
ON DIFFERENT VIEWING ANGLES
AND DISTANCES**



4.5 GREEN SCHOOL SOUTH AFRICA

sustainability, spatial and structural arrangement



Figures 86 (top left), 87 (right), 88 (bottom left): Green School South Africa (Adsttc, 2021)



Figures 89 (left), 90 (top right), 91 (bottom right): Green School South Africa (Adsttc, 2021)



Green School South Africa is located in Paarl. The school is a sustainable schooling campus that promotes sustainability and wildlife awareness through its design techniques. “The reoccurrence of multiples at incremental scales is an idea that defines the behaviour of most natural systems” (Archdaily, 2022). The forms of the individual buildings and clusters of buildings follow organic shapes, there are no sharp angles or corners around the site. The building clusters are separated and accessed through pathways around the site that connect the clusters together from a distance, the pathways are nestled between orchards and vegetable gardens which creates the link between the students and environment. The students are forced to interact with nature and the landscape as all the circulation routes are bordered by plants, this shows students nature and its natural beauty as well as teaches the students about types of plants as they are engaging with the landscape every day. The building clusters also frame central landscaped courtyards, and the buildings have large windows looking out to further create the direct link to nature and the surrounding landscape. Most of the building materials that were used are natural materials that are left in a raw finish to further display nature and its natural beauty, but also represent how nature should be respected and not altered too much. “All buildings are constructed from naturally and locally sourced materials such as dek-riet ceilings, clay and soil harvested from the site to create rammed earth walls and lime plaster walls and floors, the pebbles retrieved from the site used to construct gabion walls, and reclaimed tique doors from the larger Drakenstein region” (Archdaily, 2022).

The project also uses design techniques for sustainability. The building walls are rammed earth walls which have a great thermal mass to naturally control internal temperatures, they are fire resistant, and they require no maintenance. The buildings also include clerestory windows that allows lots of natural light into the buildings, the clerestory windows also have adjustable screens on the inside to filter the natural light entering the space to regulate the temperature on the inside. In addition, the clerestory windows are a great way of cross ventilating a space to again create comfortable internal conditions. Rainwater is collected from the roof structures and reused around the site for the ablutions and to water the gardens around the site.

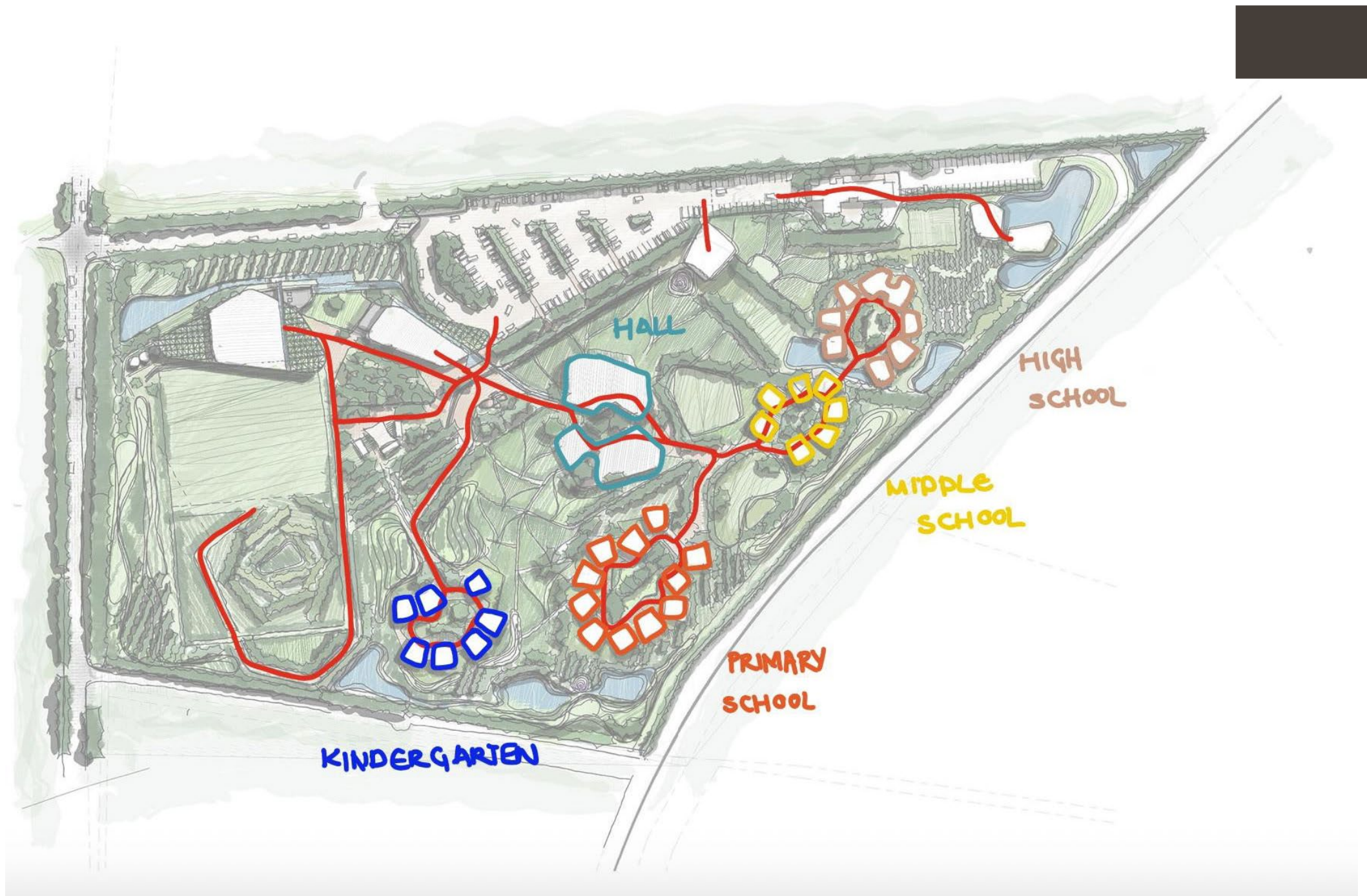


Figure 92: Site plan of Green School South Africa (Tv3, 2024)

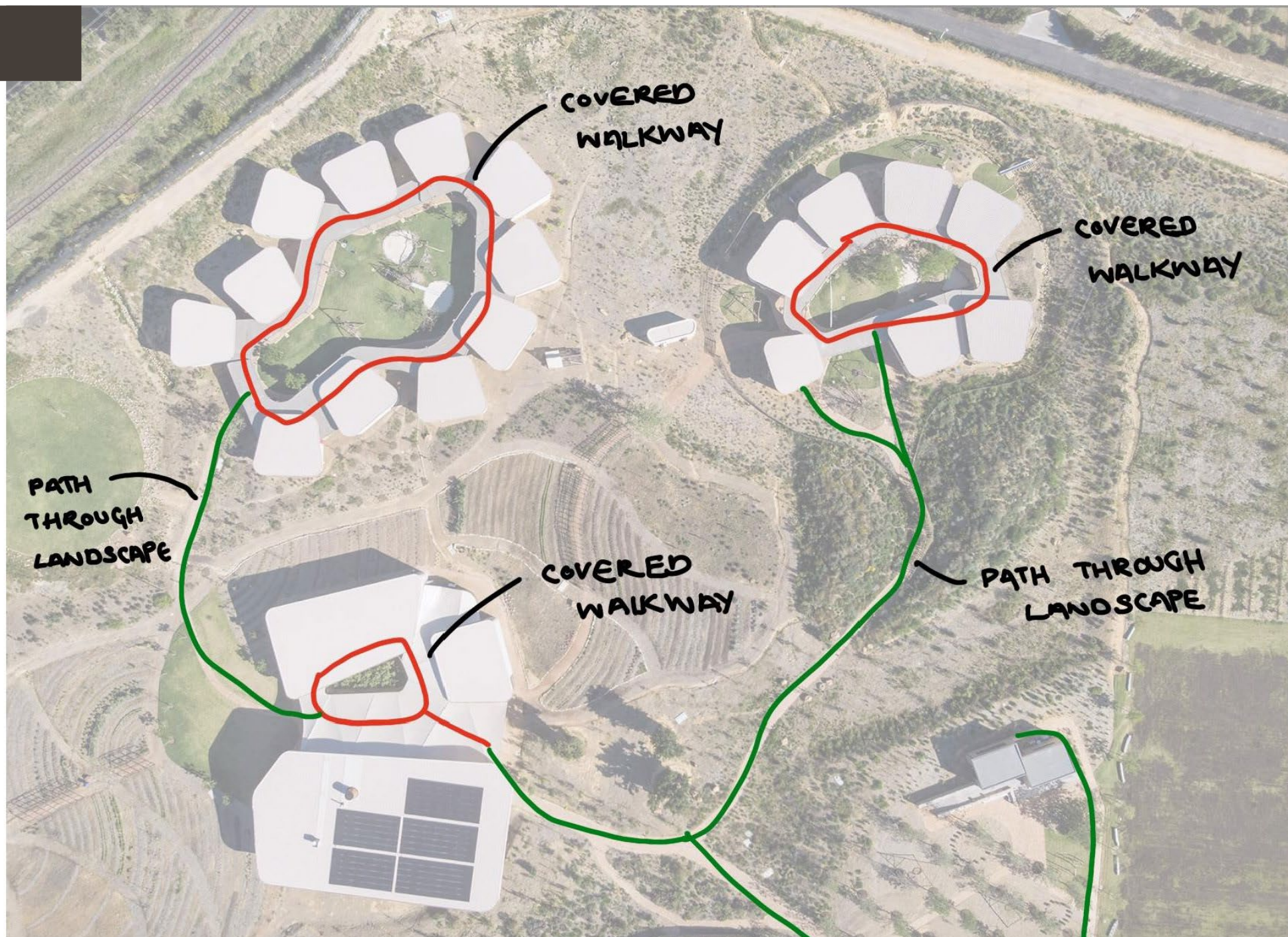


Figure 93: Green School South Africa (Adsttc, 2024)
073

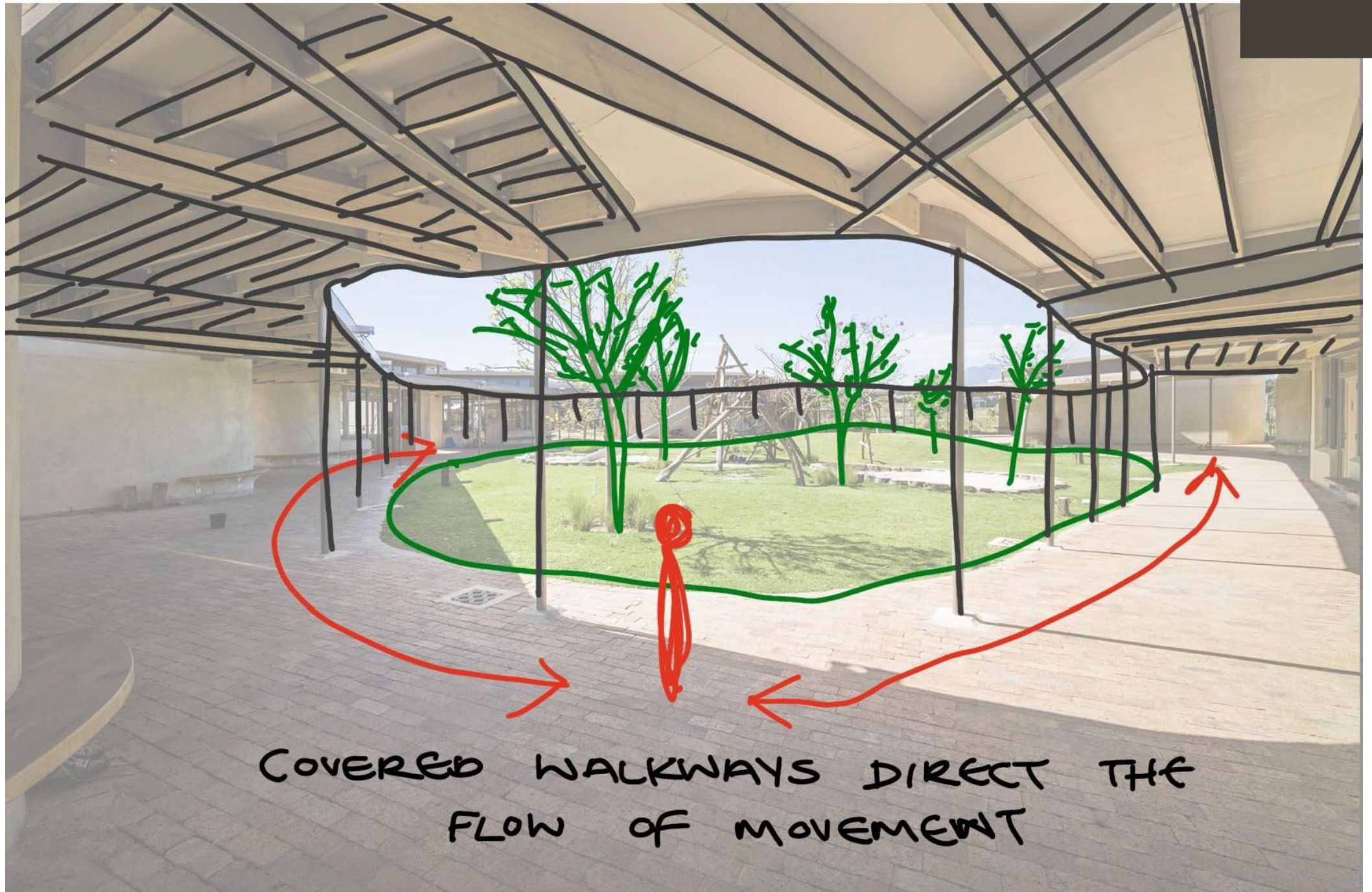


Figure 94: Green School South Africa (World Architecture, 2022)

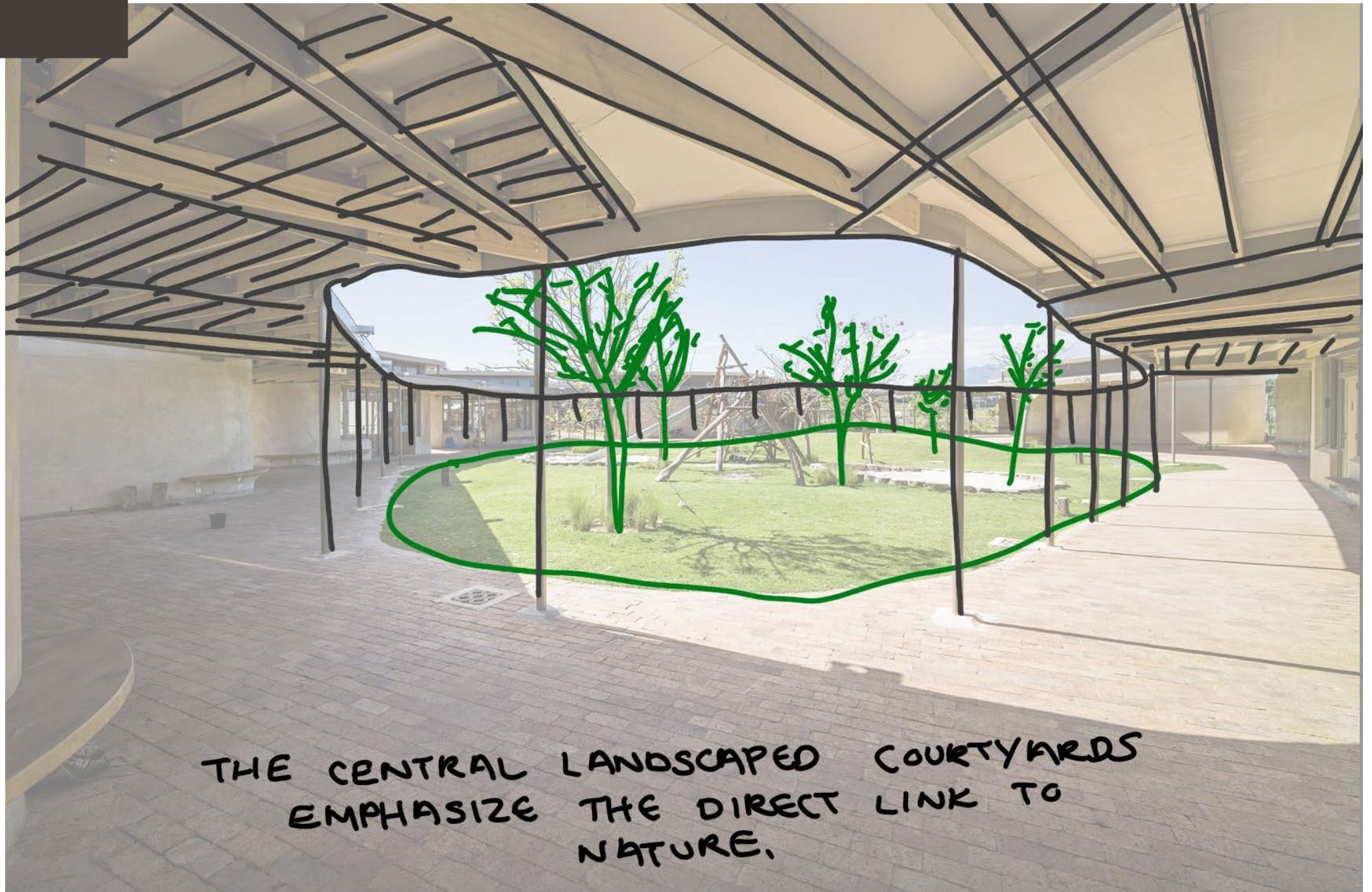


Figure 95: Green School South Africa (World Architecture, 2022)
075

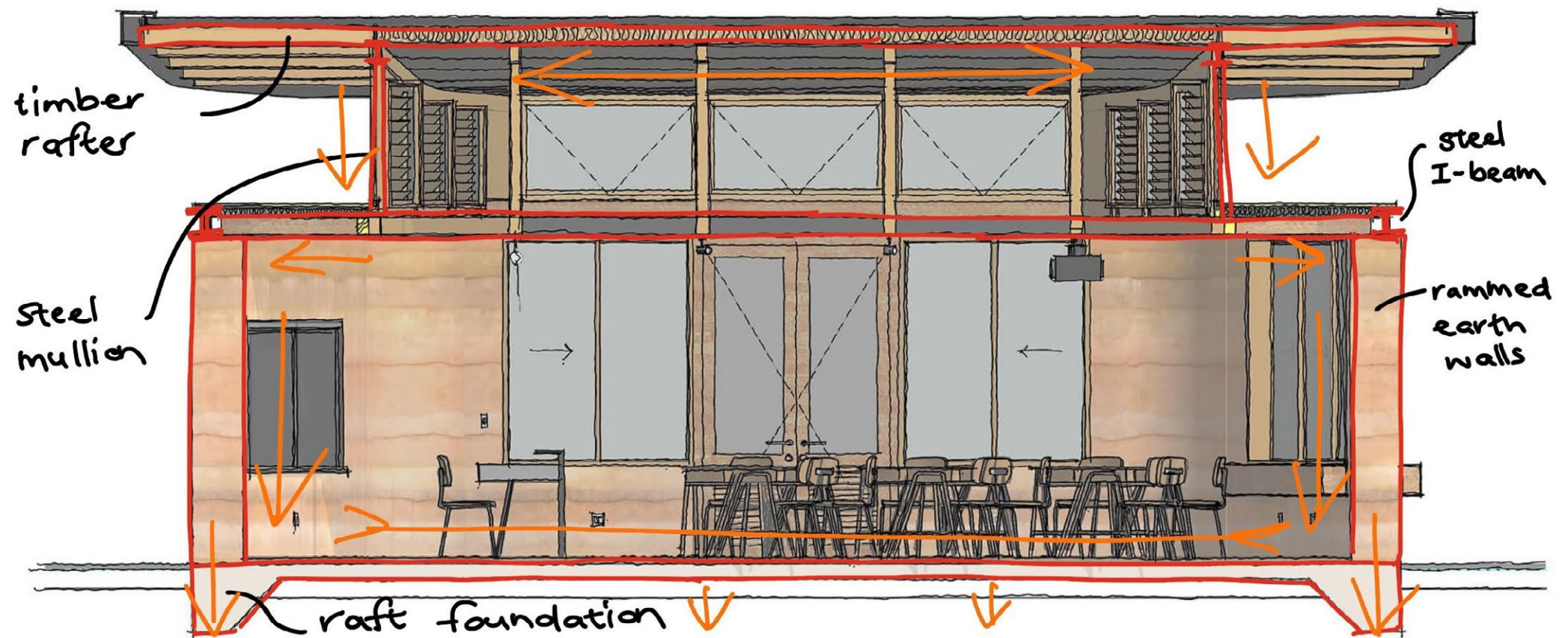


Figure 96: Section of Green School South Africa (World Architecture, 2022)



Figure 97: Section of Green School South Africa (World Architecture, 2022)
077



Figure 98: Section of Green School South Africa (World Architecture, 2022)



I am interested in this precedent for its design for sustainability, spatial and structural arrangement. My project will be designed with sustainability as a primary dictator, using locally sourced materials, passive sustainable design techniques - for thermal mass, sun shading, and ventilation -, and rainwater collection for watering the football fields and providing water for the ablutions. I found the spatial arrangement and circulation around the site interesting in this precedent. The pathways and main forms of circulation dictate how the students engage with the site and display the school's objective for nature awareness. The thresholds around the site are also interesting, the approach towards the buildings is on uncovered landscaped pathways, while the circulation around the cluster of buildings is a covered, paved pathway around a central landscaped courtyard. You go from being directly exposed to nature, to being protected by a covering around a small piece of nature in the form of a courtyard.

For my project I want to take the idea of using pathways and circulation routes to tell the story of Linhill Celtic FC and its immediate context. Before the user gets to the destination of the football club or education centre, the approach can be used to portray what they can expect to see at the end. Covered vs uncovered pathways can also be used to dictate the user experience as shown in the precedent. Pathways and circulation routes are often thrown into projects as the last step and usually aren't designed or considered as important spaces to design, however as seen in Green School South Africa the pathway is just as important as the building in telling the story and objectives of the facility. The spatial arrangement of buildings around the site in the precedent is also interesting as it creates separated zones around the site for its different programs. I can use this in my education centre to separate the age groups on the site through clusters joined by a pathway, there isn't a solid separation, but the zones naturally create the separation.

05



5.1 SOCIAL THEORY:

“The role of architecture through history has always been important because it is a physical frame of social life and also a symbol of social values and aspirations. Architectural creations are influenced by social thought. Modernism is an outstanding example of how social goals have directed planning of the cities” (Backovic; Masirevic, 2010). Architecture is the director of social interactions between people, it enhances the social experience and sets the theme for the social activity. It also influences how the social experience is perceived by people, as there are existing opinions on social events that are said to influence a persons value, ethics, and status. Thus this theory is important to consider for my project as i need to understand the society im designing for - the different social and economic status’, the context and how the building will be used - as this influences how the building is perceived and who would want to use the building (know who you are designing for).

Within the context of my intervention is a very seperated community. There is a very diverse social and economic status around my site and because of this the suburbs are extremely seperated and closed off. Although there are many cultures within the same context, these cultures aren’t mixing and socializing together. The typical architectural responses in the context are high boundary walls for privacy and security, boomed off streets to seperate suburbs (seperate the low income areas from the middle/high income areas), and no infrastructure giving back to the community for public activity and interaction. An important part of my project is the addition of a public interface onto the site, this will promote social activity between the users as well as define a community hub in the area. The architecture needs to rethink thresholds and seperations, as there needs to be a level of security and seperation for certain program, however this can’t be the typical solid wall seperation, the threshold needs to seperate while maintaining visual and atmospheric connection to promote social interaction on the site.

5.2 PLACE-MAKING THEORY:

“Placemaking is an approach to urban design that prioritizes people over infrastructure. It aims to create public spaces that are more than just utilitarian, but rather places that inspire and promote social interaction and cultural exchange” (Urban Design Lab, 2023). The key principles when it comes to place-making in architecture are people-centered designs, mixed-use developments, public participation, and sustainability. This theory is important in my project as i am proposing a mixed-use development that focus’ on public interaction. Linmeyer is a suburb that is very seperated in society through high boundary walls restricting access and interaction between the public. There are few street fronts that remain open and uninerrupted by a tall boundary wall. In my project i will propose treating the street fronts as public spaces to promote interaction between my program and the public, a portion of the design of my project will be for the people of Linmeyer. It is important for architecture to give back to the people, as modern developments do not consider the people but only the economics of a building.

In a project that focuses on people and providing opportunity for people of all backgrounds, it is equally as important for the architecture to respond to the program. Analysis will give me the understanding to make design decisions and directly respond to the sites conditions and limitations. Observation will give me the understanding of how the area is used by the people to design a architecture that will promote a specific activity that is popular in the context and make the user experience easy and accessible. When designing public spaces that promote social interaction it is important to understand who will be using the space, how will they be using the space, when will they be using the space, and how do i want them to use the space. A successful social projects designs based on the users and the context, the architecture is a place-holder for activity, the architecture is secondary to the function and spaces created.

06

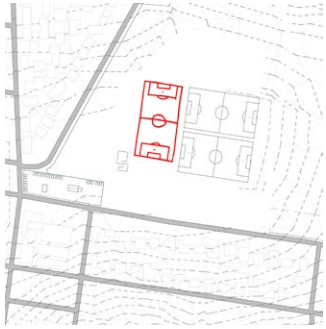
6.1 LINHILL CELTIC FC (SITE) HISTORY:

The name 'Linhill' was derived from the names of the suburbs that border the football club, the suburbs being 'Linnmeyer' and 'The Hill'. "Linhill was created for the community of Southern Johannesburg to play, enjoy and develop football in a safe environment. Football at Linhill has always been conducted in a mixed environment with equal opportunities for all communities. Football development and assistance to children from financially disadvantaged backgrounds has always been a feature of the club" (Linhill, 2024).

The Vision Statement of the football club is: "The Linhill Celtic Football Club aspires to be an outstanding educational-athletic organization that provides a high-quality experience for every athlete. A high-quality experience is one in which every athlete is coached using the principals of Positive Coaching, has fun playing the game, feels like an important part of the team regardless of performance, learns "life lessons" that have value beyond the playing field, and Learns the skills, tactics and strategies of the game and improves as a player" (Linhill, 2024).

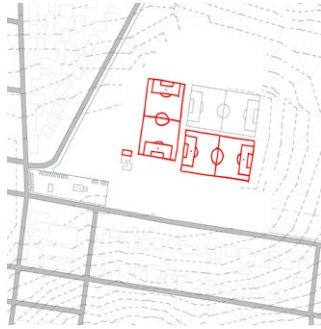
The club's Mission is: "Provide youth with organized competition in a safe environment. Bring our youth closer together through common interest in sportsmanship and competition. Instill the values of education. Acquaint the players with the fundamentals of the game rules. Teach sportsmanship, discipline and love of the game. Encourage the players to maintain satisfactory grades in school and to emphasis the importance of keeping a proper relationship and balance between scholastic and athletic endeavors" (Linhill, 2024).

Thus, from identifying the history of the club and its goals and aspirations, it is clear that the football club has an interest in education and instills the value of good grades in school. My project will allow the football club to further expand on its vision by providing education facilities to not only instill the value of education but also offer the facilities to allow financially disadvantaged children to receive the necessary help and resources.



1973

Linhill Celtic FC was established with 1 football field.



1975

A second football field was added and changerooms were built.



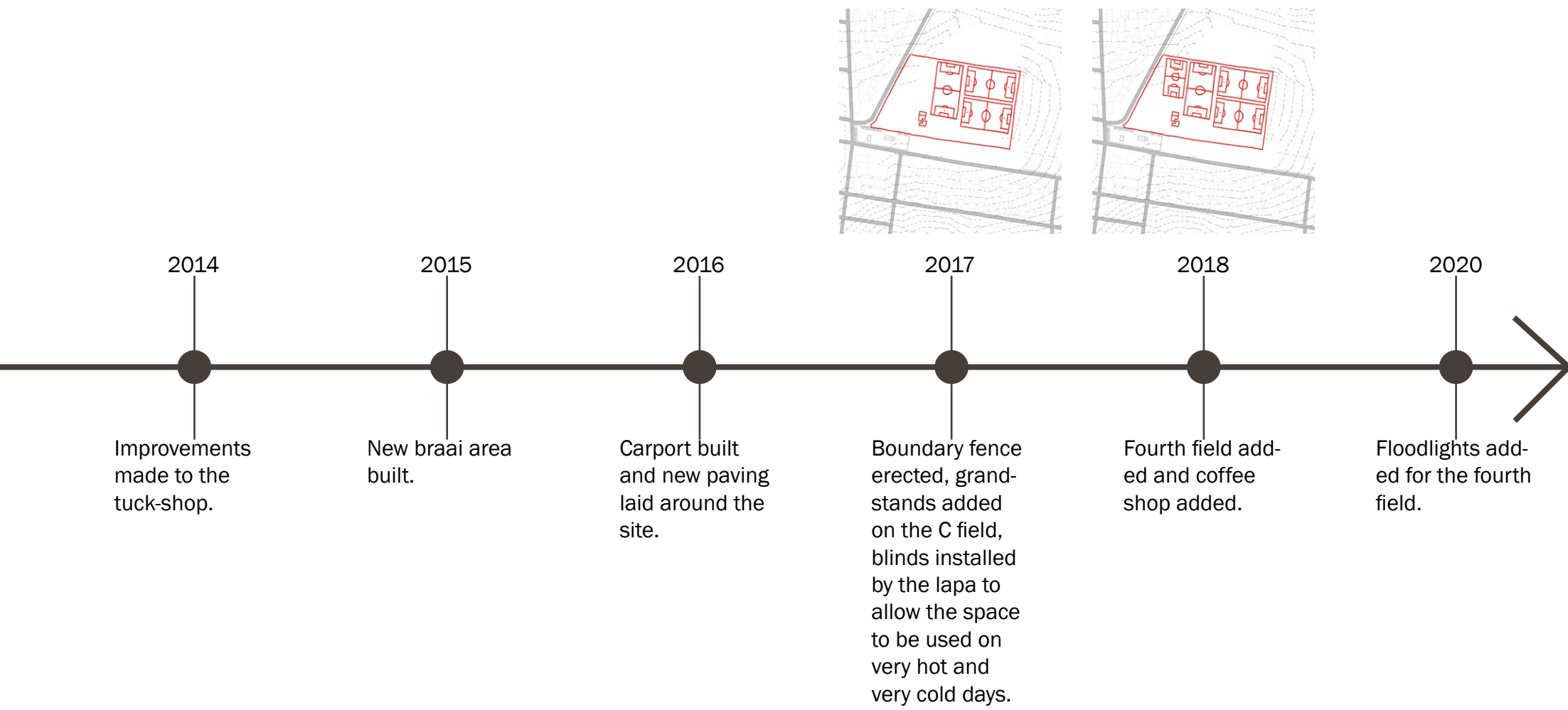
1980

Floodlights were added to enable night matches to be played at the club and allow teams to train at night, a tuck-shop and clubhouse were constructed, and a third football field was added.

2007
Lapa built.

2009
Improvements made to the clubhouse.

2013
Improvements made to the clubhouse, parking bollards added.



6.2 SITE INFORMATION

ERF: RE/304/106-IR

TOWNSHIP NAME: KLIPRIVIERSBERG
106-IR

ZONING INFORMATION:

USE ZONE: PUBLIC OPEN SPACE

HEIGHT ZONE: A

NUMBER OF STOREYS: 3

FAR: 1,2

COVERAGE: 50%

BUILDING LINES: 3M STREET BUILD-
ING LINE AND 1,5M BUILDING LINE

THE PROJECT WILL REQUIRE A REZON-
ING SUBMISSION AS THE PROJECT IS
A MIXED-USE DEVELOPMENT AND THE
SITE IS CURRENTLY ZONED AS PUBLIC
OPEN SPACE.

PROPOSED USE ZONES: BUSINESS 1,
INSTITUTIONAL, EDUCATIONAL, PUBLIC
OPEN SPACE

PROPOSED OCCUPANCY: A1 - EN-
TERTAINMENT AND PUBLIC ASSEMBLY,
A3 - PLACES OF INSTRUCTION, C1 -
EXHIBITION HALL, F1 - LARGE SHOP,
F2 - SMALL SHOP, G1 - OFFICES, H4 -
DWELLING HOUSE



Figure 99: Map of site (COJ, 2024)

6.3 LINMEYER HISTORY:

The suburb of Linmeyer was originally laid out in the late 1940's on farmland that was previously owned by Johan Meyer - Meyer Farm. In 1950 development started in Linmeyer by Risi Investment, the roads were built with a road named Johan Meyer Street after the previous owner of the land, and Risi Avenue named after the developers. Development started off very slow with only 5 houses being built between 1951 and 1955, the houses were “off-plan” house with a set price that were built by Phoenix Construction company. Thereafter the construction company went bankrupt and development came to a stand-still. After many years of the suburb at a stand-still, construction started again as the suburb was an appealing area to live due to its close proximity to Johannesburg CBD and major highways (Wikipedia, 2024). Today, Linmeyer is made up of majority freestanding houses, with many schools in close proximity, and a few retail stores.

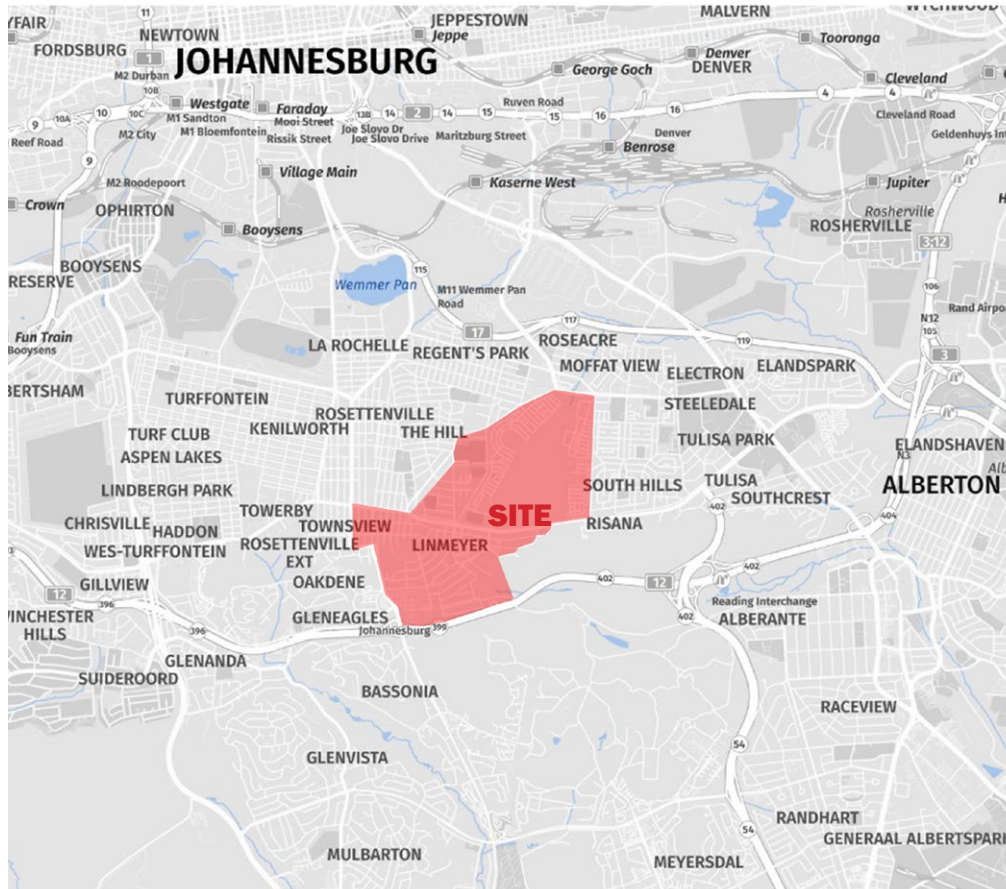


Figure 100: Map of Linmeyer (M Rainho, 2024)

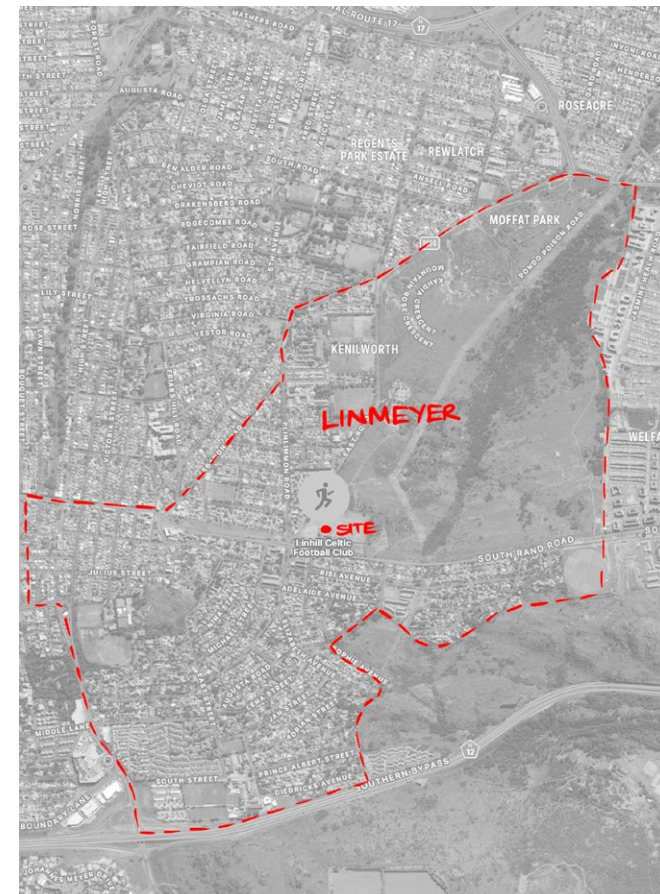


Figure 101: Map of Linmeyer (M Rainho, 2024)

6.4 THE HILL HISTORY:

The Hill is a suburb located to the south of Johannesburg CBD and is surrounded by Linmeyer, Rosettenville and Regents Park. The Hill was on an old farm called Klipriviersberg, when it was named a suburb in 1919 it was named after the 'Hill' it sat on. The suburb is made up of majority residential dwellings, with a couple schools and South Rand government hospital in close proximity. Moffat Park is close to The Hill, however, the open public park has now been obtained for housing development (Wikipedia, 2024).

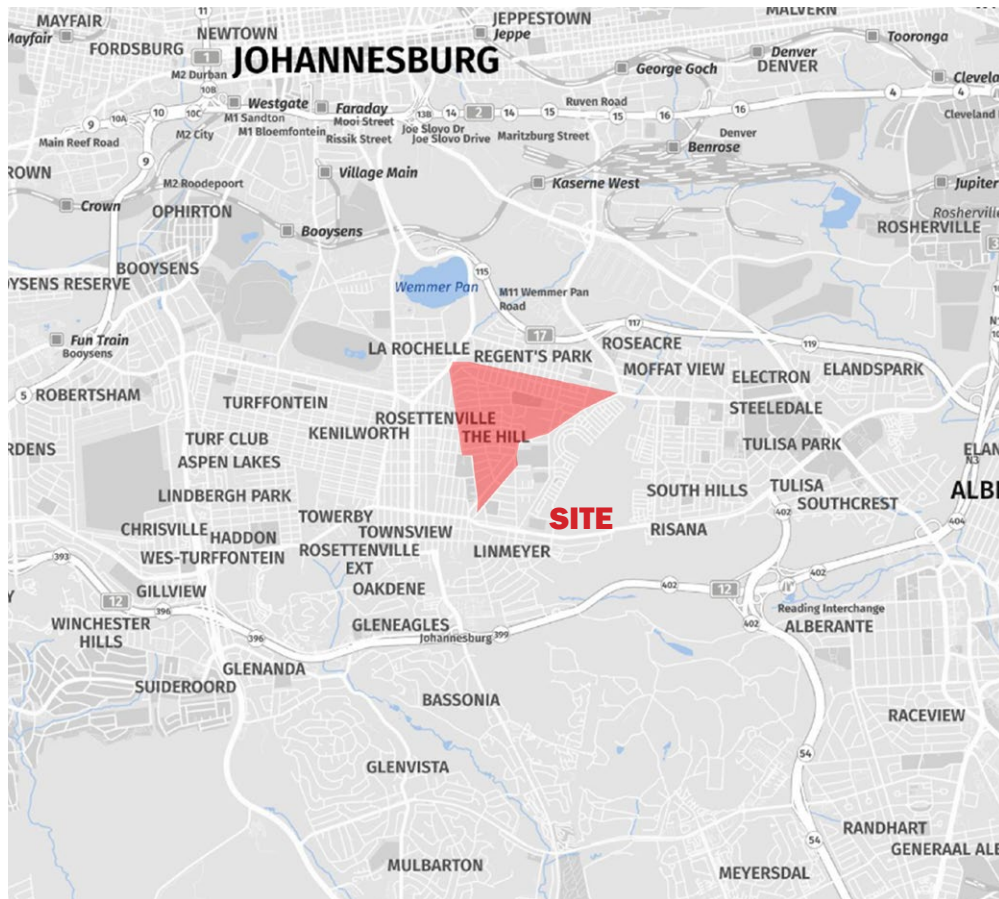


Figure 102: Map of The Hill (M Rainho, 2024)

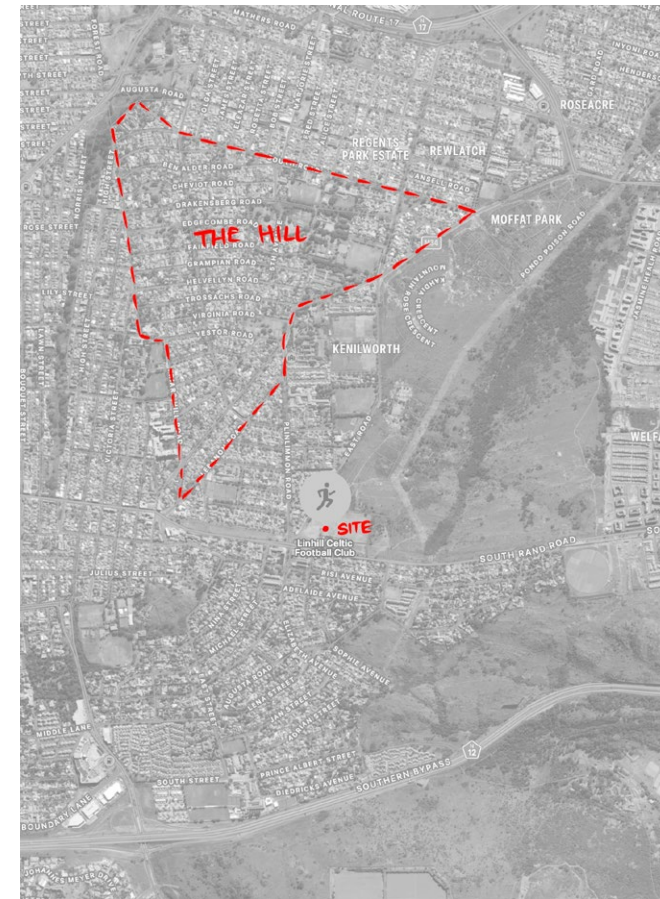


Figure 103: Map of The Hill (M Rainho, 2024)

07

7.1 BRIEF:

The aim of the project is to regenerate Linhill Celtic Football Club's facilities and add an education centre and public interface to the club. The project is split into 3 categories that all need to work together and strengthen each other; the categories are football, education, and community cohesion. The thresholds between the 3 categories will become an important part of the project as there needs to be a clear separation between the 3 different programs, but they also need to have a relationship and passive link to each other. The club currently has an existing clubhouse which comprises of a bar, changerooms, ablutions and a seating area. There is also a separate tuck shop building as well as a building where the groundsman and security live. The existing structures can be integrated into the new design (the program can be changed), or it can be demolished. If however you choose to demolish the existing structures you need to have a reason to back up your decision. The reason can not just be that it did not look good next to the new building.

7.2 PROGRAM:

The program of the project is split into 3 categories: education, sport, and public interface. The education centre will feature a library/research centre to allow people to do research or work on a computer if they do not own one, it will have classrooms to allow children to do their homework in a distraction free environment with stationary available to them, there will also be volunteer teachers and students to help children with their homework or provide them with extra lessons on topics that they may be struggling with at school, and lastly there will be after-care facilities that provides a safe environment for children to wait for their parents to pick them up after football training or wait in till football training starts. There will be multiple classrooms that will allow separation between age groups of children, this will be done for safety – to not have very young children mixing in a closed environment with older children – as well as to promote interaction for learning – the best way to learn is through hearing peoples questions and problems to be able to come up with solutions, with children of similar ages being linked together means the topics are related and valid in their chapter of life and education. The aim of the education centre is to close the education gap between government and private schools by providing help to students in need that cannot afford extra lessons, or to provide children with the basic resources needed to complete homework and research. There is a large education gap between government and private schools, research shows that the bachelor pass rate in government schools is 41 percent while the bachelor pass rate in private schools is 89 percent. The main factors contributing to the gap is in the lack of basic resources, access to information, and shortage of teaching staff and availability to extra lessons. The large classes in government schools prevents the ability to focus on class and receive 1 on 1 help, which in turn affects the academic success of the students. By providing an education centre that gives students access to basic resources and individual help in the form of extra lessons can greatly increase the academic success rate of the students, which in turn increases the opportunity of getting a job after their education.

The football facilities will be redeveloped to allow the club to run more efficiently and effectively, to provide footballers with the resources to develop their skills and opportunities, to promote the football culture in Linmeyer, and to show the potential of growth available to amateur football clubs around South Africa. The club is currently running out of a small clubhouse that contains a bar, kitchen, open area with tables and seating, ablutions and 2 changerooms. The club is able to work with the existing infrastructure, however, there are many inconveniences and limitations that better facilities would be able to address. Some of the issues are there are no offices for the club staff to work out of – all work is done using a table in the open space of the clubhouse, which creates a messy clubhouse, distracting environment to be able to work efficiently, difficulty in organisation, and no privacy for sensitive matters to be worked on. Another issue is the lack of changerooms, by only having 2 changerooms means the club is limited on hosting large tournaments; in the past when they have you often see players changing on the side of the fields under trees as the changerooms are occupied, this isn't ideal when you have females in the same facilities. Lastly, it is difficult for the club to grow in its current form as the infrastructure limits the capacity of work that can be done to have more footballers coming through the doors. The project will add a new larger clubhouse which will include a new bar, restaurant, kitchen, offices, boardroom, screening room for coaches and players, laundry room, ablutions, and storerooms. The existing clubhouse will be converted into a memorabilia building to display the history of the club and its achievements in the form of photographs, videos, articles, trophies, kits, and plaques. There will also be new grandstands constructed around the fields to provide great views of the football being played on the fields and also promote people to come spectate, there are currently 4 small grandstands which don't fill the seating demand of spectators.

The public interface will be developed off South Rand Road, which is a very busy main road. The space will contain 5 a-side football courts, a skate park, covered seating areas, retail shopfronts, and parking. By adding program to a public space will promote the public to use. 5 a-side football courts are a good way of getting public interaction as football is the most popular sport in the country, meaning the public is always interested in watching or participating in the activity. 5 a-side football is also a very popular social game, you do not have to be great to play, any team can enter to play socially. There are no 5 a-side football courts in Linmeyer meaning people are travelling out of the area to play the game. With it being available in Linmeyer the people will now use the newest and closest football courts. The skate park is also a way of bringing the public in by providing the facility to the public. There are no skate parks in Linmeyer, and this is a fast-growing activity in the country, which people are left to skate on the streets or in their home's gardens. Retail is also an easy way of creating foot traffic by supplying to peoples demands and giving them convenience of attaining items, the retail sector will also provide a healthy revenue to the football club in the form of rent. All these activities as well as the shaded seating areas around these activities will promote social interactions and community integration, it will also generate interest in the football club and potential develop into many new talented signings for Linhill Celtic Football Club. The facilities will also be maintained as because they are on the same site as the football club and are a generation income for the football club, Linhill Celtic will ensure the facilities are well maintained for the public to use, as this has now become the club's image.

Football Club:

Room:	Area:
Home team changeroom (think about how you can visually create a space that shows the club, its values and history in this space, it should be a space players get into the zone before a game and understand what they playing for), the changeroom needs to include a minimum of 4 showers	30m ² each
Minimum of 2 away team changerooms to cater for tournaments held at the club, needs to include a minimum of 4 showers in each changeroom	30m ² each
Ablutions	Calculations to be done to work out number of ablutions required
Clubhouse	300m ²
Bar	40m ²
Restaurant with tables and seating	150m ²
Kitchen	25m ²
Tuck shop	9m ²
Office for the club chairman	12m ²
Office for the vice chairman	12m ²
Office for the vice chairlady	12m ²
Office for club treasurer	12m ²
Office for the club secretary	12m ²
Office for the coach co-ordinator little league	12m ²
Office for the coach co-ordinator junior league	12m ²
Office for the registrar little league	12m ²
Office for the registrar junior and senior leagues	12m ²
Office for marketing and events	12m ²
Office for the estate manager	12m ²
Boardroom for meetings, to accommodate a table that can seat 20 people	50m ²
Screening room for players and coaches to have research sessions, to seat 40 people	100m ²
Equipment storeroom	30m ²
Laundry room to wash kits and bibs	30m ²
Memorabilia section to house photos, kits, articles and trophies	TBD
3 full sized football fields	As per standard
Home and away team benches for each football field	As per standard

Grandstands to accommodate spectators	As per standard
Parking	Calculations to be done to work out how many parking bays are required
Security building	9m ²
House on the property for the groundsman to live in, to include 2 bedrooms, living room, dining room, kitchenette, 1 bathroom	100m ²
Refuse area	Calculations to be done
Delivery and pick up zone	TBD

Education Centre:

Room:	Area:
Research centre	50m ²
Library	50m ²
Seminar room	50m ²
4 classrooms	25m ² each
Ablutions	Calculations to be done to work out how many ablutions are needed
After-care hall	50m ²
Playground	TBD
Outdoor amphitheatre	TBD
Storeroom	12m ²
Parking	Calculations to be done to work out how much parking is needed

Public Interface:

Room:	Area:
Covered outdoor seating area with tables	TBD
2 netted 5 aside football fields	As per standard
Skate park	TBD
Retail	5 stores 25m ² each
Ablutions	Calculations to be done to work out how many ablutions are needed
Parking	Calculations to be done to work out how much parking is needed

08

8.1 SITE SELECTION:

Client:

The land is owned by the City of Johannesburg Metropolitan Municipality but is used by Linhill Celtic Football Club. Due to the complex structure of the project and multi-programmatic function, several clients will be approached for the project.

Regarding the public interface the client will be the City of Johannesburg. The project will be a public project that promotes community interaction and social activity. The surrounding context has a shortage of public amenities and parks for the communities to use. The land is also zoned as public open space however is not used by the public due to the lack of maintenance to the land. It is overgrown and polluted which makes it dangerous for the public to interact with. It also is not generating revenue as there is no programme attached to the land. The proposed public interface will add activities such as a skate park, 5 a-side football fields, retail and covered seating areas that will promote activity from the surrounding community but will also generate revenue that it currently is not doing. The city of Johannesburg has stated that they have an allocated budget for infrastructure renewal and revitalization of the city, this project will bring a new life to the surrounding context of Linmeyer and revive the streetscape with a fresh interactive façade.

The football club facilities clients will be Linhill Celtic Football Club and the Department of Sports, Art, Culture and Recreation. The Department of SACR will be approached to fund the new grandstands around the existing football fields. The Department's mission is to create an enabling environment for sports, facilitate talent identification and development, provide access to sport, and hosting major sporting events. The grandstand project will provide all of the above. It will provide the facilities for people to view football matches and training sessions which could lead to talent identification, it will provide access to the sport of football as people now have clear visual view of the games and the new facilities will enable the football club to host large high level football tournaments as their facilities will be up to required standards and there will be capacity to host these events. Linhill Celtic FC will fund the new clubhouse and existing clubhouse renovations. The club can get a loan to fund the new build and pay the loan off with the revenue coming through the club's new public interface facilities, restaurant, tuck shop, retail and parking fees. The new facilities will bring in revenue to allow the growth of the football club.

The education facilities clients will be St Martin's School and Marist Brother's Linmeyer. The 2 schools are well established private schools in close proximity of the site. The schools will be approached to sponsor funds that will help in the build of the education facilities. The sponsorships can come through fundraising as well as donations made by parents of the children that attend either of the schools. The schools can benefit from this project as it will demonstrate the schools' interest in the importance of education, children development, community regeneration, and awareness of the major issues we face as South Africans. The schools will also be able to use the new facilities, this being the football fields for sports matches, tournaments, or school days as well as the education facilities for extra lessons or seminars. The project will also have signage visible to the public that will acknowledge the school's sponsorship towards the project that can potentially bring new students to their doors.

Ownership:

- City of Johannesburg Metropolitan Municipality

Rights and other constraints:

- Use Zone: Public Open Space
 - Height Zone: H: 0 A
 - Floor Area Ratio: 1,2
 - Coverage: 50%
- Density: 1 dwelling per n/a m²
- Building Line: 3m between site boundary and building line
 - Parking: As per parking calculations

Site Information:

- ERF: RE/304/106-IR
- Site Area: 539 793m², the project will only use the portion of the site that the existing football club is on
 - Township: Klipriviersberg 106-IR

The site is surrounded by primarily residential buildings, but also has a lot of schools in close proximity including 2 well established private schools, and many small businesses retail shopfronts. Linmeyer is surrounded by many low-income and densely populated areas such as Rosettenville, Turfontein, Kenilworth and La Rochelle. It is also surrounded by middle-income areas such as Oakdene, Bassonia and Glenvista. The diverse social and cultural population, together with the direct access to private schools and movement through the area due to its large residential and retail footprint make the site the perfect location for a project that is focused on community interaction, social development, and educational access. The site is also framed by 2 streets, East Road and South Rand Road. South Rand Road is a very busy main road which would provide perfect access for the public intervention, while the football club and education facilities can be accessed off the more quiet East Road.

8.2 FEASIBILITY:

Access to site:

The site is easily accessible for all types of vehicles as the entire site is open to the streets. The site is between 2 roads, South Rand Road and East Road. The current access to the football club is off East Road, it has a gate with clear-vu fencing on either side, if need be the clear-vu fence can easily be removed and placed back in its original place when necessary. In the event of construction access can be off both roads and alternating if necessary. When work is happening to the public facilities off South Rand Road then access to the football club facilities can be through the gate on East Road. When work is happening to the football club facilities off East Road access can be changed to be off South Rand Road thus accessibility to site will not be an issue throughout the full construction phase. In addition, there are no neighbouring properties on either side of the site, it is open public land, so there will be no interference and no shortage of open land for temporary storage of materials and equipment.

Materials:

The materiality for the built forms which includes the new clubhouse, education facilities and retail will be brickwork and concrete structures. The buildings are not very big buildings individually and do not exceed 2 storeys, thus simple structures out of brickwork and rib and block slabs will be sufficient for the builds. Bricks are easily available in Johannesburg as it is the main building material used in the city, together with the rib and block slabs which are typical slabs used for residential buildings in Johannesburg. The grandstands and shading structures will be steel structures due to its lightweight design, structural strength to achieve large spans and time saving construction methods. The 5 a-side football courts will be built by specialists as they come in prefabricated construction packs. The brickwork materiality blends into its surrounding context as the program around the site is primarily residential buildings with the same construction materials. The lightweight steel structures will provide a visual break between all the hardscapes of the context and also create visual interest to draw the public into the site.

Access to labour:

The proposed brick with rib and block slab structures is typical construction methodology in Johannesburg, thus there is no shortage of qualified bricklayers and shuttering builders available to do the job. It is a technique that all builders in Johannesburg have worked with and are comfortable with. It will also create a lot of job opportunity in the surrounding areas as there are plenty qualified builders in the poor surrounding areas that are looking for work. The lightweight steel structures will require specialist trades that work with steel and have welding skills. Tulisa Park is an industrial area 10 minutes away from site that has businesses that specialize in steel fabrication and construction; thus, this trade is easily accessible for the project.

Design Technology:

The design will consider the materiality and the structures will be designed in a way that the materiality is sufficient and effective. Things that will be considered with the brick and rib and block slabs will be span lengths and directions, load bearing walls, and weight loads on the slabs. There will be no innovative design technologies, but rather simple construction that uses the skills available in the local context, by doing this will mean expensive specialized trades will not be required and it will save time with the construction of the build, and limit potential unexpected issues that may arise.

8.3 VIABILITY:

Social:

The project is socially viable as it will bring the surrounding community together through its public interface. The public interface will contain 5 a-side football courts, a skate park, and shaded seating areas for the public to use. These are all amenities that are lacking in the area. The public parks that are available to the public don't get used as there is no program, they are just open lawned areas. They end up not being maintained and overgrown, which turns to a place people litter, and it overall becomes a dangerous area. By adding program to a public space will promote the public to use. 5 a-side football courts are a good way of getting public interaction as football is the most popular sport in the country, meaning the public is always interested in watching or participating in the activity. 5 a-side football is also a very popular social game, you do not have to be great to play, any team can enter to play socially. There are no 5 a-side football courts in Linmeyer meaning people are travelling out of the area to play the game. With it being available in Linmeyer the people will now use the newest and closest football courts. The skate park is also a way of bringing the public in by providing the facility to the public. There are no skate parks in Linmeyer, and this is a fast growing sport in the country, which people are left to skate on the streets or in the homes gardens. Both these activities as well as the shaded seating areas around these activities will promote social interactions and community integration. The facilities will also be maintained as because they are on the same site as the football club and are generation income for the football club, Linhill Celtic will ensure the facilities are well maintained for the public to use.

Financial:

The financial viability is determined by the return on investment (ROI) of the project, which is calculated by looking at the building costs and income, how long the project will take to pay itself off, and profit once the building has been paid off.

Estimated Cost:

Football club:
• 3 changerooms @ 30m ² per changeroom – R6 500 per m ² = R585 000
• Ablutions @ 25m ² per bathroom (male and female) – R8 100 per m ² = R405 000
• Clubhouse with bar @ 300m ² - R16 000 per m ² = R4 800 000
• Restaurant with kitchen @ 175m ² - R16 000 per m ² = R2 800 000
• Tuck shop @ 9m ² - R2 800 per m ² = R25 200
• Offices @ 132m ² - R9 300 per m ² = R1 227 600
• Boardroom @ 50m ² - R9 300 per m ² = R465 000
• Screening room @ 100m ² - R9 300 per m ² = R930 000
• Equipment storeroom @ 30m ² - R2 800 per m ² = R84 000
• Laundry room @ 30m ² - R8 100 per m ² = R243 000
• 3 full sized football fields – existing = R0
• 6x benches – 30 seats – R19 500 per seat = R585 000
• Grandstands – R39 000 per seat – 1200 seats = R46 800 000
• Parking @ 3000m ² - R650 per m ² = R1 950 000
• Security building @ 9m ² - R2 800 per m ² = R25 200
• House @ 100m ² - R6 500 per m ² = R650 000
Total estimated cost of football facilities = R61 575 000

Education centre:
• Research centre @ 50m ² - R7 600 per m ² = R380 000
• Library @ 50m ² - R7 600 per m ² = R380 000
• Seminar room @ 50m ² - R7 600 per m ² = R380 000
• Classrooms @ 100m ² - R7 600 per m ² = R760 000
• Ablutions @ 25m ² per bathroom (male and female) – R8 100 per m ² = R405 000
• After-care hall @ 50m ² - R7 600 per m ² = R380 000
• Storeroom @ 12m ² - R2 800 per m ² = R33 600
• Parking @ 1500m ² - R650 per m ² = R975 000
Total estimated cost of education centre = R3 693 600

Public facilities:
• Covered outdoor seating area @ 100m ² - R300 per m ² = R30 000
• 2x netted 5 aside football fields – R400 000 per field = R800 000
• Retail @ 125m ² - R9 100 per m ² = R1 137 500
• Ablutions @ 25m ² per bathroom (male and female) – R8 100 per m ² = R405 000
• Parking @ 400m ² - R650 per m ² = R260 000
Total estimated cost of public facilities = R2 632 500
Total estimated cost of project = R67 901 100

Monthly revenue estimate:

• Retail shops rent @ R15 000pm – x5 shops = R75 000pm
• 5 a-side football courts @ R250 per team per game – R500 per field per game – x14 games per day = R14 000pd – x30 days = R420 000pm
• Restaurant rent = R25 000pm
• Tuck Shop rent = R5 000pm
• Parking entrance fee for weekends during matches @ R5 per car – x320 cars = R1 600pw – x4 weeks = R6 400pm
• Players subs @ R1 500 per player per year – x230 players = R345 000 / 12 = R28 750pm
Total estimated monthly revenue = R560 150

Monthly expenses estimate:

• Staff salaries = R49 000
• General maintenance and utilities = R30 000
Total estimated monthly expenses = R79 000

Architectural fees:
Medium complexity build
Secondary fee calculation
 $(R67\ 901\ 100 - R40\ 000\ 001) \times 10,59\%$
 $= R2\ 954\ 726,38$
Professional fee calculation
 $R4\ 493\ 209,93 + R2\ 954\ 726,38$
 $= R7\ 447\ 936,31$

Return on Investment:
Total estimated building cost = R67 901 100
Total estimated architectural fees = R7 447 936,31
Total monthly income = $R481\ 150 \times 12\ \text{months} = R5\ 773\ 800$
 $R75\ 349\ 036,31 / R5\ 773\ 800 = 13,1$
It will therefore take 13 years to achieve a return on the investment.

8.4 IMPLEMENTATION:

Procurement:

The project will require a professional team from the outset to mitigate any potential issues that may arise. The principal agent for the project will be the architect as it is a new project, and the architect will have a great understanding of the project and the works that need to be done and will be able to consult with the building contractors. A professional consultant will manage all the other consultants. A main contractor will lead the construction team throughout the build, overseeing and managing his builders and inspecting the works to ensure quality of work as well as ensuring timelines are met. A project manager will oversee the main contractor and all sub-contractors that are coming onto the site, the project manager will be responsible for ensuring quality work, planning and co-ordination of materials and equipment between contractors, safety precautions, timelines being met, and good conditions of the site.

Due to the scale of the project a quantity surveyor will oversee cost control. The quantity surveyor will measure the value of the works in progress and determine the value of variations ordered by the project manager.

A structural engineer will be required to design or consult on the design of the foundations and structural systems of the buildings to ensure it is the best and most economical design for the buildings. The engineer will spec all structural components to meet their calculations and ensure the structural safety of the build.



A town planner will be required for the sub-division of the site. The site is currently a large open public space (539 793m²), the project will however only be focused on the area of and around the existing football club facilities of Linhill Celtic. Thus a proposed sub-division drawing will need to be done by the town planner to be sent to the City of Johannesburg council for approval. In additional, the town planner will need to apply for rezoning for a mixed use building to allow for the new development.

Contracting Methods:

The proposed contracting method is a traditional design-led contract. The architect will prepare all the relevant architectural drawings for the client to approve. The client will then go through the drawings and if the client is happy with the proposals the client will approve. Thereafter the architect will complete the full set of construction documentation and the drawings will be sent out to multiple contractors for tender. The client will then evaluate all the quotes sent through by the different contractors and choose the contractor that fits the project best based on experience, portfolio, cost, and references. The main contractor and sub-contractors will then be constructed, and a specification document issued that will highlight all important information like materials, coordination, best practice solutions, site safety protocol, timelines and site preparation.

Construction Methods:

Once all approvals are in place site preparation can begin to get the site ready for construction. The first step will be to fence off the site from the public, this is done for safety protocol as well as security measure to ensure no equipment or valuables are stolen while the workers are not on site. The fencing will have lockable gates to lock up the site but also allows access into the site during construction hours. After the site has been fenced off the site can start being cleared, any things that need to be demolished will be demolished and cleared from the site leaving a clean site for construction to begin. All temporary utilities, offices and storage will be set up for the project and construction can commence.



8.5 CONCLUSION:

The project proposal will reimagine the idea of a typical football club in South Africa, by responding directly to one of the largest issues we face in the country. It is a project that is driven by community integration, social interaction, opportunity, and landscape rebuilding. The proposed clients would be perfect candidates for the project as the project meets each of their goals and objectives. The project was also designed to be very practical and achievable in its design technologies, and with the procurement of the correct professional team the project can be a great success in the southern Johannesburg context. Let's bring opportunity and hope to the future economic force of the country and solve the unemployment issue that has been rapidly increasing in South Africa.

09

9.1 CHARETTE:

The first stage of the design development was the charette design. For my charette i analysed the typical formation of a football match and school classroom. Sketches were done for the formations of 2 football teams playing against each other - the one side was playing with a 3-5-2 formation while the opposing team fielded a 4-5-1 formation. I then linked the positions together which brought about triangular shapes/forms, in a football match we refer to this as playing in a 'triangle' with your teammates.

I did the same analysis with a typical school classroom and linked the layout which also formed triangular and square forms. This was carried onto a 3 dimensional model to understand the analysis as a form, and i used different heights based on player positions and hierarchy in the classroom and when looking at the model from a side view you get a form that when linked together has a triangular form which fluctuates in heights.

From the charette and the analysis of formation in sport and education, the triangular form that came about became my concept for the form and connections of my buildings.

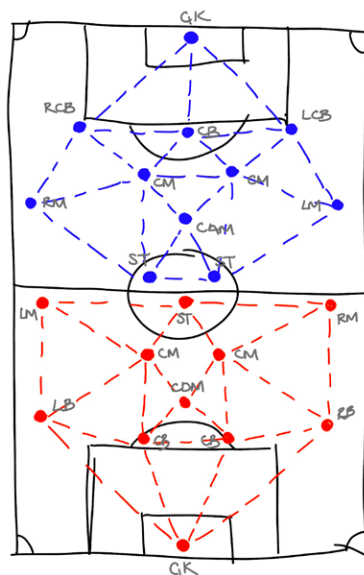


Figure 104: Formation sketch (M Rainho, 2024)

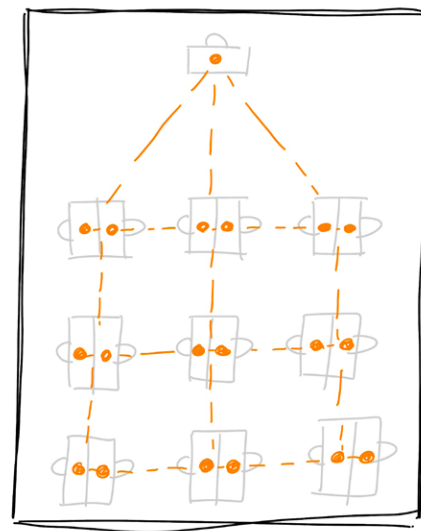


Figure 105: Formation sketch (M Rainho, 2024)

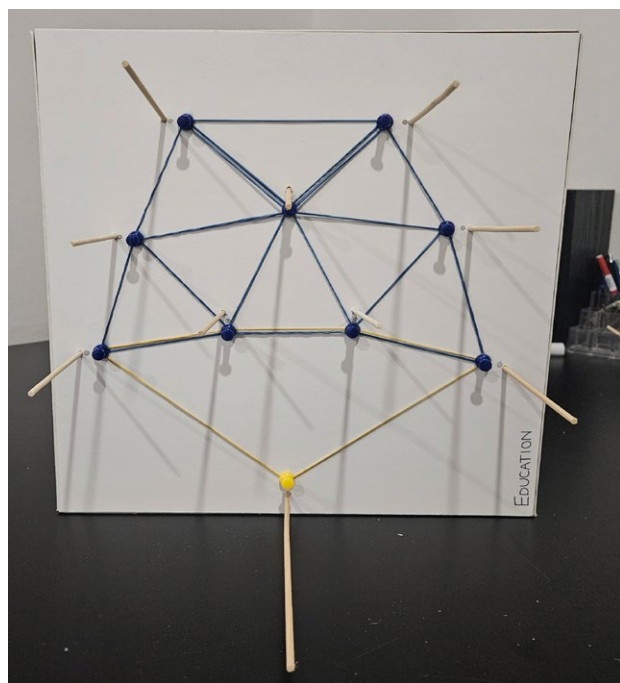


Figure 106: Charette model (M Rainho, 2024)

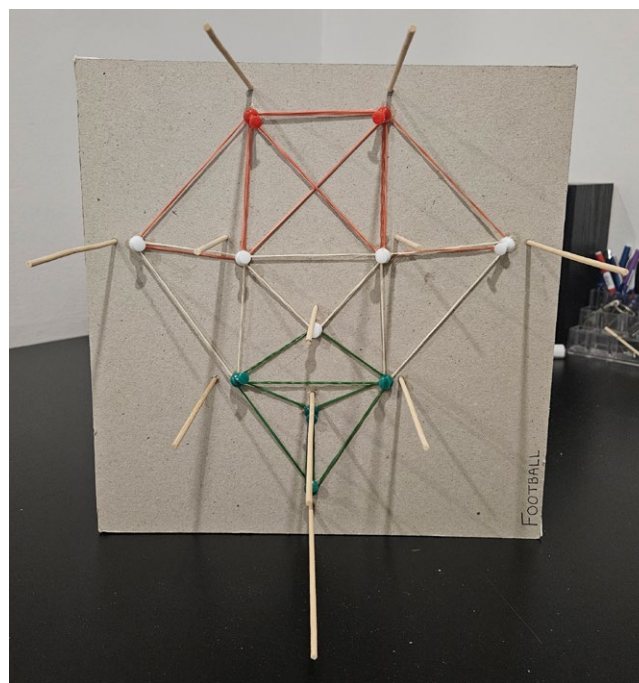


Figure 107: Charette model (M Rainho, 2024)

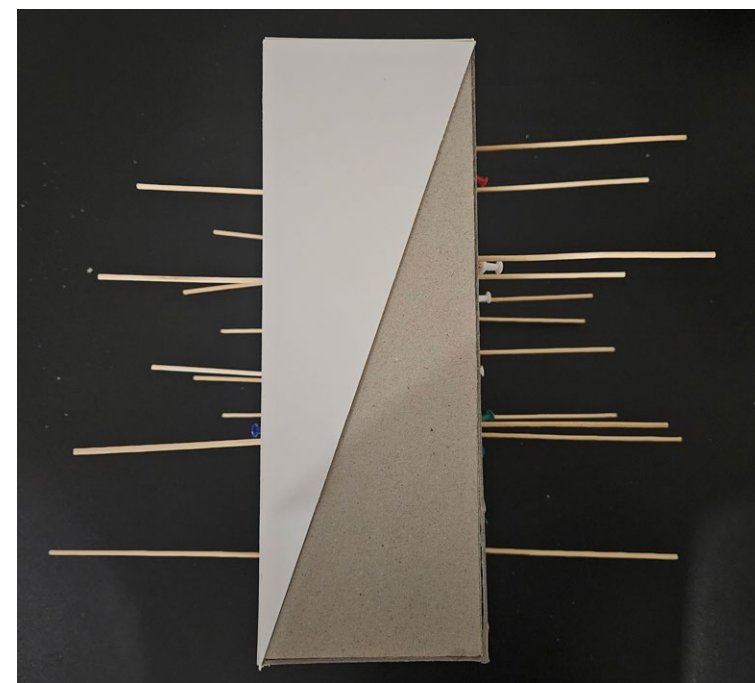


Figure 108: Charette model (M Rainho, 2024)



9.2 CONCEPTUAL MAPPING:

After the charette i began conceptually mapping out forms and links on site. I linked my site to surrounding programs that relate to my project (schools, retail, public spaces), which when analysed brought about a potential angular form that could become a roof/facade design. I explored the forms that are generated by linking the roads around the sitem which also brought up triangular geometries. By analysing climatic conditions, visibility lines. circulation, links on site, and orientation i came to a conceptual site plan of my buildings around the site that can be developed into the design of my buildings.

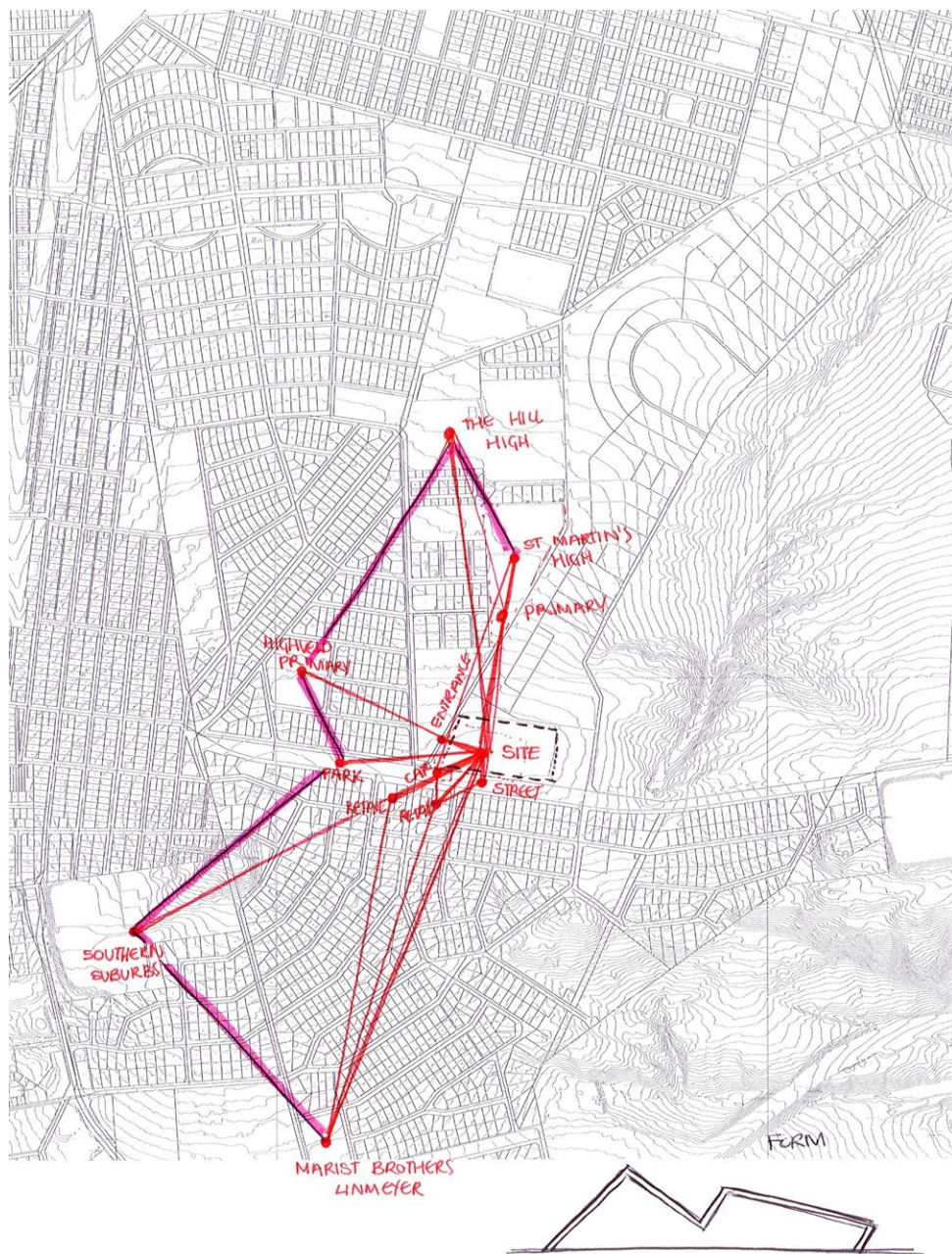


Figure 109: Map analysis (M Rainho, 2024)

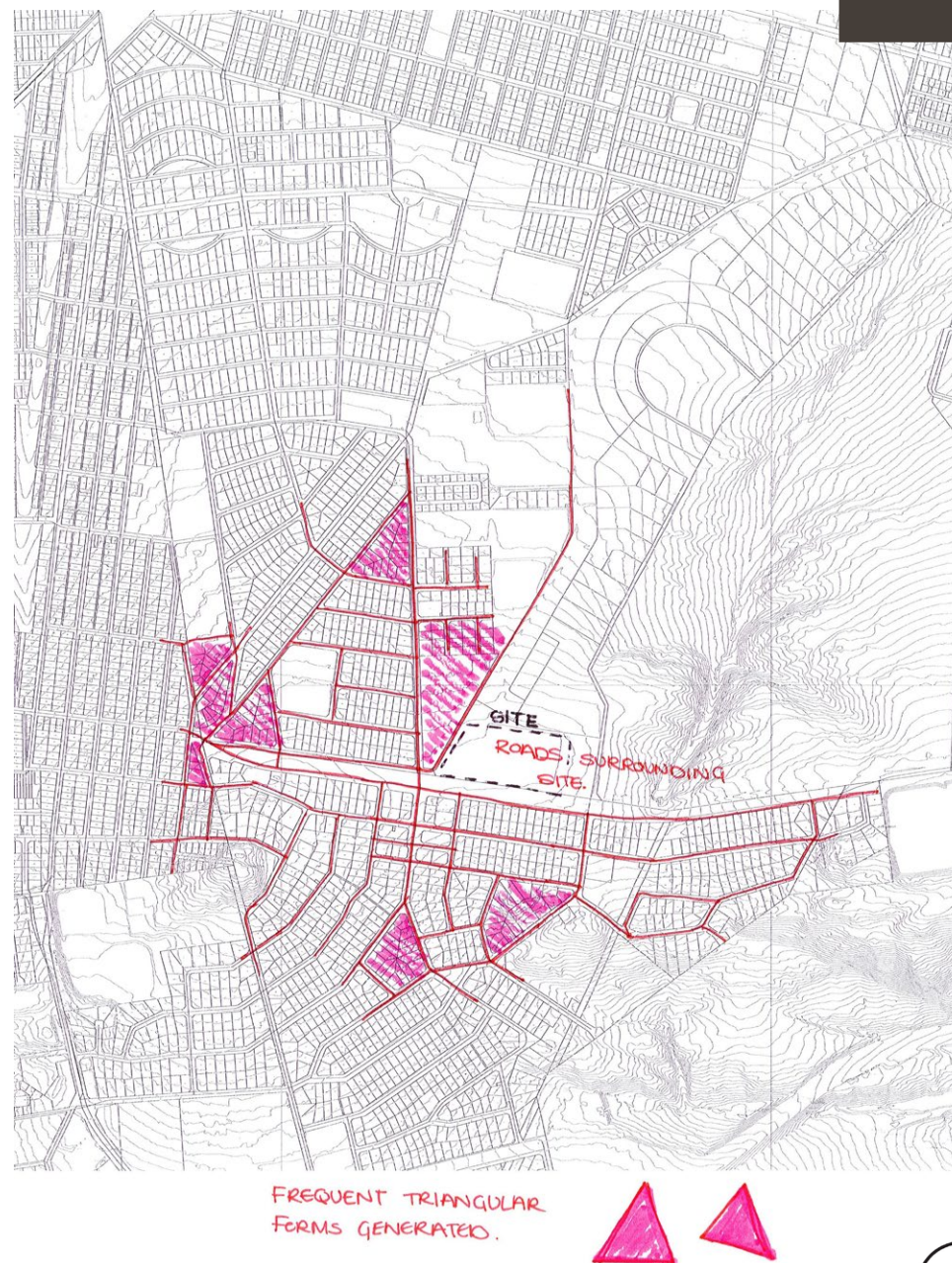


Figure 110: Map analysis (M Rainho, 2024)



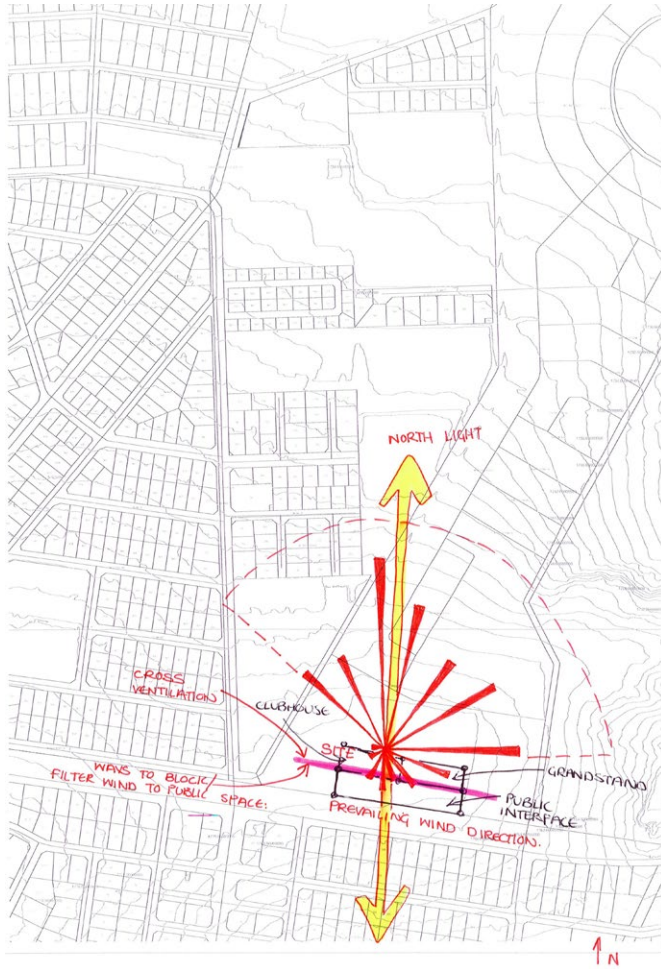


Figure 111: Map analysis (M Rainho, 2024)



Figure 112: Map analysis (M Rainho, 2024)

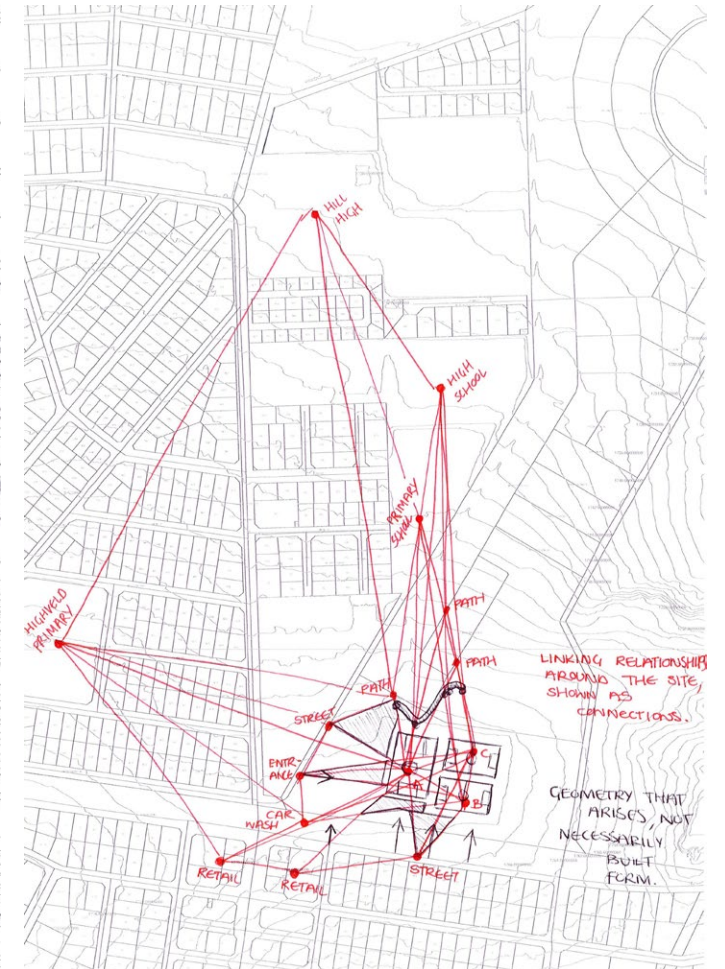


Figure 113: Map analysis (M Rainho, 2024)



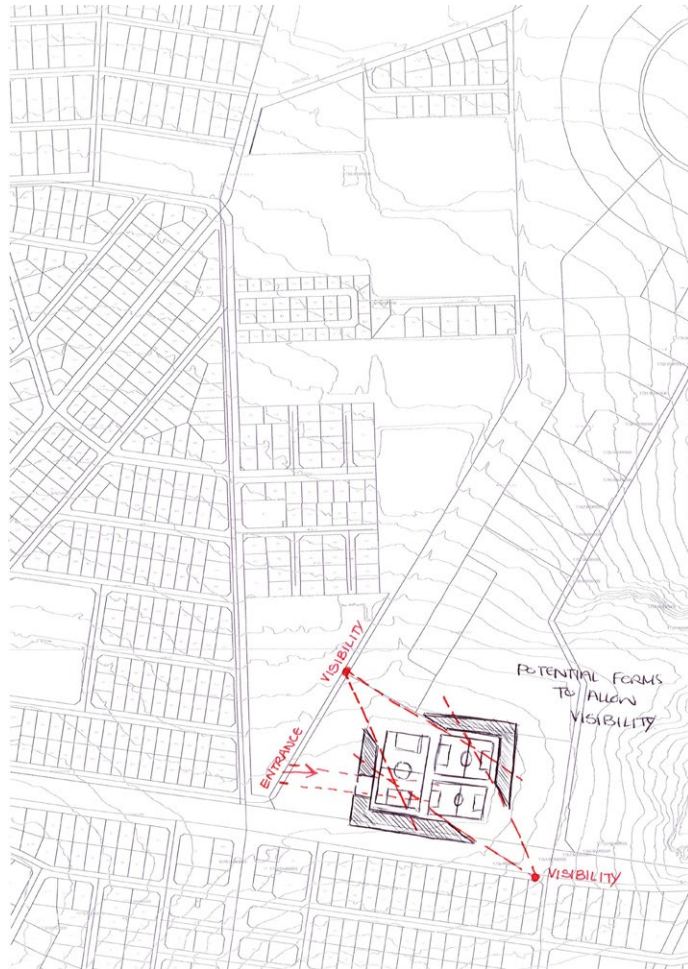


Figure 114: Map analysis (M Rainho, 2024)



Figure 115: Map analysis (M Rainho, 2024)



Figure 116: Map analysis (M Rainho, 2024)





9.3 CONCEPTUAL SKETCHES:

After analysing and exploring my concept of 'formation', the common outcome was the triangular form/geometry. I then began to do conceptual sketches using the triangular form and implementing it into potential facade designs, structural components, roofs, and screens. The conceptual sketches also begin to look at the site in section to understand the levels and conceptualise the use of levels for thresholds and links to different programs, i also began exploring the link of my site to the street conditions. Lastly, i started sketching the way people will interact with the buildings and the visibility points from the different levels.

Figure 117: Conceptual sketches (M Rainho, 2024)

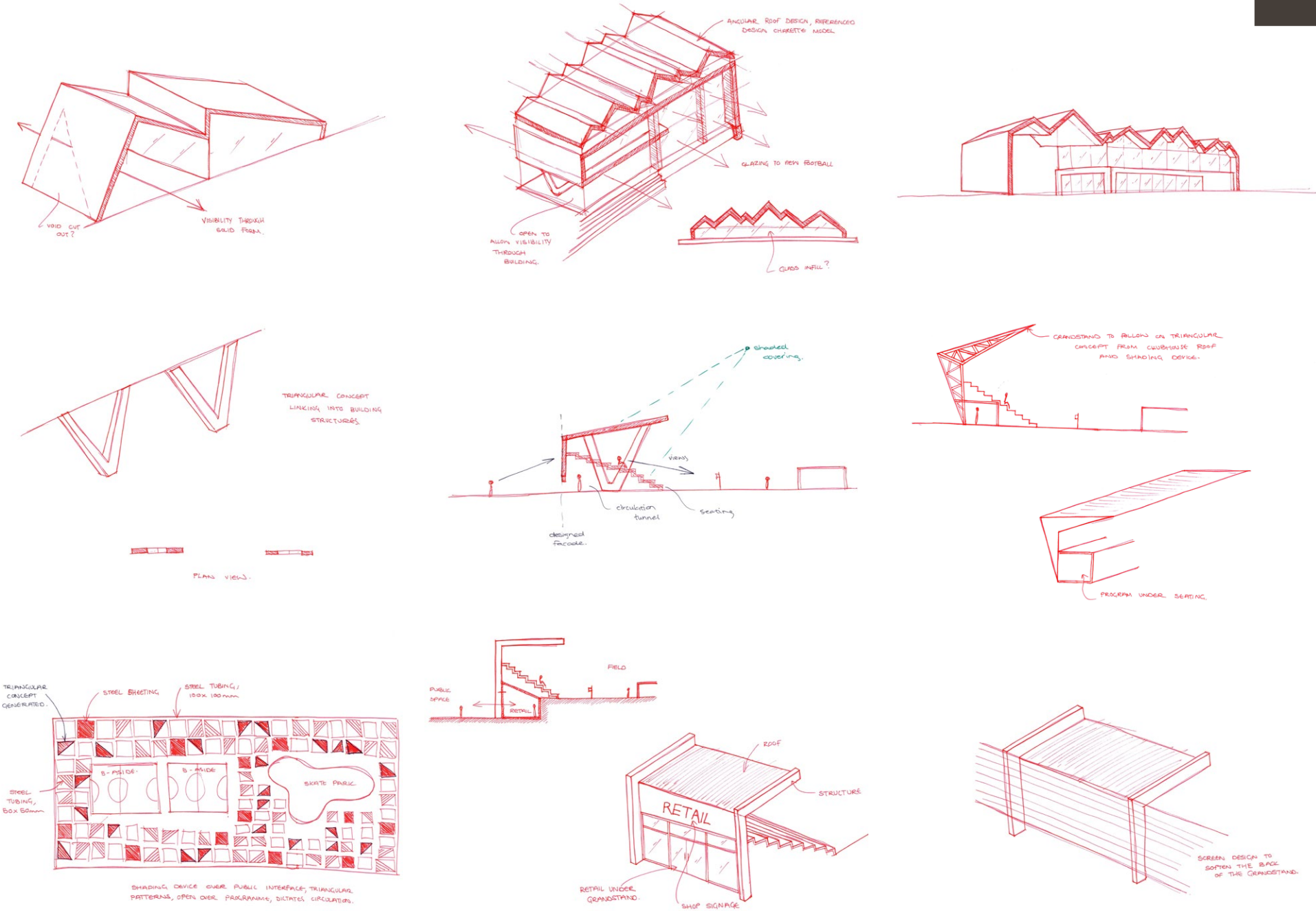
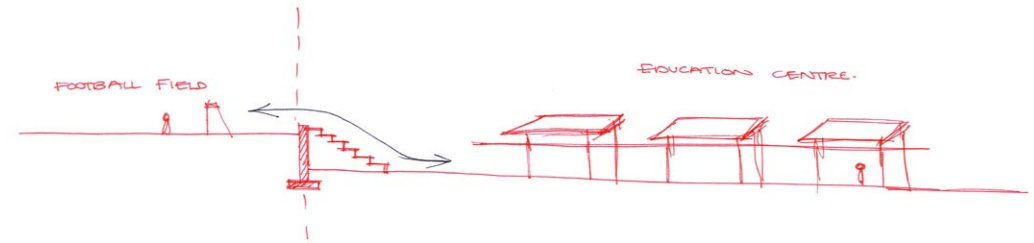
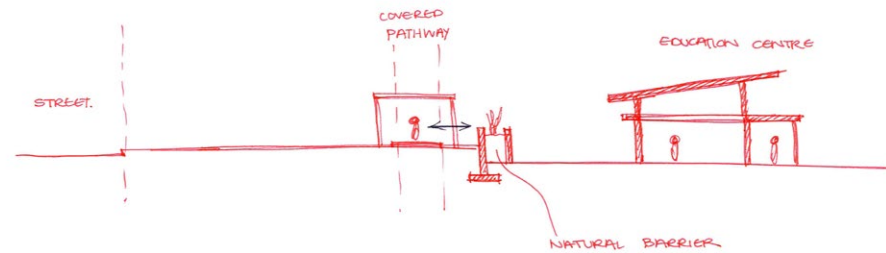
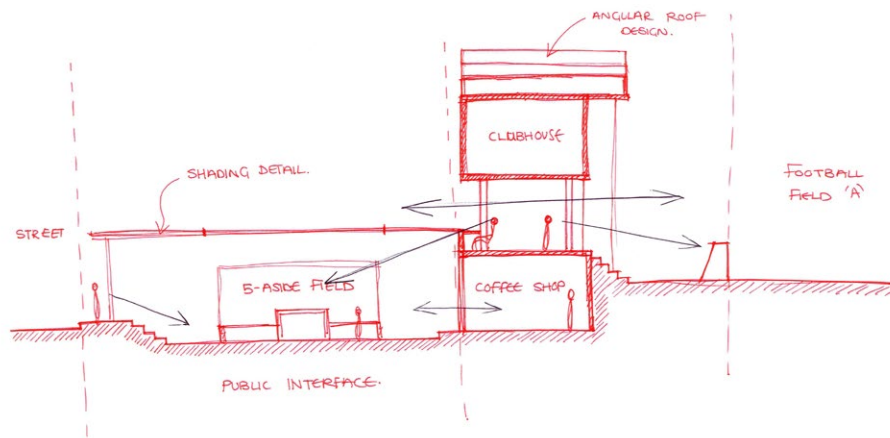
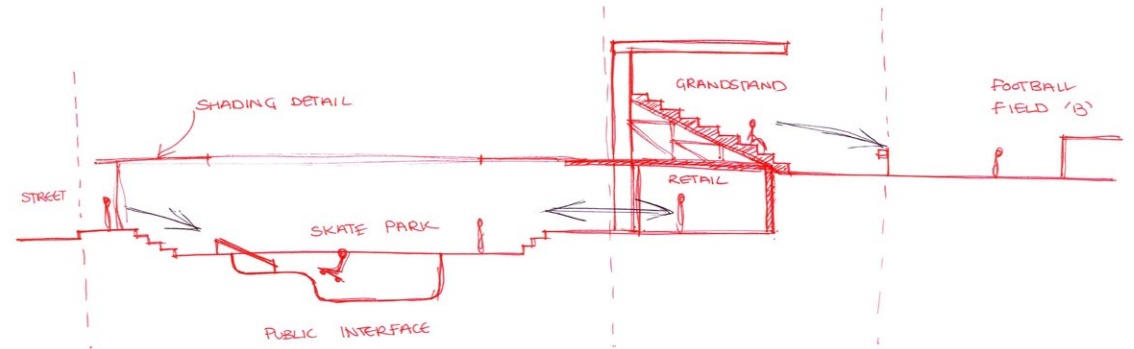
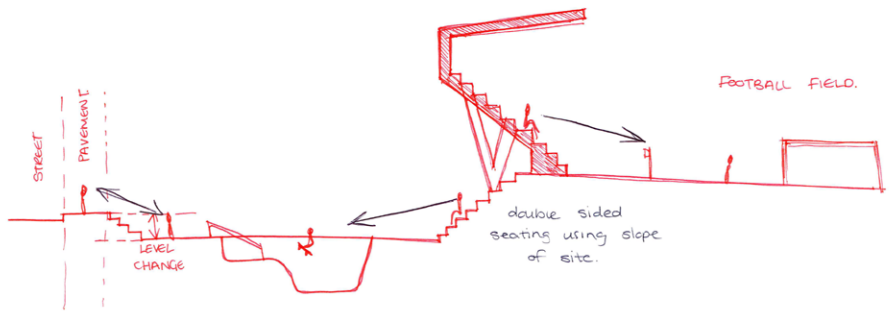


Figure 118: Conceptual sketches (M Rainho, 2024)



9.4 REVIEW 3:

Review 3 explored the design of the project looking at the layout in both plan, section, elevation and 3 dimensionally. The building program was placed in plan in the layout that came about from my analysis and conceptual sketches of the building in its landscape. The concept started to come through in the design language of the building which explores the angular forms that came about from the charette and conceptual sketches, this design language was further explored in the technical workshop which took my design concept and technically developed it to understand the construction techniques that would work best for the structural system.



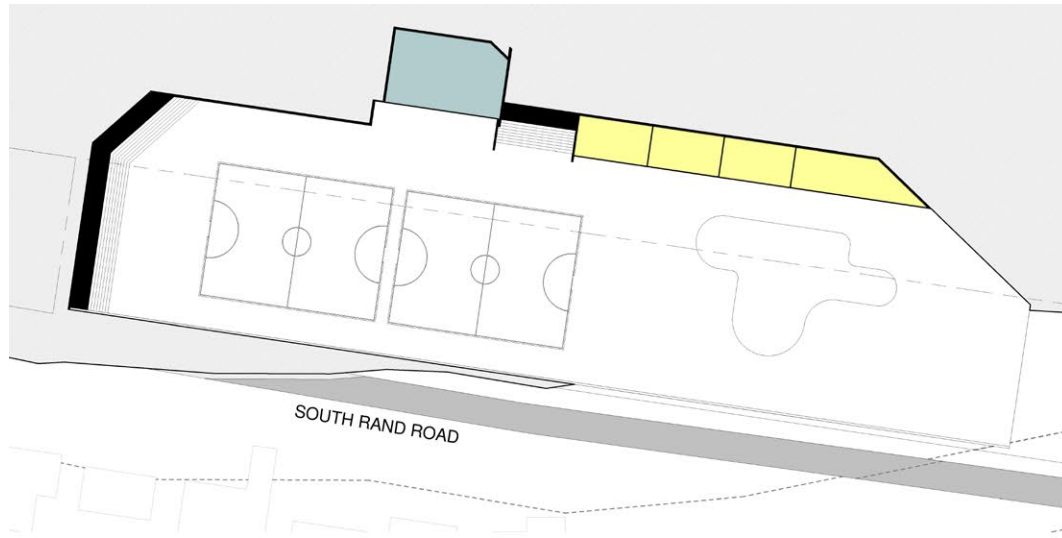
Figure 119: Review 3 (M Rainho, 2024)



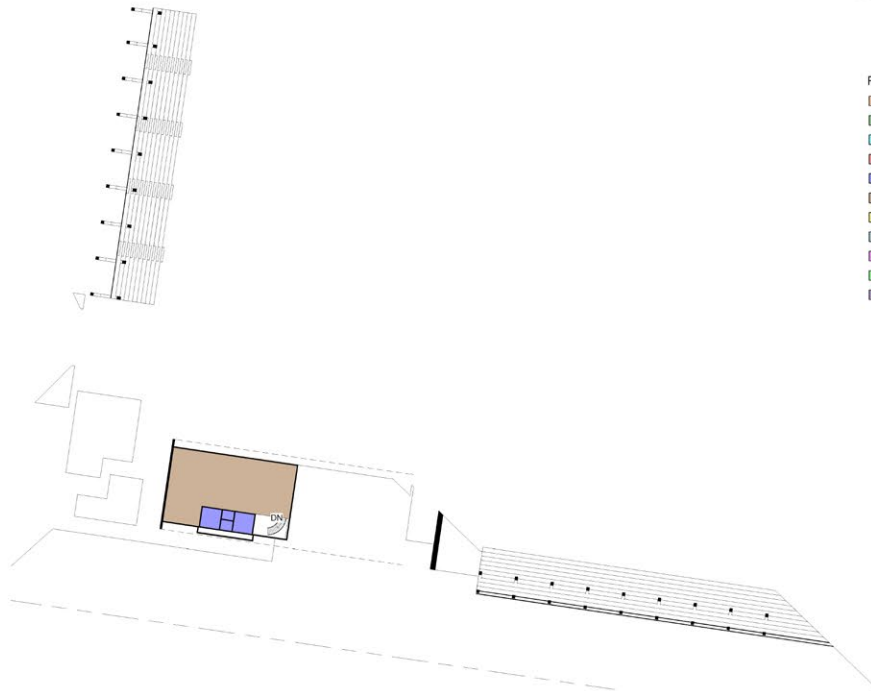
Ground Floor Plan

1 : 500

Figure 120: Review 3 (M Rainho, 2024)



Lower Ground Floor Plan
1 : 500



First Floor Plan
1 : 500

- Program:**
- Clubhouse
 - Kitchen
 - Changeroom
 - Storeroom
 - Abutions
 - Administration
 - Retail
 - Coffee Shop
 - Education Facilities
 - Accomodation
 - Tuck Shop

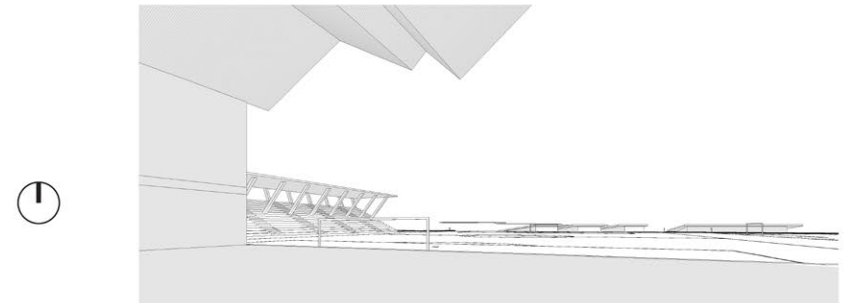
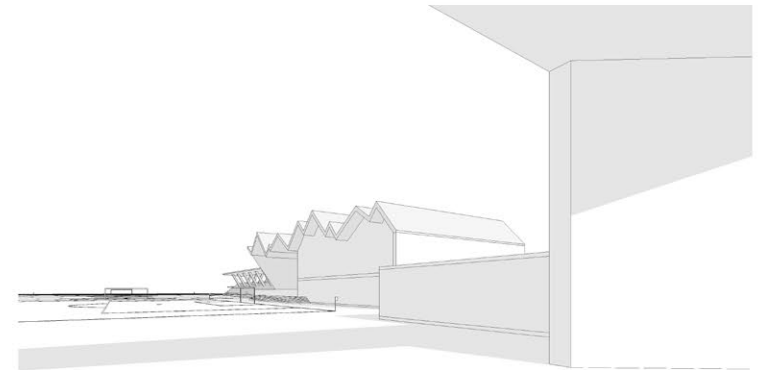
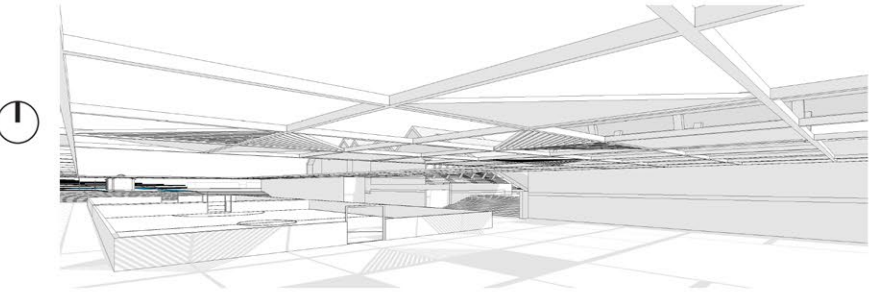
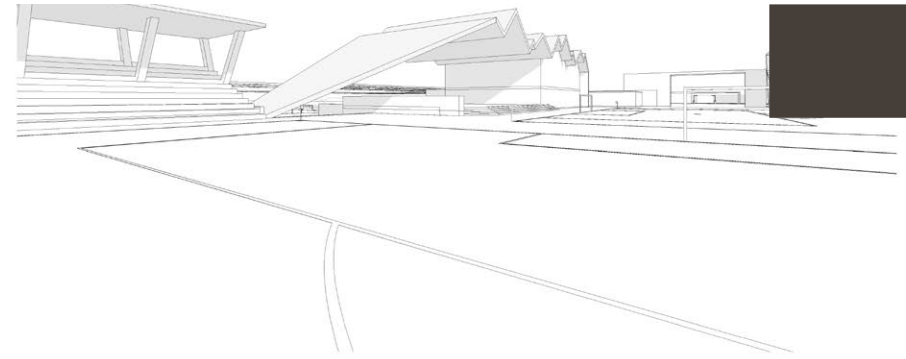
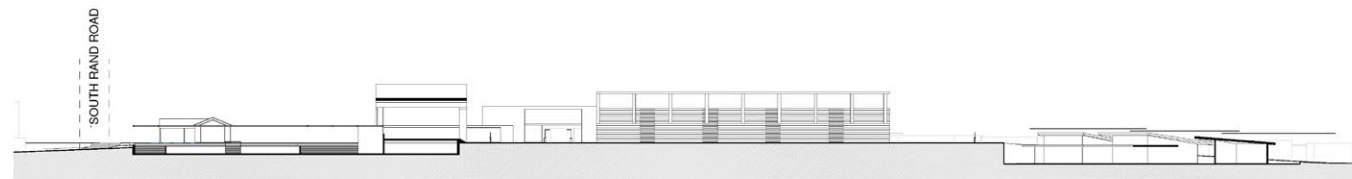
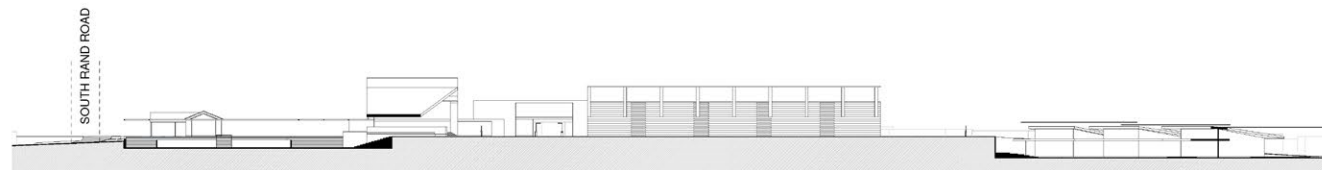


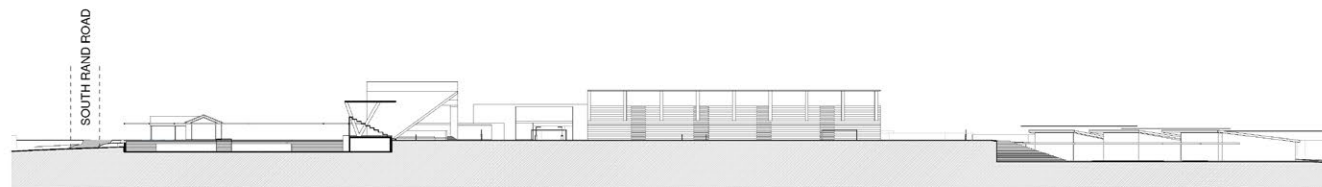
Figure 121: Review 3 (M Rainho, 2024)



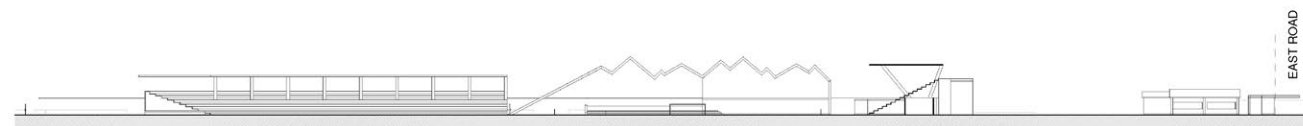
Section AA
1 : 500



Section BB
1 : 500

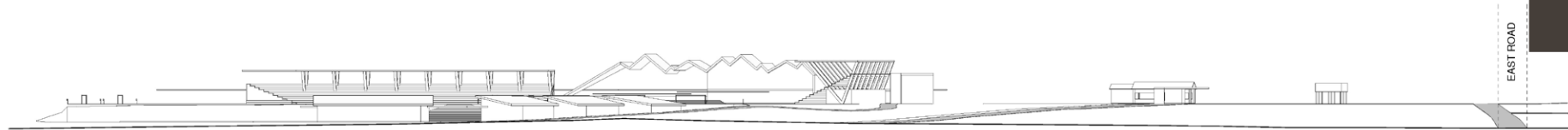


Section CC
1 : 500

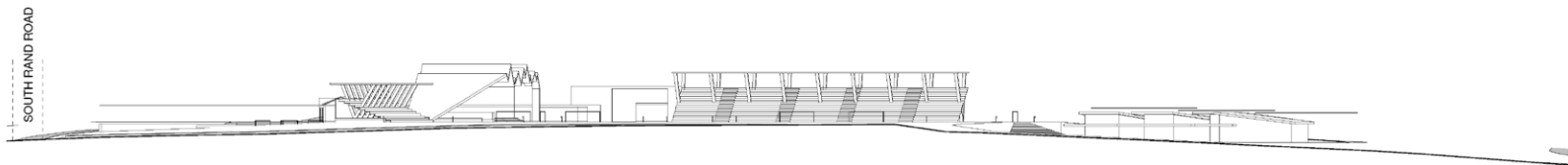


Section DD
1 : 500

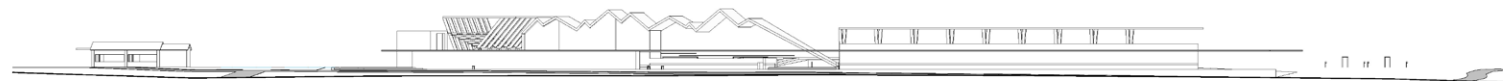
Figure 122: Review 3 (M Rainho, 2024)



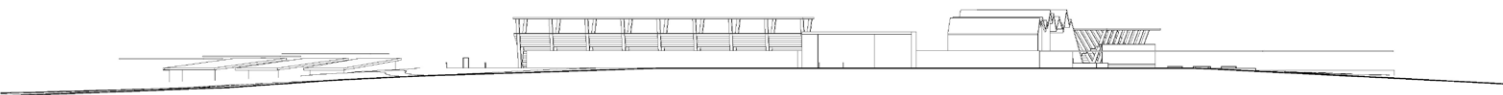
North
1 : 500



East
1 : 500



South
1 : 500



West
1 : 500

Figure 123: Review 3 (M Rainho, 2024)

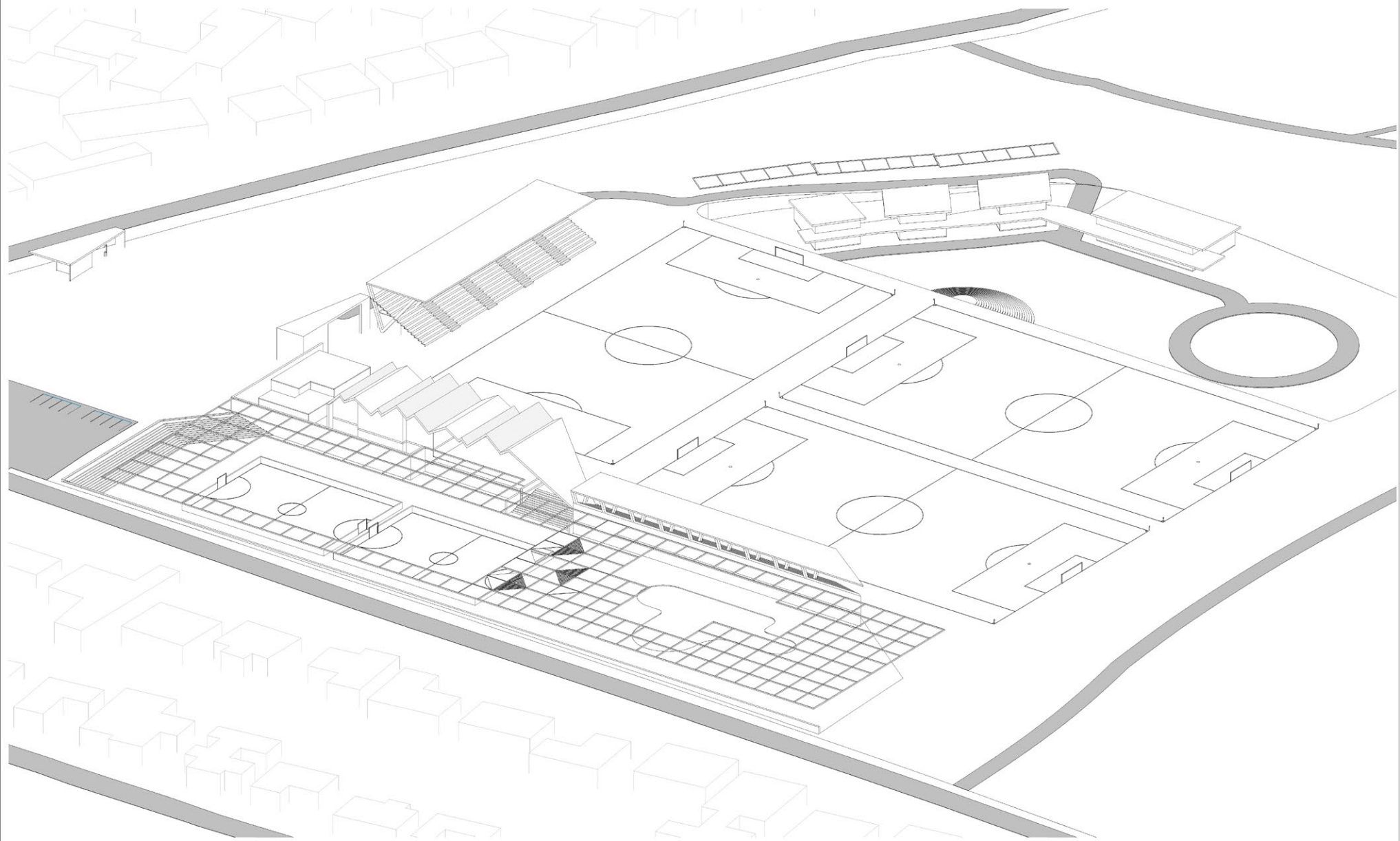


Figure 124: Review 3 (M Rainho, 2024)



9.5 TECHNICAL WORKSHOP:

The technical workshop allowed me to explore my concept and understand the materiality of the building. The conceptual phase brought about the concept of my building and the design which explored the angular forms and geometries. Thereafter in the technical workshop i got an understanding of the construction of the building and the materiality that would best suit this type of construction. The workshop also brings about design changes based on limitations and structural spans and details which is visible in the development of the design.

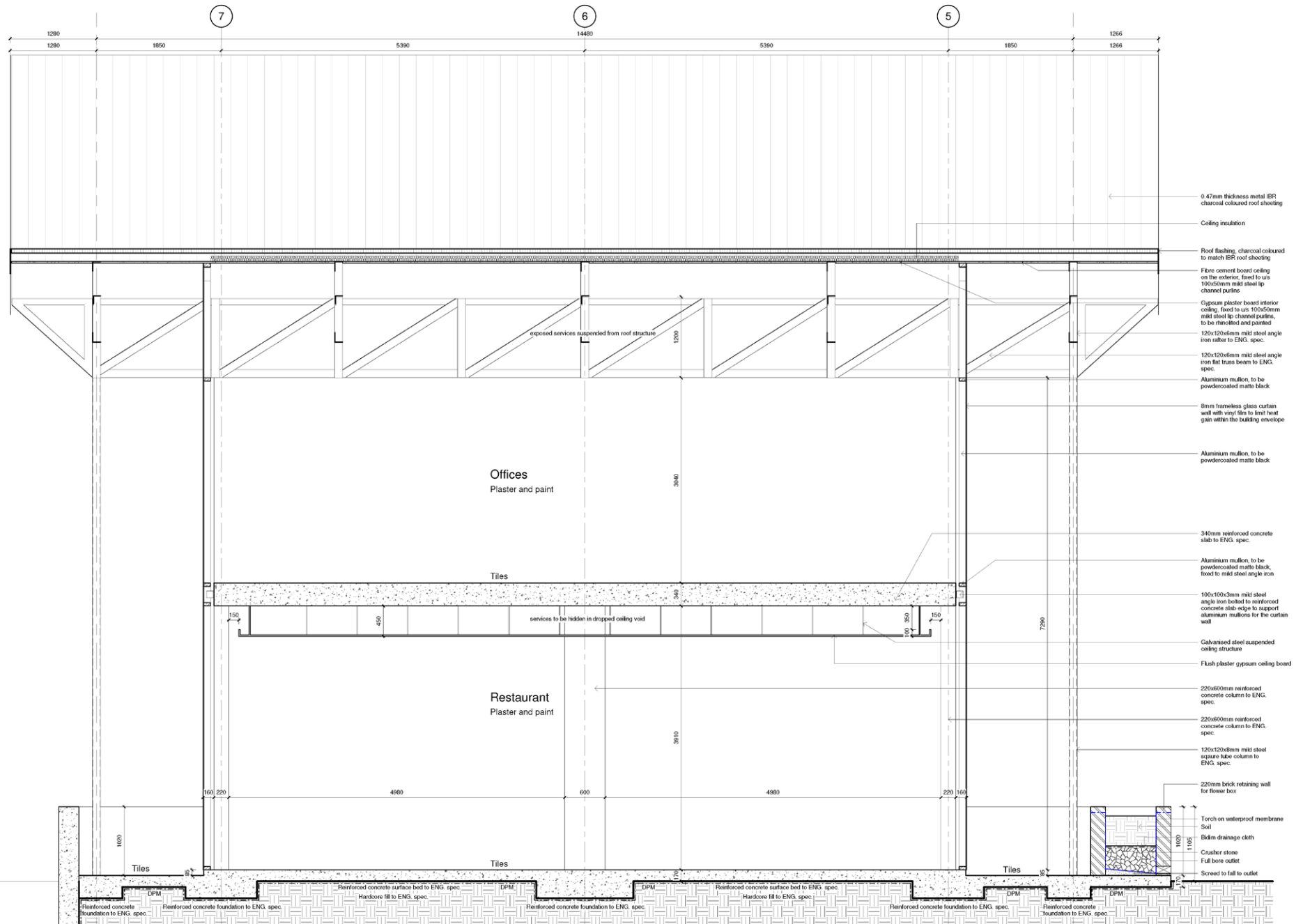
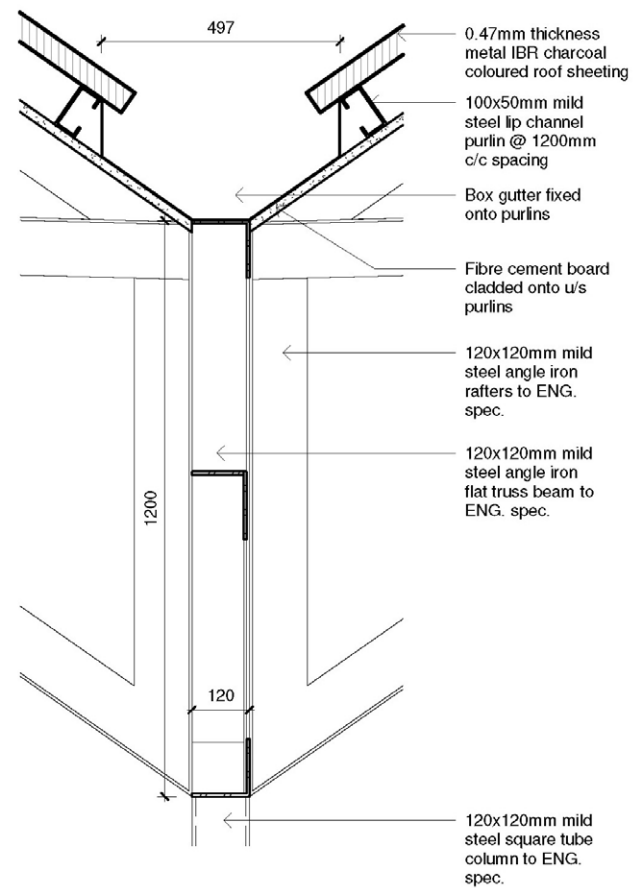


Figure 125: Technical Workshop (M Rainho, 2024)

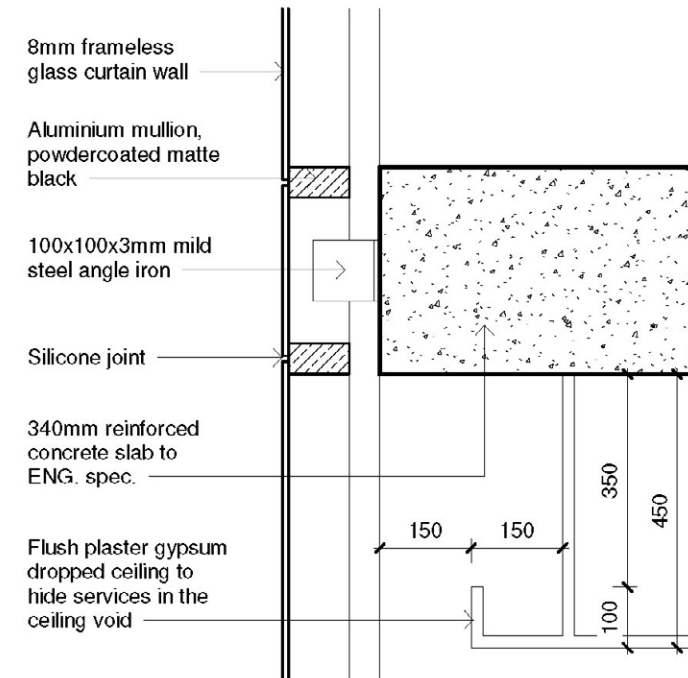


124



Section 2 - Callout 1
1 : 10

Figure 127: Technical Workshop (M Rainho, 2024)



Section 2 - Callout 2
1 : 10

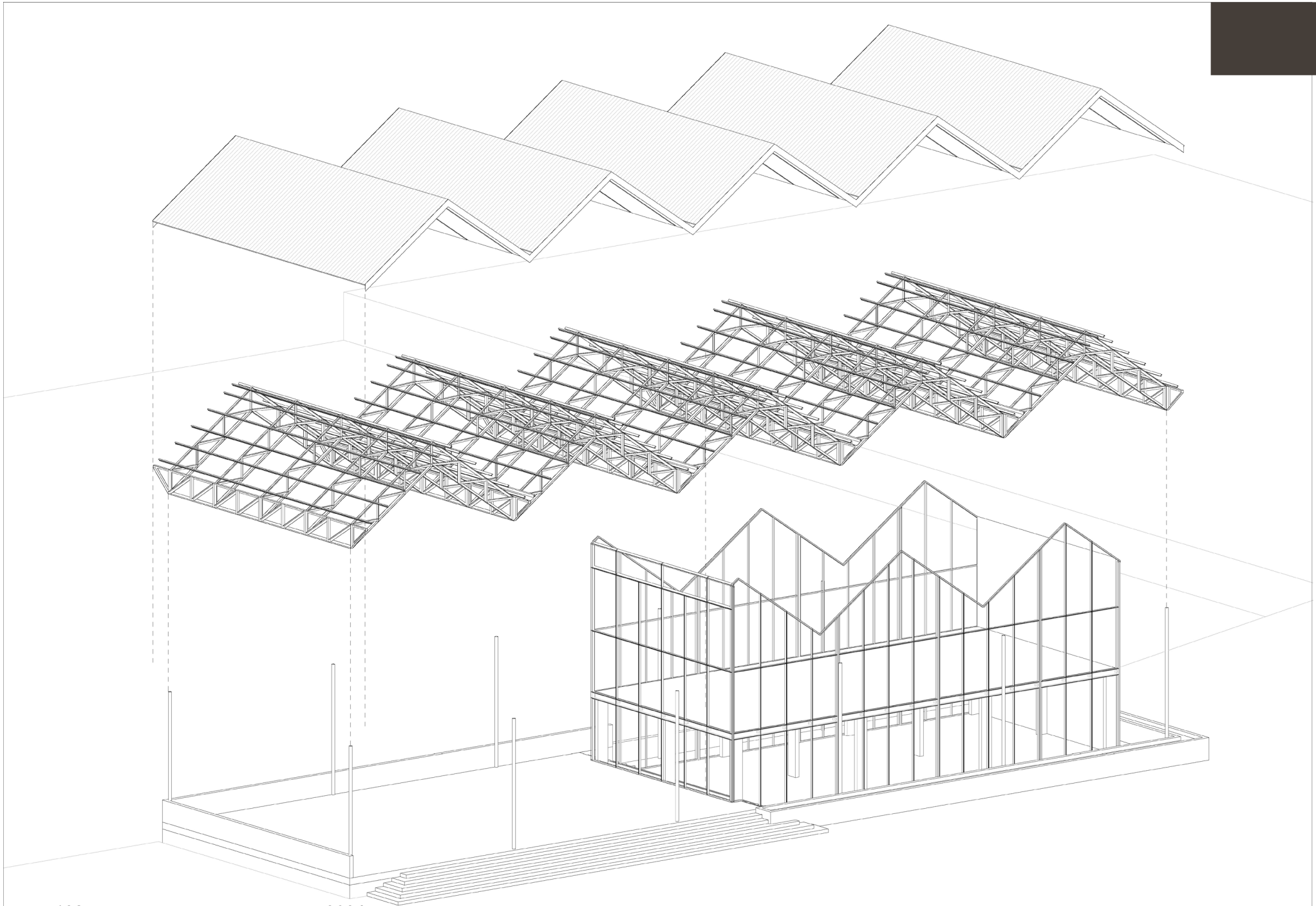


Figure 128: Technical Workshop (M Rainho, 2024)



9.6 DESIGN DEVELOPMENT:

The design developed through constant analysis of the building in its context. Circulation, links to context, connections between programs, street activation, and public vs private were all analysed between the developments of the project to ensure all the listed items are carefully orientated and laid out. Analysis between stages of development ensured a final design that was considered, responds to its context, and links the programs successfully across the site.

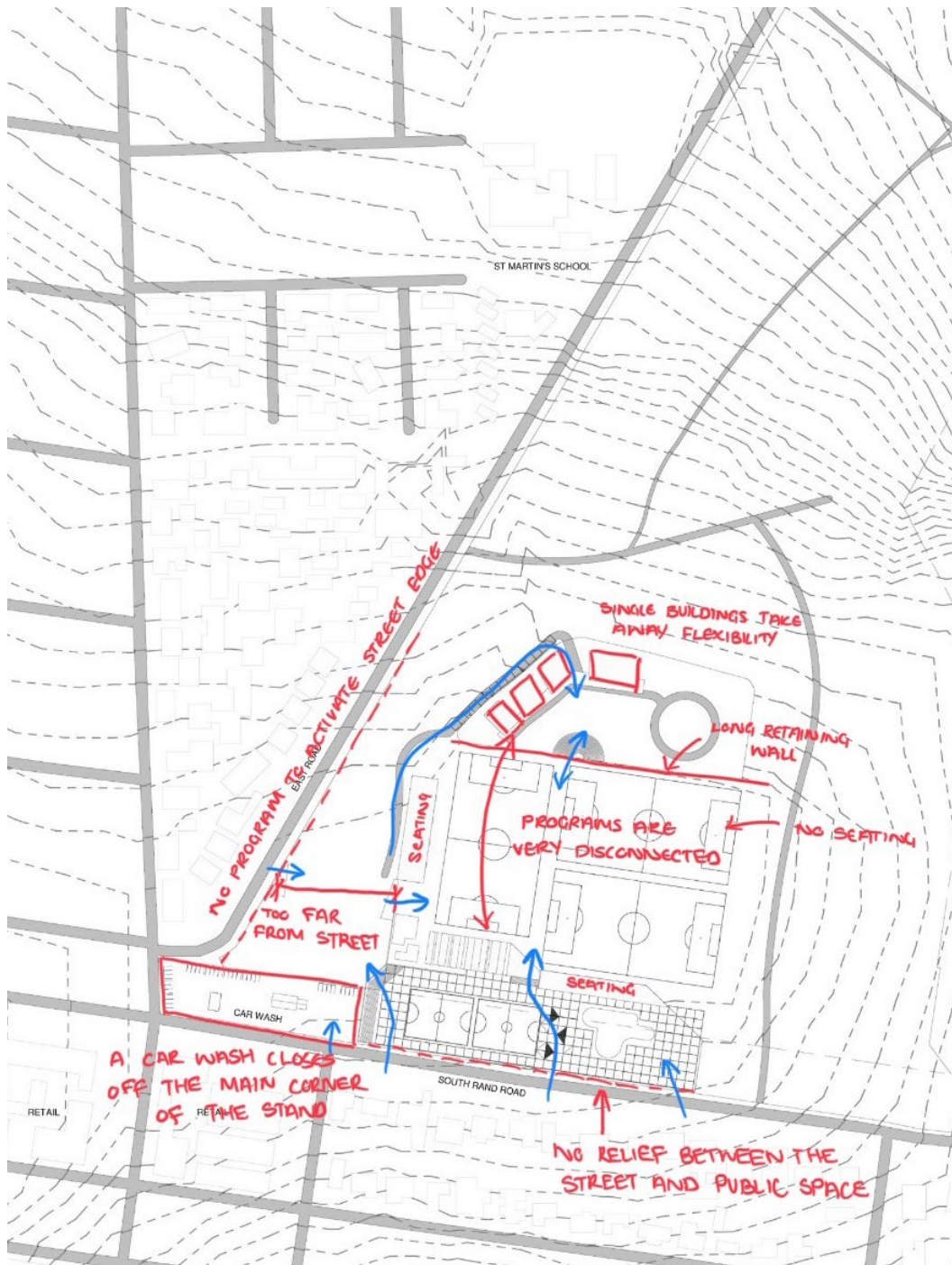


Figure 129: Design Development (M Rainho, 2024)

The analysis at this stage highlighted the need to move the car wash to another area on the site. That corner of the site has edges to 3 main streets, thus the program needs to activate the street edge and promote engagement on the site by the public. A car wash is a closed off and secured area that has controlled activity, this needs to be replaced by a public program that opens up the site to the public to promote public interaction and engagement. The built forms are also positioned too far from the street edge meaning the street is unactivated. When you are walking or driving by there is no connection to activity on the site. The built forms are also very disconnected and do not link to each other, they feel like separate projects placed on the site. The circulation is uncontrolled and there is no separation between public and private spaces.

The developed design moved the car wash off the main corner of the site and opened it up to the public. This made the corner more accessible and opened up a circulation route directly off the streets, however, the corner still needs to be designed and assigned a program or activity. By moving the built forms up to the street activated the street, however, it is too solid and closes the activity on the site off from the public. The built form needs to have cut outs to feel less solid and obtrusive, and generate more circulation routes onto the site for engagement. There is still a large open section off South Rand Road with no program that needs to be considered to activate the street edge and link the football to the public. The football fields have no clear hierarchy or separation between them.

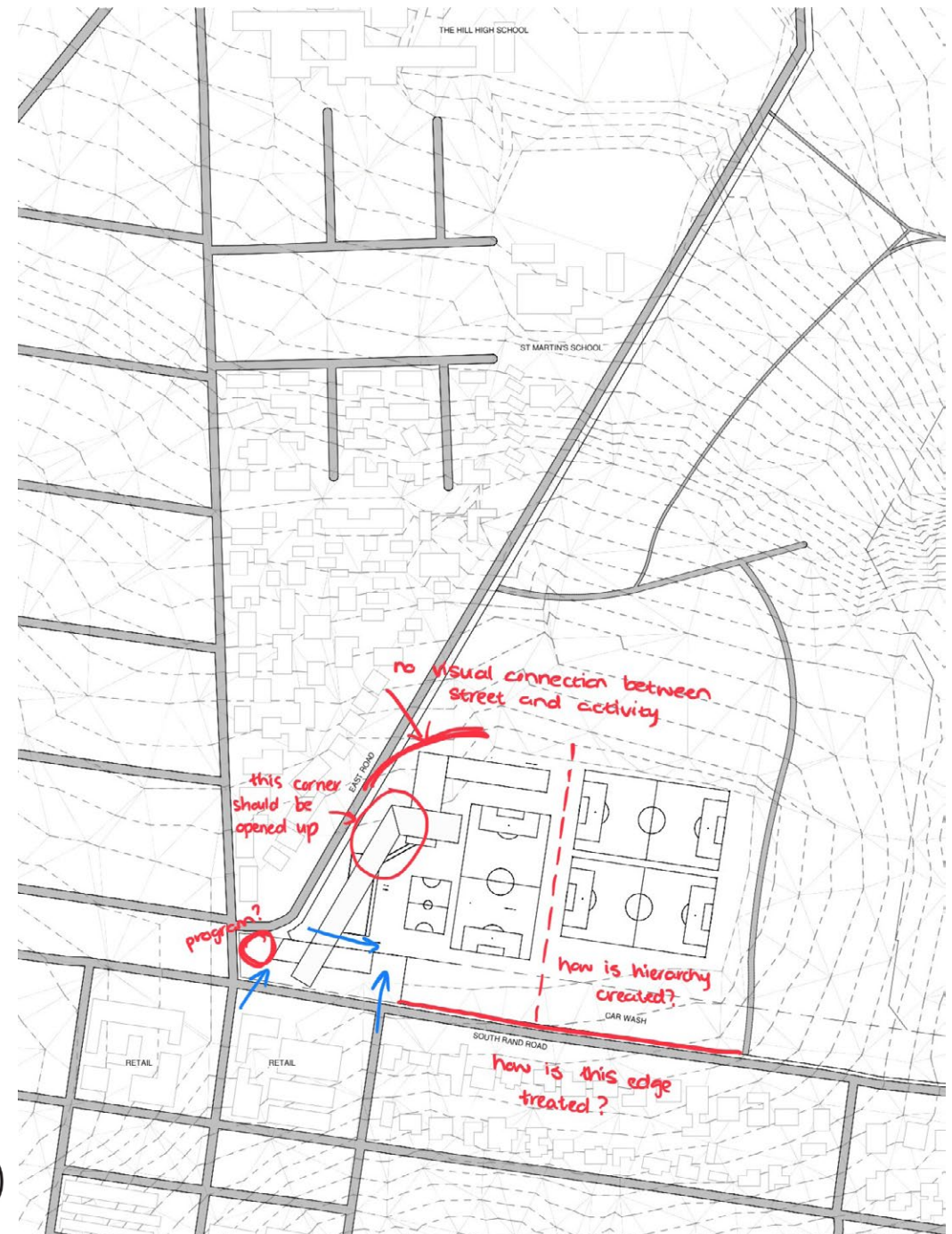
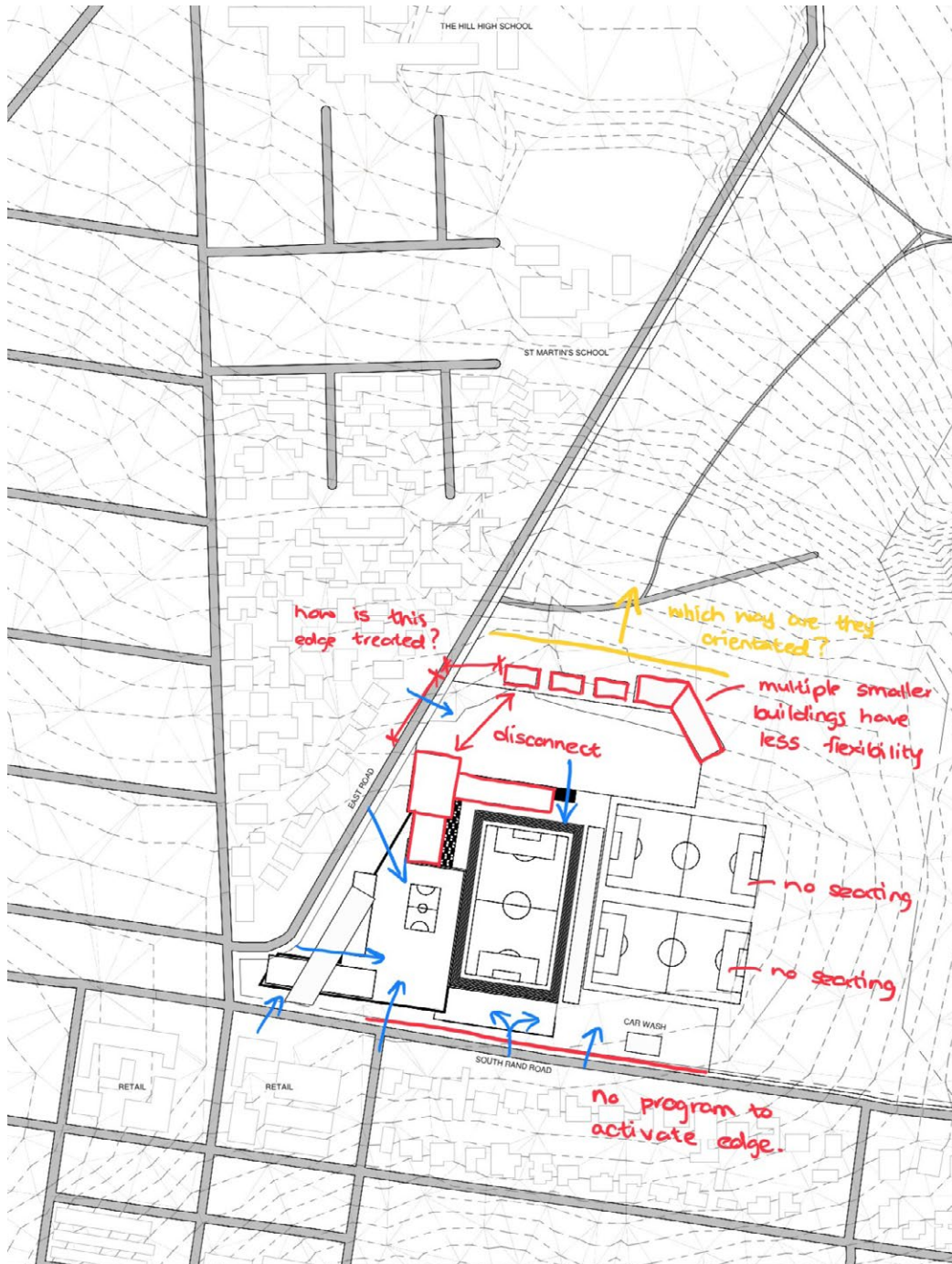


Figure 130: Design Development (M Rainho, 2024)



South Rand Road has a stepped public courtyard accessed off the street to initiate access onto the site from the street, and link the car wash to the new public courtyard and built program.

Cut outs were done in the built form to open up the activity to the public and feel less solid from the street. Hierarchy was created between the football fields, there is now a clear A field with the other additional fields. There is however no seating assigned to the additional fields which needs to be addressed, as on days when tournaments are held all 3 fields will be in full use. There is a disconnect between the education centre and football club facilities, they need to be connected in some way to link the activities. By doing smaller individual classrooms for the education centre has taken away flexibility for any future conversions that may be required. The orientation of the education centre isn't clear, they would either face a parking lot or open land which is not desirable.

Figure 131: Design Development (M Rainho, 2024)

The circulation around the site has been improved, there is a link between the existing retail on South Rand Road and the new retail on the site. The education centre has been changed into 1 larger built form which provides more future flexibility. However, there is still a disconnect between the education centre and the rest of the program on the site.

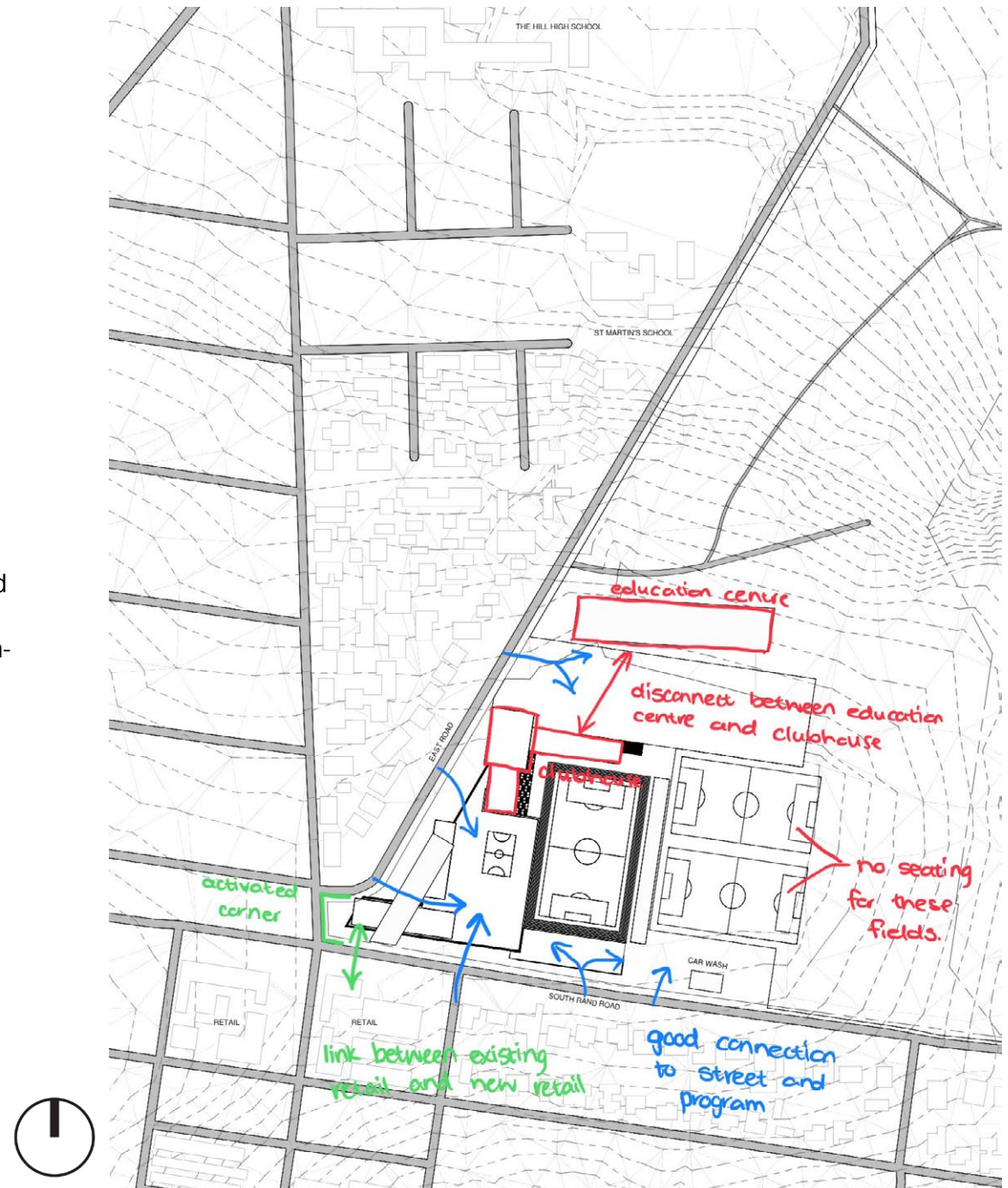


Figure 132: Design Development (M Rainho, 2024)



There is a clearer distinction between the entrance to the football club facilities off East Road and the public space entrance off South Rand Road. The circulation has been improved and there is a better link between program across the site. The education centre has become an extension of the clubhouse building creating the link between activities. There is however still a separation created through the levels on the site, the education centre is at a lower level to the clubhouse which creates a passive threshold between programs. Seating has been assigned to all football fields, still maintaining the hierarchy. The public spaces have been designed but need to be refined and considered.

Figure 133: Design Development (M Rainho, 2024)

The public space has been refined and there is a clear distinction between different floor finish materials. Parking has been added, there is separate public parking for the public amenities and private parking for the football club facilities. There is a clear distinction between public and private areas across the site. The buildings and programs are all connected through the controlled circulation routes.

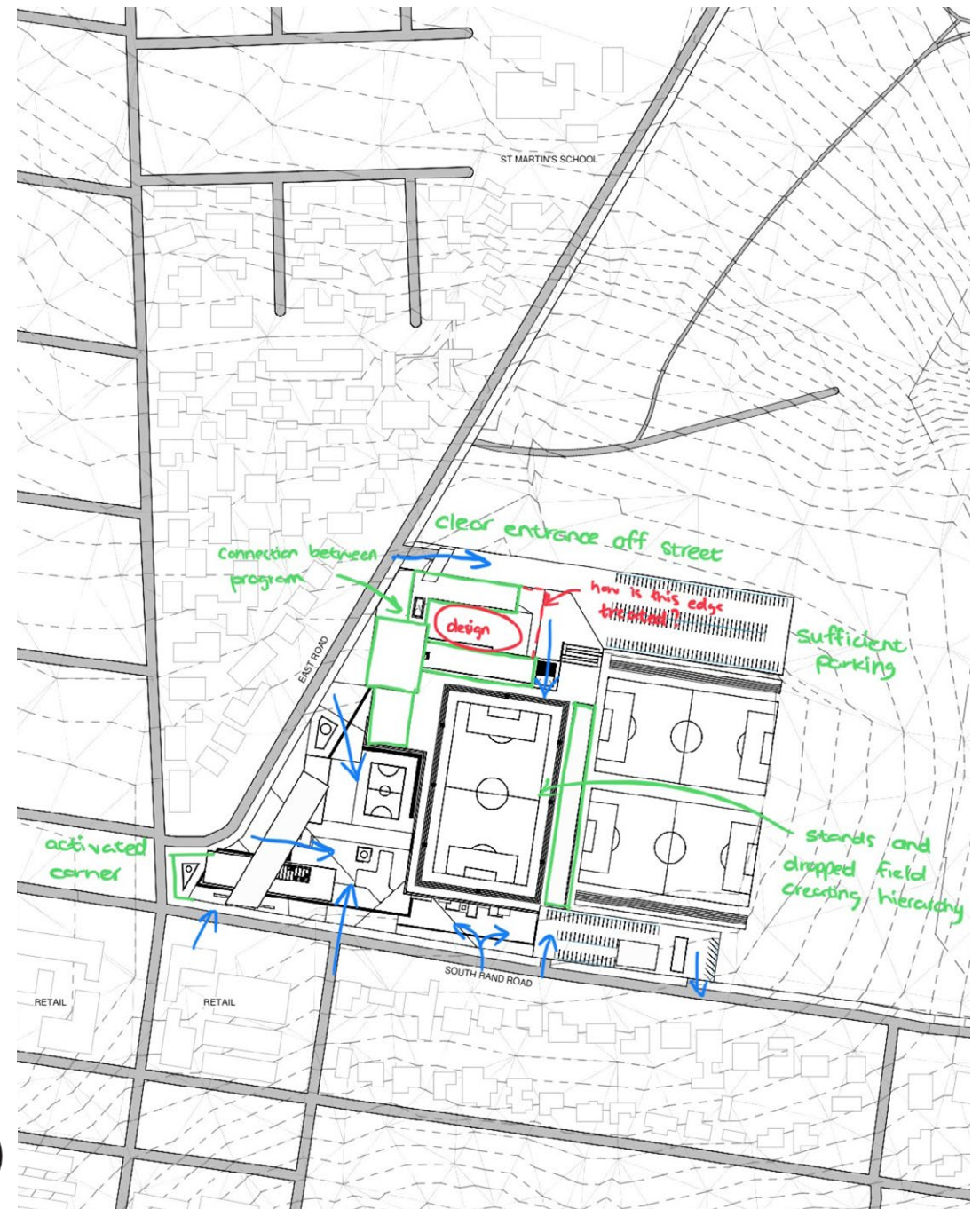


Figure 134: Design Development (M Rainho, 2024)



At this stage of the project the design was working well with the context and site. The program has been finalized together with its orientation and layout. It was down to focusing on final refinement of the floor plans, elevations, sections, and 3D views which will be visible in the final set of drawings.



Figure 135: Design Development (M Rainho, 2024)



9.7 MATERIALITY:

The materiality is an important part of a design project as it not only dictates the aesthetic outcome of the building, but also: dictates the budget of the project, allows the building to blend into the context or stand out from the context, allows technological details to be achieved, and can be a key component in the sustainability of the project.



Figure 136: Building Materiality (M Rainho, 2024)

REASONS FOR CHOOSING THE MATERIAL:

BRICKS:

- is a typical building material in South Africa available in abundance
- bricks are an affordable building material and bricklayers are easy to find
 - it does not require highly specialized and skilled labourers
 - build time is not affected as it is a quick building method
- the surrounding context is made up of residential buildings in which the majority have a facebrick component, thus the brick as a building material ties my design into the surrounding context through linking materiality
- bricks are durable, require little maintenance, and have good thermal insulation values - all of which are important for a public building

CONCRETE:

- the buildings structures are concrete column and slab structures, this structural design was chosen for its versatility, long spans, strength, and common building technology aspect
 - it allows the facades to be freely designed as they are a layer rather than structural component (infill or outer layer)
- it is a common building technology which means it will not affect construction time due to the availability of concrete and re-bar, trades, and engineering designs
- the long spans and column grid arrangement means none of the internal walls are load bearing which creates a building that is very flexible for future changes and development

STEEL:

- steel was used to create the pitched roof details
- the steel truss design allowed me to achieve very long spans over the indoor training facility, a space that cannot have any columns obstructing the field (needs to be all open and unobstructed)
- the triangulation in the steel trusses which are exposed links to my concept of the football formations - where triangulation forms the typical link up play on a football field
- steel was also used for the screens to block direct sunlight entering the buildings for sustainability, steel was chosen for its strength and durability, and for the low maintenance component

10



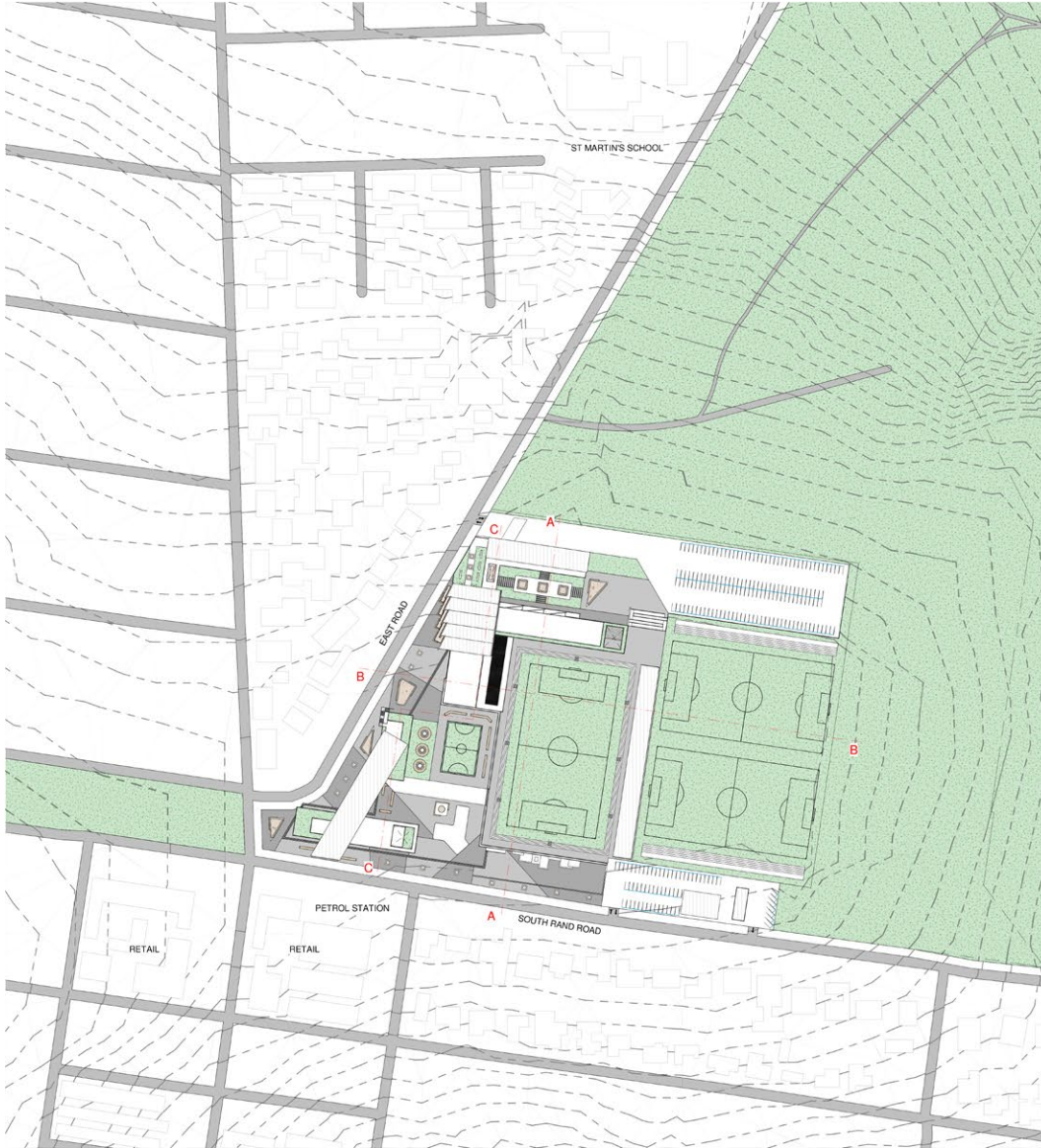
Figure 137: Final render 01 (M Rainho, 2024)



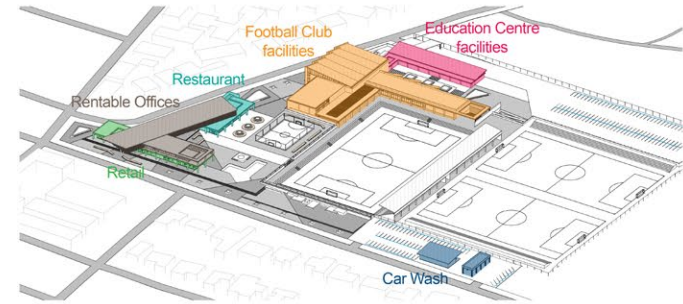
Figure 138: Final render 02 (M Rainho, 2024)



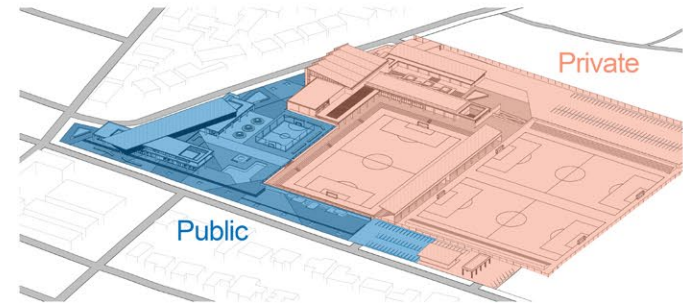
Section A-A
1 : 500



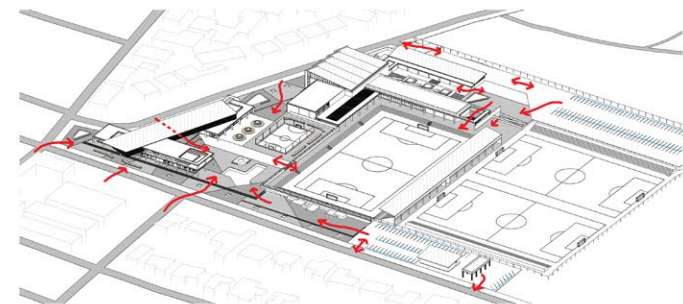
Site Plan
1 : 1500



Program

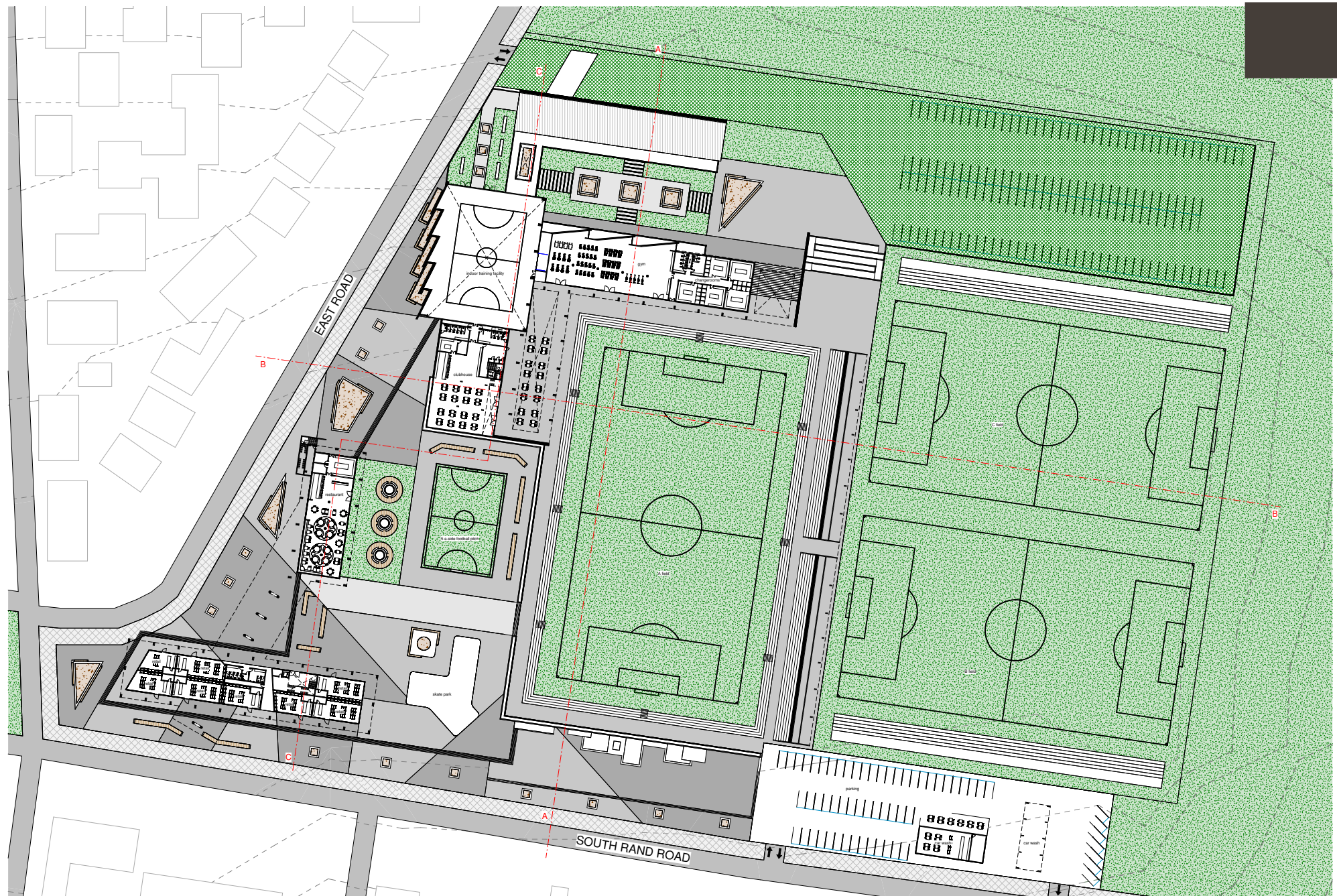


Public vs Private



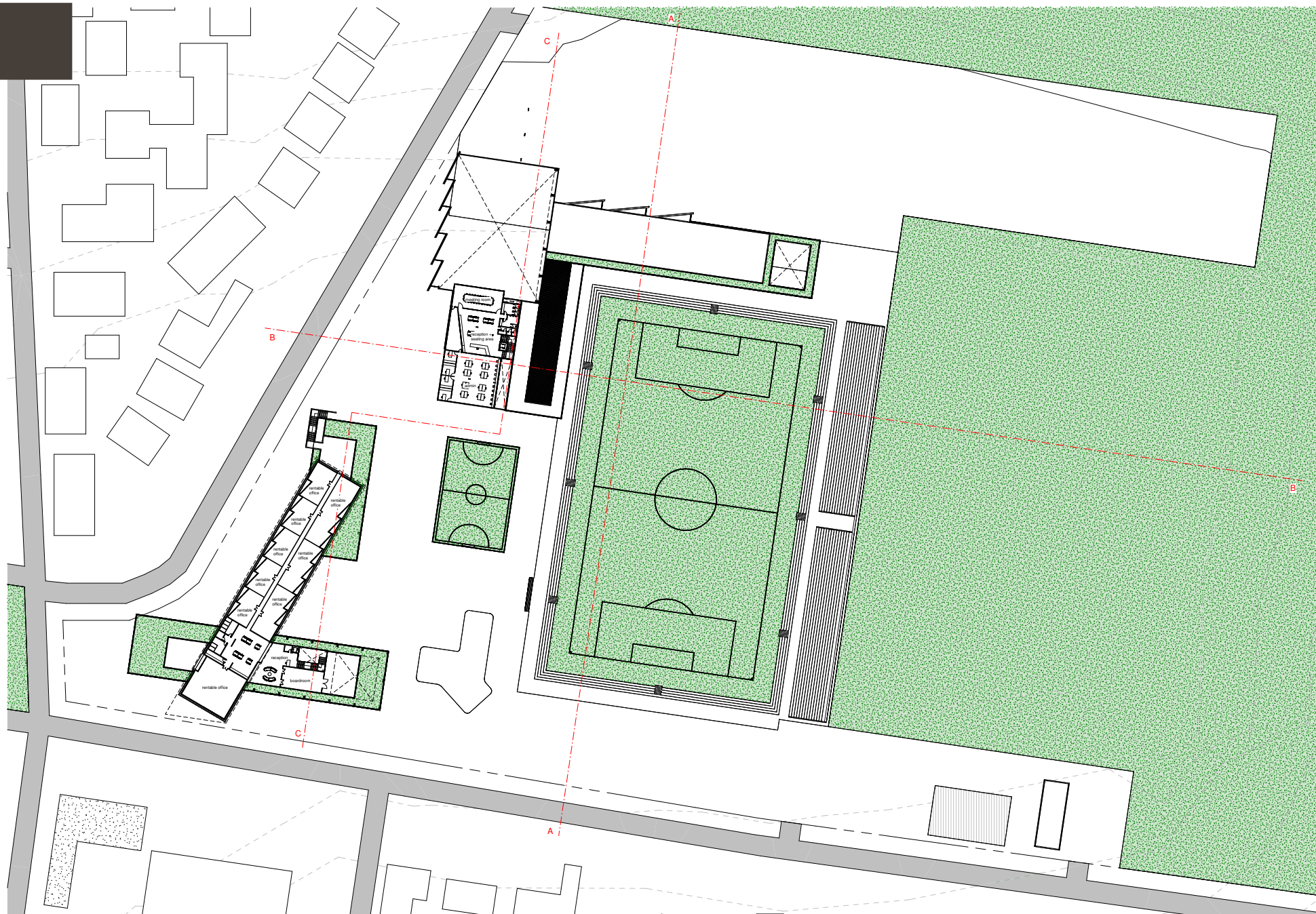
Circulation

Figure 139: Final Site plan & diagrams (M Rainho, 2024)



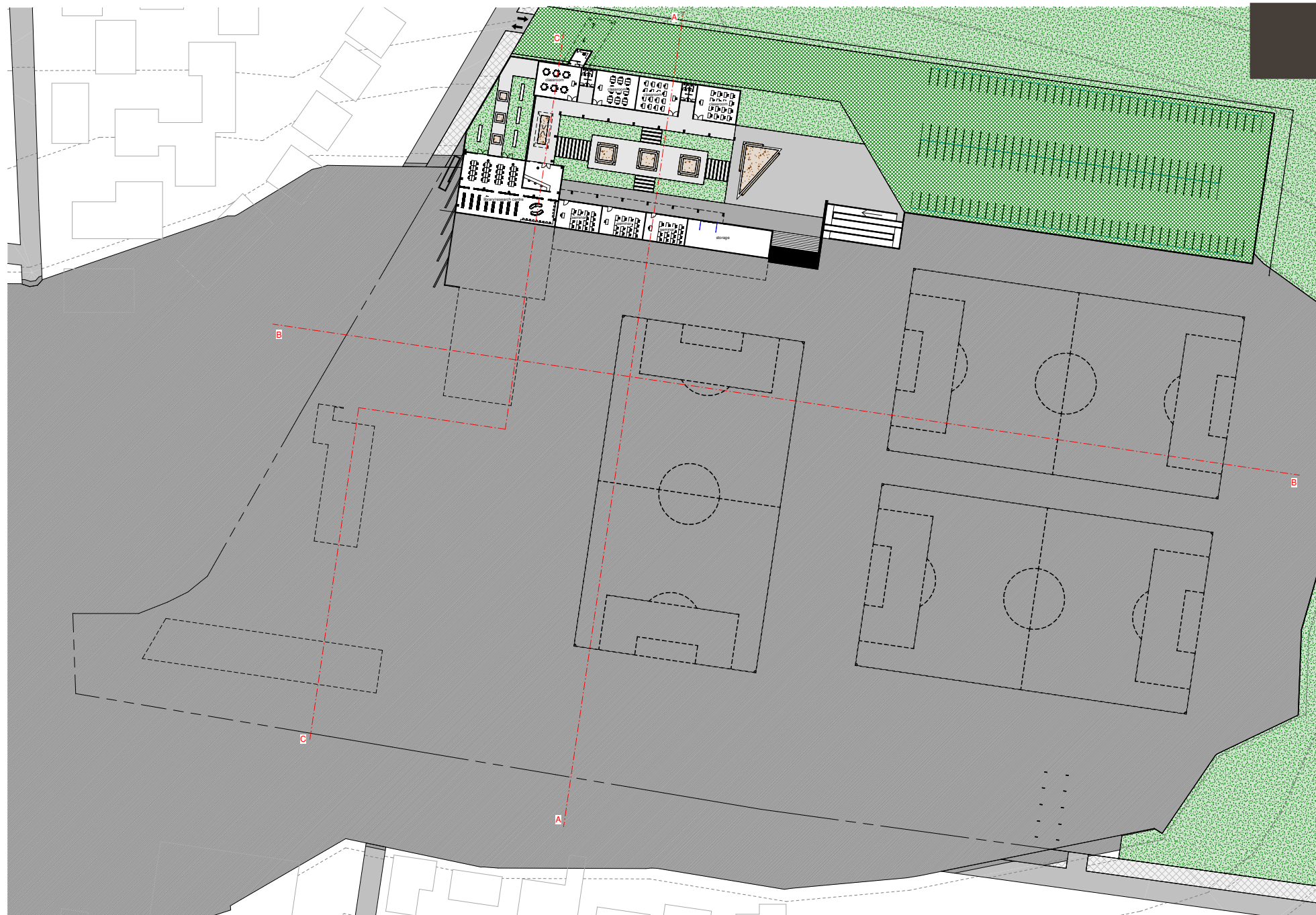
Ground Floor Plan
1:500

Figure 140: Final ground floor plan (M Rainho, 2024)



First Floor Plan
1 : 500

Figure 141: Final First floor plan (M Rainho, 2024)



Lower Ground Floor Plan
1 : 500



Figure 142: Final Lower ground floor plan (M Rainho, 2024)





Figure 143: Final render 03 (M Rainho, 2024)



Figure 144: Final render 04 (M Rainho, 2024)



Figure 145: Final render 05 (M Rainho, 2024)



Figure 146: Final render 06 (M Rainho, 2024)



Figure 147: Final render 07 (M Rainho, 2024)



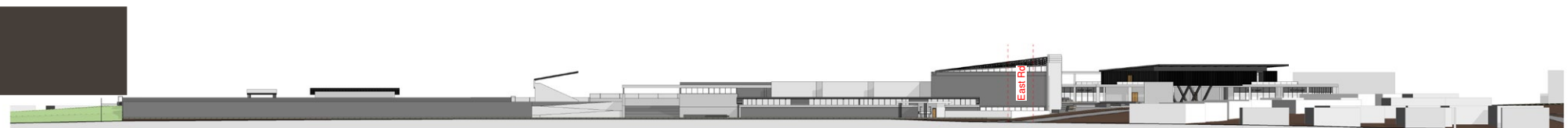
Figure 148: Final render 08 (M Rainho, 2024)



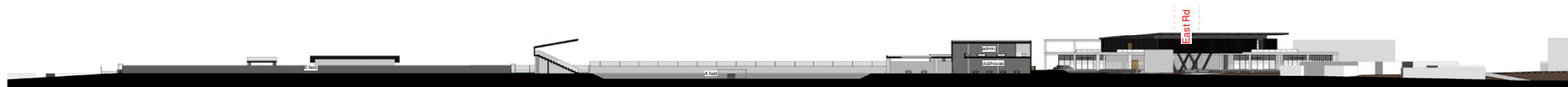
Figure 149: Final render 09 (M Rainho, 2024)



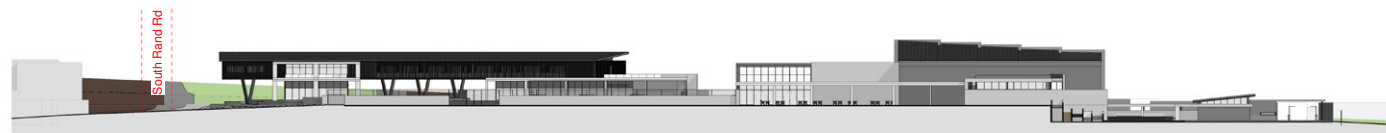
Figure 150: Final render 10 (M Rainho, 2024)



North
1 : 500



Section B-B
1 : 500



East
1 : 500



Section C-C
1 : 500



South
1 : 500



West
1 : 500



Figure 151: Final sections & elevations (M Rainho, 2024)

11

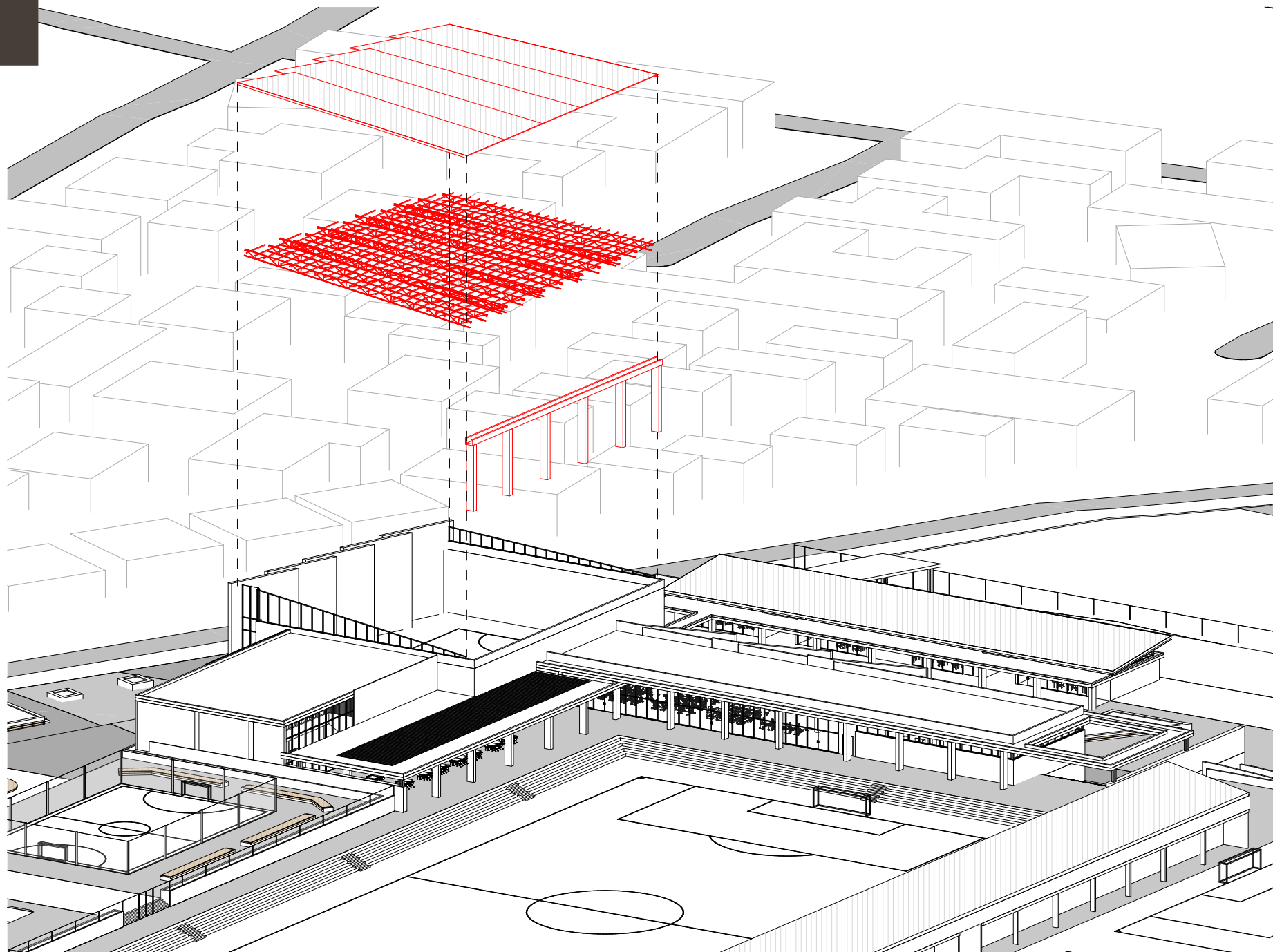


Figure 152: Final exploded axonometric (M Rainho, 2024)
155



Figure 153: Final render 11 (M Rainho, 2024)

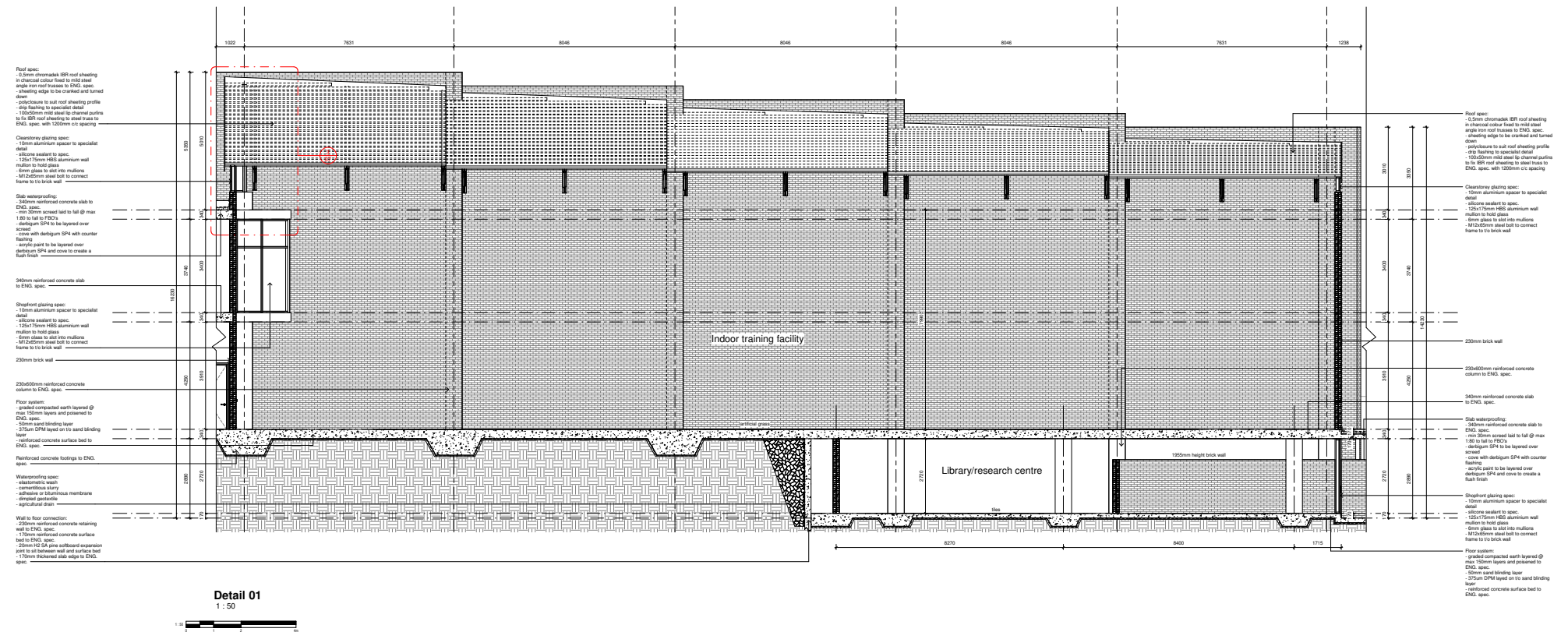
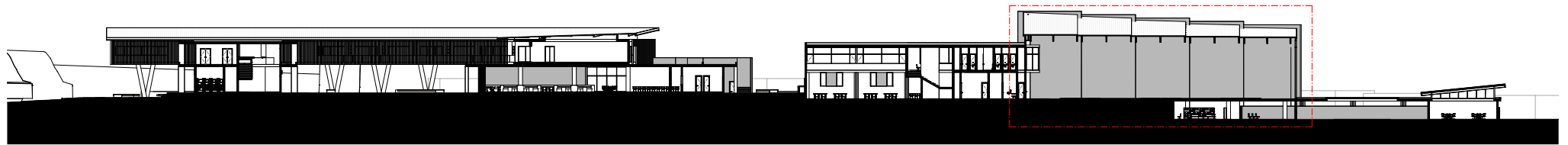


Figure 154: Final technological detail (M Rainho, 2024)

Roof spec:
 - 0.5mm chromadek IBR roof sheeting in charcoal colour fixed to mild steel angle iron roof trusses to ENG. spec.
 - sheeting edge to be cranked and turned down
 - polyclosure to suit roof sheeting profile
 - drip flashing to specialist detail
 - 100x50mm mild steel lip channel purlins to fix IBR roof sheeting to steel truss to ENG. spec. with 1200mm c/c spacing

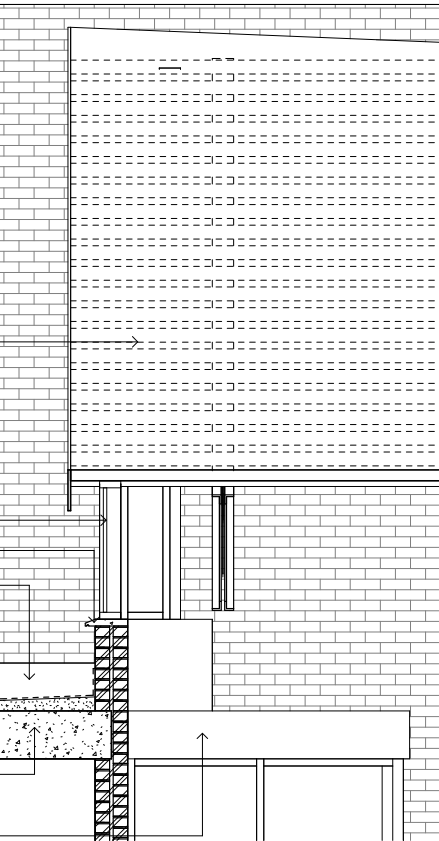
Clearstorey glazing spec:
 - 10mm aluminium spacer to specialist detail
 - silicone sealant to spec.
 - 125x175mm HBS aluminium wall mullion to hold glass
 - 6mm glass to slot into mullions
 - M12x65mm steel bolt to connect frame to t/o brick wall

Concrete coping with drip edge

340mm brick parapet wall

Slab waterproofing:
 - 340mm reinforced concrete slab to ENG. spec.
 - min 30mm screed laid to fall @ max 1:80 to fall to FBO's
 - derbigum SP4 to be layered over screed
 - cove with derbigum SP4 with counter flashing
 - acrylic paint to be layered over derbigum SP4 and cove to create a flush finish

340mm reinforced concrete slab to ENG. spec.

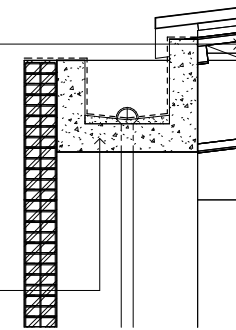


Detail 01 - Callout 1
 1 : 25

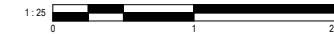


Roof spec:
 - 0.5mm chromadek IBR roof sheeting in charcoal colour fixed to mild steel angle iron roof trusses to ENG. spec.
 - sheeting edge to be cranked and turned down
 - polyclosure to suit roof sheeting profile
 - drip flashing to specialist detail
 - 100x50mm mild steel lip channel purlins to fix IBR roof sheeting to steel truss to ENG. spec. with 1200mm c/c spacing

Concrete gutter spec:
 - 700x450mm reinforced concrete gutter to ENG. spec.
 - min 30mm screed laid to fall @ max 1:80 to fall to FBO's
 - derbigum SP4 to be layered over screed
 - cove with derbigum SP4 with counter flashing
 - acrylic paint to be layered over derbigum SP4 and cove to create a flush finish



Detail 02 - Callout 1
 1 : 25



Concrete gutter spec:
 - 700x450mm reinforced concrete gutter to ENG. spec.
 - min 30mm screed laid to fall @ max 1:80 to fall to FBO's
 - derbigum SP4 to be layered over screed
 - cove with derbigum SP4 with counter flashing
 - acrylic paint to be layered over derbigum SP4 and cove to create a flush finish

Roof spec:
 - 0.5mm chromadek IBR roof sheeting in charcoal colour fixed to mild steel angle iron roof trusses to ENG. spec.
 - sheeting edge to be cranked and turned down
 - polyclosure to suit roof sheeting profile
 - drip flashing to specialist detail
 - 100x50mm mild steel lip channel purlins to fix IBR roof sheeting to steel truss to ENG. spec. with 1200mm c/c spacing

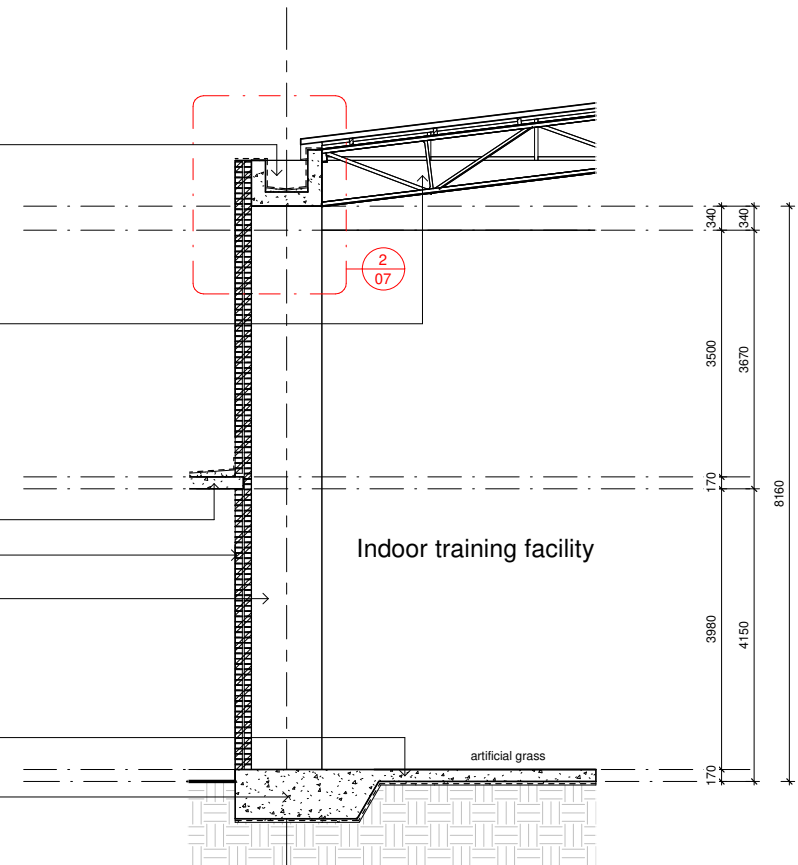
Slab waterproofing:
 - 170mm reinforced concrete slab to ENG. spec.
 - min 30mm screed laid to fall @ max 1:80 to fall to FBO's
 - derbigum SP4 to be layered over screed
 - cove with derbigum SP4 with counter flashing
 - acrylic paint to be layered over derbigum SP4 and cove to create a flush finish

230mm brick wall

500x1000mm reinforced concrete column to ENG. spec.

Floor system:
 - graded compacted earth layered @ max 150mm layers and poisoned to ENG. spec.
 - 50mm sand blinding layer
 - 375um DPM layered on t/o sand blinding layer
 - reinforced concrete surface bed to ENG. spec.

Reinforced concrete footings to ENG. spec.



Detail 02
 1 : 50



Figure 155: Final technological detail (M Rainho, 2024)

12

12.1 CONCLUSION:

On reflection of the project, what has been designed is a building that promotes public interaction and children development. The building invites the community to come together through its open street edges, which direct you to public program to allow engagement between the community - which is currently very divided and separated. The building also provides amenities and program that there is a shortage of in the direct context to limit the need for residents of the area to travel for goods and services. The addition of rentable office spaces allows small businesses to lease space short or long term, or rent out a boardroom for the day for meetings and presentations with potential clients. The separation between public and private has been considered and designed in a way that doesn't feel obstructive and aggressive. The football club's facilities provide maximum development for the players with the addition of a gym for strength training and an indoor training centre to allow sessions to continue even during poor weather conditions. In addition, by providing a large amount of seating to view matches on the fields allows the potential for large scale tournaments and events to take place at the football club - this is a good income source and marketing tool for the football club to attract players. The education centre provides facilities and resources for children to receive extra lessons, have access to wifi and other required resources, and research material. The education centre is directly linked to the football club's building, however, it is still separated to provide for an environment that is calm and inviting. The design emphasizes the links around site and its context, public and private spaces, and visibility throughout to prioritize a welcoming building for maximum engagement.

References:

- Shelflife, (2021). A Look Inside: Nike's New Shapa Soweto Training Centre. [online] Available at: <https://www.shelflife.co.za/magazine/a-look-inside-nike-s-new-shapa-soweto-training-centre> [Accessed 6 May 2024].
- World Brand Design Society. (2022). Shapa Soweto Graphic Design for Spatial Environments. [online] Available at: <https://worldbranddesign.com/shapa-soweto-graphic-design-for-spatial-environments/> [Accessed 6 May 2024].
- LivinSpaces. (2023). Inside Shapa Soweto - The Revamped Nike Football Training Center in South Africa by C76 Architects. [online] Available at: <https://livinspaces.net/projects/architecture/inside-shapa-soweto-the-revamped-nike-football-training-center-in-south-africa-by-c76-architects/> [Accessed 6 May 2024].
- C76. (n.d.). Nike Shapa Soweto. [online] Available at: <https://www.c76.co.za/nike-shapa-soweto> [Accessed 6 May 2024].
- Archdaily. (2022). Nike Experience Hub - Potsdamer Platz / Blossity. [online] Available at: <https://www.archdaily.com/988636/nike-experience-hub-potsdamer-platz-blossity> [Accessed 6 May 2024].
- Archdaily. (2016). UVA Sol De Oriente / EDU. [online] Available at: <https://www.archdaily.cl/cl/792406/uva-sol-de-orientede-educ> [Accessed 6 May 2024].
- Archdaily. (2011). Le Grand Parquet / Joly&Loiret. [online] Available at: <https://www.archdaily.com/189575/le-grand-parquet-jolyloiret> [Accessed 6 May 2024].
- Archdaily. (2022). Green School South Africa / GASS Architecture Studios. [online] Available at: <https://www.archdaily.com/978637/green-school-south-africa-gass-architecture-studios> [Accessed 5 May 2024].
- Gass Architecture Studios. (n.d.). Green School. [online] Available at: <https://www.gass.co.za/projects-1/green-school> [Accessed 6 May 2024].
- South African Government. (n.d.). Statistics South Africa on Quarterly Labour Force Survey quarter 3 2023. [online] Available at: <https://www.gov.za/news/media-statements/statistics-south-africa-quarterly-labour-force-survey-quarter-three-2023-14> [Accessed 6 May 2024].
- Stats SA. (2024). Unemployment in South Africa: A Youth Perspective. [online] Available at: [https://www.statssa.gov.za/?p=17266#:~:text=Limited%20educational%20attainment%2C%20as%20well,NEET\)%2C%20in%20South%20Africa.](https://www.statssa.gov.za/?p=17266#:~:text=Limited%20educational%20attainment%2C%20as%20well,NEET)%2C%20in%20South%20Africa.) [Accessed 6 May 2024].
- Javanmardi, E. and Liu, S. (2019). Exploring Grey Systems Theory-Based Methods and Applications in Analyzing Socio-Economic Systems. Sustainability, [online] 11(15), p.4192. doi:<https://doi.org/10.3390/su11154192>.
- Backovic, V. and Masirevic, L. (2010). Social theory and architecture. [online] Research gate. Available at: https://www.researchgate.net/publication/353313697_Social_theory_and_architecture#:~:text=The%20role%20of%20architecture%20through,directed%20planning%20of%20the%20cities. [Accessed 19 Jul. 2024].
- Anon, (2023). Placemaking In Urban Design. [online] Available at: <https://urbandesignlab.in/placemaking-in-urban-design/#:~:text=1.->.

References:

- Johnson, D.L. (2005). Rationalism. [online] architecture-history.org. Available at: <http://architecture-history.org/schools/RATIONALISM.html>.
- Banker, N. (2019). The Phenomenon of Place. [online] Synthesis. Available at: <https://www.synthinc.com/post/the-phenomenon-of-place#:~:text=In%20%E2%80%9CThe%20Phenomenon%20of%20Place> [Accessed 24 Jul. 2024].
- Sreekumar, D. (2023). What is Research Methodology? Definition, Types, and Examples | Paperpal. [online] Paperpal. Available at: <https://paperpal.com/blog/academic-writing-guides/what-is-research-methodology>.
- www.qcc.cuny.edu. (n.d.). Queensborough Community College. [online] Available at: https://www.qcc.cuny.edu/socialsciences/ppecorino/intro_text/chapter%205%20epistemology/rationalism.htm#:~:text=Rationalism%20is%20a%20method%20of.
- Mayur Waghulde (2017). Rationalism Architecture. [online] Slideshare.net. Available at: <https://www.slideshare.net/MayurWaghulde3/rationalism-architecture>.
- www.linhill.co.za. (n.d.). About Us | Linhill Celtic Football Club. [online] Available at: <https://www.linhill.co.za/about-us/> [Accessed 24 Jul. 2024].
- Wikipedia. (2023). Linmeyer. [online] Available at: <https://en.wikipedia.org/wiki/Linmeyer> [Accessed 24 Jul. 2024].
- Wikipedia Contributors (2017). The Hill. [online] Wikipedia. Available at: https://en.wikipedia.org/wiki/The_Hill.
- Eighty20. (2024). South Africa: More than just sport fanatics. [online] Available at: <https://www.eighty20.co.za/south-africa-more-than-just-sport-fanatics/> [Accessed 24 Oct. 2024].
- South Africa. (n.d.). Soccer in South Africa. [online] Available at: <https://southafrica.co.za/soccer.html> [Accessed 24 Oct. 2024].

List of Figures:

1. *Map of site and important connections (M Rainho, 2024)*
2. *Photograph of clubhouse (M Rainho, 2024)*
3. *Photograph of A field (M Rainho, 2024)*
4. *Photograph of A field (M Rainho, 2024)*
5. *Photograph of B and C fields (M Rainho, 2024)*
6. *Photograph of open space off South Rand Rd (M Rainho, 2024)*
7. *Photograph of parking off East Rd (M Rainho, 2024)*
8. *Photograph of entrance off East Rd (M Rainho, 2024)*
9. *Photograph of entrance off East Rd (M Rainho, 2024)*
10. *Photograph of East and South Rand intersection (M Rainho, 2024)*
11. *Photograph of retail on South Rand Rd (M Rainho, 2024)*
12. *Photograph of South Rand Rd (M Rainho, 2024)*
13. *Photograph of South Rand Road (M Rainho, 2024)*
14. *Photograph of open space off South Rand Rd (M Rainho, 2024)*
15. *Photograph of open space off South Rand Rd (M Rainho, 2024)*
16. *Photograph of open space off South Rand Rd (M Rainho, 2024)*
17. *Photograph of car wash next to site (M Rainho, 2024)*
18. *Analysis of site map (M Rainho, 2024)*
19. *Analysis of site map (M Rainho, 2024)*
20. *Analysis of site map (M Rainho, 2024)*
21. *Analysis of site map (M Rainho, 2024)*
22. *Analysis of site map (M Rainho, 2024)*
23. *Analysis of site map (M Rainho, 2024)*
24. *Analysis of site map (M Rainho, 2024)*
25. *Analysis of site map (M Rainho, 2024)*
26. *Analysis of site section (M Rainho, 2024)*
27. *Analysis of site section (M Rainho, 2024)*
28. *Analysis of site section (M Rainho, 2024)*
29. *Analysis of site section (M Rainho, 2024)*
30. *Analysis of site section (M Rainho, 2024)*
31. *Analysis of program map (M Rainho, 2024)*
32. *Analysis of football clubs around Johannesburg map (M Rainho, 2024)*
33. *Analysis of football clubs with an education centre around Johannesburg map (M Rainho, 2024)*
34. *Analysis of public and private schools in the context map (M Rainho, 2024)*
35. *Analysis of economic diversity map (M Rainho, 2024)*
36. *Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5013/4695/28ba/0d0e/f000/0a64/slideshow/stringio.jpg?1414492020> [Accessed 24 Jul. 2024].*
37. *Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5013/46a0/28ba/0d0e/f000/0a67/slideshow/stringio.jpg?1414492020>*

- .jpg?1414492047* [Accessed 24 Jul. 2024].
38. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5013/4691/28ba/0d0e/f000/0a63/slideshow/stringio.jpg?1414492056> [Accessed 24 Jul. 2024].
39. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5013/46a7/28ba/0d0e/f000/0a69/slideshow/stringio.jpg?1414492041> [Accessed 24 Jul. 2024].
40. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5013/46ab/28ba/0d0e/f000/0a6a/slideshow/stringio.jpg?1414492038> [Accessed 24 Jul. 2024].
41. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5013/4699/28ba/0d0e/f000/0a65/slideshow/stringio.jpg?1414492053> [Accessed 24 Jul. 2024].
42. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5013/469c/28ba/0d0e/f000/0a66/slideshow/stringio.jpg?1414492050> [Accessed 24 Jul. 2024].
43. Architizer. (n.d.). Idea 3523415: Nike Shapa Soweto by C76 Architecture and Design in Soweto, South Africa. [online] Available at: <https://architizer.com/idea/3523415/> [Accessed 24 Jul. 2024].
44. Architizer. (n.d.). Idea 3523426: Nike Shapa Soweto by C76 Architecture and Design in Soweto, South Africa. [online] Available at: <https://architizer.com/idea/3523426/> [Accessed 24 Jul. 2024].
45. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_c76_27.webp [Accessed 24 Jul. 2024].
46. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_c76_10.webp [Accessed 24 Jul. 2024].
47. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_c76_30.webp [Accessed 24 Jul. 2024].
48. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_c76_11.webp [Accessed 24 Jul. 2024].
49. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_c76_38.webp [Accessed 24 Jul. 2024].
50. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_c76_31.webp [Accessed 24 Jul. 2024].
51. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_c76_1.webp [Accessed 24 Jul. 2024].
52. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_c76_14.webp [Accessed 24 Jul. 2024].
53. Squarespace-cdn.com. (2024). Available at: https://images.squarespace-cdn.com/content/v1/504fd736e4b0fa06c0525e5b/1478047866894-I10SGR4BE118DMGFP59V/NTFC_EXT_RUF_02.jpg?format=2500w [Accessed 24 Jul. 2024].
54. Squarespace-cdn.com. (2016). Available at: https://images.squarespace-cdn.com/content/v1/504fd736e4b0fa06c0525e5b/1478051970259-YHT-4KFBYU001V7K23RLS/NTFC_EXT_RUF_40.png [Accessed 24 Jul. 2024].
55. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_drawings_c76_4.webp [Accessed 24 Jul. 2024].
56. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_c76_10.webp.
57. Livinspaces.net. (2024). Available at: https://livinspaces.net/wp-content/uploads/2023/09/nike_shapa_soweto_drawings_c76_2.webp [Accessed 24 Jul. 2024].

58. Adsttc.com. (2022). Available at: https://images.adsttc.com/media/images/6319/fe97/f55c/666c/0e84/dade/slideshow/nike-experience-hub-potsdamer-platz-blossity_15.jpg?1662648001 [Accessed 24 Jul. 2024].
59. Adsttc.com. (2022). Available at: https://images.adsttc.com/media/images/6319/fe91/f55c/666c/0e84/dada/slideshow/nike-experience-hub-potsdamer-platz-blossity_6.jpg?1662647992 [Accessed 24 Jul. 2024].
60. Adsttc.com. (2022). Available at: https://images.adsttc.com/media/images/6319/fe94/f55c/666c/0e84/dadb/slideshow/nike-experience-hub-potsdamer-platz-blossity_13.jpg?1662647975 [Accessed 24 Jul. 2024].
61. Adsttc.com. (2022). Available at: https://images.adsttc.com/media/images/6319/fea0/f55c/666c/0e84/dae3/slideshow/nike-experience-hub-potsdamer-platz-blossity_10.jpg?1662647986 [Accessed 24 Jul. 2024].
62. Adsttc.com. (2022). Available at: <https://images.adsttc.com/media/images/6318/fe09/3481/2173/5c14/95e7/slideshow/nike-experience-hub-plan-01-1.jpg?1662582298> [Accessed 24 Jul. 2024].
63. Adsttc.com. (2022). Available at: https://images.adsttc.com/media/images/6319/fe95/f55c/666c/0e84/dadc/slideshow/nike-experience-hub-potsdamer-platz-blossity_7.jpg?1662647988 [Accessed 24 Jul. 2024].
64. Adsttc.com. (2022). Available at: https://images.adsttc.com/media/images/6319/fe9b/f55c/666c/0e84/dae0/slideshow/nike-experience-hub-potsdamer-platz-blossity_9.jpg?1662648035 [Accessed 24 Jul. 2024].
65. Adsttc.com. (2016). Available at: [https://images.adsttc.com/media/images/579e/ac92/e58e/ce52/e700/0180/slideshow/PORTADA_UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__\(7\).jpg?1470016625](https://images.adsttc.com/media/images/579e/ac92/e58e/ce52/e700/0180/slideshow/PORTADA_UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__(7).jpg?1470016625) [Accessed 24 Jul. 2024].
66. Adsttc.com. (2016). Available at: [https://images.adsttc.com/media/images/579e/ad06/e58e/cec0/7900/00b0/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__\(11\).jpg?1470016753](https://images.adsttc.com/media/images/579e/ad06/e58e/cec0/7900/00b0/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__(11).jpg?1470016753) [Accessed 24 Jul. 2024].
67. Adsttc.com. (2016). Available at: [https://images.adsttc.com/media/images/579e/ac92/e58e/ce52/e700/0182/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__\(10\).jpg?1470016732](https://images.adsttc.com/media/images/579e/ac92/e58e/ce52/e700/0182/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__(10).jpg?1470016732) [Accessed 24 Jul. 2024].
68. Adsttc.com. (2016). Available at: [https://images.adsttc.com/media/images/579e/acc2/e58e/ce52/e700/0181/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__\(4\).jpg?1470016689](https://images.adsttc.com/media/images/579e/acc2/e58e/ce52/e700/0181/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__(4).jpg?1470016689) [Accessed 24 Jul. 2024].
69. Adsttc.com. (2024). Available at: [https://images.adsttc.com/media/images/579e/ad06/e58e/ce52/e700/0186/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__\(24\).jpg?1470016916](https://images.adsttc.com/media/images/579e/ad06/e58e/ce52/e700/0186/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__(24).jpg?1470016916) [Accessed 24 Jul. 2024].
70. Adsttc.com. (2016). Available at: [https://images.adsttc.com/media/images/579e/ad8d/e58e/ce52/e700/0185/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__\(21\).jpg?1470016875](https://images.adsttc.com/media/images/579e/ad8d/e58e/ce52/e700/0185/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__(21).jpg?1470016875) [Accessed 24 Jul. 2024].
71. Adsttc.com. (2016). Available at: [https://images.adsttc.com/media/images/579e/ae28/e58e/ce52/e700/0187/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__\(32\).jpg?1470017049](https://images.adsttc.com/media/images/579e/ae28/e58e/ce52/e700/0187/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__(32).jpg?1470017049) [Accessed 24 Jul. 2024].
72. Adsttc.com. (2014). Available at: https://images.adsttc.com/media/images/579e/aea1/e58e/ce52/e700/0188/slideshow/Perspective_Section_UVA_Sol_de_Oriente.jpg?1470017175 [Accessed 24 Jul. 2024].
73. Adsttc.com. (2016). Available at: [https://images.adsttc.com/media/images/579e/acc2/e58e/ce52/e700/0181/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__\(4\).jpg?1470016689](https://images.adsttc.com/media/images/579e/acc2/e58e/ce52/e700/0181/slideshow/UVA_SOL_DE_ORIENTE_-_Foto._Alejandro_Arango__(4).jpg?1470016689) [Accessed 24 Jul. 2024].
74. Adsttc.com. (2015). Available at: https://images.adsttc.com/media/images/579e/ae95/e58e/cec0/7900/00b6/slideshow/AXONOMETRIC_SOL_DE_ORIENTE_-_IngIC%CC%A7s.jpg?1470017144 [Accessed 24 Jul. 2024].
75. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee0c/28ba/0d23/5b00/04d7/slideshow/stringio.jpg?1414462069> [Accessed 24 Jul. 2024].
76. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee1a/28ba/0d23/5b00/04db/slideshow/stringio.jpg?1414462081> [Accessed 24 Jul. 2024].
77. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee2f/28ba/0d23/5b00/04e2/slideshow/stringio.jpg?1414462081> [Accessed 24 Jul. 2024].

- jpg?1414462100 [Accessed 24 Jul. 2024].
78. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee62/28ba/0d23/5b00/04f1/slideshow/stringio.jpg?1414462132> [Accessed 24 Jul. 2024].
 79. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee31/28ba/0d23/5b00/04e3/slideshow/stringio.jpg?1414462103> [Accessed 24 Jul. 2024].
 80. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee09/28ba/0d23/5b00/04d6/slideshow/stringio.jpg?1414462134> [Accessed 24 Jul. 2024].
 81. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee29/28ba/0d23/5b00/04e0/slideshow/stringio.jpg?1414462098> [Accessed 24 Jul. 2024].
 82. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee6d/28ba/0d23/5b00/04f5/slideshow/stringio.jpg?1414462158> [Accessed 24 Jul. 2024].
 83. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee41/28ba/0d23/5b00/04e8/slideshow/stringio.jpg?1414462145> [Accessed 24 Jul. 2024].
 84. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee50/28ba/0d23/5b00/04eb/slideshow/stringio.jpg?1414462155> [Accessed 24 Jul. 2024].
 85. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/5016/ee72/28ba/0d23/5b00/04f7/slideshow/stringio.jpg?1414462163> [Accessed 24 Jul. 2024].
 86. Adsttc.com. (2021). Available at: <https://images.adsttc.com/media/images/6232/018a/0ad4/6c01/66a1/6ed2/slideshow/147-green-school.jpg?1647444379> [Accessed 24 Jul. 2024].
 87. Adsttc.com. (2021). Available at: <https://images.adsttc.com/media/images/6232/018f/0ad4/6c11/2f7a/1746/slideshow/153-green-school.jpg?1647444401> [Accessed 24 Jul. 2024].
 88. Adsttc.com. (2021). Available at: <https://images.adsttc.com/media/images/6232/018a/6959/fc01/880c/e632/slideshow/142-green-school.jpg?1647444387> [Accessed 24 Jul. 2024].
 89. Adsttc.com. (2021). Available at: <https://images.adsttc.com/media/images/6232/018c/6959/fc01/670c/e637/slideshow/139-green-school.jpg?1647444405> [Accessed 24 Jul. 2024].
 90. Adsttc.com. (2021). Available at: <https://images.adsttc.com/media/images/6232/0191/6959/fc01/670c/e63f/slideshow/136-green-school.jpg?1647444393> [Accessed 24 Jul. 2024].
 91. Adsttc.com. (2021). Available at: <https://images.adsttc.com/media/images/6232/0191/0ad4/6c11/2f7a/1747/slideshow/083-green-school.jpg?1647444386> [Accessed 24 Jul. 2024].
 92. Tv3.co.za. (2024). Available at: https://www.tv3.co.za/wp-content/uploads/2020/12/Green-School_001_Feature-e1607430292203-600x400.jpg [Accessed 24 Jul. 2024].
 93. Adsttc.com. (2024). Available at: <https://images.adsttc.com/media/images/6232/018f/6959/fc01/670c/e63d/slideshow/164-green-school.jpg?1647444450> [Accessed 24 Jul. 2024].
 94. Worldarchitecture.org. (2022). Available at: <https://worldarchitecture.org/cdnimgfiles/extuploadc/074greenschool.jpg> [Accessed 24 Jul. 2024].
 95. Worldarchitecture.org. (2022). Available at: <https://worldarchitecture.org/cdnimgfiles/extuploadc/074greenschool.jpg> [Accessed 24 Jul. 2024].
 96. Worldarchitecture.org. (2022). Available at: <https://worldarchitecture.org/cdnimgfiles/extuploadc/gssaclassroomsectionsketch.jpg> [Accessed 24 Jul. 2024].
 97. Worldarchitecture.org. (2022). Available at: <https://worldarchitecture.org/cdnimgfiles/extuploadc/gssaclassroomsectionsketch.jpg> [Accessed 24 Jul. 2024].

98. Worldarchitecture.org. (2022). Available at: <https://worldarchitecture.org/cdnimgfiles/extuploadc/gssaclassroomsectionsketch.jpg> [Accessed 24 Jul. 2024].
99. Map of site (COJ, 2024)
100. Map of Linmeyer (M Rainho, 2024)
101. Map of Linmeyer (M Rainho, 2024)
102. Map of The Hill (M Rainho, 2024)
103. Map of The Hill (M Rainho, 2024)
104. Formation sketch (M Rainho, 2024)
105. Formation sketch (M Rainho, 2024)
106. Charette model (M Rainho, 2024)
107. Charette model (M Rainho, 2024)
108. Charette model (M Rainho, 2024)
109. Map analysis (M Rainho, 2024)
110. Map analysis (M Rainho, 2024)
111. Map analysis (M Rainho, 2024)
112. Map analysis (M Rainho, 2024)
113. Map analysis (M Rainho, 2024)
114. Map analysis (M Rainho, 2024)
115. Map analysis (M Rainho, 2024)
116. Map analysis (M Rainho, 2024)
117. Conceptual sketches (M Rainho, 2024)
118. Conceptual sketches (M Rainho, 2024)
119. Review 3 (M Rainho, 2024)
120. Review 3 (M Rainho, 2024)
121. Review 3 (M Rainho, 2024)
122. Review 3 (M Rainho, 2024)
123. Review 3 (M Rainho, 2024)
124. Review 3 (M Rainho, 2024)
125. Technical Workshop (M Rainho, 2024)
126. Technical Workshop (M Rainho, 2024)
127. Technical Workshop (M Rainho, 2024)
128. Technical Workshop (M Rainho, 2024)
129. Design Development (M Rainho, 2024)
130. Design Development (M Rainho, 2024)
131. Design Development (M Rainho, 2024)
132. Design Development (M Rainho, 2024)
133. Design Development (M Rainho, 2024)
134. Design Development (M Rainho, 2024)

- 
135. *Design Development (M Rainho, 2024)*
 136. *Building Materiality (M Rainho, 2024)*
 137. *Final render 01 (M Rainho, 2024)*
 138. *Final render 02 (M Rainho, 2024)*
 139. *Final site plan & diagrams (M Rainho, 2024)*
 140. *Final ground floor plan (M Rainho, 2024)*
 141. *Final first floor plan (M Rainho, 2024)*
 142. *Final lower ground floor plan (M Rainho, 2024)*
 143. *Final render 03 (M Rainho, 2024)*
 144. *Final render 04 (M Rainho, 2024)*
 145. *Final render 05 (M Rainho, 2024)*
 146. *Final render 06 (M Rainho, 2024)*
 147. *Final render 07 (M Rainho, 2024)*
 148. *Final render 08 (M Rainho, 2024)*
 149. *Final render 09 (M Rainho, 2024)*
 150. *Final render 10 (M Rainho, 2024)*
 151. *Final sections & elevations (M Rainho, 2024)*
 152. *Final exploded axonometric (M Rainho, 2024)*
 153. *Final render 11 (M Rainho, 2024)*
 154. *Final technological detail (M Rainho, 2024)*
 155. *Final technological detail (M Rainho, 2024)*